Review of Highways England’s capital delivery plan

16 July 2018

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Executive summary

Background

Highways England was set up by Government in 2015 as part of a broader set of 'Road Reform' measures. Its responsibilities include delivery of a major investment programme, as defined in the Government's Road Investment Strategy (RIS). Under the terms of its Licence Highways England must also ensure that these improvements are delivered safely, efficiently, with due regard for the impact of road users and in a way that represents value for money.

At the same time, Government also introduced approved five-year funding periods (Road Periods). Highways England's current capital expenditure plan for the first Road Period 1 (RP1) between April 2015 and March 2020 comprises £12.16bn of allocated funding from the Department for Transport (DfT). This capital plan comprises: a major projects portfolio; capital renewals programme; five Ring Fenced Funds; a package of development studies for future projects and capital funding for business and corporate functions.

The largest part of this capital plan is the major projects portfolio. When it was committed in RIS1 in December 2014 and set out in detail in Highways England's Delivery Plan in March 2015, it comprised 112 schemes, with a goal to get to construction Start of Works (SOW) for all of them before the end of RP1 in March 2020.

Review objectives

This review was commissioned by Office of Rail and Road (ORR) in December 2017 to assess and report on Highways England delivery of its capital plan, based on evidence available and provided by Highways England in the period January to June 2018. This aligned to Highways England reporting periods Quarter 3 (Q3) and Quarter 4 (Q4) 2017/2018. The specific review objectives were to assess:

1. Whether its capital plan is deliverable in RP1
2. Whether its capital plan is affordable in RP1
3. The capital plan impact on RP2

Analysis of current situation

Highways England

The RP1 capital plan represents a significant and complex portfolio of works to deliver. Highways England was a newly established organisation when RP1 started. It has progressively improved its sponsorship, planning and portfolio management of the capital plan throughout RP1 so far. It has also established and resourced a new Capital Portfolio Management (CPM) division within the Major Projects directorate, which is responsible for the capital plan. There is good evidence of this in the quality of its management activity, reporting, and understanding and management of risks.

RIS1 optimisation exercise

The RIS was set at an early stage of development, without a full picture of major projects cost, value for money, design complexities and stakeholder and public views. The National Audit Office (NAO) highlighted this issue in 2017[1]. As RP1 has progressed and major projects have been further developed Highways England has experienced increases in the estimated outturn costs of the major projects and other parts of the capital plan. Highways England has also been able to better understand the combined impact of the scheduling of multiple schemes on disruption to road users during construction works. By considering all schemes within eight key 'road corridors' using a portfolio management approach, for example A1/A19 Newcastle to Gateshead, Highways England has been able to better understand this combined impact.

[1] Progress with the Road Investment Strategy, March 2017.

In late 2016 and early 2017 Highways England undertook a 'RIS1 optimisation' exercise to address value for money challenges arising from further development of the major projects portfolio and the outputs from the deliverability review of its 'road corridors'. As a consequence adjustments have been made to the scope and timing of projects approved though change control with the DfT. Highways England published in October 2017 a Supplementary Annex incorporating these changes as an update to its RP1 Delivery Plan for 2017/2018. Further changes were introduced due to other pressures, for example as an outcome of public consultations and schemes' option appraisal. One scheme the A27 Chichester bypass was cancelled, as there was no clear consensus on the preferred option.

Table 1 below summarises the number of projects affected by schedule changes as at Q4 2017/2018. SOW is Start of Works on site.

Key data	Forecast as at Q4 2017-2018	Compared with	Difference
Total number of major projects in portfolio:	105	112 (in RIS1)	-7
• Of which planned for SOW in RP1	85 of 105	112 of 112 (in RIS1)	-20
• SOW in last month of RP1 (March 20)	30	59 (baseline in March 2016)	-29
• Planned for SOW in RP2	20	0	+20

Table 1: Summary of changes to the portfolio scope and project timings as at Q4 2017/2018

One scheme has been cancelled and six schemes paused that represented poor value for money, and maybe reconsidered in future RIS planning. As a result there are now 105 major projects in the RIS1 portfolio. In order to minimise disruption to the road users and manage challenges in resolving DfT and local stakeholder preferred route options a number of other schemes have been re-scheduled, 20 of the RIS1 projects will now start work on site (SOW) in RP2 that runs from April 2020 to March 2025. Fifteen of these twenty projects were as a consequence of taking the corridor approach and the other five were due to other pressures.

Is the capital plan deliverable in RP1?

The changes to project timings set out in Table 1 have reduced the deliverability risk within the RP1 period; for example, the number of projects that are forecast to start in the last month of RP1 (March 2019/2010) has been reduced from 59 to 30. Given the level of change and cost challenges experienced so far in RP1, there remains a deliverability risk for the remainder of RP1.

Is the capital plan affordable in RP1?

The RIS investment plan when set, incorporated a £650m 'over-programming' assumption. It included more work scope than funding allowed to compensate for potential re-scheduling of projects. When combined with emerging cost pressures on the RP1 capital plan there was a potential major affordability risk to the RP1 capital plan resulting in the forecast cost expenditure exceeding the approved funding available. However, the changes to the major projects portfolio set out in Table 1 above have helped to reduce this affordability risk. Using current (Q4 2017/18) assured forecasts, there is still a predicted difference of £465m between Highways England's costs compared with approved funding. This is with less than two years of the RP1 funding period remaining. Highways England is considering further opportunities and risks to further reduce this difference to £301m by the end of RP1.

The reasons for the cost pressures are well understood within Highways England. It has been working hard to manage the portfolio cost pressure and mitigate delivery risks. It has instigated a management action plan to address the residual difference between forecast costs and approved funding following the optimisation exercise, and further cost savings have been accounted for in the Q4 2017/2018 forecasts. There will need to be sustained scrutiny of this management action plan throughout 2018/2019 to give confidence that the difference between costs and funding can be closed further.

There is an established 'budget flex' mechanism (agreed by HM Treasury) that can be used to offset the difference providing it is within a defined tolerance at the end of RP1. The Q4 2017/2018 forecast remains above the budget flex tolerance and Highways England is therefore dependent on the success of further planned cost saving opportunities being realised.

What is the impact of the RP1 capital plan on RP2?

Highways England reports to ORR its forecast of total outturn costs for the major projects portfolio, including costs spanning pre-RIS, RP1 and beyond into RP2. The cost increases described earlier result in the Q4 2017/2018 cost forecast being £2.9bn higher than the estimate and assumptions made when the RIS was set. This Q4 total outturn cost forecast takes account of the six schemes deferred in the optimisation exercise based on poor value for money and one scheme cancelled. As a consequence of the changes introduced to Highways England's capital delivery plan during 2017/18 and the RP1 cost reduction activities additional costs have been rescheduled into RP2. This forecast rollover of expenditure into RP2 is a key impact of RP1 capital plan delivery on the planning for RP2.

As the forecasts of total outturn costs have continued to increase throughout the three years of RP1 to date, there is a risk that further increases to forecast costs will occur before the end of RP1. Highways England advised it is building portfolio level contingency into its RIS2 and RP2 planning. The forecast difference between costs and approved funding of the RP1 capital plan at Q4 2019/2020 will also need to be considered alongside and be consistent with the funding approvals process for RIS2 (between April 2020 and March 2025).

Causes for the increases in forecast costs

It was recognised by the NAO in their March 2017 report that, when RIS1 was set, over 60% major schemes estimates that formed part of the RP1 investment plan were at such early stages of development that they were inherently uncertain and provisions for optimism bias and risks to scope and costs needed to be factored into these estimates. As a result, Highways England at the time developed an expected range of cost estimates, with a lower and upper bound, of total outturn costs for each scheme. At Q4 2017/2018 the forecast total outturn costs for the portfolio of major schemes is now 83% of the value of this upper bound estimate.

Emerging scope and cost uncertainty in the RIS1 investment plan cost estimates for major schemes at early stages of development have been the most influential factor in the overall cost increase to the major schemes portfolio. Cost escalations have also been experienced for schemes that were more advanced in development or delivery at the time of the RIS. However, it is a limited number of schemes with very high forecast costs increases that drive the majority of the overall portfolio cost increase.

Some of the causes of the overall cost pressures on the RP1 capital plan are down to a number of 'other cost' areas that have added to Highways England's expenditure in RP1. Not all of these costs were within Highways England's control, such as, new land accounting cost treatment, higher completion costs for historic pre-RP1 legacy schemes and additional unfunded changes agreed through Change Control to reflect DfT and stakeholders new priorities and changes emerging after the start of RP1. The overall cost increases also include staff capitalisation and costs to set up the new business.

Conclusions

To ensure value for money and minimise disruption to road users Highways England have agreed with DfT to deliver a reduced number of major schemes in RP1, the majority of the rescheduled schemes being delivered early in RP2. It has also delivered significantly more investment in establishing and improving capability to meet the challenges of significantly increased investment in the Strategic Road Network (SRN) towards the latter part of RP1 and into RP2, all of which was unfunded in the approved funding.

The largest factor affecting increases in forecast costs since RIS1 appears to be because it was an inherently optimistic plan when it was first set by government, given the inherent scope and cost uncertainty.

Highways England have carried out extensive work to manage down the difference between forecast costs and approved funding for the RP1 capital plan from over £1bn to the current forecast of £465m. There is still a risk that this difference cannot be managed down without further changes to the portfolio to help address cost pressures and delivery risks, for example, further deferral of costs or flexed funding into RIS2. This will have an impact on the future roads period but this is being managed as part of RIS2 planning.

While there are clearly important issues and risks affecting Highways England's capital plan, we conclude that it has the team and capability in place to manage them. Highways England has been effective in reporting and starting to tackle the cost escalation issues faced, albeit with significant on-going work required to address the current difference between forecast costs and approved funding. Its role will be important in applying the lessons from RP1 into RIS2 planning with government.

Introduction

This review was commissioned in December 2017 and undertaken in the period January to June 2018. It is to support of the ORR monitoring activity. ORR undertook the review with external support from The Nichols Group.

Objectives

The primary purpose of the review was to examine the deliverability and affordability of the current five year RP1 capital plan as we approach the final two years of RP1. It was intended to be forward-looking, considering the implications for the remainder of RP1 and beyond, although references to historical issues are included where these are relevant to the conclusions drawn.

The objectives of the review were to assess and report on the quality of Highways England's evidence on three things:

1. Whether its capital plan is deliverable in RP1
2. Whether its capital plan is affordable in RP1
3. The capital plan impact on RP2

Scope

ORR defined seven activities in the scope for this review. These were to:

1. Review the current status of the capital plan, including expenditure and delivery to date.
2. Review progress in developing portfolio and programme management capability, drawing on work carried out previously.
3. Review the deliverability of the capital plan in Road Period 1, with a focus on the major scheme portfolio including identification and quantification of scope and schedule risk.
4. Review the affordability of the capital plan in Road Period 1, considering current forecast costs and levels of funding available, including for resource and capital works.
5. Review the capital plan's likely impact on performance delivery against the targets specified in the RIS.
6. Review evidence on the impact of the plan on RIS2 costs and schedule, including against the funding specified for the first year of RIS2.
7. Review how the capital plan considers alignment between major schemes, renewals and ring-fenced funds.

The structure of the rest of this report is as follows:

Findings – against each of the seven review activities listed above. In each case costs referred to are in nominal prices.

Recommendations – In the form of a summary to be discussed between ORR and Highways England in Q1 2018/19 as part of their quarterly reporting and meeting arrangements.

We are very grateful for the quality and transparency of the reporting from Highways England's team, notwithstanding that they were and still are extremely busy tackling the cost challenge faced and maintaining the alignment of the RP1 capital plan with the concurrent RIS2 planning process.

Findings

Scope element 1: Review current status of the capital plan expenditure and delivery

The 'capital plan' is Highways England's approved funding position for its entire capital works. Figure 1 below provides a summary breakdown of the key cost items of the current capital plan at Q4 2017/2018 and includes changes from the original Statement of Funds Available (SoFA) allocation of £11,351m for RP1. The plan is used to establish a control position for monitoring and reporting, alongside and integrated with a suite of other portfolio reports used by Highways England.

Build up of approved funding for the RP1 capital plan

£6.31bn	+	£0.46bn	+	£3.56bn	+	£0.68bn	+	£1.15bn	=	£12.16bn
112 Major Projects		Other Major Projects, studies		Capital renewals		Ring Fenced Funds		Corporate, internal programmes		**RP1 Approved Funding**

Figure 1: Key elements of the RP1 capital plan

We have based our review on this version of the capital plan, on Highways England's subsequent quarterly reporting (notably Q3 and Q4 2017/18 information available at the end of March and June 2018 respectively) and a series of clarification questions and answers from Highways England.

We have summarised the current status of the delivery of the RP1 capital plan in the following analysis:

- A comparison between forecast RP1 capital costs and approved capital plan funding over time expressed as a summary waterfall diagram (Figure 2). This shows how the difference between costs and funding was significant pre Q1 2017/2018 at £1,149m, reducing after the optimisation exercise and cost savings down to £669m at Q3 2017/2018, and from the Q4 2017/2018 reports at £465m.
- Highways England has reported that further savings opportunities and risks have been identified but are not included in the Q4 forecasts pending assurance checks.
- A summary breakdown of the sources of the differences between forecast costs and approved funding.
- For each major project with a cost variance, an outline analysis of cause and when the variance occurred within the Project Controls Framework (PCF) lifecycle (Table 2).
- Key data (Table 3). These are the headline variances for a number of metrics that are dealt with in more detail in this report.

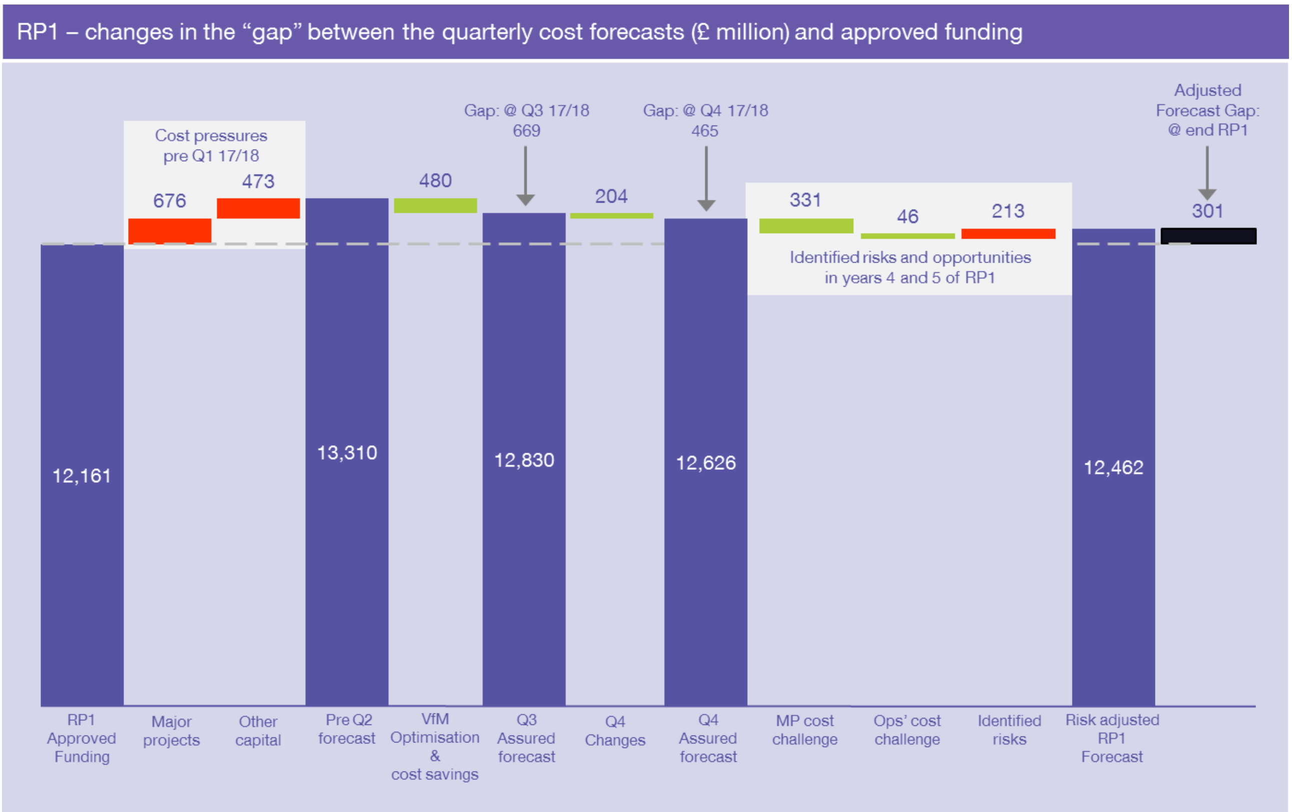

Figure 2: How the difference between approved funding and quarterly cost forecasts (£m) has changed over time

Highways England regular reporting breaks down the main categories of cost variances that contribute to the difference between forecast costs and approved funding for the RP1 capital plan. These categories are:

- Staff capitalisation. The staff cost capitalisation item reflects a reclassification policy change from resource to capital that has been applied across the business. For example, major projects costs are now 100% capitalised, so has created an unfunded capital plan pressure, though a corresponding lower operating spend.

- Other capital, for example property income, research & development and operations.

- Pinch-points schemes addressing traffic bottlenecks that were started before RIS1.

- Other major schemes, for example congestion relief and legacy schemes that started before RIS1.

- Major projects. The cost variance allocated to the major projects category is now smaller than in was in late 2015. This reflects significant work, and changes agreed by DfT, to optimise the portfolio and tackle delivery risks, notably the corridor study undertaken in late 2016 and early 2017 to bring forward the start of some projects and delay others to smooth impacts on road users. These initiatives have helped reduce expenditure in RP1. They also result, overall, in fewer schemes getting underway for construction (SOW), with costs being deferred into RP2. Major project costs are the most significant source of variance within the RIS1 capital works portfolio even if this is not wholly reflected in the difference between forecast costs and approved funding for the RP1 capital plan, with a consequential larger impact felt in the RP2 period.

Highways England's regular reporting sets out the primary causes of cost and schedule movements. These are broken down via current PCF development stage, so include some Open for Traffic (OFT) projects when the cause of the variance reported in fact occurred in earlier stages. The outline causes of variance are classified in terms of: scope; cost; and schedule, as summarised in Table 2 below.

Primary cause	Open for Traffic	Construction	Development/Options	Total
Scope	10	3	6	**19**
Cost	5	5	0	**10**
Schedule	2	4	6	**12**
Total	**17**	**12**	**12**	**41**

Table 2: Highways England categorisation of reasons for cost and schedule variance in major projects

This is not intended by Highways England to be a quantified cost analysis, so care is required in interpreting it. For example, frequency of occurrence does not translate into a comparable scale of cost impact, and some projects have experienced multiple issues. Nevertheless this indicates that scope-related issues are the most common cause. It is also clear, however, that cost variances have been experienced at every stage of development.

Highways England has provided more detail on the range of causal factors, as follows:

Scope – This includes: scope change as scheme options and designs evolve during development stage (which can result in major variances); additional asset management and technology works affecting Smart motorway schemes (both when already open and in construction); additional work due to ground conditions; dealing with poor asset condition (including via additional renewals works); and identification of archaeology issues. A number of affected schemes have been subject to formal change control with the DfT.

Cost – These impacts are distinct from scope changes described above that also drive up costs. Unexpected increases in cost (although also some instances of reduced costs) have been due to: land costs; design complexity and risk; stakeholder impact; and schedule acceleration.

Schedule – Delays to delivery, caused by various factors including issues with: the original baseline assumptions; ground conditions; traffic management solutions; extended statutory and Development Consent Order (DCO) process; and in dealing with third party requirements.

All three causal factors include examples of issues that were within Highways England's influence or ability to define and manage, as well as factors over which it had relatively little control.

A summary of key data is shown in Table 3 below. This takes the latest forecasts at Q4 2017/2018; subsequent to Highways England's optimisation work and part-way through its management action plan to address the difference between forecast costs and funding.

Key data	Forecast as at Q4 2017/18	Compared with	Difference
Forecast capital cost in RP1	£12.626bn	£12.161bn (approved funding)[2]	+ £465m
Post opportunity/risk forecasts	£12.462bn	£12.161bn (approved funding)	+ £301m
Forecast major project cost outturn (pre RIS1 + RP1 + RP2)	£17.68bn	£14.76bn (original estimate)	+ £2.9bn
Total number of major projects in portfolio;	105	112 (in RIS1)	- 7
planned for SOW before end RP1	85 of 105	112 of 112 (in RIS1)	-20
SOW in last month of RP1 (Mar-20)	30	59 (baseline in March 2016)	-29
Major projects planned for SOW in RP2	20	0 (in RIS1)	+20

Table 3: Key data, forecasts from Q4 2017/18

[2] This figure may be subject to change following a SoFA adjustment.

Scope element 2: Review progress in developing portfolio/programme management capability

In 2017 ORR and Highways England commissioned a review of Highways England's portfolio and programme management capability, undertaken by CITI[3]. This confirmed that its "programme management capability is well established and maturing. However, its portfolio management capability has received less focus until comparatively recently and is therefore less well established but is developing rapidly".

Highways England has since fully established a change programme and continues to develop its CPM division, which is responsible for managing and controlling the capital portfolio. It has established a revised capital baseline and plan to fully document and act as a control position against which to assess the performance and deliverability of the capital portfolio.

In summer 2016/17 a deliverability assessment was carried out across the capital portfolio major schemes to review whether it was delivering value for money for the tax payer and that scheduled road works, particularly in 2019/20 avoided excessive disruption to the road user. This assessment found that some schemes weren't value for money and that scheduling was not optimised. As a consequence Highways England developed and implemented an optimisation of its projects along its main road corridors, improving programme value for money and reducing deliverability and disruption impacts as well as alleviating RP1 capital plan cost pressures; in all reducing the number of schemes starting in March 2020 from 59 to 30 as well as contributing to reducing RP1 expenditure forecast by £377m. It has also improved its portfolio-level management information compared since 2016, with consistent data and reporting internally and with ORR and DfT. It continues to operate a robust change control process for the portfolio jointly with DfT and ORR.

Highways England's team is aware of and open about the portfolio-level learning to take into RIS2 planning. We have not assessed evidence of this, as review of RIS2 planning is not part of this review scope. We understand from Highways England that learning including additional governance, assurance controls for early stage schemes that have the greatest scope and cost uncertainty and substantially more time to develop and prepare designs and build RIS2 plans.

Highways England has confirmed that it is developing and has partially implemented an internal change programme to further develop its portfolio and programme management capability, for example, including cost and schedule risk management tools. Highways England has also planned to strengthen its sponsorship capability ahead of RIS2, including creating a new 'strategic sponsor' role for portfolio planning, as distinct from delivery sponsors who are responsible for projects/programmes that have been approved to progress into detailed development and delivery stages.

[3] Review of Highways England's Portfolio and Programme management capability, October 2017.

The above changes represent positive steps towards Highways England's continuing improving portfolio management capability.

Highways England recognises that there are still challenges in delivering its capital plan over the remainder of RP1 and is actively trying to address them. Highways England's reporting provides transparency to ORR on its progress.

Scope element 3: Review the deliverability of the capital plan in RP1, with a focus on the major scheme portfolio including scope and schedule risk

The major scheme portfolio comprises the 112 major projects contained in RIS1 and the March 2015 Highways England's RP1 Delivery Plan.

Optimisation exercise impact on portfolio scope and scheme timings

In summer 2016/17 a deliverability assessment was carried out across the capital portfolio major schemes to review whether it was delivering value for money for the taxpayer and that scheduled road works, particularly in 2019/20 avoided excessive disruption to the road user. This entailed Highways England undertaking a 'road corridor' assessment of its major project portfolio; a review of all projects with its regional teams from a customer and road-user perspective and to improve deliverability. This resulted in the re-timing of some schemes to address delivery risks, and to optimise disruption impacts and also to pause others that did not meet acceptable value for money criteria. This assessment was well documented within Highways England and DfT and was the subject of an ORR review in February 2017. It was also subject to Infrastructure and Projects Authority (IPA) approval/rating, which provided government independent assurance of the Highways England portfolio.

The RIS1 portfolio covered 112 schemes when it was set in December 2014, with a goal to get to construction SOW for all schemes before the end of RP1. Following the optimisation exercise and other deliverability considerations the latest update on the RIS1 portfolio now has 105 projects. The reduction reflects one scheme that has been cancelled by DfT and a further six schemes that have been deferred for consideration in future RIS planning because of projected poor value for money. Of these 105 projects, 85 are now forecast to get to SOW by the end of RP1. These numbers are correct as at Q4 2017/18 and could be subject to further changes and change control activity. As a result of this Highways England is delivering fewer projects in RP1 than originally planned, and to a currently higher forecast cost, unless this is managed down.

Highways England is currently ahead of its target in terms of SOW commitments, with seven more schemes underway to date than planned, with only one running behind its OFT target.

Project delivery

There is a distinction between the original portfolio baseline immaturity issue that Highways England had relatively little control over, and other delivery factors some of which are within its influence, including changes to scope and delivery plans, and DCO timescales. Highways England's analysis indicates that these two aspects are broadly comparable in terms of their influence on delivery and cost variances.

There is no evidence of a significant systemic performance issue in Highways England's delivery of its major projects portfolio. There have been, however, problems with individual schemes (some of which could be expected given the scale and complexity of the portfolio) and notable issues and variances evident in some projects, including its OFT schemes. We address the cost implications of this in scope element 4.

Highways England has documented the factors impacting delivery timescales at each stage of project development and delivery. The primary causes reflect issues with the original baseline plan and assumptions, knock-on impact and changes to scope, and statutory process and DCO time constraints, as described earlier in this report in scope element 1.

End of RP1 deliverability profile and risk

Highways England's March 2016 Delivery Plan update had 59 major projects getting to SOW (over half the portfolio) in the last month of RP1 in March 2020. This would have resulted in a significant 'spike' in the profile of delivery, and potentially an over-focus on SOW dates leading to a significant cumulative deliverability risk. Highways England has partly mitigated this risk as a consequence of its corridor optimisation process. 10 schemes were advanced, 16 moved later of which 15 moved into RP2. This has resulted in a more consistent pipeline of work for the supply chain.

The number of schemes planned to start in the final few months of RP1 has now been significantly reduced, but remains high, in recent updates to the plan. Any future changes on timing of schemes will be discussed and approved by DfT under change control governance process. A further five of the more complex schemes have been re-scheduled to start in RP2. These further changes were for other reasons, for example as an outcome of public consultations and schemes' options appraisals. One scheme was cancelled, as there was no clear consensus on the preferred option. This brings the total number of schemes re-scheduled to RP2 for SOW to 20.

As at the Q4 2017/2018 there are now 30 projects planned to get to SOW in the final month of RP1 compared with 59 in the original plan. This is summarised in Table 3 earlier in this report. This has further smoothed the SOW profile and when planned at regional and supply chain level, would be expected to reduce overall deliverability risks. It will also help Highways England respond to project-specific delivery risks it has experienced on some projects previously, for example, to allow more time to identify and address ground investigation and asset condition risks.

Headline SOW numbers are not a comprehensive metric for delivery progress (for example, if dates slip only a few months into RP2 to improve deliverability then this may not be an issue). As expected they do indicate that Highways England is forecasting that it will progress fewer projects into delivery in RP1 compared to its original plan for its approved funding, with more of this work undertaken in RP2.

We have examined the profile of project delivery dates and costs in Highways England's portfolio reports. There is still an opportunity to adjustment more SOW dates as this would be an effective method of tackling its deliverability risk for RP1 and would also contribute to addressing RP1 budget pressures, given that Highways England does not have many other ways of controlling expenditure. Re-scheduling of SOW dates will, however, result in reduced output in RP1 and increased scope and cost impact on RIS2. Re-scheduling of SOW dates also has the potential to complicate or disturb project delivery plans, including impact on stakeholders, DCO processes and Highways England's supply chain.

Any changes to re-profile scheme timings would be subject to change control and would then be reflected in Highways England's Delivery Plan. Changes approved in 2017/18 will be reflected in the 2018/19 Delivery Plan update.

Schedule risk

Highways England already undertakes significant Schedule Quantified Risk Analysis (SQRA) at individual project level. It has not yet developed this to assess portfolio-level schedule risk and uncertainty. It is strengthening its focus on portfolio-level schedule risk as part of capability improvements and in its internal assurance activity. This will include developing its schedule risk management tools to enhance both top-down and bottom-up assessments, as part of a planned 'CPM change programme' to be embedded ready for the start of RIS2.

Scope element 4: Review the affordability of the capital plan in RP1, considering forecast costs and levels of funding available

Over-programming

DfT and Highways England had chosen to over-programme the original major projects portfolio. More work was planned than funding provided for. This was in order to anticipate for changes where projects are delayed or drop out of the portfolio as it is developed and refined, most notably for schemes that represent poor value for money. This is fully described in the report by the NAO[4] in March 2017 on Highways England's progress delivering the RIS. This identified the over-programming assumptions and the additional cost pressures realised subsequently.

Portfolio development maturity

The projects comprising the portfolio were at an early stage of development when it was committed in the original RIS; as a consequence they contained commensurate scope, cost and delivery uncertainty that then materialised over time as both delivery and cost risk. This is documented in ORR's 2016-17 Annual Assessment.

The major project portfolio has been developed during RP1, as illustrated below in Figure 4, with commensurate increases in scope and cost certainty as projects has been developed through the PCF lifecycle, and will continue to develop in maturity for the remainder of RP1.

[4] Progress with the Road Investment Strategy, March 2017.

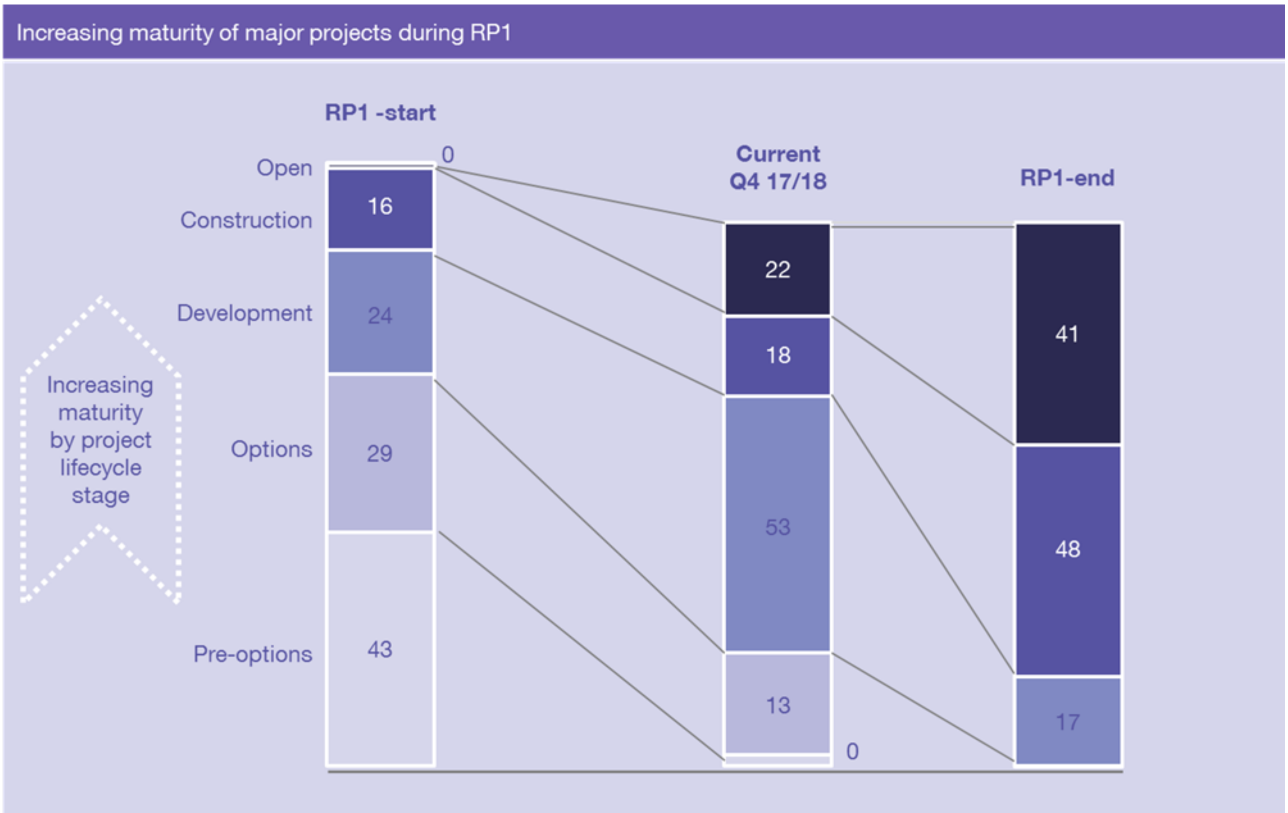

Figure 4: Major projects maturity (RIS start data as per ORR Annual Assessment)

Highways England developed a range estimate with lower and upper bound values for the total outturn costs of the major projects portfolio at the time of setting the RIS baseline. While the Q4 forecast total outturn costs of the portfolio (spanning RP1 and RP2) are still within the upper range of Highways England's RIS range estimates, the conclusion is that the original major projects baseline was inherently optimistic. Highways England's capital portfolio and programme teams have been actively managing the consequences of these cost increases on RP1 since the end of 2015.

Capital plan difference between forecast costs and approved funding

Highways England's Q4 2017/2018 reports show the currently approved capital plan funding for RP1 is £12.161bn that includes changes from the SoFA in the RIS investment plan. In the Q3 2017/18 reports it was forecasting a total spend in RP1 of £12.830bn, a difference of £669m. This shortfall is after allowing for the cost reduction achieved via the value for money led optimisation process. In the Q4 2017/2018 reports it was forecasting a total spend in RP1 of £12.626bn, a difference of £465m.

This difference to approved funding clearly represents an on-going affordability risk. While the projected difference between forecast costs and funding equates to a relatively low level of 3.5% of the total five year approved funding, it equates to a higher percentage when expressed in terms of the proportion of spend remaining in RP1. The risk is that there will come a time when it is too late to fully implement solutions required to reduce this difference. To illustrate this, Highways England's capital expenditure in the latter period of RP1 will increase to around £250m per month, so the current forecast difference equates to approximately two month's expenditure. Late changes will have consequential impacts for the projects and their supply chains.

Management action plan

Highways England has instigated a management action plan to address the difference between forecast costs and approved funding. This was reported in the Q2 and Q3 2017/2018 as follows:

Q2 2017/18 position – This indicated a target of £664m of savings in RP1 comprising a combination of 'Business Planning Opportunities' and a top-down 'Business Challenge'. Highways England confirmed that it was not expecting to cancel any projects to achieve this.

Q3 2017/18 position – By Q3 Highways England confirmed it had secured £100m[5] of savings, with a further £300m[6] identified but not internally assured. It also flagged that its Operations and other directorates had been set a target of a further £98m of savings. These savings were reported to be offset by a £207m provision for risks[7]. It is helpful that risk is being flagged alongside opportunities, providing evidence of the veracity and balance of plans and reporting. That said, the emergence of new or additional risks indicates that there are continuing challenges that impact Highways England's ability to close the difference between forecast costs and funding.

Q4 2017/18 position – By Q4 Highways England confirmed it had secured a further £204m of savings, with a further £346m identified but not internally assured and coming from cost challenges in major projects and operations. These savings were reported to be offset by a £213m provision for emerging risks.

The overall result of the above is that Highways England was forecasting in its Q4 reports a difference between forecast costs and approved funding of £465m at the end of RP1.

[5] leading to a £103m reduction in the difference between forecast costs and funding since Q2 2017/18.
[6] £40m for scheme re-profiling and change control plus a further £258m under scrutiny.
[7] £141m of project risks plus £66m for third party income risks.

Highways England have reported that they expect to assure and deliver further cost reduction activities in Q4 and are on track to achieve a forecast difference to funding of around £300m at end RP1. Highways England reports that it will continue to implement further cost savings and reduce risks even further, however, should it prove necessary Highways England could draw down up to £369m funding flex from 2020/21 funding allocation to cover this difference. DfT agreed this flex arrangement prior to the start of RP1.

More detailed information is expected in Highways England's reporting to DfT and ORR throughout 2018/19, after the completion of this review.

Other costs

As well as the cost increases in its major projects in RP1, Highways England has incurred other business costs that sit outside of major schemes, renewals and designated funds. At Q4 2017/18 these issues were forecast to total £331m (excluding variances in the major projects portfolio). The information on cost variances reflects improving tracking and reporting of costs and risks across the business, and includes cost pressures with no funding allocation within RIS1 funding allocation.

These additional costs are largely attributed to the 'corporate internal programmes' category of the capital plan, see Figure 1 for a breakdown of the capital plan into categories. Cost pressures include staff capitalisation costs, higher completion costs for historic pre RP1 legacy schemes and activities required to establish and improve Highways England's business systems, processes and accommodation. External stakeholder drivers including changes to safety process account for the remainder.

Highways England has confirmed that these other cost issues, which have arisen throughout 2017/18, are now stabilising. Its management action plan described previously includes work to contain and reduce these cost issues. We were not able to review detailed evidence of this during our review, as it remains work in progress and will continue for the remainder of RP1. We cannot, therefore, assess the scale of saving or whether they are realistic and deliverable. We do note though that some of these cost categories, for example, staff and land, are harder to achieve savings.

It will be important that Highways England takes forward learning from these 'other costs' issues, when making budget provisions for RP2.

We note for clarity that the cost issues described above do not relate to Highways England's capital renewals and Ring Fenced Funds.

Portfolio risk

Highways England's capacity to deal with cost variances has been limited because the RIS was commissioned without a portfolio contingency allocation or other mechanism to deal with intrinsic portfolio-level risk and uncertainty. Most of the individual schemes cost estimates do however include a portfolio risk allowance in line with Highways England's Major Projects Cost Estimation Manual and PCF process.

Cost management action plan

We have reviewed and endorse Highways England's strategy to act now to address RP1 cost variances given the affordability risk faced and with two years of RP1 remaining. However, we have not yet seen detailed project-level evidence of these cost-saving initiatives, so we cannot assess that they are deliverable, the impact of them or if they are vulnerable to further cost risk that will offset savings targets.

While closing the difference between forecast costs and approved funding is essential, care will be required to identify and mitigate any negative impacts that result, notably if project planning is disturbed, scope is affected or schemes are deferred. This may affect Highways England's supply chain, local communities, stakeholder handling and road users in terms of disruption impacts. Finally, Highways England will need to assess portfolio deliverability risk of additional workload moving into the early part of RP2, when the workload was already set to increase without it.

Over-programming

Highways England refers to the difference between its planned volume of work and its approved funding for RP1 as 'over-programming'; where a larger portfolio of work is planned than funding will permit, to allow flexibility to optimise delivery plans, and address emerging priorities, scope, cost, delivery schedule, risk across the portfolio.

The reported RP1 difference between forecast costs and funding has fluctuated significantly over time. It was reported as £652m at the start of the RIS then £1.7bn in 2015/16, falling to £842m in Q1 2016/17. The difference reported in Q3 2017/18 was £669m, which is very similar to the initial position, but is after the optimisation exercise. The most recent Q4 2017/2018 reported difference is £465m.

This level of difference between cost forecasts and approved funding is not simply caused by over-programming. As noted previously, the drivers of the variance are a mix of over-programming, scope change, emerging cost risk, re-scheduling into RP2, and other capital cost issues. These drivers should be considered in the context of a portfolio that was at an early stage of development maturity when it was committed, which appears to be the most important of these drivers of cost variance.

Project-specific variances

The scope of this review was not to examine the 112 individual major scheme projects. We did, however, examine trends in project outturn cost variances using regular reporting information. In general, variances for most projects appear relatively small in both absolute and percentage terms, but with a small number of projects experiencing larger cost increases. For example, two projects account for 43% of the increase in total outturn costs, and the top seven projects account for 75%.

There are specific and well understood reasons for these project cost impacts within Highways England's, with the key driver identified as a markedly different scheme, scope and benefits emerging during development to that originally assumed when the RIS1 was first set.

These project-specific factors indicate that there is not a systemic cost variance issue across the portfolio. There are projects currently forecasting to or that have already delivered to lower costs that budgeted. This finding reflects the sustained progress made (first by the Highways Agency and then by Highways England) in developing a mature cost estimating and controls capability since the issues identified within the Nichols[8] and NAO[9] reports of 2007.

Affordability summary

While project-specific factors provide important context, the significant forecast outturn cost increase for the major projects portfolio (exacerbated by other cost pressures) is clear evidence of Highways England's capital plan being subject to cost and affordability issues which will have an impact on RIS1 and will have further significant implications for RIS2.

[8] Review of Highways Agency's Major Roads Programme.
[9] Estimating and monitoring the costs of building roads in England.

Scope element 5: Review the capital plan's likely impact on performance delivery against the targets specified in the RIS

Here we consider the potential implications of the issues identified in the preceding sections on three of Highways England's agreed Key Performance Indicators (KPIs).

Supporting the free flow of traffic – network availability (KPI3)

Highways England has a target to ensure that lane availability does not fall below 97% in any year. We have reviewed regular reporting, confirming that performance is consistently above target. The corridor assessment undertaken in 2017 also considered the timing and interdependency of regional projects in order to address disruption impacts in a way that supports delivery of this KPI.

Highways England has proactively sought to address or minimise the potential impact on this KPI by reducing the number of schemes with starts of work in March 2019/20 from 59 to 30.

Achieving real capital efficiency (KPI7)

Highways England has a target to deliver £1.2bn of efficiencies against the capital investment programme during RP1 and is working with ORR to define how to measure this.

The scope of this review did not include a project-level efficiency analysis, so we have not assessed performance against this KPI. However, this review has identified that the major project portfolio is forecast to cost significantly more to deliver, with 20 projects having been deferred to RP2. This raises an important challenge: do these increasing costs and re-scheduled delivery plans contradict with Highways England achieving efficiencies?

A higher cost project or one that has experienced significant scope change can be delivered efficiently; equally a lower cost project can also be delivered inefficiently. This is compounded for early stage schemes where baseline/budgets are set before there is good cost certainty. There are many instances of scope and schedule variances, risks and change to major projects, reported by Highways England, that have no direct relationship to efficiency.

Highways England will need to ensure that further changes required to address the current difference between forecast costs and approved funding do not create unintended inefficiencies or, if this is proven to be inevitable, to be explicit about this in change control proposals that are reported to DfT and ORR, and in its planning for RIS2 and RP2.

Keeping the network in good condition (KPI8)

The capital plan includes £3.66bn for renewals in RP1, in line with the SoFA allocation. In terms of expenditure Highways England is on track to deliver its budget for this work, with a relatively uniform profile of expenditure of between £0.6bn and £0.8bn each year.

In terms of KPI8, performance previously tracked below the target for keeping the network in good condition in 2016/17 and in early in 2017/18. Highways England instigated a recovery plan that has addressed this and resulted in it exceeding its 95% target by the end of the 2017/18.

There is an internal inconsistency in performance reporting data, as Highways England's metrics on actual renewals volumes delivered reveal these to be significantly higher than planned, across almost all asset types. Highways England has confirmed this relates to issues in forecasting and reporting as well as the benefits from redeploying funding released by efficiency savings as additional renewals outputs. We note that KPI8 covers renewals work in lane 1 only, whereas actual outputs cover all lanes, so increasing volumes do not correlate directly to KPI performance.

Highways England is developing its end-to-end process to improve line of sight between this KPI and its maintenance and renewals programme. This includes strengthening of the forecasting process, reduced time-lag between completion of renewals schemes and updating its database, and a governance group established to assess and analyse performance.

Summary

Overall, Highways England is on track to achieve its required operational performance (as expressed through KPI metrics) that relates to its capital plan, notwithstanding the issues it is experiencing with its major projects portfolio. We do not have any findings in relation to its efficiency target. We believe that Highways England should clarify in its reporting if or how it has met its KPI7 efficiencies target in the face of rising costs.

The on-going work by Highways England to manage the difference between forecast costs and approved funding for RP1 has the potential to impact on these three KPIs, for example if project delivery is delayed it could affect network availability.

Scope element 6: Review of evidence on the impact of the plan on RIS2 costs and schedule, including against the funding specified for the first year of RIS2

Portfolio context

As referred to previously, assessing affordability of the major projects portfolio compared to the funding in the SoFA for RP1 provides an incomplete view of the overall capital plan.

The total outturn cost of the 112 major projects spanning RP1 and RP2 has increased significantly since the beginning of RP1. This included all costs from the pre-RIS period for early start projects, through RIS1 to the end of RIS2. The major projects portfolio is now forecast to cost £2.9bn more even though it has seven fewer schemes as a result of its value for money review and cancellation of one scheme. As already stated, this increase remains within the upper bound of the published RIS estimate range.

The consequences of the increase is that 58% of the total cost of the major projects portfolio in Q4 2017/2018 forecasts is planned to be in RP2 (this assumes projects within the original RIS do not extend into RP3 after 2025).

Highways England undertook a detailed review of project schedules from a regional perspective as part of its corridor optimisation work in 2017. Its review considered deliverability risk and feasibility. Highways England reported that it is confident that its major project teams and supply chain have the capacity needed to deliver the projected work profile. This is important given the significant ramp-up in workload ahead during year 1 of RP2 when the profile of spend is set to increase significantly. We believe this increase in profile of spend will need to remain at a high level for the majority of RP2, with cost of work undertaken in a year rising to as much as £3bn in the early years of RP2 for major projects alone, compared to £1.1bn in 2017/18. Highways England's confidence will need to be backed up with evidence that gives assurance of supply chain deliverability for the work profile when finalised.

We have not assessed RIS2 plans, as this is outwith the scope of this report, and subject to a parallel planning process. We note, however, that Highways England could smooth the profile of projects and so address project delivery risks without altering its overall commitments for RIS2.

Year 1 of RP2

The deferral of SOW dates into the first years of RP2 will also defer costs from RP1 into RP2. Highways England is aware of this and is managing the interface between its RIS1 and CPM teams leading RIS1 delivery. Highways England has confirmed that its RIS1 portfolio management data is consistently reported into the team responsible for RIS2.

The funding specified in the RIS1 SoFA included for the first year of RP2 (2020/21) being set at £3.86bn. Highways England's 2017 capital plan forecast matches this figure, although there has been significant change to the portfolio since then. Further change to the cost forecast for year 1 of RP2 is expected as a result of Highways England's management action plan to address the RP1 funding difference and to smooth the portfolio delivery profile. Therefore expenditure in year 1 of RP2 (2020/21) will either be higher (potentially significantly so) than the original SoFA allocation or further re-scheduling of work beyond the first year will be required to counter act the RP1 overflow costs.

Scope element 7: Review how the capital plan considers alignment between major schemes, renewals and ring-fenced funds

The major schemes, renewals and Ring Fenced Funds are as shown in Figure 1.

Renewals

We have addressed the renewals element of the capital plan in our discussion on KPIs in scope element 5 earlier in this report.

We have not seen evidence that suggests capital renewals work is under-spending compared to its £3.66bn budget for RP1. Given the on-going challenge to close the difference between forecast costs and approved funding, it will be important to understand if any deferral of renewals works and expenditure into RP2 is being contemplated by Highways England for the remainder of RP1.

Highways England has acknowledged and reported instances of increased project costs due to additional renewals work being required resulting from poor alignment between major projects and asset renewals, that were either not originally identified, caused by funding constraints or that result from poor asset condition knowledge. These are important learning points for RIS2 planning.

Ring Fenced Funds

The £675m Ring Fenced Fund pot is covered by a separate ORR review supported by Cambridge Economic Policy Associates Ltd (CEPA), so this review covers only the portfolio-level implications of this funding pot, not the delivery and performance of the constituent five funds.

We note that the spend profile for these funds is back-end loaded (39% of spend is forecast in the final year or RP1) which reflects the apparent 'standing start' nature of the majority of plans when the RIS was commissioned. This is understandable for RP1 though something that Highways England should address before RP2.

The capital plan provides good cost granularity by project, category, directorate and designated Ring Fenced Fund. It does not identify work or scheduling synergies across the main elements. It would be beneficial if any key opportunities to align ring fenced funds works with major projects were identified in a similar way that Highways England approached its corridor optimisation process.

Recommended actions

The following are recommended actions for Highways England to consider.

For RP1

No.	Recommendation
1.	Highways England to provide a more detailed description of the opportunities it is currently considering to reduce the forecast difference between costs and approved RP1 funding, detailing any scope, cost and schedule implications for any affected major projects or capital renewals works; and the time-frame for within which the opportunities are expected to be delivered.
2.	Highways England to provide a mitigation plan for residual risk that these opportunities (and the impact of other emerging risks) does not close the difference between forecast costs and approved funding to a level that is within the flex agreed with DfT.
3.	Anticipating on-going work to reduce the difference between forecast costs and funding over the remainder of RP1, Highways England to set out its detailed assumptions on delivery progress and costs at the transition from RP1 to RP2, to ensure transparency in establishing a baseline for RP2 (we would expect this to be a routine part of work to synchronise with on-going RIS2 planning work).

For RP2 planning

No.	Recommendation
4.	Highways England and DfT to consider if a separately identifiable and adequately sized portfolio risk and contingency provision is appropriate for RP2, and the management process and governance arrangements needed for control on draw-down from this. Such a provision would also have to be determined to align with the development maturity of the portfolio and efficiency targets.
5.	Highways England to explicitly set out its over-programming assumptions for RIS2, and the rationale for these, linked to its SoFA, when defined. It will be important that Highways England enters RIS2 with a planned and agreed level of scope and cost over-programming and that is commensurate with a quantified level of cost risk.
6.	If Highways England and DfT do adopt an over-programming mechanism for RIS2, then Highways England to develop and set out a process to manage this during the course of RP2.
7.	Highways England to confirm how the RIS1 lessons on the causes of delay and increased costs are explicitly fed into RIS2 planning, with clarity on how it plans to mitigate the risk of re-occurrence. Specifically to provide assurance in relation to projects with major cost variances, learning from higher outturn costs in OFT schemes and provision for its 'other costs' in project budgets as well as portfolio-level allowances.

Abbreviations

CPM	Capital Portfolio Management division
DCO	Development Consent Order
DfT	Department for Transport
IPA	Infrastructure and Projects Authority
NAO	National Audit Office
OFT	Open for Traffic
ORR	Office of Rail and Road
PCF	Project Control Framework
RIS1	Road Investment Strategy 1 (for RP1)
RIS2	Road Investment Strategy 2 (for RP2)
RP1	Road Period 1 (2015/16 to 2019/20)
RP2	Road Period 2 (2020/21 to 2024/25)
SoFA	Statement of Funds Available
SOW	Start of Works
SQRA	Schedule Quantified Risk Assessment