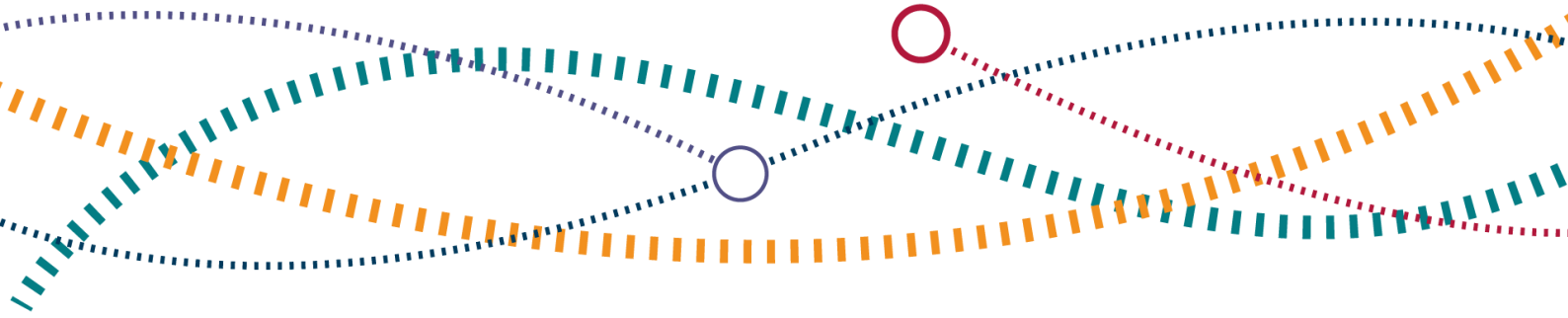
OFFICE OF RAIL AND ROAD

Fourth annual assessment of safety performance on the strategic road network

19 March 2026



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Executive summary

Introduction

1. The Office of Rail and Road (ORR) holds National Highways to account for delivery of the requirements set by government, including the company's key priority of improving safety for road users. This is ORR's fourth annual assessment of National Highways' safety performance on the strategic road network (SRN). In this report we will:

   (a) assess National Highways' 2024 performance against its key performance indicator (KPI) safety target to halve the number of people killed or seriously injured on the SRN by the end of 2025, compared to a 2005 to 2009 baseline; and

   (b) summarise our findings in relation to recommendations 4 and 6 from the Transport Select Committee's (TSC) inquiry into the rollout and safety of smart motorways.

2. This report does not consider the issue that was identified in 2025 where an anomaly with speed cameras (HADECS) on the SRN resulted in some drivers incorrectly facing enforcement action for speeding. On 19 January 2026, the Department for Transport (DfT) announced that it is conducting an independent investigation into this issue.

Background

3. National Highways was set up as a government-owned company in 2015, tasked with managing the SRN – the motorways and major A-roads in England.

4. For the second road investment strategy (RIS2), government specified a set of outcomes and investments that it requires National Highways to deliver over the second road period (RP2), from April 2020 to March 2025. This includes a target to halve the number of people killed or seriously injured (KSI) on the SRN by the end of 2025, compared to a 2005 to 2009 baseline. The same target also covers the interim period settlement (April 2025 to March 2026), with performance against the target assessed to the end of December 2025.

5. This report uses the latest road casualty data for the SRN, published by DfT on 25 September 2025, to inform our assessment of National Highways' progress against its target during 2024.

6. In March 2020, following publication of RIS2, DfT released its smart motorway evidence stocktake and action plan, which included a set of actions to improve the safety of, and public confidence in, smart motorways. We held National Highways to account for delivering these actions that were completed in 2024.

7. In February 2021, due to concerns over the safety of smart motorways, the TSC launched an inquiry into the roll-out and safety of smart motorways. It published a report in November 2021, containing nine recommendations aimed at improving the safety of smart motorways.

8. In its response, published in January 2022, DfT agreed to take forward these nine recommendations. At DfT's request, we are leading on two recommendations:

   (a) Assessing the effectiveness of the safety systems in place on smart motorways (recommendation 4); and

   (b) Evaluating the effectiveness of the action plan in reducing the frequency and duration of live lane incidents and educating drivers on what to do if they break down in a live lane (recommendation 6).

9. In April 2023, government announced that plans for new smart motorways would be cancelled, recognising the lack of public confidence felt by drivers and cost pressures. Following this announcement, National Highways continues to operate, manage and improve existing smart motorways, and we also continue in our role to assess the effectiveness of the safety systems in place on smart motorways, as set out in this report.

10. National Highways published its 2024 Road safety performance overview in March 2026 that includes detailed analysis of casualty rates on different road types, including smart motorways, using road casualty data up to and including 2024. The comparisons of headline casualty rates between different road types were broadly similar to those reported previously.

11. This report builds on the findings in our three previous annual assessments of safety performance on the SRN. Three main areas of focus for this report are set out below.

Area of focus 1:

Safety on the strategic road network

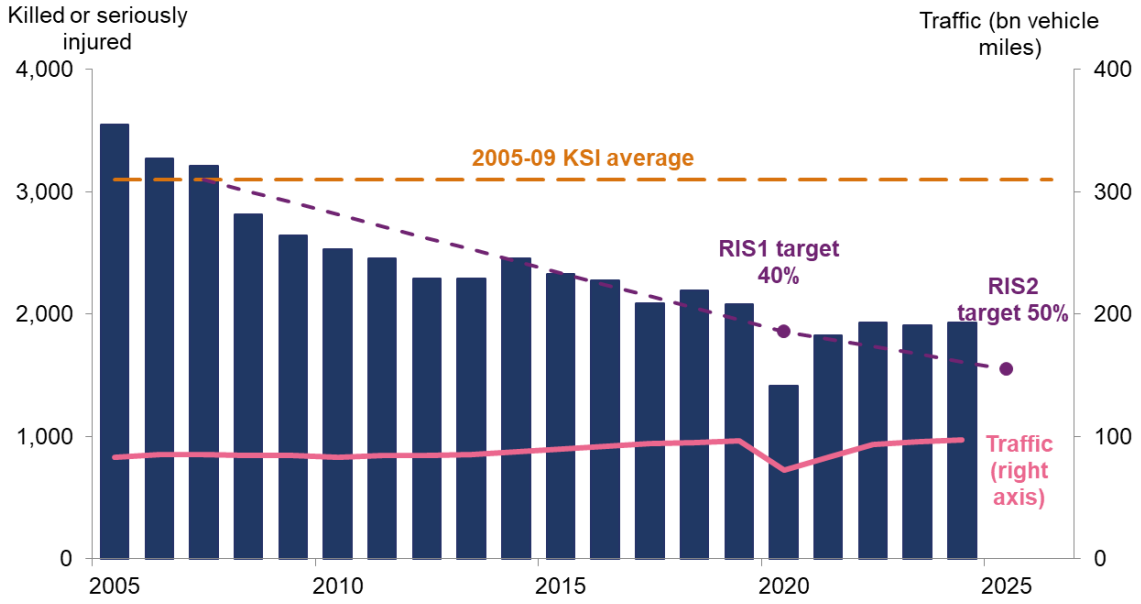
Casualty rates per mile travelled on the strategic road network (SRN) remain at the lowest level on record, excluding 2020 when traffic volumes were significantly lower

due to the pandemic. In 2024, the number of deaths and serious injuries on the SRN was 1% higher than in the previous year, with traffic increasing by a similar amount over the same period. National Highways has now achieved a 38% reduction in the number of people killed or seriously injured (KSIs) on the SRN compared to a 2005 to 2009 average baseline. While the company continues to work hard to deliver its plans to improve safety, the latest figures confirm that it is now almost certain that it will have missed its target of a 50% reduction in KSI casualties by the end of December 2025. It is important that the company implements its learnings from the second road period to inform and improve the actions it takes to deliver the safety benefits for road users in road period 3.

12. The latest road casualty statistics for 2024 show that 23 more people were killed or seriously injured (KSI) on the SRN than in 2023, an increase of 1%. The longer-term trend of decreasing deaths and serious injuries on the SRN has stalled in the last three years. Over the same period, traffic levels have returned to pre-pandemic levels.

13. Traffic on the SRN increased by 1% in 2024. As a result, the KSI rate was unchanged, at 19.9 KSI casualties per billion miles travelled. Excluding 2020 (when fewer people were travelling because of the pandemic), this is the equal lowest casualty rate recorded on the SRN, which remains one of the safest road networks in the world and is significantly safer than the local road network in England.

Chart 1: KSIs and traffic on the SRN, 2005 to 2024



14. The 1,931 KSI casualties that were recorded on the SRN in 2024 means that National Highways has now achieved a 38% decrease compared to the 2005 to 2009 average baseline. This compares to a 39% reduction that was recorded last year, based on 2023 casualty data and 2023 adjustment factors.

15. The latest figures fall short of the RIS1 target for a 40% reduction in KSI casualties by the end of December 2020 and confirm that it is almost certain that National Highways will not meet its RIS2 target of a 50% reduction by the end of 2025.

16. In our previous annual safety reports we have regularly highlighted that this target was at risk. As a result of our intervention and challenge, in March 2024 National Highways produced a plan that included 43 actions aimed at closing the gap to the target.

17. National Highways has now delivered 41 of these additional actions. In addition, the company is on track to deliver its target of a further five to seven safety schemes by the end of March 2026 as part of its interim period delivery plan. As we reported last year, government mandated a reduction in budgets for communication campaigns in 2024, which resulted in National Highways scaling back some of its proposed activities. Following the reduction in funding the company identified innovative solutions that enabled it to still deliver elements of all eight planned communication campaigns.

18. While National Highways continues to work hard to deliver its plans to improve safety, its actions are unlikely to have delivered the reduction of 381 KSIs required to achieve the KPI target by the end of 2025. Even if the company does not meet its target, it is important that it continues to do all it reasonably can to reduce casualties by as much as possible.

19. It is accepted that not all factors affecting safety on the SRN are within the direct control of National Highways. In the future, it is important that the company is better able to identify those areas where it does have control and quantify how all its work – not just those projects specifically designed to deliver targeted safety benefits – contributes to improved safety for road users. It should also continue to use its position in the sector to promote innovation and seek to influence those areas where it has less control, as these will become increasingly important in the future when it will be more difficult to rely on on-road engineering solutions alone to improve safety.

20. These recommendations align with expectations in DfT's Road Safety Strategy, published in January 2026. This strategy sets out government's vision for improving safety on all roads in Great Britain and provides an opportunity for National Highways to work closely with other stakeholders to further develop its safe system approach to road safety. This will reduce casualties and ultimately support the company's longer-term ambition of zero harm in the SRN.

Area of focus 2:

Effectiveness of safety systems in place on smart motorways

In 2025 National Highways completed a programme to build 151 additional emergency areas on all lane running smart motorways. Following this work, the company has resumed reporting performance data for safety technology on these roads. Data show that stopped vehicle detection technology continues to meet national level performance requirements set by the company. However, its programme to improve availability of safety technology on these roads, which was due to finish by end of March 2025, is now expected to complete in April 2026. In particular, the planned upgrade of variable message signs and signals has taken significantly longer than expected. It is imperative that National Highways demonstrates that it has applied the lessons it has learnt from this programme to ensure that it can reliably and effectively deliver renewals of roadside technology across the SRN in road period 3.

21. In last year's safety report, we highlighted that the National Emergency Area Retrofit (NEAR) programme, to build 151 additional emergency areas on all lane running (ALR) smart motorways by the end of March 2025, meant that there was less data to measure the performance and availability of safety technology on smart motorways than in previous years.

22. Following completion of the NEAR programme in March 2025, National Highways is again able to report detailed data.

23. National Highways tested performance of stopped vehicle detection (SVD) technology at 25 sites in 2025. This is four more than the 21 sites tested by the company in 2023, prior to the start of the NEAR programme roadworks, which meant that only 12 sites were tested in 2024. Testing results show that SVD performance continues to meet the national level targets that were set by the company for the key metrics of:

    (a) detection rates (the proportion of stopped vehicles correctly identified by SVD, target: ≥80%)

    (b) false discovery rates (the proportional of SVD alerts that are not related to a stopped vehicle event, target: <15%); and

    (c) average time to detect stopped vehicles (the elapsed time between a vehicle stopping and an SVD alert being generated, target: ≤20 seconds).

Table 1: SVD performance in 2024 and 2025

Metric	Target	2024 results (12 schemes)	2025 results (25 schemes)
Detection rate	≥80%	86%	85%
False discovery rate	<15%	6%	5%
Alert time average (seconds)	≤20	12.9	16.2

24. Although SVD performance is measured at a national level, we have also scrutinised testing data for individual schemes, in particular to identify those that have failed more than one metric, or where metrics have failed in consecutive years. Data for individual schemes show that, of the 75 metrics tested (25 schemes with three metrics each), 13 metrics are below target.

25. Our analysis identified one scheme that failed more than one metric in 2025: M1 J28-30, which had a 76% detection rate, and an average time to detect of 25.1 seconds. It also identified one scheme (M1 J13-16) that has failed to achieve the 80% target for detection rates in each of the past three years, having returned a score of 76% in 2025. All unmet metrics were close to the target level, which provides confidence that there are no underlying performance issues with the wider SVD system.

26. Scheme level SVD testing shows greater variance because it relies on smaller sample sizes than national level data, which provide a more robust assessment of system performance. However, National Highways has established an internal working group to review scheme level performance, undertake further analysis of missed events and faults, and implement targeted improvements.

27. In our first annual assessment of safety performance on the SRN in 2022, we found that operational technology on smart motorways was not meeting the availability targets that National Highways had set itself. As a result, the company committed £105m to its modernisation and refresh programme to improve availability of certain asset types on ALR motorways.

28. This work originally planned to increase availability of four key asset types (CCTV, motorway incident detection and automatic signalling (MIDAS), variable message signs and signals) to 97% by March 2025. National Highways has completed almost all its plans for upgrading CCTV and MIDAS equipment, but has more work to do upgrading signs and signals. At the end of January 2026, the company had completed 92% of the work and has reported 95% availability for these assets. The programme is now due to complete in April 2026, over one year later than originally planned.

29. We have worked closely with National Highways to understand the reasons for the delays to the programme. This highlighted ongoing issues caused by incomplete and inconsistent asset data that resulted in difficulties for the company when integrating new Operational Technology (OpTech) assets, such as variable message signs, with the existing infrastructure. The company has demonstrated that it is learning lessons from this experience by improving the asset information it holds and updating its design and installation process for OpTech. This is important if National Highways is going to effectively and efficiently deliver its commitments for renewing OpTech across the wider SRN in the third road period, starting in April 2026.

30. Last year, we highlighted that National Highways should continue to improve its understanding of the extent of technology outages on the network. OpTech can be classed as unavailable for various reasons, ranging from damage to an individual piece of equipment, to power or system outages that affect multiple assets at the same time.

31. During 2025, National Highways has made progress in improving the data it collects on outages. This enables the company to better understand and manage outages so it can identify actions to minimise their effect on road users. One intervention that has improved National Highways' ability to manage outages is its project to move to metered electricity supplies. This has reduced the proportion of power outages on ALR smart motorways that were unplanned, which improves the company's ability to plan ahead and more effectively put mitigation measures in place.

Area of focus 3:

Smart motorway evidence stocktake and action plan

In the first year since delivering the smart motorway action plan, National Highways continues to make progress with evaluating the effectiveness of the plan in reducing the number and duration of live lane stops. The company has collected and analysed data that are necessary to support its evaluation work, and has responded to recommendations that we made last year to enhance its evaluation approach. The need for several years of robust data means that final conclusions about the effectiveness of the stocktake actions are unlikely to be available before 2028. It is important that National Highways does as much as it can to draw definitive conclusions from its evaluation, and carefully considers how it will communicate the findings in a way that is meaningful and understandable for the public and other stakeholders.

32. National Highways' successful delivery of the NEAR programme in 2025 was a significant achievement for the company as part of its response to the Transport Select Committee's (TSC) inquiry into the roll-out and safety of smart motorways.

33. Now that National Highways has completed all the stocktake actions it was due to complete in the smart motorway evidence stocktake and action plan, the company is able to progress its work to evaluate the effectiveness of the stocktake actions in reducing the number and duration of live lane stops on smart motorways.

34. Last year we reported that National Highways' evaluation of the education campaigns that it ran as part of the action plan aligned with best practice, and the company would need to progress the more challenging work to evaluate the effect of the actions on the number and duration of live lane stops.

35. In 2025 National Highways has made progress with these more substantial and challenging elements of its assessment by continuing its collection and analysis of data needed to evaluate the stocktake actions.

36. There are many external factors that influence traffic on the SRN, which makes it difficult for National Highways to isolate the effect of individual actions it has taken. This is further complicated by events that have introduced further uncertainties, such as the pandemic, which affected traffic volumes, and the NEAR programme roadworks that temporarily changed how smart motorways operate. In combination, this makes it more difficult for the company to produce a definitive assessment of what effect the smart motorway action plan has had on the number and duration of live lane stops on smart motorways.

37. In our previous work to assess National Highways' approach to evaluation we sought independent advice, which concluded that the company is addressing these issues appropriately. It is also clear that several years of consistent data are needed before any firm conclusions can be drawn about the effectiveness of the action plan. This will not be possible before 2028 and, even then, the limitations of the data mean there are uncertainties about how conclusive the final evaluation will be. It is important that National Highways carefully considers how it will communicate its findings in a way that is meaningful and understandable for the public and other stakeholders.

1. Safety performance on the strategic road network in 2024

1.1 National Highways' licence requires it to protect and improve safety on the strategic road network (SRN). This is reflected, in part, in the company's key performance indicator (KPI) target to reduce the number of people killed or seriously injured (KSI) on the SRN by at least 50% by the end of 2025, compared to a baseline of the 2005 to 2009 average.

1.2 This chapter uses the Department for Transport's (DfT) road casualty statistics for 2024, published on 25 September 2025, to assess National Highways' progress against its safety KPI target. It also reports the actions taken by the company during 2025 to improve road safety.

Severity adjustment

1.3 The KSI casualty figures referred to in this report are based on adjusted data reported by DfT. These adjustments account for changes in the reporting of injury severity by some police forces in recent years. This adjustment is applied to the historical time series each year and enables a more reliable comparison of trends over time. Therefore, all KSI data in this report can be subject to revision in future years. More details can be found in DfT's severity adjustments guidance.

KPI: number of people killed or seriously injured on the SRN

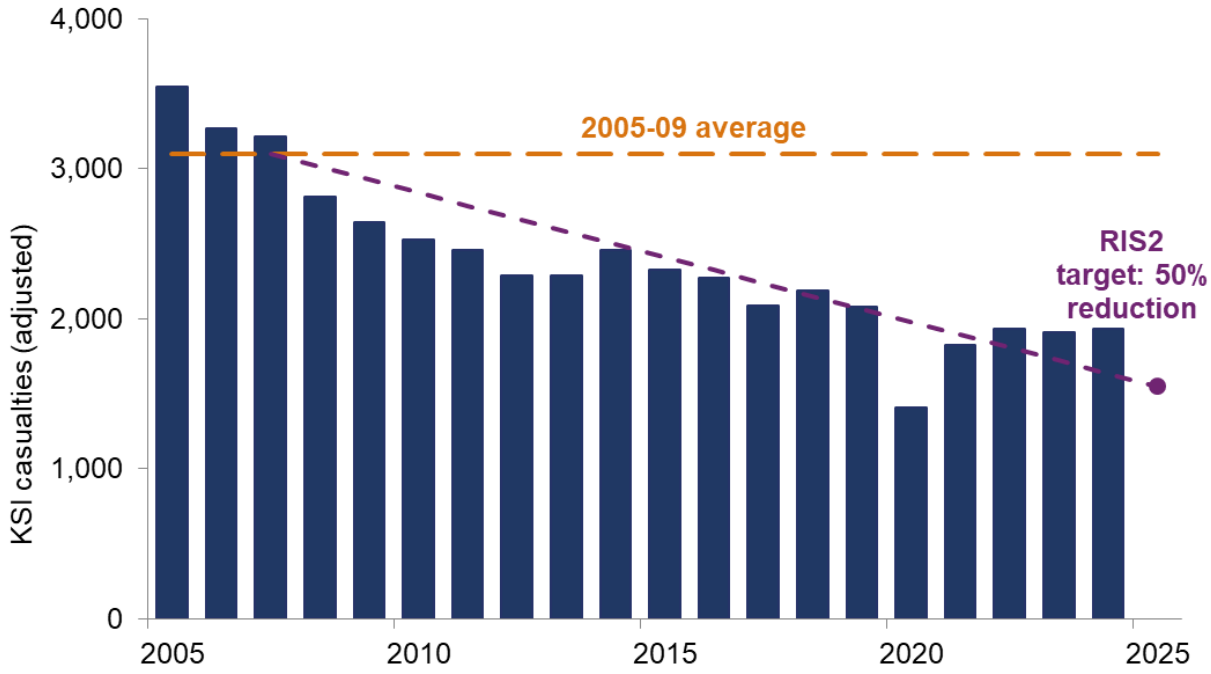
1.4 A total of 1,931 people were killed or seriously injured on the SRN in 2024. This is 23 (1%) more than in 2023 and represents a 38% reduction in KSI casualties compared to the 2005 to 2009 average baseline. This compares to a 39% reduction that was reported last year, based on 2023 casualty data and 2023 adjustment factors.

1.5 Over the same period, traffic on the SRN increased by 1%. As a result, the KSI rate was unchanged in the most recent year, at 19.9 KSI casualties per billion miles travelled. Excluding 2020 (when fewer people were travelling because of the pandemic), this is the equal lowest casualty rate recorded on the SRN.

1.6 The longer-term trend of decreasing deaths and serious injuries on the SRN has stalled in the past three years. Over the same period, traffic levels have returned

to pre-pandemic levels. National Highways needs to achieve a further reduction of 12 percentage points (381 KSI casualties) to meet its target of at least a 50% reduction by the end of 2025.

Figure 1.1 Killed or seriously injured casualties (adjusted), SRN, 2005 to 2024



1.7 The latest figures fall short of the RIS1 target for a 40% reduction in KSI casualties by the end of December 2020 and confirm that the RIS2 target will almost certainly not be met.

1.8 In our previous annual safety reports, we have regularly highlighted that this target was at risk. As a result of our intervention and challenge, in March 2024 National Highways produced an enhanced plan that included 43 actions aimed at closing the gap to the target. These actions were in addition to the company's delivery plans.

Comparison with previous years

1.9 The longer-term trend of decreasing deaths and serious injuries on the SRN has stalled in the last three years, as traffic levels have returned to pre-pandemic levels. The 1,931 KSIs reported in 2024 is 1% more than the previous year. Traffic on the SRN also increased by 1% over the same period and as a result KSI casualty rates are unchanged.

1.10 There were 215 fatalities on the SRN in 2024, which is 17 (9%) more than in 2023 and a reduction of 40% compared to the 2005 to 2009 average baseline.

Table 1.1 Killed or seriously injured casualties (adjusted), SRN, 2023 to 2024 and baseline

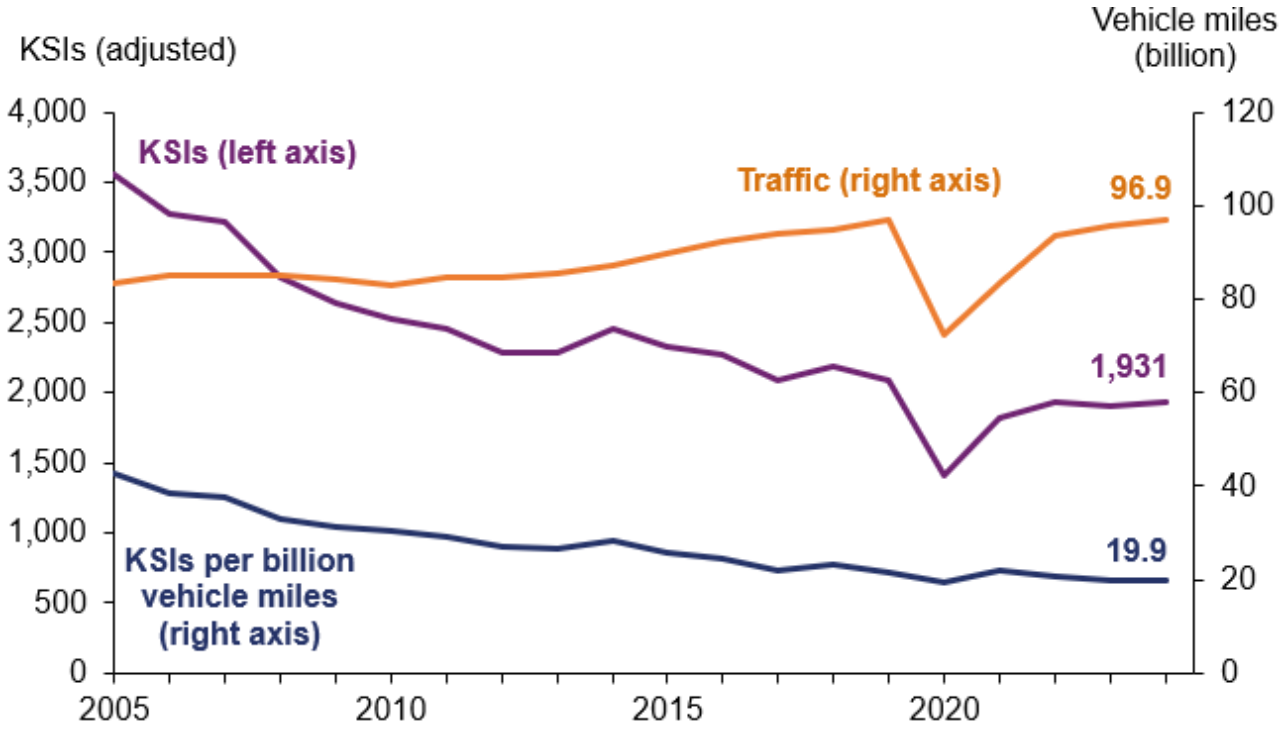
Severity	2024	2023	2005 to 2009 baseline	Percentage change from 2023	Percentage change from baseline
Killed	215	198	357	9%	-40%
Seriously injured	1,716	1,710	2,743	0%	-37%
Killed or seriously injured (RIS2 KPI)	1,931	1,908	3,100	1%	-38%

Casualty rates

1.11 A total of 96.9 billion vehicle miles were driven on the SRN in 2024, an increase of 1% compared to 2023. This is the highest annual figure ever recorded, and the first time that traffic has been above the pre-pandemic level of 2019.

1.12 In 2024 there were 19.9 KSI casualties per billion vehicle miles travelled on the SRN. This is unchanged from 2023 and the second lowest KSI casualty rate on record. Only 2020, the year that was most affected by the pandemic, has a lower rate (19.5 KSI casualties per billion vehicle miles travelled). KSI casualties, traffic and KSI casualty rates on the SRN are shown in figure 1.2.

Figure 1.2 Killed or seriously injured (KSIs, adjusted), traffic and KSI rate per billion vehicle miles travelled, SRN, 2005 to 2024



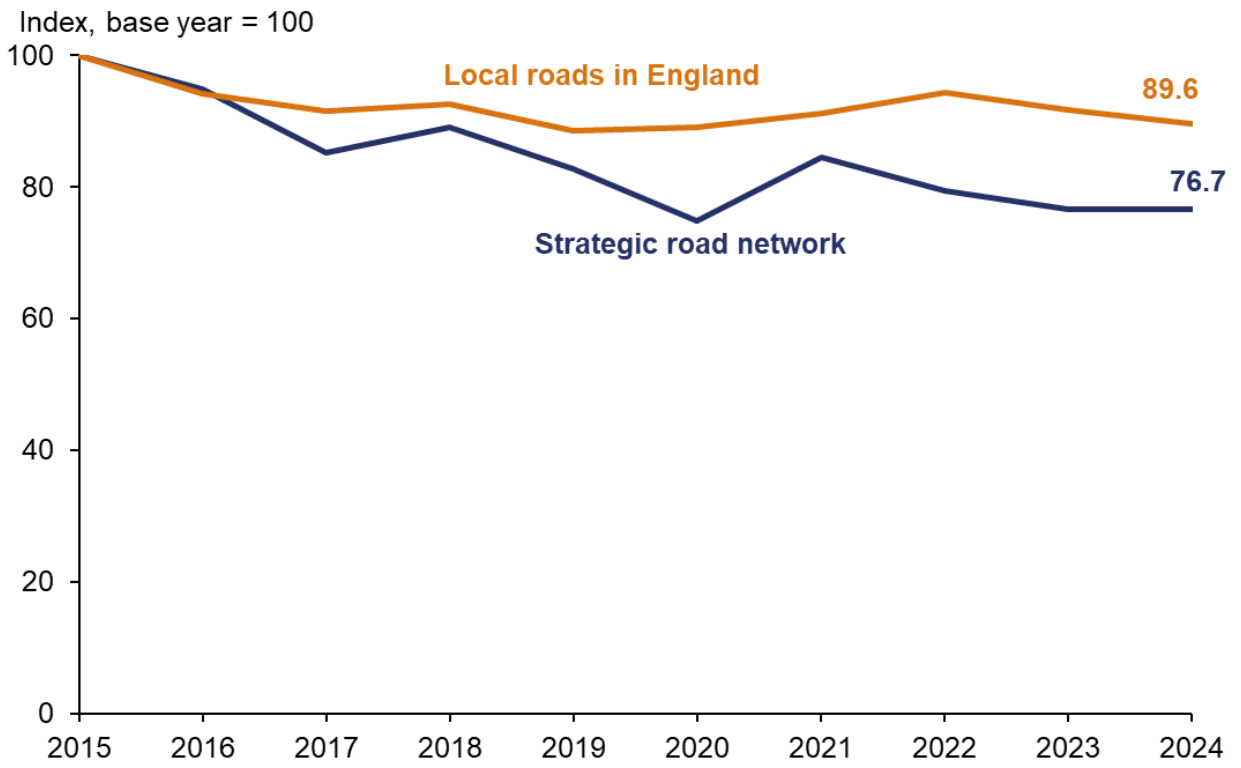
1.13 Analysis of casualty rates shows that the SRN remains significantly safer than local road network, per vehicle mile travelled. In 2024 there were 126.9 KSI casualties per billion vehicle miles travelled on local roads in England, which is six times higher than on the SRN (19.9 KSI casualties per billion vehicle miles travelled).

1.14 The large difference in KSI casualty rates between the SRN and local roads reflects the different road types that make up both networks. In particular, the SRN has a much higher proportion of motorways and dual carriageways that separate opposing flows of traffic, significantly reducing the risk of head-on collisions.

1.15 Analysing trend data allows us to compare the rate of improvement on different networks over time. Figure 1.3, below, shows that KSI casualty rates have improved by more on the SRN than on local roads in England over the past ten years. It is difficult to determine how much of this improvement is due to National Highways' actions, and how much is a result of external factors. However, this does provide some evidence on the effectiveness of the company's approach to improving safety on the SRN. An important factor that is likely to have contributed to better safety outcomes on the SRN over the last 10 years is National Highways'

higher level of funding compared to local highways authorities and the increased focus that comes with government setting the company a national casualty reduction target.

Figure 1.3 Killed or seriously injured (adjusted) casualty rates, SRN and local roads in England, indexed, 2015 to 2024



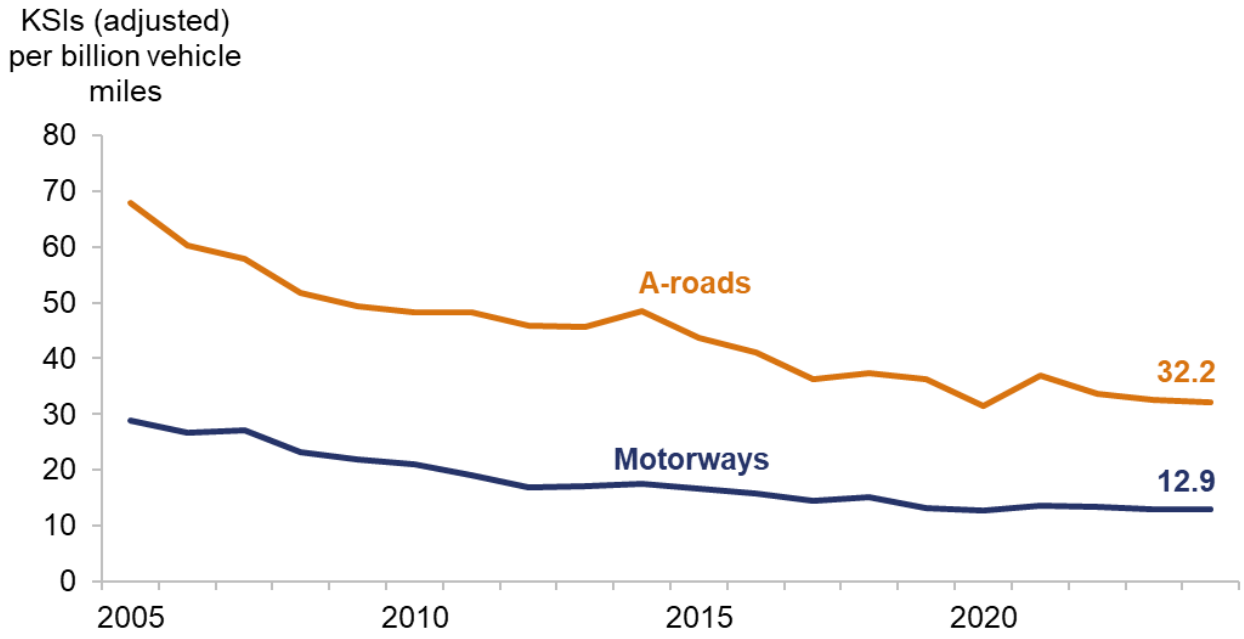
1.16 The SRN remains amongst the safest road networks in the world. Differences in how road types are classified, and how road casualty data are collected, means it is difficult to directly compare the SRN to road networks in other countries. However, when considering fatality rates per million population on all roads in 2024, DfT statistics show that Great Britain had the fourth lowest rate out of 36 countries. Analysis in National Highways' 2024 Road safety performance overview shows that, where 2023 data are available, Great Britain has the third lowest fatality rate on motorways out of nine countries. National Highways manages and operates 82% of the motorways in Great Britain.

Comparisons by road category and road user type

1.17 There were 800 KSI casualties on motorways on the SRN in 2024, an increase of nine (1%) compared to 2023. A-roads on the SRN saw 1,131 KSI casualties in 2024, an increase of 14 (1%) compared to 2023.

1.18 Figure 1.4 shows that, per distance travelled, motorways remain the safest type of road on the SRN. In 2024, SRN motorways had a KSI casualty rate of 12.9 KSI casualties per billion vehicle miles, compared to 32.2 KSI casualties per billion vehicle miles on SRN A-roads.

Figure 1.4 Killed or seriously injured (adjusted) per billion vehicle miles travelled, SRN by road type, 2005 to 2024



1.19 National Highways' 2024 Road safety performance overview provides a more detailed analysis of trends on different road types. Single carriageway A-roads are consistently identified as the highest risk roads on the SRN, which supports the company's approach of prioritising improvements on these roads. Its most recent overview report also brings together analysis of safety performance on conventional motorways and different types of smart motorway that had previously been published separately.

Performance indicators: improving safety for all

1.20 In the performance specification for RIS2, government specified five untargeted safety performance indicators (PIs). These provide additional context to the KPI and support transparency of wider aspects of National Highways' safety performance.

PI: Total number of people killed or injured on the SRN

1.21 This PI reports the number of casualties of all severities, including 'slight injuries' that are excluded from the KPI.

1.22 In 2024, a total of 9,750 people were killed or injured on the SRN. This is a decrease of 339 (3%) compared to 2023. This is the lowest total on record excluding 2020, the year that is most affected by the pandemic and is 55% below the 2005 to 2009 average baseline.

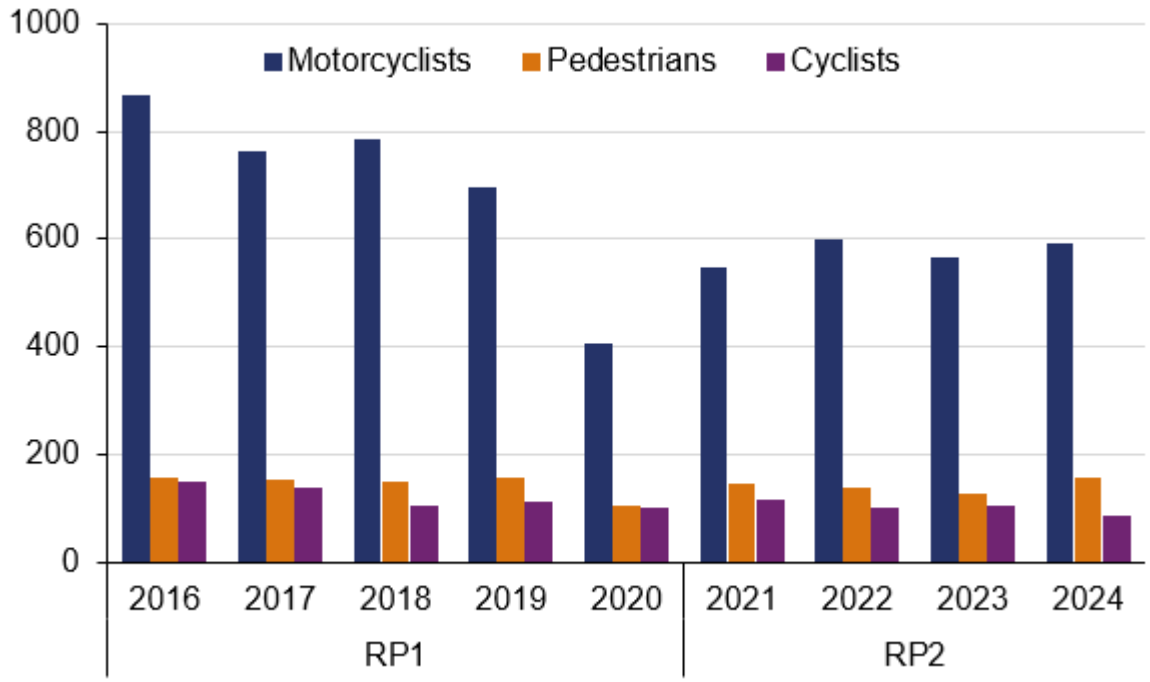
PI: Non-motorised and motorcyclist users killed or injured

1.23 In 2024, a total of 831 non-motorised and motorcyclist users were killed or injured on the SRN. This is an increase of 36 (5%) compared to 2023.

1.24 The 831 non-motorised and motorcyclist casualties in 2024 comprised:

- 591 motorcyclist casualties, which is 26 (5%) more than in 2023;
- 157 pedestrian casualties, which is 32 (26%) more than in 2023; and
- 83 cyclist casualties, which is 22 (21%) fewer than in 2023.

Figure 1.5 Non-motorised and motorcyclist users killed or injured, SRN, 2016 to 2024



1.25 We have previously reported on the actions National Highways has taken to improve safety on the SRN for non-motorised and motorcyclist users. The company's research into motorcycle training and intervention concluded that interventions tailored to different categories of motorcyclists are essential. The research also identified collision types most relevant to the SRN, particularly rural collisions involving larger motorcycles away from junctions. This research has been published and shared with stakeholders within National Highways' regions and road safety partnerships to help inform the development and delivery of locally targeted interventions.

1.26 National Highways has used the findings from this research to refine its approach to motorcycle safety, including informing the next phase of the Bikertek campaign, running in parallel with the company's longer-term road to zero harm ambition.

1.27 The 2024 Road safety performance overview includes analysis of non-motorised road user casualties. In 2024 there was a 4.5% increase in vulnerable road user casualties compared to 2023. This included a rise in pedestrian casualties and a decrease in cyclist casualties over the period. National Highways is undertaking analysis to better understand the underlying causes, circumstances and locations associated with the increase in pedestrian casualties in the latest data. We expect the company to use the findings from this work to identify the most effective interventions it can take improve safety outcomes for pedestrians.

PI: Number of injury collisions on the SRN

1.28 In 2024, a total of 6,495 collisions were recorded on the SRN that resulted in at least one injury of any severity. This is 82 (1%) fewer than in 2023 and the lowest total on record, excluding 2020, the year most affected by the pandemic.

PI: Percentage of traffic using iRAP 3-star or above roads

1.29 The International Road Assessment programme (iRAP) is a charity that works in partnership with National Highways and other roads authorities around the world to reduce road deaths and serious injuries.

1.30 iRAP star rating provides an objective measure of the level of 'built-in' safety for vehicle occupants, motorcyclists, cyclists and pedestrians. It uses star ratings on a five-point scale, where a 1-star rating reflects a high-risk road with little safety infrastructure, while 5-star indicates a road with minimal risk, designed for safety. As set out in the Road safety strategy 'some of the most high-risk roads in the country are rural single carriageways, with high speeds and limited infrastructure'.

1.31 We have previously reported results from iRAP modelling that show 89% of vehicle miles travelled on the SRN are on roads rated 3-stars or above for safety (using model version 3.02). This is unchanged from the previous year as the full iRAP survey is carried out every five years. The next survey is currently underway, with data expected to be available to National Highways from June 2026.

1.32 As part of our work to assess National Highways' approach to improving safety we asked the company to demonstrate how it uses iRAP assessments to inform the development of safety interventions on the SRN. We have reviewed case studies and evidence the company has used to develop schemes currently in feasibility and design stages, for potential delivery in road period 3 (RP3).

1.33 National Highways' work in this area focusses on improving safety on the roads with the lowest star-ratings. The evidence reviewed reflects a range of route characteristics, including known collision locations, roads where interventions are limited due to the geography of the route, and schemes where stakeholder or local authority concerns have influenced scheme development.

1.34 National Highways is using iRAP data to identify sections of road with the lowest levels of built-in safety. The company then identifies countermeasures and calculates the estimated KSI reductions. For each scheme, the Route Review Tool was used to test different combinations of interventions, including speed management, signage and road lining treatments, junction enhancements, and measures to improve provision for vulnerable road users.

1.35 The evidence provided shows that National Highways is applying iRAP analysis to existing 1- and 2-star routes to identify the interventions most likely to improve safety outcomes. These include measures such as improved lane delineation, enhanced signing, pedestrian and cyclist safety improvements, speed management and access control (where road users join the SRN from local or other major roads). The aim of these interventions is to raise the star rating of the route and reduce the predicted number of KSI casualties over time.

PI: Accident frequency rate for National Highways' staff and supply chain

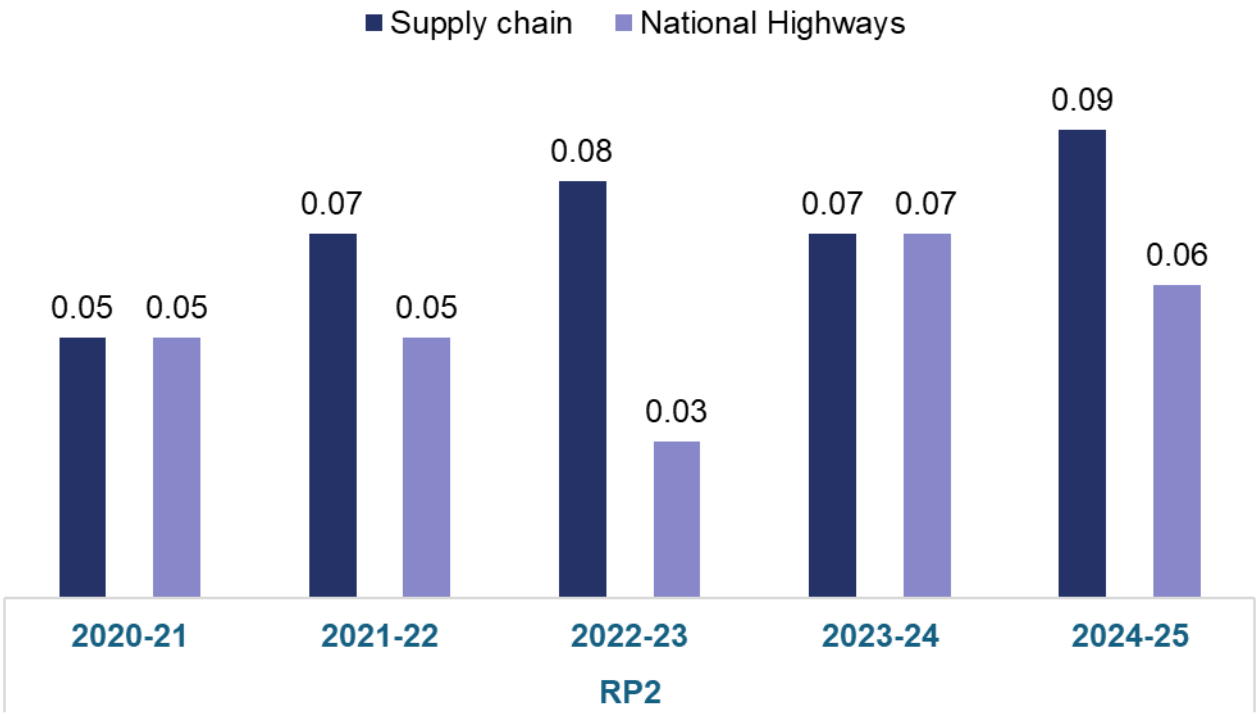
1.36 National Highways has two PIs that measure the safety of workers. The company reports the accident frequency rate (AFR) for its own employees, and for those working in its supply chain.

1.37 We reported National Highways' performance in the year from April 2024 to March 2025 in our most recent annual assessment of the company's performance, published in July 2025. This showed there were 10 RIDDOR (Reporting of Injuries,

Diseases and Dangerous Occurrences Regulations 2013) reportable incidents on the SRN in 2024-25. This is an AFR of 0.06 reportable incidents per 100,000 hours work, which is lower than in the previous year when the rate was 0.07.

1.38 For National Highways' supply chain, there were 30 RIDDOR reportable incidents on the SRN in 2024-25. This is an AFR of 0.09 reportable incidents per 100,000 hours work, which is higher than the previous year when the rate was 0.07.

Figure 1.6 RIDDOR accident frequency rate per 100,000 hours worked, National Highways and supply chain staff, April 2020 to March 2025



1.39 We meet with National Highways regularly to understand what actions it is taking to manage the health, safety and wellbeing of its employees and supply chain. The company's approach to this is set out in its Home Safe and Well approach.

1.40 In response to increases in the supply chain AFR, National Highways has engaged with the Supply Chain Safety Leadership Group and a supply chain Engagement Council.

1.41 These groups enable structured engagement with suppliers and provide assurance that workplace significant risks are understood and addressed. In 2025, this has included regular supplier performance reviews, dedicated supplier safety events, and targeted communications on incident reporting, alongside ongoing

benchmarking of health and safety performance and the systematic sharing of best practice across the supply chain.

1.42 We will report the AFR during the interim period (April 2025 to March 2026) in our next annual assessment of National Highways' performance that is due to be published in July 2026.

Safety actions in 2025

1.43 In 2025 National Highways delivered actions to improve safety on the SRN through two separate safety plans. The first of these is the company's enhanced safety plan that it produced in March 2024 and was in addition to existing RP2 safety plans. This included 43 actions to be completed between 2024 and the end of December 2025. The second is the safety action plan, developed as part of National Highways' interim period delivery plan, and included 12 actions the company would take to improve safety between April 2025 and March 2026.

Enhanced safety plan: March 2024 to December 2025

1.44 The 43 actions in the enhanced safety plan were made up of:

(a) 24 road safety schemes;

(b) 8 communication campaigns and activities; and

(c) 11 'working with others' actions to develop safety interventions in partnership with other stakeholders as part of the long-term programme to achieve zero harm on the SRN.

1.45 National Highways has now delivered all the actions that could reasonably be expected of it, having completed 41 of the 43 actions by the end of December 2025. These are listed in Annex A. Of the two actions that were not delivered, one (A47 Swaffham to Fransham) was cancelled following challenges from the local authority. The remaining action, to implement recommendations from the roads policing review, cannot be completed until government publishes the outcome of the roads policing review.

1.46 We reported last year that government mandated a reduction in budgets for communications campaigns in 2024. As a result, the company scaled back some of its proposed activities in this area, but used innovative solutions delivered elements of all eight campaigns.

Interim period safety action plan: April 2025 to March 2026

1.47 In its interim period delivery plan, National Highways set out 12 actions that it would take to improve safety between April 2025 and March 2026. Any actions delivered by the company that contribute to a reduction in KSI casualties during 2025 have the potential to contribute to the KPI target, which runs to the end of 2025.

1.48 One of the actions is to deliver between five and seven safety schemes using designated funds. At the end of December 2025, National Highways has delivered three of these schemes (listed in annex A). The company has five more schemes in construction, with at least three expected to complete by the end of March 2026. It is therefore on track to achieve its aim of five to seven schemes by the end of March 2026

1.49 Of the remaining 11 actions, National Highways has completed three: to share its Road to Zero Harm Roadmap with key stakeholders; publishing the 2023 Safety Overview Report; and to complete an analytical project looking at the differences between provisional and validated STATS19 data. At the end of December, the company reported that it is on track to deliver the remaining eight actions by the end of March 2026. As part of this, National Highways is developing a programme of small safety schemes and a national safety programme for delivery in road period 3.

Evidence and analysis to make improve safety

1.50 It is important that National Highways can demonstrate that it uses robust evidence to prioritise its actions to improve safety on the SRN. One way that the company does this is through its analytical work to better understand the causes of collisions on the network.

1.51 In 2025 National Highways published its latest detailed analysis of road safety data on the SRN, in its 2024 Road safety performance overview. The company used additional information about demographics, vehicle type and other factors that are included in the STATS19 database to identify wider trends and inform decisions about future safety improvements.

1.52 The 2023 report highlighted an increase in the proportion of casualties in older age groups. In response to this, National Highways commissioned a research report aimed at building a better understanding of current trends and risk factors to shape the development of future interventions. This follows on from similar work in the previous year where the company's analysis informed interventions to improve

safety for motorcyclists, which account for a disproportionately high number of casualties on the SRN.

1.53 In 2025 National Highways also used evidence from collision investigations to address the risk of wrong way driving. The company developed a wrong way driving toolkit to support the identification and mitigation of wrong way driving risks. This work directly informed the A5 Little Brickhill slip road scheme that forms part of the company's interim period safety action plan.

1.54 DfT's road casualty statistics are subject to extensive quality assurance and produced in line with the Code of Practice for Statistics. This assurance process results in a lag between a collision occurring on the network and the official statistics becoming available. National Highways also works with police forces on a weekly basis to review operational information and learn lessons from serious incidents on the SRN. This enables the company to identify more immediate actions to mitigate against similar incidents in the future. It is important that National Highways remains proactive and uses operational intelligence as well as official statistics to identify opportunities to improve safety on the SRN.

1.55 Improved data analytics are a key part of government's new Road Safety Strategy that was published in January 2026 and National Highways has a central role in supporting delivery of this strategy. In doing so, the company should continue to improve its understanding of the causes of collisions and casualties on the SRN and use its influence when working closely with relevant stakeholders to ensure that safety interventions are as effective as possible.

Conclusions and recommendations

1.56 In 2024, KSI casualties were 38% below the 2005 to 2009 average baseline. It is almost certain that National Highways will not have met the RIS2 KPI target of a 50% reduction by the end of 2025.

1.57 Despite a 1% increase in the number of people killed or seriously injured in 2024, the SRN remains one of the safest road networks in the world. Traffic on the network also increased by 1% in 2024, so the KSI casualty rate remains unchanged and the lowest on record, excluding 2020 when there was significantly less traffic due to the pandemic.

1.58 Earlier in the road period we raised concerns that this target was at risk. National Highways responded well to our challenge by developing, and then delivering, an enhanced safety plan at pace. We recognise that the company cannot influence all

the factors that cause casualties, and we consider that it is continuing to work hard to deliver its plans to improve safety on the SRN.

1.59 National Highways will face similar challenges in the next road period, as traffic increases and the company will be less able to rely on on-road engineering solutions alone to improve safety. Therefore it is important that the company implements its learnings from RP2 as it further develops and evolves its plans for RP3. National Highways should continue to enhance its evidence-based approach so it can improve how it identifies and prioritises interventions that will deliver safety benefits for road users. It will also be increasingly important for the company to influence, and quantify, factors over which it has less control in the future, when it will be more difficult to rely on engineering solutions alone to improve safety.

1.60 DfT's Road Safety Strategy, published in January 2026, sets out government's vision for improving safety on all roads in Great Britain. National Highways should continue to actively engage and use its influential position in the sector to promote innovation and share best practice with other stakeholders as it enhances its Safe System approach to road safety. This will further reduce casualties and ultimately support the company's longer-term ambition of zero harm in the SRN.

2. Effectiveness and operation of the end-to-end safety systems on smart motorways

2.1 England's strategic road network (SRN) is made up of 4,566 miles of motorways and A-roads, of which 446 miles (9.8%) are smart motorways. Smart motorways use technologies and features not present on conventional motorways to control traffic and support road user safety. The three different types of smart motorway are described below in Table 2.1.

2.2 In 2021, the Transport Select Committee's (TSC's) inquiry into the roll-out and safety of smart motorways made nine recommendations aimed at improving safety for road users. At the Department for Transport's (DfT's) request, the Office of Rail and Road (ORR) is leading on two of these recommendations.

2.3 This chapter sets out the latest findings in relation to recommendation 4, to assess the effectiveness of the safety systems in place on smart motorways. It specifically focuses on smart motorways that permanently operate with no hard shoulder, also known as all lane running (ALR) smart motorways. The main areas of focus are the performance of:

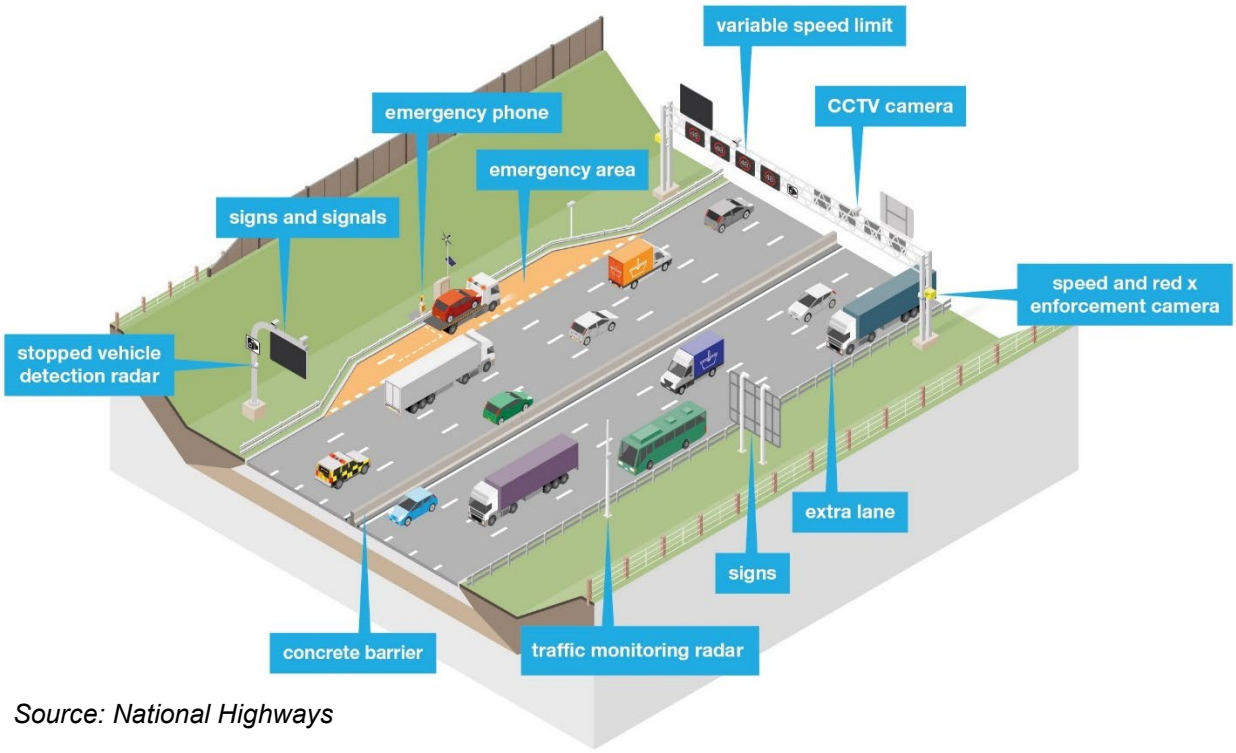
- stopped vehicle detection (SVD) technology; and
- operational technology (OpTech).

Table 2.1 Types of smart motorway

Motorway type	Features
Controlled motorways	Controlled motorways add variable and mandatory speed limits to a conventional motorway to control the speed of traffic, while retaining a permanent hard shoulder. Overhead electronic signs display messages to drivers, such as warning of an incident ahead, slowing traffic approaching an incident, or closing lanes using a red-X.
Dynamic hard shoulder (DHS) motorways	DHS motorways also apply the controlled motorway technology. The hard shoulder is selectively opened as a running lane during periods when there is a lower speed limit in force and electronic signs to guide drivers when it is safe to use. Emergency areas are installed as on ALR motorways.

Motorway type	Features
All lane running (ALR) motorways	ALR motorways apply the controlled motorway technology, permanently convert the hard shoulder as a running lane, and feature emergency areas to stop in an emergency. ALR motorways also have stopped vehicle detection technology.

Figure 2.1 Technology on ALR smart motorways



Source: National Highways

The national emergency area retrofit (NEAR) programme

2.4 In 2021 the TSC recommended that DfT and National Highways should retrofit emergency areas to existing ALR motorways to make them a maximum of 1,500 metres apart, decreasing to every 1,000 metres where physically possible. In response, National Highways delivered a National Emergency Area Retrofit (NEAR) programme that added 151 emergency refuge areas on ALR sections of smart motorway by March 2025.

2.5 In our last safety report we highlighted that, during the NEAR programme roadworks, it was necessary for National Highways to switch off much of the

technology that is normally in place on smart motorways. The company put mitigation measures in place to maintain the safety of road users and workers during the work, but it could not collect data to measure the performance and availability of the technology when it was switched off. The NEAR programme roadworks continued into early 2025. This meant that, between January and April 2025, up to 14% of assets were switched off, compared to the corresponding months in the previous year. This affects the latest annual figures for OpTech availability, and therefore our limits our ability to draw firm conclusions about National Highways' progress in this area.

Stopped vehicle detection (SVD) performance

2.6 National Highways' SVD system uses radar technology to detect stopped vehicles on ALR smart motorways. The company tests SVD system performance when the equipment is first commissioned, and then annually, to assess its effectiveness in detecting stopped vehicles and subsequently alerting control room operators at the Regional Operations Centre (ROC). A full dataset of performance data is available for 2025, as testing was undertaken after completion of the NEAR programme.

2.7 The testing process uses CCTV footage from each scheme to measure performance over a 24-hour period. When a vehicle is observed to have stopped on the CCTV footage, this is defined as a 'stopped vehicle event'. The response of the SVD system to each stopped vehicle event is then checked to determine whether the stopped vehicle event was correctly identified by the system. This information is used to calculate a 'detection rate' for each scheme.

2.8 Alerts generated by the SVD system are also checked to determine whether they relate to an observed stopped vehicle event on the CCTV footage. This information is used to calculate 'false discovery rates'.

2.9 SVD testing takes place retrospectively and does not affect the company's response to alerts in real time. The company measures SVD performance at a national level against three key metrics:

(a) detection rates (the proportion of stopped vehicles correctly identified by SVD, target: ≥80%);

(b) false discovery rates (the proportion of SVD alerts that are not related to a stopped vehicle event, target: <15%); and

(c) average time to detect stopped vehicles (the elapsed time between a vehicle stopping and an SVD alert being generated, target: ≤20 seconds).

2.10 National results from SVD testing are presented in table 2.2. This uses data from all 25 ALR schemes on the network and shows that, at a national level, SVD achieved its performance requirements in 2025. Overall performance levels are similar to those reported last year, although comparisons between years should be treated with caution as less than half of these schemes were assessed in 2024 due to the NEAR programme.

Table 2.2 SVD testing performance results, number of schemes tested and number of stopped vehicle events, ALR smart motorways, 2024 and 2025

Metric	Target	2024 results	2025 results
Detection rate	≥80%	86%	85%
False discovery rate	<15%	6%	5%
Alert time average	≤20 seconds	12.9 seconds	16.2 seconds
ALR schemes tested	-	12	25
Stopped vehicle events during 24hr testing period	-	476	926

2.11 Since 2024 we have asked National Highways to also report the percentage of stopped vehicles that are correctly detected within 20 seconds. In 2025 this shows that, of the 786 stopped vehicles that were detected during testing, 88% were detected within 20 seconds. The equivalent figure in the previous year was 91%, but due to the smaller sample size of observations in 2024 the two figures are not directly comparable.

Individual scheme analysis

2.12 Although SVD is achieving its performance targets at a national level, we have undertaken additional analysis of data from individual schemes to better understand how the system performs at a local level.

2.13 SVD performance data for each ALR scheme in 2025 are set out in Annex B. These results are published to provide transparency of National Highways' SVD testing results. However, performance data for individual schemes represent a

snapshot of performance over a 24-hour testing period, and the small sample sizes involved may not provide a reliable indication of longer-term SVD performance of an individual scheme. Therefore, any conclusions based on these data should be treated with caution.

2.14 The results show that, of the 75 metrics assessed (25 schemes with three metrics each):

- six did not meet the target for detection rates;
- two did not achieve the target for false discovery rates; and
- five did not meet the target for average detection times.

2.15 We challenged National Highways on the reasons why individual metrics fell below national target levels and asked the company to set out what actions it is taking. In response, in 2025 National Highways established an internal working group to review scheme level performance, undertake further analysis of missed events and faults, and implement targeted improvements.

2.16 For example, our latest analysis identified that there is one scheme (M1 J13-J16, L2b & 3) where detection rates have been missed in each of the past three years. Last year we reported that this scheme was affected by individual asset faults when testing was undertaken in 2023 and 2024. National Highways told us that these were different faults that were addressed and resolved through established processes. The detection rate in 2025 was 76%, based on a sample size of 29 stopped vehicle events. In response to our challenge, the working group is undertaking analysis to identify trends and has planned enhanced monitoring at sites where metrics are below national targets, this includes a focus on how it can better manage faults within the SVD system.

Response to ORR recommendations

2.17 The working group has also made progress against recommendations we have made in relation to wider SVD system performance and effectiveness.

2.18 We previously recommended that National Highways should consider whether increased sample sizes and frequency of testing can provide a more robust basis for assessing SVD system performance. During 2025, the company continued to investigate how video analytics can be used to achieve this by extending SVD testing beyond the current 24-hour period.

2.19 Separately, we previously reported that National Highways was meeting the requirement that at least 95% of the ALR network is covered by SVD. However we recommended that the company should develop a system for robustly measuring any changes in SVD coverage over time, for instance where it is affected by vegetation growth. In 2025, the company has progressed work to develop new ways to identify and respond to changes in SVD coverage as changes are made to the network.

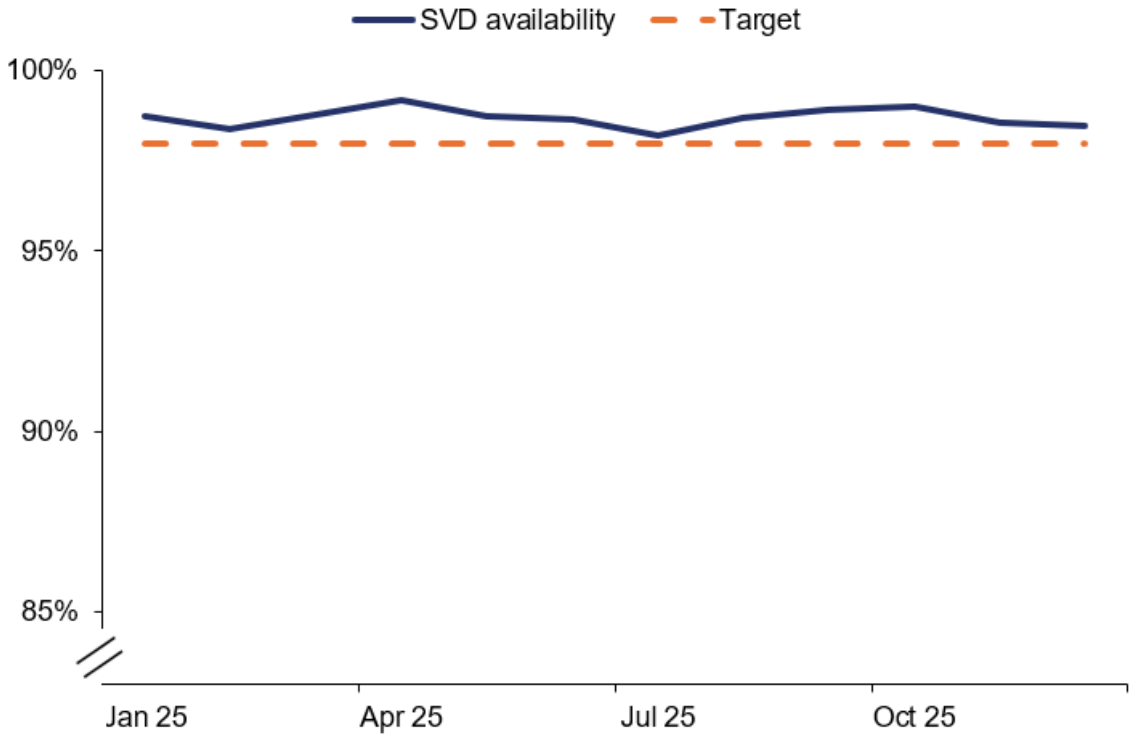
2.20 Work in both these areas is ongoing, and we continue to engage with National Highways to understand and report on the progress of the working group in 2026.

Stopped vehicle detection availability

2.21 National Highways has an internal target for SVD to be available for use 98% of the time. 'Available for use' means that the system is functioning and unaffected by faults or power or technology outages. This is separate to the company's aim that technology assets across the entire SRN are available 95% of the time. We report against this performance indicator in our annual assessment of National Highways' performance.

2.22 The average availability score for SVD remained above National Highways' 98% target throughout 2025. The overall average score for the year was 98.7% which compares to 98.4% in 2024. The number of SVD assets included within this figure during the first half of 2025 was affected by the NEAR programme and therefore comparisons between years should be treated with caution. Figure 2.2 below shows SVD availability during 2025 against the 98% availability target.

Figure 2.2 SVD availability on ALR smart motorways, January 2025 to December 2025



Operational Technology performance

2.23 Operational Technology (OpTech) refers to the systems and assets that enable National Highways to operate and monitor the SRN. These technologies can be found at the roadside and in the company's regional operations centres (ROCs).

2.24 OpTech assets include CCTV cameras, radars, signs and signals that are part of the end-to-end safety systems on ALR smart motorways. This technology enables National Highways to detect and respond to incidents, supporting better safety outcomes for road users.

2.25 In 2022, we reported that National Highways was not meeting the wider technology availability target of 95% the company set itself for the SRN. This included OpTech availability on ALR motorways. In response, it committed to a £105 million modernisation and refresh programme, with the aim of achieving 97% availability across four key ALR assets by the end of RP2:

(a) Motorway incident detection and automatic signalling (MIDAS);

(b) variable message signs (VMS, also known as signs);

(c) signals (speed and lane control signals); and

(d) CCTV cameras.

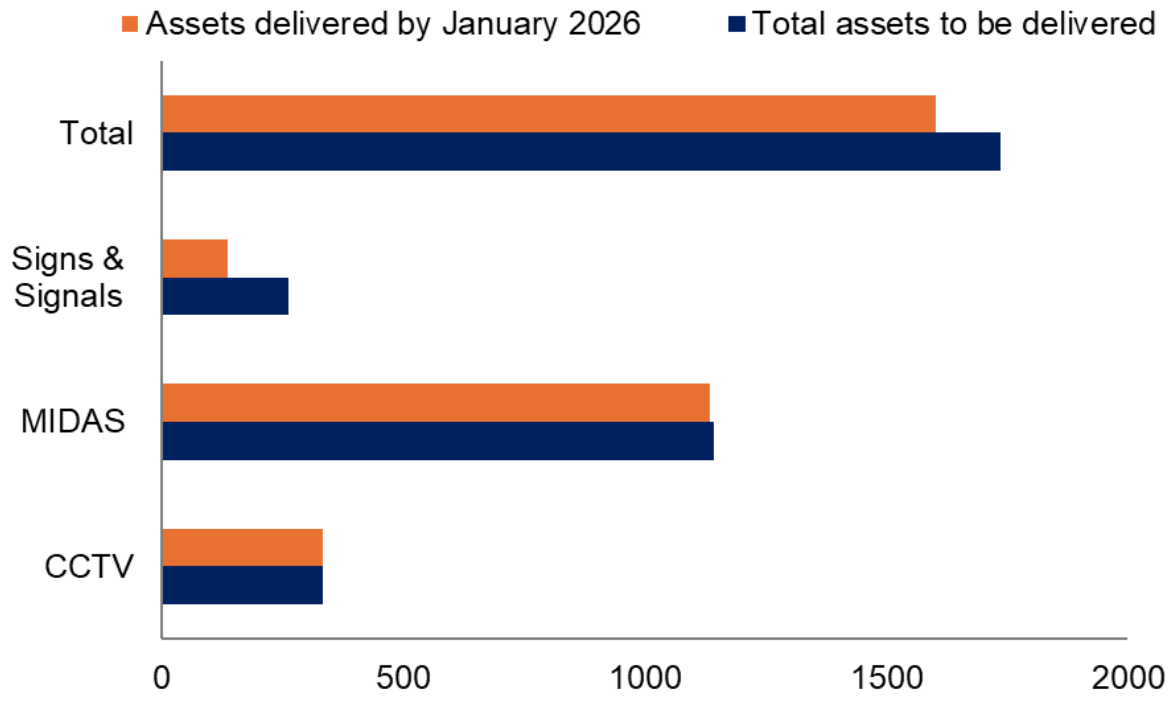
2.26 During 2024 and early 2025, extensive roadworks on ALR smart motorways as part of the NEAR programme affected National Highways' ability to report robust OpTech availability data during this period. This also affected delivery of the modernisation and refresh programme. This is discussed in more detail below.

Delivery of modernisation and refresh programme

2.27 National Highways was originally due to complete the modernisation and refresh programme by the end of March 2025. At the time this report was published, in March 2026, the programme has not yet been fully delivered.

2.28 At the end of January 2026, the company had upgraded 1603 OpTech assets, as shown in figure 2.3, below. This represents 92% of the assets that the company plans to deliver through the programme. The remaining 133 assets are expected to be delivered by April 2026, over one year later than expected.

Figure 2.3 Number of OpTech assets delivered against modernisation and refresh plan, January 2026



2.29 We have challenged National Highways on the reasons why it has not completed the modernisation and refresh programme to the original timeline it intended, and

has underspent against its budget. The company forecasts that by the end of March 2026 it will have spent £87 million against the original budget of £105 million.

2.30 National Highways told us that the NEAR programme was a contributing factor to the delay in delivery, as the company encountered challenges in carrying out work to upgrade signs and signals where roadworks were taking place at the same location.

2.31 National Highways also highlighted issues relating to procurement, global shortages of necessary components, incomplete and inconsistent asset data, and difficulties integrating new technology with existing infrastructure. For example, changes to the design of new automatic message signs meant that different brackets were required to install the updated signs. This required the company to undertake additional design and testing to ensure that the signs were compatible with existing infrastructure on the network, delaying the delivery of the programme.

2.32 National Highways is taking steps to address these issues. This includes improving the information it holds relating to technology assets on the SRN and using the experience of the modernisation and refresh programme to update its design and installation processes more widely.

2.33 It is positive that National Highways has identified, and is now applying, lessons learnt from the delivery of this programme. It is important that the company now ensures that this informs its future OpTech renewals programme and provides assurance that it can deliver its programme on time and efficiently.

OpTech availability

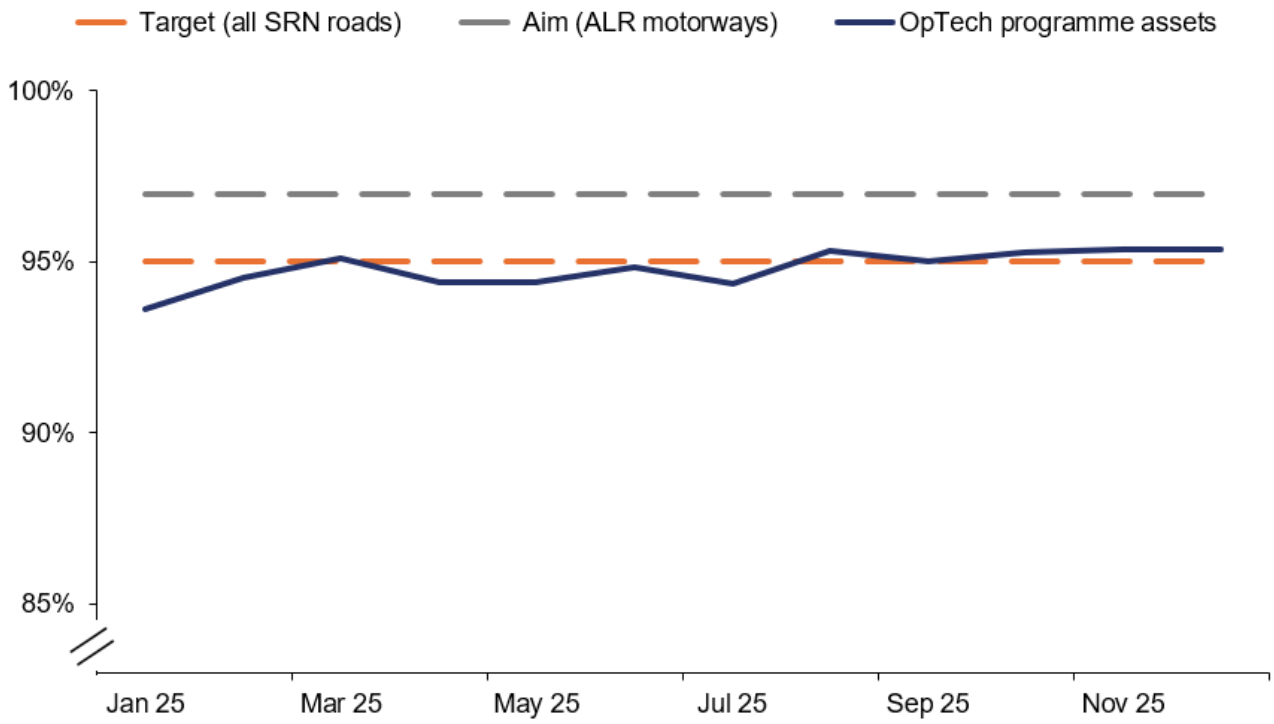
2.34 OpTech availability is measured by the percentage of time that assets are online, available for use, and not subject to any faults or outages. National Highways has an aim to achieve 97% availability on ALR motorways for the four asset types included in the modernisation and refresh programme. Between January and April 2025, up to 14% of assets were switched off to avoid interference from the NEAR roadworks. This means it is not possible to present a full year of OpTech availability data for all ALR motorways which limits our ability to assess how effective the modernisation and refresh programme has been in improving OpTech availability during 2025.

2.35 Through the modernisation and refresh programme, National Highways renews assets that are near the end of their life expectancy. Figure 2.4, below, shows that

availability of these assets has improved over the course of 2025. However, comparisons between performance at the start and end of the year should be treated with caution due to the number of OpTech assets that were switched off during the first half of 2025.

2.36 It is important that once the programme completes, the company sets out how it has progressed against the 97% aim and whether the investment is delivering the intended outcomes. In 2026 the company should review ALR OpTech availability data for the first full year unaffected by the NEAR programme to support its assessment of the programme's impact.

Figure 2.4 OpTech availability on ALR smart motorways, January 2025 to December 2025



2.37 National Highways also reports data on the availability of other OpTech assets on the ALR smart motorways that are not part of the modernisation and refresh programme. This includes cameras that are used to enforce variable speed limits and 'red-X' compliance. These cameras were also affected by NEAR roadworks in the first half of 2025. Therefore, data relating to their availability are subject to the same caveats as discussed for other OpTech assets above. The data show that enforcement camera availability was 98.1% during 2025.

2.38 National Highways is not the enforcing authority for speed limit or red-X compliance. However, in 2025 the company progressed work to develop an approach to better understand road user compliance with speed limits and red-X signals on smart motorways by bringing together sign and signal data with traffic detection systems. This will enable the company to better understand the effectiveness of its interventions that aim to improve safety outcomes through increased road user compliance. We will continue to monitor progress in this area in 2026.

2.39 This report does not consider the issue that was identified in 2025 where an anomaly with speed cameras (HADECS) on the SRN resulted in some drivers incorrectly facing enforcement action for speeding. On 19 January 2026, the Department for Transport announced that it is conducting an independent investigation into this issue.

Outages

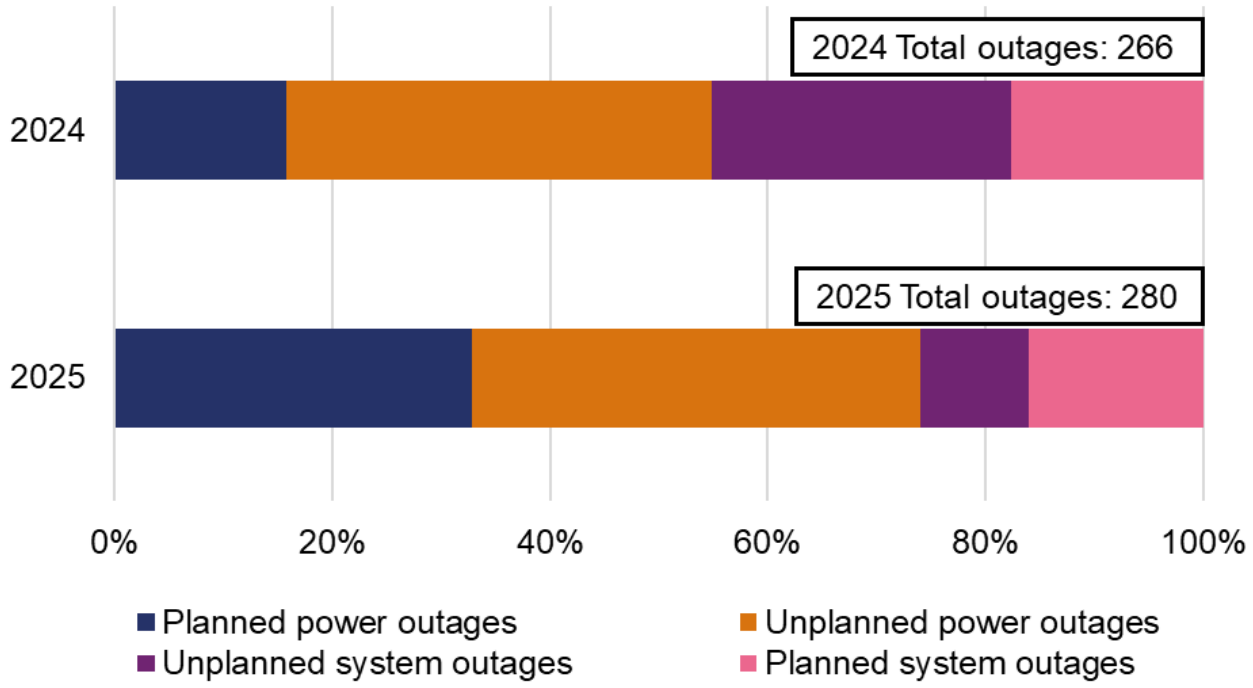
2.40 OpTech assets can be classed as unavailable for a variety of reasons including equipment faults, power failures, or wider system outages. Unlike individual equipment faults, power or system outages, which can be planned or unplanned, can affect multiple assets at the same time. Different outages are described in table 2.3, below.

Table 2.3 Description of outages

	Type	
Category	**Power**	**System**
Planned	Scheduled power supply outages that can affect systems and assets. While recorded as planned outages, the distribution network operator (DNO) is not required to notify customers on unmetered supply.	Planned upgrades or maintenance of key National Highways' systems. These activities can affect a range of systems and assets.
Unplanned	Unexpected power supply outages. National Highways typically identify these through system notifications and subsequently confirmed with the DNO.	Unplanned outages affecting National Highways' operational technology system. These can affect various systems and assets

2.41 Data provided by National Highways shows that, in 2025, there were 306 outages on all smart motorway types, including 280 on ALR smart motorways. This compares to 304 outages across all smart motorway types in 2024, of which 266 were on ALR. Outages are discussed in more detail below and a comparison of 2024 and 2025 outages is provided at Figure 2.5.

Figure 2.5 Percentage of outages (by type and category) affecting ALR smart motorways, 2024 and 2025



Power outages

2.42 Power outages (planned and unplanned) were the most common type of outage in 2025, accounting for 207 (74%) of all recorded outages on ALR smart motorways. This is an increase from 2024, when 146 power outages were recorded. Power outages are the result of actions taken by the electricity distribution network operator (DNO), so National Highways has no influence over the total number that take place. However, early notification of power outages better enables the company to put planned mitigation measures in place if necessary.

2.43 To improve its ability to mitigate the effect of power outages on road users, National Highways has progressed its metering project that involves moving from unmetered to metered power supplies on its network, including smart motorways. With a metered supply, the DNO is required to inform National Highways when the electricity supply will be affected by its actions.

2.44 National Highways has completed all 1,445 planned surveys of power supply locations on smart motorways as part of its metering project. Of these the company identified that 882 (61%) sites were already metered or required no further work (e.g. they did not provide power to OpTech on the SRN). In 2025 National Highways installed meters at 150 sites, including where this had not previously been feasible, for example due to access restrictions or requiring other remediation work. This brings the total number of power supply locations where meters have been installed through the metering project to 491. The company is progressing work to identify where further meter installations will be possible at the remaining 72 sites where remedial actions are required, such as vegetation clearance or resolving other access issues.

2.45 Following this work, National Highways reports that the proportion of power outages that were planned increased from 29% in 2024 to 44% in 2025. This is positive because it increases the company's ability to better plan and implement mitigation measures in advance and reduce disruption for road users.

System outages

2.46 System outages (planned and unplanned) accounted for 73 (26%) of all outages on ALR smart motorways in 2025. This is fewer than the 120 system outages on ALR motorways in 2024. The decrease in the total number of system outages over the last year may indicate improvements in the resilience of the system. However, National Highways should explore the underlying causes for this reduction to better understand if it reflects a sustained improvement in system performance, rather than short term variability.

Outage case studies

2.47 To better understand the effect of outages on road users, we asked National Highways to provide detailed information on a sample of case studies drawn from the 2025 outage data. In a similar approach to our review of 2024 data, we selected case studies in each type and category of outage (power and system, planned and unplanned). A more detailed description of each case study is included at Annex D.

2.48 The information provided by National Highways demonstrates that the circumstances of each outage were different, with each requiring a different response from the company. National Highways evidenced that it continues to deploy a range of mitigation measures on a case-by-case basis, taking account of factors such as the type of asset affected, location and traffic conditions. These

measures include reduced speed limits, lane closures where appropriate and increased traffic officer patrols.

2.49 Our last safety report included analysis of the frequency and duration of outages on ALR motorways during 2024 and explained how National Highways puts plans in place to mitigate their effect on road users. We concluded that it was important for the company to improve its ability to collect and interrogate data to better inform the actions it takes to address outages.

2.50 In 2025 National Highways made progress to better understand outages. For example, our analysis of case studies in last year's safety report showed that several of the power outages included in the company's log did not affect any assets on the SRN and therefore had no effect on road users. Previously it was only possible to distinguish between outages that did effect road users, and those that did not, by investigating each outage individually. Improvements that National Highways has made to the data it collects means that the company is now able to routinely collect and more effectively interrogate system-level information for all outages.

2.51 Further use and analysis of these data will enable National Highways to identify trends and prioritise interventions where they will have the greatest benefit. The company should continue to develop its ability to collect and interrogate data to support its efforts in reducing the effect of outages on road users.

Fault detection

2.52 Reliable fault detection and timely resolution are important to ensure the availability of OpTech assets on ALR smart motorways. As set out earlier, OpTech availability reflects the proportion of time that assets are online and not subject to faults or outages. Effective fault management supports the safe and efficient operation of the network and helps minimise disruption to road users by enabling faults to be identified and resolved quickly, and reducing the length of time that assets are unavailable.

2.53 We previously recommended that National Highways should develop a robust methodology for reporting comprehensive fault resolution data for OpTech assets on ALR smart motorways. During 2025 the company has progressed work to collect more detailed data that will enable it to better report on fault resolution in the future. It is important that the company continues to develop its capability to report comprehensive fault detection and resolution data. This will require the company to combine data sources from different parts of the business, including

Digital Services, to ensure it can produce consistent and transparent reporting in future, and enable it to improve how it fixes faults. We expect National Highways to make further progress in this area, which will monitor and report on in 2026.

Conclusions and recommendations

2.54 The completion of the NEAR programme in 2025 means that National Highways is again able to report comprehensive data relating to the current performance of safety systems on smart motorways.

2.55 The latest annual results for SVD shows that, at a national level, the technology is meeting the performance requirements set by National Highways. The company should build on the work it has undertaken in 2025 to strengthen its understanding and management of SVD performance and effectiveness at both a national and scheme level. This includes continuing its work in relation to increasing sample size and addressing changes in SVD coverage on the ALR network.

2.56 National Highways has faced challenges in delivering the modernisation and refresh programme and is now expected to finish over a year late. The delay means that it is still not clear if the company has achieved its aim for 97% availability. It is important that the lessons learned from the programme are applied to the planning and delivery of future OpTech renewals programmes. In 2026, once a full year of performance data that is unaffected by NEAR roadworks are available, the company should provide a detailed assessment of how the programme has improved the availability and performance of operational technology assets on ALR smart motorways.

2.57 It is encouraging that National Highways' metering project has contributed to a reduction in the proportion of unplanned power outages. This allows the company to better plan mitigations and reduce the effect of power outages on road users. During 2025 we have seen the company progress its understanding and management of outages. The improvements in how system wide data on types of outages are captured means that it is now better equipped to analyse trends and assess the effect of outages on road users. National Highways should continue to develop its use of data to identify trends in power and system outages to enhance the timeliness and effectiveness of the solutions it implements.

2.58 By developing its capability to report comprehensive fault detection and resolution data, National Highways will also improve its ability to identify faults quickly and reduce the length of time that OpTech assets are unavailable, helping minimise disruption to road users.

3. Smart motorways evidence stocktake and action plan

3.1 In March 2020, the Department for Transport (DfT) published the smart motorway evidence stocktake and action plan (the 'stocktake actions'). This included eighteen actions to improve smart motorway safety. National Highways committed to two additional actions in its first year progress report in April 2021 and classified the 20 actions under three themes:

(a) Giving clarity to drivers;

(b) Finding a safe place to stop; and

(c) Being safer in moving traffic.

3.2 In November 2021, the Transport Select Committee (TSC) published the outcome from its inquiry into the roll-out and safety of smart motorways. As part of DfT's response to recommendation 6, it commissioned the Office of Rail and Road (ORR) to report on the delivery of the stocktake actions and on National Highways' evaluation of their success in:

(a) Reducing incidences of live lane breakdowns;

(b) Reducing the time for which people who breakdown or stop in a live lane are at risk; and

(c) Educating drivers on what to do if they breakdown in a live lane

3.3 In our last safety report we confirmed that National Highways had completed all actions it was set in the smart motorway evidence stocktake and action plan. Our focus in this report is on the company's ongoing work to evaluate the effectiveness and impact of those stocktake actions, and how it is addressing the challenges in drawing robust conclusions from complex and evolving data.

3.4 During 2025, National Highways made progress with collecting and analysing data that is necessary to support evaluation of the stocktake actions' effect in reducing the number and frequency of live lane stops on all lane running (ALR) smart motorways. This includes analysis to compare data from the period before the stocktake actions were delivered to the first full year when the majority of actions

were complete (2023). This work is ongoing, and subsequent years' data are required before it will be possible to draw final conclusions.

3.5 Various factors have added to the challenge of National Highways' work to evaluate the effectiveness of the action plan. These include changes to systems and data recording over time, different traffic patterns caused by the pandemic and, between 2024 and 2025, and the National Emergency Area Retrofit (NEAR) programme to install 151 additional emergency areas across the smart motorway network that temporarily altered how smart motorways operate. During the NEAR roadworks, much of the technology normally in place on smart motorways was switched off, which meant that there are significantly less data available during this period that can be used to support the company's evaluation work.

3.6 In our previous work to assess National Highways' approach to evaluation we sought independent advice, which concluded that the company is addressing these issues appropriately. It is also clear that several years of consistent data are needed before any firm conclusions can be drawn about the effectiveness of the action plan. This will not be possible before 2028 and, even then, the limitations with the baseline data that are discussed above mean there are uncertainties about how conclusive the final evaluation will be.

3.7 It is important that National Highways does as much as it reasonably can to draw definitive conclusions from its evaluation and carefully considers how it will communicate the findings in a way that is meaningful and understandable for the public and other stakeholders. We continue to monitor the outputs of the evaluation work.

Reducing incidents of live lane breakdowns

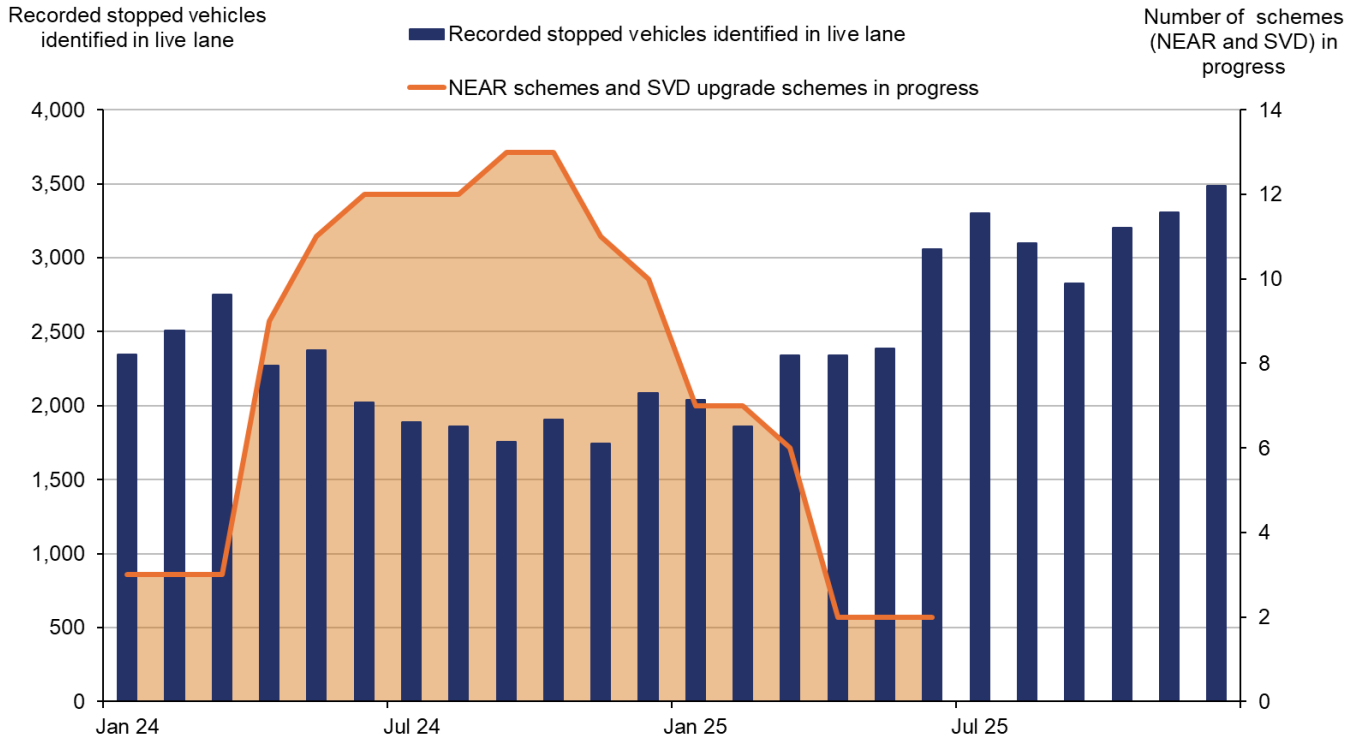
Recorded live lane stops

3.8 National Highways collects data that measure the number of vehicles stopping in live lanes on ALR smart motorways to support its evaluation of the stocktake actions.

3.9 Live lane stop data from January 2024 to December 2025 are presented in figure 3.1, below. The reduction in live lane stops between April 2024 and June 2025 reflects the NEAR programme and SVD upgrade works that were in progress during this period. The subsequent increase in the second half of 2025 follows the completion of this work.

3.10 In 2025, National Highways began work to evaluate the NEAR programme that will support its assessment of actions aimed at reducing the rate of live lane stops. This will include an assessment of why there are now more live lane stops being reported than before the NEAR programme. The company states that one potential reason for this is improvements to monitoring technology that mean the company is better able to detect and record stopped vehicles. It is important that the company's evaluation work provides a robust analysis of the reasons for this increase.

Figure 3.1 Number of recorded stopped vehicles in live lanes and NEAR and SVD upgrade schemes in progress, ALR smart motorways, January 2024 to December 2025



3.11 In 2024, National Highways completed a project to evaluate the duration of stopped vehicle events on ALR motorways, covering stops in both live lanes and emergency areas. In 2025, the company supplemented this with operational data from Traffic Officers attending stopped vehicles. This information enables it to build a better understanding why vehicles stop on smart motorways, and for how long. Building a better understanding of road user behaviour provides important evidence that National Highways can use inform the actions it takes to reduce the duration and frequency of live lane stops.

Reducing the time for which people who break down or stop in a live lane are at risk

Traffic Officer attendance times

3.12 National Highways continues to report against its internal metric for average traffic officer attendance times. In December 2025, the average traffic officer attendance time was 8 minutes 38 seconds. The company reports it has met its target of 10-minute traffic officer attendance times each month since it was first achieved in September 2022.

Educating drivers on what to do if they breakdown in a live lane

3.13 As part of the smart motorway stocktake action plan, National Highways delivered communication and education campaigns to improve driver understanding of what to do in the event of a breakdown on a smart motorway.

3.14 In our previous report we noted that National Highways' approach to evaluating these campaigns aligned with recognised best practice. As the company collects more data on the number and duration of live lane stops, this will strengthen its ability to assess the effectiveness of communication campaigns and identify where further intervention may be needed. The company has indicated that findings from this work will inform actions within its wider Road to Zero Harm work, and shape communications and intervention during the third road period (RP3).

National Highways' progress in evaluating the success of the smart motorways evidence stocktake and action plan

3.15 In 2025, National Highways made progress with collecting and analysing data that is necessary to support evaluation of the effect of the stocktake actions in reducing the number and frequency of live lane stops on ALR smart motorways. This has included detailed analysis of data relating to live lane stops on seven dynamic hard shoulder (DHS) schemes and eight ALR schemes that existed in 2018 and 2023 (before and after delivery of the stocktake actions) and analysis of live lane stops following 10 additional emergency areas that were installed on the M25.

3.16 The M25 evaluation work that has now completed was inconclusive due to inconsistencies in data, alteration of traffic patterns during the pandemic, and the size of the intervention area limiting the measurement of significant change. National Highways should consider how it can use the wider NEAR evaluation work to isolate and better demonstrate the effect of additional emergency areas on live lane stops.

3.17 National Highways has also progressed initial analysis of collisions on smart motorways. The aim of this is to evaluate the extent to which the stocktake actions have contributed to improved safety outcomes on ALR and DHS smart motorways. This analysis uses traffic and casualty data from 2023, when the majority of stocktake actions were completed.

3.18 In both these areas, National Highways has highlighted the challenges of attributing a direct causal relationship between the actions the company has taken in delivering the stocktake actions and outcomes on the smart motorways. In particular, improvements in its ability to detect and record stopped vehicles, and changes to the layout of the network complicate direct comparison between the baseline and post implementation years.

3.19 This work is ongoing and several more years of data are required before it will be possible to draw firm conclusions.

Evaluation timeline and data

3.20 National Highways' evaluation work will continue through to at least 2028 to allow sufficient post implementation data to be collected following the completion of the stocktake actions and the NEAR programme.

3.21 Given the limitations with the available data, we consider it is appropriate that conclusions remain uncertain at this stage. It is therefore important that National Highways is clear about the strengths and limitations of its evidence when communicating its findings to road users.

Assurance of National Highways' evaluation approach

3.22 Last year we reported on the independent review we commissioned to assess National Highways' approach to evaluating the action plan (the stocktake actions). Our assessment found that National Highways' approach remained aligned with best practice, using a robust mix of data sources and analytical methods that match the challenging delivery environment. The assessment also recognised the company's efforts to address challenges such as the NEAR programme rollout, the pandemic, and the phased roll out of the stocktake actions.

3.23 In 2025 we continued to monitor progress against these findings. National Highways has committed to strengthening its analytical approach, including further work around STATS19 analysis, exploring additional techniques, and improving transparency around data limitations and uncertainty. We will continue to monitor progress as this work progresses.

Conclusions and recommendations

3.24 National Highways has completed of the smart motorway action plan, and successfully delivered the NEAR programme. This means that the company is now able to progress work to evaluate what effect the action plan has on the frequency and duration of live lane stops on smart motorways.

3.25 In 2025, National Highways made progress with collecting and analysing data that is necessary to support its evaluation work. Factors such as improvements in the company's ability to detect and record stopped vehicles, and extensive roadworks on smart motorways in recent years means that it will be challenging to draw definitive conclusions from the data.

3.26 We consider that National Highways' approach to its evaluation work aligns with best practice and it is addressing these challenges appropriately. However, several more years of robust data are required before it will be possible to make final conclusions about the effectiveness of the stocktake actions, which is unlikely to be before 2028.

3.27 It is important that National Highways does as much as it can to draw definitive conclusions from its evaluation, and carefully considers how it will communicate the findings in a way that is meaningful and understandable for the public and other stakeholders.

Annex A: Safety actions

Table A.1 Enhanced safety plan March 2024 to December 2025

Safety Action	Action type	Status (end December 2025)
A1 near Haggerston, Pedestrian Safety Improvement	Targeted local safety intervention	Complete
A1 south of Grantham signage, road markings and road studs safety improvements.	Targeted local safety intervention	Complete
A1 Speed Reduction between the M25 and Barnet *	Targeted local safety intervention	Complete
A120 East of Bradwell to Little Tey Safety Cameras	Targeted local safety intervention	Complete
A120 Horsley Cross-Parkeston Roundabout Harwich Safety Cameras	Targeted local safety intervention	Complete
A19 Knayton to A684 Gap Closures and safety improvements	Targeted local safety intervention	Complete
A23 Brighton Road between M23 and Coulsdon Speed Limit Reduction	Targeted local safety intervention	Complete
A38 Plymouth Parkway speed limit reduction*	Targeted local safety intervention	Complete
A40 Huntley to Boxbush speed limit reduction	Targeted local safety intervention	Complete
A417 Double White Lining Safety (Birdlip overtaking scheme)	Targeted local safety intervention	Complete
A46 Hartley bends to Cotswold Way Crossing Speed Reduction	Targeted local safety intervention	Complete
A46 Warwickshire A435 to A439 road bends and junction safety improvements.	Targeted local safety intervention	Complete
A47 Acle Straight Safety Cameras	Targeted local safety intervention	Complete
A47 Swaffham to Fransham Safety Cameras	Targeted local safety intervention	Cancelled

Safety Action	Action type	Status (end December 2025)
A47 Thorney New Cut to B198 Wisbech Safety Cameras	Targeted local safety intervention	Complete
A49 Herefordshire road bends safety improvements	Targeted local safety intervention	Complete
A49 Herefordshire Junction Improvements	Targeted local safety intervention	Complete
A5 Little Brickhill to A4012 Hockliffe Safety Cameras	Targeted local safety intervention	Complete
A550 A540 to A494 Safety Cameras	Targeted local safety intervention	Complete
A585 M55 J3 to Windy Harbour Safety Cameras	Targeted local safety intervention	Complete
A590 Brettargh Holt to Ayside Safety Cameras	Targeted local safety intervention	Complete
A66 Dubwarth to Cockermouth Safety Cameras	Targeted local safety intervention	Complete
A663 Monston Lane East to the A627(M) Safety Cameras	Targeted local safety intervention	Complete
A616 & A628 Village Gateway installations	Targeted local safety intervention	Complete
Communication campaign: radio fillers	Communication campaign	Complete
Communication campaign focusing on considerate drivers: Middle lane hogging; Tailgating and Features of smart motorways	Communication campaign	Complete
Communication campaign focusing on HGVs	Communication campaign	Complete
Communication campaign focusing on leisure riders	Communication campaign	Complete
Communication campaign focusing on litter	Communication campaign	Complete
Communication campaign focusing on spring issues	Communication campaign	Complete

Safety Action	Action type	Status (end December 2025)
Communication campaign focusing on summer holidays	Communication campaign	Complete
Communication campaign focusing on winter driving	Communication campaign	Complete
DfT to complete work on permitting red flashing lights for breakdown vehicles, helping to protect recovery drivers by making them more visible at the roadside.	Working with others	Complete
DfT to work with National Highways to review governance and coordination of various road safety forums and working groups to focus on key issues such as speeding, drink/drug driving, seat belt compliance, mobile phone use while driving, and fatigue.	Working with others	Complete
DVSA to work with National Highways to explore opportunities to improve driver training standards.	Working with others	Complete
DVSA to work with National Highways to explore opportunities to support and promote the Road to Earned Recognition and Earned Recognition programme, aiming at improving HGV standard compliance.	Working with others	Complete
National Highways to develop and agree data and insight-sharing MoUs with Road to Zero Harm Delivery Partners.	Working with others	Complete
National Highways to establish Road Safety Panel as an engagement forum, including all Road to Zero Harm delivery partners and wider stakeholders.	Working with others	Complete
National Highways to explore opportunities for developing and standardising monitoring and evaluation tools, which delivery partners and their members can use to help assess the impact of their interventions.	Working with others	Complete

Safety Action	Action type	Status (end December 2025)
NFCC, NPCC, PROSE (Professional Recovery Operators Safety Executive) and National Highways to work together to standardise key advice both for drivers and emergency services/ recovery operators, such as breakdown advice.	Working with others	Complete
NPCC (alone, with National Highways or with other delivery partners) to: • Explore wider opportunities to enforce the law as it stands. • Progress more efficient powers and procedures to bring offenders to justice fairly and swiftly, thereby taking risk of the roads more promptly. • Advocate for greater sentencing powers (including preventative powers) and greater sentences for offenders. • Advocate for greater funding and support for victims of road crime/collisions and their families. • Contribute to consultations on a review of road traffic legislation.	Working with others	Complete
NPCC to work with National Highways to implement (where possible) Roads Policing Review recommendations.	Working with others	Awaiting publication of Roads Policing Review
ADEPT to work with National Highways to use its membership and Transport and Connectivity Board (and/or similar forums) to amplify communication campaigns and use local expertise to adapt national campaigns to local requirements.	Working with others	Complete

** Scheme change controlled to 25/26*

Table A.2 Interim period safety action plan April 2025 to March 2026

Description	Type	Status (end December 2025)
A5 Little Brickhill Southbound Slip Road	Action 1, safety schemes	Complete
A38 Carkeel to Trerulefoot Safety Cameras	Action 1, safety schemes	Complete
A616 Wortley wrong way driving safety improvements	Action 1, safety schemes	Complete
A1/A1068 Willowburn Interchange wrong way driving safety improvements	Action 1, safety schemes	In construction
M62 Hartshead Moor Service area wrong way driving safety improvements	Action 1, safety schemes	In construction
A35 Charmouth to Yellowham safety cameras	Action 1, safety schemes	In construction
A66 Boldron Bypass gap closures	Action 1, safety schemes	In construction
M6 J37 safety improvement	Action 1, safety schemes	In construction
Share 'Road to Zero Harm' roadmap with key stakeholders	Action 2, publication	Complete
SRN 2023 Safety Overview report	Action 3, publication	Complete
Operation Tramline	Action 4, working with others	On track for delivery by end March 2026
Suicide prevention	Action 5, interventions	On track for delivery by end March 2026
2024 Jan – June provisional STATS19 data, comparative	Action 6, analysis	Complete

Description	Type	Status (end December 2025)
analysis project with 2024 validated data		
'Safe T.R.I.P. Checks' campaign	Action 7, campaign	On track for delivery by end March 2026
Motorcycle (Bikertek) campaign	Action 8, campaign	On track for delivery by end March 2026
Search engine advertising (PPC)	Action 9, campaign	On track for delivery by end March 2026
Cabinet Office radio fillers	Action 10, campaign	On track for delivery by end March 2026
Small scheme enhancements	Action 11, scheme development	On track for delivery by end March 2026
Safety national programme route treatments	Action 12, scheme development	On track for delivery by end March 2026

Annex B: SVD performance monitoring and reporting results by scheme

Table B.1 SVD detailed performance monitoring and reporting results by scheme

Scheme	Number of events (a)	Number of events detected (b)	False discovery rate: Total number of alerts (c)	False discovery rate: Alerts not related to an event (d)	Detection rate. Target: ≥80% ** (e)	False discovery rate. Target: <15% *** (f)	Average time to detect (seconds) (g)	Alert time ≤20 seconds % **** (h)	Total number of alerts * (i)	Unverified alerts (j)
M20 J3-5	64	49	71	70	77%	1%	16.2	88%	181	110
M1 J16-19	49	46	91	79	94%	13%	13.7	83%	428	337
M6 J2-4	31	28	57	53	90%	7%	9.9	96%	120	63
M1 J39-42	17	16	33	28	94%	15%	11.1	94%	62	29
M1 J32-35a	16	13	37	32	81%	14%	47.5	77%	79	42
M1 J23a-25	28	27	80	79	96%	1%	15.1	93%	374	294
M5 J4a-6	29	27	66	64	93%	3%	14.9	85%	211	145

Scheme	Number of events (a)	Number of events detected (b)	False discovery rate: Total number of alerts (c)	False discovery rate: Alerts not related to an event (d)	Detection rate. Target: ≥80% ** (e)	False discovery rate. Target: <15% *** (f)	Average time to detect (seconds) (g)	Alert time ≤20 seconds % **** (h)	Total number of alerts * (i)	Unverified alerts (j)
M6 J13-15	39	32	57	46	82%	19%	9.5	97%	184	127
M6 J10a-13	22	22	43	43	100%	0%	16.7	86%	170	127
M56 J6-8	29	22	50	49	76%	2%	18.0	91%	129	79
M62 J10-12	39	35	121	113	90%	7%	24.7	83%	176	55
M62 J18-20	16	15	37	37	94%	0%	12.3	87%	151	114
M6 J16-19	26	22	45	45	85%	0%	13.7	91%	131	86
M1 J28-30	21	16	29	29	76%	0%	25.1	75%	91	62
M1 J30-31	31	29	65	62	94%	5%	21.9	79%	294	229
M23 J8-10	47	40	53	51	85%	4%	8.9	90%	108	55
M27 J4-11	22	19	27	26	86%	4%	7.5	100%	69	42
M1 J13-16 (L1a&b, 2a)	32	29	43	41	91%	5%	15.5	79%	119	76

Scheme	Number of events (a)	Number of events detected (b)	False discovery rate: Total number of alerts (c)	False discovery rate: Alerts not related to an event (d)	Detection rate. Target: ≥80% ** (e)	False discovery rate. Target: <15% *** (f)	Average time to detect (seconds) (g)	Alert time ≤20 seconds % **** (h)	Total number of alerts * (i)	Unverified alerts (j)
M1 J13-16 (L2b&3)	29	22	32	30	76%	6%	15.6	86%	52	20

**An event can trigger multiple alerts*

***Detection rate (e) is number of events detected (b) as a proportion of events (a)*

****False discovery rate (f) is the total number of alerts related to an event (d) as a proportion of the total number of alerts (c)*

*****Alert time within 20 seconds (h) is the percentage of detected vehicles listed in (b) that were detected within 20 seconds*

Annex C: Operational technology availability

Table C.1 National operational technology availability figures

Operational technology availability: SVD availability target 98%

CCTV, VMS, MIDAS, Signs and Signals, Enforcement cameras: availability target 95%

	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	Jun 2025	Jul 2025	Aug 2025	Sep 2025	Oct 2025	Nov 2025	Dec 2025
SVD	98.7	98.4	98.8	99.2	98.7	98.7	98.2	98.7	98.9	99.0	98.5	98.5
CCTV	96.4	97.8	97.5	98.1	98.4	98.5	98.5	98.7	98.3	98.7	98.7	97.9
Variable Message Signs (VMS)	90.1	91.0	91.9	91.8	91.9	91.3	89.9	91.1	90.2	90.9	90.3	89.1
MIDAS	95.8	96.5	96.2	95.5	95.0	95.2	95.3	96.2	96.2	97.2	97.3	97.5
Signals	92.2	92.9	94.5	93.0	93.0	93.5	92.9	93.6	93.3	93.6	93.7	94.2
Enforcement cameras	98.3	97.9	97.4	97.7	98.2	98.2	97.2	97.4	98.1	98.2	99.0	99.5

Annex D: Outage case studies

Table D.1 Outage case studies and affected assets

Date	Location	Duration	Category	Type	Detail
2 April 2025	National	3 hours, 30 minutes	Unplanned	System	All CCTV cameras initially affected and subsequently all Emergency roadside telephones (ERTs) CCTV in the Dartford and Hindhead tunnels not affected Reduced speeds and active traffic officer patrols were implemented as mitigation
28 June 2025	M25 J24-J25	1 day, 9 hours, 40 minutes	Unplanned	Power	Approximately 1.3km of motorway affected Technology impacted included SVD, MIDAS, Signs and signals and CCTV Reduced speeds and active traffic officer patrols were implemented as mitigation
2 July 2025	National (DYNAC)	31 days, 6 hours, 30 minutes	Planned	System	Planned maintenance to DYNAC system over the course of the month One overnight outage (23:00 to 05:30) recorded as impacting technology for road users Reduced speed, social media posts and signs and signals implemented as mitigation

Date	Location	Duration	Category	Type	Detail
6 July 2025	M3 J3	7 days, 17 hours, 28 minutes	Unplanned	System	Three consecutive CCTV cameras were affected. One camera was repaired within 48 hours, reducing the affected area to approximately 900m of motorway Reduced speeds and active traffic officer patrols were implemented as mitigation
8 October 2025	National	6 days, 8 hours	Planned	System	No roadside technology assets were affected.
5 November 2025	M6 J18-J19	7 hours	Planned	Power	Two variable message signs and two CCTV cameras were affected, along with MIDAS and DYNAC between two marker posts. Reduced speeds were implemented as mitigation
10 November 2025	South West	4 days, 7 hours, 30 minutes	Planned	System	MIDAS and ERTs affected on part of the M4 during replacement of damaged roadside hardware. The outage affected road user facing systems was recorded as resolved within 48 hours Lane closure and signs and signals set for electrical works implemented as mitigation

Annex E: Glossary

Terminology	Description
All lane running (ALR) motorways	A type of motorway design where the hard shoulder is permanently converted to a running lane, with refuge areas available for drivers to use in an emergency. It also deploys technology, such as overhead electronic signs, which can be used to set variable speed limits and display messages to drivers.
Closed-circuit television (CCTV)	CCTV plays a vital role in the SVD service. When an alarm is presented to the ROC operators, they utilise cameras to verify and classify it before adjusting signals accordingly. The inclusion of CCTV enables ROC operators to visually inspect sections of the highway network, providing a comprehensive view of 100% of the carriageway on All Lane Running (ALR) smart motorways.
Coverage area	The area that SVD radar covers on ALR. This includes all the primary running lanes of the mainline carriageway (outside of carriageway markings) and every emergency area (formerly referred to as emergency refuge areas). If any portion of a vehicle is situated within this space, it is deemed to be within the coverage area.
Detection rate	The proportion of stopped vehicles correctly identified by SVD.
Detection time (time to detect)	The time to detect is the elapsed time between a stopped vehicle event occurring and being detected.
Delivery plan	National Highways' plan, which sets out in detail how it will deliver its strategic outcomes and measure success for the road investment strategy (RIS1 and RIS2) and interim settlement.
Emergency areas	A purpose-built place of relative safety that is located adjacent to the nearside of a mainline carriageway or diverge connector road.
False discovery rate	The proportion of SVD alerts that are not related to a stopped vehicle event
Incident	Unplanned traffic incidents including road traffic collisions (RTCs) and ad hoc road closures.
Interim period	The period from April 2025 to March 2026 year, which covers the period between the end of road period 2 and road period 3.

Terminology	Description
iRAP	The International Road Assessment Programme is a registered charity dedicated to saving lives by eliminating high risk roads throughout the world. iRAP develops the star rating method of measuring the safety of a particular stretch of road.
Key performance indicator (KPI)	In the RIS2 performance specification and interim settlement, DfT sets out the key performance indicators that are used to measure National Highways' performance in the road period.
Killed or seriously injured (KSI)	A person killed or seriously injured in a road traffic collision.
Message signs and signals	Signals display illuminated speed information and lane closure symbols, while message signs present illuminated text. This information encompasses signal settings, journey time details, incidents, weather conditions, planned works, or road layout changes. In the context of the SVD service, signs and signals play a crucial role in alerting drivers to potential hazards ahead. They also employ 'Red-X' signals to indicate lane closures to other traffic when a stopped vehicle is identified. *Message signs can be referred to as variable message signs (VMS) or warning signs* *Signals can be referred to as speed control and lane signals*
MIDAS	Motorway Incident Detection and Automatic Signalling. MIDAS detectors monitor traffic by collecting data on vehicle speeds, volumes, classification, and occupancy. *MIDAS can be referred to as traffic monitoring radar*.
Missed detection	A stopped vehicle event that is not detected by the SVD system (in direct proportion to the detection rate, e.g. detection rate 85% = missed detection rate 15%)
Performance monitoring and reporting (PMR) formerly known as ground truthing	The process used by National Highways to assess and validate the performance of the Stopped Vehicle Detection (SVD) system. It involves testing the system against predefined requirements of detection rate, detection time, and false discoveries. In the PMR process, recorded CCTV footage is employed, and this footage is later reviewed to monitor, verify and time the stopped vehicle events throughout a 24-hour period.
Road investment strategy (RIS)	This document sets out a long-term vision for England's strategic road network, including a multi-year investment plan for improving the network and high-level objectives. RIS1 covers the first road period (2015-20), and RIS2 the second road period (2020-25). The interim period is documented in the interim period delivery plan (2025-26) and RIS3 refers to the third road period (2026-31).

Terminology	Description
Road period (RP)	The period that the road investment strategy covers. RP1 covered April 2015 to March 2020. RP2 covers April 2020 to March 2025. The interim period covers April 2025 to March 2026.
Regional operations centres (ROC)	Control rooms based in each region that manage the safety and flow of traffic using signs, signals and cameras. Used for the management of incidents and despatch of on-road Traffic Officers
Stopped vehicle event (as it relates to SVD performance measurement)	One or more vehicles that have come to a complete stop within the coverage area as part of a single event. The time the vehicle/s stopped and then set off, and the time taken to detect the vehicle are captured in SVD performance measurement. Stopped vehicle events do not include queuing vehicles that have stopped due to congestion or an incident.
Stopped vehicle detection alarm	This refers to the notification of a stopped vehicle generated by National Highways' SVD system that is presented to National Highways' operators via the traffic management system. In the ROC, the terms alarm and alert are interchangeable as they serve an equivalent function. Multiple alarms for the same location can be raised but only one is presented to an operator.
Stopped vehicle detection alert	The notification of a stopped vehicle that is generated by the SVD radar and passed to National Highways' SVD system before being presented to an operator via the traffic management system. There can be multiple alerts related to a single stopped vehicle event.
Stopped vehicle detection system	The Stopped Vehicle Detection (SVD) system is defined as the roadside system responsible for sending alerts regarding stopped vehicles to National Highways. Presently, the technology employed for the SVD system is radar-based, with National Highways having a single supplier nationwide. The scanning SVD radar is a technology that monitors the movement of vehicles within its radar field of view and triggers an alarm to a Regional Operations Centre (ROC) operator if a vehicle comes to a stop in the carriageway or emergency area (EA).
Strategic road network (SRN)	The road network that National Highways is responsible for managing, comprising 4,566 miles of motorways and main 'A' roads in England.
System availability	System availability is a performance metric that reports the proportion of time that a system is available for use. It is defined as the percentage of time available. It is measured through obtaining the percentage of uptime / (uptime + downtime).

Terminology	Description
Unverified event	A stopped vehicle event for which the CCTV footage was insufficient to record attributes necessary to determine if an event definitely was, or definitely wasn't detected (these events, unlike unverified, would be captured by the detection rate, or the false discovery rate). These attributes include the event start time and event end time; for example, an unverified event would include where footage has not captured these attributes.



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