

Updated review of Roadside Technology Renewals Plans

Office of Rail and Road

30 November 2025



FINAL REPORT

Important notice

This document was prepared by CEPA LLP (trading as CEPA) for the exclusive use of the recipient(s) named herein on the terms agreed in our contract with the recipient(s).

CEPA does not accept or assume any responsibility or liability in respect of the document to any readers of it (third parties), other than the recipient(s) named in the document. Should any third parties choose to rely on the document, then they do so at their own risk.

The information contained in this document has been compiled by CEPA and may include material from third parties which is believed to be reliable but has not been verified or audited by CEPA. No representation or warranty, express or implied, is given and no responsibility or liability is or will be accepted by or on behalf of CEPA or by any of its directors, members, employees, agents or any other person as to the accuracy, completeness or correctness of the material from third parties contained in this document and any such liability is expressly excluded.

The findings enclosed in this document may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties.

The opinions expressed in this document are valid only for the purpose stated herein and as of the date stated. No obligation is assumed to revise this document to reflect changes, events or conditions, which occur subsequent to the date hereof.

The content contained within this document is the copyright of the recipient(s) named herein, or CEPA has licensed its copyright to recipient(s) named herein. The recipient(s) or any third parties may not reproduce or pass on this document, directly or indirectly, to any other person in whole or in part, for any other purpose than stated herein, without our prior approval.

Contents

1. INTRODUCTION	4
2. CONTEXT AND SCOPE.....	5
2.1. Context.....	5
2.2. Scope.....	5
2.3. Approach.....	5
3. JUNE 2024 ASSESSMENT OF THE INTERIM dSBP	6
3.1. Overall findings on roadside technology renewals	6
4. ASSESSMENT OF THE 2025 dSBP	7
4.1. dSBP expenditure and deliverables	7
4.2. Alignment with National Highways' Asset Management Policy and Strategy.....	9
4.3. Maturity of NH's approach and use of data and modelling tools in plans.....	9
4.4. the use of internal and external unit cost benchmarks.....	13
4.5. Deliverability of plans and risks to delivery	14
4.6. Alignment with Smart Motorway KPI, performance targets and DfT requirements...	14
4.7. Summary	15

1. INTRODUCTION

The Office of Rail and Road (ORR) is responsible for independently monitoring National Highways' (NH) management of the strategic road network (SRN) – the motorways and main A roads in England. As part of its role, the ORR advises the government on the appropriate level of funding and performance requirements for future road periods.

The ORR reviews NH's draft Strategic Business Plan (dSBP) and provides advice to the Secretary of State on the extent to which the proposed requirements for Road Investment Strategy (RIS) 3 are challenging and deliverable within the financial resources to be provided. This process is referred to as the Efficiency Review.

In June 2024, the ORR commissioned CEPA to support the ORR in its Efficiency Review. CEPA completed an initial review of NH's plans for Operations, Maintenance and Renewals, as outlined in its interim dSBP. This included a review of NH's proposed roadside technology renewals.

In June 2024, the draft RIS for Road Period 3 (RP3) was not final. To maintain progress, the Department for Transport (DfT) instructed NH to produce an interim version of its dSBP based on agreed assumptions. DfT invited the ORR to review these interim plans.

CEPA prepared a report for the ORR in June 2024 titled 'Lot 1 – Operations Maintenance and Renewals' that included our views on NH's plans for roadside technology. In the remainder of this report we refer to the interim submissions at the 'interim dSBP'.

The draft RIS was published in August 2025 and NH subsequently provided an updated version of the interim dSBP and CEPA conducted a further assessment of the dSBP for NH's approach to renewals of roadside technology. This report presents CEPA's views on this updated version of the dSBP.

2. CONTEXT AND SCOPE

2.1. CONTEXT

RIS3 includes revised plans for renewals of roadside technology renewals. The interim dSBP allocated £906m to these renewals. ORR previously raised concerns around the deliverability of NH's plans and their alignment with DfT's requirement to maintain current performance levels. In the updated dSBP, the allocation for road side technology increased to £1,019m.

2.2. SCOPE

As in the interim review in June 2024, CEPA was asked to assess the:

- Alignment of NH's plans with NH's Asset Management Policy and Strategy;
- Use of data and modelling tools in the final plans;
- Maturity of NH's approach, including the use of internal and external unit cost benchmarks; and
- Risks to delivery.

In addition, CEPA was to evaluate whether NH has provided new evidence to address previous concerns regarding the deliverability of its plans and their alignment with the Department for Transport's (DfT) requirement to maintain current performance levels. CEPA scope also included assessment of the extent to which NH has incorporated evidence and lessons learned from the operational technology modernisation and refresh programme. Furthermore, CEPA's updated assessment considers DfT's intention to introduce a Smart Motorway technology availability KPI in RIS3 and examine how this aligns with any performance targets proposed by NH.

2.3. APPROACH

Our approach was to:

- Examine how NH has prioritised and constructed its plans, and to understand the approach that it has used to translate national prioritisation to regional programmes;
- Assess how it has incorporated appropriate unit costs into its forecasts;
- Understand any trade-offs NH has proposed between renewal volumes and technology availability; and
- Review NH's approach to the Smart Motorway technology availability KPI.

3. JUNE 2024 ASSESSMENT OF THE INTERIM DSBP

In June 2024 CEPA was commissioned to support the ORR in its Efficiency Review. Our report set out CEPA’s views on NH’s plans to operate, maintain and renew the SRN in Road Period 3. Supported by TRL, CEPA reviewed Operations, Maintenance and Renewals (OMR) plans for five asset types and also reviewed NH’s plans for handback and subsequent OMR of roads managed at the time via Design, Build, Finance, Operate (DBFO) arrangements.

Roadside technology was one of the asset types reviewed by CEPA for renewals.

3.1. OVERALL FINDINGS ON ROADSIDE TECHNOLOGY RENEWALS

We summarised our assessment of the quality of justification and evidence provided by NH using a Red-Amber-Green (RAG) rating for the main aspects of the interim dSBP that we examined.¹

Section of interim dSBP	Overall spend	Asset Mngt	Modelling & data use	Climate change	Cost estimation	Risks to delivery	Link to perf.
Roadside Technology	Red	Red	Amber	Amber	Red	Red	Amber

Our specific findings for roadside and operational technology renewals were that:

- Under NH’s plans, roadside technology was set to benefit from a substantial increase in renewals expenditure to £906m, including a £300m National Programme. Even excluding the National Programme in RIS3, this represented a real increase of 76% compared to RP2 expenditure. This level of expenditure would result in NH replacing around 40% of its asset base in RIS3.
- This forecast expenditure was based on modelling of asset ages, failure rates, obsolescence, and the availability of roadside technology. However, it was unclear to CEPA whether this amount in the interim dSBP reflected the additional £100m of renewals expenditure allocated via the modernisation and refresh programme introduced during RP2. The basis of the fault rate estimates, and the sensitivity of the model to changes in these, were not explained for all technology asset types.
- While we recognised that the age of the assets likely warranted some increase in expenditure and acknowledged that some of the assets were safety critical, it did not seem credible that replacing 40% of the asset base was the most appropriate response to ageing assets.
- In our view, the modelling approach, while appropriate in principle, appeared insufficiently mature and stable to justify roughly £900m of additional expenditure.
- We recommended that the ORR consider excluding some or all of the additional spend for this area, pending improved detail on how NH would improve performance and deliver its long-term vision for this asset class.

¹ It is important to note that the RAG ratings that we gave for each area were necessarily a broad-brush view of a potentially complex situation, but our aim was been that the RAG rating would typically represent the following criteria:

Red: Area was not addressed, or was poorly justified AND was material for the asset/area in question.

Amber: Area was addressed in part, but there were shortcomings in the analysis or evidence provided to demonstrate deliverability or efficiency; OR

Area was not addressed or poorly justified but was not material for the area/asset in question.

Green: Area was sufficiently addressed AND evidence or analysis provided gave confidence in deliverability or efficiency

4. ASSESSMENT OF THE 2025 DSBP

Key findings

- Overall, we remain concerned that the £1,019m of expenditure on roadside technology renewals has not been well-justified as the best use of limited funds. While this high level of expenditure may enable NH to meet technology availability targets set by DfT, there is no evidence to support NH's assertion that this level of expenditure is *required* to achieve those targets. It is possible that the targets could be met with less, potentially far less, expenditure on roadside technology renewals. NH is still unable to link spending to outcomes such as technology availability, making it difficult to assess whether reduced funding would allow NH to meet its performance targets.
- NH has presented information on the link between asset age and reliability in its dSBP and in briefings on the modelling and prioritisation approach NH indicated that it had modelled the impact of obsolescence on time to fix. Combining reliability and time to fix suggests that NH should have, or be able to develop rapidly, at least some high-level indication of the impact on technology availability under alternative expenditure scenarios. ORR has requested that NH provide such evidence and we agree that this would be extremely useful in assessing the extent to which proposed expenditure is required.
- Despite these concerns, NH has made good progress since the interim dSBP in improving the credibility and deliverability of this high level of expenditure. In particular, NH now has a consistent way for prioritising its renewals programme and delivering demonstrably improved asset life and condition. It has also made progress on deliverability; initiating new contracts with the supply chain and mobilising a central team to manage and coordinate the programme. However, the level of asset renewals proposed in the dSBP is more than three times the level delivered in RIS2, and there remains insufficient evidence that such a significant increase can be delivered, especially in the early years of RIS3.
- NH maintains that it is too early to move toward with removing roadside technology in RIS3, despite its vision for no further implementation of roadside technology by 2035. While NH has stated that it will reduce overall asset numbers if possible, this remains an aspiration that seems unlikely to be realised at any scale in the short term. This introduces a risk that, in RIS3, significant sums of money will be spent on renewing assets that are not required beyond 2035. We recommend that NH be asked to set out its high-level plans for consolidation and removal of assets beyond 2035 taking account of its planned expenditure in RIS3.
- NH's unit costs are generally based on detailed analysis and are applied correctly within its prioritisation. Unit costs are derived from detailed estimates of costs incurred between 2018 and 2021, updated for inflation and adjusted for efficiencies within RIS3. However, it appears that efficiencies between the date of the estimate and RIS3 are not included, suggesting that dSBP costs are overstated. We recommend that NH's approach to indexation and efficiencies be checked against its assumptions, such that the unit rates applied in the prioritisation model can be verified.
- The dSBP now includes a KPI for All Lane Running (ALR) Technology, set at 95% to 97%, which NH states is its expected range based on current performance and spend. The dSBP makes clear that the roadside technology renewals plan does not include any renewals of Stopped Vehicle Detection, as these assets are new and NH does not believe that they will need significant renewals work in RIS3. Around 11% of the proposed roadside technology renewals relate to ALR sections. However, no analysis is provided of the impact that different levels of renewals would have on the KPI.

4.1. DSBP EXPENDITURE AND DELIVERABLES

The profile of roadside technology renewals set out in the dSBP is summarised in Table 1. The dSBP plans involve replacing approximately 15,000 assets, more than half of NH's asset base², during RIS3. Renewals total £1,019m

² The number and proportion of assets renewed vary between different sources in the dSBP and supporting analysis, this statement is taken from 1.1.6 in A.1.4 - Refreshed – OMR – Renewals – Roadside Tech [0.1]

across RIS3, with expenditure roughly constant at around £200m per annum. Renewals spend in this area totalled around £305m in RP2.

Table 1: Expenditure for roadside technology renewals included in the dSBP (£m, nominal)

Sub-Asset	2026/27	2027/28	2028/29	2029/30	2030/31	RIS3 Total
CCTV Site	54	29	23	12	12	129
Message Sign Site	63	58	49	42	42	254
Signals Site	35	67	84	96	97	379
Other	50	48	43	58	58	257
Total	202	202	199	208	209	1,019

Source: dSBP Financial Model

The dSBP describes the expected number of renewals, by sub-asset, that are anticipated across RIS3. This is set out in Table 2.

Table 2: Expected numbers of renewals of main sub-assets in RIS3

Sub-Asset	Expected number of renewals
CCTV Site	1,612
Message Sign Site	5,565
Signals Site	2,744
Other	5,255
Total	15,176

Source: dSBP

The interim dSBP anticipated replacing 14,400 assets at a total nominal cost of £906m in RIS3. The updated plans equate to a roughly 5% increase in the total number of renewals and a 12% increase in nominal expenditure (8% if deflated by assumed interim year renewals inflation of 4.09%). In contrast to the interim dSBP, where this expenditure was split between a “renewals programme” and a “national programme”, the entirety of this expenditure appears intended to be coordinated by a new team in the Operational Control Directorate.

Performance on the technology availability Performance Indicator³ (PI) during RP2 deteriorated significantly from over 95% at the beginning of RP2 to around 90% at the end of RP2. NH estimates that around 2.5% of this 5% reduction in performance was due to the rectification of problems in the base data that overstated reliability. NH’s capital specification includes a performance objective for roadside technology that it will “stabilise availability of assets at 95-97% aligned to RIS2 KPI 3.3 (ALR Technology Availability)” and it states in its dSBP that it “expects to target 95% availability for non smart motorway technology and a higher number/range on smart motorways”.

³ Defined as the percentage of time that roadside technology services are available and running

Overall, NH's plans include an increase in the volume and cost of renewals relative to the dSBP.

4.2. ALIGNMENT WITH NATIONAL HIGHWAYS' ASSET MANAGEMENT POLICY AND STRATEGY

Our review of the interim dSBP noted that NH has a long-term vision to eliminate implementation of roadside technology by 2035 and that the large-scale renewal of assets appears inconsistent with this vision. NH does not consider current technologies to be sufficiently advanced to enable a paradigm shift at this time.

We agree that it remains too early for a large-scale move to eliminate roadside technology. However, we would expect NH's current plans to reflect this long-term vision and to offer concrete steps toward achieving it, given that, by the end of RIS3 in 2031, only four years will remain to realise this goal.

NH has, to some extent, acknowledged this aim in the dSBP, stating that "we are considering the processes in which we use each of the asset types and will reduce overall numbers if at all possible". However, this is presented as an aspiration rather than a defined target supported by concrete plans and analysis. For example, we would expect to see evidence of process analysis and identification of specific asset-types that might be consolidated or removed. The analysis NH has undertaken clearly emphasises identifying and replacing life-expired or unreliable assets, rather than to consolidating and reworking its asset base to align with its future aspirations.

This introduces a risk that, in RIS3, significant sums of money will be spent on renewing assets that are not required beyond 2035. While it may be too early to develop detailed plans, we would expect NH to have an understanding of which classes of assets (for example, CCTV) will be retained longer term, and which may become obsolete in the 2030s as technology progresses (for example, message signs). We recommend that NH be asked to set out its high-level plans for consolidation and removal of assets beyond 2035.

4.3. MATURITY OF NH'S APPROACH AND USE OF DATA AND MODELLING TOOLS IN PLANS

NH has built a bespoke model to consistently prioritise roadside technology renewals. This model is based on a thoroughly cleaned asset register and that calculates an "asset need" score for each asset (ranging from -100 to +25, with more negative numbers indicating a greater need for renewal). The score incorporates factors such as road and asset type, asset age, and obsolescence. The resulting list of assets and their scores is shared with regional teams who use these scores, alongside their local knowledge, to develop a deliverable renewal plan. For example, regions may package similar assets in a given area rather than focusing solely on the highest priority assets. However, we have not been provided with evidence demonstrating the extent to which these regional plans amend the prioritised list. Any impact that these revised regional plans might have on unit costs (for example, through packaging efficiencies) is not included.

We have analysed the data provided by NH on the proposed roadside technology renewals for RIS3 to understand how well these address asset needs. Below, we set out the number of renewals for each sub-asset type to be delivered each year, and the average asset need score of proposed renewals across RIS3.

Table 3: Number of renewals⁴ delivered by year for main sub-assets

Sub-Asset	2026/27	2027/28	2028/29	2029/30	2030/31	RIS3 Total
CCTV Site	870	624	476	277	1	2,248
Message Sign Site	386	385	373	202	223	1,569
Signals Site	490	1,112	1,429	1,566	1,503	6,100

⁴ 15,533 of the proposed renewals (96%) have asset scores assigned, analysis in tables 3 and 4 is of these renewals

Sub-Asset	2026/27	2027/28	2028/29	2029/30	2030/31	RIS3 Total
Other	66	342	711	1,265	3,232	5,616
Total	1,812	2,463	2,989	3,310	4,959	15,533

Source: CEPA Analysis of RFI003

The data shows that CCTV renewals are concentrated in the earlier years of RIS3, with around 66% of proposed renewals delivered in the first two years. In contrast, renewals for Signals sites and Other (predominantly MIDAS and Emergency Roadside Telephone (ERT) sites) are scheduled toward the end of RIS3. For example, 56% of MIDAS renewals are planned for 2030/31.

Table 4: Average ‘Asset Need’ score addressed by proposed renewals

Sub-Asset	2026/27	2027/28	2028/29	2029/30	2030/31	RIS3 Average
CCTV Site	-3.02	-3.21	-1.38	-2.92	-0.02	-2.71
Message Sign Site	-0.43	-0.66	-1.55	-1.65	1.91	-0.58
Signals Site	4.06	2.24	2.26	2.56	2.29	2.48
Other	5.75	0.53	0.99	-1.42	0.23	0.03
Total	-0.23	0.17	0.90	0.33	0.93	0.54

Source: CEPA Analysis of RFI003

Comparing the proposed numbers of renewals and their average priority (with more negative scores indicating higher priority), it is clear that NH’s plans focus early renewals on the highest priority assets. Large numbers of CCTV sites are renewed early in RIS3 and these are, based on NH’s prioritisation scores, significantly more in need of renewal than other assets. This is largely due to the shorter assumed obsolescence life for CCTV cameras⁵ and the relatively old age of the current systems⁶. In contrast, assets renewed later in RIS3 such as signals sites and other assets have less need of renewal based on NH’s prioritisation scoring.

The approach of renewing assets most in need of replacement early in RIS3 is what we would expect to see from a consistently prioritised approach. In terms of addressing the most pressing asset needs, expenditure early in RIS3 on CCTV sites and message sign sites most effectively targets the highest asset needs.

It is evident that the data, modelling, and process have developed since the interim dSBP. However, significant issues remain in justifying such a large amount of expenditure:

- Firstly, the model appears to have been developed as an operational tool to guide expenditure on roadside technology assets. Its main purpose is to consistently prioritise assets according to their need, with the resulting prioritisation and regional discussion focusing on “the best way to spend £1bn” rather than “the best balance of cost and performance”. As a result, NH is unable to provide evidence of the **impact** of different levels of expenditure. This inability to test different funding and renewal approaches limits its usefulness to the ORR and DfT in understanding the balance of cost and performance between different asset classes, as set out in the dSBP. For example, would it be better for £250m to be spent on pavement or roadside technology renewals?

⁵ 8 years for CCTV, 15 for other roadside technology assets

⁶ Current average age of CCTV asset subclasses ranges from 9 to 13 years

- Secondly, the model has two key stages: prioritisation and regional discussion/development. NH is not able to provide the output from the model at the intermediate stage (i.e. after prioritisation but before regional development). Therefore, we are unable to assess the extent to which the regions have used the prioritisation as a guide in developing the renewals programme.
- Thirdly, as noted above, the model is intended as an operational tool. The renewals embodied within the dSBP are not fully consistent with the outputs from the model provided by NH. While in aggregate differences are relatively small, for some sub-assets there are material discrepancies between the two sources. We understand this is because the dSBP is based on the model “at a point in time” but NH’s view has evolved further since then. While this shows the model being used to develop plans, it limits our confidence in the dSBP modelling.

In response to the first of the issue, NH has provided an indication of how it could prioritise expenditure on roadside technology if RIS3 expenditure were reduced from £1,097m to £754m⁷. NH used a simplified approach of removing renewals with the lowest score in its prioritisation tool. NH notes that this ignores other constraints on the roadside technology programme and would not be the actual approach applied. Tables 5 and 6 show the revised number of renewals by sub-asset type for the £754m case and how this compares to the higher expenditure scenario.

Table 5: Number of renewals⁸ delivered by year for main sub-assets – £754m expenditure

	2020	2021	2022	2023	2024	Total
CCTV Site	953	685	434	249	1	2,322
Signals Site	78	485	610	724	560	2,457
Total	1,382	1,713	1,818	2,202	3,101	10,216

Source: CEPA Analysis of RFI003

Table 6: Comparison of asset renewal numbers between £1.1bn and £754m expenditures

Sub-Asset	Number of renewals (£1bn)	Number of renewals (£750m)	Change in number of renewals	Change as %
CCTV Site	2,248	2,322	74	3%
Message Sign Site	1,569	1,304	-265	-17%
Signals Site	6,100	2,457	-3,643	-60%
Other	5,616	4,133	-1,483	-26%
Total	15,533	10,216	-5,317	-34%

Source: CEPA Analysis of RFI003

⁷ These were the total renewals expenditures included within the detailed data provided in response to RFI003

⁸ Two of the proposed renewals do not have asset scores assigned, analysis in tables 6 and 7 is of the 10,216 that remain

Under this lower budget, NH’s prioritisation has retained all CCTV renewals⁹ (typically assessed as high-priority), but reduced the number of signals site renewals by 60%. These signal site renewals were relatively low priority, based on asset scores, in the higher expenditure case. The average asset scores of renewed assets in the lower expenditure case are set out in Table 7.

Table 7: Average Asset Need score addressed by proposed renewals - £754m expenditure

Sub-Asset	2026/27	2027/28	2028/29	2029/30	2030/31	RIS3 Average
CCTV Site	-3.05	-3.14	-1.86	-3.87	-0.02	-2.94
Message Sign Site	-2.15	-2.82	-2.98	-2.77	0.28	-2.16
Signals Site	0.38	-1.11	0.12	-0.01	0.68	-0.02
Other	-0.58	-1.14	-0.87	-2.47	-1.04	-1.38
Total	-2.57	-2.22	-1.12	-1.84	-0.63	-1.51

Source: CEPA Analysis of RFI003

It is clear that NH’s example prioritisation has successfully focused suggested renewals on assets with high needs, as measured by the asset needs score. Renewals of all sub-asset classes are having a greater impact, per renewal, on the asset needs score (i.e. a greater proportion of assets renewed have low scores, indicating high asset needs).

It may be tempting to conclude that this lower expenditure is therefore “better”. While it appears to address assets with the highest needs, the impact of this reduced expenditure (or any further reductions) on NH’s performance on the technology availability metric or on customer perceptions is not clear. While this analysis shows that the prioritisation of renewals seems to produce the expected results in terms of addressing asset needs, it does not provide any information on the impact of this reduced expenditure on performance.

We would expect that reduced expenditure would have a proportionally larger impact on technology availability than the higher spend (i.e. £754m will increase the technology availability metric from a “no renewals” case by more than 754 / 1,097 of the higher expenditure case) since older and/or more obsolete assets are being renewed in the lower expenditure case. However, it is not clear from the information provided by NH whether this will meet or exceed DfT’s expectations for roadside technology assets. For example, current performance of Message Signs is particularly poor (around 83% availability), so renewal of these might be expected to have an outsize impact on the PI. While most of these renewals are retained by the prioritisation the overall impact on the PI is not obvious.

We believe that this lack of linkage between expenditure and performance is the key issue with the reduced expenditure example. NH has presented information on the link between asset age and reliability in its dSBP, and its briefings on the modelling and prioritisation approach indicated that NH had modelled the impact of obsolescence on time to fix. Combining reliability and time to fix suggests that NH should have, or be able to rapidly develop, at least some high-level indication of the impact on the technology availability of alternative expenditure scenarios. The ORR has requested that NH provide such evidence and we agree that this would be extremely useful in assessing the extent to which proposed expenditure is required.

⁹ We would suspect that the small increase is due to some CCTV sites with high asset need being excluded from the £1.1bn case after input from the regions

4.4. THE USE OF INTERNAL AND EXTERNAL UNIT COST BENCHMARKS

NH has provided detailed information supporting the unit rates used within the prioritisation model described above. The process for generating these rates involve several steps:

- 1. Estimation of total out-turn cost for asset renewals under typical scenarios.** For example, the low complexity scenario for HSM motorway cameras involves a simple replacement, while the high complexity scenario includes replacement of the supporting post and renewal of fibre-optic cables. All costs are converted to a Q1 2019 price base from their original estimation date. We assume that the price-base of these estimates, which appear to range from 2018 to 2022, represents the point at which the component costs were estimated. Some of these costs are therefore dated and may not accurately reflect current costs. Nevertheless, the resulting costs appear plausible and the breakdown of their components is suitably detailed.
- 2. Calculation of a blended unit rate:** A blended rate is calculated based on an assumed proportion of low and high complexity replacements for each asset type. The blended rate is usually based on a 95% / 5% mix of low and high complexity scenarios, though some assume a 90% / 10% and for two message sign types, the majority are assumed to be high complexity. For these two message signs, the low and high complexity scenarios costs do not differ greatly, while for others, the high-complexity costs are substantially higher. There is no explicit justification for the mix of low/high complexity rates included in the blended rates, but the assumed percentages seem reasonable. However, since the high and low complexity costs are often very different, small changes in the mix can have a material impact on the blended rates. Typically, increasing the proportion of high complexity renewals from 5% to 10% would increase the blended rate by 15 to 20%.
- 3. Calculation of unit rates for each year:** The blended rates are allocated to more detailed asset descriptions within a costing spreadsheet. There appears to be a small, consistent difference between the unit rates calculated in the blended rate stage and those used in this allocation. The “Base Rates” used as inputs to this stage are typically about 1% higher than those calculated in the blended rate and we can reconcile the “uplifts” in NH’s costing sheet with other NH indices. It seems likely that the 1% discrepancy in the Base Rates is due to an undocumented indexation adjustment. We have been unable to trace the approach to efficiencies through this source. The efficiency amounts included in the unit rate calculations are higher than stated in the dSBP, typically by around 2% in each year¹⁰. In addition, given that the price base of the underlying unit costs is Q1 2021, we would expect to see efficiencies delivered from 2021 to 2026 (i.e. from the price base to the start of RIS3) in addition to the RIS3 efficiencies set out in the dSBP. We would expect this RIS2 efficiency to be greater than the other effects, resulting in the dSBP unit costs being overstated¹¹.
- 4. Application of calculated unit rates in prioritisation model:** We have traced the use of the unit rates into NH’s detailed costs estimates. These appear to have been correctly applied. However, since the total expenditure does not match with the values in the dSBP we cannot confirm whether the potential errors in indexation and efficiencies noted above are corrected or retained in the dSBP values.

We recommend that NH’s approach to indexation and efficiencies are checked against their assumptions, such that the unit rates applied in the prioritisation model can be verified.

NH does not appear to have used external benchmarks for its unit rates. Unit rates are calculated internally by the contracts and procurement team. As noted above, these estimates appear to be based on sensible assumptions, but they are in many cases more than five years old. Given this age, and the rapid pace of change in this area, it

¹⁰ We have compared efficiency levels with those stated in the dSBP. Given the age of the base cost estimates, it could be argued that costs should also be reduced by an assumed level of efficiency from RIS2. This would reduce the unit costs. It may be that this is a reason behind the apparent underestimate of costs.

¹¹ We do not have the RIS2 efficiencies to estimate the level of overstatement, but would expect it to be around 10%

would be worthwhile re-estimating the costs. We understand that NH is currently working on incorporating its more recent experience of unit costs into its estimates.

4.5. DELIVERABILITY OF PLANS AND RISKS TO DELIVERY

NH has made good progress in improving the deliverability of the roadside technology programme since the interim dSBP. Important steps have been taken to develop prioritisation tools that ensure investment is directed to the right place at the right time, providing a consistently derived basis for prioritising renewals. We also understand that NH has worked with suppliers to implement national 6-year contracts with both a North and South supplier, aiming to maximise standardisation of designs across regions.

Nevertheless, the RIS3 plan represents a substantial increase in both expenditure, which averaged around £60m per annum in RIS2 but is targeted to be around £200m per annum in RIS3, and the number of renewals compared to RIS1 and RIS2 levels. Historic data in the dSBP shows that actual renewals averaged 915 assets per annum from 2015/16—significantly higher than the planned delivery rate of 525 per annum, but still far short of the over 3,000 per annum required for RIS3. NH note that reporting in RIS1 and RIS2 differed between regions included supporting infrastructure rather than just end devices and so renewals cannot be directly compared between RIS1/2 and RIS3. Nevertheless, it is clear that there is a large increase in renewals expenditure and numbers from RIS1/2 to RIS3. The dSBP plans represent such a large increase that, despite further work with the supply chain, we doubt that NH can deliver the volume of renewals throughout RIS3. It seems more likely that the early years of RIS3 will see fewer renewals as both NH and the supply chain become familiar with the work. We would suggest that the target of 3,000 renewals per year will only be reached in the later years of RIS3.

NH has sized the programme largely based on its assessment of the supply chain's capacity to deliver the necessary components, equipment and renewals. We understand that the ORR is currently reviewing NH's position with its supply chains and would expect this analysis to inform its view on whether the supply chain can support such a large increase in delivery.

Another significant risk lies in the balance between lower and higher complexity sites. As noted above, increasing the proportion of complex sites from 5% to 10% raises the blended rate by 15 to 20%, so this plausible level of uncertainty has a large impact on aggregate costs.

Overall, while delivering the plan is very challenging, it may be possible for NH to deliver the required volumes. NH now has some essential tools in place to target renewals consistently, but it remains to be seen whether it can combine such a large increase in renewals delivery with efficiency in programme execution.

4.6. ALIGNMENT WITH SMART MOTORWAY KPI, PERFORMANCE TARGETS AND DfT REQUIREMENTS

DfT's requirement is that NH should seek to at least maintain current performance of SRN assets. NH has suggested its plans would likely achieve availability of technology assets of between 93% and 95%. NH appears confident that, if it delivers the renewals set out the dSBP, it will meet this requirement. Based on the substantial increase in renewals, it seems likely that this is the case. However, it is not clear whether lower, potentially much lower, levels of expenditure might also meet this requirement.

The capital specification also includes a commitment to renew 15,176 (+/- 5%) roadside technology assets. We believe that, with the funds requested, this could be straightforward to deliver if it becomes the sole aim. For example, rather than delivering the commitment by renewing high-priority assets NH could focus purely on delivering the number of renewals in the lowest cost way. This approach would be more effective for roadside technology rather than for, say, flexible pavement since roadside technology unit costs differ greatly. An Emergency Roadside Telephone (ERT) has a unit cost of £5k, while most message signs are around £150k. This commitment would be more valuable if it were combined with a requirement to demonstrate that high-priority assets were being renewed, for example, via outputs from the prioritisation tool showing the asset need scores addressed through

renewals. As noted above, we do not believe that NH is likely to deliver this many renewals if the mix of assets currently anticipated were to be renewed.

DfT has proposed introducing a KPI for the availability of All Lane Running Technology. NH has proposed that the KPI is set at 95% to 97% availability, which it states is its expected range based on current performance and spend. The dSBP is clear that the roadside technology renewals plan does not include any renewals of Stopped Vehicle Detection, as the assets are new and NH do not believe that they will need significant renewals work in RIS3. Around 11% of the proposed roadside technology renewals relate to ALR sections. As with other roadside technology renewals, no analysis is provided of the impact that differing levels of renewals would have on the KPI – albeit that NH argue that the ALR metric was a later addition to the performance specification and so more difficult to include in its dSBP.

Overall, NH should reach the targets set if it is funded at the level it has requested and delivers the number of renewals implied in a prioritised manner. However, this conclusion is based solely on the scale of renewals requested: it would be a major refresh of older assets and we would expect performance to recover to target levels broadly in line with better years of historical performance. The lack of any evidence of the performance impact of the proposed renewals, or any alternative level of renewals, means that the high level of renewals proposed is not well-justified. It may be that lower, potentially far lower, levels of renewals may be consistent with the target levels of performance.

4.7. SUMMARY

Overall, we remain concerned that the £1,019m of expenditure on roadside technology renewals has not been well-justified as the best use of limited funds. While this high level of expenditure may enable NH to reach the targets set by DfT, there is no evidence to support NH's assertion that this level of spending is required to DfT's requirement to at least maintain current performance levels. It is possible that safe operations, appropriate customer service and technology availability targets could be achieved with less, potentially far less, expenditure on roadside technology renewals.

NH has made good progress since the interim dSBP. In particular, it now has a consistent method for prioritising its renewals programme and for delivering demonstrably improved asset life and condition. NH has also made good progress on deliverability, initiating new contracts with the supply chain and mobilising a central team to manage and coordinate the programme. However, the dSBP plans represent such a large increase that, despite further work with the supply chain, we doubt that NH can deliver the required volume of renewals throughout RIS3. It seems more likely that early years in RIS3 will see fewer renewals as both NH and the supply chain become familiar with the work.

It remains unclear whether all of the requested funds are necessary. While NH has been able to indicate what type and how many assets it might renew for reduced funding, it has not demonstrated what this would mean to road-users or in terms of technology availability. This makes it difficult to judge the extent to which NH could achieve its targets with less, potentially far less, funding.

In tracing the development and application of unit rates, we have noted some discrepancies in the application of inflation uplifts and efficiencies that may underestimate roadside technology renewals costs, though this is uncertain since the total expenditures in the prioritisation model differ from those in the dSBP.



UK

Queens House
55-56 Lincoln's Inn Fields
London WC2A 3LJ

T. +44 (0)20 7269 0210

E. info@cepa.co.uk

www.cepa.co.uk

Australia

Level 20, Tower 2 Darling Park
201 Sussex Street
Sydney NSW 2000

T. +61 2 9006 1308

E. info@cepa.net.au

www.cepa.net.au



Cepa-ltd



@cepald