

Review use of Central Risk Reserve and consider implications for monitoring and reporting of efficiency -CT21-38

ORR

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FINAL REPORT - REDACTED

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Contents

EXECUTIVE SUMMARY	5
1. INTRODUCTION	13
1.1. What is portfolio risk and how is it managed?	13
1.2. Context	14
1.3. Structure of the report	15
2. CRR - EXISTING ARRANGEMENTS	16
2.1. The Risk Reserve Protocol	16
2.2. National Highways approach to managing the CRR.....	18
3. CRR - WHAT HAPPENS IN PRACTICE	23
3.1. Top-down review	23
3.2. Bottom-up review - Sample review	27
4. EFFICIENCY	32
4.1. Efficiency context.....	32
4.2. How the relationship between CRR and Efficiency is intended to work	33
4.3. How the relationship between CRR and Efficiency works in practice.....	35
5. COMPARISON WITH OTHER SECTORS	36
5.1. Network Rail.....	36
5.2. Crossrail	39
5.3. Transport for London	41
6. RECOMMENDATIONS.....	43
6.1. How has the CRR been used in RP2 compared with the governance process as initially envisioned?.....	43
6.2. How has the CRR process been applied to projects that have sought to access the fund? 44	
6.3. Are there sufficient funds in the CRR for the remainder of RP2?.....	45
6.4. What are the implications of the use of the CRR for reporting and monitoring efficiency in particular for the Efficiency KPI?	46
APPENDIX A THE DRAFT PROTOCOL	49
APPENDIX B NATIONAL HIGHWAYS LIST OF PORTFOLIO RISKS.....	50
APPENDIX C SAMPLE REVIEW	52
APPENDIX D REFERENCES	53

APPENDIX E INTERVIEWS.....56

EXECUTIVE SUMMARY

CEPA was commissioned by the Office of Rail and Road (ORR) to review the approach to, and use of, the Central Risk Reserve (CRR) used by National Highways to manage portfolio level risk in Road Period 2 (RP2).

The project includes:

- A review of the Protocol between the Department for Transport (DfT) and National Highways that governs the use of the CRR, and National Highways' internal policy documents developed from the Protocol. Here we seek to understand whether the Protocol and policies are clear and consistent.
- A top-down review of National Highways' management of the CRR focused on control and reporting of the use of the CRR and its likely sufficiency for RIS2.
- A sample review of nine projects using the CRR to provide a view on the application of the Protocol and policy in practice.
- Consideration of the implications of our findings for the efficiency KPI.
- A case study review of other large infrastructure managers' use of risk funding and portfolio level risk management.

Based on these activities, we make recommendations to ORR on lessons learned and improvements that might be made to the management of the CRR in the short and medium term.

Context

The CRR approach to portfolio risk management was established as part of RIS2, it is therefore in the early stages of development within National Highways. This is a positive step forward from RIS1 reflecting movement towards good practice in risk management for RIS2.

National Highways has adapted its internal governance processes to include the management of the CRR. This step towards active management of risk by type is widely used in infrastructure provision and credited with being a more efficient means to manage scarce risk funds. Our review identifies a number of areas for improvement with the process at present. These issues do not suggest that the plan to manage risk funds differently in RIS2 is problematic. The areas identified for improvement can be addressed in the short to medium term and doing that will help National Highways operate the CRR in a more disciplined way in line with good practice seen in comparator organisations.

In the sections which follow, we set out key findings and then provide recommendations to ORR. We point out a number of areas for improvement which we think will allow the CRR to mature appropriately and instil the right level of discipline in its use. These observations should be reflected upon with the understanding that the CRR is a new approach for National Highways and we would expect there to be learning and adjustment.

Governance via the Protocol

The Protocol between DfT and National Highways that governs the CRR remains in draft and its lack of clarity in parts is unhelpful as it is difficult to confidently discern intent. Based on discussions with DfT we understand that it was expecting National Highways to implement a typical portfolio risk approach (where the CRR is used for risks that are outside of the control of the projects and which impact the portfolio as a whole) but with an acceptance that wider issues might necessitate use of the CRR to address "potential future issues."¹

¹ DfT's monitoring letter also refers to the purpose of the CRR. It says "Unbudgeted scheme costs will be met through risk allowances held at a project level and programme level, as proposed by Highways England in its draft SBP and supported by ORR in its Efficiency Review, in a central risk reserve." This further adds to the lack of clarity about intent.

DfT explained its intention was that reserving a tranche of RIS2 funds outside of projects would be efficient and could be used to induce discipline. It expected National Highways to introduce policy internally that would make it more challenging to access this fund than would be the case if accessing the risk provision at project level. In response National Highways has updated its internal governance processes.

Building on the Protocol language and its reading of the monitoring letter, National Highways drafted its internal policies translating 'future issues' to 'unforeseen costs' generating freedom to apply the CRR widely because, other than at project level, it has no reserves or alternative risk provision. National Highways is of the view that the CRR can be the fund of last resort if project risk is insufficient or exhausted. DfT acknowledged that adhering to a strict interpretation of portfolio risk would be challenging and it anticipated that there might be circumstances – e.g. when all other options had been exhausted – where project risks would necessitate access to the CRR. As a result, in practice, the CRR can and is being used for a range of project cost overspends that would not typically have recourse to portfolio level funding. Overall, we conclude that a lack of clarity in the form of a signed Protocol has contributed to the CRR process not delivering discipline as was intended.

Projects are routinely putting requests to the National Highways' Investment Decision Committee (IDC) for additional funding as they would have in RIS1 when there was no CRR. Our understanding is that there are no *additional* hurdles to receiving CRR funding compared to RIS1 requests. So, while there are hurdles in the form of programme governance, preparing papers and setting out reasons for a funding request which take time to prepare, the discussions that we have had with National Highways staff suggest that there are no new or strong incentives to avoid asking IDC for CRR funds for cost over-runs. There is also no incentive for applicants to consider whether their request for funds align with what the CRR is intended to cover, as they are not requesting funds specifically from CRR. Instead, IDC is taking a view on how any cost overspend will be funded and if CRR will be allocated.

Based on the sample of schemes we reviewed, we think this reliance on the CRR is likely exacerbated by early project estimates being under provisioned for risk and uncertainty. We note that the Nichols' Report "Assessment of Highways England's cost estimation approach for RIS2" from June 2019 indicated that "overall contingency provision for risk and uncertainty in its RP2 modelling within the draft Strategic Business Plan (dSBP) is typically well below the maximum benchmark levels for Optimism Bias set out in HM Treasury's Green Book Guidance." National Highways explained that their uncertainty and early stage risk provision reflects affordability considerations and an understanding that DfT is reticent about funding at a higher level that would be more in line with actual levels of uncertainty.

National Highways' schemes are funded based on their 'Most Likely' cost – meaning that they are funded broadly in the range of P45 to P50; the exact P value differs between projects as some are larger and more complex, whilst others were at an earlier 'options' phase when the RIS2 settlement was made. On top of which the CRR is applied to cover a range of portfolio risks. In total, we understand that the RIS2 post efficient funding settlement was set broadly in the range of P60 to P65.² National Highways have indicated their view that other government funded infrastructure is funded at a higher P value. We consider that there are a number of options that might be explored to address this possible funding gap – in Section 5 we refer to CAA's approach for Heathrow and to DfT's rolling programme of investment approach on Rail.³ For the purposes of this report, we simply conclude that the CRR is likely to continue to be used as the 'fund of last resort' if the uncertainty and risk provisions included in early stage estimates that form part of the RIS, are systematically insufficient.

In the first two years of RIS2 there have been many calls on the CRR only some of which, based on the nine projects sampled in our review, are of the nature of portfolio risks. The fund is now substantially allocated: effectively to a level that would be unlikely to see National Highways through to the end of the RIS without additional funds being injected (which could come from projects paying back into the CRR).⁴ In our view, the default National

² We have not reviewed the QRA from the RIS submission to independently verify this.

³ See DfT's Rail Network Enhancements Pipeline A New Approach for Rail Enhancements, 2017.

⁴ We note that National Highways has indicated that a major transformation programme is due to start which could see substantial project cost savings paying back into the CRR. We have not seen any documentation of this programme or forecast of paybacks to take a view on whether this is likely to materialize.

Highways position on cost pressure if the fund were depleted appears to be deferral, cancellation or descoping of schemes not yet in construction; a further indication of the CRR approach not delivering the discipline that might be expected. Historically, undertaking more or less renewals work has also been used to balance the overall financial position.

Top-down review

Internal summary reporting to the IDC, ORR, and DfT provides oversight of the use of the CRR. National Highways is tracking drawdowns and provision of funds. Quarterly reports to ORR provide a simple dashboard of spending/provision by fund by year.

However, National Highways' developing approach to risk management is not tracking fund use by risk type i.e. against the risks that the CRR is intended to cover. Although there is some reporting of fund use by year, there is no commentary on the likely sufficiency of the fund over the course of the RIS. Elsewhere risk funding and programme slippage might be offsetting, at least to some degree. We recognise that before the start of RIS2, £655m of the CRR was allocated. National Highways explained that this was because of the delay between settling of the RIS and the start of the RIS leading to a shortfall in funding reflecting changes to the programme over the time period. As a result, National Highways' view is that they started the RIS on the backfoot with regards to the CRR. It is our position that with the right level of uncertainty and risk provision in the cost estimates at the outset, the impact of the delay between settling and starting the RIS could be mitigated for RIS3. National Highways view is that shortening the time between settlement and start of the RIS or being provided the chance to re-open the RIS prior to the start of RIS3 would be its preferred solution.

Sample review

National Highways' internal processes for managing the CRR are broadly followed. IDC papers for enhancements provide useful insight into projects. However, based on our sample review, Early Warning Notices (EWNs) via the change control process are inconsistently provided⁵, and the relevant section on efficiency in the Change Request Forms (CRFs) is frequently incomplete. The process of drawing CRR funds for renewals complies with the requirement to make the request of IDC however the evidence provided to IDC in support of those requests and the challenge made by IDC is cursory based on a review of the IDC paper and IDC meeting minutes for 24 Renewals Risk Reserve (RRR) drawdowns.

It is not clear from IDC minutes how issues raised by those who assure IDC papers are being managed and lessons learnt. This is important as we observed a number of repeated issues in the papers but no clear response to them reported in IDC minutes. National Highways indicated that these issues were subsequently dealt with through business as usual activities. However we were not provided any materials to allow us to confirm this assertion.

The sample review suggests that in addition to having lower than expected risk provision within project estimates, those estimates are not routinely narrowing as the project moves through development and towards procurement, as we would expect. The combination of early-stage projects seeking CRR as they develop and wider flux in the estimates raises a concern that resulting reporting may not provide a sound basis for planning.

There is also scope to improve the governance requirements for IDC and through that enhance portfolio level reporting. National Highways should require project sponsors to allocate the CRR funds sought to categories of risk covered by the CRR and using that track use of the fund e.g. against the risk categories in the Protocol. Doing so would provide the IDC and ORR with a better sense of appropriateness of use and overall sufficiency. This also requires that project sponsors explicitly apply for CRR funds having considered the guidance on what the CRR is for and do not simply request additional funds from IDC.

⁵ National Highways have indicated that there are substantial improvements in the consistency in use of EWNs and CRFs since RIS1. We did not investigate this as it was not part of our scope.

Efficiency

The link between expenditure on the RIS2 improvement schemes, CRR and the efficiency KPI is proving challenging to monitor. There is intended to be an explicit link between the CRR and the Total Efficiency KPI, because it was agreed between National Highways, DfT and ORR that as a general principle any “unspent portfolio risk allowance at the end of the road period would represent an efficiency”⁶ net of any external changes to the RIS2 programme (which we assume to mean RIS outputs removed from or added to the programme). This is clear in terms of its implications for efficiency reporting at the end of RP2 but does not assist ORR’s annual monitoring of progress towards embedded efficiency targets which are built into the later years of RP2.

As well as asking us to review the practical implications and challenges associated with the monitoring and reporting of efficiency where there has been funding change or use of the CRR, the ORR asked us to consider whether the back-ended status of embedded efficiency in RP2 created an incentive to use the CRR to improve efficiency reporting in the early years of RP2.

We saw no evidence to suggest that the CRR has been used to improve embedded efficiency performance at the expense of portfolio risk management. But the perceived risk is real, because in practice use of the CRR is not limited to portfolio risks. For ORR, monitoring National Highways’ progress towards the embedded efficiency target is made additionally challenging because 70% of embedded efficiencies in the enhancement portfolio will be claimed in the final year of RP2, assuming no further slippage in the Major Projects portfolio. Therefore, we conclude that the link between the CRR and embedded efficiency is broken in its current form.

The ORR also asked us to recommend changes which would improve the reporting and/or monitoring of efficiency. As tracking the use of the CRR is improved, we recommend that thought should be given to the possibility of more effectively tracking the Efficiency KPI over time, particularly with regards to enhancements.

For schemes that are in the construction phase, we suggest that ORR utilises the earned value metrics that are already part of the Performance Specification: the measures of cost performance index (CPI) and schedule performance index (SPI) which are industry standard high-level metrics. Whilst we note that the baselines which are used to set the embedded efficiency and CPI metrics for each scheme may be different, as long as ORR understands how they are different then the CPI and SPI metrics will provide more forward-looking evidence on efficiency, and give a sense of whether projected efficiencies are ‘real’ rather than an artefact of delay. To do this ORR will need to ensure that National Highways standardises processes for updating the baseline against which CPI and SPI are calculated.

We recognise that monitoring efficiency on schemes in the options and development phases is more challenging. But we recommend that ORR requests additional information from National Highways to assure itself on a forward-looking basis that the Company is on track to deliver the ~£560m of embedded efficiency in the enhancement portfolio by the end of RP2 (~25% of the Total Efficiency KPI target). This could include: National Highways’ latest ‘most likely estimate’ for each scheme and a comparison against its embedded efficiency baseline; the ‘max’ cost estimate for each scheme recognising the risk of cost increases (and decreases) through the development stage; and an assessment of the sufficiency of remaining CRR to cope with such risks if a portion of them later materialize.

For future Road Periods, we recommend that National Highways, DfT and ORR work together to develop a more sophisticated forecasting approach to future risk exposure, supported by (but not limited to) a ‘living’ portfolio QRA analysis that should be routinely updated as a means of monitoring National Highways’ level of confidence that it will deliver the specified RIS portfolio within the funds available.

Case studies

We undertook desk top reviews and held discussions with representatives of Network Rail, Crossrail, and Transport for London (TfL). All indicated that their own processes were imperfect, but we were able to draw lessons from them and have included those within the recommendations that we set out.

⁶ EIMM 4.2.1 and 310121 Efficiency Principles paper - draft for discussion.pdf.

In considering the approaches that others are using we recognise the differences in their circumstances. Crossrail for example is a single project and therefore has more limited scope to delay discrete parts of the project without impacting the whole system opening date. National Highways have the ability (with DfT's agreement) to reduce in Road Period scope, number of projects, and delay delivery to manage expenditure. Any changes to the CRR process should bear this in mind from the start to allow proper prioritisation of projects / outcomes.

We found that the comparator organisations:

- Embed and prioritise discipline in the management of their reserve. This includes using their reserves for the risks they are meant to cover and reporting on how use compares with expectations. This allows them to actively manage the reserve based on strategic business decisions rather than on a first come first served basis.
- Provide incentives to mitigate risks using standard project management techniques before calling on the reserves.
- Recognise that risk levels vary through the stages of the project life cycle and rely on standard risk and uncertainty provisions where top down or bottom up QRA is not available.

While we did not prepare a detailed case study on the Civil Aviation Authority (CAA) but its approach to capex governance at Heathrow may provide an interesting option for consideration. CAA splits the portfolio into development capex and delivery capex. Development capex is for schemes in the pre-investment decision gate, delivery is for capex thereafter. Development capex is notionally a block of funds that is broadly assigned to a pre-agreed group of projects that are in development. It is set at a predicted P80 level to allow for uncertainty of scope and design. In 2016, when we undertook our review of CAA's capex governance, there was no formal business case methodology being applied, but in theory a P80 cost estimate and the establishment of a required business case CBA level could govern these early stage projects. Delivery capex is for projects that are investable - single design ready to progress through procurement. Allowances for these projects are set at P50 and CPI/SPI are used to monitor progress.

Recommendations

Based on the case studies and the review of the CRR we recommend to ORR that:

Short term

- National Highways and DfT finalise the Protocol. In finalising the Protocol, the intent of the CRR should be made clear and any ambiguities in the text should be explained – for example, around the language for “potential future issues”; and the approach to re-baselining the CRR. The approach to re-baselining could range from a considered method based on the portfolio risk associated with the projects being added/removed to a blunt addition/subtraction based on a percentage of the overall change to the RIS.
- Following finalisation of the Protocol, ORR should clarify that internal National Highways policy documents reflect the Protocol, for example, defining “unforeseen costs”, removing the language in the National Highways policy documents which refers to programme level risk reserves, which we understand, do not exist.
- As part of revising its internal policy documents, National Highways might consider further how and when early stage projects are permitted to access the CRR, ideally provisions from CRR would only be made in exceptional circumstances before a single fully costed option is developed. We acknowledge that this change may only be practicable after there has been further consideration of the risk and uncertainty provisions applied to early project cost estimates.
- National Highways further develop its internal governance such that, at a minimum, requests for CRR funding are supported by documentation outlining what the request for CRR is for, what risk type(s) the request is for, and the breakdown of costs driving the crystallization of each risk. Changes should seek to ensure that no drawdown, payback or provision is implicitly approved by virtue of the inclusion of an

updated operating plan. This would require that project sponsors explicitly apply for CRR funds with consideration to the guidance of what the CRR is for.

- Related to the bullet above, National Highways should be encouraged to collect better data and provide more useful reporting for both internal management of the CRR and external understanding. At a minimum, there is scope for:
 - Analysis of drawdowns, pay backs and provisions over time to put the snapshot in perspective.
 - More detail on how the CRR is being used – what are the key risks leading to drawdown and the timing of drawdown in terms of PCF stage.
 - Information on the source of paybacks – whether these are real savings on projects or deferral/delay to schemes.
 - Forecasting of future risk exposure, supported by (but not limited to) a ‘living’ portfolio QRA analysis that should be routinely updated as a means of monitoring National Highways’ level of confidence that it will deliver the specified RIS portfolio within the funds available.
- To address the perceived risk that there is a presentational incentive to use the CRR to improve reported efficiency performance (especially during the early years of the Road Period), at the expense of its portfolio risk management function, ORR should consider providing guidance on the supporting evidence that National Highways must provide before it can claim embedded efficiencies.

On enhancements this would include evidence that, where the CRR is used, inefficient expenditure is excluded from changes to scheme capital baselines. ORR could facilitate this by describing the principles it would use in deciding whether expenditure was efficiently incurred, which may differ depending on scheme maturity at the start of RP2:

- For schemes that were in construction before or during the first year of RP2 (i.e. before 31 March 2021), this might include a requirement on National Highways to demonstrate that the additional costs could not have reasonably been foreseen and/or avoided/mitigated – and therefore reflected in the capital baseline – at the time of the RP2 settlement.
- For schemes that started construction after 1 April 2021, this might include a requirement on National Highways to demonstrate that the additional costs could not have reasonably been foreseen and/or avoided/mitigated – and therefore reflected in the capital baseline – at the time that it made its investment decision (to proceed to construction).
- Schemes which OfT in RP3 but do not start construction in any meaningful sense during RP2 because of delay would not be permitted to claim embedded efficiency in line with EIMM paragraph 5.2.3.

ORR’s review of the supporting evidence need not be a complex or disproportionately burdensome process. For example, it could decide to focus its review on schemes with the largest embedded efficiency components. And the review could be ‘principles-based’ recognising that each project will have a unique set of risks that should be considered on a case-by-case basis (see Section 6.4 for further detail). In deciding on the depth of its review, ORR might also take into account whether there is good evidence to suggest that National Highways is likely to deliver the investment programme within the post-efficient RIS funding settlement.

For renewals, ORR could require National Highways to analyse how the RRR expenditure is used – i.e. split between portfolio risk; project risk/overspend; additional scope; deliberate over-delivery/bringing forward planned activity. ORR and National Highways could also agree principles to ensure that claimed embedded renewals efficiencies reflect how the RRR is actually used, and whether that use is likely to deliver additional efficiencies over and above that which is embedded.

Medium term

- The embedded efficiency calculations and CPI metric calculations share a similar issue: the metrics are only as good as the change control process. The 'efficiency' or cost baseline should only be updated for changes in scope or where there is agreement that the increase in scheme costs could not be foreseen and/or avoided/mitigated at the start of RP2, otherwise the metric is of limited use for monitoring. The evidence gathered during our sample review suggests that the controls on the embedded efficiency baseline are not working as they should.⁷ To address this, ORR should work with National Highways and DfT to explore whether stronger controls over changes to Efficiency and CPI baselines could be developed, to ensure that the efficiency metrics accurately reflect DfT's intention when it set the Performance Specification.

Given the ongoing work to rebaseline the RIS post SR21, we recommend that ORR encourages exploration of stronger controls in parallel. The aim would be to introduce them before the end of RP2 where possible, but they could also be implemented alongside any longer term changes which apply from the start of RP3.

Long term (for RIS3)

ORR should encourage DfT and National Highways to ensure:

- That risk estimation and CRR allocation are internally consistent. This means being clear which risk provisions reside where – what is held at project level versus the portfolio level (akin to the approach of Crossrail). Subsequently, it should make the rules for accessing the CRR clear and ensure that they are well understood based on the delineation of risks.
- That early-stage project estimates have a sufficient allowance for risk and uncertainty akin to TfL and drawing on DfT TAG guidance/ Green Book. Getting this right will help to reduce the likelihood of a large day-one allocation of CRR funding in RIS3, similar to the £655m allocation at the start of RIS2, and that the CRR can be reserved to risks that it is intended to cover.
- That there is clarity about the basis of costs in the dSBP and whether/how they will be updated for the final SBP/ final RIS.
- That the interaction of slippage in-year and use of the CRR is considered akin to Network Rail's approach, where outturn experience of slippage is built into the core plan; there is explicit consideration of works that could be deferred if required; and the Group Portfolio Fund is consciously allocated to corporate priorities in future years.

ORR should also:

- Monitor changes to project baselines and make CRR sufficiency monitoring a requirement.
- Consider further how the embedded efficiency monitoring approach could be strengthened; or if the embedded efficiency approach remains fit for purpose in RIS3. In its assessment ORR might take into account whether the RIS3 plan is also back-ended, and the balance between schemes in construction and those in the options and development phase.
- For schemes in construction, ORR might consider whether embedded efficiency (as a component of the Total Efficiency KPI) is more or less useful than the Earned Value (CPI and SPI) metrics which apply to projects in construction as a 'real time' efficiency monitoring indicator.
- For schemes at the options and development phase, ORR might explore how it captures the uncertainty around the delivery of future embedded efficiencies; and in that context how it monitors the latest

⁷ For example, National Highways has assumed that the use of CRR draw down fully offsets any impact on embedded efficiency on some schemes, despite an increase in costs due to productivity issues. This would appear to meet a commonly understood definition of 'inefficient expenditure'.

development scheme cost estimates and the range of possible outturn costs around the 'most likely estimate'.

- Consider the approach to risk funding used by CAA which splits the portfolio between development and delivery. This would see projects in development attracting an optimism bias level allowance for uncertainty but without access to the CRR (before reaching a prespecified gate) or alternatively using P70 for early stage projects noting this is a proxy given early stage projects will not have undergone a QRA. Later stage projects would be funded at P50 based on the QRA for a single agreed design. The CRR could then be restricted to unknowns in delivery – for example exceptional inflation or unanticipated changes to environmental standards.

1. INTRODUCTION

ORR commissioned CEPA to review the approach to and use of the CRR used by National Highways to manage portfolio risk in RP2. As part of the review, we were specifically asked to:

- Review changes in CRR funding and use of the CRR for enhancements and renewals in RP2 against the governance process as initially envisioned.
- Examine in detail CRR activity through September 2021 by reviewing how the process has been applied to a sample of projects that have sought to access the fund.
- Consider whether there are sufficient funds in the CRR - after taking into account forecast paybacks - for the remainder of RP2.
- Assess the implications of the use of the CRR for reporting and monitoring efficiency in particular for the Efficiency KPI.
- Provide a set of practical recommendations on how the policy on the use of the CRR might be improved based on a review of best practice from other comparable sectors.

1.1. WHAT IS PORTFOLIO RISK AND HOW IS IT MANAGED?

Businesses use a range of techniques to manage the impact of risk and uncertainty on project estimates. Although the issues are common the means of dealing with them vary by organisation and there is no one method that is universally applied. Here, to provide context for the approach used by National Highways, we consider key issues to be addressed by risk management and typical or common responses to those.

To manage risk, reserves are needed, and these are often split between reserves held within the project budget used to cover risks and uncertainties that are specific to the project and those held centrally i.e. at the programme or portfolio level which are likely to be used to address risk/uncertainties that are common across a programme or portfolio.

At the **project level**, the project manager, with the help of the wider team, identifies risks usually through a risk assessment process. Individual risks are identified and for infrastructure might typically include items such as ground conditions differing from those included within the budget or shortage of a specific skill in the workforce. The monetary value of these risks is estimated, and a risk fund is allocated to the project to allow these risks to be funded at the project level. In addition to risks that can be quantified there exists further uncertainty, particularly early in project development when important factors such as the design, land take etc. are not certain. Typically, this will result in a larger risk/uncertainty provision for early-stage projects and over time that provision will reduce as uncertainty is resolved creating a cost, specific risk provision or falling away altogether.

Project level risk funding is added to the base cost estimate to arrive at the cost baseline which is available to the project during delivery. Funds for changes in scope e.g. as a result of a detailed design altering the outline design, are typically part of the project risk fund. This is because scope changes are not uncommon and are largely within the control of the project. It therefore makes sense to align the risk funds and control of the risk.

Although not a feature of National Highways approach to risk management, funds may also be held at the **programme level** to create an efficient provision for similar projects or large one-off projects on the basis that not all projects within the programme or within a single major project will eventuate; the provision overall will be smaller than if a sum were held in each project. This approach is also used to create an incentive to manage risk at project level; programme reserves require an application process that would routinely necessitate a review of the project and consideration of the ability to manage risk pressure at the project level.

At the **portfolio level**, a management reserve might be used for risks that are classified as “unknown/unknowns”, i.e. those that have not been specifically identified and are outside of the control of the projects/programme and which impact the portfolio as a whole. Examples of such risks might include industry wide supply chain issues

related to events like the Covid-19 pandemic, changes to legislation emerging from COP26, and Brexit. Where programme level risk facilities do not exist, the portfolio level management reserve might cover a wider range of portfolio risks not all of which would be “unknown/unknowns”.

The rationale behind holding the management reserve at the portfolio level is also two-fold. First it is more efficient to have a central provision than trying to account for portfolio wide risk at the project level. Second it creates an incentive effect, such that projects aim to deliver within their project budget and only call on centrally held funds in extreme circumstances, having exhausted all other options.

Within this typical structure, it would be unusual for projects to draw down regularly on a programme or portfolio level reserves, and we might expect drawdowns of a specific nature to be systematically recorded across several projects. Typically project managers will not have access to programme or portfolio reserves without approval from the sponsor.

A risk management framework typically sets out the various components of risk, how they inter-relate, and how risks are managed. Within the framework sits a risk management plan which sets out the approach, the management components and resources to be applied to the management of risk. This guides when or if management reserves may be used, reduced, or eliminated over time. What is key to the approach is that it must be internally consistent and well understood.

We explore approaches adopted by large infrastructure managers in further detail in Section 5 which summarises how Network Rail, Crossrail and TfL manage their risk reserves.

1.2. CONTEXT

National Highways is responsible for operating, maintaining and improving the Strategic Road Network (SRN) in England. It was established (as Highways England) in April 2015 and is a government-owned strategic highways company. For the second roads period known as RIS2, National Highway’s funding settlement includes an allocation of £1,716m as a Central Risk Reserve (CRR) to cover portfolio level risks in delivering the capital investment plan. The funding is split into three parts, with the latter two ring fenced:

- Enhancements - £1,372 million⁸
- Lower Thames Crossing (LTC) - £185 million
- Renewals - £159 million

As at Q2 2021/22 there had been:

- £358m of approved drawdown; and
- £774m of provisions where drawdowns were not yet approved but cost risks are likely to materialise.

This sums to £583m of CRR available for future draw down, although at the time of our review the situation was evolving as National Highways adjusted to its post SR21 funding settlement. We understand that £175m relating to the A303 Amesbury to Berwick Down scheme was surrendered during SR21 negotiations, so we calculate that the residual CRR is in practice £408m. Of this we calculate that £129m is ring-fenced for renewals.⁹ LTC has not drawn down or provisioned funds from its ring-fenced £185m allocation which was subsequently surrendered in SR21. Therefore, we calculate that £94m was available for enhancement schemes based on the information available at the time of our review.¹⁰

⁸ Including a ‘pay-back’ of [Information redacted].

⁹ CEPA analysis of National Highways’ RIS2 Capital Portfolio Investment Report: Status Review Q2 2021/22.

¹⁰ ORR subsequently received Q3 2021/22 information from National Highways that shows £134m was available for enhancement schemes due to ‘add backs’ that were not captured in the data provided to our review.

1.3. STRUCTURE OF THE REPORT

The remainder of the report is structured as follows:

- Section 2 outlines the intent of the CRR, starting from the risk reserve Protocol established between National Highways and DfT and how that has been translated into National Highways' policies and approach.
- Section 3 examines how the CRR has been operating in practice from both a top-down perspective and through a bottom up sample review. Here we examine whether National Highways' use of the CRR is in line with both the intentions of the Protocol and their own policies.
- Section 4 explores the implications of the use of the CRR for reporting and monitoring efficiency in particular for the efficiency KPI.
- Section 5 compares the CRR with the approach to managing portfolio risk for Network Rail, Crossrail, and TfL.
- Section 6 presents our recommendations for the CRR.

2. CRR - EXISTING ARRANGEMENTS

In this section:

- We explore the intent behind the establishment of the CRR as set out in the risk reserve Protocol.
- Discuss National Highways' stated policies for use of the CRR.
- Consider whether National Highways' policy for use of the CRR is consistent with the Protocol.

We conclude that:

- It is a positive step forward from RIS1 that there has been an attempt to move towards good practice in risk management for RIS2.
- Uncertainty has been introduced because the CRR Protocol between NH and DfT is unclear in parts and remains in draft form and that there is ambiguity in National Highways' policies that would benefit from clarification.
- While the Protocol and policy note that if the overall funding for the RIS changes (up or down) the CRR will be re-baselined, the manner in which that would be undertaken is not stipulated. How it would be re-baselined is important and has implications for the measurement of efficiency.
- Although consistent with the protocol, the governance processes have some flaws that inhibit proper tracking of use of the CRR funds. Without proper tracking it is very difficult to ascertain whether there are sufficient funds left in the CRR and whether it is being used appropriately.

We recommend that ORR should ensure that:

- The Protocol is finalised and signed as soon as is practicable and that it is further clarified in places. ORR cannot monitor effectively if the intent of the Protocol is not clear and shared between all parties.
- Alongside this, National Highways' internal governance documents are updated to reflect the final version of the Protocol and to remove ambiguity.

We reviewed the existing and planned approach for the use of the CRR. This involved both *desk-based research* and *interviews* with National Highways, ORR and DfT. A complete list of the documents we reviewed is found in Appendix D and the list of interviews we conducted is in Appendix E.

The document review and interviews provide insight into the planned governance and management arrangements for the CRR and the mechanics around how the reserve was intended to operate.

2.1. THE RISK RESERVE PROTOCOL

The risk reserve Protocol established between DfT and National Highways is in draft form but represents the best understanding of the proposed framework, approach and governance arrangements to provide oversight and management of the CRR. The draft Protocol is presented in Appendix A.

The Protocol was the basis for the subsequent policies developed by National Highways for the operation of the CRR.

2.1.1. What does the Protocol indicate the CRR is for?

The Protocol makes clear that the CRR was established to deal with the *portfolio risks* (i.e. risks above the level of individual projects) associated with the enhancements and capital renewals portfolio from RIS1, RIS2 and where surplus funding exists it can be used to speed RIS3 development work.¹¹ Surpluses may also be used to deliver further outputs – additional scope or RIS commitments and National Highways may seek to transfer surplus reserve funding from one year to the next using the 10% capital flex mechanism, subject to standard approvals.

¹¹ DfT's monitoring letter also refers to the purpose of the CRR. It says "Unbudgeted scheme costs will be met through risk allowances held at a project level and programme level, as proposed by Highways England in its draft SBP and supported by ORR in its Efficiency Review, in a central risk reserve." This further adds to the lack of clarity about intent.

National Highways' schemes were funded based on their 'Most Likely' cost – meaning that they are funded broadly in the range P45 to P50; the exact P value differs between projects as some are larger and more complex, whilst others were at an earlier 'options' phase when the RIS2 settlement was made. On top of which the CRR is applied to cover a range of portfolio risks. In total, the RIS2 post efficient funding settlement was set broadly in the range of P60 to P65. The CRR does not represent 'uncommitted' funding. Part of this reserve covers the costs of Portfolio Risk, as estimated at a project-by-project level; another part represents increased efficiency savings and savings from lower inflation assumptions across the RIS, which are held in reserve to deal with potential future issues on the enhancements programme.¹² The wording “potential future issues” without a definition of what type of issues are meant, introduces a degree of ambiguity regarding the intent of the CRR. This appears to have later been interpreted by National Highways to mean “unforeseen costs”.

The Protocol also specifies a ringfenced amount for renewals and for complex programmes such as the LTC. The management arrangements and quantification for scheme specific ring-fenced funds are agreed on a case-by-case basis.

The approach to the CRR outlined in the Protocol broadly aligns with a typical management reserve with the exception that the risks that the CRR is intended to cover could be seen as wider than the typical risks that would affect the portfolio: the inclusion of “potential future issues” creates uncertainty as to the extent that projects exceeding the amounts held at project level might be able to access the CRR. National Highways points out that it does not hold a risk reserve at the Programme Level and therefore the CRR would naturally cover some of the reserves typically seen at a Programme Level. Discussions with DfT indicate that it was their intention for the CRR to cover risks typically considered portfolio risk. However, they also acknowledge that adhering to a strict interpretation of that would be challenging and they expected that there could be circumstances – e.g. when all other options had been exhausted – where project risks would access the CRR.

The draft Protocol has formed the basis of policies developed by National Highways for the operation of the CRR.

2.1.2. Under what circumstances can the CRR baseline be changed according to the Protocol?

The Protocol makes clear that if there are additions or removals of major enhancement capital investments from the RIS, then corresponding adjustments to the CRR should be made as part of the Delivery Plan Update or Change Control processes relating to these additions or removals.¹³ If the overall quantum of RIS enhancement investment remains unchanged then corresponding changes to the CRR allocation would not be required. How adjustments to the CRR baseline would be made (e.g. equivalent % change to CRR baseline vs. bottom-up assessment of risk removed/added based on changes) is not discussed in the Protocol.

The Protocol also specifies that if the reserve is changed to either provide more risk cover or to reallocate surplus to new outputs, the total size of the CRR will be re-baselined to reflect the change. The Protocol also indicates that it does not expect changes to the CRR to change the overall settlement of the SoFA unless there is a new injection of funds.¹⁴

2.1.3. How should the CRR be governed according to the Protocol?

The Protocol outlines the governance principles and arrangements for the CRR. It stipulates that National Highways is responsible for the day-to-day operation of the reserve and for developing internal policies to demonstrate compliance with the Protocol. It provides National Highways with the authority to spend the reserve within the limits set in the RIS as otherwise adjusted through annual budgets, subject to any re-baselining or update.

¹² Risk Reserve Protocol.

¹³ This review focused on the period up to Q2 2021 but looked at a longer time horizon when considering sufficiency. While we make reference to re-baselining for example in our recommendations, we have not reviewed how that process is being undertaken.

¹⁴ DfT have indicated that in the case of a new injection of funds they would include portfolio risk. However, it is our understanding that additional funding was provided to accelerate the A66 in 2020-21 without any adjustment to the CRR.

Importantly the Protocol envisions use of existing governance structures within National Highways for overseeing the use of the CRR, the National Highways' Investment Decision Committee (IDC) and Board-level Investment Committee (HEIC), are tasked with approving drawdowns and provisions. It is also clear that application to the CRR does not negate the requirement to use the internal and external change control processes as otherwise required.

The Protocol specifies the CRR reporting requirements for National Highways. National Highways is to monitor and report on use and tracking of reserve activity. National Highways reporting includes monthly Executive and Board reports; ORR quarterly capital performance updates; bi-annual IPDC capital reports¹⁵; IPDC reporting through sponsor teams and individual submissions for the Tier 1 portfolio and at the Tier 1 Forum; and quarterly client and tripartite (National Highways, HMT, DfT) meetings.

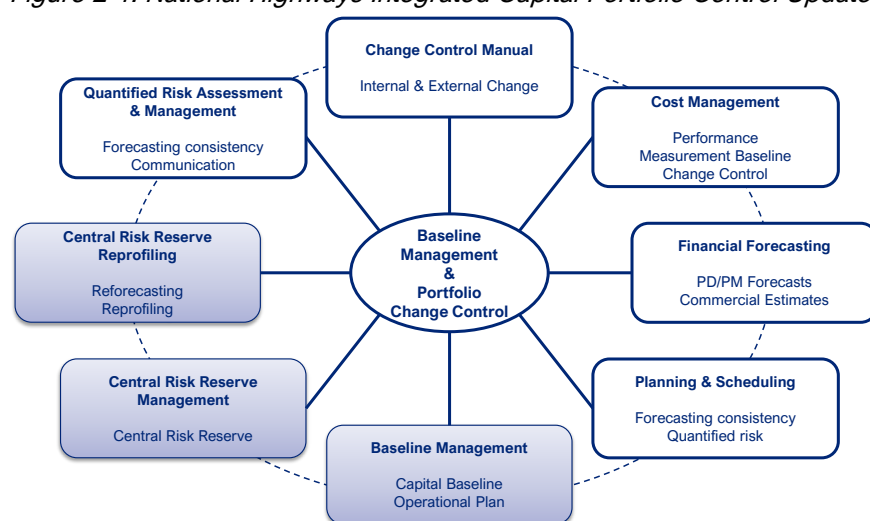
External oversight of the CRR is provided by DfT Investment, Portfolio and Delivery Committee (IPDC) through its bi-annual review. DfT's role in relation to the CRR is envisioned to be at the strategic level and it is not intended for DfT to undertake individual decision level scrutiny. However, DfT can request project-by-project and year-by-year evidence to undertake portfolio level analysis of the CRR. Oversight by DfT forms part of existing meetings it has set with National Highways.

2.2. NATIONAL HIGHWAYS APPROACH TO MANAGING THE CRR

National Highways translated the Risk Reserve Protocol into three internal policy documents: Baseline Management Policy; Risk Reserve Management Policy; Central Risk Reserve Reprofilling Policy. Based on a review of these policy documents and interviews with the CPM team we describe our understanding how the CRR is managed.

Each policy and how they fit in the overall Capital Portfolio Control Updates architecture is presented in Figure 2-1 below.

Figure 2-1: National Highways Integrated Capital Portfolio Control Updates



Source: Central Risk Reserve Management Policy

2.2.1. What are allowable drawdowns /paybacks to the CRR?

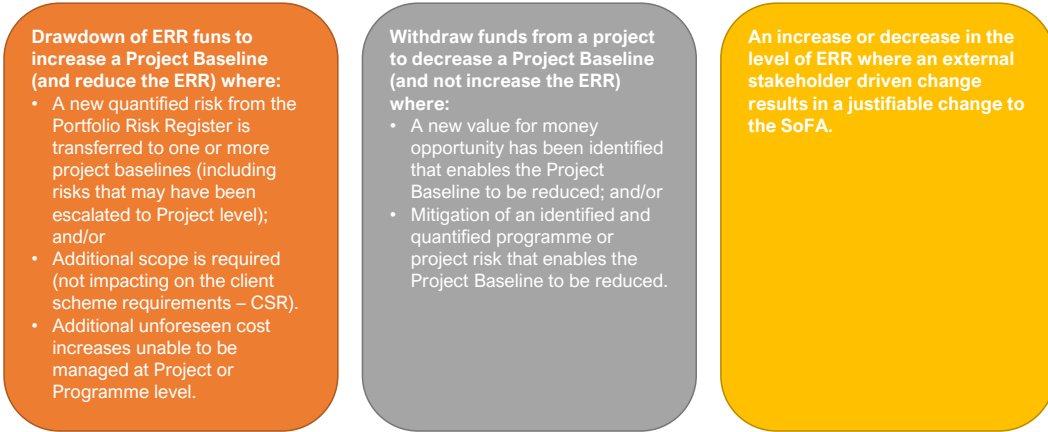
The CRR Management Policy states that the CRR will be used to manage risks within the enhancements and renewals programmes not covered by project or programme level risk allowances. It is unclear why there is reference to programme level risk allowances in National Highways' policy as interviews with CPM have indicated that National Highways does not hold programme level risk reserves.

¹⁵ Specific reporting requirements for the IPDC capital report are specified in the Protocol.

There are three components to the CRR according to National Highways’ policy documents - the Enhancements Risk Reserve (ERR), the Renewals Risk Reserve (RRR), and the LTC. The latter two being ringfenced amounts.

The governing body for the ERR, RRR, and LTC is IDC. The policy documents focus on the management of the ERR, but state that the RRR will be governed in the same manner. Allowable IDC approvals for drawdowns and payback are presented in Figure 2-2 below.

Figure 2-2: IDC approvals for the ERR



Source: CPM CRR Management Policy

Looking at the first column in Figure 2-2 above, the first two bullets are clear and well-defined, and it should be possible to identify the impact of these two categories: i.e. there should be a clear transfer of a risk amount from the ERR to the Project Baseline to fund either a risk from the Portfolio Risk Register or additional scope. The final bullet contains a reference to “unforeseen cost increases” and opens the door for the ERR (and by extension RRR) to be used for any unforeseen cost that cannot be accommodated elsewhere. If our sample review (see Section 3.2) is representative of the total usage of the CRR, we conclude that in practice the CRR is mostly allocated to unforeseen project costs rather than the crystallisation of portfolio risks, apart from a limited number of examples e.g. where additional cost has been incurred due to the impacts of Covid-19. In practice, many of these “unforeseen costs” would normally be managed at project level, but where there are insufficient funds available, the CRR ultimately funds project risks. While, this might be valid in some circumstances because the granularity of reporting is limited in National Highways it is hard to identify whether a CRR drawdown or provision is ‘legitimate’ or not.

In column two, the two rationale that allows a project to reduce a Project Baseline and increase the ERR are very clear cut: a new value for money opportunity has been identified that enables the Project Baseline to be reduced; and/or mitigation of an identified and quantified programme or project risk that enables the Project Baseline to be reduced. We found that in practice, where the latest scheme commercial estimate is lower than National Highways’ current ‘governed’ position, the CPM team is automatically allocating funds back into the ERR.

Annex B of the CRR Management Policy includes a useful distinction between the various levels of risk held within National Highways and is reproduced in Figure 2-3 below.

Despite there being a category of risks at the Programme level in Figure 2-3, and by extension the implication that a programme level reserve fund exists, National Highways does not hold programme level risk reserves. In interviews with CPM they have indicated that some risks deemed to be programme level would be covered under project risk, while others would be considered portfolio risk. How they would distinguish between those is unclear.

Figure 2-3: Risks held within National Highways

		Type	Description	Calculation	Governing body	Risk /change categories	
PMB	Project baseline	Capital baseline (SoFA)	ERR	The central pot of portfolio level contingency calculated through P-Risk process at start of RIS2	P-Risk analysis	IDC	<ul style="list-style-type: none"> Realisation of defined portfolio risk event (e.g. contractor insolvency) Risks common across company (e.g. changes to NH standards, H&S requirements) Spend to save risks/ opportunities New C&P estimate impacts on Project Baseline Budget
			Programme risk	An allocated sum of money based on QRA of bottom up project risk registers	Estimate QRA	Programme Committee	<ul style="list-style-type: none"> Realisation of defined programme risk event on the specific PMB
			Project risk	Based on QRA of bottom up project risk registers	Estimate QRA	Project Committee	<ul style="list-style-type: none"> Realisation of defined project risk event impacting on the specific PMB (e.g. archaeological, environmental, third party interfaces) NH performance issues Design performance issues Construction performance issues
			Contract risk	A sum of money calculated during tender process. Based on evaluation of contractor construction risk	Contractual agreement	Project Manager	<ul style="list-style-type: none"> Realisation of defined contract risk event during development event (scope book change not impacting CSR) Buildability risk Unforeseen sight conditions
			Base cost /Contract price	Includes unscheduled items and uncertainty allowance up to the point of contract award	Base cost/Contract price	Project Manager	<ul style="list-style-type: none"> n/a

Source: CPM CRR Management Policy, Annex B – Technical Annex

This allocation of risks, in particular the examples of “contractor insolvency” and “changes to H&S requirements”, emphasise that the risks that are covered by the ERR are intended to be exceptional. However, the final ERR risk of “New C&P estimate impacts on Project Baseline Budget” seems to be a mechanism that allows the Project Baseline to be amended in the event of new estimates of the Baseline cost. To be true to the intent of a portfolio level reserve, this mechanism requires careful management to ensure that is not simply used for “changing the Project Baseline” rather than identifying and addressing risks that have crystallised.

In addition to the policy documents, National Highways provided us with a list of what it considers to be Portfolio Risks eligible for the CRR. They are presented in Appendix B. They broadly align with what we would consider to be Portfolio Risk. There are however some which might overlap with what we would consider to be project risk, specifically with regards to Environment, Sustainability/Capacity of Supply Chain, and HE Lack of Knowledge/ Capability to Manage Contract/ Framework Management.

An item that is absent from the Risk / Change categories is inflation and / or cost index changes. The Risk Reserve Protocol, states, “...another part represents increased efficiency savings and savings from lower inflation assumptions across the RIS, which are held in reserve to deal with potential future issues on the enhancements programme.” National Highways advises that it submitted a dSBP that included a conservative assumption of inflation. It is our understanding that the risk reserve was increased prior to RIS2 based on an ORR recommendation that £520m for inflation in capital works and electricity base costs be moved to CRR as well as £130m for increased efficiency savings identified in the RIS2 Efficiency Review. The CRR therefore contains provision for a greater increase in inflation that was assumed in business planning but this is not explicitly set out. It may be that a lack of clarity in the build-up of the CRR is reflected in the lack of clarity of the third available use of the CRR (i.e. unforeseen cost increase).

Our overarching finding is that while National Highways has a clear articulation of what portfolio level risks are eligible for application to the CRR, the addition of the “unforeseen costs” category has created a potential disconnect with the intended use of the CRR as outlined in the Protocol. Noting above that the Protocol also has elements of ambiguity.

2.2.2. What are National Highways' processes for accessing the CRR?

The policy documents provided to us by National Highways do not explicitly map the process by which a scheme would apply to CRR for a drawdown or provide a payback. However, Annex A to the CRR Management Policy outlines the various roles and responsibilities with respect to the CRR. This Annex alongside interviews with the CPM team suggests that the process for drawing down on the CRR should be as follows:

- Project Managers and Sponsors are in regular discussion with their suppliers about forecast cost pressures, and identifying options for mitigating cost risks/forecast cost pressures.
- Before IDC, the Project Sponsor must produce an Early Warning Notice as part of the change control process.
- An application to change control is prepared and submitted.
- If the application is approved, an IDC paper is prepared. Before the IDC paper is prepared, the issues will be discussed at a Change Control Working Group, Change Control Steering Group and the Sponsorship Forum.
- The IDC paper is sent for Subject Matter Assurance (SMA).
- The IDC paper is revised following input from the assurance process.
- The IDC paper is submitted to IDC for approval.
- Approvals are captured in the IDC minutes.
- The CRR baseline is updated for actual drawdowns/paybacks (money paid out/in) and forecasted drawdowns/paybacks (provisioned based on EWNs from the change control processes or IDC papers submitted with new cost profiles).

It is important to note that it was intentional that the CRR use existing governance arrangements rather than necessitate its own. This may explain why explicit process documents and templates do not exist for its use. It may be entirely clear to National Highways staff how an application should be made if they are told to use the existing IDC and change control processes. However, to an outsider this is not readily evident.

2.2.3. What are the management arrangements for the CRR?

Day-to-day management of the CRR sits with the CPM team. The decision-making body for the CRR is IDC, and the IDC can approve drawdowns, or increases, from / to the CRR only for certain risks.

It is not clear what context IDC takes into account, or how (or if) it considers the long-term sustainability of the CRR. From the IDC and CPM papers we have reviewed it does not appear that IDC explicitly considers the issue of sufficiency.

Similarly, it is not clear whether drawdowns of the CRR are considered in aggregate and / or prioritised. CPM papers provide a summary of the quanta of CRR used/provisioned and details of project drawdown, but we have not seen any analysis of prioritisation or consideration of sufficiency in year or overall.

A related issue is the assurance of requests for CRR drawdowns. Aside from the level of detail presented in the IDC papers - which based on the sample review vary significantly - it is not clear what level of assurance the IDC receives that:

- The risk is one that can be requested of the CRR.
- The quantum requested is appropriate.
- All reasonable attempts to avoid calling on the CRR have been made.

2.2.4. How is the CRR adjusted as scope of works are changed / delayed

Our interviews consistently found that everyone anticipates that, in principle, the CRR should be adjusted if the scope of works to be delivered in RP2 is materially changed. But there seems to be no consensus or agreement on how, in practice, such an adjustment should be made.

The CRR Reprofile Policy does not explain how National Highways reprofiles and forecasts future drawdowns (and potentially the sufficiency) of the CRR. It states that:

“Forecasting will be carried out monthly, in line with reporting of drawdown, taking into account: up to date Commercial estimates aligned to latest project developments; latest Project forecasts; risk reserve drawdown trends to date; and assessment of risks and overall potential exposure across the capital portfolio.”

This implies that the CRR profile is forecast by aggregating together the currently forecast costs for all projects and adding an overlay of potential or likely drawdowns based on some historical analysis and, potentially, some consideration of the portfolio risks.

2.2.5. What are National Highways required to report?

National Highways CPM provide reports on the use of the CRR through the HEIC; quarterly ORR reports (for the whole capital portfolio); bi-annual IPDC capital reports (for the whole capital portfolio); quarterly client and tripartite (NH, DfT & ORR) meetings; and IPDC reporting through sponsor teams and individual submissions (Tier 1 portfolio)

National Highways policy specifies CPM reporting is meant to cover:

- Allocations of the risk reserve to date, relative to the capital baseline and operational plan.
- Forecasts and predictive analysis of future risk reserve allocation. These will be informed through routine forecasts and change control early warnings and assessment of wider risks across the portfolio.
- Recommendations as to whether the status of the forecast is in surplus or deficit and significant drivers of change. This would be accompanied by further recommendation(s) for action to consider releasing reserve for additional investment or other measures in the event of a forecast deficit.

Overall we find that the ambiguity in the Protocol is carried forward into National Highways policy. The policy offers substantial leeway around the type of additional costs that the IDC can approve. The CPM reporting follows the Protocol intent but is hard to understand from the outside and has some flaws e.g. not capturing the type of drawdown and why it is appropriate to the CRR which limits its usefulness for purposes of learning and for how sufficiency can be estimated and assessed.

3. CRR - WHAT HAPPENS IN PRACTICE

In this section we consider how the CRR has been used in practice and whether this is consistent with the intent set out in Section 3. The review is limited to the period April 2020-September 2021; being the first 18 months of the five-year RIS2 period. It is split into two parts:

- A top-down review focusing on use of the CRR in aggregate and sufficiency of the CRR for RIS2.
- A bottom-up sample review of nine projects that have either drawn down from or added back to the CRR which considers NH's internal processes for use of the CRR at a more granular level.

Top down we find that:

- The link to the assumptions made in establishing the CRR has been lost; it is not possible (without undertaking substantial rework) to assess precisely whether the fund has been used to cover the risks anticipated at the outset.
- Internal reporting processes provide oversight of what is spent but not why at an aggregate level, limiting learning for the next road period.
- No aggregate analysis of types of risks generating a request to the fund and tracking use to the Protocol is undertaken at present.
- IDC is not formally tracking the likely sufficiency of the fund over RIS2.

Based on the sample review, we find that:

- Project managers are generally following the procedures for making a request for additional funds to IDC in line with the CRR process; this is not always the case for internal change requests forms or efficiency monitoring.
- There is a lack of understanding of the CRR at project level – project managers do not necessarily know that they are seeking CRR or are returning funds to it.
- There may be insufficient project risk to permit the CRR to operate as a central reserve would typically do.
 - Project risk estimates and uncertainty provision for early-stage projects may be systematically underestimated placing significant pressure on the CRR.
 - Aligned to the concern on cost estimation, project estimates are changing in an unexpected manner (not narrowing over time) such that reporting on sufficiency of the CRR will be problematic until more stability is achieved.
- More could be done to ensure that learning from issues identified in projects is captured in the process and used in planning.

3.1. TOP-DOWN REVIEW

The top-down review draws upon CPM summary papers prepared for IDC, Quarterly Capital Portfolio Investment reports to ORR, briefing presentations, and materials provided by National Highways in response to specific questions.

3.1.1. Use of the CRR

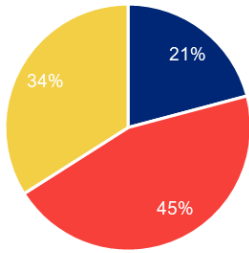
At the start of the RIS the CRR was set at £1,541m. It increased to £1,716 as a result of a pay back for the deferral of the A303. In total, this amount represents ~8.7% of National Highways' total capital investment programme.¹⁶ This is a plausible percentage of investment for a portfolio level reserve assuming that project risk levels are set at appropriate levels.

The CRR is predominantly aimed at the enhancement programme which has a provision of £1,372m. A sum of £185m was provisioned for renewals and £159m is ringfenced to the Lower Thames Crossing project (LTC). Our review focuses on the period to Q2 21/22 i.e. to end September 2021. By that date, 21% of the total CRR had been drawn and a further 45% had been allocated to future drawdowns.

¹⁶ £1,716 (CRR allocation) / £19,755 (RP2 investment forecast) = 8.69%.

Figure 3-1: Composition of the CRR

Central Risk Reserve Summary (% of £1716m total)



■ Approved drawdown (as of Q2 21/22) ■ CRR Provision ■ Remaining

By fund the figures were:

Table 3-1: Status of drawdowns and provisions by fund

Type	Drawn	Provisioned	Remaining
Enhancement	24%	56%	20%
Renewal	19%	0%	81%
LTC	0%	0%	100%

Source: RP2 Capital Portfolio Investment Report. Status Review Quarter 2 (2021/22). These figures do not include the changes from SR21 and **as we explain in Section 3.1.4 below, we consider that the figure for enhancements is ~6%**. In addition the LTC provision was surrendered as part of SR21.

The table shows that between April 2020 and September 2021 National Highways had drawn down or allocated roundly two thirds of the available CRR funding. These results raise a number of questions:

- In aggregate, why was there such a significant drawdown for enhancements early in the RIS and is it consistent with the original expected profile of use?
- In respect of enhancements and renewals what risks is the CRR being used to fund in practice and is actual use consistent with the intent of the Protocol?
- What does a substantial early drawdown/provision from the CRR imply for the sufficiency of the fund over RIS2?

We consider the evidence provided on these points in the sections which follow.

3.1.2. Expected use of the CRR

National Highways has advised that it cannot provide data on the build-up of the CRR originally (without undertaking substantial rework) so the link back to its underlying assumptions and profile is broken. Alongside ambiguity in the Protocol, the lack of audit trail makes it challenging to ascertain precisely what the CRR is meant to be used for. Furthermore, the QRA described is based on enhancements and not renewals, so it is even more difficult to conclude on whether the use has been appropriate on the renewals side.

3.1.3. Drawdown from the CRR

Enhancements

A substantial component of the early provision against the enhancement portion of the CRR was related to ‘known issues that have emerged since 2018 when the RIS funding was set out for the ORR Efficiency Review which occurred in the period between the dSBP and the RIS being set.’¹⁷ The total quantum of this provision is £655m.

While we would expect risks such as supply chain issues post Brexit and the Covid-19 pandemic to have had an unforeseeable impact that could require use of the CRR, we would usually expect projects to be carrying their own provision for more routine aspects of risks such as price inflation. As we note in Section 2, the Protocol and policies that govern the CRR are in the main silent on inflation. There is no audit trail to allow us to ascertain whether this large drawdown represents risk that under the Protocol should properly utilise the CRR.

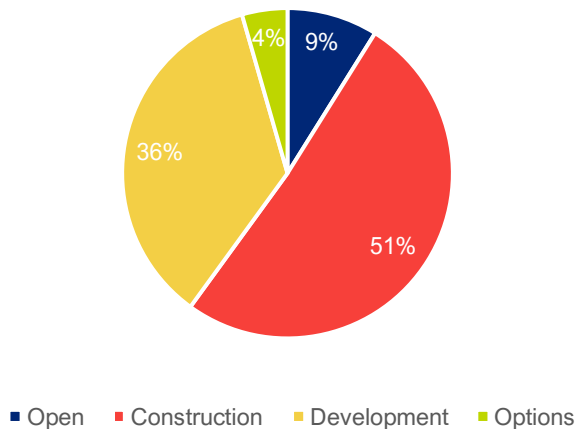
We also note National Highways’ indicate that at the point of the dSPB in 2018 many of its designs were immature, and that by 2020 when the CRR was set the designs and cost estimates had moved on but there was no other source of funds available for a portfolio cost increase of this magnitude and that DfT/ORR accepted the use of the CRR for this purpose. We believe that National Highways’ early estimates should include a more substantial allowance for uncertainty consistent with DfT’s Tag Guidance.¹⁸ This would mean that projects could continue to develop between dSBP and the RIS being finalised without this type of funding gap emerging.

There are also examples of the CRR being used for projects not originally in the RIS (e.g. M49 Avonmouth) with National Highways and DfT not holding a shared view on what source of funds should be used (CRR vs capital headroom). As funder, DfT can choose to make such decisions but if they do ask National Highways to use CRR for unfunded projects, this can further obscure the underlying rationale for accessing a fund like the CRR.

In addition to the CRR fund uses discussed above, numerous enhancement projects have accessed the enhancement CRR such that 80% was allocated or drawn by September 2021. Based on documentation shared with us we can see that drawdowns tend to occur in the development and construction phases (see Figure 3-2 below) which is what we would expect.

Figure 3-2: Stage of development when the CRR drawdown was made

Stage of development when CRR drawdown is made



However, it is not possible to ascertain in aggregate what the main causes of drawdown are or whether those are consistent with the intent of the Protocol. We therefore consider this issue further in the sample review.

¹⁷ RP2 Capital Portfolio Investment Report Review date: 24 June 2021 (Data set: Q4 March 2021) Status Review Quarter 4 (2020/21)

¹⁸ DfT (May 2021) “TAG: Optimism bias workbook” available [online](#).

Renewals

We understand that National Highways' process for accessing the renewals portion of the CRR to be the same as for enhancements in that it requires IDC approval, and that the fund is reserved to portfolio level risks.

In February 2021 a summary paper was brought to the IDC requesting a drawdown of c.£30 million to be enacted as a transfer to the operations budget for 24 renewals projects. The paper reports pressure on the renewals plan for the year noting that this would normally be managed within the renewals programme. It contains no overarching discussion of the reasons behind the inability to contain budget pressure in this instance.

It presents an analysis of a sample of projects with a budget exceeding £1m. It discusses both cost pressures and underspend across the group and demonstrates a net quantum pressure for the sample in excess of £32m (anticipated to exceed £37m by the financial year end). For each example scheme a brief description of the emerging risk/reason for saving is provided. There is no categorisation of these risks by type and no analysis of whether the risks are of the nature reserved to the CRR.

The paper contains no assurance statements, and no change control documentation was provided to us.

The IDC minutes provide acknowledgement of the paper and approval of the expenditure. No further discussion is recorded.

3.1.4. Sufficiency of the fund over RIS2

For IDC meetings, National Highways CPM produces a summary paper, covering drawdowns to date and the requests for decision in the current meeting. This ensures that IDC members have access to high level statistics on the amount of the CRR used and detail on impact of current requests against the total fund. This overarching paper does not provide analysis on the likely sufficiency of the fund over the course of the RIS. Any discussion of these issue is not being captured in IDC minutes that we have reviewed.

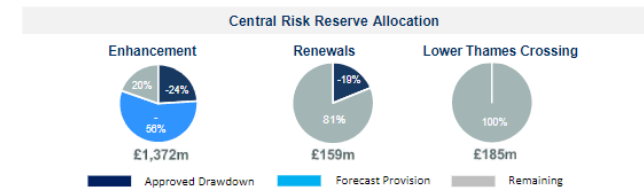
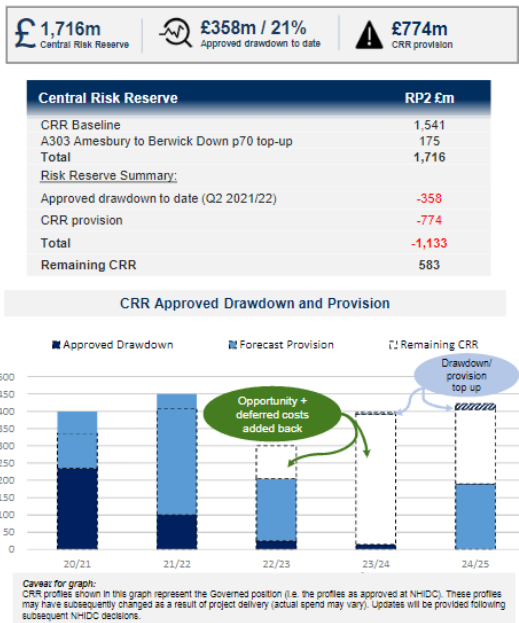
National Highways also produces a quarterly CRR dashboard for ORR in the form set out below:

Figure 3-3: Extract from RP2 Capital Portfolio Investment Report - Status Review Quarter 2 (2021/22)

Central Risk Reserve Summary

Key points:

- The initial RP2 allocated funding included a Central Risk Reserve (CRR) of £1,541m. DCO delays on A303 Amesbury to Berwick Down resulted in £175m being reallocated to the CRR (as previously reported). The CRR allocation is currently £1,716m.
- At the start of RP2 NHDC had 'approved' increases to major scheme projects that allocated a provision against the CRR of £655m. This aligns with the Capital Baseline and largely represents known issues that have emerged since 2018 when the RIS funding position was set out for the ORR Efficiency Review. Following NHDC approvals since the start of RP2 up to the end of Q2, the provision has increased to £774m from £530m reported at Q1, with £583m remaining of the total £1,716m CRR.
- As at Q2 2021/22, £358m is shown as 'approved drawdown to date' and reflects decisions taken through governance prior to RP2 (i.e. CRR governance for drawdown retrospectively). For the CRR provision of £774m, NHDC has yet to approve construction budgets, which is the point at which most will crystallise a drawdown decision.
- As part of Business Planning, the Renewals programme requested c£30m of risk reserve funding - the outcome of which is reflected below.
- Approved CRR requests for drawdown have been offset by further project delays, resulting in a decrease in drawdown from £404m (Q1) to £358m (Q2) and an increase in the provision from £530m (Q1) to £774m (Q2).
- Note the SR21 outcome will decrease the overall CRR, the revised totals will be included in the revised baseline and operational plan and aim to include in the Q3 report.



Source: National Highways RP2 Capital Portfolio investment Report Q2 2021/22

The dashboard provides similar high-level statistics to the summary IDC paper, in an accessible format. It delivers a good overview of what has been drawn or provisioned and provides some insight into the quantum of CRR likely to be available in future years. It does not give an indication of the rationale for expenditure against the Protocol or provide National Highways' assessment or opinion on sufficiency of the reserve over the RIS.

ORR's remit extends to considering efficiency. The quarterly review does not provide information on whether or how the CRR might contribute to meeting or exceeding the KPI target.

The Q2 Capital Portfolio Investment Report shows that £583m remains unallocated in the CRR (i.e. undrawn and un-provisioned) as of September 2021. We understand that this includes £175m of risk funding that was 'added back' to the CRR due to a deferred start of works target date for the A303 (Amesbury to Berwick Down), but which was subsequently surrendered by National Highways during SR21 negotiations with DfT and HMT. As a result, the remaining CRR is reduced to £408m (or 26%), of which £185m (12%) is ring-fenced for the LTC¹⁹ and ~£129 (~8%) remains in the ring-fenced RRR. Although National Highways is still re-planning the portfolio post-SR21, we calculate that £94m was available for enhancement schemes based on the information available at the time of our review.²⁰

3.2. BOTTOM-UP REVIEW - SAMPLE REVIEW

To add detail to the top-down review and to test National Highways' policies in operation we undertook a sample review of nine schemes. A detailed assessment of the individual schemes' use of the CRR is presented in Appendix C.

For each of the schemes in the sample we reviewed:

- The IDC paper.
- The IDC minutes.
- The CRF form and/or Early Warning Notices (where provided).

We also interviewed the Project Sponsors for each scheme with the exception of the A14 where we provided written questions and received written answers.

The sample review covered a number of areas:

- What information IDC receives to inform its decisions?
- How is the information provided to IDC assured? What scrutiny is there of (i) the costs themselves (e.g. consistency with pricing principles), (ii) the steps that have been taken to avoid drawing down the CRR, (iii) alternatives to the CRR (e.g. not completing project and or reducing scope)?
- How this is the information provided to IDC considered? For example, if it meets certain criteria is it accepted? Is there pushback and / or potential for IDC to approve a reduced amount? What happens if / when there isn't sufficient available (or forecast to be available for a given year)?
- The impact of change control and other decisions affecting the funding allocated to the CRR.

3.2.1. Approach to selecting the sample

National Highways provided a list of enhancement schemes which have drawn down or paying back to the CRR. We selected a sample of nine schemes from that list. The rationale for each scheme selected is described below:

- A14 Cambridge to Huntingdon – at ORR's request, CIP Tier 1 scheme.
- M1 Junctions 13-19 – the largest drawdown in RP2, smart motorways scheme.
- M27 Jct 4 -11 – Impact of stopped vehicle detention (SVD) installation, smart motorways scheme.
- A47 North Tuddenham to Easton – Large drawdown in RP2, RIP scheme.

¹⁹ The ringfenced LTC fund was surrendered as part of SR21.

²⁰ ORR subsequently received Q3 2021/22 information from National Highways that shows £134m was available for enhancement schemes due to 'add backs' that were not captured in the data provided to our review.

- A38 Derby Jcts – Large drawdown in RP2, RIP scheme, DCO cancelled.
- A66 Trans-Pennine – RIP Tier 1, accelerated delivery with more construction taking place in RP2.
- A417 Air Balloon – at ORR’s request, RIP Tier 1.
- M3 Jct 9 – to achieve a balance in our sample review, between RIP and SMP schemes, and between schemes in construction and in development.
- Mottram Moor – pay back, overlap with internal audit project sample.

The list of schemes drawing down or paying back to the CRR did not provide detail around the type of risk which had crystallized, information which would have provided a useful means by which to sample. Absent that information, we aimed in our selection to sample a range of scheme types, PCF stages, and regions.

Table 3-2 below summarises the reason for the CRR funding request/pay back for each of the sample review schemes.

Table 3-2: Sample schemes and nature of their CRR funding request

Scheme name	CRR funding request	Reason for CRR request
A14 Cambridge to Huntingdon	[Figure redacted], with principle that any land receipts (forecast as [Figure redacted]) will offset this. In total the RP2 CRR ask is [Figure redacted] as at September 2021	<ul style="list-style-type: none"> • Primarily increased contractor costs
M1 Junctions 13-19	[Figure redacted] for additional Emergency Areas (EAs) and [Figure redacted] for additional construction budget (~21% increase in cost)	<ul style="list-style-type: none"> • [Information redacted]. • Additional vegetation clearance, environmental constraints and associated delays. • Design changes required after more extensive survey work was carried out. • Impacts of Covid-19 on sub-contractor availability and establishing safe working practices. • Installation of 8 additional EAs between J13-16 as part of NHs commitment to address smart motorway safety concerns.
M27 Jcts 4 -11	[Figure redacted]	<p>To enable the scheme:</p> <ul style="list-style-type: none"> • [Figure redacted] of core scheme construction costs arising from lower than anticipated productivity, the impacts of COVID 19 and higher than forecast staff and subcontractor costs. • [Information redacted]. • [Figure redacted] for 5 additional EAs as part of National Highways’ Smart Motorway Stocktake commitments. <p>Of this, it was recommended that [Figure redacted] should be funded from the CRR or capital headroom, and [Figure redacted] to be funded from the Stocktake budget. Consists of a drawdown of [Figure redacted] ([Figure redacted] provisioned)</p>
A47 North Tuddenham to Easton	[Figure redacted] with provision for additional [Figure redacted]	<ul style="list-style-type: none"> • Omitted scope and other additional costs arising post a project pause.
A38 Derby Jcts	None explicitly requested but [Figure redacted] change to the spend profile	<ul style="list-style-type: none"> • None provided in the IDC document. Based on the interview, the [Figure redacted] drawdown related to expressway standards not being

Scheme name	CRR funding request	Reason for CRR request
		finalised. Once Safety Engineering & Standards (SES) defined the environmental engineering standards that were required the budget was revised.
A66 Trans-Pennine	None, noting [Figure redacted] financial 'pressure'	<ul style="list-style-type: none"> Accelerated project delivery under Project Speed initiative.
A417 Air Balloon	None explicitly requested, though implication from the IDC paper is that costs in excess of [Figure redacted] are Portfolio Risk	<ul style="list-style-type: none"> Cost increase, primarily due to having to use national RDP framework.
M3 Jct 9	[Figure redacted]	<ul style="list-style-type: none"> To address the additional works identified through due diligence, enabling completion of Stage 3. [Information redacted] Changes to the traffic models
Mottram Moor	None, the paper seeks a reallocation of [Figure redacted] from the construction to the development stage. Based on current estimates the project will outturn below the RDP budget and will return funds to the CRR.	<ul style="list-style-type: none"> [Information Redacted] Desirable design changes Additional National Highways costs

3.2.2. Summary of findings

For the projects we sampled, we observed that the IDC process itself was broadly being followed. Specifically, Project Managers worked with Project Sponsors to complete IDC templates which were then subject to Subject Matter Assurance across the areas relevant to the project. From the interviews with Project Sponsors, it is our understanding that typically Project Managers and Project Sponsors undertake extensive internal discussions via existing governance arrangement (e.g. project committees, programme committees, and Major Projects IDC) before deciding to take a request to IDC. While these processes may fall outside the formal requirements to request a CRR drawdown, for the sample of projects we reviewed this is embedded business as usual (BAU) activity prior to going to IDC for a change to baseline costs.

According to National Highways CRR management policy, all CRR drawdowns need to go via internal change control and gain approval prior to bringing the request to IDC.²¹ Based on interviews with CPM, it is our understanding that this is not consistently undertaken. Some schemes are coming to IDC at the same time as going to change control, or before going to change control. CPM are trying to instill this discipline with Project Sponsors. For renewals it is our understanding that none of the CRR fundings requests went to change control.

According to interviews with CPM, Project Managers and some Sponsors preparing the IDC paper do not necessarily know they are making a request for CRR funding. This was further confirmed through interviews with Project Sponsors. They know they are asking for a change to their baseline costs or spend profile, but many will be unaware of the source of additional funding. The CRR was bolted on to National Highways existing governance

²¹ The Portfolio Change Control process must be followed to obtain approval to a change to a Project / Programme Baseline before submitting an investment paper for approval to spend against the approved Project / Programme Baseline position held within the Operational Plan. Each investment funding paper submitted to an Investment Decision Committee contains a Summary Table that sets out the approved baseline funding positions held within the Operational Plan and Capital Baseline against which approval to spend requests can be made.

processes - the IDC process and templates were not substantially amended to deal with CRR requests.²² These two factors may explain why in none of the papers is there an explicit justification or rationale provided for using the CRR for a specific type of risk crystallizing or an attempt to disaggregate the increased costs into components which can be mapped to the type of risks the CRR was intended to cover.

There were some further issues we observed from the small sample of IDC papers we reviewed, specifically:

- The papers often cover a number of issues requiring IDC's attention. We found most papers had a headline issue which may or may not be driving the CRR request. Where the headline issue was driving the CRR request e.g., poor contractor performance, change to the traffic model, etc., there were frequently other very relevant drivers to the CRR request (e.g. desired design changes, omitted costs) and the quantum associated with each including the headline issue were not presented clearly, if at all, in the paper.
- The result of which is it is hard to determine based on the documentation alone what is driving CRR requests and the quantum of each of the separate drivers. It is also hard to challenge whether use of the CRR is appropriate for the request because the breakdown for the request and the risks associated with them are not explicitly articulated. This is evidenced by CRR drawdowns being approved covering overspend driven by several issues, only some of which represent what we regard as an appropriate use of the CRR.
- Where the CRR request is not specifically stated, it is implied based on a change in the spend profile and/or a change to the operational baseline forecast. There were examples of CRR approvals being made (e.g., A38 drawdown, Mottram Moor, payback) where the drawdown to the CRR is implicitly approved without an explicitly request or an approval contained in the IDC paper or the IDC minutes.
- It was frequently unclear why there is a call on the CRR at all. For example, when costs are moving around in the early stages of development and those changes might later deliver savings in construction.
- Consideration of funding of risks from other sources (e.g. project risk, capital headroom) are not clearly set out in the IDC paper, and so it is not evident why the CRR is the most appropriate source of funding. This is because project sponsors are asking IDC for additional funds and not for CRR specifically. We see this as problematic – a single request to IDC for a specific amount was frequently due to a number of different reasons some (or all) of which may not have been appropriate for the CRR. The breakdown in the value of the overall request by the reason was seldom provided, it is therefore unclear how IDC can determine which source is most appropriate and how a single request might be split by source.
- The assurance statements that form part of the IDC papers help to give confidence that the issues have been tested and challenged but there are some material issues raised in those sections and there is no way of tracking how they are being resolved – as the IDC minutes do not specifically cover those points.

Considering the findings of the sample review in the round we make several further observations:

- If the level of risk held within projects at early stages is more generally ~ 10%, as was indicated in the interviews with some Project Sponsors and later confirmed by risk amounts by project over time provided for the sample review schemes,²³ there is a risk that some have insufficient risk funding. This seems to have been a factor in the early large drawdown for change between the dSBP and RIS as discussed in the top-down review. Clearly the level of funding allocated to risk and uncertainty will vary by project stage as we discuss in introduction, but the sample review included projects that are some way from having a firm and fixed design for a single option and we observe that they had no larger provision than was the case for

²² We understand the IDC template has been updated to accommodate the CRR but we have not been provided with side by side templates to compare.

²³ National Highways provided us with project risk amounts by scheme which we divided by the Most Likely Estimate at that stage of design. We found that project risks percentages ranged from 5% to 17%. There also appeared to be no relationship between scheme maturity and the amount of project risk held.

more developed projects. If early project estimates are systematically low, then the pressure on the CRR will be large and use of the CRR may become inevitable unless projects can be dropped, deferred, or de-scoped.

- We also observed large fluctuations in the range on project budget estimates which rather than narrowing over time as would be expected, was increasing. We requested follow up data on all the sample review projects on this point which confirmed this trend for the projects we looked at. It is not clear to us why this is happening, but it needs to be understood because the value of any reporting of CRR use and sufficiency that National Highways adds as a result of this review relies on their being a degree of stability (or at least consistency with expected practice) in the projects which make up the programme.
- It is unclear how the IDC discriminates requests from any other in terms of priority e.g. importance/significance. As CRR diminishes the IDC members will have no choice but to defer, cancel or de-scope schemes or seek further Government funds. This seems likely to incentivise early application as projects are able to secure funds on a first come first served basis.

The implication of these observed issues is that it is not necessarily the case that when project data is rolled up, summary reports provide insight that forms a sound foundation for planning.

4. EFFICIENCY

In this section we review the practical implications of the CRR for the reporting and monitoring of Efficiency KPI performance; and identify and examine any challenges for the monitoring and reporting of efficiency where there has been a funding change or use of the CRR.

We found that:

- The link between expenditure on the RIS2 improvement schemes, CRR and the efficiency KPI is challenging to monitor.
- We found no evidence to show that CRR has been used so far to improve embedded efficiency performance at the expense of portfolio risk management. But the perceived risk is real, because in practice use of the CRR is not limited to portfolio risk.
- For ORR, monitoring National Highways' progress towards the embedded efficiency target is made additionally challenging because 70% of embedded efficiencies in the enhancements portfolio will be claimed in the final year of RP2, assuming no further slippage in the Major Projects portfolio.

Therefore, for ORR's monitoring purposes, we conclude that the link between the CRR and embedded efficiency is broken in its current form.

4.1. EFFICIENCY CONTEXT

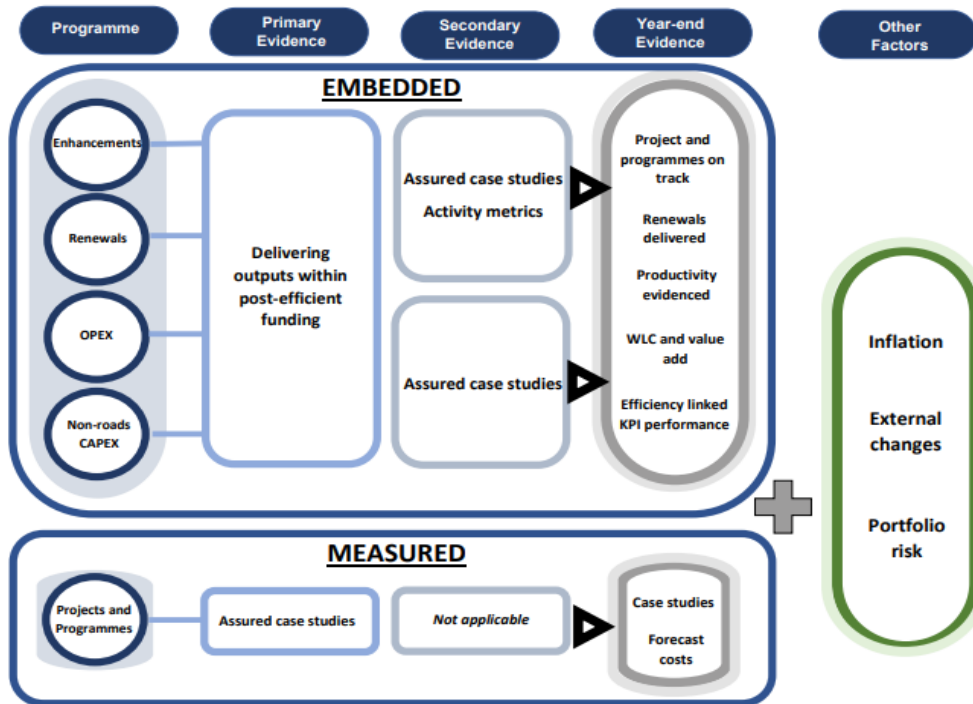
National Highways has a *Total Efficiency KPI* target of £2.23bn, which must be delivered by the end of RP2. ORR monitors and assures National Highways' performance against the RP2 target and annual 'efficiency milestones'.²⁴

The Efficiency and Inflation Monitoring Manual (EIMM), defines how National Highways must evidence efficiencies, based on a set of principles agreed between National Highways, DfT and the ORR. There are three 'categories' of efficiency which contribute towards National Highways' KPI performance:

- **Embedded efficiency.** Applies to activities with a defined scope or output, which are funded as post-efficient costs. Where National Highways delivers outputs within the post-efficient funding envelope, this provides 'primary evidence' of the delivery of the embedded efficiency, but it must also produce 'secondary evidence' in the form of assured case studies and activity metrics.
- **RP2 Generated Efficiency (measured).** Applies to activities where the scope or output could not be defined with confidence prior to the start of RIS2, and where the main efficiency benefits will be realised in future road periods.
- **Carryover efficiency (measured).** This reflects efficiency-improving activities undertaken during RP1 that reduce costs in RP2.

²⁴ The annual efficiency milestones are not 'regulated outputs' but are reported for monitoring purposes.

Figure 4-1: Efficiency KPI requirements and sources of evidence



Source: Highways England (July 2021) “Highways England Efficiency Report” available [online](#).

Of the £2.23bn RP2 Total Efficiency KPI target:

- £559m is embedded efficiency within the RIS2 enhancements portfolio; and
- £592m is embedded within capital renewals.²⁵

National Highways set a £233m Total Efficiency milestone for 2020/21, which it achieved – delivering £243m of total efficiency, of which £91m was embedded.²⁶ The capital enhancement programme contributed minus £8.2m to the 2020/21 efficiency milestone value – i.e. there was a net overspend. The renewals programme contributed £5.8m to the 2020/21 efficiency milestone value, in that National Highways over-delivered on its outputs for the year (in part because it drew on the RRR), but it also overspent its post-efficient funding by £26.6m.²⁷

4.2. HOW THE RELATIONSHIP BETWEEN CRR AND EFFICIENCY IS INTENDED TO WORK

There is intended to be an explicit link between the CRR and the Total Efficiency KPI, because it was agreed between National Highways, DfT and ORR that as a general principle any “unspent portfolio risk allowance at the end of the road period would represent an efficiency”²⁸ net of any external changes to the RIS2 programme (which we assume to mean RIS outputs removed from or added to the programme). This is because the CRR was intended to reflect portfolio-level risk and was therefore included within a post-efficient aggregate funding envelope. If there is any residual funding in the CRR at the end of RP2, it will be added to Total Efficiency for RP2. But National Highways told us that, in practice, its planning assumption is that the CRR will be spent in full.

For enhancement projects, ERR that is ‘drawn down’ by projects with insufficient approved funds is added into the scheme’s approved (or ‘governed’) capital baseline, against which embedded efficiency is measured. A similar principle applies to renewals and the RRR, but we understand that National Highways monitors renewals efficiency

²⁵ A further £296.9m is embedded in operational, business and maintenance expenditure (opex); and £145.8m is embedded in non-roads capex.

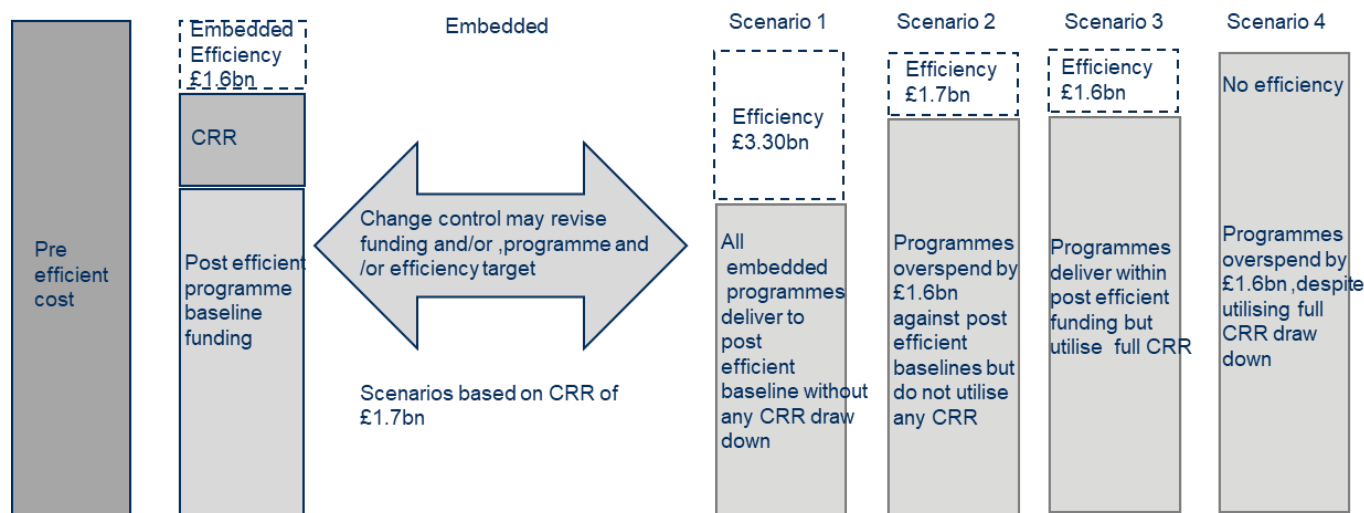
²⁶ Over half of the £243m realised in 2020/21 is ‘Carryover’ – i.e. efficiency created in RP1 that is reported in RP2.

²⁷ Highways England (July 2021) “Highways England Efficiency Report” available [online](#).

²⁸ EIMM 4.2.1 and 310121 Efficiency Principles paper -draft for discussion.pdf.

at a portfolio level because renewals schemes are much smaller than enhancement projects on an individual basis. Therefore, in theory, transfers between the CRR and individual capital baselines will be neutral at the end of RP2, because CRR transferred into the scheme baseline will increase embedded efficiencies / reduce embedded inefficiencies, but will reduce the residual amount of CRR that can be added to *Total Efficiency* at the end of RP2.

Figure 4-2: Two-way movements between the CRR and post-efficient programme baseline funding



Source: National Highways “CRR impact on efficiency reporting.pptx”.

The RP2 Efficiency Principles paper²⁹ sets out the rules that determine when National Highways is able to claim embedded efficiency:

- Where schemes with embedded efficiency open for traffic (OfT) in RP2, efficiency contributions are reported in the year they open.³⁰
- Schemes which OfT in RP3 monitor efficiency in-year and report formally at the end of RP2.³¹
- Schemes which had been assumed to have no embedded efficiency in RP2, including those which OfT in RP1 or RP2, report any variance to baseline in the year the scheme OfT or in line with annual baseline.

Based on National Highways’ current forecasts for OfT milestones, around 70% of embedded enhancements efficiencies will be realised in the 2024-25 – the final year of RP2. The equivalent figure for renewals is 35%, but almost two-thirds of embedded renewals efficiencies will be realised in the last two years of RP2. ORR and National Highways agree that the impact on (embedded) efficiency reporting at the end of the RP2 is straightforward, although the process to adjust reported efficiency for additional RIS outputs and re-baselining the CRR post-SR21 has not been agreed and the basis on which this would be done is not written down.

ORR is concerned that it is more challenging to monitor progress towards embedded efficiencies on an annual / forwards-looking basis, because there might be a presentational incentive to use the CRR to reduce or remove forecast inefficiency, especially in the first half of RP2. It cited the example of the A14, where early discussions with National Highways led to an expectation that the scheme would report a large inefficiency in the final year of construction, but this was subsequently reduced after a CRR drawdown (see Section C.1 of Appendix C).³²

²⁹ Marked ‘Draft for discussion’.

³⁰ Three schemes OfT in 2020/21, but none had embedded efficiency milestones. These were the A61 Westwood roundabout; A500 Etruria; and A14 Cambridge to Huntingdon. The A61 paid back to the CRR [Figure redacted], but the A500 [Figure redacted] and A14 [Figure redacted] have drawn down on the CRR.

³¹ Several RIS2 enhancement schemes fall into this category. Of those included in our sample review, examples include the M3 Junction 9 scheme, the A57 Mottram Moor Link Road, and the A66 Northern Trans-Pennine upgrade.

³² The IDC paper flags a range of issues, primarily an increase in construction costs incurred [Information redacted] in excess of the maximum potential ‘pain’ caps; but also smaller increases in non-recoverable VAT and Lands costs.

4.3. HOW THE RELATIONSHIP BETWEEN CRR AND EFFICIENCY WORKS IN PRACTICE

Based on what we have seen, the implications of CRR for efficiency reporting are as expected: none of the schemes which have so far OfT in RP2 had embedded efficiencies, and the majority of ERR has been allocated to schemes which OfT in the latter years of RP2, so National Highways cannot claim embedded efficiency on these schemes until future years. But usage of CRR on those RP1 carryover schemes which have OfT to date (e.g. the A14) has been factored into the calculation of over/under-expenditure, and therefore was taken into account in the 2020-21 milestone reporting.

We agree that the implications of CRR usage for annual efficiency monitoring is challenging. We found no evidence amongst the IDC papers that we reviewed to suggest that CRR has been used to improve the reporting of embedded efficiency performance at the expense of the CRR's main purpose as a portfolio risk management fund. However, we also found that several of the schemes in our sample review had used CRR to fund additional costs that did not meet an objective definition of portfolio risk; and that National Highways did not seek to split out the impact on embedded efficiency reporting between the materialisation of portfolio risk and that which is general project overspend.

To further illustrate this point:

- Each enhancement scheme must submit an MS Excel-based 'Major Project Change Control' form when applying to IDC for additional funds. Each form has an 'Efficiency impact' tab which should be completed with the impact of the additional funds on the Efficiency KPI. We did not find any examples in our sample review where the 'Efficiency impact' had been usefully calculated. As long as the efficiency category is embedded, and the project manager assumes that a CRR allocation is approved, it is assumed that the additional cost impact on efficiency is zero.
- In practice, National Highways has approved the use of CRR to fund additional, unanticipated expenditure in the financial year 2020-21 even though it did not need to, because it subsequently reported an in-year capital underspend of £173m in 2020-21, mainly due to enhancement scheme slippage.³³ We also understand that National Highways was forecasting a capital underspend for 2021-22 as well³⁴, although ORR now expects some of that underspend to have been removed via the SR21 settlement. Nevertheless, use of capital headroom or 'capital flex' would have reduced the pressure on the CRR, and therefore it seems likely that there is scope to learn financial management lessons from the first two years of RP2.

We note that the assumption that the impact on embedded efficiency is zero when the CRR is used is not contrary to the 'rules' or 'principles' that govern the CRR of the reporting of efficiency. That is because neither the EIMM nor the RP2 Efficiency Principles³⁵ contain rules which would require National Highways to determine whether the capital baseline should be updated for efficiency reporting purposes, depending on whether the CRR was used for portfolio risk or some other category of risk.³⁶ Therefore, we find that the controls over the embedded efficiency baselines could be strengthened, to ensure that the *Total Efficiency* metric is a better reflection of efficiencies actually achieved, and to address the perceived risk that the CRR could be used to improve reported performance at the expense of portfolio management.

Finally, we note that whilst National Highways has set internal milestones for embedded enhancement and renewals efficiencies against which ORR can track progress to date, the current Major Projects portfolio is so back-end loaded (with significant slippage risk around the final year of RP2) that forward-looking monitoring using the embedded efficiency metric is not possible in any meaningful sense. We suggest that all parties (National Highways, DfT and ORR) might learn from this experience.

³³ ORR (July 2021) "Annual Assessment of Highways England's Performance: 2020-21" available [online](#).

³⁴ CEPA analysis of National Highways' RIS2 Capital Portfolio Investment Report: Status Review Q2 2021/22.

³⁵ 310121 Efficiency Principles paper - draft for discussion.pdf

³⁶ See Highways England (July 2020) "Efficiency and Inflation Monitoring Manual (EIMM)", Section 5.2.2, p12, available [online](#).

5. COMPARISON WITH OTHER SECTORS

In this section:

We examine what companies in other regulated sectors do to manage portfolio level risk. Specifically we looked at Network Rail, Crossrail and TfL. We describe the approach of each in turn below.

In considering the approaches that others are using it is important to recognise the differences in their circumstances compared with National Highways before determining whether their approach is suitable.

We find that the comparator organisations:

- Embed and prioritise **discipline** in the management of their reserve. This includes using their reserves for the risks they are meant to cover and reporting on how use compares with expectations. This allows them to **actively manage the reserve** based on strategic business decisions rather than on a first come first serve basis.
- Provide **incentives** to mitigate risks using standard project management techniques before calling on the reserves.
- Recognise that risk levels vary through the stages of the project life cycle, and rely on standard risk and uncertainty provisions where top down or bottom up QRA is not available.

Each of the comparators below utilise a different approach to managing risk, aspects of which are relevant to National Highways. There is no one size fits all approach and therefore the notion of “best practice” is difficult to apply in this situation. We do however consider that the clarity and discipline with which these entities manage their risk reserves are particularly relevant for National Highways.

While we did not prepare a detailed case study on the CAA its approach to capex governance at Heathrow may provide an interesting option for consideration. CAA splits the portfolio into development capex and delivery capex. Development capex is for schemes in the pre-investment decision gate, delivery is for capex thereafter. Development capex is notionally a block of funds that is broadly assigned to a pre-agreed group of projects that are in development. It is set at a predicted P80 level to allow for uncertainty of scope and design. In 2016 when we looked at these governance arrangements there was no formal business case methodology being applied, but in theory a P80 cost estimate and the establishment of a required business case CBA level could govern these projects. Delivery capex is for projects that are investable - single design ready to progress through procurement. Allowances for these projects are set at P50 and CPI/SPI are used to monitor progress.

In the sections which follow we summarise the approaches taken based on public documents and interviews with staff in each organisation, however they have not been independently verified by the organisations themselves. We draw out aspects that we consider to be relevant to the findings that we have set out in previous sections, and we reference these in our conclusions and recommendations.

5.1. NETWORK RAIL

Context

Network Rail’s financial settlement for CP6 covers Operations, Support, Maintenance and Renewal (OSMR) expenditure, and includes contingency funds to enable it to manage financial risks.³⁷ These contingencies are not limited to ‘portfolio risk’ but were generally intended to cover higher than anticipated cost pressures and/or reduced income, which would otherwise force Network Rail to cancel the delivery of activities, reduce outputs and lead to inefficiency.

Network Rail’s confidence in delivering its plans, based on the proposed expenditure levels, was around:

- P45–P55 with no risk funding, on the principle that each region should be funded such that their plan is deliverable within budget in at 50 per cent of scenarios.

³⁷ Network Rail’s CP6 settlement does not cover enhancement projects, which are separately funded.

- P60 after the allocation of £600m of risk funding to be controlled by the routes.
- P80 with the additional provision of route-held 'contingent asset management funding' (£856m) and a centrally held group portfolio fund (£856m³⁸).

Route-controlled risk funding was intended to provide the Routes with some 'headroom' over and above their plan to respond to uncertainty, so that they do not face the frequency of re-planning issues experienced in CP5 and are better able to provide a stable work programme.

Contingent asset management funding is programmed into route plans as expenditure on projects that can be cancelled or delayed relatively easily (and without safety consequences) if risks do materialise, thereby creating additional 'headroom' over and above the route-controlled risk funding. Asset condition and performance improvement targets are raised if those risks do not materialise.

The centrally held group portfolio fund was intended to provide headroom for risks which are best managed at portfolio-level.³⁹ The group portfolio fund has been used to fund corporate / strategic initiatives, for example Network Rail has decided to take a different approach to earthworks and structures management.

ORR notes that Network Rail has used £1.8 billion of net risk funding (out of ~£2.6 billion) in the first two years of CP6. Despite ORR's concern about the relatively low level of remaining risk funding for years 3 to 5 of CP6, the risk funding approach is perceived to have worked quite well at mitigating the impact of Covid-19 risks⁴⁰, inflationary pressures and other unanticipated costs.⁴¹

Network Rail regularly updates its risk modelling to monitor the deliverability of the plan within available funding.⁴² It has consciously decided to release risk funding to use it for 'discretionary' initiatives, where it is not required to fund emerging risks.⁴³ But it does not allocate group portfolio funding to projects and programmes 'in-year'. Decisions over discretionary release of risk funding are made for future years via the company's business planning rounds, to maintain control and make more conscious decisions over the use of risk funding.

Key observations

- **Headroom.** There is more headroom in the Network Rail plan because it is funded to P80, but also because the CP6 Final Determination required a plan for works that could be deferred if needed.

As we have said in our previous work on risk funding for ORR, the degree of required risk funding is ultimately a judgement call.⁴⁴ Higher risk funding for National Highways (e.g. to P80)⁴⁵ would reduce the need to request additional funding or to defer/cancel activities as risks materialise. On the other hand, it would mean that a larger share of public funds would be tied up with National Highways and may ultimately prove not to have been needed. Put another way, the suitable level of risk funding for National Highways depends on the government's appetite to absorb cost pressures should costs escalate over and above the

³⁸ 2017-18 prices.

³⁹ Network Rail told us that this could include project 'slippage risk' because this is more challenging to model appropriately at a project level, and because small delays can have a large impact on scheme milestones. This is because opportunities to access the rail network need to be carefully managed and restricted, to maintain operational performance.

⁴⁰ Largely driven by lower than expected property income.

⁴¹ For example, it has spent ~£1 billion of risk funding on additional earthworks expenditure in response to the Carmont derailment in 2020; higher than expected regional and national functions expenditure such as additional weather related expenditure and fatigue management expenditure; higher track and signalling rates; and additional business rates.

⁴² Network Rail's February 2021 forecasts show that its confidence level in delivering its CP6 plan within available funding has decreased from 80 percent to 71 percent.

⁴³ For example, it has spent a further £0.7 billion on additional renewals and maintenance volumes; a track worker safety programme; and a package of train performance improvement initiatives.

⁴⁴ CEPA (April 2018) "Review of Network Rail's approach to financial risk assessment and management in its strategic business plans for PR18" available [online](#).

⁴⁵ National Highways told us that the RIS2 funding envelope was set at broadly P60 to P65.

SoFA, or to accept the implications of delayed/deferred works and missed RIS commitments for network sustainability and performance.⁴⁶

- **Stability and maturity.** The contingency funds have enabled Network Rail to absorb cost and revenue shocks without having to undertake disruptive re-planning at Route-level. The funds were not explicitly linked to particular types of risk (e.g. portfolio risk) at the time of the PR13 determination.

But there was a general understanding that the Route's plans should be sufficiently mature that the P50 estimates were robust and projects were adequately funded for project-level risk; schemes at an earlier stage of design had much larger optimism bias percentages applied to base costs, but the overall 'core' programme should be P50.

It was also understood that that the group portfolio fund was for portfolio-level risks and risks that are managed less well at the project/programme-level.

- **Risk monitoring and strategic decision making.** Network Rail is regularly re-running its risk models to track emerging risks and monitor the degree of confidence that it will deliver the plan within available funds. This ongoing, quantitative monitoring of risk enables it to make more conscious decisions about release of risk funding for strategic priorities (e.g. track worker safety). There is an opportunity for National Highways to learn from this by having a clearer link between its QRA exercises, its ongoing monitoring of risk, and its strategic decisions to allocate risk funding.
- **Slippage.** To reduce the probability that it underdelivers whilst also accessing risk funding, Network Rail mandated the routes to improve their forecasting of slippage. Network Rail's baseline plan is deliberately overprogrammed on the evidence that a portion of the work programme has a historical tendency to slip; it also ensures that the routes factor in capacity to undertake reactive works, to reduce pressure on the programme.

Rail Network Enhancements Pipeline

Further to the CAA/Heathrow capex governance process described above, we note that DfT has also moved away from funding rail enhancement schemes at a point in time where cost estimates are very uncertain.

This is because several previous reviews into Network Rail's planning and delivery of the CP5 enhancements programme (2014 – 2019) found that costs increased significantly on several enhancement projects compared with Network Rail's initial estimates, and that over half of the total portfolio of enhancement projects (or 60% of projects by volume) had 'uncertain' costs when the 2014–2019 programme was agreed.⁴⁷ In particular, the Bowe Review concluded that significant and complex upgrade schemes (in which planning and delivery may extend well beyond the duration of a control period) would benefit from focused and bespoke governance, and recommended that DfT consider whether major route enhancement schemes should continue to be tied to the periodic review cycle or whether they should be handled under bespoke arrangements.⁴⁸

In response to the Bowe Review, the government separated rail enhancement projects from the five-year price control cycle and implemented the Rail Network Enhancement Pipeline (RNEP) approach. The RNEP is "*a rolling programme of investment, with clear options and decision points, to ensure that projects are progressed in defined stages, subject to a review of their readiness to move forward to the next stage, and the benefits they are on course to deliver for users and the taxpayer.*"⁴⁹ In effect, the new 'pipeline' approach requires that DfT and Network Rail only make a committed decision to deliver a project "once it has reached an appropriate level of maturity" and

⁴⁶ The implications of delayed delivery on the rail network can be significant because to ensure the continual operation of the network, there are limited windows for engineering access to the network. DfT might consider whether the implications are more or less significant for the delivery of highways schemes.

⁴⁷ National Audit Office (September 2015) "PAC memorandum: Planning and delivery of the 2014–2019 rail investment programme" available [online](#).

⁴⁸ DfT (November 2015) "Report of the Bowe Review into the planning of Network Rail's Enhancement Programme 2014–2019" available [online](#).

⁴⁹ DfT (March 2018) "Rail Network Enhancements Pipeline: a new approach for rail enhancements" available online.

there is reasonable certainty on the final construction costs (and evidence of assurance and contingency – i.e. the final budget for the enhancement) and delivery schedule.

5.2. CROSSRAIL

Context

Establishing risk funds

Crossrail moved from top-down estimates of risk amounts to detailed QRA in 2009, when preliminary design had been completed and Royal Assent received (i.e. similar to moving from PCF4 to PCF5 in National Highways). Top-down estimates of risk amounts were c.55-60% of base costs, and we understand that initial estimates of risk sums calculated by QRA were c. 40%. The evolution of early risk amounts is set out in Table 5-1.

Table 5-1: Risk included within cost estimates (Direct Crossrail works only)⁵⁰

	Sept-2007 (£m)	Jan-2010 (£m)	Dec-2010 (£m)
Construction costs	8,028	9,585	8,694
Risk	4,571	4,928	2,959
Total	12,599	14,512	11,653
Risk as % total	57%	51%	34%

Crossrail's PDA required that risk-adjusted forecast costs (i.e. Estimated Final Costs, EFCs) be used throughout, and that QRA be used at P50 and P80 levels to calculate EFCs. The EFC was used to define Intervention Points: EFCs which, if breached, allowed TfL and the DfT ("Sponsors") to intervene. A hierarchy of three Intervention Points was available (0, 1, 2) with remedies ranging from a remedial action plan (Intervention point 0) to a requirement that the DfT takes ownership of Crossrail Limited (Intervention point 2).

We have been told that this focus on risk adjusted costs enforced a relatively mature approach to and understanding of risk within Crossrail and also in discussion Sponsors: both the Sponsors and Crossrail considered QRA and risk adjustment as business as usual and there were regular discussions about the level of risk anticipated and its main components.

Managing risks

Crossrail used a clear risk allocation, with a hierarchy of Contractor-Project-Area-Programme-Board-Sponsor. This is depicted in Figure 5-1. The Programme risks are most analogous to National Highways' CRR.

⁵⁰ Values from [Crossrail \(nao.org.uk\)](http://nao.org.uk)

Figure 5-1: Crossrail Risk Allocation

Contractor	Project	Area	Programme	Board	Sponsor
<ul style="list-style-type: none"> Contractor owned risks as defined in the contract for example: Contractor and supply chain performance Production rates Change to material and subcontractor prices Impact on local stakeholders Construction quality Contract/ site management Delivery in accordance with approved schedule Contract specific risks 	<ul style="list-style-type: none"> Any risk not allocated to any other party for example: Contractor performance (through pain/gain mechanism) Interface between Contracts within Project Failure to provide timely and accurate information to the Contractor Late design not supporting the construction schedule Interface with third parties at project level Delivery in accordance with Master Control Schedule Inter-contract scope omission (intra-project) Consequences of OCI Unforeseen site conditions 	<ul style="list-style-type: none"> Interface between Projects within Area including: -P2P schedule interfaces, -P2P design interfaces, -P2P site management interfaces. Inter-project / inter Area scope omission Interface between Areas 	<ul style="list-style-type: none"> Catastrophic events connected to our works Failure to obtain timely decisions from CRL Board or Sponsors Railway integration Rolling Stock and Depot procurement Failure to secure global approvals from Industry Partners for design or asset acceptance Failure to provide property and access Failure to procure Tier 1 contractors Financial assumptions and indirect costs 'Extra-ordinary' delivery risks not included within Projects (e.g. Significant ground condition impacts, asbestos, logistics etc.) Construction impact of design including: <ul style="list-style-type: none"> - Design development pre IFC issue - Inaccuracies/ incompleteness/ inadequacy of design - CAT III checking [Design risk allocation under review*] <p>Note: Systemwide Area risks currently retained in Programme</p>	<ul style="list-style-type: none"> Catastrophic events not connected to our works Failure of CRL Executive Strategic relationships with Government, Sponsors, stakeholders and partners Cost overrun in excess of all other funded contingency Unfunded Sponsor changes e.g. Plumstead sidings (or unfunded Material Events) Board instructed scope change Further categories of risk as agreed 	<ul style="list-style-type: none"> Change in scope or execution originated by sponsors Material Event (i.e. Change in law, excess inflation) Failure of CRL or Industry Partners Railway service performance Operations procurements Force majeure

Source: *Improving Infrastructure Delivery: Project Initiation Roadmap Risk Management Module, Infrastructure and Projects Authority, 2016*

Crossrail monitored its use of risk allocation against these specified risks, which were assessed at each level via QRA and rolled up to estimate a total risk amount. Changes to costs and the crystallisation of risks were monitored against these QRA forecasts. Crossrail found that this was a powerful way of representing risks, and allowed it to discuss changes in forecasts and estimates with Sponsors.

Crossrail's structure and funding ensured that the management and mitigation of risks was clearly separated from funding at an early stage. The EFC was effectively compared to funding available via Intervention Points, but the process of risk identification, quantification and management was managed as a separate process with clearly defined processes.

Programme risks were discussed and agreed by a quarterly meeting within Crossrail and reported to Sponsors every 6 months. There were a large number of calls on Programme risks, hundreds during the project.

In terms of lessons to learn or improve, Crossrail felt that their approach to risk had been overly focussed on the delivery within projects and that the high-level integration had had insufficient attention. In practice, sponsorship had been assumed to be "delivery of the contracts to schedule" rather than "delivery of the system". As a result there were gaps between the contracts that were only appreciated late in the delivery process.

In addition, Crossrail tendered many of its main contracts at what was a low point in construction activity. This resulted in very aggressive bids and assumptions from contractors, especially on contractors' assessments of risks. Crossrail did not negotiate these risk positions, which in retrospect resulted in higher likelihood of cost-overruns.

Key observations

- Early use of QRA to evaluate risks and understand changes.** High-level optimism bias was only used very early in the options and design process, with the project moving from top-down % estimates to QRA. The use of QRA to define P50 and P80 forecasts of costs was required by the Crossrail Project Delivery Agreement (PDA).

- **Clear criteria for intervention of Sponsors / Funders.** “Intervention Points 0, 1, 2” were defined, based on forecast costs of Crossrail’s direct works. If the forecast costs exceeded the Intervention Points TfL and the DfT had a hierarchy of options, such as suggesting remedial action plans or discontinuing the project, depending on which Intervention points were breached.
- **High levels of risk included in agreed costs.** Early (2007) estimates of risk, based on top down % estimates of optimism bias, were around 57% of base costs. Initial (2009) QRA suggested risk amounts of c. 40% of base costs, which was refined during the 2010 Spending Review to result in a risk allocation of 34% of base costs.
- **Clear definition of tranches of risks and monitoring against these.** Risks were defined as Contractor, Project, Area, Programme, Board or Sponsor with a clear allocation of risks at each level. “Programme” risks in this hierarchy are most analogous to National Highways’ CRR. Drawdowns and changes in risk amounts available were tracked against the risk allocation at each level to ensure that (i) appropriate levels in the hierarchy were utilised and (ii) the evolution of risks was understood. This was useful in discussions with Sponsors in discussing changes.

5.3. TRANSPORT FOR LONDON

Context

TfL’s investment programme has typically been substantial but the pandemic has resulted in significant change given the loss of revenues and the requirement for emergency funding from Government which is subject to its own set of governance and controls. Here we focus on TfL’s more typical pre-pandemic approach.

Key observations

- **Standard risk provision.** TfL’s investment programme has 22 sub-programmes which range from a single large project (such as the four lines upgrade) to a group of many smaller projects. Risk is typically held within the project and standard levels of risk provision are used in the early stages – 40% at options, 25% at scheme development. As part of approving a single option, a QRA process is undertaken. The QRA produces a scheme specific risk allowance.
- **Considering opportunities.** Alongside the QRA projects are required to develop and estimate the scale of opportunities that exist. Internal assurance processes place some emphasis on the quality of the risk and opportunity analysis to ensure that issues have been considered and costed appropriately. At this point i.e. as schemes move into construction, a project will generally hold the P50 level of funding and the difference between that and P80 is held at the programme level. This gives programme level management the opportunity to recycle funds across the programme as required.
- **Rapid regularisation of overspend.** A project is authorised on the basis of a budget amount. If the project declares an estimate of funds to complete that which exceeds the budget, TfL’s systems require the overspend to be regularised as soon as practicable. Usually this will be done by a reallocation across the programme. If that is not possible, funds will be sought from other programmes or even budget transfers from elsewhere within the business. The process, as for National Highways, is governed through a series of meetings at varying levels of seniority (Director, Managing Director, CFO/Board) for which standard form papers and evidence of need are prepared.
- **Incentives.** TfL has experienced challenges with project managers forecasting and reprofiling accurately. As a result, it has introduced a concept of ‘retiring risk’ the objective of which is to provide an incentive to be accurate in forecasting. Project managers are required to profile risk funds and remove the provision (retire risk) if the project does not use the allocation by the date planned.
- **Discipline.** During the pandemic the management of risk funds has been more challenging as overall funds are limited across the board and there is a real possibility of projects being stopped for lack of available

finds e.g. Rotherhithe Tunnel.⁵¹ At present the focus has shifted to projects that are supported by a real need on an asset management basis i.e. condition necessitates action. There is a sense that the imperative of limited funding has forced a level of discipline and evidence that is not so apparent in more routine circumstances. TfL is in the process of reviewing its risk and governance processes drawing on experience including of the impact of the pandemic.

⁵¹ New Civil Engineer (September 2020). TfL unable to fund Rotherhithe Tunnel upgrade as cost rises to £178M. Available here: <https://www.newcivilengineer.com/latest/tfl-unable-to-fund-rotherhithe-tunnel-upgrade-as-cost-rises-to-178m-29-09-2020/>

6. RECOMMENDATIONS

In this section we considered the approaches of others in the context of capital investment delivery in the roads sector in order to make observations and pragmatic recommendations for the CRR. No one case study example provides all the answers; however they have offered different approaches which DfT, ORR and National Highways could consider in the context of the CRR. While some of the recommendations are based on the benchmarking exercise, the shorter-term recommendations (within RP2) are based in larger part on analysis undertaken on how the CRR has been set up and governed to date.

The recommendations set out below are for ORR to consider in discussion with National Highways and DfT. These can be broadly split into (i) within RP2 modifications to the processes and controls in place for the CRR; and (ii) longer term for RP3.

We think it is important to highlight that while the recommendations below are focused on improving the CRR, there is a larger issue in question around how and where you account for risk. The existence of the CRR cannot fix wider risk estimation issues which we have observed.

We present the recommendations under each of the main areas of investigation from the ITT.

6.1. HOW HAS THE CRR BEEN USED IN RP2 COMPARED WITH THE GOVERNANCE PROCESS AS INITIALLY ENVISIONED?

We have found that National Highways has made a positive step forward from RIS1 and that there has been an attempt to move towards good practice in risk management for RIS2. However, uncertainty has been introduced because the CRR Protocol between National Highways and DfT remains in draft form and there is ambiguity in both the Protocol and National Highways' policies that would benefit from clarification.

DfT's intention as explained to us was that reserving a tranche of RIS2 funds outside of projects would be efficient and could be used to induce discipline. It expected National Highways to introduce policy internally that would make it more challenging to access this fund than would be the case if accessing the risk provision at project level. Based on discussions with DfT we understand that it was expecting National Highways to implement a typical portfolio risk approach (where the CRR is used for risks that are outside of the control of the projects and which impact the portfolio as a whole) but with some acceptance that wider issues might necessitate use of CRR for "potential future issues." However, DfT have not provided sufficient clarity in its various communications with National Highways to formally articulate its intent for the CRR.

Building on the Protocol language, as National Highways drafted its internal policies it created a means to access CRR for 'unforeseen costs' generating license to apply the CRR widely. National Highways is of the view that the CRR may become the last resort fund if project risk is insufficient or exhausted. Projects are routinely putting requests to the IDC for additional funding as they would have previously when there was no CRR. As far as we understand, there are no *additional* hurdles to receiving CRR funding compared with how historical (RIS1) requests to IDC for additional funds were made. So while there are hurdles in the form of programme governance, preparing papers and setting out reasons for a funding request which take time to prepare, the discussions that we have had with National Highways staff suggest that there are not new or strong incentives to avoid asking IDC and (by extension the CRR) to provide funds for cost over-runs. There are also no incentives for applicants to consider whether their request for funds align with what the CRR is intended to cover as they are not requesting funds specifically from CRR – instead, IDC is taking the view on how the cost overspend will be funded and if CRR will be allocated.

In addition, while the Protocol and policy note that if the overall funding in the RIS changes (up or down) the CRR will be re-baselined, the manner in which that would be undertaken is not stipulated. How it would be re-baselined is critical and has implications for the measurement of efficiency.

Although consistent with the Protocol, the governance processes put in place by National Highways require improvements to allow both proper tracking of use and the ability to ascertain whether the funds held in the CRR at any point in time are likely to be sufficient for the period.

Table 6-1: Recommendations on the CRR governance

Short term	Long term
<ul style="list-style-type: none"> • National Highways and DfT finalise the Protocol. In finalising the Protocol, the intent of the CRR should be made clear and any ambiguities in the text should be explained – for example, around the language for “potential future issues”; and the approach to re-baselining the CRR. • Following from finalisation of the Protocol, ORR should clarify that internal National Highways policy documents reflect the Protocol, for example, defining “unforeseen costs”, removing the language in the National Highways policy documents which refer to programme level risk reserves, which as we understand, do not exist. 	<p>ORR should encourage DfT and National highways to ensure:</p> <ul style="list-style-type: none"> • That risk estimation and CRR allocation are internally consistent. This means being clear which risk provisions reside where – what is held at project level versus the portfolio level (akin to the approach of Crossrail). • Subsequently, make the rules for accessing the CRR clear and ensure that they are well understood based on the delineation of risks to avoid the CRR being used substantially for project related cost overruns. • Recognise that risk levels vary through the stages of the project life cycle, and rely on standard risk and uncertainty provisions where top down or bottom up QRA is not available. Getting this right will help avoid a large day-one allocation of CRR funding in RIS3 similar to the £655m allocation at the start of RIS2 and that the CRR can be reserved to risks that it is intended to cover. • Consider the approach to risk funding used by CAA which splits the portfolio between development and delivery. This would see projects in development attracting an optimism bias level allowance for uncertainty but without access to the CRR (before reaching a prespecified gate) or alternatively using P70 for early stage projects noting this is a proxy given early stage projects will not have undergone a QRA. Later stage projects would be funded at P50 based on the QRA for a single agreed design. The CRR could then be restricted to unknowns in delivery – for example exceptional inflation or unanticipated changes to environmental standards.

6.2. HOW HAS THE CRR PROCESS BEEN APPLIED TO PROJECTS THAT HAVE SOUGHT TO ACCESS THE FUND?

The sample review found that project managers are generally following the procedures for making a request to IDC for additional funds as required by the CRR process. However, the requirement to first apply to internal change control and to track the impact on efficiency is not always adhered to.

Project managers do not necessarily understand that they are seeking funding from the CRR, rather they are requesting a change to their spend profile from the IDC. Some IDC papers do not explicitly request funding from the CRR, and approval of drawdowns/provisions are sometimes implicit rather than explicitly approved by the IDC. Having a more explicit link between the request for additional funds and the CRR would require that those seeking

additional funds to articulate why the CRR is the right source for the request, including the type of risk which has crystallised.

Pay back into the fund is not well understood by project managers – this issue is managed at a by CPM. Some of these issues may arise from the fact that the CRR was appended to the National Highways existing governance processes.

We also found that there may be insufficient project risk and uncertainty provision early in the project life cycle to permit the CRR to operate as a central reserve would typically do:

- Project risk included in early-stage estimates may systematically underestimate risk/uncertainty placing significant pressure on the CRR.
- Aligned to the concern on under provision of project risk and uncertainty, project estimates are changing in an unexpected manner (not narrowing over time) such that reporting on sufficiency of the CRR will be problematic until more stability is achieved.

More could be done to ensure that learning from issues identified in projects is captured in the process and used in planning.

Table 6-2: Recommendations on the CRR processes

Short term	Long term
<ul style="list-style-type: none"> • National Highways further develop its internal governance such that, at a minimum, requests for CRR funding are supported by documentation outlining what the request for CRR is for, what risk type(s) the request is for, and the breakdown of costs driving the crystallization of each risk. Under the current process this would require an update to the IDC templates to more clearly accommodate CRR requests. Changes to the template should seek to ensure that no drawdown, payback or provision is implicitly approved by virtue of the inclusion of an updated operating plan. 	<p>ORR should encourage DfT and National Highways to ensure:</p> <ul style="list-style-type: none"> • That there is clarity about the basis of costs in the dSBP and whether/how they will be updated for the RIS (e.g. how scheme costs reflect latest scope, and how inflation will be managed). • That the interaction of slippage in year and use of the CRR is considered akin to Network Rail’s approach. <p>ORR should also:</p> <ul style="list-style-type: none"> • Monitor changes to project baselines.

6.3. ARE THERE SUFFICIENT FUNDS IN THE CRR FOR THE REMAINDER OF RP2?

We found that the link to the assumptions made in establishing the CRR has been lost; it is not possible (without undertaking substantial rework) to assess precisely whether the fund has been used to cover the risks anticipated at the outset. Internal reporting processes provide oversight of what is spent but not why at an aggregate level, limiting learning for the next road period.

There is no aggregate analysis of types of risks generating a request to the fund and tracking use to the Protocol is not undertaken at present. IDC is not formally tracking the likely sufficiency of the fund over RIS2. We calculate that there is ~6% left unallocated on Enhancements as of September 2021, which would suggest that further unforeseen costs will be managed via deferrals, cancellations, de-scoping or potentially from projects outperforming their baseline and recrediting the CRR with funds. Renewals are more on track with 81% remaining for the three and half years left in RP2.

Table 6-3: Recommendations on reporting

Short term	Long term
National Highways should be encouraged to collect better data and provide more useful reporting for	<p>ORR should also:</p> <ul style="list-style-type: none"> • Make CRR sufficiency monitoring a requirement.

Short term**Long term**

both internal management of the CRR and external understanding. At a minimum, there is scope for:

- Analysis of drawdowns, pay backs and provisions over time to put the snapshot in perspective.
- More detail on how the CRR is being used – what are the key risks leading to drawdown and the timing of drawdown in terms of PCF stages.
- Information on the source of paybacks – whether these are real savings on projects or deferral/delay to schemes.
- Forecasting of future risk exposure, supported by (but not limited to) a ‘living’ portfolio QRA analysis that should be routinely updated as a means of monitoring National Highways’ level of confidence that it will deliver the specified RIS portfolio within the funds available.

6.4. WHAT ARE THE IMPLICATIONS OF THE USE OF THE CRR FOR REPORTING AND MONITORING EFFICIENCY IN PARTICULAR FOR THE EFFICIENCY KPI?

We found that there is no evidence to show that CRR has been used so far to improve embedded efficiency performance at the expected of portfolio risk management. But the perceived risk is real, because in practice use of the CRR is not limited to portfolio risk. For ORR, monitoring National Highways’ progress towards the embedded efficiency target is made additionally challenging because 70% of embedded efficiencies in the enhancements’ portfolio will be claimed in the final year of RP2, assuming no further slippage in the Major Projects portfolio.

We conclude that in its current form, the link between the CRR and embedded efficiency is broken for monitoring purposes. But we consider that there are options that ORR could consider to address the issues described above. They are summarised in Table 6-4 below.

Table 6-4: Recommendations on efficiency

Short term**Long term**

Efficiency reporting versus portfolio management.

To address the perceived risk that there is an incentive to use the CRR to improve reported efficiency performance (especially during the early years of the Road Period), at the expense of its portfolio risk management function, ORR could provide guidance on the supporting evidence that National Highways should provide before it can claim embedded efficiencies.

On enhancements this would include evidence that, where the CRR is used, inefficient expenditure is excluded from changes to scheme capital baselines. ORR could facilitate this by describing the principles it would use in deciding whether additional expenditure was efficiently incurred, which may differ depending on scheme maturity at the start of RP2:

- For schemes that were in construction before or during the first year of RP2 (i.e. before 31 March 2021), this might include a requirement on National Highways to demonstrate that the additional costs

Monitoring progress towards the KPI target. ORR should consider further how the embedded efficiency monitoring approach could be strengthened; or if the embedded efficiency approach remains fit for purpose in RIS3. ORR might take into account whether the RIS3 plan is also back-ended, and the balance between schemes in construction and those in the options and development phase.

To address the challenge of monitoring efficiency on a back-ended Major Projects portfolio, for schemes in construction ORR could consider whether embedded efficiency (as a component of the Total Efficiency KPI) is more or less useful than the CPI and SPI metrics as ‘real time’ efficiency monitoring indicators.

ORR could also consider whether the CPI and SPI metrics can be ‘tied together’, such that efficiency can be claimed in-year if both the CPI and SPI⁵³ metrics are around 1 or better (see below for recommendation on monitoring changes to the metric baseline).

⁵³ Schedule Performance Index.

Short term

could not have reasonably been foreseen and/or avoided/mitigated – and therefore reflected in the capital baseline – at the time of the RIS2 settlement.

- For schemes that started construction after 1 April 2021, this might include a requirement on National Highways to demonstrate that the additional costs could not have reasonably been foreseen and/or avoided/mitigated – and therefore reflected in the capital baseline – at the time that it made its investment decision (to proceed to construction).
- Schemes which OfT in RP3 but do not start construction in any meaningful sense during RP2 because of delay would not be permitted to claim embedded efficiency in line with EIMM paragraph 5.2.3.

ORR's review of the supporting evidence need not be a complex or disproportionately burdensome process. It could decide to focus its review on schemes with the largest embedded efficiency components. And the review could be 'principles-based' recognising that each project will have a unique set of risks that should be considered on a case-by-case basis. In deciding on the depth of its review, ORR might also take into account whether there is good evidence to suggest that National Highways is likely to deliver the investment programme within the post-efficient RIS funding settlement.

For example, ORR might provide guidance on the type of risk-related expenditure that it considers aligned with the notion of 'portfolio risk' and therefore efficiently incurred (e.g. extreme weather conditions beyond statistical expectations; Covid-19 impact on sub-contractor availability); on risks that it will consider on a case-by-case basis (e.g. contractors and other parties failing to deliver on their contracted obligations); and on risks that it would expect to be inefficient, because they should have been included in the scheme cost estimate (e.g. performance of the project team leads to delays and/or additional costs; inadequate project design).⁵²

For renewals, ORR could require National Highways to analyse how the RRR expenditure is used – i.e. split between portfolio risk; project risk/overspend; additional scope; deliberate over-delivery/bringing forward planned activity. ORR and National Highways would also agree principles to ensure that claimed embedded renewals efficiencies reflect how the RRR is actually used, and whether that use is likely to deliver additional efficiencies over and above that which is embedded.

Long term

For schemes in the options and development stages, we recommend that ORR explores how it should capture the uncertainty around the delivery of future embedded efficiencies; and in that context how it monitors the latest development scheme cost estimates and the range of possible outturn costs around the 'most likely estimate'.

ORR might consider this option as part of its preparation for its future advice to DfT on RIS3 which (if agreed) would formally apply from the start of RP3. However, we also suggest that ORR and National Highways explore whether it could be applied in 'shadow' form sooner.

⁵² Various economic regulators carry out ex-post efficiency assessments in different contexts. In this context, we suggest a 'principles-based' approach which might draw on the general approach applied by Ofgem in the Post-Construction Review of risk-related capital expenditure on electricity interconnector projects under the Cap and Floor regime. See Ofgem (March 2021) "Electricity Interconnectors Cost Assessment Guidance Document" available [online](#), p46-47.

Recognising that ORR would need time to develop the approach suggested above, this option could be implemented from Year 3 of RP2 (i.e. the 2022-23 reporting year):

Metric baseline control. The embedded efficiency calculations and CPI/SPI metric calculations share a similar issue: the metrics are only as good as the change control process. Good practice requires that the 'efficiency' or cost baseline should only be updated for changes in scope or where there is agreement that the increase in scheme costs could not be foreseen and/or avoided/mitigated at the time of DfT/National Highways' investment decision, otherwise the metric is of limited use for monitoring.

The evidence gathered during our sample review suggests that the controls on the embedded efficiency baseline are not working as they should.⁵⁴ To address this, ORR should work with National Highways and DfT to explore whether stronger controls over changes to Efficiency and CPI baselines should be developed, to ensure that the efficiency metrics accurately reflect DfT's intention when it set the Performance Specification.

Given the ongoing work to rebaseline the RIS post SR21, we recommend that ORR encourages exploration of stronger controls in parallel. The aim would be to introduce them before the end of RP2 where possible but they could also be implemented alongside any longer term changes which apply from the start of RP3.

We recognise that setting an efficiency baseline for schemes at the options stage when the RIS is decided is more challenging, but expect that our recommendation on ensuring that there is sufficient allowance for risk and uncertainty in scheme cost estimates would go some way to addressing this issue.

⁵⁴ For example, National Highways has assumed that the use of CRR draw down fully offsets any impact on embedded efficiency on some schemes, despite an increase in costs due to productivity issues. This would appear to meet a commonly understood definition of 'inefficient expenditure'.

APPENDIX A THE DRAFT PROTOCOL

[Information redacted]

APPENDIX B NATIONAL HIGHWAYS LIST OF PORTFOLIO RISKS

Risk category		Risk Title	Risk Description
Imposed risk/opportunities	1	Health & Safety	Changes in H&S regularly occur and even though they are introduced to improve working conditions and safety on site, the impact of them is generally reflected in an increase in the unit costs.
	2	Cultural changes in working hours	The cultural changes in reduced working hours and possible further introduction of EU directives, could result in changes to working patterns in order to maintain construction programmes to time and budget.
	3	Changes in standards (imposed)	Changes in standards resulting from changes in Europe or elsewhere. (Eurocodes in place from 2009). The majority of changes in the standards would be for the benefit of the product and would have little effect when compared on a whole life cost basis. However, the impact to the capital programme would result in the need to undertake additional re-design and increase in the overall construction cost.
	4	Environnemental issues – Noise, Carbon, Ecology	Commitment to address environmental issues including sustainability, carbon reduction, affects of climate change, noise, ecology etc. will have a greater impact with more stringent requirements (including those from standards changes and Environment Agency). There will inevitably be knock on effects to various parts of projects, e.g. carbon design reduction, drainage resulting from greater flooding, cultural changes, sustainability.
	5	Protestors/ Legal challenge	Impact of protectors or legal challenges on projects will result in delays to the projects and increase in overall cost of the project at preparation.
	6	Approach to WebTag, Inc. Traffic Modelling	More sophisticated modelling and analysis of projects may be required to investigate the impact of traffic and cost benefits of projects, resulting in delay to the design.
	7	Sustainability of project management	Problems associated with maintaining a sustainable project management capability gives rise to reduced quality and inefficiencies. Problems relate to lack of experienced resource, demographics and aging skilled engineers.
	8	Changing third party requirements e.g. Network Rail	The ongoing impact of regulation/policy changes introduced by Network Rail and others introducing more stringent requirements for work near or over railways. This risk also covers other various 3rd parties e.g. Britishwaterways, English Heritage, CABE etc. It excludes Environment Agency as EA impact generally covered in Environmental issues above and utilities as covered below.
	9	Changing third party requirements – Statutory undertakers	The ongoing impact of regulation/policy changes introduced by public/private utilities organisations, introducing more stringent requirements, or non-performance of duties gives rise to increased costs and delays to works associated with services.
	10	Sustainability/Capacity of supply chain	Lack of skilled individuals, short fall in capacity of the supply chain, in terms of resource, guidance and leadership would lead to an increase in unit rates and extended delivery times. This is currently not reflected in the inflation values. Greater potential for defects / efficiency. Extended delivery time of projects.
	11	HA lack of knowledge / capability to manage contract / Framework management	There are uncertainties / difficulties associated with managing the various new framework contracts to meet the EDS fast-track timescale. These could result in delays / disruption and additional costs to projects. Also there may be an issue on one contract which has ramifications across the MMS programme. SMART MOTORWAY ONLY RISK
	12	General capacity of client resource	Shortage of HA resource to meet project programme causes delays and costs to development of project. SMART MOTORWAY ONLY RISK
	13	Capacity of design consultant resource	Lack of skilled individuals, short fall in capacity of the consultant supply chain, in terms of resource, guidance and leadership would lead to inefficient working / re-working and extended delivery times of projects. SMART MOTORWAY ONLY RISK
	14	Safety report findings, operational & technology issues affecting design development, construction and commissioning of MMS EDS	This is a composite risk to cover MMS EDS uncertainty related to design, construction, commissioning and handover issues. Re-design of project scope and possible delays to programme, design development/integration of technology and commissioning uncertainties arising from various sources including the safety report requirements, consultation with 3rd parties including emergency services, Technology, equipments, h/s monitoring, safety related matters resulting in changes to design, addressing operational needs, interfaces with MP and NO etc. SMART MOTORWAY ONLY RISK

Risk category		Risk Title	Risk Description
Value adding risks/opportunities	15	Improvement in productivity, lean / Procurement efficiency savings	Opportunity to gain additional savings from projects resulting from lean/process efficiency improvements and use of alternative procurement mechanisms through the supply chain.
	16	Whole life cost / Design for maintenance	Design for maintenance would increase the capital cost of the projects initially, but when based on whole life cost of the asset this would be neutral or beneficial, with reduced impact on the network from reduced maintenance (resource budget)
	17	Managing journey time reliability- Network operations	More stringent traffic management guidelines to assist with journey time reliability, would increase the proportion of night time working, could significantly extend construction periods and reduce productivity. However the overall impact of this would be improved JTR for the travelling public. This would impact the capital expenditure, but it is not monetarily offset against the improvement in the journey.
	18	Impact of technology solutions	Over time the creep of greater technology on all parts of the network being introduced to projects to assist network usage and traffic management, e.g. signs, signals, additional power requirements, will increase cost of design and preparation. Ultimately there may be greater benefits in achieving improved safety and better journey time reliability. TRADITIONAL / CONVENTIONAL ONLY RISK
Time related risks/opportunities	19	Delay in decision making process	A delayed decision by the SoS/ DfT following PI would increase costs of the preparation at the development stage of the project.
	20	Infrastructure planning commission	Introduction of IPC could cause delays to projects in the short term although decision making process could be improved in the longer term.
	21	Government changes in priorities	Changes in priorities leads to delays in project delivery and possible reviews. SMART MOTORWAY ONLY RISK

APPENDIX C SAMPLE REVIEW

[Information redacted]

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APPENDIX E INTERVIEWS

ORR

[Name redacted], Senior Financial Analyst

[Name redacted], Head of Performance (Roads) – Highways Directorate

[Name redacted], Principal Highways Engineer

[Name redacted], Principal Economist

National Highways

[Name redacted], Capital Portfolio Director

[Name redacted], Interim Programme & Project Consultant

[Name redacted], RIS Client Sponsorship Team Leader

[Name redacted], Head of Commercial Intelligence

[Name redacted], Commercial and procurement

[Name redacted], Portfolio Manager

[Name redacted], Development & Sponsorship Director

[Name redacted], South East Smart Motorways Regional Sponsor

[Name redacted], Smart Motorways Programme Regional Sponsor

[Name redacted], Audit Manager

[Name redacted], Director Corporate Assurance

[Name redacted], Director, RIP Programme Sponsor

[Name redacted], Regional Sponsor, Regional Investment Programme, South East

[Name redacted], Regional Sponsor, Regional Investment Programme, East of England

[Name redacted], Regional Sponsor, South West Regional Investment Programme Major Projects

[Name redacted], Programme Sponsor, Regional Investment Programme, North West

[Name redacted], Regional Sponsor, Midlands

[Name redacted], Tier 1 Regional Sponsor, A66 Northern Trans-Pennine

[Name redacted], Internal Audit Manager

[Name redacted], Head of Internal Audit

DfT

[Name redacted], Capital Portfolio, Performance and Governance, Strategic Roads

Comparators

[Name redacted], Director of Risk and Assurance, Transport for London

[Name redacted], Director, Project and Programme Management, Infrastructure, Turner & Townsend on Crossrail

[Name redacted], Group Controller, Network Rail

[Name redacted], Head of Efficiency Monitoring for Rail, ORR



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

 [cepa-ltd](https://www.linkedin.com/company/cepa-ltd)  [@cepald](https://twitter.com/cepald)

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