CEPA

Review of Highways England's Input Price Inflation Proposals

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Office of Rail and Road

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1. EXECUTIVE SUMMARY

The Office of Road and Rail (ORR) is currently in the process of providing advice to DfT on the level of challenge and deliverability of Highways England's plans for the second road investment strategy, RIS2, which will run for five years from April 2020. Highways England has submitted its draft Strategic Business Plan (dSBP) to ORR, which includes a proposed approach to inflation.

ORR asked us to describe Highways England's proposed approach to inflation as set out in the dSBP, and to also describe approaches taken by other regulators.

Highways England's draft inflation proposals split costs into four categories: operating costs, maintenance contracts, electricity costs, and capital works. Our analysis concludes:

- The approach to opex is simple and reasonable.
- The inclusion of maintenance contracts as a separate cost category is atypical, and we have concerns about the proposed assumptions. More evidence and justification are needed to support the proposed approach – it is important that while the assumptions recognise the current contractual arrangements, they do not embed these arrangements (e.g. the use of RPI, as CPI should be taking its place).
- The inclusion of electricity costs as a separate cost category is atypical, and we have concerns about the proposed assumptions. Without further justification we conclude that treatment of these costs should not differ from that of operating costs.
- The proposed approach to capex is complex, involving a range of calculations and combination of various indices, which we have not had access to in preparing this report (e.g. RICS indices are subscriber-only). We consider that an alternative approach (discussed further below) would be more appropriate or ORR could recommend the use of DfT's interim proposal (which appears to use the publicly available ONS construction price indices) for RIS2.
- Highways England proposes an inflation risk premium, of 0.25%, on its capital works allowance. This is to reflect that Highways England receives a nominal allowance, which is in contrast with many other regulated companies in the UK receiving a real allowance which is updated each year for outturn economy-wide inflation and sometimes adjusted for forecast or outturn input price inflation. The lack of precedent or reliable point estimate makes it difficult to determine whether 0.25% can be considered correct or incorrect.

- Highways England[1] apply a 5.0% indexation for the final two years of RIS1 for all renewals and enhancements. We believe that this is in excess of the long-term trend, or any forecasts of their index for renewals or enhancements over these two years. This affects the starting index of all RIS2 capital expenditure. We disagree with this approach. In determining RIS2 values it is appropriate to apply the most up-to-date information to reflect Highways England's actual costs.

We recognise that Highways England has developed a bespoke index in response to the Nichols Review recommendation in 2007 that they should develop an index focused on "*highways construction costs*" (which it recommended be agreed with DfT). There is a balance to be struck between striving for 'perfection' (and the complexity it brings) and taking a simpler approach. Often a simpler approach may be more proportionate. Highways England's approach to capex inflation demonstrates the difficulties of trying to develop a bespoke index. We have not been able to fully assess every sub-index that makes up Highways England's bespoke forecast or the chosen weightings used to combine these into a bespoke index, and so are unable to comment on the appropriateness of the index for use in RIS2. In addition, it has not been agreed with the DfT.

We consider that the balance between accuracy and proportionality for capex inflation forecasts can be more appropriately met through an analysis of Real Price Effects (RPEs) in line with approaches used by regulators such as Ofgem and Ofwat. Where there is a clear argument that an economy-wide index will not reflect the input cost inflation faced by Highways England, a further adjustment would be permitted. Real Price Adjustments (RPAs) are generally accepted in regulated industries and provide important transparency and clarity. Clear criteria for the analysis of RPEs should be established before any adjustment is made and then used to assess and refine any proposed approach. If adopting an RPE-based approach is not considered feasible in the time available, then we consider that DfT's proposed long-term sectoral average (which we interpret as the ONS COPI average) would be a reasonable alternative for RIS2.

Highways England's allowances are given in nominal terms before the relevant RIS period begins, rather than being updated each year for actual inflation, and so any RPA would rely on forecasts of the relevant indices. Other regulated companies tend to be set an allowance in real terms which updates for inflation each year, and the regulator chooses whether to apply forecast or actual RPEs

[1] See Highways England response to queries 0006, 0083, and 0095.

– there seems to be a recent move towards actual RPEs to keep allowances linked to actual costs. This is not an option for Highways England due to its funding being set as nominal values.

Table 1.1 below summarises key points with respect to the approach proposed in the dSBP and provides thoughts on next steps.

Table 1.1: Summary of our key points and suggested next steps

Cost item	Summary of key points about approach	Immediate next steps
Operating costs	Opex inflation is estimated using a CPI forecast of 2.0% p.a. on approximately £3,375m. The proposed approach, of using CPI forecasts, appears to be reasonable – CPI and CPIH are becoming standard.	Ensure the most up to date forecasts are being used.
Maintenance contracts	Maintenance contract inflation is estimated as: CPI forecast of 2.0% p.a. plus 0.76% p.a. on £1,258m. The proposed approach uses historical data, which depends heavily on contracts for which RPI was the standard approach, to provide forecasts for RIS2 when we would expect to see more contracts linked to CPI (or potentially other indices). A more reasonable approach may be to use CPI or to base any deviation from CPI on an analysis of the policy and approach to setting indexation in future contracts. The impact over RIS2 (nominal) is £30m, stated by Highways England as compared to using CPI.	The inclusion of maintenance contracts as a separate cost category is atypical, and we have concerns about the proposed assumptions. More evidence and justification are needed for the proposed approach – it is important that while the assumptions recognise the current contractual arrangements, they do not embed these arrangements (e.g. the use of RPI, as CPI should be taking its place).
Electricity costs	Forecast of 5% p.a. based on historical statistics on the electricity component of CPI, on £146m of costs. The proposed approach, treating electricity as a single cost item rather than including it in the business area where it is used, is unusual. We do not agree with this approach – not least because it is just 0.6% of total RIS2 costs and 1.7% of total RIS2 opex (2.4% if excluding PFI). Electricity costs are included in CPI with a weighting of 1.4% and CPIH with a weighting of 1.7%, so it seems that using CPI/H would reasonably represent electricity costs without	Highways England would have to provide compelling evidence to demonstrate that their electricity costs differ substantially from the measure being used in the relevant business area, whether that is opex or capex. Without such justification, the costs should not be treated separately to the relevant business area.

Cost item	Summary of key points about approach	Immediate next steps
	having to split them out. The impact over RIS2 (nominal) is approximately £12m, compared to using CPI, or £10m compared to the maintenance inflation estimate of 2.76%. Even if electricity should be separated out, we question whether the CPIH component is the correct index to use.	
Capital works	Bespoke index of 3.41-4.75% p.a. on ~£16,848m. Although the Nichols 2007 report recommended using a roads-specific index, we highlight that they also specifically stated that the index should be agreed with DfT. This agreement should be sought on whatever approach is taken, whether that is a bespoke index or a simpler approach. We question the use of a bespoke index, including the application of a 0.25% premium, and have not had access to the inputs to the proposed index to analyse them in more detail. The impact over RIS2 of using the bespoke index instead of the sectoral average is £521m (nominal): £151m on renewals and £369m on enhancements.	Ideally, Highways England would develop a new proposal which focuses on an RPE approach – i.e. how can we expect capital works inflation to deviate from CPI? An RPE may be a preferable balance between complexity and accuracy. If determining a more traditional RPE is not considered possible, or if Highways England is willing to accept the likely lower accuracy of a simpler approach, then an approach such as DfT's interim proposal (using the ONS construction price indices) would be reasonable. Any approach should be agreed with DfT.
	Highways England's calculations apply a 5.0% indexation for the final two years of RIS1 for all renewals and enhancements (RFI 0083 and 0095). We believe that this is in excess of the long-term trend, or any forecasts of Highways England's index for renewals or enhancements over these two years. This value affects the starting index of all RIS2 capital expenditure. The impact of this may be to increase all capital costs by approximately £350m, over RIS2 (if assuming 3.9% as a reasonable alternative) – £90m renewals and £260m enhancements (if removing the £1,411m enhancements already contracted, this falls to £230m – if removing the £4,677m	The approach to the RIS1 indexation should be corrected in line with more reasonable expectations for cost inflation in these two years.

Cost item	Summary of key points about approach	Immediate next steps
	enhancements expected to be contracted by the time RIS2 starts, this falls to £160m). If combined with a reduction in the RIS2 inflation assumption to the DfT interim proposal of 2.7%, the overall reduction is £861m over RIS2 (or to £680m-£815m if removing the contracted enhancements at dSBP/start of RIS2).	

2. INTRODUCTION

2.1. CONTEXT

Highways England's revenue allowances are set as nominal values in advance. This requires that the allowances take account of forecast inflation and results in Highways England taking inflation risk i.e. if inflation deviates from the forecasts and assumptions included in the calculation, Highways England would make gains or losses that may have consequences for its level of output or its efficiency. Different sources have been used for the inflation forecasts since 2010:

- 2000 to 2005: Inflation was set equal to the Treasury forecast of RPI, 2.5%.
- 2005 to 2010: Inflation was set based on a bespoke index. The "EC Harris index" - a composite of an infrastructure index and an output price index.
- 2010 to 2015: Originally intended to be on RPI forecasts, but the Nichols review advised use of an index "designed specifically to reflect trends in highways construction costs."[2]
- 2015 to 2020: Inflation was set based on bespoke indices using Building Cost Information Service (BCIS) data.

Highways England's use of bespoke indices followed the findings and recommendations of the Nichols Review in 2007, which is summarised in Box 2.1.

Box 2.1: Findings of the Nichols Review 2007

In 2006 the Secretary of State for transport requested a strategic review of the Highways Agency (now Highways England) in light of increases in the cost estimates for roads projects, known as the Nichols Review.[3] At the time, cost estimates used the Treasury estimate of RPI. The Nichols Review found that this led to "*a consistent underestimation of highways construction cost inflation*", which led to unanticipated cost increases.

The NAO similarly found underestimating highways construction cost inflation to be one of eight factors which caused the "*biggest increases*" in the construction sector, with other factors including design changes, meeting stakeholder requirements, unforeseen work, and underestimating the complexity of a scheme. To mitigate against such an underestimate of Highways England's input cost inflation in future, the Nichols Review recommended that Highways England develop an index focused on "*highways construction costs*", which should be agreed with DfT. The NAO did not make specific recommendations

[2] Mike Nichols (2007) "Review of Highways Agency's Major Roads Programme" p.34

[3] Mike Nichols (2007) "Review of Highways Agency's Major Roads Programme"

Box 2.1: Findings of the Nichols Review 2007

on inflation or comment on the Nichols Report recommendation for Highways England to develop a bespoke index.

Creating a bespoke inflation index is not straightforward due to the range of factors that must be considered as it is developed, e.g. which input costs to include and the weighting to apply to them, which indices to represent those input costs in the bespoke index, ensuring stability of the index etc. Creating a bespoke index can be as least as contentious as using a readily available economy-wide index like CPI.

The approach for 2020-2025 (RIS2) has not yet been finalised. Highways England has provided its proposals in its dSBP. In Section 4 we discuss Highways England's approach to selecting and applying the bespoke inflation indices.

2.2. Scope of work

ORR requested that CEPA set out Highways England's approach to input cost inflation as set out in its dSBP and compare it to approaches taken by other regulators. Following DfT's provision of a proposed interim index in response to the outstanding issue on inflation identified in the Draft RIS published in October 2018, ORR also asked CEPA to compare Highways England's proposed allowance, to what the allowance would be if we instead applied DfT's proposed interim position.

2.3. Structure

The remainder of this report is set out as follows:

- Section 3 provides regulatory precedent, including assessment criteria for input cost inflation adjustments.
- Section 4 sets out Highways England's approach and assesses it against the identified assessment criteria.
- Section 5 provides our conclusions.

3. REGULATORY PRECEDENT

Before introducing and assessing Highways England's approach, we first set out how other regulators have approached some of the key decisions in indexing regulated revenue allowances.

3.1. CHOICE OF ECONOMY-WIDE INFLATION INDEX

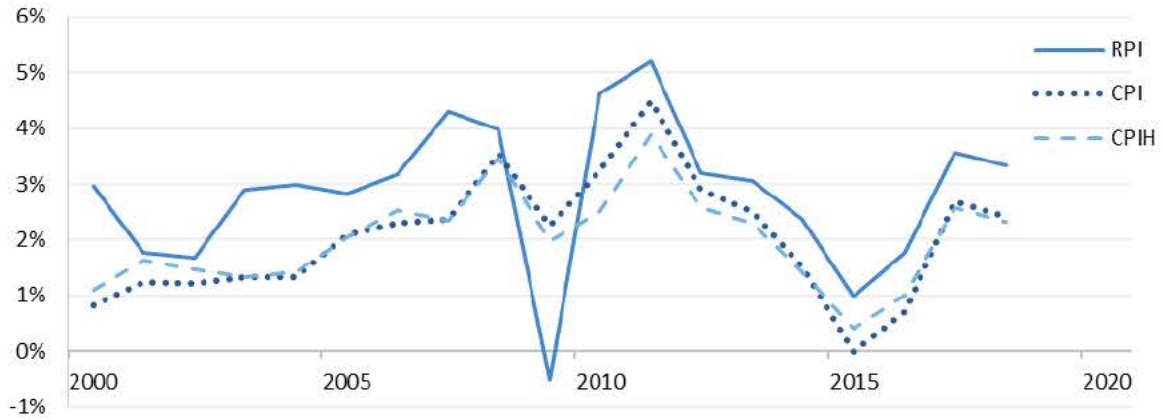
There are three key 'economy-wide' inflation indices in the UK that are relevant to the discussion in this report:

- Consumer Price Index (CPI): CPI is a key inflation statistic in the UK, with the Government targeting a CPI of 2%. The ONS publishes updated values monthly and twice a year the OBR publishes five-year forecasts.
- Consumer Price Index including owner occupiers' housing costs (CPIH): Exactly the same as CPI but with housing costs included, this measure became the ONS' lead measure of inflation in March 2017. Historically, CPI and CPIH are very similar (see Figure 3.1). The ONS publishes updated CPI values monthly but the OBR does not publish CPIH forecasts (their reason is: "as these do not currently affect the public finances").[4]
- Retail Price Index (RPI): This was a leading measure of inflation in the UK, including in the regulated sectors but was de-designated as a national statistic in 2013, regulators and companies have since moved away from RPI to CPI or CPIH where possible, but in many cases RPI is still considered appropriate (e.g. where long-term contracts or index-linked bonds refer to it). The ONS publishes updated RPI values monthly due to its use in public contracts, and the OBR publishes five-year forecasts twice a year.

Figure 3.1 below shows how these three indices compare for 2000-18, over which period the CPI and CPIH indices average 2.0% and RPI averaged 2.7%.

[4] OBR (Mar 2019) "Economic and fiscal outlook" p.44

Figure 3.1: Movements in RPI, CPI, and CPIH for 2000-18. Source: ONS



The 2015 review of consumer price statistics[5] recommended that "*government and regulators should work towards ending the use of the RPI as soon as is practicable*," following the identification of flaws in the measurement which led to it being de-designated in 2013. Table 3.1 sets out how the major UK economic regulators have reacted to the recommendation; all have started to make a move towards using CPI or CPIH, with some employing transitional arrangements where the regulated company's situation increases the inflation risk through an immediate transition. It is now generally considered prudent to use CPI/H where possible.

Table 3.1: Summary of key recent regulators' decisions regarding use of RPI versus CPI/CPIH

Regulator	Summary of any proposed or actual move away from RPI
CAA for Heathrow (Consultation and decision)	The CAA intends to retain RPI but notes that it will eventually become necessary to move to CPI or CPIH for setting all aspects of the price control. It states that it will take a cautious approach on changes to inflation benchmarks, to manage any short-term uncertainty particularly that related to short-term affordability (with higher charges in the short term) and financing concerns (given that index-linked debt predominantly references RPI, with few CPI instruments available).
CAA for NATS	Since 2015 NATS uses CPI, following the legislative framework's transition from domestic to European law.
Ofcom	CPI is used to set fixed and wholesale broadband access charge controls. Ofcom has also set the 2015 mobile call termination charge control and the 2016 leased lines charge control using a CPI-X formulation.

[5] Paul Johnson (2015) "UK Consumer Price Statistics: A Review"

Regulator	Summary of any proposed or actual move away from RPI
Ofgem	RIIO-2 Framework Decision confirms that Ofgem will switch from RPI to CPIH for calculating the RAV and allowed returns. Their December 2018 consultation proposed not phasing the move away from RPI (so 100% CPIH linked from day one of RIIO-2).
Ofwat	There is a transitional approach in the 2019 price review, to recognise that regulated companies may hold RPI-linked debt, but also recognising that CPI-linked debt is expected to become more available. The company's Regulatory Capital Value (RCV) at the start of the control period (April 2020) will be indexed 50/50 to RPI and CPIH, with all new RCV linked 100% to CPIH.
ORR for Network Rail (final PR18 determination and financial annex)	From the start of CP6 in April 2019, Network Rail's Track Access Charges are indexed using actual CPI. Previously ORR set them using RPI, since Network Rail had RPI-linked debt, but since Network Rail has now been reclassified as a government body it no longer accesses the debt markets. ORR chose CPI over CPIH because (1) CPI is used as the Bank of England target; (2) CPI forecasts are more readily available; and (3) CPI and CPIH are historically very similar. They will review use of CPIH at PR23.
Water Industry Commission for Scotland (WICS)	WICS moved from RPI to CPI in its 2014 determination of Scottish Water's price controls for charges from April 2015. The Consumer Forum supported this, stating that customers would recognise CPI as the official UK measure of inflation which is used for many pensions and benefits. Scottish Water does not have access to index-linked debt, and the argument for RPI was less strong. To reduce uncertainty during the transition, the price caps are nominal for the first three years.

3.2. CRITERIA FOR APPLYING INPUT COST INFLATION ADJUSTMENTS

Figure 3.2 sets out four key criteria that must be considered when deciding whether to adjust allowances according to an index, in this case deciding to apply input cost inflation adjustments or a bespoke forecast instead of using CPI/H. We consider these criteria later when discussing Highways England's proposals.

Figure 3.2: Criteria to consider when deciding whether to apply an input cost inflation adjustment

Does the cost category represent a meaningful proportion of the total allowance?	This criterion requires some subjective decision making regarding what the threshold for a "meaningful" proportion is. It is a worthwhile factor to consider – particularly if the available method of applying an input cost inflation adjustment involves significant amounts of work or if the best available index or forecast is unlikely to remove much of the inflation risk.

Can the underlying value be seen to differ to CPI/H over time?	If it meets the first criterion, will applying CPI/H (either as a forecast or throughout the regulatory period) accurately reflect the costs incurred or is the application likely to lead to material gains or losses by the regulated company? In the case of considering input cost inflation adjustments, we also consider whether the value changes differently to CPI/H – Ofwat, when assessing whether to apply input cost inflation adjustments, also considers whether the cost item is an input to CPI/H.
Does an alternative measure exist that reasonably represents the value?	Depending on the approach to applying the index, this may require reliable forecasts or simply a reliable (ideally publicly available) index. This also requires that the measure uses sufficiently diverse inputs such that it is not vulnerable to single items creating disproportionately large fluctuations in the overall measure. Where there is a consistent difference between CPI/H and input costs, it may be appropriate to apply a flat-rate adjustment instead of indexing.
Are movements in the measure uncontrollable for the regulated company?	It is important that the regulated company has minimal ability to impact the measure chosen to represent the underlying value. For example, it is preferable to use a market-wide index rather than using data from just the regulated company. This minimises unintended consequences/perverse incentives.

Source: CEPA analysis

Ofwat has set similar criteria[6] for PR19 (2020-25) to determine whether it is appropriate to allow an adjustment to any individual cost item, and indicated that only cost categories that pass all four of its criteria would be considered for an adjustment.[7]

A regulator can typically choose whether to use a forecast of an index (i.e. to set nominal values for annual revenue allowances in advance, based on forecast values) or to use actual values of the index as they are revealed (i.e. to index the allowance). Regulators may find it most appropriate to use actual values of the index if the movement of an index is difficult to forecast accurately – for example Ofgem used forecast values in RIIO-1 but has indicated that it will use outturn values in RIIO-2 due to issues with inaccurate forecasts. We recognise that this approach is not available for

[6] Key differences are: not including the requirement that a measure exists that reasonably represents the value, and requiring "compelling reasons to think that CPIH does not adequately capture the input price" in addition to there being a difference between CPIH and the relevant input cost inflation. Ofwat focuses on CPIH, its chosen measure.

[7] Europe Economics (2018) "Real Price Effects and Frontier Shift" p.18.

Highways England given that its allowances are assessed and allocated as nominal values prior to the start of each RIS period.

3.3. Adjustments to take into account input cost inflation

Regulators recognise that the costs of operation, maintenance and renewals may not move in line with economy-wide inflation measures, but all apply an economy-wide inflation measure as the starting point for indexing the RAB and revenue allowances. The difference between input price inflation and the economy-wide measure could be material, increasing inflation risk for the regulated company.[8] As noted above, to reconcile the difference between input price inflation and economy-wide inflation, and reduce the inflation risk regulators sometimes include adjustments, which may be referred to as "real price adjustments" (RPA).[9]

RPAs can be set as ex-ante adjustments or as an uncertainty mechanism:

- An ex-ante adjustment to the allowed revenue using historical and forecast RPEs to determine an appropriate estimate/forecast for the difference between economy-wide inflation and input prices. This ensures companies know what rate will be applied in advance but puts them at risk if the actual difference between input price inflation and economy-wide inflation differs from the forecast.
- An uncertainty mechanism, which applies the actual ('outturn') RPAs throughout a regulatory period. This minimises the inflation risk by applying a reasonable inflation measure as the actual values become known, but means firms have to plan using forecasts before they find out the actual values.

A regulator may also choose to apply RPAs set to zero, or to an ex-ante amount, with the agreement that they would re-set the RPAs if the actual figures exceed a pre-determined threshold.[10]

[8] Often, regulated companies will have an allowance in 'real' terms, which is updated for actual inflation each year. This is intended to minimise the inflation risk taken on by the regulated company. Adjustments for input price inflation are sometimes made in advance based on forecasts, or made each year using actual input price inflation. Highways England has fixed nominal allowances through a RIS period, and so is allocated a higher degree of inflation risk.

[9] Ofgem (2014) "RIIO-ED1 real price effects workshop"

[10] CEPA (2018) "Review of the RIIO framework and RIIO-1 performance" p.84

We set out below the approaches taken by Ofgem, ORR (for Network Rail), and Ofwat, including how that approach may have changed since the previous control period.

Ofgem

As indicated previously, Ofgem set ex-ante RPAs for the current RIIO-1 price controls using both historical averages and short-term forecasts (Ofgem refers to these as RPEs). RPAs can vary by company or region of the regulated network. Ofgem constructs trends for chosen price indices which are assumed to appropriately reflect input costs terms, and then applies weights to these based on an assumed proportion of these inputs in the regulated company's expenditure.

To date, the difference between forecast and actual RPAs has resulted in gains for the regulated companies in the RIIO-T1 (gas and electricity transmission) and RIIO-GD1 (gas distribution) price controls, with an approximately neutral effect in ED1 (electricity distribution).[11] This highlights the risks of forecasting errors. Because of these gains from using forecast RPAs, in RIIO-2 there will be an annual update based on actual input cost changes for any categories where Ofgem consider RPAs appropriate. Ofgem has signalled that it will consider wage and construction-linked RPAs in the upcoming price controls.[12]

In the ongoing price controls (RIIO-1), Ofgem applied RPAs to high-level categories of expenditure (opex, capex, repex) as appropriate for that type of company. The allowances were set relative to RPI, the index being used in price controls at the time – as discussed in Table 3.1, Ofgem is moving to CPIH in RIIO-2. The cost categories considered for RIIO-1 RPAs by Ofgem were: [13]

- Labour. The regulated energy companies typically employ highly-skilled staff with wage inflation higher than average, and so it was considered appropriate to include RPAs for labour costs in the RIIO-1 price controls for gas transmission, gas distribution, electricity transmission. Ofgem considered contractors' labour costs in addition to the regulated companies' direct labour costs, and found no reasonable justification for assuming any difference between the two. In their calculations, Ofgem excluded 2010/11 and 2011/12 as anomalies due to the recession.

[11] CEPA (2018) "Review of the RIIO framework and RIIO-1 performance" pp.26-28

[12] Ofgem (2018) "RIIO-2 Framework Decision"

[13] See e.g. Ofgem (2012) "RIIO-T1/GD1: Real price effects and ongoing efficiency appendix" p.8 and Ofgem (2012) "RIIO-T1/GD1: Initial Proposals – Real price effects and ongoing efficiency appendix"

- Materials. RPAs were approved for several types of materials used as inputs to the regulated companies' activities. Ofgem rejected some calls for an RPE for electricity, stating that it is not required "because it constitutes a very low share of network companies' costs (ie less than 2 per cent)". Ofgem highlighted that their RPE analysis focuses on the "important" input prices.
- Equipment and plant. This category was allowed an RPA based on Ofgem's analysis of the relevant indices available.
- Transport. Companies' proposals for an RPA for transport ranged from 0% to 41% over the eight-year price control, but as they do not represent a large proportion of regulated companies' costs, Ofgem chose not to allow an RPE for transport.
- Other costs. These were assumed to grow in line with economy-wide inflation, so had no RPA.

Where possible, Ofgem determined a "notional structure" for each type of company, setting out how total costs would be expected to be split between the main cost categories. This means that the multiple companies of the same type (e.g. the Gas Distribution Network companies) receive the same RPA as each other.

ORR (for Network Rail)

ORR applies an economy-wide inflation measure with an ex-ante adjustment for input price inflation, although it does not refer to these as RPAs. The adjustment was set at 5% per annum for CP4 (2009-14) and ORR found that input prices fell in that period. Recognising the gain made through lower-than-anticipated input prices during CP4, ORR set Network Rail's input price inflation as 0% per annum in CP5 (2014-19).[14] The cost categories considered were labour and materials.

The approach for CP6 (2019-24) is not publicly available, with its limited references to input price inflation including highlighting that IT costs (which were presumably being considered for input price inflation adjustments) are expected to rise closer to CPI than RPI.[15] In its final determination

[14] ORR (2014) "Network Rail Annual Efficiency and Finance Statement"
[15] ORR (2018) "2018 periodic review final determination"

for CP6, ORR stated: "*Whether we link Network Rail's revenue to CPI or RPI, we expect Network Rail to manage its costs efficiently. It should not simply assume that costs change with reference to any index.*"[16] This direction to manage costs includes Network Rail being expected to set fixed-price (or target cost) contracts, rather than index-linked contracts, with its suppliers where possible: a review in 2013 found that 40% of Network Rail's supplier contracts were not index-linked. Of the 60% that were, they mostly referenced RPI or CPI rather than bespoke indices.[17]

Ofwat

Ofwat implicitly included its RPA forecasts in PR14 (2015-20), by including input cost inflation assumptions in its time trends which also included ongoing productivity and other trends.

For PR19 (2020-25) Ofwat is applying similar assessment criteria to those in Figure 3.2 to determine whether a non-zero RPA is appropriate. A cost item would have to meet all four of the criteria before a non-zero RPA may be applied for that cost item. Table 3.2 shows the categories considered for RPEs and a summary of the assessment against the criteria.

Table 3.2: Cost items considered by Ofwat for RPEs in PR19

	Labour	Energy	Chemicals	Materials, plant and equipment
A material proportion of total company costs?	✓	Fail	Fail	✓
Compelling reason to think CPIH doesn't capture the input price?	Fail	Fail	Fail	Fail
Significant likelihood that will differ from CPIH over the price control?	Fail	Fail	Fail	Fail
Are the input price and exposure to it outside of the control of the company in the price control?	Partial pass	Partial pass	✓	Fail
Overall	Fail	Fail	Fail	Fail

[16] ORR (2018) "PR18 draft determination consultation: summary of comments and ORR response" 8.39

[17] Credo (2013) "Network Rail inflation"

Source: Europe Economics (2018) "Real Price Effects and Frontier Shift" Table 0.1

Ofwat ultimately concluded that the evidence was neither sufficient nor convincing enough to justify an RPA for any cost item in the upcoming price control (i.e. all cost items will be indexed to CPI).

4. HIGHWAYS ENGLAND'S APPROACH TO INFLATION IN RIS2

HE set out six key overarching principles that have guided its approach to developing RIS2 inflation proposals, as in Figure 4.1.

Figure 4.1: Highways England's "key overarching principles" for developing the approach to inflation, from the dSBP

> Need to maintain the case for the application of a combination of Highways England bespoke inflation indices and OBR benchmarked indices appropriate to each area of cost.

> That Highways England should accept full 'reasonable' risk transfer on RIS2 inflation risks in preference to a more complicated risk-share arrangement – as such [Highways England] should price inflation risk prudently to avoid future criticism, particularly in light of the 2007 NAO Report recommendations.

> Highways England bespoke TPI and Cost Indices for capital works have been updated by BCIS. These have been issued with some caveats and concerns around the methodology and robustness of forecasting in the current environment and as such a 25bps [0.25%] risk premium has been added to the Cost Indices noting these are still generally lower than market TPI forecasts.

> For capital works, the proposed forecast represents an average reduction of 25 basis points (bps) [0.25%] against the previous profile used, to 3.9% CAGR (compound annualised growth rate). The impact of this change is a circa £200m reduction from the current RP2 plan value.

> For operating costs, this represents a simplification from the previous different profiles used for pay, non-pay and projects. The proposal is that all these costs should be indexed using the Office for Budget Responsibility's (OBR) March 2018 forecast for CPI.

> For maintenance and electricity costs (which form part of operating costs), where it is recognised that CPI does not accurately reflect the inflationary pressures it is proposed that bespoke forecasts are applied.

Highways England's inflation proposals follow three steps:

- Separate the costs into four categories by type.
- Determine the preferred index for each.
- Set a value for RIS2 based on either forecast or historic data for the preferred index.

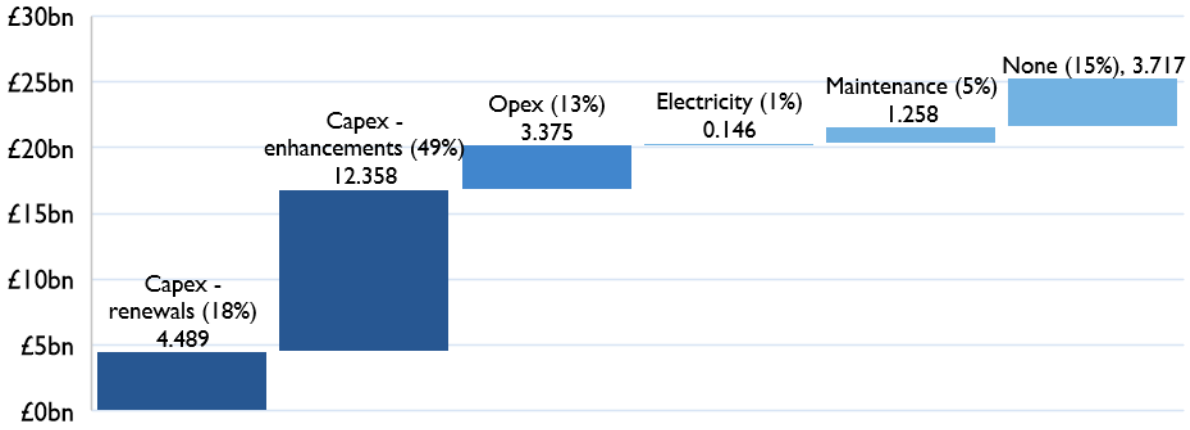
These three steps result in the proposals in Table 4.1.

Table 4.1: Highways England's inflation proposals in the dSBP

Cost area	Selected index	Calculation	RIS2 proposals in the dSBP					RIS2 value (£m)
			Y1	Y2	Y3	Y4	Y5	
Operating costs	CPI forecast	OBR March 2018 forecasts up to 2022/23 (all 2.0%) and the target rate of 2.0% thereafter.	2.00%	2.00%	2.00%	2.00%	2.00 %	3,375
Maintenance contracts	CPI forecast + difference between 'maintenance contract annual cost inflation' and CPI over 2010-18	2.00% CPI forecast plus 0.76% representing the calculated historical difference.	2.76%	2.76%	2.76%	2.76%	2.76 %	1,258
Electricity costs	Rounded average difference between CPIH and CPIH electricity component for 2005-18	5% each year on the basis that: historically, electricity is on average 6.5% p.a., 4.1% p.a. above CPI.	5.00%	5.00%	5.00%	5.00%	5.00 %	146
Capital works: renewals	Bespoke Highways England cost index for enhancements, plus a 0.25% risk premium.	Detailed calculation unavailable. Between 3.41% and 4.57% p.a.	3.41%	3.75%	4.57%	4.25%	3.53 %	4,489
Capital works: enhancements								12,358

Figure 4.2 shows the allowances for RIS2 from the values shown in Table 4.1.

Figure 4.2: Summary of split of RIS2 costs between inflation categories



We discuss Highways England's proposed assumptions and costs categories in the sections below.

4.1. Assessment of chosen cost categories and assumptions

4.1.1. Operating costs

Highways England proposes to link operating costs to CPI forecasts. OBR provides forecasts for five years and publishes an update every March and October. The Highways England proposal uses the March 2018 forecasts, both are shown in Table 4.2 alongside the most recent forecast (March 2019).

Table 4.2: CPI forecasts and Highways England's dSBP proposals[18]

	2020-21	2021-22	2022-23	2023-24	2024-25
Highways England proposals	2.00%	2.00%	2.00%	2.00%	2.00%
OBR March 2018	2.0 %	2.0 %	2.0 %	-	-
OBR March 2019	1.9 %	2.0 %	2.0 %	2.0 %	-

It is common for operating costs to be indexed to an appropriate economy-wide inflation measure, as discussed in Section 3.1. Of the three inflation measures introduced in that section, CPI is the most suitable to use if forecasts are required. CPIH is the lead measure, but there are no reliable forecasts; CPI and CPIH have historically been similar, as shown in Figure 3.1 on page 12.

Highways England's use of CPI as the economy-wide inflation measure is therefore a reasonable one. We do not apply the assessment criteria from Section 3.2 as there is no proposed input cost inflation adjustment (versus economy-wide inflation) here. We would recommend that the RIS2 allowances are set using the most recent forecasts available. This recommendation would also apply to any other categories using CPI (e.g. electricity costs).

4.1.2. Maintenance contracts

The RIS2 maintenance contracts are estimated at £1,258m including inflation, approximately 5% of the total RIS2 post-inflation cost of £25,343m.

[18] OBR does not yet have a forecast available for 2024-25, and it is reasonable to assume a forecast of 2.0% (the government's target) for this year given that it would not demonstrate a large change from the current forecast for the previous year.

Highways England proposes that maintenance contracts receive an allowance adjusted for CPI inflation plus an add on to take account of their calculated wedge between "Contract Annual Resource Inflation" (CARI) and CPI. CARI is specific to Highways England's contract costs. Up to 2015, all maintenance contracts were linked to RPI, with bespoke indices used since, with two current types of contract:[19]

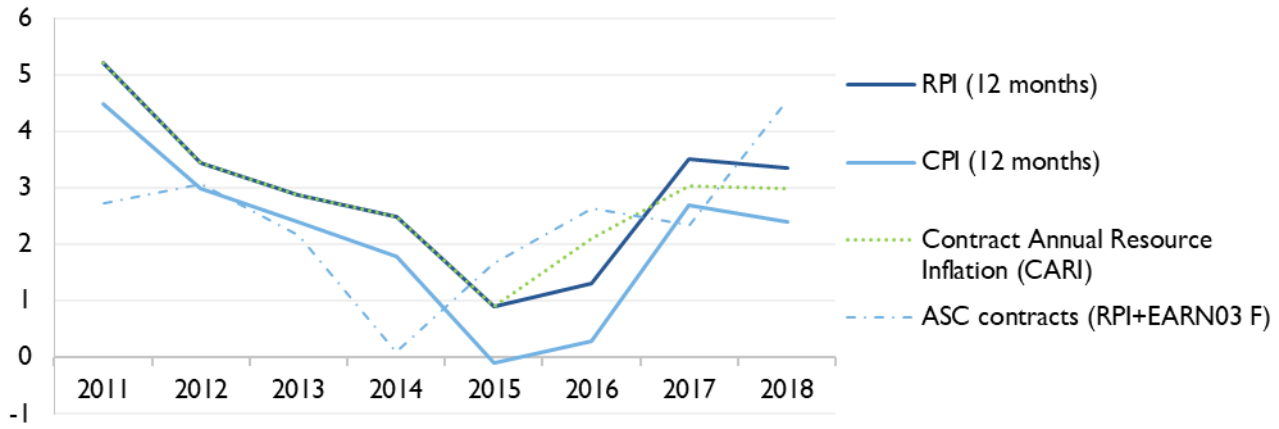
- Asset support contracts (ASC) began to be used in 2012, and the final one is expected to end in 2022. At the start of RIS2, four maintenance contracts are expected to be linked to ASC. The index is calculated using the following two indices:
    - RPI, ONS Series: CHAW – weighting of 62%.
    - Average Weekly Earnings (EARN03, ONS Series: K5AH) – weighting of 38%.
- Asset delivery (AD) contracts appear to be the predominant maintenance contract type in the future. By the start of RIS2, six contracts maintenance areas will be on AD contracts, and all existing contracts maintenance areas (except the M25 which is a DBFO) will have transferred to AD contracts by mid-2022. The index is calculated with the following two indices:
    - RPI, ONS Series: CHAW – weighting of 56%.
    - Routine, Cyclic and Time Charge Works (4/HM/WC/01, BCIS series 4731) – 44% weighting.

For 2016-18, since the change away from contracts being linked solely to RPI, CARI was on average very close to RPI (0.1% lower) – given that AD and ASC contracts also have RPI as a majority component, this is not surprising. In this time period there were three types of contract: some that began before 2015 and so are still linked solely to RPI, some AD contracts, and some ASC contracts.

The annual inflation figures for CARI, ASC contracts, CPI, and RPI are shown in Figure 4.3. We do not include AD contracts as the BCIS indices are only available to subscribers.

[19] This information was provided by Highways England in RFI 0088.

Figure 4.3: Indices used in Highways England's calculation for the maintenance contracts inflation assumptions, and RPI for reference. The data used is from the ONS and Highways England RFIs 0066 and 0088.



Over the period 2011-2018, CARI was on average 0.76% higher than CPI, and on average very close to RPI (0.1% lower). Highways England proposes that the inflation assumption is CPI plus 0.76%, making the proposed allowance for maintenance contracts CPI forecast + 0.76%, equal to 2.76% each year. This means that the maintenance contracts inflation is set closer to RPI than to CPI, given the difference between the two measures is typically up to 1.0%.[20] This is unsurprising given that the contracts all include RPI as a majority component.

We would expect that maintenance contracts let in the future would more closely reflect CPI, given the general move away from RPI across the UK. Given that the UK is generally moving towards CPI/H as the key measure of economy-wide inflation, we would expect that underlying costs would become more correlated with CPI (such as wage inflation). We would recommend a review of the contracts agreed since 2015 in order to set an approach to negotiating future contracts. This analysis may also inform RIS2 expectations, including whether cost input inflation is expected to be meaningfully different to CPI. A more reasonable approach may be to use CPI, or to base any deviation from CPI on an analysis of the policy and approach to setting indexation in future contracts.

Table 4.3 sets out a brief assessment of the proposed assumptions against the assessment criteria.

[20] The wedge between CPI and RPI between 2000 and 2018 was 0.7%, but the wedge does change over time, e.g.: 1.0% in OBR (2015) "Revised assumption for the long-run wedge between RPI and CPI inflation"

Table 4.3: Discussion of how Highways England's proposed "maintenance" forecasts fit with the criteria provided earlier

Criterion	Comment
This costs category must account for a meaningful proportion of total RIS2 costs.	Current data from Highways England suggests that this is approximately 5% of total RIS2 costs.
The underlying value must be seen to differ to CPI over time.	Somewhat – the historical difference was due to being tied to RPI. We expect the link to RPI to decline as more RPI-linked contracts expire and CPI takes its place.
A measure must exist that reasonably represents the value.	No forecast used; Highways England used historical data. Given that five out of the eight years of data have the issue of being linked to RPI by definition, it is difficult to use this in the calculation for a forecast for the next five years.
Movements in the measure must be uncontrollable for the regulated company.	The data used appears to be historical costs of Highways England's contracts. Use of data on its own contracts to create the index fails this criterion, since the costs agreed with contractors are within Highways England's control.

Based on our high-level assessment, we consider that there are some issues with the use of CARI for the maintenance contracts, in particular that Highways England has some control over this index (as it is based on Highways England's historical negotiated contracts with its suppliers) and that the proposed index maintains a reliance on RPI despite this measure being phased out and replaced with CPI/H.

Link between inflation assumptions and efficiency in maintenance contracts

Highways England begins its cost estimates with a pre-efficient, pre-inflated base cost. It then adjusts this base cost, including with a decrease due to targeted efficiencies and an increase to account for estimated inflation, to arrive at a post-efficient, post-inflated cost. If Highways England is able to reduce the increase in costs due to inflation, this would be equivalent to an efficiency improvement for the purpose of the post-efficient, post-inflated cost.

If contracts are linked to CPI rather than RPI, with no offsetting change in the base cost, the expected post-efficient, post-inflated cost would be lower (given that CPI is generally lower than RPI). This lower cost could be perceived as an efficiency improvement, or a change in inflation. It is difficult to ascertain whether a lower post-efficient post-inflated cost would indeed be efficiency

here, without understanding in more detail the approach to any change in the contract terms when adopting a new index.

In the years since the move away from RPI (2015-18), CARI was on average very close to RPI, initially increasing faster than RPI and afterwards increasing slower than RPI. This is consistent with (but does not by itself demonstrate) a "net present value (NPV) neutral" approach to shifting towards an inflation index that is typically lower (such as moving from RPI to CPI).[21] There may also be a shift in the "real" price of the inputs to the maintenance contracts. As highlighted, we would require more detail of Highways England's contracting to understand in enough detail to suggest a non-CPI inflation assumption for maintenance contracts.

We recognise that Highways England's efficiency proposals include setting efficiency targets as equal to inflation for the first two years of RIS2.[22] As the inflation assumptions differ from the efficiency targets for the final three years of RIS2, the chosen inflation is meaningful (i.e. has an impact on the post-inflation, post-efficiency totals) and so deserve careful consideration. The impact of the 0.76% on the final three years of RIS2 is approximately £23m of the £30m (nominal) if comparing to using 2.00% for all five years, but this falls to £12m if assuming that first two years remain at 2.76%.

4.1.3. Electricity costs

Highways England have highlighted a £146m pot of expenditure as 'electricity costs' (see RFI 0089). This is roughly 0.6% of the total RIS2 costs, 1.7% of the RIS2 opex, or 2.4% of the RIS2 opex excluding PFI (using data from RFI 0067).

Highways England calculated the difference between the overall CPIH quarterly values and the CPIH quarterly component for electricity, from 2005 Q1. They calculated that annual CPIH electricity was on average 4.1% higher than annual CPIH and that this represented an average increase of 6.5% per annum (using a compound average growth rate, CAGR, calculation).[23] On this basis, Highways England proposes a 5% annual forecast for electricity inflation. Figure 4.4 displays the

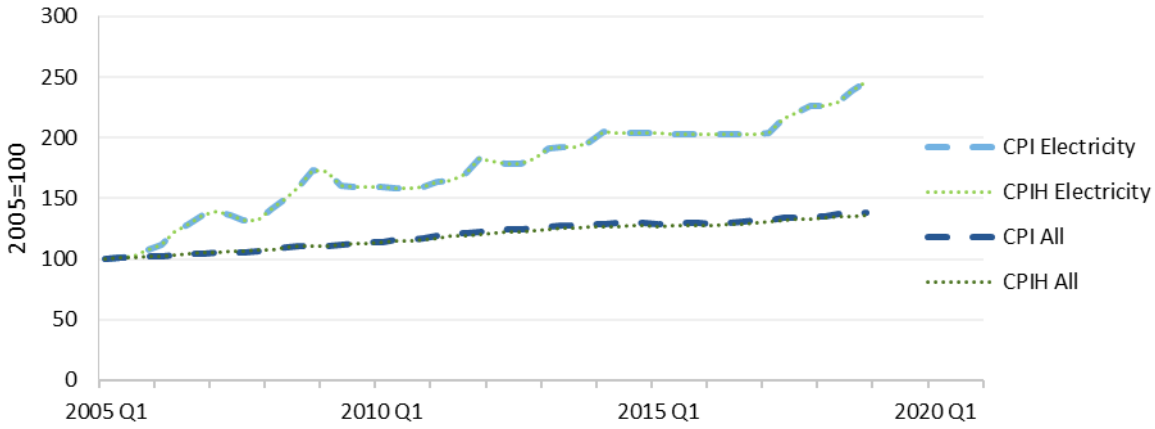
[21] The change in the profile of revenue when taking an "NPV neutral" approach to changing inflation measures is discussed in: UKRN (2018) "Position paper on the use of inflation indices" pp.4-5 including Figure 1.

[22] RFIs 0103 and 0115 suggest that these efficiency targets may not apply to all of the £1,258m maintenance costs.

[23] The CAGR for the electricity price component of CPIH would reduce to approximately 5% if using the period 2010-2018, and is lower still at approximately 4% for the period of data available 1988-2018.

indices used by Highways England and includes the equivalent CPI indices to show that there is minimal difference between the two indices.

Figure 4.4: CPI and CPIH, full indices and electricity component.



We have two concerns regarding Highways England's decision to make this a separate cost category, and the choice of index.

- Electricity is a component that is included within the headline CPI/H figure, with a weighting of 1.4% in CPI and 1.7% in CPIH.[24] Electricity costs make up roughly 0.6% of the RIS2 total costs – 1.7% of the RIS2 opex, 2.4% of the RIS2 opex excluding PFI. On this basis, there does not seem to be a strong case for electricity costs being treated separately – they should already be accounted for in Highways England's use of CPI for other opex. We are unaware of any UK regulated companies that separate out electricity in this way rather than including it within the wider costs for the relevant business area, and Ofgem explicitly stated that it rejected the requests to include RPAs for electricity in its RIIO-T1/GD1 price controls.[25] If applying CPI/H to opex while separating out electricity costs, the CPI/H that is applied to opex should be adjusted to remove the electricity costs component, to avoid double counting.
- If it is considered reasonable to treat electricity costs separately, consumer electricity prices may not be the best measure to represent Highways England's costs. Considering Highways England's high level of electricity consumption, we might expect that they would receive

[24] ONS (March 2019) "Consumer price inflation, updating weights: Annex A, Tables W1 to W3"
[25] Ofgem (2012) "RIIO-T1/GD1: Initial Proposals – Real price effects and ongoing efficiency appendix"

different costs than household users, and so an index aimed at industry, rather than households, would be more appropriate.[26]

Table 4.4: Discussion of how Highways England's proposed "electricity" forecasts costs fit with the criteria provided earlier

Criterion	Comment
This costs category must account for a meaningful proportion of total RIS2 costs.	Our current data from Highways England suggests that electricity accounts for £146m (see RFI 0089), which is 0.6% of the RIS2 total costs and 1.7% of the total opex costs. We do not consider this to be a meaningful proportion, particularly given that electricity is included in CPI/H in similar proportions. This represents a £12m (nominal) increase over the estimate if using CPI for electricity costs over RIS2.
The underlying value must be seen to differ to CPI over time.	Electricity is a component within CPI, and is given a weighting in CPI not dissimilar to the proportion of electricity costs in Highways England's overall opex. While Highways England has shown consumer electricity prices to differ to CPI over time, it is accounted for in the CPI calculation. The case for separate treatment is not strong.
A measure must exist that reasonably represents the value.	Highways England used historical data for CPIH. Without data regarding Highways England's previous electricity costs, it is difficult to understand whether consumer electricity prices reasonably represent their electricity prices, or if another measure may be more suitable.
Movements in the measure must be uncontrollable for the regulated company.	Yes, CPIH and its component parts are economy-wide measures.

4.1.4. Capital works

Table 4.5 shows Highways England's proposals for capital works for RIS2, developed as follows:

- Highways England built "archetypical projects" to demonstrate key resource cost drivers and their weightings.
- Highways England selected inflation metrics to represent those key resource cost drivers.

[26] BEIS, for example, provides figures for "industrial electricity prices in the EU". It's October 2018 release gives UK figures for 2008-17 which show a per annum increase of 1.8% excluding tax, or 3.6% including tax (for the largest users, and using CAGR).

- From this it developed a bespoke Highways England cost index for enhancements and added a 0.25% risk premium.

This results in values between 3.41% and 4.57% per annum, shown in Table 4.5.

Table 4.5: Highways England's proposed index

2020/21	2021/22	2022/23	2023/24	2024/25
3.41%	3.75%	4.57%	4.25%	3.53%

It is reasonable to use an inflation index other than CPI for capital works, as is highlighted specifically for Highways England in the Nichols and NAO reports discussed in Box 2.1 on page 9. We therefore consider whether Highways England's proposed index is appropriate, and note several characteristics:

- The index will not accurately reflect the actual costs, even if it were forecast perfectly, because renewals and major projects contracts are set with a gain/pain share mechanism. This demonstrates that Highways England has influence over the contracts it negotiates, and that it can incentivise its contractors to minimise costs which in turn benefits Highways England. The assumed/forecast inflation should still represent anticipated inflation and act as a benchmark against which gains (or losses) can be made depending on how the individual contracts and activities are managed.
- Several indices are included in the calculation of the renewal schemes part of the bespoke capex index.[27] This includes the Highways Term Maintenance Price Adjustment Formulae Indices Work Category 10/2 Renewals and Construction work (by BCIS), Highways England Maintenance Cost Index (by BCIS), Resource Cost Index of Road Construction (by BCIS), and RPI (by ONS). It is inappropriate to include RPI, as discussed earlier in this report. As these other indices are not publicly available, we are unable to properly assess their inclusion.
- The Nichols report recommended that Highways England develop an index that is agreed with the DfT. Without any bespoke index being specifically agreed with the DfT, it may be

[27] See Highways England's response to RFI 0088.

more prudent to use the most appropriate available statistics, such as the construction output price index (COPI).

Overall, we have not received sufficient detail from Highways England about the construction of this bespoke index to allow us to assess it.[28] The approach is at present difficult to rate on its own merits. While we have tried to assess the proposals against our criteria, in Table 4.6, we cannot confirm whether it is reasonably representative and out of Highways England's control.

Table 4.6: Discussion of how Highways England's proposed "capital works" forecasts costs fit with the criteria provided earlier

Principle	Comment
This costs category must account for a meaningful proportion of total RIS2 costs.	Yes, this accounts for 65% of RIS2 costs.
The underlying value must be seen to differ to CPI over time.	The Nichols report and NAO report both suggest that it is appropriate to use a different index to CPI for roads construction costs.
A measure must exist that reasonably represents the value.	Highways England has developed a bespoke index, and with current information it is unclear whether it passes these two criteria.
Movements in the measure must be uncontrollable for the regulated company.	

We would recommend that a more typical RPE/RPA approach is taken. If it does not prove possible to develop an appropriate RPA for Highways England's capital works an industry-focused index, such as COPI, might be more appropriate. The ONS "all construction" COPI increase between April 2014 and December 2018 represented an average increase of 2.0% p.a. (using a CAGR calculation). As this is a short time series, we also consider the BIS construction price index. This was discontinued in 2014 and replaced with the ONS index, and averaged 2.8% between 2005 and 2013 (on a CAGR basis).

[28] We requested information from Highways England on their calculation of their bespoke indices (RFI 0088). The level of detail provided was not sufficient to allow us to analyse the approach. In addition, many of the indices used by Highways England are published by BICS, whose data series are only available to subscribed members.

Inflation risk premium

Highways England proposes a risk premium of 0.25%. This is to reflect that Highways England receives a nominal allowance, which is in contrast with many other regulated companies in the UK receiving a real allowance which is updated each year for outturn economy-wide inflation and sometimes adjusted for forecast or outturn input price inflation. The proposed risk premium accounts for approximately £116m (0.7%) of the proposed £16,848m capex for RIS2. Inflation risk is included in the cost estimate ranges for each major project; Highways England state in the dSBP that they have made no additional provision for inflation risks in their portfolio risk.

A risk premium of some amount is reasonable given that Highways England's allowances are set as nominal amounts based on inflation forecasts – Highways England takes on all "forecast risk", meaning that if inflation is higher than anticipated, their allowance will not reflect this. It is common for other regulated companies' allowances to be linked to outturn inflation, and so there is little regulatory precedent for an inflation risk premium. One point of comparison may be nominal bonds – these include assumptions on future inflation and an implicit inflation risk premium to account for uncertainty in those assumptions, and many studies have estimated the premium based on comparisons between nominal and inflation-linked bonds. A 2015 Bank of England staff working paper[29] showed that for 2004-14 the implicit inflation risk premium in ten-year government bonds averaged 0.15%, with a range of -0.40% to +0.75%; estimates in other studies also tend to have wide ranges and varying averages or point estimates.[30]

This lack of precedent or reliable point estimate makes it difficult to determine whether 0.25% can be considered correct or incorrect. Instead, it should be considered whether it is reasonable. Table 4.7 shows the dSBP proposal of 0.25% and how the RIS2 capex total changes if the inflation risk premium is adjusted.

Table 4.7: Summary of impact of the inflation risk premium on capex – there may be some rounding differences.

Inflation risk premium	RIS2 capex (£m)	Difference to dSBP (£m)
0.00%	16,732	-116

[29] Lui, Z et al (2015) "The informational content of market-based measures of inflation expectations derived from government bonds and inflation swaps in the United Kingdom" p.11

[30] For example, see the summary in Kupfer (2018) "Estimating inflation risk premia using inflation-linked bonds: a review" Table 1

0.15%	16,801	- 46
dSBP proposal: 0.25%	16,848	-
0.35%	16,894	+ 47

DfT alternative proposal

DfT proposed an interim position of using the long-term sectoral average of enhancement costs of 2.7% per annum inflation. This proposal addresses the key current issues with the Highways England proposals, as it uses a sectoral average (it is unclear exactly which index is used, but the result is close to our 2.8% long-term CAGR calculated from COPI) which reasonably represents the costs that Highways England could be expected to efficiently incur. The impact is over £500m, as shown in Table 4.8Table 4.8, or £430m if only considering contracts that are not expected to be contracted by the time RIS2 starts.[31]

As some of the enhancements capex will be contracted before RIS2 starts, we provide figures for series:

1) total RIS2 capex
2) the relevant values if excluding enhancement capex 'not yet contracted'; and
3) the relevant values if excluding enhancement capex that is expected to be contracted by the time RIS2 starts.

This figure also shows the effect if we use 2.95% instead, representing the DfT's 2.7% plus a 0.25% risk premium; this represents over a £400m reduction as compared to Highways England's dSBP proposals.

Table 4.8: Summary of the impact of DfT's alternative proposal on all capex, showing the profile across RIS2

		2020/21	2021/22	2022/23	2023/24	2024/25	RIS2 Total
All capex	Nominal values in dSBP (£m)	3,313	4,132	3,623	3,079	2,701	16,848
	Difference if use DfT's 2.7% (£m)	-23	-70	-125	-150	-153	-521

[31] £1,411m of contracts for RIS1 schemes to be delivered in RIS2 has already been committed. While this is 8% of the RIS2 capex estimate in the dSBP, it is incurred in the earlier years of RIS2 and so reducing the annual inflation assumption will have a less-than-proportionate impact on the overall RIS2 estimate. Calculations use RFI 0067, 0089, and 0096.

		2020/21	2021/22	2022/23	2023/24	2024/25	RIS2 Total
	Difference if use DfT's 2.7% + 0.25% risk premium (£m)	-15	-50	-99	-122	-121	-407
All capex, excluding enhancement capex contracted at the time of the dSBP	Nominal values in dSBP (£m)	2,532	3,545	3,586	3,075	2,698	15,437
	Difference if use DfT's 2.7% (£m)	-17	-60	-124	-150	-152	-504
	Difference if use DfT's 2.7% + 0.25% risk premium (£m)	-11	-43	-98	-122	-121	-395
All capex, excluding enhancement capex expected to be contracted by the start of RIS2	Nominal values in dSBP (£m)	1,419	2,464	2,966	2,717	2,605	12,171
	Difference if use DfT's 2.7% (£m)	-10	-42	-102	-133	-147	-434
	Difference if use DfT's 2.7% + 0.25% risk premium (£m)	-6	-30	-81	-107	-117	-342

Assumed RIS1 inflation

Highways England's calculations[32] apply a 5.0% indexation for the final two years of RIS1 for all renewals and enhancements. We believe that this is in excess of the long-term trend, or any forecasts of their index for renewals or enhancements over these two years. This affects the starting index of all RIS2 capital expenditure. The impact of this appears to be to increase all capital costs over RIS2, as demonstrated in Table 4.9 which sets out the effect as compared to a range of alternative 2018/19 and 2019/20 inflation values. We set out the difference if applying the change to all capex, and to if applying the change only to capex that was not yet contracted at the start of

[32] See Highways England response to queries 0006, 0083, and 0095.

the dSBP, and to if applying the change only to capex that is not expected to be contracted by the start of RIS2.

Table 4.9: Summary of impact of 2018/19 and 2019/20 inflation assumptions on RIS2 period.

Inflation rate in 2018/19 and 2019/20	Index being taken into RIS2 (2017/18=100)	Renewals (£m)		Enhancements (£m)		Total capex (£m)	
		RIS2 total	Difference to 5% row	RIS2 total	Difference to 5% row	RIS2 total	Difference to 5% row
All RIS2 capex							
5.0% p.a.	110.25	4,489	-	12,358	-	16,848	-
2.8% p.a.	105.68	4,303	-186	11,846	-512	16,149	-699
3.0% p.a.	106.09	4,320	-169	11,892	-466	16,212	-636
3.5% p.a.	107.12	4,362	-127	12,008	-351	16,370	-478
3.9% p.a.	107.95	4,396	- 94	12,101	-258	16,496	-351
All RIS2 capex, excluding enhancement capex contracted at the time of the dSBP							
5.0% p.a.	110.25	4,489	-	10,947	-	15,437	-
2.8% p.a.	105.68	4,303	-186	10,494	-454	14,797	-640
3.0% p.a.	106.09	4,320	-169	10,534	-413	14,854	-582
3.5% p.a.	107.12	4,362	-127	10,637	-311	14,999	-438
3.9% p.a.	107.95	4,396	- 94	10,719	-228	15,115	-322
All RIS2 capex, excluding enhancement capex expected to be contracted by the start of RIS2							
5.0% p.a.	110.25	4,489	-	7,682	-	12,171	-
2.8% p.a.	105.68	4,303	-186	7,363	-319	11,666	-505
3.0% p.a.	106.09	4,320	-169	7,392	-290	11,712	-459
3.5% p.a.	107.12	4,362	-127	7,464	-218	11,826	-345
3.9% p.a.	107.95	4,396	- 94	7,522	-160	11,917	-254

Note: Figures may not add precisely in this table due to rounding. 2.8% refers to the long-term COPI average up to 2013, 3.9% refers to Highways England's updated estimated average as of April 2019, and 3.0% and 3.5% are for additional reference.

Highways England confirmed that the 5% assumption for 2018/19 and 2019/20 is used in setting the cost assumptions for RIS2, with their explanation (in their responses to queries 0083 and 0095) being that it is appropriate to maintain the inflation assumptions that were agreed for RIS1 (i.e. 5%

for 2018/19 and 2019/20) as to do otherwise might suggest that RIS1 is being reopened, or that it should be.

We disagree with this approach. In determining RIS2 values it is appropriate to apply the most up-to-date information to reflect Highways England's actual costs. Such an approach does not represent updating or re-opening the RIS1 assumptions; the previously-agreed values for 2018/19 and 2019/20 will still be applied to the RIS1 allowances. An update also does not suggest that RIS2 could be "re-opened" if actual inflation differs from the assumptions made in setting the RIS2 allowances.

The combined impact of applying the above 2018-20 inflation rates alongside DfT's interim proposal of 2.7% is set out Table 4.10, which also includes rows demonstrating the impact of also allowing a 0.25% risk premium based on the discussion earlier in Section 4.1.4. Table 4.11 and Table 4.12 set out the similar values if we exclude enhancement capex that (1) was contracted at the dSBP and (2) that is expected to be contracted by the time RIS2 starts.

Table 4.10: Combined effect of updating the 2018/19 and 2019/20 inflation assumptions, and applying 2.7% or 2.95% (2.7% plus a 0.25% risk premium) p.a. for all RIS2 capex

Inflation rate in 2018/19 and 2019/20	Inflation rate in RIS2	Renewals (£m)		Enhancements (£m)		Total capex (£m)	
		RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal
Highways England's proposals for 2018/19, 2019/20, and RIS2							
5.0% p.a.	3.41-4.57% p.a.	4,489	-	12,358	-	16,848	-
DfT's proposal of 2.7% for RIS2, with various 2018-20 inflation assumptions							
2.8% p.a.	2.70% p.a.	4,158	-331	11,492	-866	15,650	-1,198
3.0% p.a.	2.70% p.a.	4,174	-315	11,537	-822	15,711	-1,137
3.5% p.a.	2.70% p.a.	4,215	-274	11,649	-709	15,684	-984
3.9% p.a.	2.70% p.a.	4,248	-242	11,739	-619	15,987	-861
5.0% p.a.	2.70% p.a.	4,338	-151	11,989	-369	16,327	-521
2.95% for RIS2 (DfT proposal + 0.25% risk premium), with various 2018-20 inflation assumptions							
2.8% p.a.	2.95% p.a.	4,189	-300	11,569	-789	15,758	-1,089
3.0% p.a.	2.95% p.a.	4,205	-284	11,615	-744	15,820	-1,028
3.5% p.a.	2.95% p.a.	4,246	-243	11,728	-631	15,974	-874

Inflation rate in 2018/19 and 2019/20	Inflation rate in RIS2	Renewals (£m)		Enhancements (£m)		Total capex (£m)	
		RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal
3.9% p.a.	2.95% p.a.	4,279	-210	11,818	-540	16,098	-750
5.0% p.a.	2.95% p.a.	4,370	-119	12,070	-228	16,440	-407

Table 4.11: Combined effect of updating the 2018/19 and 2019/20 inflation assumptions, and applying 2.7% or 2.95% (2.7% plus a 0.25% risk premium) p.a. for RIS2 capex excluding enhancement capex contracted at the time of dSBP

Inflation rate in 2018/19 and 2019/20	Inflation rate in RIS2	Renewals (£m)		Enhancements not contracted at dSBP (£m)		Total capex (£m)	
		RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal
Highways England's proposals for 2018/19, 2019/20, and RIS2							
5.0% p.a.	3.41-4.57% p.a.	4,489	-	10,947	-	15,437	-
DfT's proposal of 2.7% for RIS2, with various 2018-20 inflation assumptions							
2.8% p.a.	2.70% p.a.	4,158	-331	10,156	-792	14,314	-1,123
3.0% p.a.	2.70% p.a.	4,174	-315	10,195	-752	14,370	-1,067
3.5% p.a.	2.70% p.a.	4,215	-274	10,295	-653	14,509	-927
3.9% p.a.	2.70% p.a.	4,248	-242	10,374	-573	14,622	-815
5.0% p.a.	2.70% p.a.	4,338	-151	10,595	-352	14,933	-504
2.95% for RIS2 (DfT proposal + 0.25% risk premium), with various 2018-20 inflation assumptions							
2.8% p.a.	2.95% p.a.	4,189	-300	10,229	-719	14,418	-1,019
3.0% p.a.	2.95% p.a.	4,205	-284	10,268	-679	14,474	-963
3.5% p.a.	2.95% p.a.	4,246	-243	10,368	-579	14,615	-822
3.9% p.a.	2.95% p.a.	4,279	-210	10,449	-499	14,728	-709
5.0% p.a.	2.95% p.a.	4,370	-119	10,671	-276	15,041	-395

Table 4.12: Combined effect of updating the 2018/19 and 2019/20 inflation assumptions, and applying 2.7% or 2.95% (2.7% plus a 0.25% risk premium) p.a. for RIS2 capex excluding that expected to be contracted by the start of RIS2

Inflation rate in 2018/19 and 2019/20	Inflation rate in RIS2	Renewals (£m)		Enhancements not contracted at the start of RIS2 (£m)		Total capex (£m)	
		RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal	RIS2 total	Difference to HE proposal
Highways England's proposals for 2018/19, 2019/20, and RIS2							
5.0% p.a.	3.41-4.57% p.a.	4,489	-	7,682	-	12,171	-
DfT's proposal of 2.7% for RIS2, with various 2018-20 inflation assumptions							
2.8% p.a.	2.70% p.a.	4,158	-331	7,093	-589	11,251	-920
3.0% p.a.	2.70% p.a.	4,174	-315	7,120	-561	11,294	-876
3.5% p.a.	2.70% p.a.	4,215	-274	7,189	-492	11,404	-767
3.9% p.a.	2.70% p.a.	4,248	-242	7,245	-436	11,493	-678
5.0% p.a.	2.70% p.a.	4,338	-151	7,399	-282	11,737	-434
2.95% for RIS2 (DfT proposal + 0.25% risk premium), with various 2018-20 inflation assumptions							
2.8% p.a.	2.95% p.a.	4,189	-300	7,149	-532	11,338	-833
3.0% p.a.	2.95% p.a.	4,205	-284	7,177	-504	11,382	-788
3.5% p.a.	2.95% p.a.	4,246	-243	7,247	-435	11,493	-678
3.9% p.a.	2.95% p.a.	4,279	-210	7,303	-378	11,582	-589
5.0% p.a.	2.95% p.a.	4,370	-119	7,459	-223	11,829	-342

4.2. PFI

PFI contracts should be treated at cost, i.e. if these contracts are linked to RPI, Highways England should use the RPI forecast. Although Highways England would be taking some RPI forecast risk here, they could stand to make either gains or losses.

We highlight that when PFIs expire, maintenance costs associated with expired PFIs are currently included within the PFI line (i.e. not the maintenance line) – it may be more prudent to include them within the maintenance line if these are new contracts (i.e. they can be negotiated).

5. CONCLUSIONS

Highways England's draft proposals split costs into four categories: operating costs, maintenance contracts, electricity costs, and capital works:

- The approach to opex is simple and reasonable.
- The inclusion of maintenance contracts as a separate cost category is atypical, and we have concerns about the proposed assumptions. More evidence and justification are needed for the proposed approach – it is important that while the assumptions recognise the current contractual arrangements, they do not embed these arrangements (e.g. the use of RPI, as CPI should be taking its place).
- The inclusion of electricity costs as a separate cost category is atypical, and we have concerns about the proposed assumptions. Without further justification we conclude that treatment of these costs should not differ from that of operating costs.
- The proposed approach to capex is complex, involving a range of calculations and combination of various indices, which we have not had access to in preparing this report (e.g. RICS indices are subscriber-only). We consider that an alternative approach (discussed further below) would be more appropriate or ORR could recommend the use of DfT's interim proposal (which appears to use the publicly available ONS construction price indices) for RIS2.

We recognise that Highways England has developed a bespoke index in response to the Nichols Review recommendation in 2007 that they should develop an index focused on "*highways construction costs*" (which it recommended be agreed with DfT). There is a balance to be struck between striving for 'perfection' (and the complexity it brings) and taking a simpler approach. Often a simpler approach may be more proportionate. Highways England's approach to capex inflation demonstrates the difficulties of trying to develop a bespoke index. We are not confident that it is appropriate for use in RIS2. In addition, it has not been agreed with the DfT.

We consider that the balance between accuracy and proportionality for capex can be more appropriately met through an analysis of RPEs in line with approaches used by other regulators such as Ofgem and Ofwat. Where there is a clear argument that an economy-wide index will not reflect inflation faced by Highways England a further adjustment would be permitted. RPAs are generally accepted in regulated industries and provide important transparency and clarity. Clear

criteria for the analysis of RPEs should be established before any RPA is made, and then used to assess and refine any proposed approach. If adopting an RPE-based approach is not considered feasible in the time available, then we consider that DfT's proposed long-term sectoral average is used.

Table 5.1: Summary of our key points and suggested next steps

Cost item	Summary of key points about approach	Immediate next steps
Operating costs	Opex inflation is estimated using a CPI forecast of 2.0% p.a. on approximately £3,375m. The proposed approach, of using CPI forecasts, appears to be reasonable – CPI and CPIH are becoming standard.	Ensure the most up to date forecasts are being used.
Maintenance contracts	Maintenance contract inflation is estimated as: CPI forecast of 2.0% p.a. plus 0.76% p.a. on £1,258m. The proposed approach uses historical data, which depends heavily on contracts for which RPI was the standard approach, to provide forecasts for RIS2 when we would expect to see more contracts linked to CPI (or potentially other indices). A more reasonable approach may be to use CPI or to base any deviation from CPI on an analysis of the policy and approach to setting indexation in future contracts. The impact over RIS2 (nominal) is £30m, stated by Highways England as compared to using CPI.	The inclusion of maintenance contracts as a separate cost category is atypical, and we have concerns about the proposed assumptions. More evidence and justification are needed for the proposed approach – it is important that while the assumptions recognise the current contractual arrangements, they do not embed these arrangements (e.g. the use of RPI, as CPI should be taking its place).
Electricity costs	Forecast of 5% p.a. based on historical statistics on the electricity component of CPI, on £146m of costs. The proposed approach, treating electricity as a single cost item rather than including it in the business area where it is used, is unusual. We do not agree with this approach – not least because it is just 0.6% of total RIS2 costs and 1.7% of total RIS2 opex (2.4% if excluding PFI). Electricity costs are included in CPI with a weighting of 1.4% and CPIH with a weighting of 1.7%, so it seems that using CPI/H would reasonably represent electricity costs without	Highways England would have to provide compelling evidence to demonstrate that their electricity costs differ substantially from the measure being used in the relevant business area, whether that is opex or capex. Without such justification, the costs should not be treated separately to the relevant business area.

Cost item	Summary of key points about approach	Immediate next steps
	having to split them out. The impact over RIS2 (nominal) is approximately £12m, compared to using CPI, or £10m compared to the maintenance inflation estimate of 2.76%. Even if electricity should be separated out, we question whether the CPIH component is the correct index to use.	
Capital works	Bespoke index of 3.41-4.75% p.a. on ~£16,848m. Although the Nichols 2007 report recommended using a roads-specific index, we highlight that they also specifically stated that the index should be agreed with DfT. This agreement should be sought on whatever approach is taken, whether that is a bespoke index or a simpler approach. We question the use of a bespoke index, including the application of a 0.25% premium, and have not had access to the inputs to the proposed index to analyse them in more detail. The impact over RIS2 of using the bespoke index instead of the sectoral average is £521m (nominal): £151m on renewals and £369m on enhancements.	Ideally, Highways England would develop a new proposal which focuses on an RPE approach – i.e. how can we expect capital works inflation to deviate from CPI? An RPE may be a preferable balance between complexity and accuracy. If determining a more traditional RPE is not considered possible, or if Highways England is willing to accept the likely lower accuracy of a simpler approach, then an approach such as DfT's interim proposal (using the ONS construction price indices) would be reasonable. Any approach should be agreed with DfT.
	Highways England's calculations apply a 5.0% indexation for the final two years of RIS1 for all renewals and enhancements (RFI 0083 and 0095). We believe that this is in excess of the long-term trend, or any forecasts of Highways England's index for renewals or enhancements over these two years. This value affects the starting index of all RIS2 capital expenditure. The impact of this may be to increase all capital costs by approximately £350m, over RIS2 (if assuming 3.9% as a reasonable alternative) – £90m renewals and £260m enhancements (if removing the £1,411m enhancements already contracted, this falls to £230m – if removing the £4,677m	The approach to the RIS1 indexation should be corrected in line with more reasonable expectations for cost inflation in these two years.

Cost item	Summary of key points about approach	Immediate next steps
	enhancements expected to be contracted by the time RIS2 starts, this falls to £160m). If combined with a reduction in the RIS2 inflation assumption to the DfT interim proposal of 2.7%, the overall reduction is £861m over RIS2 (or to £680m-£815m if removing the contracted enhancements at dSBP/start of RIS2).	

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