AMCL
LEADING ASSET MANAGEMENT

OFFICE OF ROAD AND RAIL

Supporting ORR in holding National Highways to account with respect to its delivery of operational activity on the Strategic Road Network

Version: 1.0

Date: 6th June 2024

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DOCUMENT CONTROL

APPROVAL

File Ref: 114/013

Version	Date	Compiled by	Reviewed by	Authorised by
1.0	6th June 2024	[redacted]	[redacted]	[redacted]
Draft	5th April 2024	[redacted]	[redacted]	[redacted]

AMENDMENT HISTORY

Version	Date	Sections	Amendment Details
Final Draft	19th April 2024	All	Final Draft issue for client comment.
Draft	5th April 2024	All	Initial Draft issue for client comment

EXECUTIVE SUMMARY

This report contains the findings and recommendations from an assessment undertaken by AMCL on National Highways' capability for reviewing and reporting operational activity performance. National Highways is a government-owned company responsible for operating, maintaining and improving the Strategic Road Network (SRN) of motorways and major A roads in England.

The primary objective of this assessment was to provide the Office of Rail and Road (ORR) with a better understanding of National Highways' operational activity to help enhance how ORR holds the company to account to support its strategic objective for Better Highways. The ORR is a government department responsible for monitoring and enforcing the performance and efficiency of National Highways.

The project comprised of three stages: **diagnostic**, **benchmarking,** and the development of a **roadmap** to turn the findings into a toolkit that ORR can use to enhance its oversight of operational activity at National Highways. This report presents the diagnostic and benchmarking stages. The roadmap is provided under separate cover.

The diagnostic assessed how well National Highways reviews and reports its performance against ten operational activity areas defined within the scope of work. National Highways' current and potential performance review and reporting capability for each operational activity area was assessed and graded as an average of four criteria: **coverage**, **effectiveness**, **acted upon**, and **integration** (see Section 2.2).

A number of key findings emerged from the study, including:

1) **Defining good performance**: What 'good looks like' is currently largely defined by Road Investment Strategy (RIS) strategic objective outcome KPIs and PIs rather than output or technical measures specific to the operational activity.
2) **Complexity of operations**: Whilst the study scope defined ten distinct operational activity areas, there is significant interdependency between them, reflecting the complex nature of operations in asset management lifecycle delivery.
3) **Service provider vs. National Highways performance**: Some measures of performance used across some operational activity areas are framed on service provider rather than National Highways performance. In-house decision making is a fundamental aspect of National Highways' Asset Delivery model and so the company could take the opportunity to better demonstrate this capability.
4) **Benchmarking**: The benchmarking analysis underscored the complexity of drawing direct comparisons with similar organisations, given the diversity in operational contexts and objectives. However, it affirmed the relevance of several operational metrics, such as incident response times and defect management, while advocating for a more nuanced understanding of the impact and efficacy of National Highways' operational technology systems in facilitating the expeditious movement of traffic.

The report makes a number of recommendations at a strategic and tactical level. Tactical recommendations provide an opportunity to enhance National Highways' performance review and reporting capability across each of the operational activity areas. These recommendations include reporting decision-making processes, regional consistency, preparedness of plans and improved definitions.

Strategic recommendations and activities outlined in the roadmap will inform the development of a performance monitoring framework for ORR to improve its approach to holding National Highways to account for its operational activity.

The table below summarises the diagnostic findings against the ten Operational Activity areas, which are described in more detail in Section 3 and Appendix A**.**

Operational Activity Area	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
1. Asset safety defects	3.5	4	Improve coverage by reporting decision-making processes such as inspections, reporting of defect backlogs, consistent defect categorisation.
2. Non-asset related safety **and** 3. Long-duration incidents	3.25	4	Improve coverage by reporting performance against entire SRN, and aspects of incident preparedness, for example planning, resources, roles, debriefs.
4. Multi-region events	0	2	Report aspects of incident preparedness, for example planning, resources, roles, debriefs.
5. Management of expeditious movement of traffic	4	5	Improve coverage and effectiveness by reporting process and activities (rather than mainly outcomes). Improve integration by externally reporting Operational Technology in-station system performance to provide wider view on end-to end system performance.
6. Improving the reliability of Operational Technology systems	2.75	4	Improve coverage by clearly defining reliability and outcomes served, and disaggregation of assets and system components. Improvements to effectiveness with improved asset diagnostic/fault feedback capability.
7. Proactive and reactive systems used to manage customer journeys	3.25	4	Improve coverage and integration through further clarity on full system landscape. Coverage and effectiveness improvements from customer journey mapping as the basis of a performance framework.
8. Provision of welfare to customers	0	2	Report aspects of incident preparedness, external liaison, incident scenario participation.
9. Systems that support third-party access to the SRN	2.25	4	Improve coverage and effectiveness and how measures are acted upon with use of new 'Network Occupancy Ways of Working' performance measures.
10. Management of severe weather events	3.75	5	Improve coverage by reporting decision-making processes for addressing severe weather hazards, consistent processes across regions.
Note: Current capability is an average of four criteria scores hence is a decimal, whereas potential capability is an estimate and therefore kept as a whole number.			

AMCL would like to thank National Highways and ORR participants and to acknowledge the time commitment from the leadership teams of both National Highways and ORR in supporting this assessment.

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1. INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

The Office of Rail and Road's (ORR) road monitoring role was established under the Infrastructure Act 2015 as part of the government's roads reform package. ORR scrutinises National Highways and holds it to account for its management of the Strategic Road Network (SRN) in England, including delivery of performance and efficiency. ORR has powers to enforce National Highways' compliance with the government's Road Investment Strategy (RIS) as well as its licence[1].

ORR's understanding and regulatory approach to National Highways' operational activity is less well established than for other key aspects of Asset Management lifecycle delivery such as capital renewals and cyclical and reactive maintenance. Whilst some specific aspects of operational activity, such as traffic officer attendance on All Lane Running (ALR) motorways, are well defined and performance is understood, other areas are less so. The objective of this study is to provide ORR with a better understanding of National Highways' operational activity to help enhance how ORR holds National Highways to account to support its strategic objective for Better Highways.

1.2 SCOPE

The following ten areas of National Highways' operations are considered within the scope of this review and are referred to as 'operational activity areas' within this report:

1) operational response to asset safety defects;
2) operational response to non-asset related incidents*;
3) competency and capacity to respond to and manage long duration incidents, for example, bronze, silver and gold emergency responses, and engagement with suppliers and third parties*;
4) management and resolution of multi-region events;
5) systems and operations that are used to manage the expeditious movement of traffic, including but not limited to the role of smart motorway technology and the progress the company is making against the Smart motorway evidence stocktake and action plan;
6) improving the reliability of operational technology systems including but not limited to CCTV, radar technology, MIDAS and variable message signs;
7) proactive and reactive systems used to manage customer journeys and the systems that support this;
8) provision of welfare to National Highways' customers, where applicable;
9) the systems that support third party access to the network including but not limited to public utilities; and
10) operational competency and capacity in the delivery of severe weather events.

**note that non-asset related and long duration incidents have been combined within the diagnostic assessment due to similarities in approach to these operational activity areas by National Highways.*

The review comprises three stages: **diagnostic, benchmarking** and the development of a **roadmap** to turn the findings into a toolkit that ORR can use to strengthen its monitoring of National Highways' operational activity. This report presents the diagnostic and benchmarking stages, the roadmap is provided under separate cover.

[1] https://assets.publishing.service.gov.uk/media/5a80c317ed915d74e33fc43c/strategic-highways-licence.pdf

2. APPROACH AND METHODOLOGY

2.1 OVERVIEW

AMCL's model for diagnosing asset-intensive organisations and setting out a pathway to improvement that realises value for the business is shown in Figure 1. This approach for the way AMCL engages with our clients has been developed over many years to ensure our services are delivered logically and systematically and applies a methodology that offers consistency, provides the opportunity for benefits validation, and provides a focus on unlocking value for clients through a structured methodology and robust work plan. AMCL has applied key stages of this approach for this assignment, highlighted in yellow in Figure 1.

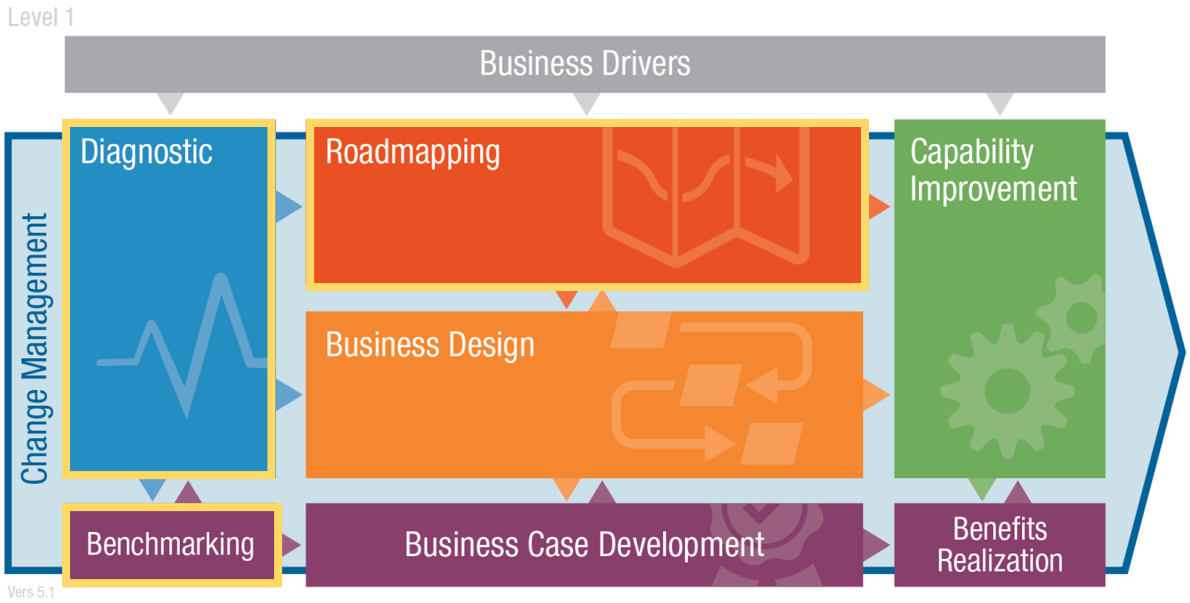

Figure 1 - AMCL Approach: Transforming Asset Management Organisations

These key stages in the model's approach are **diagnostic, benchmarking** and **roadmapping** which align with the three parts of this project. The methodology for each section is outlined below.

2.2 DIAGNOSTIC

The diagnostic phase of this project aims to assess how well National Highways reviews and reports its performance against each of the ten operational activity areas within the scope of this project (see Section 1.2). The diagnostic assessment was undertaken in four key stages:

1) **Review of National Highways documentation** – a desktop review of relevant documentation and information sources.
2) **Kick-off awareness briefing** – initial meetings with ORR and National Highways staff to introduce the scope of the project and identify key stakeholders.
3) **Interviews with key representatives** – a series of interviews with key National Highways stakeholders to verify the findings from the desktop review and to expand the understanding of operational practices and performance indicators that were not documented.
4) **Evaluation of evidence** – completion of a capability assessment that allowed for collation and documentation of findings and validation with technical oversight assurance checks.

The diagnostic assessment and findings are grouped into five sections for each of the ten operational activity areas:

1) **Activities Identified** – a summary of the activities National Highways delivers against the operational activity area, identified from the documentation review and interviews with National Highways personnel.
2) **Performance Measures Identified** – a summary of the performance measures identified as being relevant to review and reporting of performance of each operational activity area.
3) **Current Capability** – an assessment of how well the performance of the activities National Highways manages and delivers are currently reviewed and reported using the performance metrics made available and reviewed as part of this work.
4) **Potential Capability** – an assessment of how well the performance of the activities National Highways manages and delivers could potentially be reviewed and reported in the future based on the diagnostic findings. For example, this could include expansion of current measures to improve coverage; generating reporting of operational items that National Highways does but does not necessarily measure or report on currently; or areas of development that National Highways is delivering to improve current capability.
5) **Summary of Diagnostic Scores** – using the scoring criteria in Table 1 on the following page, National Highways' current and potential capability for reviewing and reporting its performance against each operational activity area is assessed and graded as an average of four measures:
    i. **Coverage** – how much coverage does, or could, performance reporting provide of the operational activity area?
    ii. **Effectiveness** – how effective is, or could, performance reporting be in assessing the operational activity area?
    iii. **Acted Upon** – what is, or could be, the extent to which performance reporting is reported and acted upon?
    iv. **Integration** – how well is, or could, performance reporting be integrated with ORR and / or its service providers?

Score	Performance Review and Reporting Capability	Description
0	None	No measures in place that assess performance of operational activity area
1	Basic	Coverage: Coverage estimated at less than 20% Effectiveness: Ineffective / inconsistent measurement Acted Upon: Rarely acted upon Integrated: Not integrated with ORR or Service Providers

Score	Performance Review and Reporting Capability	Description
2	Limited	Coverage: Coverage estimated at between 20% and 40% Effectiveness: Effective / consistent measurement Acted Upon: Reviewed but not acted upon Integrated: Minimal integration with ORR or Service Providers
3	Moderate	Coverage: Coverage estimated at between 40% and 60% Effectiveness: Defined but not systematically produced Acted Upon: Reviewed and generally acted upon Integrated: Some integration with ORR or Service Providers
4	Good	Coverage: Coverage estimated at between 60% and 80% Effectiveness: Defined and systematically produced Acted Upon: Systematically reported and acted upon Integrated: Some integration with ORR and Service Providers
5	Excellent	Coverage: Coverage estimated at greater than 80% Effectiveness: Defined and systematically produced and integrated Acted Upon: Systematically reported and acted upon and closed out Integrated: Full integration with ORR and Service Providers

Table 1 – Performance Review and Reporting Capability Assessment Criteria

2.3 BENCHMARKING

The purpose of the benchmarking exercise is to compare the National Highways' performance indicators for operational activities against similar organisations in the UK and abroad, provide ORR with insights into best practice performance measures and approaches, and highlight potential areas for improvement.

Within the timescales allowed for this project, a desktop exercise was conducted to search and analyse publicly available information for similar and comparable organisations both in the UK and overseas.

2.4 ROADMAP

The purpose of this activity is to develop a roadmap designed to enhance ORR's ability to effectively monitor performance, support decision-making, and ensure National Highways is accountable for its licence requirement to ensure the effective operation of the SRN.

The process of developing the roadmap has been informed by the findings of the diagnostic and benchmarking activities, leading to an outline of activities to improve performance measures where

obvious gaps were identified to inform the development of a performance monitoring framework for ORR to improve its approach to holding National Highways to account for its operational activity. These recommendations were presented to ORR for prioritisation and to establish feasible timelines for implementation.

Ultimately, the implementation of the roadmap will be fundamental in addressing critical gaps and embedding best practice performance monitoring practices, enabling ORR to hold National Highways to account for the delivery of operational activities across the SRN, ensuring alignment between strategic KPIs, operational performance measures, asset-level performance indicators and strategic objectives.

The roadmap has been provided as a separate document.

The roadmap will be achieved by adopting best practice performance measures and methodologies to monitor and align performance indicators with strategic objectives, ensuring performance indicators are systematically measured, collected, analysed, reported, and actioned to improve operational performance.

This entails establishing and implementing best practice performance indicators that facilitate consistent evaluation, ensuring ORR strategic objectives are aligned with operational activities delivered by National Highways.

3. FINDINGS & RECOMMENDATIONS

3.1 DIAGNOSTIC FINDINGS

This study has identified a number of key findings emerging across some or all of the operational activity areas considered within the scope of this review. These include:

1) **Defining good performance:** What 'good looks like' is currently largely defined by RIS strategic objective outcome Key Performance Indicators (KPIs) and Performance Indicators (PIs) rather than output or technical measures specific to the operational activity. For example, response to non-asset related and long-duration incidents is defined by the incident clearance rate KPI for motorways to inform the fast and reliable journey outcome, rather than any tactical leading indicators of incident response preparedness.

2) **Complexity of operations:** Whilst the study scope defined ten distinct operational activity areas, there is significant interdependency between them, reflecting the complex nature of operations in asset management lifecycle delivery. For example, operational capacity in the delivery of severe weather operations relies in part on processes for incident management planning to identify and prepare operational response, reliability of operational technology systems to monitor conditions and systems to manage expeditious movement of traffic.

3) **Service provider vs. National Highways performance**: Some measures of performance used across some operational activity areas are framed on service provider rather than National Highways performance. For example, external reporting of defects completed, and winter maintenance treatment activity is based on Collaborative Performance Framework measures that National Highways uses to hold its service providers to account. In AMCL's 2023 asset management capability assessment of National Highways[2], it was found that the change to its Asset Delivery[3] model has had a significant effect on the capability of National Highways to define, implement and control an Asset Management system. National Highways is not yet taking the opportunity to provide performance measures and reporting that show how it is implementing and controlling parts of the system it is directly responsible for and in control of.

4) **Regional consistency**: National Highways highlighted that gaining a consistent approach to operational activities such as incident response, third-party access to the network and defects, is a priority. This is consistent with a finding from AMCL's 2023 asset management capability assessment of National Highways where it was found that although improvements in how investment decisions are being made, the approach to investment and operational prioritisation and optimisation currently still varies across the regions because of legacy factors. There is limited evidence of measures used to assess consistency in approaches to operational activities across regions in this study.

5) **Performance framework:** Much of the performance reporting National Highways produces externally is delivered through RIS performance outcome metrics that do not necessarily align with operational activity areas defined in the scope of this study. This is reflected by the limited coverage scores made against each operational activity area within the diagnosis exercise. ORR would benefit from a performance monitoring framework that clearly defines what it expects

[2] AMCL commission for internal review to assess National Highways' Asset Management Capability carried out in 2023 (unpublished)

[3] Asset Delivery is where National Highways is directly responsible for managing all aspects of the operation of the network.

to understand about National Highways' operational activity. It is noted that the ORR's Monitoring Reporting Guidelines for Road Period 2[4] make minimal reference to reporting of National Highways' operational activities.

6) **Performance influence:** National Highways is not always in control of factors affecting the performance measures used to assess operational activities. For example, incident response clearance times will sometimes be affected by decisions made by third parties such as the emergency services. A number of opportunities have been highlighted (see recommendations) of measures that may better demonstrate the performance of activities that National Highways has greater control of, such as its decision-making processes, or regional consistency of defect assessment.

7) **Multi-agency collaboration:** Operational activity areas such as incident response, provision of welfare and severe weather require multi-agency response and coordination. In order to better understand how well National Highways is performing, ORR and National Highways may wish to consider performance measures that monitor the satisfaction of the external agencies National Highways works with, such as emergency services or Local Resilience Forums. Gauging an opinion from third parties on National Highways' management of network occupancy may similarly support an understanding of operational performance and opportunities to improve.

3.1.1 KEY DIAGNOSTIC FINDINGS AND SCORES BY OPERATIONAL AREA

A summary of the findings from the diagnosis of the capability of National Highways' current state and future potential is presented in Table 2. Note that the capability scoring is an average of four criteria: **coverage**, **effectiveness**, **acted upon**, and **integration** (see Section 2.2).

[4] https://www.orr.gov.uk/sites/default/files/om/monitoring-reporting-guidelines-for-highways-england-for-road-period-2.pdf

Operational Activity Area	Capability Assessment				Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
	Coverage	Effectiveness	Acted Upon	Integrated			
1. Operational response to asset safety defects	1	4	4	5	**3.5**	**4**	• Improve coverage by reporting National Highways decision-making processes such as inspections, reporting of defect backlogs, consistent defect categorisation.
2. Operational response to non-asset related safety incidents; and 3. Long-duration incidents	1	4	4	4	**3.25**	**4**	• Improve coverage by reporting performance against entire SRN, and aspects of incident preparedness that National Highways is in full control of for example planning, resources, roles, debriefs.
4. Management and resolution of multi-region events	0 - No measures in place that assess performance				**0**	**2**	• Report aspects of incident preparedness that National Highways is in full control of for example planning, resources, roles, debriefs.
5. Systems and operations that are used to manage the expeditious movement of traffic	4	4	4	4	**4**	**5**	• Improve coverage and effectiveness by reporting process and activities (rather than mainly outcomes). • Improve integration by externally reporting Operational Technology in-station system performance to provide wider view on end-to end system performance.
6. Improving the reliability of Operational Technology systems	1	2	4	4	**2.75**	**4**	• Improve coverage by clearly defining reliability and outcomes served, and disaggregation of assets and system components. • Improvements to effectiveness with improved asset diagnostic/fault feedback capability.
7. Proactive and reactive systems that are used to manage customer journeys	2	4	4	3	**3.25**	**4**	• Improve coverage and integration through further clarity on full system landscape.

Operational Activity Area	Capability Assessment				Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
	Coverage	Effectiveness	Acted Upon	Integrated			
							• Coverage and effectiveness improvements from customer journey mapping as the basis of a performance framework.
8. Provision of welfare to customers	0 - No measures in place that assess performance				**0**	**2**	• Report aspects of incident preparedness, Local Resilience Forum liaison, incident scenario participation.
9. Systems that support third-party access to the network	1	1	3	4	**2.25**	**4**	• Improve coverage and effectiveness and how measures are acted upon with use of new 'Network Occupancy Ways of Working' project performance measures.
10. Operational competency and capacity in the delivery/management of severe weather events	3	4	4	4	**3.75**	**5**	• Improve coverage by reporting National Highways decision-making processes for addressing severe weather hazards, consistent processes across regions.

Table 2 - Diagnosis of Performance Review and Reporting Capability – Summary Scores

3.2 BENCHMARKING FINDINGS

The following overall findings were concluded from the benchmarking exercise:

1) **Variation in data collection**: Several previous large-scale studies have attempted to internationally benchmark road transport performance measures, such as the EU Baseline Project[5], but a key theme is that direct comparisons are not possible, or advisable, due to the variation in the ways in which data was collected and presented. Data collection is driven by the countries' overarching performance measures and the particular outcome of the measure. For example, road condition data can be collected to inform cost and maintenance efficiency but also can be collected in relation to road safety measures. Whilst the base data may be similar the published data cannot easily be compared.
2) **Benchmarking limitations**: When similar data was available, direct comparison was not advised due to the differing nature of the road networks in each country or even each region. Factors such as terrain, climate and population density all impact the road operator's ability to respond to incidents, complete maintenance and improve operation through asset enhancements. It has been possible to determine, to some extent, which of the ten operational metrics identified by ORR are considered a valid measure of operational performance and theses are summarised in Table 3 and discussed in more detail in Appendix B. The metrics have been grouped where the outcomes and discussions are similar, for example, severe weather and multi region response, to avoid duplication.
3) **Shifting Focus of Performance Indicators for Government Organisations**: There have been clear trends in the development of performance metrics in recent years with increased focus on alignment with organisational strategic goals, a focus on measures that directly impact of citizen satisfaction and a move from output based to outcome based metrics. There is more focus on measuring the 'change' in the performance metric rather than benchmarking against a static benchmark.

A benchmark, by definition, is a standard or point of reference against which things may be compared. But in the transport sector the term benchmark is often used to refer to a wider context of performance measurement[6]. Whilst there are limitations to making comparisons between specific values of targets and standards to be achieved, there is considerable value in comparing and sharing knowledge relating to the metrics to be measures, the methods of measurements and their application to overall outcomes.

3.2.1 KEY BENCHMARKING FINDINGS BY OPERATIONAL AREA

A summary of the key benchmark findings by the ten operational areas is presented in Table 3.

[5] The BASELINE project: Harmonized measurement of road safety Key Performance Indicators, High level group on road safety, March 28th 2023.
[6] For example the Community of Metros (COMET) is referred to as a benchmarking group but also supports knowledge share, decision making a performance measure systems. https://communityofmetros.org/.

Operational Activity Area	Benchmarking Key Findings
1. Operational response to asset safety defects	• Data for this metric was available but varied considerably depending on the definition of a 'safety defect'. Most organisations adopt a risk-based approach. • The speed at which safety defects can be identified and reported has changed with phone applications that allow users to report incidents as they occur. This will impact overall response times (by reducing time to identify the defect) and the public perception of what constitutes an acceptable response time. • It is not constructive to comment on whether the actual response time, and the extent to whether this is achieved, is appropriate but there is evidence to confirm that this is a valid metric and there is ability (now and in the even more so in the future) to measure this in more granular detail, without significant burden on road network operator, through the use of the real time data available. • Targets and performance levels must be determined though local analysis of impacts of non-performance on required outcomes, balanced against operational constraints, costs and practicality.
2. Operational response to non-asset related safety incidents competency and capacity to respond to and 3. manage long-duration incidents	• Data for this metric was widely available but difficult to compare due to variation in incident type, involvement of multiple agencies and the need for quality incident investigation. • Target response times cannot be compared directly due to road criticality, accessibility and public acceptance of delay. • Evidence suggested that measuring incident response times for road incidents is essential for efficient traffic management and ensuring public safety. • With increasing availability of 'real time' traffic data via phone apps, any performance measures must align with public awareness and reflect their experience of the incident.
4. Management and resolution of multi-region events	• No directly comparable published data was found due to the varied nature and duration of events. Information available focused on demonstration of preparedness for event scenarios and subsequent learning from experience. • There is evidence to confirm that the measurement of performance in these areas is important to ensure there is continual adaptation and enhancement of response plans based on learning from experience and ensure that any lessons identified are actioned.
10. Operational competency and capacity in the delivery/management of severe weather events	
5. Systems and operations that are used to manage the expeditious movement of traffic	• No directly comparable published data found that related to the reliability, use and application of traffic management systems (data related only to the output of such systems). • There is evidence to suggest that measurement of this metric is useful to determine the efficiency of highway operators in maintaining and utilising their assets. Consideration must also be given to the accuracy of the data and resistance to cyber-attack. • The increasing reliance on IT and technology-based assets for the management of traffic flow means that it will become more important
6. Improving the reliability of operational technology systems	

Operational Activity Area	Benchmarking Key Findings
7. Proactive and reactive systems that are used to manage customer journeys	(and easier) to measure and report the performance of the system components at all levels.
8. Provision of welfare to National Highways' customers	• No comparable published data found. • There is no evidence to suggest that measurement of this metric unless it is a designated National Highways responsibility.
9. Systems that support third-party access to the network	• No comparable published data found. • There is evidence to suggest that measurement of response times for 'permit to work' systems is a good metric for measurement of performance.

Table 3 – Summary of Benchmarking Key Findings

3.3 OVERALL FINDINGS & RECOMMENDATIONS

This study has made a number of findings from the diagnostic and benchmarking exercises across all of the operational activity areas, as well as recommendations for improving performance review and reporting capability specific to each of the ten operational activity areas as presented in Table 4 on the following page. These findings and recommendations form the basis of an improvement roadmap that also embraces best practices in performance monitoring, as well as provide a blueprint for a holistic transformation of the existing performance monitoring approach. It details a series of activities aimed at developing a performance monitoring framework to ensure ORR monitors how National Highways delivers operational activities and manages operational technology efficiently.

The roadmap guides the development of a comprehensive and efficient performance-monitoring framework. This ecosystem will foster a culture of continuous performance enhancement, aligning closely with ORR's and RIS's strategic objectives. The roadmap has been designed to be delivered in partnership between ORR and National Highways to collaboratively develop and implement a robust performance monitoring approach.

The recommendations within the roadmap aim to address specific improvement areas identified as part of the diagnostic of the operational activities assessed during this commission. However, they also highlight the need for a review of the RIS Performance Specification and KPI hierarchy used by ORR to hold National Highways to account, especially around the delivery of operational activities and operational technology management.

The gaps identified in each of the operational activities assessed bring to light a gap in the RIS Performance Specification and KPI hierarchy. Overall, KPI's monitoring strategic outcomes, and asset-level performance indicators reported as part of monthly and quarterly performance monitoring statements, are defined and aligned to ORR and RIS top-level strategic objectives and bottom-tier asset-level performance. However, this commission has identified structural gaps in the performance monitoring of operational activities and technology in general, which will typically sit between strategic and asset-level KPIs in typical best practice performance management hierarchies.

Given the complexity encountered by the benchmarking exercise in comparing the performance of National Highways' operational activity with comparator organisations, it would be beneficial to develop a community that would better facilitate sharing of performance information.

Strategic Recommendation 1: It is recommended that ORR implements the roadmap and the recommendations within it to enhance how it holds National Highways to account for its operational activity on the SRN. The roadmap is designed not only to improve performance monitoring but also to embed a robust framework where safety, efficiency, and accountability are paramount.

Strategic Recommendation 2: It is recommended that ORR undertakes a review of the RIS Performance Specification and develop a comprehensive performance monitoring framework that is fit for purpose and drives correct behaviours at all levels within ORR and National Highways. This review should look to balance top down policy and strategy outcomes with bottom up practicality, data availability and resource requirement, whilst taking into account local and regional influences and constraints.

Strategic Recommendation 3: It is recommended that ORR and/or National Highways considers forming a 'benchmarking community' that looks to develop, share and standardise operational performance metrics across road/transport organisations both domestically and internationally.

3.3.1 SUMMARY OF FINDINGS AND RECOMMENDATIONS BY OPERATIONAL AREA

A summary of the findings and recommendations to improve performance review and reporting capability by operational area is presented in Table 4.

Operational Activity Area	Summary of Findings	Recommendations to Improve Performance Review and Reporting Capability

1. Operational response to asset safety defects	• Defect response reporting is focused on service provider performance rather than National Highways performance at following its own decision-making processes and requirements.
	• Opportunity to move beyond reporting response process to reporting that informs wider asset management lifecycle delivery e.g. health of asset, need for capital maintenance.
		• Define and monitor National Highways decision making processes:
		  ○ Inspections and/or inspector vacancies, attrition rates, competency.
		  ○ Defects/maintenance/inspections backlogs.
		  ○ Consistency in assessing defects and evaluating service provider response.
		• Expand coverage of current reporting to all asset types (for example operational technology defects currently excluded).
		• Consistently define and monitor decisions based on progression of defects across risk categories e.g. from monitoring status to safety-critical.
		• Red claims analysis – define and monitor trends behind red claims applicable to National Highways processes.

Operational Activity Area	Summary of Findings	Recommendations to Improve Performance Review and Reporting Capability
2. Operational response to non-asset related safety incidents competency, and 3. Capacity to respond to and manage long-duration incidents	• Current reporting is focused on incident clearance rates and Traffic Officer attendance (lagging indicators) rather than leading indicators of preparedness/readiness – things National Highways is in full control of. • National Highways notes that the unique nature of incidents means that attending an incident is a rehearsal for the next – but reporting does not show how it is learning and adapting plans. • National Highways' Crisis Management Manual makes reference to an Incident Analysis Unit – AMCL did not speak to this unit as part of this study. • Given multi-agency nature of event and incident management, there may be benefit in gauging opinions on National Highways' role and performance from third parties e.g. emergency services.	• Extend coverage of incident clearance rate and traffic officer attendance metrics to the entire SRN (where applicable, for example Traffic Officers may not patrol non-motorways) and align targets to requirements. Consider weighting by criticality of route or nature of the incident. • Define and monitor aspects of incident preparedness including Incident Response Plan (IRP) status, roles and competency, availability of resources, and communications. • Define and monitor compliance with debriefing processes and lessons learned leading to IRP updates. • Define and monitor the number of incidents, severity and category.
4. Management and resolution of multi-region events	• Similar recommendations to incident response above. Multi-region events tend to be covered by specific plans, but National Highways doesn't report readiness of plans or whether plans were satisfactory, reasons for changes to plans, lessons learned. • Given multi-agency nature of event and incident management, there may be benefit in gauging opinions on National Highways' role and performance from third parties e.g. emergency services.	• Define and monitor aspects of incident preparedness including IRP status, roles and competency, availability of resources, and communications. • Define and monitor compliance with debriefing processes and lessons learned leading to IRP updates. • Note: the above bullets deal with planned multi-region events; recommendations for incidents will be valid for unplanned multi-region events.

Operational Activity Area	Summary of Findings	Recommendations to Improve Performance Review and Reporting Capability
5. Systems and operations that are used to manage the expeditious movement of traffic	• Well reported at outcome level, but less so at tactical/output level. Consideration by ORR should be given as to the importance of this given 'expeditious movement of traffic' is affected by the full range of operational activity areas that are reported at varying levels of outcome/tactical/output.	• Define and monitor National Highways' processes and activities (tactical) that support expeditious movement of traffic. • Operational technology-specific – define and monitor end-to-end reporting of the whole system (may include in-station system performance). • Defining expeditious movement against route criticality, traffic density and time of day may be beneficial – rather than outcome averages of the entire SRN.
6. Improving the reliability of operational technology systems	• Capability improvements are likely to improve as newer assets with better fault/diagnostic reporting capability are installed. • Operational technology defects and response not reported under IP5 defects reporting.	• Define reliability of operational technology - reliability (and the outcomes reliable operational technology serves) is not reported because it is not currently defined. • Define and monitor end-to-end performance of the whole system (may include in-station system performance). • Define and monitor disaggregation of assets and routes/regions.

Operational Activity Area	Summary of Findings	Recommendations to Improve Performance Review and Reporting Capability
7. Proactive and reactive systems that are used to manage customer journeys	• Identification of the full range of systems National Highways uses and the outcomes they serve is required (a system architecture map was not made available in this study). • Non-digital system contribution to journey management performance should be better understood – although may be highlighted in National Highways customer journey maps. • Similarities to 'expeditious movement of traffic' – generally well reported at outcome level, but less so at tactical/output level. Consideration by ORR should be given as to the importance of this given 'customer journeys' are affected by the full range of operational activity areas that are reported at varying levels of outcome/tactical/output.	• Monitor progress in developing customer journey maps – define and monitor performance measures relevant to programme. • Annual Customer Service Plan – develop quantitative measures related to improvements.
8. Provision of welfare to National Highways' customers	• Similarities with incident response (as welfare is a sub-set of incident management): reporting that National Highways is ready for incidents and has plans in place should welfare be required. • Given multi-agency nature of event and incident management, there may be benefit in gauging opinions on National Highways' role and performance from third parties e.g. emergency services.	• Define and monitor aspects of defined incident preparedness including IRP status, roles and competency, availability of resources, communications. • Monitor Local Resilience Forum liaison activities. • Monitor the participation in incident scenario readiness activities. • Monitor occurrences of welfare distribution and lessons learned.

Operational Activity Area	Summary of Findings	Recommendations to Improve Performance Review and Reporting Capability
9. Systems that support third-party access to the network	• Improved reporting capability will be dependent on rolling out 'Network Occupancy Ways of Working' project principles and performance measures. • National Highways referenced 'Enhanced Network Occupancy and Control' project – it would be beneficial to understand more about this and how it may contribute to performance enhancements. • Third-party access to the SRN accounts for roughly 5% of total road space occupancy bookings, with the remainder coming from internal National Highways teams. ORR may consider expanding this activity area to cover all network occupancy, not just that of third parties noting its potential impact on expeditious movement of traffic and customer journeys.	• Monitor the new 'Network Occupancy Ways of Working' project implementation activities, and monitor new performance measures.
10. Operational competency and capacity in the delivery/management of severe weather events	• Potential benefits from reporting 'mitigations' trends could allow National Highways to demonstrate how it uses such information to improve how it delivers its operations e.g. depot locations, resource allocation.	• Define and monitor National Highways' decision making processes: timeliness, effectiveness, consistency of decision making related to severe weather response. • Enhance reporting of wider aspects of service provider response (e.g. vehicle recovery, SWIS availability, Airwave availability). • Potential benefits from reporting service provider performance 'mitigations' trends to support continuous improvement.

Table 4 – Summary of Recommendations to Improve Performance Review and Reporting Capability of Operational Activity Areas

APPENDICES

Appendix A DIAGNOSTIC FINDINGS

This appendix provides details of the diagnostic findings across each of the operational activity areas within the scope of the study. Any actions or recommendations implied in this Appendix are captured in the main body of the report and roadmap.

A.1 1. OPERATIONAL RESPONSE TO ASSET SAFETY DEFECTS

Activities identified

Defects to assets are initially identified through a range of sources such as planned or cyclical safety inspections, internal reports from those working on the SRN, third-party reports such as SRN users, or incident reports. National Highways inspectors play a crucial role in this process by assessing and categorizing defects as either safety defects, which typically require completion (repair or make-safe) within 24 hours, or non-safety defects. National Highways then communicates instructions to its service providers through its works ordering system. Subsequently, National Highways' maintenance and response service providers are tasked with carrying out repairs or making assets safe within the specified timeframe, adhering to performance measures outlined in the Collaborative Performance Framework (CPF)[7]. Once the defect is resolved, it is 'closed out' in the works ordering system, completing the cycle of operational response to asset safety defects. These diagnostic activities help in understanding the workflow, responsibilities, and timelines involved in National Highways' defect management process.

Performance Measures Identified

Performance Measure	Assessment
Defects completed within the required timescale (IP5 Statement)	• Measure is fully integrated up to ORR (national and regional figures reported quarterly) and national performance published annually within National Highways Performance Monitoring Statement. • Due to poor/variable performance reported under the measure, National Highways commenced a project workstream under its Operational Excellence programme (OE2025) to develop a playbook to better manage defects consistently by all inspectors. Using the evidence of poor performance reported under the metric ORR has commenced an investigation into how National Highways manages defects. • Measure is based on National Highways Collaborative Performance Framework (CPF) so is aligned with service provider performance requirements. • Measure was introduced specifically to address the needs of ORR to better understand road condition and maintenance/operations, and transparency to the road user. • Measure does not capture defect performance of all asset types, for example roadside technology defects are excluded.

[7] National Highways' Collaborative Performance Framework (CPF) sets out contract requirements for its service providers. A copy of the CPF has not been made available for review in this study.

Performance Measure	Assessment
Red and Green insurance claims – total number of claims (IP5 Statement)	• Measure is fully integrated up to ORR (national figures reported quarterly) and national performance published annually within National Highways Performance Monitoring Statement. • Measure was introduced specifically to address the needs of ORR to better understand road condition and maintenance/operations, and transparency to the road user.

Table 5 - Performance Measures Identified

Current Capability

IP5 Performance Statement Metric Integration: National Highways' IP5 defects and insurance claims reporting metric is systematically reported and fully integrated up to the ORR. The defects reporting metric is a direct report of the CPF measure National Highways uses to measure how well its service providers are meeting defect response performance requirements. This measure was introduced as part of National Highways' reporting to ORR to enhance the value of asset condition reporting, prompting both internal National Highways and external ORR reviews of performance metrics.

Shift in Responsibility: The current Asset Delivery model places greater responsibility on National Highways' decision-making in the defect management process compared to prior contract models where service providers held all responsibility. However, the current IP5 defect reporting primarily focuses on reporting service provider performance and lacks reporting on National Highways' internal performance in defect management.

Incomplete Asset Coverage: Current IP5 defects reporting does not encompass all asset types; for instance, roadside technology is excluded due to varying requirements for defect detection and completion processes specific to these assets.

Backlogs and Reporting Challenges: National Highways highlighted challenges it has had with backlogs of defects. Current reporting of defects does not provide a clear understanding of the scale of backlogs or progress that any management strategies are making to clear them.

Consistency in Defect Assessment: Ensuring consistency in assessing defects and evaluating service provider responses across all regions has emerged as a challenge. The current reporting structure does not adequately indicate how consistently processes are followed across different geographical areas, leading to potential discrepancies in performance evaluation.

Potential Capability

National Highways' future capability in operational response to asset safety defects relies on enhancing reporting mechanisms to encompass critical decision-making aspects currently not captured in the existing defect performance reporting framework. Presently, the focus of defect performance reporting revolves around the response of service providers to defect completion instructions, lacking visibility into National Highways' direct ownership of the decision-making process in defect management. This absence hinders the ability to ascertain the accuracy and consistency of defect categorisation or validate completion of input processes such as safety inspections.

To address these limitations, National Highways has recognized the need for ad-hoc audits of its defect data, aiming to gain insights into adherence to decision-making processes. However, there remains an untapped opportunity to establish routine reporting and measurement practices for key factors influencing defect backlogs and the consistent application of defect risk and response

categories. Incorporating performance reporting metrics related to inspector vacancies, attrition rates, and inspector competency would provide additional assurance of adherence to standards across regions.

Moreover, National Highways could leverage this opportunity to establish routine review and reporting mechanisms tracking the progression of defects across risk categories, from initial monitoring status to escalated safety-critical levels. This proactive approach would not only enhance defect management practices but also contribute valuable insights to broader asset health reporting initiatives, thereby augmenting overall operational effectiveness and safety within National Highways' asset management framework.

Highway authorities are able to defend themselves from being sued for damages due to defects and poorly maintained roads under Section 58 of the Highways Act 1980 if they can prove they did everything they could reasonably be expected to do to keep the road safe. National Highways' Design Manual for Roads and Bridges (DMRB) standards bring attention to this in setting out approaches to maintenance requirements. Whilst National Highways' red claims reporting provides important transparency on the number of claims brought against it for not satisfying Section 58, it is not clear the extent of detailed analysis and reporting that is used to understand the reasons behind claims. It is presumed that National Highways undertakes this analysis internally to build a case for its defence against litigation. Wider reporting that captures key aspects of this would support continuous improvement to defect and wider maintenance management processes, for example by highlighting whether inspection regimes are adequate, defect assessment criteria, asset health and so on.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 1 Effectiveness: 4 Acted Upon: 4 Integrated: 5	3	4	• Improve coverage by reporting National Highways decision-making processes such as inspections, reporting of defect backlogs, consistent defect categorisation.

Table 6 - Summary of Diagnostic Scores

A.2 2. OPERATIONAL RESPONSE TO NON-ASSET RELATED SAFETY INCIDENTS & 3. COMPETENCY AND CAPACITY TO RESPOND TO AND MANAGE LONG-DURATION INCIDENTS

Activities Identified

In its GM 703 DMRB document National Highways specifies the operational requirement standards and outcomes for incident management:

1. Assets are made safe following all incidents.
2. Provision of timely and accurate incident intelligence.
3. All incidents are managed to secure both the expeditious movement of traffic on the SRN and facilitate the expeditious movement of traffic on road networks for which another authority is the traffic authority.

National Highways adopts a holistic approach to incident response, which does not specifically categorize responses based on incident duration. Incidents are managed based on their severity, and escalation or de-escalation between command levels is determined by the nature and complexity of each incident.

The operational response framework followed by National Highways is outlined in its Crisis Management Manual (CMM), which delineates key stages in incident management:

Initial Response: Prompt and effective initial actions taken upon incident notification to mitigate immediate risks and initiate response procedures.

Scene Management: Coordination and management of resources and personnel at the incident scene to ensure safety, facilitate operations, and minimize disruptions.

Recovery to Normality: Implementation of strategies and actions to restore normal operations, infrastructure, and services affected by the incident.

Reporting (including Debrief): Comprehensive documentation of incident details, response actions, outcomes, and lessons learned.

Key factors in National Highways' management of incidents include:

Planning: National Highways' CMM provides a template for use by the regions to produce Incident Response Plans detailing local roles and responsibilities, liaison arrangements, resources and reporting requirements.

Roles and Responsibilities: Key roles such as accountable persons under escalation protocols (for example Duty Operations Manager, Regional Strategic Lead, Regional Silver Commander, National Network Manager), on-road and control room traffic officers, emergency services, vehicle recovery operators and maintenance and response service providers.

Resources: Local details of materials, vehicles, and storage for use in incident response and management.

Communication: Details systems and processes for communicating messages and instructions about incidents internally, and externally with multi-agency responders and with wider SRN customers.

Performance Measures Identified

Performance Measure	Assessment
Incident Clearance Rate (RIS KPI)	• Measure is fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. It is systemically reported monthly and acted upon internally and analysed externally by ORR. • The measure applies to motorways only and so provides no coverage of the wider SRN.
Faster attendance by traffic officers – 10-minute attendance time for traffic officers on ALR sections (National Highways Internal PI)	• Measure is an internal National Highways PI but is fully integrated up to ORR within monthly reporting of performance as part of additional reporting of smart motorway action plan progress. The measure is systemically reported and acted upon internally and analysed externally by ORR. • The measure applies specifically to all lane running sections of smart motorway with Emergency Refuge Areas (ERA) more than one mile apart and so doesn't provide coverage of traffic officer attendance at incidents on the wider SRN.
National Vehicle Recovery Manager – service provider contract for removal of vehicles on the SRN – contract KPI based on average recovery time at regional and national level: • Light vehicles 52 minutes national, 55 minutes regional. • Heavy vehicles 90 minutes national, 105 minutes regional.	• Detail on the measure has not been made available in this study, but National Highways reported that the measure is defined and systematically reported and acted upon as part of a service provider contract measure for payment. • The measure is reviewed internally at National Highways and not reported or published externally.

Table 7 - Performance Measures Identified

Current Capability

National Highways' current capability in reporting performance of non-asset related and long-duration incidents is primarily gauged through metrics such as incident clearance rates and 10-minute attendance times. The measures are fully integrated up to ORR through the RIS performance specification and to support reporting against the smart motorway stocktake action plan. The incident clearance rate metric is based on requirements set in its standards and aligned with service provider requirements.

Whilst these metrics provide an indication of incident clearance and response performance, they are limited in coverage by only considering motorways and smart motorways and are not weighted by criticality of route or the nature of an incident. Due to the unique nature of incidents and incident response it is also noted that National Highways may not always be in full control of factors that affect performance, for example resulting from decisions made by emergency services or that traffic officers must adhere to standard traffic laws.

The Incident Clearance Rate KPI requires a target percentage of incidents to be cleared within 60 minutes. Although the timings appear to be based on a range of time-based requirements within National Highways' DMRB standards, it is not clear why 60 minutes is considered good or to what extent National Highways' processes are optimised to achieve 60 minutes. For example, there appears to be misalignment with service provider requirements for vehicle recovery where the timings for heavy vehicles exceed 60 minutes.

The measures in use are lagging indicators as they provide a view on actions that have already taken place. Planning and preparedness along with the availability of resources, required roles and responsibilities and communication systems are identified as key factors affecting incident response but no form of measurement or reporting of these items has been identified.

Potential Capability

National Highways prescribes requirements for incident clearance for the entire SRN and so could provide a report of this to expand the coverage of the existing metric beyond that of motorways. This broader scope of reporting will provide a more comprehensive view of National Highways' incident response across its entire network.

National Highways acknowledges that its response to incidents is influenced by various external factors beyond its direct control, including the location, timing, severity of incidents, and the decisions of third-party entities such as emergency services. However, National Highways maintains control over critical aspects of incident preparedness, such as having comprehensive plans, adequate resources, and effective communication strategies in place. Reporting could be expanded to capture:

Verification of Incident Response Plans: National Highways could implement reporting mechanisms to verify the creation, currency, and adherence to Incident Response Plans (IRP). Specific requirements within these plans, such as response timescales and post-incident debriefs, could also be reviewed, and reported on.

Assessment of Key Role Competency: National Highways could establish reporting criteria to assess whether key roles in incident management are adequately filled and meet competency requirements. This ensures that personnel responsible for critical tasks during incidents possess the necessary skills and qualifications.

Resource Availability Monitoring: National Highways could develop reporting that tracks the availability of resources required for incident response. This includes personnel, equipment, and other essential resources needed to effectively manage and resolve incidents.

Communication System Effectiveness: National Highways could measure and report on the availability and effectiveness of internal and external communication systems during incident response efforts. This includes evaluating the timeliness and accuracy of incident reporting (for example blue tops, green tops, and Commonly Recognised Information Pictures (CRIPs)) and assessing the overall communication efficacy with stakeholders, including SRN customers.

Whilst incidents are often common in type, they will always be unique in severity and consequence/impact. A significant aspect of National Highways' incident management processes is incident debrief to promote better understanding and continual improvement to future plans and response techniques. National Highways could consider reporting compliance with debrief requirements and highlighting the impact the process has on plans (similarly to ORRs annual 'prepare for winter review' where National Highways highlights where Severe Weather Plans are updated due to lessons learned from prior events). National Highways' CMM refers to an Incident Analysis Unit – we have not spoken to those responsible for this unit as part of this study and recommend further work to understand its role.

The benchmarking review has highlighted the use of reporting incident rates, severity, and category by other organisations. This would provide several opportunities to expand current reporting by highlighting trends, patterns, and potential hazards, further demonstrating how post-event analysis supports continual improvement in the preparation of future plans, or for wider decisions about the management of the SRN and its assets.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 1 Effectiveness: 4 Acted Upon: 4 Integrated: 4	3	4	• Improve coverage by reporting performance against entire SRN, and aspects of incident preparedness that National Highways is in full control of for example planning, resources, roles, debriefs.

Table 8 - Summary of Diagnostic Scores

A.3 4. MANAGEMENT AND RESOLUTION OF MULTI-REGION EVENTS

Activities Identified

National Highways employs a structured approach guided by industry standards and best practices to manage and resolve major multi-region events, particularly those categorized as 'Rising Tide' incidents by the Joint Emergency Services Interoperability Principles (JESIP). These incidents are characterized by lead times ranging from hours to months, allowing for proactive planning and preparation. National Highways' approach to generating plans for such events is grounded in the principles outlined in its CMM, ensuring a comprehensive and effective response strategy.

The CMM specifies escalation levels at a regional operations level (Routine Operations, Regional Alert and Regional Response) and at a national level (National Alert, National Response, National Gold). At each escalation level the CMM defines those responsible within the company for leading, escalation triggers, key activities and functions, and reporting requirements. National Highways' National Resilience Team is responsible for ensuring that any response aligns with the government. Note that in the event of an emergency response led by Category 1 responders, typically 'blue light' emergency responders, then the response would align with multi-agency plans developed under the auspices of the Local Resilience Forum.

In line with CMM principles, National Highways undertakes the development of specific plans tailored to each multi-region event, such as a Royal funeral. These plans typically encompass key elements crucial for successful event management and resolution:

National Highways' Involvement and Concept of Operations (CONOP): Clearly defining National Highways' strategic involvement in the event and outlining the overall CONOP, including objectives and strategic priorities.

Roles and Responsibilities: Clearly defining roles, responsibilities, and reporting structures for all involved personnel and teams.

Activation and Communications: Establishing protocols and procedures for timely activation of response mechanisms and maintaining effective communications channels internally and externally.

Actions Relevant to Event: Detailing specific actions required for the event, such as standing up relevant command levels (e.g., National Silver Group) and coordinating with relevant stakeholders.

Media Relations: Outlining strategies and protocols for engaging with media outlets, managing public communications, and ensuring a consistent messaging approach.

Maps and Route: Providing detailed maps and route information relevant to the event, including traffic management plans and alternative routes if applicable.

Draft Meeting Agendas and Activation Emails: Developing draft meeting agendas for coordination meetings and drafting activation emails to ensure timely and coordinated response efforts.

These diagnostic activities underscore National Highways' proactive and systematic approach to managing multi-region events, ensuring readiness, effective coordination, and successful resolution in alignment with best practice.

Performance Measures Identified

No relevant measures were observed in use for National Highways during our assessment. While it is possible that such measures exist, they were not evident based on our observations and analysis.

Current Capability

Due to no relevant measures being observed, we are unable to score the current capability for this operational area.

Potential Capability

National Highways' future capability in managing and resolving multi-region events is influenced by the unique nature of incident management within this context. While opportunities to expand reporting in this area may be limited, National Highways emphasizes that planning and plan production are integral components of its operational processes. Therefore, there is potential to develop reporting mechanisms aligned with National Highways' CMM, focusing on whether event plans are in place and the effectiveness of plan execution.

To enhance preparedness for planned events, National Highways may consider reporting on the following aspects:

Status of Major Event Plans: Reporting on the status of major event plans, including their completeness, relevance, and alignment with National Highways' operational objectives.

Availability of Required Plan Resources: Reporting on the availability and readiness of resources outlined in event plans, ensuring National Highways can effectively execute planned responses.

Competency Requirements: Reporting on key roles filled within event plans and broader roles outlined in the CMM, ensuring personnel meet competency requirements and are prepared to fulfil their responsibilities effectively.

Similar to how National Highways addresses non-asset and long-duration incidents, considerations for reporting compliance with debrief requirements and assessing the impact of these processes on event plans are essential. National Highways could highlight instances where lessons learned from previous events influence plan updates, akin to ORR's annual 'prepare for winter' review. Additionally, National Highways' CMM references an Incident Analysis Unit, suggesting a need to engage with relevant personnel responsible for incident analysis as part of future studies to further enhance National Highways' incident management capabilities. Incorporating these aspects into future reporting mechanisms will contribute to National Highways' ongoing improvement and preparedness for multi-region events.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
0 - No measures in place that assess performance	0	2	• Report aspects of incident preparedness that National Highways is in full control of for example planning, resources, roles, debriefs.

Table 9 - Summary of Diagnostic Scores

A.4 5. SYSTEMS AND OPERATIONS THAT ARE USED TO MANAGE THE EXPEDITIOUS MOVEMENT OF TRAFFIC

Activities Identified

National Highways employs a range of core traffic management systems and operations to ensure the expeditious movement of traffic across its network:

CHARM (system): A comprehensive traffic management system utilized by National Highways to monitor and manage traffic flow, incidents, and congestion across various regions.

DYNAC (application): An application within National Highways' traffic management framework designed to support dynamic traffic control and optimize traffic flow in real-time.

COBS (legacy system): While primarily used in Southeast and East regions, COBS remains an integral part of National Highways' traffic management infrastructure, contributing to effective traffic monitoring and control.

Control Works (interface system): This system serves as an interface supporting incident logs and telephony operations, facilitating seamless communication and coordination during traffic incidents.

National Highways' Product Portfolio team within National Highways Digital Services oversees the management of these systems using the National Highways IT Service Management (ITSM) system, primarily through ServiceNow. This team collaborates with National Highways' Maintenance and Response (M&R) contractors as needed for fault resolution and ongoing maintenance activities.

The performance of all traffic management systems is continuously reviewed internally, with availability metrics reported through dedicated dashboards overseen by the Chief Digital Information Officer (CDIO). National Highways acknowledges that system evolution from past projects has led to instances where system requirements were not explicitly defined by end-users, a concern being addressed through the establishment of the Digital Services team.

National Highways also reviewed the performance of road-side operational technology assets using availability metrics, with external reporting monitoring average availability across all assets and specific asset types on smart motorways. National Highways has established specific responses to operational technology road-side asset faults/defects within its GM 701 (Asset Delivery and Maintenance Requirements) standard. The Asset Information Management System (AIMS) incident desk manages faults related to physical assets, ensuring prompt resolution, and minimizing asset availability downtime. Recent M&R contracts have also introduced a requirement for service providers to 'attend, assess, and fix' faults, further enhancing process efficiency and asset reliability across National Highways' network.

The DfT's 2020 Smart Motorway Safety Evidence Stocktake and Action Plan set out actions for National Highways to implement on its smart motorway network to, in part, support expeditious movement of traffic. The actions included faster roll-out of Stopped Vehicle Detection (SVD), faster attendance of traffic officers (10-minute attendance) and automatic messaging if SVD sends an alert. National Highways produces an annual report that sets out progress against the actions from the plan along with progress reporting of specific actions in its monthly reporting to ORR. ORR assesses and reports on National Highways' progress against actions within its Annual Assessment of Safety Performance on the SRN.

Performance Measures Identified

Performance Measure	Assessment
Various RIS customer satisfaction and journey reliability performance metrics (RIS KPIs/PIs): • KPI 2.1 Average delay • KPI 2.2 Roadworks network impact • KPI 2.3 Incident clearance rate • PI 2.4 Delay on smart motorways • PI 2.5 Delay from roadworks • PI 2.6 Journey time reliability • PI 2.7 Delay on gateway routes • PI 2.8 Average speed • KPI 5.1 Road user satisfaction • KPI 5.2 Roadworks information timeliness and accuracy • PI 5.3 Timeliness of information provided to road users through electronic signage • PI 5.5 Working with local highway authorities to review diversion routes for unplanned events	• Measures are fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. They are systemically reported monthly and acted upon internally and analysed externally by ORR.
Technology Availability – percentage of time that technology assets on the SRN are available and operational (RIS PI)	• Measure is fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. It is systemically reported monthly and acted upon internally and analysed externally by ORR.
All lane running motorways stocktake and TSC actions (National Highways Internal PI) – smart motorway operational technology performance: • Availability of SVD, CCTV, warning signs, speed control signs • Time to set electronic signs • Set signs speed • Traffic officer attendance time • Stopped vehicles identified in live lane • SVD accuracy improvement • Setting signs on smart motorways	• Measure is an internal National Highways PI but is fully integrated up to ORR within monthly reporting of performance as part of additional reporting of smart motorway action plan progress. The measure is systemically reported and acted upon internally and analysed externally by ORR.
Chief Data Information Officer Report (National Highways Internal dashboard) – system availability including: • SVD, MIDAS, CCTV, Signs/Signals • NRTS, DYNAC, COBS, ControlWorks • IT systems e.g. M365, Oracle etc	• Internal National Highways dashboard showing the availability of National Highways in-station systems. An overview of the dashboard has been made available in this study. National Highways reported that the measure is used to identify service interruptions and understand system availability to inform maintenance requirements, as well as supporting service provider contract performance. • The measures within the dashboard are reviewed internally at National Highways and not reported or published externally.

Performance Measure	Assessment
Smart motorways stocktake annual progress report	• This is not a performance measure but a specific annual report detailing progress against smart motorways stocktake actions.

Table 10 - Performance Measures Identified

Current Capability

Outcome performance associated with the expeditious movement of traffic is very well considered in RIS2 under 'fast and reliable' and 'meeting the needs of all users' outcome areas. There is a large array of performance measures that are systematically reported and fully integrated up to ORR and aligned with National Highways internal and service provider performance requirements.

From an operational technology perspective, the technology availability RIS PI is systematically reported and fully integrated up to ORR. The measure has been used to prompt internal National Highways, and external ORR reviews of performance. In addition to the wider technology availability measure specific smart motorway operational technology asset availability is also systematically reported and fully integrated up to ORR. Whilst external reporting is limited to roadside asset availability, National Highways Digital Services use the internal dashboards to review performance of operational technology communication (in-station) systems.

National Highways recognises that its road-side operational technology assets limit its understanding of overall system capability, in part due to age of some assets and limited diagnostic reporting/fault codes capability compared to modern equivalent assets.

Progress against improvement actions that facilitate journeys on smart motorways are specifically reported in monthly reporting to ORR and published annually. ORR undertakes specific analysis of this progress in its annual safety report.

Potential Capability

Current reporting extensively covers outcomes associated with expeditious movement of traffic and is well covered by operational technology systems and assets. However, reporting that details how well the processes and activities that support the expeditious movement of traffic is less clear. National Highways sets out prescriptive requirements within its standards like the DMRB and it is understood that National Highways' Collaborative Performance Framework details service provider requirements. Some specific measures of operations that affect expeditious movement of traffic are reported externally, such as defect response, or winter service. Further consideration of operations that impact the expeditious movement of traffic would be beneficial to establish if and how they are currently captured and measured within National Highways.

National Highways recognises that, on the operational technology side of systems and assets, it has a decent understanding of the main components of system performance (i.e. road-side asset and in-station system availability) but less so on the end-to-end aspect of the overall system. This capability is likely to improve as older operational technology assets are renewed with those that can provide better fault diagnosis and support a wider analysis of performance than the current focus only on availability.

Consideration may also be given to weighting existing measures by criticality of whole or sections of routes to improve capability. Expeditious movement of traffic is likely to have different meanings in areas more prone to higher traffic density and peak time impacts.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 4 Effectiveness: 4 Acted Upon: 4 Integrated: 4	4	5	• Improve coverage and effectiveness by reporting process and activities (rather than mainly outcomes). • Improve integration by externally reporting operational technology in-station system performance to provide wider view on end-to end system performance.

Table 11 - Summary of Diagnostic Scores

A.5 6. IMPROVING THE RELIABILITY OF OPERATIONAL TECHNOLOGY SYSTEMS

Activities Identified

National Highways' responsibility for managing operational technology systems is divided between its Operations and Digital Services directorates. Operations oversees road-side assets, while Digital Services manages the communication network, ensuring a coordinated approach to system reliability.

Under the current RIS, performance reporting primarily focuses on the availability of road-side assets rather than the entire system. In earlier road periods, reporting also included the availability of the control centre and National Roads Telecommunication Services (NRTS), highlighting a broader scope of performance monitoring.

National Highways' Technology Performance and Availability Management (TPAM) team is currently exploring available data to identify and address reliability issues within operational technology systems. This proactive approach aims to enhance understanding of system reliability.

Asset faults are actively monitored and communicated with service providers through National Highways' works management system, ensuring timely resolution and maintenance activities. The incorporation of newer technology assets equipped with advanced diagnostic capabilities provides National Highways with greater insights into asset performance, contributing to improved overall system understanding and reliability management.

Performance Measures Identified

Performance Measure	Assessment
Technology Availability – the percentage of time that technology assets on the SRN are available and operational (RIS PI)	• Measure is fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. It is systemically reported monthly and acted upon internally and analysed externally by ORR.
All lane running motorways stocktake and TSC actions – availability of following smart motorway assets (National Highways Internal PI): • Stopped Vehicle Detection • CCTV • AMI and MMS • Warning Signs • Speed Control Signs	• Measure is an internal National Highways PI but is fully integrated up to ORR within monthly reporting of performance as part of additional reporting of smart motorway action plan progress. The measure is systemically reported and acted upon internally and analysed externally by ORR.
Chief Data Information Officer Report (National Highways Internal Dashboard) – system availability of in-station components, including: • Stopped Vehicle Detection • MIDAS • CCTV • NRTS	• Internal National Highways dashboard showing the availability of National Highways in-station systems. An overview of the dashboard has been made available in this study. National Highways reported that the measure is used to identify service interruptions and understand system availability to inform maintenance requirements, as well as supporting service provider contract performance.

Performance Measure	Assessment
	• The measures within the dashboard are reviewed monitored internally at National Highways and not reported or published externally.

Table 12 - Performance Measures Identified

Current Capability

The technology availability RIS PI is systematically reported and fully integrated up to ORR. The measure has been used to prompt internal National Highways, and external ORR reviews of performance. Specific smart motorway operational technology asset availability is systematically reported and fully integrated up to ORR. Operational technology asset performance analysis is an important input to National Highways procurement policies to ensure products with known issues are not reused. It also helps National Highways navigate factors that affect operational technology such as obsolescence, availability of spares and increasing international market demand for technology assets.

Whilst external reporting is limited to roadside asset availability, National Highways Digital Services use the internal dashboards to review performance of operational technology communication systems.

Current performance assessment is centred around operational technology availability. We have not seen any definition of reliability used by National Highways (or wider stakeholders) or reporting that explicitly measures reliability. However, there is an informal recognition that consistently under-target availability may suggest reliability issues.

Potential Capability

Current performance measurement is shaped around availability because it is a defined requirement under the RIS performance specification. There is no current definition of operational technology reliability in use as it is not a performance measure that National Highways is required to report against. It would be beneficial to clearly define what operational technology reliability means and what outcomes reliable operational technology is aligned to. Current external reporting of availability informs well maintained network outcomes rather than necessarily whether safety and reliable journey outcomes are served.

National Highways recognises that it has a good understanding of the main components of system performance (i.e. road-side asset and in-station system availability) but less so on the end-to-end performance of the overall system. National Highways highlighted that future reporting capability is being reviewed by its TPAM team currently, although the team has not been consulted as part of this study. This capability is likely to improve as older operational technology assets are renewed with those that can provide better fault diagnosis and support a wider analysis of performance than the current focus only on availability.

Reporting of roadside technology availability is currently presented as an average across the entire asset base. National Highways may consider disaggregating the metric to specific asset types or routes, similar to that done for smart motorway technology assets, to provide a better understanding of performance. The age of asset and product manufacturer were highlighted as known proxy indicators for reliability of technology assets. This has an influence on regional performance of assets where routes on the SRN had technology installed at particular times as part of capital schemes. There

may be some benefit in disaggregating the current availability measure by known influences as it may assist validating assumptions about reliability issues.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 1 Effectiveness: 2 Acted Upon: 4 Integrated: 4	3	4	• Improve coverage by clearly defining reliability and outcomes served, and disaggregation of assets and system components. • Improvements to effectiveness with improved asset diagnostic/fault feedback capability.

Table 13 - Summary of Diagnostic Scores

A.6 7. PROACTIVE AND REACTIVE SYSTEMS THAT ARE USED TO MANAGE CUSTOMER JOURNEYS

Activities Identified

National Highways operates within a complex system landscape, segmented into three primary categories to manage customer journeys efficiently:

Systems to Monitor, Manage, and Identify: This category encompasses a diverse range of systems such as SVD, MIDAS (Motorway Incident Detection and Automatic Signalling), traffic monitoring tools, CHARM (Control of Highways Assets Recording and Monitoring), as well as personnel resources like traffic officers and inspectors. Additionally, it includes systems for managing abnormal loads, weather monitoring stations, road signage and traffic signals, all crucial for real-time monitoring and management of road conditions and incidents.

Systems to Verify Incidents/Occurrences: National Highways utilizes various systems like Closed-Circuit Television (CCTV) and roadside telephones to verify and confirm incidents or occurrences on its road network promptly. These systems play a critical role in accurately assessing the situation on the ground, aiding in swift response and management.

Systems to Respond to Incidents/Occurrences: National Highways is equipped with a suite of systems dedicated to responding effectively to incidents or occurrences. This includes ADI (Automated Displays of Information) and MMS (Motorway Messaging Signage) for incident management, the National Traffic Information Service for real-time traffic updates, Airwave for communication during emergencies, vehicle recovery services, the Customer Contact Centre, and a Customer Relationship Management (CRM) system for streamlined customer interactions and support.

National Highways also leverages external systems, such as floating car data provided by TomTom, to supplement its internal data and enhance its monitoring capabilities for customer journeys.

Moreover, National Highways has established governance frameworks to guide its customer management strategies, including initiatives like Digital Roads focusing on digital solutions for customers, a comprehensive Customer Service Strategy, and Annual Customer Service Plans. National Highways actively engages with external forums like the 'Roads for All' group to gain insights into the unique needs of disabled road users, ensuring inclusivity and accessibility in its services.

Performance Measures Identified

Performance Measure	Assessment
• Various RIS customer satisfaction performance metrics: • KPI 5.1 Road user satisfaction • KPI 5.2 Roadworks information timeliness and accuracy • PI 5.3 Timeliness of information provided to road users through electronic signage • PI 5.5 Working with local highway authorities to review diversion routes for unplanned events	• Measures are fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. They are systemically reported monthly and acted upon internally and analysed externally by ORR.
National Highways Customer experience tracker (National Highways internal granular customer satisfaction review)	• Detail on the measure has not been made available in this study, but National Highways reported that the measure is defined and

Performance Measure	Assessment
	systematically reported and acted upon as part of a service provider contract measure for payment. • The measure is reviewed internally at National Highways and not reported or published externally.
Technology Availability – percentage of time that technology assets on the SRN are available and operational (RIS PI)	• Measure is fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. It is systemically reported monthly and acted upon internally and analysed externally by ORR.
All lane running motorways stocktake and TSC actions – availability of following smart motorway assets (National Highways Internal PI): Stopped vehicle detection • CCTV • AMI and MMS • Warning Signs • Speed Control Signs	• Measure is an internal National Highways PI but is fully integrated up to ORR within monthly reporting of performance as part of additional reporting of smart motorway action plan progress. The measure is systemically reported and acted upon internally and analysed externally by ORR.
Chief Data Information Officer Report – system availability including: • SVD/MIDAS/CCTV • NRTS • IT systems e.g. M365, Oracle etc • (National Highways Internal dashboard)	• Internal National Highways dashboard showing the availability of National Highways in-station systems. An overview of the dashboard has been made available in this study. National Highways reported that the measure is used to identify service interruptions and understand system availability to inform maintenance requirements, as well as supporting service provider contract performance. • The measures within the dashboard are reviewed internally at National Highways and not reported or published externally.

Table 14 - Performance Measures Identified

Current Capability

National Highways' current capability in managing customer journeys through proactive and reactive systems is marked by a comprehensive range of measures reported against the RIS performance specification. These measures are strategically integrated up to ORR, consistently demonstrating value in assessing RIS outcomes related to customer journey experiences.

External reporting primarily focuses on measures related to the availability of operational technology systems that directly impact customer journeys, such as roadside asset availability. However, National Highways' Digital Services internally utilize dashboards to comprehensively review the performance of operational technology communication systems.

Despite these strengths, National Highways faces challenges in fully mapping all the systems it utilizes and establishing specific performance measures for each system. This lack of comprehensive mapping hinders a holistic view of system performance across the network.

National Highways has also acknowledged the difficulty in aligning system performance measures with user priorities during their journeys. For instance, determining whether users experience higher satisfaction when signs and signals are set quickly poses a challenge in linking technical performance with user satisfaction metrics.

Potential Capability

National Highways currently utilises performance data across several different sources such as individual operational technology assets and communication systems however they don't necessarily provide a complete picture, or at least one tailored to each user type. National Highways is in the process of developing customer journey maps that are helping bring together this complex landscape. The maps identify factors that National Highways has influence over that are important to users, identified from user satisfaction surveys and the customer experience tracker, and highlight relevant available performance measures to each factor. They provide the opportunity to improve future capability as a form of performance framework that clarifies what is a complex landscape.

However, while National Highways' focus on digital and technology systems is evident, there remains an opportunity for improvement in capturing and evaluating the performance of non-digital or technology-related systems crucial to customer journeys. These encompass essential elements such as safety inspections, the effectiveness of traffic officers, the reliability of permanent road signage, and diversion route signage. Although National Highways likely tracks the performance of these factors, particularly when outsourced to service providers, detailed performance data specific to these aspects has not been readily available for this study.

National Highways' annual customer service plan sets what National Highways intends to action to improve things that it has identified customers are interested in. This provides an opportunity to set out measures that show how well it is delivering the items in its plan.

Moving forward, National Highways' future capability hinges on adopting a more holistic approach to performance measurement, encompassing both digital and non-digital systems pivotal to enhancing customer journeys.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 2 Effectiveness: 4 Acted Upon: 4 Integrated: 3	3	4	• Improvement on coverage and integration from further clarity on full system landscape. • Coverage and effectiveness improvements from customer journey mapping as the basis of a performance framework.

Table 15 - Summary of Diagnostic Scores

A.7 8. PROVISION OF WELFARE TO NATIONAL HIGHWAYS' CUSTOMERS

Diagnostic Activities

Under the Civil Contingencies Act 2004 National Highways is classified as a Category 2 responder. Category 1 responders are typically 'blue light' emergency services and are responsible for leading emergency responses. The provision of welfare is not necessarily the defined responsibility of any single responder organisation. National Highways' role in the provision of welfare to customers held within closures on the SRN during incidents has been a topic of ambiguity. To provide clarity internally and externally National Highways has drafted a standard letter template on the subject as an annex within its CMM.

National Highways highlights that in very rare circumstances where it is unable to remove traffic held within closures there may be a need to provide welfare support to those held. National Highways' experience has shown that no single organisation could provide welfare by itself, and such exceptional circumstances require a multi-agency emergency response led by Category 1 responders, using the multi-agency plans developed under the auspices of the Local Resilience Forum. Where National Highways becomes aware of the potential for the need for welfare support, it will declare a major incident and request that a Tactical Coordination Group is established to manage the consequences of the incident. National Highways believes this may be necessary on some occasions, including for the provision of welfare, even where the original incident response did not require this level of escalation.

National Highways therefore does not have a legislative requirement to provide welfare, but it is committed to supporting a multi-agency response which may include the provision of welfare. National Highways' priority with incident management is to remove obstructions on the highway and to manage traffic which may involve escorting traffic through the scene, turning traffic around, removing barriers, and guiding traffic to service areas.

Performance Measures Identified

No relevant measures were observed in use for National Highways during our assessment. While it is possible that such measures exist, they were not evident based on our observations and analysis.

Current Capability

Due to no relevant measures being observed, we are unable to score the current capability for this operational area.

Potential Capability

National Highways is not directly responsible for providing and managing welfare provision in emergency situations. However, it is committed to support a multi-agency response which may require provision of welfare. Therefore, as with reporting of wider incident response and management, there are opportunities to provide reporting that assures National Highways' preparedness should an incident require welfare. This may include verification that Incident Response Plans are current and set out any specific local arrangements should welfare distribution be required, including that liaison with relevant Local Resilience Forums has taken place and roles clarified. This may extend to confirmation of participation in incident scenarios that test plans and readiness.

Whilst it is recognised that the provision of welfare is a rare occurrence, it would be beneficial to highlight where and when National Highways has supported the distribution of welfare in response to incidents on the network to provide intelligence on the frequency of occurrences. This would support continual improvement by showing how National Highways learns from incidents to better understand risk factors and therefore develop better plans.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
0 - No measures in place that assess performance	0	2	• Report aspects of incident preparedness, Local Resilience Forum liaison, incident scenario participation.

Table 16 - Summary of Diagnostic Scores

A.8 9. SYSTEMS THAT SUPPORT THIRD-PARTY ACCESS TO THE NETWORK

Activities Identified

National Highways has a statutory obligation under Section 59 of the New Roads and Street Works Act 1991 (NRSWA) to use its best endeavours to coordinate the execution of works on the SRN. This includes works promoted by its internal teams along with those required by third parties, such as utilities companies or other transport infrastructure managers such as Network Rail or HS2. Access to road networks is typically referred to as network occupancy.

The Network Occupancy Management System (NOMS) is National Highways' system for managing network occupancy on the SRN. The Network Events Management System (NEMS) is the central database of occupancy. Network occupancy access is managed through National Highways' 7 regional network occupancy teams. Internal National Highways occupancy bookings are made through an internal application called the Road Space Booking Portal. Third party occupancy bookings are made through a web-based solution that is operated by the DfT named Street Manager. The use of two independent systems to manage network occupancy constrains National Highways' ability to undertake clash analysis between internal and external third-party bookings.

Permitting scheme regulations were introduced under amendments to the Traffic Management Act 2004 (TMA). Permitting schemes are typically used by highway authorities to improve communication with third party utility companies and the enhance information that is made available to road users. Unlike most highway authorities in England, National Highways does not operate a permitting scheme. However, the Street Manager system operated by the DfT on behalf of National Highways operates as a permitting system and so processes associated with third party network occupancy bookings are similar to those used by other highway authorities.

National Highways has made the decision not to operate a permitting scheme and instead develop a new policy and framework for network occupancy based around a new set of principles under its 'Network Occupancy Ways of Working' project. The principles will be released in June/July 2024 and aim to address issues National Highways has had with:

- Insufficient forward planning.
- Undefined principles/processes.
- Coordination of occupancy.
- Performance measurement.

Performance Measures Identified

Performance Measure	Assessment
Roadworks information timeliness and accuracy (RIS KPI 5.2)	• Measure is fully integrated up to ORR and wider stakeholders to support RIS strategic outcomes. It is systemically reported monthly and acted upon internally and analysed externally by ORR.

Table 17 - Performance Measures Identified

Current Capability

National Highways' current capability in managing third-party access to the network is primarily measured and integrated up to ORR as part of the RIS performance specification. The relevant performance measure provides insight that National Highways' regional network occupancy teams utilize to assess third-party bookings efficiently.

It is important to note that third-party road space bookings constitute a relatively minor fraction of all occupancy bookings on the Strategic Road Network (SRN), accounting for approximately 5%. Consequently, their impact on overall network occupancy is limited.

The existing performance measure predominantly focuses on one operational aspect related to network occupancy, specifically overnight road closures. This limited scope underscores National Highways' acknowledgement of the current system's constraints and the absence of a comprehensive framework outlining clear metrics for network control.

National Highways recognizes that the lack of robust performance measures may inadvertently contribute to behavioural challenges, particularly regarding the timely submission of occupancy bookings. Addressing these issues necessitates a broader framework encompassing various operational requirements and proactive measures to encourage adherence to booking timelines and efficient network utilisation.

Potential Capability

National Highways is actively advancing its capability in managing third-party access to the network, aligning with legislative requirements outlined in the New Roads and Street Works Act 1991 (NRSWA). The 'Network Occupancy Ways of Working' project led to the development of a comprehensive network occupancy framework, incorporating essential principles and a suite of performance measures. This framework is due for release in the summer of 2024 and will provide significant opportunities for enhancing performance reporting related to network occupancy.

The key performance measures outlined in the upcoming framework include:

- Occupancy applications granted on the first attempt.
- Timely submission of occupancy applications within specified lead times.
- Response times of controllers handling occupancy requests.
- Instances of occupancy applications granted but subsequently cancelled.
- Accuracy in occupancy duration estimates.
- Average duration of works permitted under occupancy.
- Frequency of repeat visits for occupancy purposes.
- Number of change requests related to occupancy.

Most of the new performance measures will be used to assess compliance and accuracy of road space bookings by internal scheme promoters along with third party applicants. However, three of the new performance metrics under 'response times of controllers handling occupancy requests' will be used to assess how occupancy team members handle and respond to occupancy bookings.

National Highways has also referenced an 'Enhanced Network Occupancy and Control' project aimed at improving communication among various network occupancy systems. This initiative underscores National Highways' commitment to not only streamline processes related to network occupancy but also to ensure effective coordination and communication among stakeholders involved.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 1 Effectiveness: 1 Acted Upon: 3 Integrated: 4	2	4	• Improve coverage and effectiveness and how measures are acted upon with use of new 'Network Occupancy Ways of Working' project performance measures.

Table 18 - Summary of Diagnostic Scores

A.9 10. OPERATIONAL COMPETENCY AND CAPACITY IN THE DELIVERY/MANAGEMENT OF SEVERE WEATHER EVENTS

Activities Identified

National Highways sets out its operational requirements for severe weather within its DMRB standard GM 704. It specifies that the following outcomes shall be delivered:

1. safe passage on motorways and all-purpose trunk roads is not endangered by ice or snow in accordance with Chapter 66 of the Highways Act 1980.
2. the risk to safe passage on motorways and all-purpose trunk roads posed by fog, high temperatures, heavy rain, high winds is minimised.

The standard also refers to the use of CD 535 (drainage asset data and risk management) for requirements specific to the management of flood risk.

Along with multi-region events, National Highways considers the management of severe weather as a 'Rising Tide' type incident under JESIP principles where lead times can range from hours to months and so can be planned and prepared for.

National Highways requires that its regional teams produce Severe Weather Plans based on a national template but containing details specific to the area, such as sites at higher risk of severe weather impacts. The plans are continually reviewed and updated and tested annually under scenario exercises. Severe Weather Plans typically include:

- Annual service timetable specifying when key actions in support of the plan take place
- Roles and responsibilities
- Escalation arrangements (aligned with those in the CMM)
- Reporting requirements
- Materials, storage, and vehicles
- Winter service route details
- Actions for weather conditions

National Highways has specific competency requirements for those with winter decision making (and verifying) responsibilities. The company produces a Severe Weather Handbook that supports the training and competency of those involved in severe weather operational activities.

Performance Measures Identified

Performance Measure	Assessment
Percentage of precautionary salting delivered and percentage of running lanes available in accordance with Severe Weather Plan (IP5 Statement)	• Measure is fully integrated up to ORR (national figures reported quarterly) and national performance published annually within National Highways Performance Monitoring Statement. • Measure was introduced specifically to address the needs of ORR to better understand road condition and maintenance/operations, and transparency to the road user.
Annual "ready for winter" qualitative assessment by ORR – review of Severe Weather Plan and other readiness criteria	• This is not a performance measure but a specific annual qualitative assessment where National Highways shares its preparations for winter with ORR. The review includes some aspects of specific resource and capacity criteria aligning with standards and service provider requirements, and review of Severe Weather Plan lessons learned and updates. • Information is shared with ORR only as part of assurance checks and not published to a wider audience.
Various performance measures National Highways uses to monitor/manage performance of service provider delivery through National Highways' Collaborative Performance Framework (CPF): • Airwave telecommunications system. • Reporting of information into Severe Weather Information System (SWIS), for example completion of winter treatment routes. • Snow clearance lane availability (based on requirements in GM 704), snow gate closures, snow blower positioning. • Positioning of crews in locations vulnerable to heavy rain.	• Detail on the measures have not been made available in this study, but National Highways reported that the measure is defined and systematically reported and acted upon as part of a service provider contract measure for payment. • The measure is reviewed internally at National Highways and not reported or published externally.
National Vehicle Recovery Manager – service provider contract for removal of vehicles on the SRN – contract KPI based on average recovery time at regional and national level: • Light vehicles 52 minutes national, 55 minutes regional. • Heavy vehicles 90 minutes national, 105 minutes regional.	• Detail on the measure has not been made available in this study, but National Highways reported that the measure is defined and systematically reported and acted upon as part of a service provider contract measure for payment. • The measure is reviewed internally at National Highways and not reported or published externally.
Severe Weather Information System (SWIS) – service provider contract for system – contract	• Detail on the measure has not been made available in this study, but National Highways

Performance Measure	Assessment
KPI based on availability and response times to system faults.	reported that the measure is defined and systematically reported and acted upon as part of a service provider contract measure for payment. • The measure is reviewed internally at National Highways and not reported or published externally.

Table 19 - Performance Measures Identified

Current Capability

The as-is capability has been scored well mainly due to the annual 'ready for winter' qualitative assessment reporting exchange between ORR and National Highways. Although this is not strictly a performance measure as such, unlike other aspects of 'planned' incident management National Highways proactively shares evidence that actions it is responsible for, such as preparation of Severe Weather Plans, have been reviewed and renewed, and that resources and service providers are in place as required. Whilst the focus of external reporting is on lagging indicators such as winter salting delivered, the supply of Severe Weather Plan information to ORR provides a useful leading indicator that National Highways is ready for winter.

It is recognised that at outcome level, effective operational response to severe weather will contribute to journey reliability performance reporting under the RIS (although not explicitly referenced under this area).

Many of the performance measures included in the diagnostic are those used to assess service provider performance. We have seen limited evidence of performance measures used to assess the operational activities National Highways is responsible for, such as timeliness and accuracy of the decisions it makes and adherence to plan requirements.

The focus of external reporting is on the performance of service providers in mitigating hazards associated with cold weather but no other severe weather hazards and conditions such as high winds and heavy rain.

Potential Capability

Our diagnostic highlighted performance measures National Highways uses to assess its service provider performance through contract mechanisms such as its Collaborative Performance Framework. Under the Asset Delivery model National Highways operates under, it has taken back control of much of the decision-making that was previously undertaken by outsourced service providers. We have seen minimal evidence of the measures that National Highways uses to assess the operational items it is directly responsible for in the management of severe weather such as the timeliness and effectiveness of decision making, and consistency of decision-making actions across all regions. This may have important consequences for the management of severe weather incidents. For example, instructions to service providers to respond to standing water and flooding are issued through the works ordering system. If the incorrect response option is selected, for example 24 hours instead of 30 minutes, then it not only affects service provider response to the hazard itself, but also may miss opportunities to gain intelligence on causes of the issue that could be used to prevent reoccurrence (as flooding may have drained away by the time the service provider attends). National

Highways may wish to consider reporting that demonstrates the timeliness and consistency of decision-making processes across its regions.

National Highways highlighted that the CPF scoring used to review service provider performance does not always drive the right behaviours. For example, performance measures on completing winter are based on completing winter salting routes within time limits whereas in the past performance was assessed on whether hazards like ice were mitigated, irrespective of the time taken. In some locations on the SRN, it's challenging for service providers to meet time-based performance measures due to the locations of the National Highways depots they operate from. National Highways referenced the use of 'mitigations' to grant exceptions to service providers where they are unable to meet CPF requirements due to extenuating circumstances. It may be beneficial to measure and analyse such exceptions to provide intelligence on causes to support continuous improvement of, for example optimizing gritting routes and resource allocations.

National Highways may wish to consider expanding its reporting externally beyond cold weather hazards to a fuller range of severe weather hazards, noting that it has highlighted measures it uses internally to review the performance of its service providers.

Summary of Diagnostic Scores

Current Capability Assessment	Current Capability Score	Potential Capability Score	Opportunities to Realise Potential Capability
Coverage: 3 Effectiveness: 4 Acted Upon: 4 Integrated: 4	4	5	• Improve coverage by reporting National Highways decision-making processes for addressing severe weather hazards, consistent processes across regions.

Table 20 - Summary of Diagnostic Scores

Appendix B BENCHMARKING FINDINGS

B.1 OPERATIONAL RESPONSE TO NON-ASSET RELATED INCIDENTS

Data for this metric was the most widely available but the most difficult to compare. It was universally agreed that measuring incident response times for road incidents is essential for efficient traffic management and ensuring public safety. However, several challenges can arise when collecting and interpreting such data:

a) Incident types can vary significantly (e.g., accidents, breakdowns, road closures, poor weather, flooding).

b) There may be many agencies that are part of the 'response', and their actions can impact the measured response times.

c) While quick response times are crucial, focusing solely on speed might compromise the quality of incident resolution – balancing speed with thorough investigation is essential.

d) Gathering accurate data on incident response times can be challenging due to multiple agencies and potential inaccuracies in reporting.

e) Setting a target response time is complex as it is influenced by numerous factors including road criticality, accessibility, and public perception of acceptable delay times.

f) Metrics should resonate with both technical experts and non-technical audiences and will likely be interpreted in many ways depending on the outcomes being measured.

The operational response to non-asset related incidents appears to be the most significant KPI metric used by other organisation and countries, primarily as it relates directly to public safety, but also as it has the most impact on road users. With increasing availability of 'real time' traffic data via phone applications[8] the public is very aware of the delay caused to their journey. Any performance measures that are widely reported must align with public awareness and reflect their experience of the incident.

The current National Highways PI for response to incidents is 86% responded to within one hour. As discussed above, is it not constructive to comment on whether the actual response time and the extent to whether this is achieved is appropriate, but there is evidence to confirm that this is a valid metric[9] and there is ability (now and in the even more so in the future) to measure this in more granular detail, without significant burden on the road network operator, through the use of the real time data now available. Targets and performance levels must be determined though analysis of local impacts of non-performance on required outcomes, balanced against operational constraints, costs and practicality.

[8] For example, Google Maps and Waze (which is Google owned) are phone applications that collect map data, travel times, and traffic information from users and transmits it to a central server. Users can report accidents, traffic jams, speed, and police traps, and, from the online map editor, can update roads, landmarks and house numbers, etc. These applications collate anonymous information, including users' speed and location, which is used to provide real time traffic information to users.

[9] Almost all road operating organisation monitor incident response times. The Baseline report on the KPI Post-crash care, January 2023 lists accident response times for 18 European countries.

B.2 OPERATIONAL RESPONSE TO ASSET SAFETY DEFECTS

Data for this metric was available but varied considerably depending on the definition of a 'safety defect'. A common method of setting measurable targets for response to defects was to take a risk-based approach. This involves evaluating the level of risk associated with each defect and assigning a priority for response, against which a target response time established. For example:

- Priority 1 (Immediate Risk): Requires immediate action (e.g., severe structural damage).
- Priority 2 (High Risk): Repair within 5 working days.
- Priority 3 (Medium Risk): Repair within 28 working days.
- Priority 4 (Low Risk): Repair within 90 working days.

There appears to be data available from local authorities with regards to lower priority problems such as fixing potholes within the designated time period, but less data available on response time to respond to and fix 'Priority 1' issues.

The ability and speed at which safety defects can be identified and reported has changed considerably with phone applications that allow users to report incidents and assets defects easily and quickly for the benefit of other users. The availability of this data could allow road operators to identify defects almost as they occur and without the need for inspections. This will impact overall response times and influence not only the way that this metric is measured but the public perception of what constitutes an acceptable response time.

National Highways' current KPI/PI for response to asset defects that are deemed to impact on safety is 24 hours. As discussed above, is it not constructive to comment on whether the actual response time, and the extent to whether this is achieved, is appropriate but there is evidence to confirm that this is a valid metric and there is ability (now and in the even more so in the future) to measure this in more granular detail, without significant burden on road network operator, through the use of the real time data available. Targets and performance levels must be determined though analysis of local impacts of non-performance on required outcomes, balanced against operational constraints, costs and practicality.

B.3 MANAGEMENT AND RESOLUTION OF MULTI-REGION, LONG DURATION OR SEVERE WEATHER EVENTS

The management of long duration, multi-region or severe weather events is very difficult to measure due to the varied nature, duration and required response of such events. No specific published comparable data was found, with most information focused on:

a) demonstrating preparedness for a number of event scenarios, such as extreme weather, and

b) learning from experience and sharing lessons learnt.

A key theme for reporting of the response to multi-region, large scale and pre-planned or predictable events is to compare the organisation's actual performance against the expected performance (based on pre-established plans) and identify where there were shortfalls. Key elements of the plans should include response times (including ability to effectively predict or identify the event), resource allocation and communication with other agencies and the public.

Other themes for measurement of multi-region events were:

a) the perception of risks, and how these were prioritised and managed,

b) the impact of the event, both short and long term, on the organisation and wider stakeholders and community, and

c) the adaptive capacity of the organisation, both during the events and post-event, to alter and adjust the process to better respond to the problems at hand.

There is a similar argument as above as to the effectiveness of applying a benchmark to these performance measures as any specific targets set will be influenced by national and regional factors, climate, terrain, governance structures, roles and responsibilities relating to the event response.

There is evidence to confirm that the measurement of performance in these areas is important to ensure there is continual adaptation and enhancement of response plans based on learning from experience. Where there is an opportunity to learn from experience, internal and external audits should be carried out to ensure that any lessons identified are incorporated into future plans and actioned.

B.4 SYSTEMS AND OPERATIONS THAT ARE USED TO MANAGE CUSTOMER JOURNEYS AND THE EXPEDITIOUS MOVEMENT OF TRAFFIC, INCLUDING RELIABILITY OF TECHNOLOGY SYSTEMS

Whilst there are multiple ways to measure the 'expeditious movement of traffic', there is little data on the performance of the systems and operational processes that are used to support traffic management. National Highways has a number of KPI/PIs that relate to the 'expeditious movement of traffic' (incident response, delays, journey time reliability, averages speeds, user satisfaction, etc.) but currently do not directly measure the use and application of the systems that are used to enable traffic flow.

It is understood that most digital traffic management systems can measure system downtime and the system and application availability is measured as part of the contracts that highway operators have in place with their suppliers. However, this information was not published or available in the public domain.

Similarly, there is very little information available regarding the reliability of operational technology systems. The rapid pace of change, equipment enhancements and emerging technologies makes it difficult for any organisation to consistently monitor and publish reliability data.

The discussion relating to reliability of technology is complicated by the lack of clarity as to the purpose of the technology, some of which has been made redundant by advances in end user can and phone technology. There are, however, some systems that will remain vital to road user safety and the reliability of these systems should be measured. The extent to which systems are safety critical and the acceptable 'downtime' must be clearly defined for each part of the road network.

Consideration must also be given to the reliability and accuracy of the data as well as the system down time. A system that appears to be functioning and reporting data may not be calibrated correctly or be sending erroneous data that may have a greater impact on operations than a system that is not operating at all. In some 'technology systems' it may be important to measure resistance to cyber-attack to prevent interference with operational outputs.

National Highways do report availability and downtime of traffic management systems and it is a useful metric to determine the efficiency of highway operators in maintaining and utilising their assets. The IT systems and roadside assets used to monitor traffic flows and customer journeys are an essential part of the traffic management system and regular reviews to ensure the assets are still 'fit

for purpose' (and encompassing the latest technology and advancements) are as important as measuring the performance of existing systems.

In trying to find comparable benchmark data it appears that most countries consider the systems and operational methods used to ensure good traffic flow to be a 'means to an end' and therefore only report and publish data on the overall outcome supported by the system. However, the overall performance can only be determined by the continual and comprehensive collection of data at the operational level that feeds the overall performance metrics.

The lack of benchmarking data should not be considered an indicator that the metrics relating to systems and operations are not valid. The increasing reliance on IT and technology-based assets for the management of traffic flow means that it will become more important (and easier) to measure and report the performance of the system components at all levels.

B.5 PROVISION OF WELFARE TO NATIONAL HIGHWAYS' CUSTOMERS

No benchmarking data was found relating to the provision of welfare to road users. There were marked differences in who is responsible this kind of activity within each country. Where references to welfare provision were found, there were no indications of performance metrics or whether they were measured.

National Highways does not currently report any metrics relating to this performance measure. There is no wider evidence to suggest that this would be a valid metric for measuring road operator performance unless it is a specified responsibility of National Highways.

B.6 THE SYSTEMS THAT SUPPORT THIRD-PARTY ACCESS TO THE NETWORK

There was very little published information related to third-party access to the road network in other countries. Activities required for road closures are likely reported via other metrics such as response to incidents and time to restore normal traffic flows. Published 'permits to work' system data did not seem to be widely available. Whilst some data exists relating to the impacts of third-party access in terms of time for road closures, there was no information relating to the efficiency of the application, permit and implementation process.

National Highways currently reports third-party access to the road network via the regional network occupancy teams, but this currently accounts for less than 5% of total occupancy and so has limited impact on the network. There is currently no measure of how effective or efficient National Highways' systems and processes are, but it is understood that this will be addressed in the new framework that is due to be released in summer 2024.

There is evidence to suggest that measuring National Highways response to access requests is a valid performance metric. Many public sector agencies are set targets and monitored for their ability to effectively respond to requests and their response and resolution times, and it provides a good measure of the level of service the agency is providing in this area.

B.7 DEVELOPMENTS IN KEY PERFORMANCE INDICATORS (KPIS) FOR GOVERNMENT ORGANISATIONS

In carrying out the benchmarking exercise it became apparent that whilst there is limited published information, the need for, and awareness of, performance metrics is increasing. A few recurring themes were evident across international performance measure discussions. It was noted that there is:

a) A desire to align performance measures with the strategic goals of the organisation.

b) More focus on performance measures that directly impact citizen satisfaction and well-being (i.e. service quality, responsiveness, and accessibility).

c) A clear move beyond output-based metrics (e.g., number of services provided) to outcome-based metrics (e.g., impact on citizens' lives). This partly driven by availability of public domain data and increasing awareness which is raising expectations and accountability.

d) More focus on measuring the actual change achieved by government initiatives rather than performance against an arbitrary benchmark (e.g. percentage improvements each year).

e) Availability of data that is driving a move towards more granular level of detail in reporting in some areas and more regular review and adjustment of performance measures based on changing priorities and external factors.

The shift towards demonstrating outcomes and improvements in collation and analysis of data has not only improved the improved the ability to measure performance but has also increased the public's awareness and expectations with regards to an organisation's performance and the transparency of their operations. This has placed increasing emphasis on accountability of both the road network operators and those that are responsible for holding them to account.

Whilst it was difficult to find directly comparable data to use as a benchmark for National Highways this was partly due to the wide range and sheer volume of data, and there is a need to take time to consider and develop the performance metrics that are used by ORR and National Highways if future benchmarking exercises are to yield useful results.

B.8 DEVELOPMENT IN DIGITAL TECHNOLOGIES

Development in digital technologies, including technologies such as the internet of things (IoT) and artificial intelligence (AI), provides National Highways, and the broader road sector, with an opportunity to revolutionise its data collection and analysis methods. These advancements can enhance performance measures, from efficiency and resilience to customer satisfaction. This is achieved by:

a) **Improving Data Collection**: By integrating sensors, cameras, and connected devices into the SRN, National Highways, and key stakeholders, will have access to real-time information regarding traffic flow, road conditions, and incidents.

b) **Optimizing Network Performance:** Improving data collection on the SRN will facilitate network monitoring and enable National Highways to construct detailed models for road asset analysis. This will improve decision-making processes, enabling more responsive and adaptable management of the road networks. This will lead to improved capabilities in areas such as predictive maintenance, automated incident detection, and proactive network rerouting to offer less congested routes in real-time. This will contribute to the increase in asset life and improved network performance.

c) **Enhancing Customer Experience:** Digital advancements can significantly improve customer experience by providing accurate and real-time journey information. This not only boosts customer trust and satisfaction but can also enhance the overall travel experience.

B.9 KEY REFERENCES

- Baseline report on the KPI Infrastructure. Baseline project, Brussels: Vias institute. (2022)
- Baseline report on the KPI Post-crash care. Baseline project, Brussels: Vias institute (2022).
- Innovation and Best Practice in Performance Measurement and Transport Outcomes, Austroads (2020)
- KRA Performance Framework Guidelines, NZ Transport Agency Waka Kotahi (NZTA) (2023)

- The Baseline Project website https://www.baseline.vias.be/en/
- PIARC (World Road Association) Website https://rno-its.piarc.org/en
- International Road Federation website https://worldroadstatistics.org/
- Nordic Road and Transport Research website https://nordicroads.com/
- Transport Scotland website https://www.transport.gov.scot/transport-network/roads/
- Rijkswaterstaat (Dutch Road Operator) website https://www.rijkswaterstaat.nl/en
- Die Autobahn (German Motorway Operator) website https://www.autobahn.de/ueber-uns
- Austroads website https://austroads.com.au/
- NZ Transport Agency https://www.nzta.govt.nz/

- COMET The Community of Metros website https://communityofmetros.org/
- The International Association of Public Transport website https://www.uitp.org/

Appendix C PERSONNEL INTERVIEWED

Focus Session Name	Activity Area	Date & Time	National Highways Stakeholders (Role Titles)
Provision of Welfare	8	29th Feb 10.00-11.00	Head of Resilience, Delivery Manager, National Operations Team Leader
Competency and capacity to respond to and manage long-duration incident & Management and resolution of multi-region events	3 & 4	29th Feb 12.00-14.00	Head of Resilience, Delivery Manager, National Operations Team Leader
Proactive and reactive systems used to manage customer journeys and the systems that support this	7	1st March 15.00-16.00	Customer Service Director
Operational response to non-asset related incidents & Systems and operations that are used to manage the expeditious movement of traffic	2 & 5	6th March 15.30-17.00	Operational Control Director, Delivery Director
Improving the reliability of operational technology systems including but not limited to CCTV, radar technology, MIDAS, and variable message signs	6	12th March 09.30-12.30	Service Delivery Manager, Head of Operational Technology, Head of Operational Technology
The systems that support third-party access to the network including but not limited to public utilities	9	12th March 11.30-12.30	Business Systems Owner, Solutions Architect, Project Manager
Operational response to asset safety defects	1	13th March 14.30-15.30	Head of Service Delivery (Midlands)
Operational competency and capacity in the delivery /management of severe weather events	10	18th March 13:00 – 14:00 21st March 13:00 – 14:00	Network Availability Manager, ROC Operations Manager, Resilience Planner (Yorkshire Northeast), Programme Development Manager (Yorkshire Northeast), Network Resilience Planner, Senior Media Manager (North), Team

Focus Session Name	Activity Area	Date & Time	National Highways Stakeholders (Role Titles)
			Leader (SW), Head of Service Delivery (Central Ops), Project Sponsor (Weather Information Services), National Winter and Severe Weather Team Leader, Team Leader, Contract Manager

Table 21 – National Highways Interview Schedule and Attendees

Appendix D DOCUMENTS REVIEWED

Author	Source	Name/Reference	Year
National Highways	Received	Incident management and provision of welfare for customers stranded on the SRN (slide deck)	2017
National Highways	Received	Resilience Standard Emergency Customer Welfare	2019
National Highways	Received	Operation London Bridge Support Plan	2022
National Highways	Received	Asset Class Handbook Guidance - Carbon reduction and net zero	2023
National Highways	Received	Asset Class Handbook Handbook - Drainage	2023
National Highways	Received	Asset Class Handbook Handbook - Pavement	2023
National Highways	Received	Asset Class Handbook Handbook - Geotech	2023
National Highways	Received	Asset Class Handbook Handbook - Lighting	2023
National Highways	Received	Asset Class Handbook Handbook - Structures	2023
National Highways	Received	Asset Class Strategy - Roadside Technology	2023
National Highways	Received	Chief Data Information Officer System Performance Dashboard (screenshot)	2024
National Highways	Received	Crisis Management Manual - Operations Annex A	2023
National Highways	Received	Crisis Management Manual	2023
National Highways	Received	Customer journey map - Freight Driver	NA
National Highways	Received	Stopped Vehicle Detection (SVD) Service Review	2023
National Highways	Received	Network Occupancy - Ways of Working (slide deck summary)	NA
National Highways	Received	Traffic Officer Manual (requested extracts)	NA
National Highways	Received	Soft Estate Asset Class Strategy	2023
National Highways	Received	Operational Guidance for Technology Outages (planned and unplanned)	2023
National Highways	Received	Technology Management and Maintenance Manual (TMMM)	2017
National Highways	Received	Welfare of Customers Held Within Closures on Strategic Roads During Incidents (letter to Local Resilience Forum chair)	2023
National Highways	Received	National Highways Winter Preparations: 2023/24	2024
National Highways	Received	AREA 4 - Asset Delivery Severe Weather Plan 2023 - 2024	2023
National Highways	Received	AREA 4 - Asset Delivery Severe Weather Plan 2023 - 2025 Appendices	2022
National Highways	Received	Drainage Asset Class Strategy	2022
National Highways	Received	Asset Class Management Strategy - Geotechnical Assets	2022
National Highways	Received	Asset Class Strategy - Lighting	2022
National Highways	Received	Asset Class Strategy - Pavements	2022

Author	Source	Name/Reference	Year
National Highways	Received	Asset Class Strategy - Highway Structures	2022
National Highways	Received	Asset Class Strategy - Vehicle Restraint Systems	2022
National Highways	Received	Our Approach to Asset Management	2022
National Highways	Received	Asset Management Policy	2022
National Highways	Received	Asset Management Systems Strategy	2022
National Highways	Public	GM 701 Asset delivery asset maintenance requirements	2020
National Highways	Public	TM 501 Road lighting maintenance	2020
National Highways	Public	CD 535 Drainage asset data and risk management	2021
National Highways	Public	GM 704 Operational requirements for severe weather	2020
National Highways	Public	GG 104 Requirements for safety risk assessment	2018
National Highways	Public	GG 128 Requirements for reporting incidents, events and undesirable circumstances: health, safety, wellbeing, structural and environmental	2022
GOV	Public (website)	Guidance - Emergency planning and preparedness: exercises and training	2014
GOV	Public (website)	Guidance - Emergency response and recovery	2013
National Highways	Public	GM 703 Operational requirements for incident management	2020
ORR	Received	Highways England Incident Management Study	2018
JESIP	Public (website)	JOINT DOCTRINE: The Interoperability Framework	2021
National Highways	Public	Network Management Manual (PART 7 - Traffic Incident Management and Contingency Planning)	2009
GOV	Public (website)	Guidance - Preparation and planning for emergencies: responsibilities of responder agencies and others	2013
IAM	Public	Contingency Planning & Resilience Analysis	2019
DfT	Public	Smart Motorway Safety - Evidence Stocktake and Action Plan	2020
National Highways	Public	Smart motorways stocktake - First year progress report 2021	2021
National Highways	Public	Smart motorways stocktake - Second year progress report 2022	2022
National Highways	Public	Smart motorways stocktake - Third year progress report 2023	2023
ORR	Public	Second Annual Assessment of Safety Performance on the SRN	2023
National Highways	Received	Digital Roads	2021
National Highways	Received	Operational technology: our 2035 strategy	NA
ORR	Received	Review of Highways England's asset management of road technology	2019

Author	Source	Name/Reference	Year
National Highways	Received	Making a difference for our customers - Customer service strategy	2022
GOV	Public (website)	News story - £20 million to improve roadside facilities for HGV drivers	2022
National Highways	Public (website)	Boost for roadside facilities	2022
GOV	Public (website)	News story - Up to £100 million boost to improve HGV roadside facilities	2022
National Highways	Public	Network Management Manual (PART 6 - Network Occupancy Management)	2009
National Highways	Public	GM 702 Operational Requirements for Network Occupancy	2023
AMCL	-	Road Investment Strategy 3: Review of National Highways' ability to improve efficiency from its asset management capability	2022
AMCL	-	Asset Management Capability & Efficiency Review	2023
National Highways	Received	Corporate Performance Report (December 2023)	2023
National Highways	Received	KPI and PI data sheet (December 2023)	2023
National Highways	Received	OPEX and CAPEX (P9 tables)	2023
National Highways	Received	Performance Headlines (December 2023)	2023
National Highways	Received	Supplementary Performance Report (December 2023)	2023
National Highways	Received	Delivery plan 2020-2025	2020
ORR	Received	Annual Assessment of National Highways' performance	2023
National Highways	Received	CS 641 Managing the maintenance of highway geotechnical assets	2020
DfT	Public	National Highways' Performance Report to Parliament 2021/22	2022
National Highways	Received	Operational Metrics Manual	2023
DfT	Public	Road Investment Strategy 2: 2020–2025	2020
IAM	Public	Maintenance Delivery and Asset Operations	2019
National Highways	Requested	System Architecture Map/Plan	NA
National Highways	Requested	Incident Response Plan (IRP)	NA
National Highways	Requested	Business Continuity Plans	NA
National Highways	Requested	Maintenance Response Plan (MRP)	NA
National Highways	Requested	DCGN playbook for managing defects	NA
National Highways	Requested	Collaborative Performance Framework	NA

Table 22 – Summary of Documents Reviewed