Independent review of the National Highways speeding enforcement issue

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Lead reviewer foreword

Technology is changing every aspect of transport. In-vehicle technology, roadside systems and data-led services are already shaping how people travel and how road networks are managed. This brings real opportunities to improve safety, reliability and service to road users, but it also places new demands on the organisations responsible for operating complex transport systems. Those organisations need to keep pace with technological change, understand how systems interact, and maintain a clear view of the risks that can arise when digital services support safety-critical or enforcement-related activity.

National Highways (NH) was originally established as the Highways Agency in 1994. It became Highways England, a government-owned company, in 2015 and was renamed National Highways in 2021. While its core purpose remains operating, maintaining and improving England's motorways and major A-roads, technology now plays a critical role in managing the strategic road network and will only grow in importance.

Although NH has a clear statutory and operational purpose, it now operates in an environment where physical infrastructure, digital systems, data, suppliers and stakeholder relationships are increasingly interdependent.

The issue considered by this review came to light because of a specific incident where dashboard camera (dashcam) footage from a member of the public highlighted a discrepancy between traffic management systems and enforcement cameras, resulting in a Notice of Intended Prosecution (NIP) being issued incorrectly.

It was eventually ascertained that in specific circumstances where variable speed limit signage changed multiple times over a very short period, drivers could be wrongly identified as speeding and erroneously prosecuted. This set of circumstances could have remained undetected had it not been for the member of the public presenting this dashcam footage to Avon and Somerset Police.

In reviewing how the issue arose and how it was handled, it has been important to focus on the respective responsibilities of the organisations involved. NH is responsible for facilitating the development, operation and maintenance of road-side technology systems to support police enforcement on the network. The police are responsible for decisions about enforcement action and rely on the integrity of the data provided to them. That distinction is central to understanding both the issue itself and the observations made in this report.

The review's terms of reference were to establish the cause of the problem, consider whether there were missed opportunities to identify or prevent it earlier, examine how it was escalated within NH, and assess the governance, accountability and response processes applied to technical and operational issues.

This is an independent review and the contents of this report and the recommendations it contains should therefore be considered with that in mind.

It is important that NH's leadership recognises the seriousness of the issue and learns real lessons. Initially, the scale of the issue would not have been clear to NH, but the implications, in terms of public losing trust in the police and government, definitely were. This should be treated as an opportunity to strengthen processes, clarify escalation routes and ensure that responsibilities are understood at every level of the organisation.

A recurring theme in the evidence was the importance placed on safety. That focus is right and necessary. However, safety considerations are not only the concern of NH and potential issues must therefore be addressed through timely, transparent engagement with the police and other relevant partners.

As highlighted in the Department for Transport's (DfT) Road Safety Strategy, speed enforcement is an important contributor to road safety and can affect citizens financially, legally and personally. It is therefore essential that the systems and data supporting enforcement are accurate, reliable and subject to appropriate governance. Where confidence in that data is called into question the response must be prompt, evidence-based and properly escalated.

This report therefore makes recommendations aimed at reducing the risk of similar issues arising in future and improving how such issues are managed if they do occur. They focus on data and technology, critical systems, crisis handling, legal advice and support, culture and stakeholder engagement, governance, and procurement and contracting. These themes are closely connected. Taken together, they point to the need for clearer ownership, stronger governance and a more strategic approach to technology and data across NH.

I am grateful to all those who contributed to this review, including those who provided evidence, participated in interviews and supported the review process. The purpose of this report is not to apportion blame, but to identify lessons and support improvement.

NH is staffed by committed, hardworking, passionate and expert people who believe in the mission of safer roads for citizens. With clearer structures, stronger escalation routes and an organisation-wide understanding of the importance of technology-enabled services, it is well placed to learn from this issue and strengthen its approach for the future.

Executive summary

The Secretary of State for Transport commissioned this review to examine how the enforcement technical issue occurred and how it was handled, tasking the lead reviewer to make recommendations for improvements that could be made.

The issue considered by this review arose from the interaction between variable speed limit signs, largely controlled by the Motorway Incident Detection and Automatic Signalling (MIDAS) and the Highways Agency Digital Enforcement Camera System (HADECS3X). In some specific circumstances, rapid changes to displayed speed limits triggered by MIDAS were not recognised by the HADECS3X system, creating a risk that drivers could be identified as speeding after the displayed limit had changed.

When the scale and impact of the issue was understood, it was believed to have affected 154 HADECS3X cameras across 22 police force areas in England, causing 2,650 erroneous camera activations between 2021 and 2025. Steps are currently being taken to redress any incorrectly applied enforcement action that occurred as a result of these erroneous camera activations.

The detailed technical explanation and chronology are set out later in this report; the significance of the issue lies in what it revealed about system ownership, escalation, governance and stakeholder communication.

There is a recognition that this review is conducted with the benefit of hindsight and reflection and this report therefore attempts to reflect what should have been considered a reasonable organisational response.

From the point in January 2025 when NH was first made aware of an issue, intervention and escalation points were missed, highlighting a series of issues that inform the recommendations in this report:

- Limited use of data and evidence delayed the response.
- Incorrect assumptions about the cause and scale.
- Voices not heard.
- A lack of pace and ownership in the response.
- Failure to adhere to internal processes, including crisis management.
- Insufficiently visible leadership, governance and direction.
- Ineffective communication with key stakeholders.
- Limited strategic understanding of technology.

The lack of initial momentum in grasping the issue created problems further down the line, ultimately contributing to a loss of trust and confidence within key stakeholder relationships. This in turn led to an eventual critical response path that could and reasonably should have been avoided, if earlier opportunities had been taken to grasp control of the issue and engage all relevant agencies in a collegiate and co-ordinated way.

One wrongful prosecution is one too many. Any erroneous enforcement activity has the potential to cause severe detriment to members of the public and undermines trust and confidence in policing and government, with potentially far-reaching consequences.

The issue was demonstrated to have occurred in fewer than 0.1% of overall speed camera activations and only in a specific set of circumstances, however it is absolutely vital that NH is focused on both the actual **and** potential impact.

The recommendations in this report reflect the seven themes that underpin these missed opportunities and offer NH the opportunity to improve its identification and handling of issues arising in the future.

1. Data and technology

Improvements in how NH prioritises technology issues strategically in a rapidly changing operational environment are needed. Better data handling should assist in potential problem identification at testing stage, before issues arise in the real world, or at the very least enable much swifter and more evidence-based fault diagnosis once an issue has occurred. Considered use of AI and other tools would drive innovation and better protect NH against a wide range of threats or emerging issues. Finally, changes to NH's approach to supporting its technology systems, including organisational structures and responsibilities, would improve its ability to oversee systems and underpin an effective response when dealing with complex issues.

2. Critical systems

The cause of the issue was a lack of detailed understanding of the way in which two systems exchanged data. These two systems were treated differently by NH, in that only one of them was identified as a critical system, despite their interoperability. NH's critical system definition brings with it a set of governance, testing and risk management considerations – because only one of the two systems was defined in this way, there were inconsistencies in NH's approach to systems management and issue response.

As a result of this issue, NH has undertaken a review of its definition of a critical system and subsequently implemented a new approach. However, it is important that there is confidence that any inconsistences in managing different parts of overall systems that caused governance gaps and hampered the speed of NH's initial response have been addressed. To achieve this, a comprehensive review of NH's procedures in this area is needed.

3. Crisis management

NH has crisis management processes in place, but these were not utilised early enough or effectively. A review is needed to ensure all staff understand how and when to enact these processes. It is not clear that existing crisis management processes give due consideration to technology-related incidents, so a review of the definitions and scope of the existing processes is needed.

4. Legal advice and support

NH would benefit from greater clarity regarding the role of its legal services function. Governance, ownership and stakeholder communication would have been improved if the role of legal services and how NH's board and executive teams should respond to their advice had been clearly understood.

5. Culture, communications and stakeholder engagement

NH's staff need to feel empowered to speak up and raise concerns when issues arise, with the expectation that their voices will be heard and acted on. NH also needs to review how it communicates with its key stakeholders. In this particular situation, a failure to share information with the police in a timely and collaborative manner eroded trust in this key relationship and created difficulties in terms of delivering an effective and co-ordinated response. NH should ensure its stakeholder management is underpinned by a clear understanding of respective roles and responsibilities.

6. Governance

NH's senior leadership did not grasp ownership of the issue as swiftly and decisively as it should have. Challenges in the working relationship between the board and executive teams exacerbated this and need to be addressed. NH retains remnants of a historical organisational structure with some unclear operational technology responsibility. This does not support joined up and effective governance and ownership in the management of its technology systems. As a government-owned, arms-length company, NH has a clear governance framework that sets out how it interacts with the DfT which it must comply with.

7. Commercial and procurement

NH's commercial contracts need to contain quality control levers within their performance frameworks, to support the quality of system outputs rather than simply the availability of services, especially when procuring technology solutions. There is a lack of technology procurement expertise that potentially heightens the risk of contracting issues. NH also takes a very hands-on approach to system specification which leads to complex and bespoke systems that are expensive, hard to maintain and deter innovation. A review is needed to challenge this approach, to ensure systems are not over specified and unnecessarily costly.

Methodology

To ensure its conclusions were based on the strongest possible evidence base, the review examined an extensive body of documentary evidence alongside a comprehensive programme of interviews conducted over a 20-week period.

NH and DfT established a dedicated secretariat to coordinate responses to information requests and provide access to relevant documentation. The review considered a large volume of written material and supplemented this with interviews involving key individuals from across NH, as well as selected representatives from stakeholder organisations.

An initial phase of evidence gathering and interviews concluded in mid-May. Emerging findings were then used to identify areas requiring further scrutiny, leading to requests for additional information and follow-up interviews during the latter stages of the review.

The findings, presented under seven themes, are drawn from this substantial documentary record and the evidence provided by interviewees.

The review team is grateful to all those who contributed so openly to the process, whether through interviews or by providing supporting evidence and documentation.

The technical issue

On 25 January 2025, Avon and Somerset Constabulary alerted NH to a potential issue following a challenge to a Notice of Intended Prosecution (NIP) issued for a speeding offence on the M5. The driver provided dashcam evidence showing that a 50mph speed limit had been displayed on the gantry at the time, whereas the NIP alleged that the driver had exceeded a 40mph limit.

This case triggered a series of investigations which ultimately identified an issue with how two key systems work together which could potentially result in discrepancies between the speed limit displayed to drivers and the limit used for enforcement.

The two key systems in question were Motorway Incident Detection and Automatic Signalling (MIDAS) and Highways Agency Digital Enforcement Camera System (HADECS3X), used on smart motorways to manage traffic and enforce speed limits.

MIDAS is NH's principal traffic management system that uses sensors embedded in the road or radar at roadsides to monitor vehicle speeds and traffic flow. When MIDAS detects congestion or potential incidents, it can automatically trigger changes to variable speed limits on overhead gantries to help smooth traffic, reduce stop-start conditions, and improve safety. It also interacts with automated weather systems and manual operations.

HADECS3X is the enforcement camera system linked to gantries and used to enforce variable and national speed limits as well as lane closures. It uses radar to measure vehicle speed, cameras to capture vehicle images, and an External Aspect Verification camera, which captures the speed limit displayed on the variable messaging signs and enables evidence of a speed limit infringement to be sent to the police. Police may then issue a NIP to the driver once the evidence from HADECS3X has been validated.

To avoid reacting to brief or unreliable signal changes, HADECS3X waits about 17.33 seconds before recognising that a speed limit has changed. The investigation found that if the displayed speed limit changes and then changes back within those 17.33 seconds, HADECS3X does not acknowledge the temporary change and continues enforcing the earlier speed limit. In these specific circumstances the effect is that, for a short period, HADECS3X cameras may be capturing enforcement images and data based on a lower speed than that displayed on the overhead gantry.

Once the issue was fully understood, data analysis suggested a total of 2,650 erroneous camera activations occurred between 2021 and 2025, as a result of rapid speed changes triggered by MIDAS that were not recognised by HADECS3X. This represents less than 0.1% of total camera activations in this period.

At the time of writing, a solution is being implemented to overcome this risk on a temporary basis until a permanent solution can be applied. Steps are also being taken to remedy any erroneous enforcement action.

Response timeline – missed opportunities

NH's ability to identify and respond to the emergence of the issue was affected and influenced by a series of missed opportunities, particularly in the initial months of 2025, prior to formal response structures being set up in September.

The evidence considered by this review leads to a characterisation of those missed opportunities, falling under seven thematic issues, which the recommendations explained in subsequent chapters are based upon.

Prior to 2025 - system specification

As described in the technical issue section of this report, HADECS3X was designed to operate with a time buffer to prevent it reacting to rapid signal changes triggered by MIDAS. During the course of the review, several different timings have been suggested for this buffer. At the time of writing, 17.33 seconds is considered the most accurate figure.

The existence of any buffer indicates that the operational scenario causing this enforcement issue should reasonably have been anticipated and assessed during the testing phase. Given that the system is designed to operate in this way, the specification and testing stage represents the **first and most obvious missed opportunity** for NH to understand, document and mitigate against the issue. Many of the subsequent problems arose because this did not happen.

First contact and early response

An initial query was raised with NH by Avon and Somerset Police on 25 January, after they were contacted by a member of the public who had received a NIP, and had presented dashcam footage highlighting a discrepancy between the variable speed limit displayed on an overhead gantry and the speed enforced against by the police, resulting in the NIP.

The initial police contact was with one of NH's Regional Operations Centres, which has expertise in enforcement and operations. After initial review, they identified rapid changes to speed limits in that period and relayed this information to Avon and Somerset Police.

Given that a potential wrongful prosecution had been identified, this represents the **second missed opportunity** to escalate the matter internally within NH and undertake an examination of the root cause of the issue, in case it was more widespread. This is not a reflection on any individual who dealt with the query, who responded in line within their scope of responsibility, but rather a reflection of the fact that there was no procedural obligation to report more widely or instigate an escalation process.

At some point in this early stage, an initial root cause hypothesis suggested that the issue was caused by an isolated faulty MIDAS loop. It is still not clear what data or

evidence was used to draw this conclusion. No further analysis was triggered and NH were not investigating whether the issue might be linked to the HADECS3X system.

This represents a **third missed opportunity**. The initial assumption of an isolated incident caused by a faulty MIDAS loop was not based on any demonstrable data analysis or other hard evidence, but simply that only one such incident had been reported. This suggests that NH lacks a clear process for assigning responsibility for pro-active analysis in the early stages of problem diagnosis to understand the potential scale of the issue, which prevented an earlier and more decisive response.

There is also a **fourth missed opportunity** to avoid further wrongful prosecutions at this stage, since the police (at a national level) could first have been advised of a case of erroneous enforcement data at this point. It could be argued that, without sufficient data evidence to inform whether the issue was isolated or not, this might have been an overreaction. However, without the dashcam footage, this single incident would have resulted in wrongful prosecution, raising a question about data integrity. It is the opinion of the review that this confirmed case of erroneous data was a sufficient risk to have warranted a discussion with police about the way forward.

This did not necessarily need to be a formal crisis response process but could simply have been an initial escalation to explain the issue, clarify a need to undertake a root cause analysis to identify the cause and scale of the problem and implement a temporary work around. This would have been an indicator that NH understood enforcement is a police responsibility which relies on the quality of data to comply with legislative requirements.

There are SLAs in place in place between NH and individual police forces. These SLAs should clearly set out how data integrity issues are both handled locally and escalated nationally.

Contact from Road Safety Support (RSS)

In early March, NH was contacted by Road Safety Support (RSS), who were providing technical support services to Avon and Somerset Police. RSS is a not-for-profit company that provides specialist technical services to safer roads partnerships, the police and highway authorities. In highways enforcement settings, it provides support for police forces in relation to the assurance of enforcement technology as well as independent expert evidence and legal assistance in road traffic prosecutions.

RSS appeared to be still investigating the issue on behalf of Avon and Somerset Police, suggesting that not all parties accepted the premise it was an isolated incident. This should have triggered an escalation or review in NH.

By mid-March, a series of follow up emails between NH and RSS suggest that this may not be an isolated issue and needed to be escalated to the police and to NH's legal services. This did not take place and is perhaps the first instance of a point where early,

expert voices within NH were not heard and a lack of system ownership created a governance void.

Exchanges between NH and RSS in March suggest that HADECS3X speed determination was highlighted as a potential cause of the issue. This point represents the **fifth missed opportunity.**

Technical assessment

In mid-March, a technical assessment of the issue was instigated by a separate team within NH. The early hypothesis that the issue was caused by an isolated faulty MIDAS loop was still the focus of the technical investigation at this point and it is not clear whether the technical review team considered the prior exchange of information between NH and RSS. This represents the **sixth missed opportunity**. When the technical investigation was instigated, access to better data would have helped NH to draw accurate conclusions more quickly. This also presented another opportunity to escalate the issue internally and with the police, which did not happen.

Between April and June, NH was focused on MIDAS as the root cause of the issue rather than confirming whether this was the case and managing potential implications. This was despite several members of staff offering different explanations of the problem but seemingly not being heard. It is not clear to the review or from the evidence why this issue wasn't escalated or alternative hypotheses considered.

An absence of clear ownership of the entire enforcement data system meant that, whilst some individuals suggested possible root causes or highlighted the need to escalate the issue, this did not take place since no single point of responsibility for doing so existed, meaning that NH was not delivering an appropriate response to the issue. The conclusion is that it was being treated as an unexplained technical issue rather than as a serious business impact risk.

Wider involvement and executive updates

The focus of the investigation was still a faulty MIDAS loop at this point, and action was taken to disable what were thought to be the faulty loops on the M5 (with the loops being disabled in a way that does not impact safety). HADECS3X and MIDAS interoperability was still not being discussed at this point, even though it had been mentioned as a possible cause at an earlier stage several times.

In early June, a meeting took place with representation from Legal, Digital Services, Operations and Safety Engineering and Standards. The recommendation arising from this meeting was to advise the NH executive team and police forces of a potential issue with enforcement data. This was briefly flagged in the weekly executive round-up on 9 June as a limited impact issue with MIDAS, with further work required to clarify. This is the first recorded point at which members of executive team were made aware that there was an issue.

This point can be regarded as **the seventh missed opportunity** to brief the executive team comprehensively and initiate escalation. Initial executive updates did not define the cause of the issue from an evidence base. The initial presentation was that of a limited technical issue relating to MIDAS loops, without consideration of other potential causes such as the interoperability of systems. At this point, a data set had not yet been formulated to prove the hypothesis. Improved end-to-end system ownership would have enabled this to take place much sooner and therefore provide more comprehensive briefing to the executive team. Initial briefing to the executive on the issue did not present a fully researched assessment and the executive team did not demonstrate that they understood the wider risks of erroneous enforcement activity. At around this time, the risk of erroneous enforcement and the need to engage with the police had been identified internally but was not acted on.

Wider issues emerging

In July, NH were made aware of exchanges between Thames Valley Police and the HADECS3X camera suppliers regarding a challenge to a NIP and issues with rapidly changing speed limits on the M1 motorway. A freedom of information request regarding M62 variable speed limit changes was also received. These indicated the issue was not just affecting junction 16 on the M5 but were not identified as related issues at this stage.

Legal concerns

In early August, **the eighth missed opportunity** came when NH Legal Services raised concerns at Director level about FOI requests relating to variable speed limit related issues in other locations and requested clarity on ownership of the issue, progress, mitigation measures, the impact on enforcement and communication. This was an opportunity to retain control of the communication, advise key stakeholders, reduce the risk of potential continued wrongful prosecution and manage the political implications but it was not taken and the concerns of the Legal Services team were not immediately acted on.

Formal response team

On 8 August, to coordinate effort, a formal investigation team was formed with working-level representation from across NH. The first substantive executive-level discussion took place on 11 August. Given that there was now a clear indication that the issue may be more widespread, it is unclear why it took until 11 August for this discussion to take place, or why NH's board and the National Police Chiefs' Council (NPCC) were not updated.

Despite the emerging understanding of the overall impact in terms of the potential risk of wrongful prosecution and reputational risk, NH did not instigate its Crisis Management Manual (CMM) during this period, representing the **ninth missed opportunity**.

It took 10 weeks from the initial notification to the executive in early June for a formal crisis style response team to be stood up; even then it was outside of NH's CMM process. There is no debate or criticism about the effort and commitment of those staff who were involved in this response but the lack of clear direction, ownership, focus and reporting undermines this effort. There was frustration expressed to the review from some of those involved in the response at the lack of decision-making and lack of support.

Data testing and manual filtering

In late August, an interim investigation team report acknowledged earlier concerns that the issue may be more geographically widespread. In response, in early September the NH executive team agreed to the team's request for further testing to understand and quantify the issue and agreed to proceed with establishing the Moreton-in-Marsh test facility (NH's test and development centre), where a physical testing environment was built. It is the review's opinion that the establishment of this testing process should have been instigated earlier and clear ownership and implementation of the CMM would have supported that.

Alongside working with the supplier to identify a fix, in parallel, NH commissioned an interim solution – the Manual Filtering Process (MFP) to be developed. The issue was formally communicated to the NH board, the DfT and the Office for Road and Rail (ORR) on 10 September.

NH legal services had some initial discussions with a noted King's Counsel (KC) in late September, with a view to obtaining advice on NH's potential liabilities and legal risk. That advice was formally commissioned in early October.

At the same time, some 2.5m lines of data relating to rapid speed limit changes triggered by MIDAS and subsequent enforcement camera activations were analysed. Testing at Moreton-in-Marsh concluded there was a potential discrepancy between HADECS3X and MIDAS that was linked to instances of rapid speed limit changes. By the end of September, the root cause was still not fully acknowledged, but it was clear that instances of rapidly changing speeds had coincided with activations of HADECS3X outside of Avon and Somerset Police area, confirming something initially suggested in January 2025.

Updating key stakeholders and establishing crisis management structure

In early October, NH provided a preliminary briefing to the NPCC on the issue, although this briefing did not present a finalised picture and made it clear that hypotheses were still being tested.

The root cause of the issue was agreed and shared with an NH executive sub-group on 6 October. On 10 October, a more comprehensive briefing was shared with DfT, ORR and the NH board, identifying all 154 HADECS3X cameras as affected. Around this time, daily meetings were convened with DfT and the Home Office, though the police were

not directly involved in these daily discussions. This led to a fragmented approach to sharing information with the NPCC, which risked undermining confidence in the ongoing relationship between NH and the police at national level.

On 17 October, NH's executive informed the NPCC via letter of the national scale of the issue and instructed their camera supplier to pause the transfer of variable speed data to police forces. Discussions with NPCC followed on 21/22 October to agree an enforcement approach whilst the issue was being resolved. NH also formally established gold and silver crisis management structures. From this point, the response was managed through a more structured and comprehensive approach, although the NPCC initially sat outside the gold and silver daily response structures and attended on a weekly basis as external advisors. This period represents a **tenth missed opportunity**, where there was a lack of understanding of the power of partnership working with police.

On 3 November, NH finally notified the relevant 22 police forces of the issue and on 4 November, the NPCC hosted a formal briefing which was attended by 21 of those forces.

The issue was escalated to Cabinet Office Briefing Room (COBR) level meetings in December and an interim solution to the issue was agreed. A Written Ministerial Statement was agreed with cross-government partners and published on 16 December:

https://www.gov.uk/government/speeches/speed-enforcement-on-the-strategic-road-network

At the time of writing, NH is continuing to work with key stakeholders to enable the police to implement this solution.

Theme 1: Data and technology

Technology and organisational structure

The use of technology has brought about extensive change in all organisations over recent decades, and NH is therefore not unusual in how technology has impacted its operations and its organisational structure.

Historically a civils business with expertise in building and operating road infrastructure, technology has increasingly become a core component of NH's activities, and this will undoubtedly increase further.

In the early days of technological change, many organisations' IT departments typically managed internal IT infrastructure and it wasn't unusual to find front line systems being managed separately and treated as operational activities rather than technology solutions. Fortunately, as technology has shifted from being a nice-to-have to a fundamental business enabler, organisational best practice has changed to recognise that whilst there is a difference in front-line and back-office technology, the skills, resources, capabilities and processes involved should join up and be managed in a logical, coherent way.

There is no doubt that there is genuine complexity in the support and management of technology in NH. The organisation is responsible for a mixture of roadside technology and back-office systems, with some of these being legacy systems that predate the formation of NH. At the time of the development of these systems, the supporting architecture wasn't necessarily formulated with interoperability in mind.

Within NH, there are still some remnants of the older style of organisational model in place. At various points, NH's Operations and Digital Services functions take responsibility for different aspects of technological development and deployment. There is an ongoing business improvement programme which seeks to move the entire management of systems into the Digital Services' remit, but it is taking time and there is still work to do to harmonise that model completely.

Some of the complexity is further exacerbated by budget processes that dictate which parts of the organisation own responsibility for different aspects of technological systems. For example, NH's Operations function maintains budgetary responsibility for replacing roadside technology equipment, including cameras. It is necessary that the final Digital Services structure assumes an end-to-end technology responsibility including the budget.

Current service support structures are, to an extent, based more on the historical structure of the organisation rather than being designed with efficiency of technical service delivery in mind. Where technology delivery still sits within Operations' scope of responsibility, Digital Services are regarded as a support rather than core function.

In terms of this issue, NH's Digital Services is responsible for service availability of both HADECS3X and MIDAS, but not the actual roadside components which are managed by Operations. Historically, Operations has also owned the investment, planning and maintenance of operational technology and holds the budget for equipment replacement.

In practical terms, this has created a situation where MIDAS loops and radars are remotely monitored by Digital Services, but when a failure is reported, a ticket is raised and submitted to Operations who are responsible for the maintenance of these end point devices. The call is triaged and then prioritised depending upon the operational importance of the component in question, meaning that faulty devices can remain outstanding for a length of time and Digital Services does not have overall control of the system. There is also a lack of live dashboard information supporting this which would be expected to be available from a third-party service provider.

This operations-led approach leads to a level of ongoing risk to NH, in that it can isolate the board from ongoing technology discussion, reduces the challenge on investment decisions and underplays the value of innovation and the potential impact of technology on the road network in the future. The review noted very limited use of AI, and it was highlighted that there were no obvious ways of introducing innovation into the organisation.

The interaction between Operations and Digital Services warrants further review. Clear lines of responsibility for system specification, testing, service support, maintenance, replacement, funding and ensuring compliance with overall enterprise architecture is fundamental. This allows the business to think about new technology innovation, AI investment and deployment, data and information management strategy in a joined up strategic way.

Service management

NH has already identified a need to improve its end-to-end service management approach for systems delivery to ensure there is overall ownership, oversight and understanding of the service outcomes it delivers. This needs to be based on the outputs and outcomes from whole systems rather than performance metrics from individual system components.

HADECS3X is regarded as a discreet system with its own full-service support, including remote monitoring and hardware replacement delivered by a third-party supplier. However, it is not treated as one component of a multi-faceted system with dependencies, delivering enforcement data to prosecuting authorities.

MIDAS does not have a similar support framework, despite the fact that HADECS3X relies upon and responds to speed signals from MIDAS. This means that a fault within a MIDAS loop or radar, for example, could impact HADECS3X' ability to provide accurate enforcement data.

Treating system components in an individual way, without considering interdependencies between components, creates challenges in terms of consistency of management, development and system outputs.

Any new service management approach for systems needs to ensure that its role within the Home Office Type Approval (HOTA) process is understood from both an operational and governance perspective. HOTA is the process by which road traffic law enforcement devices are assessed and approved, to enable records from approved devices to be admissible in court as evidence without additional corroboration.

At present, with an external supplier responsible for HADECS3X system operation and support while MIDAS is managed internally, there is no clear oversight of NH's engagement with HOTA in terms of enforcement system management.

The HOTA process does not absolve NH of its responsibility for the appropriate operation and management of its systems. NH retains responsibility for ensuring that all its systems function correctly and deliver the specified and required outcomes.

Digital strategy and governance

Having a clear technology strategy with an eye on future innovations clearly signals that the organisation has digital ambitions that are central to its future. The development of such a strategy means that resources can be maximised, long term opportunities and threats can be planned for and staff can see clear personal development paths.

Currently, there is a general lack of technology visibility at board level within NH. Specific technology matters have been discussed at board level sporadically and the board would benefit from more regular contact with its Digital Services executive, especially as AI and other new technologies are becoming more pervasive.

Having a greater focus on technology as a strategic driver, with increased visibility at both executive and board level, would enable NH to better understand its systems, plan for future developments and respond to technological issues affecting the strategic road network.

The Road Investment Strategy (RIS) is the government's multi-year investment plan for operating, maintaining, renewing and enhancing the Strategic Road Network (SRN). NH's RIS roadmap outlines its ambition to have a technology strategy in place by 2030. However, there is scope for greater ambition, especially against a backdrop of technological changes in vehicles. The limited suppliers available to support some of NH's existing technology offers a timely opportunity to explore new approaches to manage stranded investment, operational effectiveness and future proofed innovation.

Whilst outside the main scope of the review, opportunities to improve the management of all technologies should be taken. For example, most organisations consider cyber to be one of their key risks and NH is no different. Hostile action taking out core systems on the SRN would be a major incident and cyber investment is therefore recognised as important. However, cyber threat planning is currently undertaken as an annual

investment case activity rather than as part of a longer-term strategic programme. This should be reviewed and a new approach considered.

All of the above means technology should sit alongside infrastructure investment in equal importance. It is hard to see large scale project issues not receiving senior level scrutiny or escalation in the same way that this did. The recent appointment of a Digital Non-Executive Director (NED) will assist in this prioritisation of understanding but given the growing importance of technology, the demands in this area will increase further.

Data continues to be one of NH's most important assets. Information about traffic management, driver behaviour and travel patterns influences all aspects of the SRN. Managing that data and utilising it to deliver safer roads should be a cornerstone of the technology roadmap for the business. If the organisation does not appreciate the importance of data flow and handover points, this becomes very challenging. Although a NH Data Strategy was developed in 2019, this was not formally adopted by the organisation and it is recommended that this is revisited.

As part of a recent business transformation programme, there was a reorganisation resulting in a reduction in number and changing of role titles including that of the Chief Data Officer (CDO) and Chief Technology Officer (CTO). The CDO and CTO roles were combined into a Director of Digital Technical Competence, removing the title of Chief from anyone not in the executive. This change to the previous role of CDO and CTO could undermine the external perception of the importance of data to NH.

Better strategic management of data would have helped the organisation arrive at an impact status position much earlier, as a result of NH being able to carry out robust data scenario testing and make best use of real-time system performance data. This approach would also have helped with stakeholder management and provided confidence that the issue was under control. It is recommended that the organisation develops and implements a data strategy to support the long-term business plan and ensure that NH's technology accommodates new areas such as AI.

Although there has been progress in simplifying and streamlining the delivery and support of technology in NH, there is still much to do and the current progress should be accelerated.

RECOMMENDATIONS

1. **NH should ensure it has a clear strategic and operational understanding of all aspects of its data and technology usage**

To support this, NH needs to:

1.1 Ensure it has an adopted overarching strategy for innovation, technology and data (including managing cyber threats)

1.2 Set out a clear plan to increase its use of AI and implement autonomous root cause analysis, in order to assist with problem diagnosis and cyber threat analysis in complex environments with multiple data sets.

1.3 Redefine its service management approach to ensure it has a fully-wrapped, end-to-end approach based on measurable outputs and with clear responsibility for engagement with the HOTA process.

1.4 Ensure that its systems management approach has strategic and budgetary support for mission critical and important systems, including replacement, business continuity, lines of responsibility and governance.

1.5 Use data to be able to see real-time quality and performance information relating to its critical systems.

1.6 Implement a more regular and structured regime of board reporting from its Digital Services executive.

1.7 Ensure that it has a designated CIO that sits on its executive and board and maintains a Digital Non-Executive Director role on its board.

1.8 Speed up the implementation of its Business Improvement Plan. This should be supported by clear executive and board ownership and be led by a nominated Responsible Officer.

Theme 2: Critical systems

Evidence provided to the review points to inconsistencies in the way in which NH classifies its critical systems, which can lead to deficiencies in the responses to system incidents.

Put simply, the two systems at the heart of the enforcement issue are treated differently by the organisation, despite their operational interdependency. MIDAS is defined as a critical system by NH, whereas HADECS3X is not.

There are further differences in terms of the way in which these systems are supported. MIDAS is essentially a time and materials model, meaning that the resources needed to support it are costed as they are used. HADECS3X has a full remote monitoring service wrap and replacement contract in place via a third-party supplier.

Given that the interdependencies between these two systems are at the heart of the cause of the issue, these differences create material difficulties for NH. Differing system definitions, combined with the organisational issues highlighted earlier in terms of a lack of overall enforcement system owner, have created a situation where responses to issues can be fragmented and inconsistent.

Safety and critical systems

Concern for safety was an overarching theme mentioned by a large number of interviewees. It is perfectly reasonable and indeed important that a focus on safety is a key priority of the organisation and a core mission objective. There is also no doubt that in recent times, NH's focus on safety has in part been shaped by its experiences of working on Smart Motorways. This has clearly left an indelible mark on the business - even interviewees who were not there during that time mentioned Smart Motorways and their impact on the perception of safety within NH.

Safety is therefore the number one criteria for NH in terms of identifying and classifying its critical systems. This definition is important, because the critical system definition carries with it a set of processes, procedures, governance structures, risk assessments and mitigation plans.

Given the role of HADECS3X in enabling enforcement, a key component of influencing driver behaviour, it is hard to explain why it is not identified as a critical system by NH. Identifying HADECS3X as a critical system would have ensured regular impact reviews, mitigation strategies and business contingency plans in case of system failure. This was not in place.

RECOMMENDATIONS

2. NH needs to improve how it defines and supports critical systems

To support this, NH needs to:

2.1 Commission an independent review of its criteria for identifying critical systems, risk registers and corresponding contingency planning.

2.2 Review its definition of critical systems to ensure that technological systems are appropriately prioritised.

2.3 Ensure that the performance of all critical systems is visible on a comprehensive dashboard.

2.4 Ensure that for all critical systems, full risk registers are maintained and appropriate contingency plans are in place to deal with system failures.

Theme 3: Crisis handling and response

It is clear that once NH's crisis management process was activated in October 2025, the response, ownership, communication and progress in dealing with the issue improved dramatically. From this point on, there was greater clarity over who was leading the response, a regular daily regime of leadership team calls, regular communication and more definite sense of progress within an agreed approach.

What is less clear is why the crisis management process took so long to be activated, despite the executive team first being made aware of the issue in June 2025 and a range of senior staff and subject matter experts being aware of the issue months before that point.

The long time taken to inform the police and implement a manual filtering process to protect enforcement data integrity underlines the need for earlier implementation of the crisis management process. Manual filtering of data already takes place for a number of perfectly sensible data integrity reasons. It is unclear why a similar approach to this issue could not have been instigated by NH at an earlier stage if they had engaged with the police.

NH's Crisis Management Manual (CMM) is clear in who makes the decision to stand up a response and in what circumstances. The CMM outlines that the decision to implement the CMM is made by either the duty executive (depending upon the incident parameters) or CEO. Based on the evidence examined as part of the review, it is clear that opportunities were missed to invoke the CMM at a much earlier stage and therefore set in train a much more effective, speedy and structured response. There is a need for NH to increase awareness of its CMM at all levels across the organisation.

The definition of typical CMM triggers already includes *"national emergency with significant government and public interest"* and, although the description then goes on to include pandemic, national power outage or major cyber-attack, it is reasonable to see that potential wrongful prosecution risk would be of significant government and public interest. In addition, CMM activation criteria states *"an incident with the potential to have exceptional impacts on the reputation of the company"* and again, this issue should most certainly have passed that test.

The CMM also specifies criteria for defining 'rising tide' issues – these being issues that may develop in seriousness over time rather than coming about through a single, serious incident.

The issue had first been flagged in January 2025, with little substantive progress made in the subsequent few months in terms of root cause diagnosis, clarifying the scale of the issue or determining a resolution. This set of circumstances met the rising tide criteria and should therefore have triggered the CMM process much earlier than October 2025.

However, whilst the rising tide criteria does cover the set of circumstances that led to this issue, technology failure is not specifically scoped within the rising tide framework,

and this may be a factor in why the CMM was not triggered at an earlier stage. It seems prudent therefore to review CMM definitions to include technology issues within rising tide situations and ensure that all staff are aware of the circumstances under which the CMM should be activated.

Internal training could include a wider range of scenario test exercises. NH should also look to take learnings from the work of other stakeholders with experience in crisis handling in road safety settings, notably blue light services. These services have a broad range of experience in dealing with major and critical incidents, as well as incidents that could be smaller in scale but risk undermining public trust, including the establishment of effective operational structures and expertise in enacting a confident effective multi agency response.

RECOMMENDATIONS

3. **NH needs to improve both the design and usage of its processes for crisis handling**

To support this, NH needs to:

3.1 Conduct an audit of its crisis management system to ensure it is fit for purpose. This needs to cover definitions of critical incidents, escalation points (including to DfT) and governance and accountability processes.

3.2 Ensure its crisis management system and scenario planning exercises are set up to appropriately respond to technology-related and/or rising tide incidents that are not brought to light in a single, serious incident.

3.3 Ensure all staff are appropriately trained in the application of the CMM.

3.4 Take learnings from all blue light services, who have a broad range of experience in dealing with major and critical incidents including establishing effective operational structures and protocols to get to a resolution.

Theme 4: Legal advice and support

From a relatively early stage in NH's response to the issue, NH Legal Services were involved in many of the briefings and discussions that took place.

It is clear that, on more than one occasion, members of staff from within that function raised concerns as to the validity of prosecutions and offered advice in terms of guiding the organisational response, but these were not always acknowledged or taken forward.

The lack of assigning a core team to get to the bottom of the issue was clearly a factor here, but the lack of action in relation to Legal Services advice on communication with the police and a lack of update to the Chair, the board, or the shareholder underpins a view that the seriousness of the issue was not clearly understood and advice was not being heeded.

Members of Legal Services had concerns that their advice was not being acted on and potential impact of the issue was seemingly not recognised. It is important that the executive recognises the role Legal Services plays in safeguarding elements of NH's governance, risk management and compliance.

Legal Services commissioned external legal advice from an external King's Counsel (KC) in early October 2025 on any legal risks for NH arising from erroneous enforcement activity.

It is accepted that commissioning routine legal opinion is not an unusual practice, however there is room for additional clarity within NH as to the role of its Legal Services team and the way in which it acts for the business and supports and informs both the executive and board when commissioning external advice.

There is also a need to clarify the responsibility and accountability of the board and executive when it receives such advice and in instances where it decides on an alternative approach, there should be full transparency in that decision process.

This also brings in focus the role of the General Counsel and how that sits inside the executive. The role of the General Counsel as a Company Secretary role is in ensuring that the company complies with all legal, statutory and regulatory obligations acting as a crucial link between the board, shareholders, executives and other bodies. It is important that the General Counsel, whilst having clear engagement with the wider executive team, also retains a level of independence from the executive that provides a measure of additional governance and reputational safeguarding.

NH has an extensive Legal Services function with over 70 staff. It is vital that Legal Services are able to advise across the full range of legal specialisms required by the business.

RECOMMENDATIONS

4. **NH needs to ensure it has robust processes and governance arrangements in place to ensure it makes effective use of its legal services function**

To support this, NH needs to:

4.1 Review the role of Legal Services to clarify its overall purpose, remit, scope of responsibility and authority to the board and executive. This should also cover the response of the board and executive when receiving advice and how decisions are taken and recorded.

4.2 Establish a clear skills and competency matrix and gap management strategy to ensure that Legal Services has all of the core skills, experience and capability needed to cover all aspects of liability that it is likely to encounter; including government, digital and Information, health and safety and coroner law experience.

4.3 Establish a clear process for commissioning external advice which is understood by the executive and the board. This should include an expectation of how that advice is instigated, approved, commissioned, disseminated and ultimately acted upon.

Theme 5: Culture, communications and stakeholder engagement

Culture and empowerment

NH has processes in place to support issue identification and escalation and has been running an internal culture change programme aimed at empowering staff to identify opportunities to improve the organisation and to speak up.

Nevertheless, issues around internal culture and senior management's responses to issues were raised during the review that suggest that there is still work to be done to embed cultural change. It is also clear, particularly in the early stages of 2025, that opportunities were missed to hear the voices of subject matter experts and act on concerns.

The review identified a pattern of processes being available but not utilised. For example, NH has a CMM process in place, which was not triggered swiftly. Likewise, NH has policies and programmes in place which are designed to empower staff to speak up, yet these did not seem to function effectively in this instance.

Evidence gathered through the review indicates a negative perception of senior-level responses within NH in addressing adverse information, and that opportunities remain to strengthen how challenge is encouraged and acted upon across the organisation.

The culture that drives this needs to be set from the top of the organisation and NH would benefit from a review of its existing approach to staff empowerment and creating safe opportunities for staff to speak up and challenge the organisation to improve.

Any review of NH's internal culture to support openness and challenge should take account of the recently introduced Public Office (Accountability) Bill (widely known as the Hillsborough Law), which plans to embed new duties on public bodies and individuals in this area.

NH also needs to consider whether its structure could better encourage ownership and escalation of issues. As already noted, there is an opportunity to review the interplay of responsibility between Operations and Digital Services in a way that encourages overall service ownership and grip when issues arise.

Communication with the police

It is clear from evidence provided to the review that there were plenty of advocates for speaking to the police (as a collective entity rather than with individual forces), quite early on in the response to the issue.

A fundamental requirement of HADECS3X is to provide data that allows the police to undertake safe speed limit enforcement. Although NH does not interrogate HADECS3X

data itself, it retains an obligation to advise police of issues that might affect effective speed limit enforcement. It is then for the police to consider the impact of any such issues.

NH has service level agreements (SLAs) in place with a number of police forces with commitments to sharing information, including specifically in situations where data integrity may be compromised. However, there is currently no equivalent arrangement in place with police representatives at a national level. The NPCC were not notified until October 2025, despite the first occurrence of a potential erroneous prosecution being in January 2025. Even when the NPCC was finally informed, there was no formal agreement setting out information sharing responsibilities. This meant that the NPCC was not formally brought into the crisis response arrangements quickly enough and information was shared in a sporadic manner.

Once NH became aware that there was an issue with data integrity, there should have been an obligation to advise police accordingly at a national level. The creation of a formal SLA covering this aspect of stakeholder engagement on enforcement matters would bring clarity to this important relationship in the future and assist in the formation of co-ordinated, multi-agency responses to issues.

There was genuine concern in NH about the safety implications of potentially suspending enforcement which was further exacerbated by the failure to fully diagnose the root cause. However, any implications for enforcement activity sit outside the scope of NH's decision-making powers. As such if NH had safety concerns, then this should have been shared with the police to develop a collaborative plan to support safety. This did not happen.

The impact of this and the subsequent approach to drip feeding information undermined confidence and trust in the engagement between two key road safety partners. The use of police data, information sharing and joint working from the outset would have meant the issue could have moved forward to resolution much faster and potentially avoided some of the escalation activities that took place.

It should be noted that the review has not found evidence to support the idea that this was in any way a deliberate attempt to withhold information, but rather a course of action based in a genuine belief about the potential impact on road safety.

What is not in doubt is that once it was clear there was an issue, the police should have been engaged. A lack of clarity over the responsibilities and governance of the relationship between NH and the Police (particularly at national level) led to confusion and impacted NH's approach to stakeholder management. This is a governance challenge which needs to be reviewed and resolved, including establishing more structured links between NH and the police.

RECOMMENDATIONS

5. **NH should update its approaches to communication and stakeholder engagement, to ensure they invite constructive challenge from staff and key stakeholders.**

To support this, NH needs to:

5.1 Review its internal communications approach around organisational culture, in particular to support opportunities for staff to speak up, escalate issues and raise accountability concerns.

5.2 Commission an independent culture assessment, to look at ways in which it can remove silos and engender better interdepartmental working.

5.3 Review its stakeholder engagement approach to ensure that secure, consistent and productive relationships with key stakeholders are maintained and that stakeholder needs are mapped and understood.

5.4 Review its approach to police liaison, to ensure it is empowered to oversee this key relationship, with a requirement to report regularly to the board on enforcement-related matters.

5.5 Develop a communications SLA between NH and NPCC that covers the information sharing responsibilities of both parties in respect of enforcement issues.

Theme 6: Corporate governance

The review found that organisational governance was a key factor in the effectiveness of the NH response, particularly in relation to how its leadership cadre responded as the issue developed in 2025.

Leadership culture

A common theme amongst responses was that there was a lack of visible leadership in terms of direction and clear ownership of the issue. After the executive team was informed of the issue in June 2025, it was over three months before a Gold Command structure was initiated. Recognising that this was a rising tide issue with potential reputational, legal and operational implications, the roles of the executive and the CEO include providing direction and leadership through critical stages of the response.

The evidence provided in the review suggests the potential significance of the issue was not fully understood by the executive team when it was first raised to them in June 2025. Whether this is because of how it was first raised or a lack of understanding of the potential implications, it is now apparent the initial senior-level response did not reflect the scale and risk of the issue.

The first formal executive briefing contained a recommendation to liaise with police to suspend enforcement to mitigate further wrongful prosecution impact which was not implemented at that time.

There was a perceived lack of ownership and clear lines of responsibility, meaning that people working on root cause diagnosis felt unheard and at times unsupported.

Some interviewees noted that this in part reflects NH's culture of committee-style working with consensus decision making. Whilst this can make for a positive working environment, it does not always support swift and decisive responses to potential crisis situations. There is sometimes a need to make decisions which may not always be achieved through consensus.

One recurring theme was the feeling of being unheard. The evidence gathered suggests challenging or dissenting views are not always given sufficient attention. This is borne out by the missed opportunities to proactively handle the issue, assign resources, talk to stakeholders and get on the front foot in terms of a response.

In the early months of the response, reactions appeared slower than necessary and sometimes took the form of requests for further evidence and information rather than early intervention or decision making. As new staff were introduced to the process at various stages, it resulted in time being spent going back over old ground or overlooking earlier advice.

An organisational review took place prior to April 2025 supporting business transformation activities and it cannot be ruled out that the resulting realignment of

roles and responsibilities may have contributed to some of the delays in responding to the issue. The aim of the review was to simplify the structure and remove previous silos and although this may have been successful, it is conceivable that governance and ownership gaps may have appeared during transition.

The organisation has a strong ethos of internal promotion and is proud of its career progression opportunities which is to be applauded. However, as the step up to executive level is significant, consideration needs to be given to ensure adequate support, training, mentoring and formal qualification development continually support the executive. This will ensure their skills keep pace with the developing requirements of the organisation, the wider sector and support continued internal promotion to a senior level.

The lessons learned through this review must be embedded, so that similar issues are managed differently in future.

It is important that NH's leadership recognises the seriousness of the issue and learns real lessons. At the start, the scale of the issue would not have been clear to NH, but the implications, in terms of public losing trust in the police and government, definitely were. It is important that NH does not equate the issue's scale with a conclusion that it was handled well.

Board and executive interaction

The relationship between the board and the executive was highlighted. A common theme was perceived optimism of the executive's assessment of the seriousness of the issue and the timelines for resolution.

Evidence suggests that the initial focus was on understanding and resolving the technical issue, with less emphasis on managing its wider operational and stakeholder impacts, particularly for policing partners.

A particular issue raised repeatedly was the relationship between the then CEO and Chair, which was stated as being often challenging, with differing views on the balance between oversight and operational involvement.

They both cared deeply about doing a good job and ensuring successful outcomes for NH. However, the review identified concerns that challenges within this key relationship may have limited the effectiveness and timeliness of aspects of the organisation's senior-level response. The CEO has since left the organisation.

A future imperative when appointing the CEO is to recognise the importance of effective board governance, particularly during times of challenge. NH is an equivalent FTSE 100 scale business, operating as a government arms-length body. Given the scale and complexity of NH's responsibilities, consideration should be given to ensuring that governance arrangements, including board-executive engagement, reflect the demands placed upon the organisation.

The review has highlighted opportunities to improve stakeholder communication, political management and the provision of general support and advice during the

response. An effective trusted working relationship between the Chair and CEO helps an organisation work in alignment, thereby supporting trust and confidence across various stakeholders. The continued development of trust and confidence of the board in the executive comes from establishing transparency. The organisational antenna should be strongest between the board and the executive with each looking at the reputational, political and safety risk to the business as well as any legal jeopardy. These issues are best managed where the dynamic between the board and the executive is healthy, with effective challenge.

A wide-ranging governance review looking at how genuine challenge and scrutiny is achieved would be beneficial, offering the opportunity to reflect on the organisation's identity. NH is a state-owned company that was set up to act and behave like a commercial enterprise. There is an opportunity to review what is expected of the organisation to manage significant operational, reputational and legal risks.

The board are statutory directors with the fiduciary responsibilities that accompany such roles. Given not all executive team members sit on the board, there is a need to ensure an ongoing development programme aimed at improving understanding of the role of the board, how it works with the executive and building strong relevant engagement to help promote a healthy senior leadership model.

RECOMMENDATIONS

6. **NH should undertake a wide-ranging review of its governance**

To support this, NH needs to:

6.1 Review the roles and responsibilities of the CEO and wider executive team to ensure that accountability and areas of responsibility are clearly defined and ensure opportunities for genuine independent challenge and scrutiny are enabled across its executive and board teams.

6.2 Ensure that its executive is supported with appropriate training, mentoring and formal qualification activities.

Theme 7: Procurement and contracting

The procurement of technology can be complicated. However, as more and more organisations and industries have gained technology procurement experience best practice processes are now increasingly used to avoid costly legacy issues. Many organisations have established technology procurement capability to support this complex and costly activity. NH has removed digital expertise from its procurement team as part of its transformation programme, which should be revisited.

HADECS3X is a legacy system which is scheduled for replacement and has gone through various updates and changes in recent years. Ideally, a system like HADECS3X would have a service wrap contract that includes obligations on the validity of its data output. However, HADECS3X service wrap is an up-time and availability service managed by a third party contractor, with the NH obligation focused on service availability and not the quality or performance of the output data.

The review has been unable to establish how interoperability parameters between HADECS3X3X and MIDAS were considered at the time of procurement and initial testing. However, that is the root cause of the issue – the two systems work to their individual specifications, but a particular set of environmental circumstances affected how they operated together. This set of circumstances could have remained undetected had it not been for a member of the public presenting dashcam footage to Avon and Somerset Police.

Improved supplier management and internal systems ownership would build up a better working knowledge of the environment, including interoperability of systems. This subject matter expertise would assist in problem diagnosis and potential hypothesis exploration.

With planning for a replacement for HADECS3X3X currently underway, it is timely to consider issues relating to how NH procures services and manages its supplier relationships.

In a typical contracting model, the customer would define the outcomes and requirements from the system, with vendors acting as design authority with responsibility for the end-to-end solution.

It has been highlighted that when specifying technological equipment, NH sometimes retains overriding design authority and the vendor acts as an outsourced engineering service. This can lead to a ‘gold standard’ approach to system specification that is not necessarily focused on the required output from the system. Overly complex and bespoke systems increase the risk of a lack of understanding of the overall system operational environment and require tailored support arrangements which can hamper innovation and system development.

The implications of using this approach rather than using a standard supplier offering are that approvals and implementation of new systems take longer, which in turn increases cost.

NH should review its overall approach to technology procurement to ensure it offers opportunities for flexibility, innovation and value for money whilst retaining its core commitment to safety.

If the HOTA process is another driver for this level of system specification, this should also be explored and reviewed.

It was highlighted to the review that other jurisdictions, including within the UK, use the same or similar technology to enforce speed limits, yet do not specify their systems to the same degree. Since they are not likely to disregard safety or legal enforcement parameters, it is worth evaluating the costs and benefits of NH's bespoke system specification approach.

RECOMMENDATIONS

7. NH needs to review its procurement and contracting processes

To support this, NH needs to:

7.1 Ensure it retains access to data and possesses appropriate service management, specification accountability, value for money and quality levers within its supplier relationships.

7.2 Ensures that system interoperability is considered when contracting with external suppliers and, when relevant, covered by contract arrangements.

7.3 Review and justify any non-standard industry approach to system specification, especially for technology-related contracts, to ensure that over-specification does not hamper innovation and add un-necessary complexity to systems.

7.4 Ensure the procurement team retains access to the appropriate digital expertise.

Conclusion

This review has gathered evidence from a wide variety of sources and sought to use this to identify key issues and themes that NH should address to improve its ability to identify and respond to technical issues affecting the strategic road network.

It is clear from the evidence reviewed that this issue had the potential for significant scale and that the impact was considerable. Given the effect that even a single erroneous prosecution can have, it is vital that NH learns lessons from this process based on its impact rather than its scale.

NH has already undertaken its own internal lessons learned exercise, which identified many of the same themes that this report highlights.

Whilst NH has therefore demonstrated its willingness to learn and change, the pace and ambition of its change programme needs to increase. At the time of writing, it is unclear whether the emergence of a similar issue today would elicit a more comprehensive and co-ordinated response from NH.

Recent and planned senior level changes within NH present an opportunity for it to grasp the initiative with clarity of thought and ambition.

NH is an organisation full of committed and professionally expert people who, with the right structures and support mechanisms around them, are more than capable of delivering the changes needed.

Appendix A – Summary of recommendations

1. **NH should ensure it has a clear strategic and operational understanding of all aspects of its data and technology usage**

To support this, NH needs to:

1.1 Ensure it has an adopted overarching strategy for innovation, technology and data (including managing cyber threats)

1.2 Set out a clear plan to increase its use of AI and implement autonomous root cause analysis, in order to assist with problem diagnosis and cyber threat analysis in complex environments with multiple data sets.

1.3 Redefine its service management approach to ensure it has a fully-wrapped, end-to-end approach based on measurable outputs and with clear responsibility for engagement with the HOTA process.

1.4 Ensure that its systems management approach has strategic and budgetary support for mission critical and important systems, including replacement, business continuity, lines of responsibility and governance.

1.5 Use data to be able to see real-time quality and performance information relating to its critical systems.

1.6 Implement a more regular and structured regime of board reporting from its Digital Services executive.

1.7 Ensure that it has a designated CIO that sits on its executive and board and maintains a Digital Non-Executive Director role on its board.

1.8 Speed up the implementation of its Business Improvement Plan. This should be supported by clear executive and board ownership and be led by a nominated Responsible Officer.

2. **NH needs to improve how it defines and supports critical systems**

To support this, NH needs to:

2.1 Commission an independent review of its criteria for identifying critical systems, risk registers and corresponding contingency planning.

2.2 Review its definition of critical systems to ensure that technological systems are appropriately prioritised.

2.3 Ensure that the performance of all critical systems is visible on a comprehensive dashboard.

2.4 Ensure that for all critical systems, full risk registers are maintained and appropriate contingency plans are in place to deal with system failures.

3. **NH needs to improve both the design and usage of its processes for crisis handling**

To support this, NH needs to:

3.1 Conduct an audit of its crisis management system to ensure it is fit for purpose. This needs to cover definitions of critical incidents, escalation points (including to DfT) and governance and accountability processes.

3.2 Ensure its crisis management system and scenario planning exercises are set up to appropriately respond to technology-related and/or rising tide incidents that are not brought to light in a single, serious incident.

3.3 Ensure all staff are appropriately trained in the application of the CMM.

3.4 Take learnings from all blue light services, who have a broad range of experience in dealing with major and critical incidents including establishing effective operational structures and protocols to get to a resolution.

4. **NH needs to ensure it has robust processes and governance arrangements in place to ensure it makes effective use of its legal services function**

To support this, NH needs to:

4.1 Review the role of Legal Services to clarify its overall purpose, remit, scope of responsibility and authority to the board and executive. This should also cover the response of the board and executive when receiving advice and how decisions are taken and recorded.

4.2 Establish a clear skills and competency matrix and gap management strategy to ensure that Legal Services has all of the core skills, experience and capability needed to cover all aspects of liability that it is likely to encounter; including government, digital and Information, health and safety and coroner law experience.

4.3 Establish a clear process for commissioning external advice which is understood by the executive and the board. This should include an expectation of how that advice is instigated, approved, commissioned, disseminated and ultimately acted upon.

5. **NH should update its approaches to communication and stakeholder engagement, to ensure they invite constructive challenge from staff and key stakeholders.**

To support this, NH needs to:

5.1 Review its internal communications approach around organisational culture, in particular to support opportunities for staff to speak up, escalate issues and raise accountability concerns.

5.2 Commission an independent culture assessment, to look at ways in which it can remove silos and engender better interdepartmental working.

5.3 Review its stakeholder engagement approach to ensure that secure, consistent and productive relationships with key stakeholders are maintained and that stakeholder needs are mapped and understood.

5.4 Review its approach to police liaison, to ensure it is empowered to oversee this key relationship, with a requirement to report regularly to the board on enforcement-related matters.

5.5 Develop a communications SLA between NH and NPCC that covers the information sharing responsibilities of both parties in respect of enforcement issues.

6. **NH should undertake a wide-ranging review of its governance**

To support this, NH needs to:

6.1 Review the roles and responsibilities of the CEO and wider executive team to ensure that accountability and areas of responsibility are clearly defined and ensure opportunities for genuine independent challenge and scrutiny are enabled across its executive and board teams.

6.2 Ensure that its executive is supported with appropriate training, mentoring and formal qualification activities.

7. **NH needs to review its procurement and contracting processes**

To support this, NH needs to:

7.1 Ensure it retains access to data and possesses appropriate service management, specification accountability, value for money and quality levers within its supplier relationships.

7.2 Ensures that system interoperability is considered when contracting with external suppliers and, when relevant, covered by contract arrangements.

7.3 Review and justify any non-standard industry approach to system specification, especially for technology-related contracts, to ensure that over-specification does not hamper innovation and add un-necessary complexity to systems.

7.4 Ensure the procurement team retains access to the appropriate digital expertise.

Appendix B – Glossary

Key Terms

Term	Meaning
Board	The body responsible for the governance and strategic direction of National Highways. The board provides oversight and scrutiny of organisational performance, risk and delivery, and is accountable for ensuring that National Highways fulfils its responsibilities and statutory obligations.
Civils	Civil engineering works and expertise relating to the design, construction, maintenance and operation of physical road infrastructure, such as roads, bridges, gantries and other roadside assets.
Critical system	A system whose failure could have significant safety, operational, legal, reputational or public confidence consequences and which therefore requires clear ownership, governance, risk management and contingency planning.
Crisis Management Manual	NH' documented process for identifying, escalating and managing serious incidents or emerging issues, including "rising tide" events that develop over time.
Data integrity	The accuracy, reliability and consistency of data used to support decisions, operational activity or enforcement action.
End-to-end service management	An approach that considers the performance and ownership of a whole service, including all systems and interdependencies that contribute to the final outcome.
Enforcement data	Data generated by speed enforcement systems and provided to police forces to support decisions about potential speeding offences.
Executive Team	The group of senior executives responsible for the leadership, management and delivery of National Highways' activities. The executive team is accountable for implementing board decisions, directing the organisation's operations, and ensuring effective governance, performance and delivery across National Highways.

External aspect verification camera	A camera used as part of the HADECS3X system to record the speed limit shown on an overhead gantry or roadside sign at the time of a potential speeding offence.
Home Office Type Approval	The process by which road traffic law enforcement devices (speed, traffic signal, and prohibited lane cameras and drink / drug drive testing instruments) are assessed and approved to enable records from type approved devices to be admissible in court as evidence without corroboration.
Manual Filtering Process	An interim process agreed to identify and remove potentially affected enforcement records before they are passed to police forces.
Missed opportunity	A point at which earlier escalation, investigation, communication or decision-making could reasonably have improved the response to the issue.
Rising tide issue	An issue that develops gradually over time and may increase in seriousness if not identified, escalated and managed effectively.
Service level agreement	An agreement setting out expected service standards, responsibilities and communication requirements between parties.
Smart motorway	A motorway that uses technology, including variable speed limits and traffic monitoring systems, to manage traffic flow and improve safety.
Strategic Road Network	England's network of motorways and major A roads, managed by National Highways, which provides the main routes for long-distance travel and the movement of goods across the country.
Variable speed limit	A speed limit displayed on electronic signs that can change in response to traffic conditions, incidents, weather or manual intervention.

Acronyms

Acronym	**Meaning**
AI	Artificial intelligence

CEO	Chief Executive Officer
CIO	Chief Information Officer
CMM	Crisis Management Manual
COBR	Cabinet Office Briefing Rooms
CPS	Crown Prosecution Service
DfT	Department for Transport
EAV	External Aspect Verification
HADECS3X	Highways Agency Digital Enforcement Camera System
HOTA	Home Office Type Approval
KC	King's Counsel
MFP	Manual Filtering Process
MIDAS	Motorway Incident Detection and Automatic Signalling
NED	Non-Executive Director
NH	National Highways
NIP	Notice of Intended Prosecution
NPCC	National Police Chiefs' Council
OBE	Officer of the Order of the British Empire
ORR	Office of Rail and Road
RIS	Road Investment Strategy
ROC	Regional Operations Centre
RSS	Road Safety Support
SLA	Service level agreement
SRN	Strategic Road Network
ToR	Terms of reference