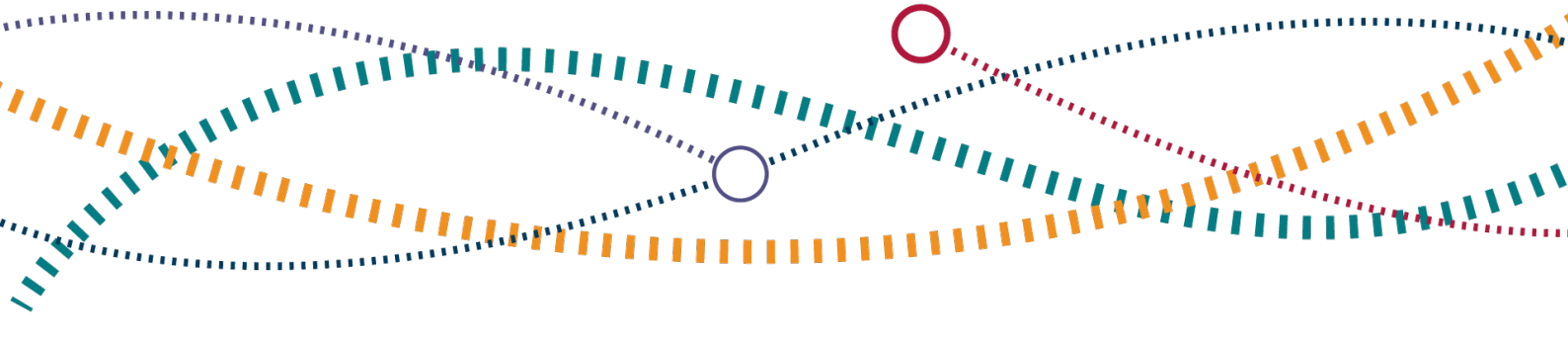
Periodic review of HS1 Ltd 2024 (PR24)

Draft Determination

30 September 2024



Contents

1. Executive Summary

1.1 Our 2024 periodic review (PR24) assesses HS1 Ltd's plans for the fourth control period under its Concession Agreement and station leases (CP4, from 1 April 2025 to 31 March 2030). This is our third periodic review for the HS1 route infrastructure; and it is our first review of the four HS1 stations.

1.2 Since our last periodic review (PR19), the COVID-19 pandemic and other events have resulted in significant fluctuations in traffic levels, as well as cost pressures for operators. There remains significant uncertainty about future traffic levels and costs in the HS1 system.

1.3 Our approach to PR24, which we published in January 2023, acknowledged this uncertainty and the need for us, HS1 Ltd and system stakeholders to look for ways to make the system more resilient to the risks arising from this uncertainty. HS1 Ltd and stakeholders have engaged effectively with us during PR24 to consider the processes and legal mechanisms available to the system.

1.4 This approach has resulted in plans for the network which we consider manage uncertainty more efficiently than in previous reviews. Improvements include HS1 Ltd’s cost policy for forecasting renewals costs over 40 years; and setting charges to account for expected traffic growth. HS1 Ltd’s approach has reduced the renewals charges significantly, compared to its initial estimates using the previous models. We support these changes.

1.5 We have reviewed HS1 Ltd’s route plans to confirm that they comply with its duties under the Concession Agreement, as we did in previous periodic reviews. This included reviewing asset management plans and charging models. We have also applied a similar approach to review asset management and charges for stations renewals.

1.6 But, following a clear steer from the HS1 stakeholders, in PR24 we have also looked more widely for opportunities to make the HS1 network more efficient and more resilient to change. In particular:

- where HS1 Ltd has introduced new approaches, we have scrutinised its methodology to identify any opportunities to improve these;
- we revisited contracts and incentives in light of events in the current control period (CP3), to seek opportunities to make these more resilient going forward; and

- we examined issues specific to stations in detail (because PR24 was our first review including stations).

1.7 Overall, we found that HS1 Ltd's plans were of good quality. Our Draft Determination proposes small but important adjustments to its final Five Year Asset Management Statement (5YAMS) and Life Cycle Reports (LCRs) to reflect opportunities we have identified for further efficiency.

1.8 We identified some specific areas of the plans where there are opportunities to reduce costs. We have proposed adjustments to the charges to account for these, as shown in Table 1.1. Each of these adjustments is a relatively small percentage of the total costs, which reflects the overall good quality of the plans. However, when these adjustments are combined, they result in a material reduction in the charges for operators in CP4, in particular for freight operators. HS1 Ltd's revenue from charges is shown in Table 1.2 and the charges for each operator are shown in Table 1.3.

Table 1.1 ORR adjustments to HS1 Ltd's proposals for charges per year

ORR Adjustment to HS1 Ltd proposal (£m/yr change)	Route renewals	Stations renewals	Route Operations & Maintenance
Asset management: efficiencies through data maturity and cost estimation	-2.0	-0.9	-2.9
Modelling: remove underfunding factor	-0.9	no change	no change
Modelling: traffic growth weighting for stations	no change	-0.3	no change
Modelling: assumption on escrow returns (that is, on future renewals funding) and assuming negative balances resolved	-0.9	-0.8	no change

Table 1.2 Adjustments to revenue from charges per year

Revenue from charges £m/yr, Feb 2023 prices	CP3	CP4 HS1 Ltd Final 5YAMS/LCRs	CP4 ORR Draft Determination	Change from 5YAMS/LCRs
Route Operations & Maintenance	95.8	91.8	88.9	-3%
Route renewals annuity	34.0	31.6	27.8	-12%
Stations renewals annuity	11.6	10.2	8.2	-20%

Table 1.3 Adjustments to charges for operators

£m Feb 2023 prices	CP3	CP4 HS1 Ltd 5YAMS/LCRs	CP4 ORR Draft Determination	Change from 5YAMS	Change CP3 to CP4
Eurostar International Ltd (EIL)	338.5	329.5	312.3	-5.2%	-7.7%
Southeastern	517.0	485.5	461.2	-5.0%	-10.8%
East Midlands Railway (EMR)	48.5	51.5	50.0	-2.8%	+3.2%
Freight	2.0	1.5	0.7	-54.7%	-66.0%
Total	**905.5**	**868.0**	**824.3**	**-5.0%**	**-9.0%**

1.9 As well as these financial adjustments, we have set out our conclusions on areas of good practice within the plans; and items where we have identified opportunities for HS1 Ltd to address in its final 5YAMS and LCRs. All of our conclusions are listed in Table 1.4 below.

1.10 Under the Concession Agreement and stations leases, HS1 Ltd is now required to revise its final 5YAMS and LCRs in light of our Draft Determination. In parallel with this, we are now required to consult stakeholders on our Draft Determination and to consider stakeholders' feedback before reaching our Final Determination.

1.11 We now invite stakeholders to provide comments on our Draft Determination, addressed to PR24@orr.gov.uk, by 11 November 2024. We will take views into account as we conclude our scrutiny of HS1 Ltd's revised plans, before publishing those responses alongside our Final Determination by 6 January 2025. Please indicate where any information provided to us should be treated as confidential.

Table 1.4 Summary of our Draft Determination conclusions

Chapter 4 - Asset Management Activity
The structure of the Asset Management documents was in line with best practice
The strategies for Track and Electrification asset groups represent best practice
There are opportunities to accelerate step changes in maturity in other asset groups
We support the CP4 route renewals plans (noting deliverability challenge below)
There is an opportunity to review deliverability challenges for the CP4 ballast renewal
We support the CP4 station renewals plans (noting scope challenge below)
There are opportunities for efficiency through scope review on specific CP4 station projects (5% efficiency on three specific projects)
Planning for renewals over 40 years has improved significantly since PR19
There are opportunities to improve estimating and governance for CP4 station renewals
There are opportunities for efficiency in 40-year renewals plans, through asset data maturity (9% efficiency in specific asset groups, starting in CP5)
We support plans for maintenance activity in CP4 (noting efficiency opportunities below)
Agile changes to maintenance in CP3 demonstrated best practice
There are opportunities to optimise maintenance strategies in less mature asset groups
We support CP4 access plans (noting deliverability challenge on one project, above)

We support the CP4 R&D fund
We support the proposed R&D funding mechanism and governance
There are opportunities to prioritise R&D funding to accelerate asset data maturity
We support the CP4 operations plans
We expect a commitment by HS1 Ltd to demonstrate improvements in operations
We support the CP4 safety strategy
We expect a commitment by HS1 Ltd to report on 'safety by design' in CP4 annual reports
We support HS1 Ltd's priorities on environmental sustainability
We expect a commitment by HS1 Ltd to lead a working group with stakeholders, to address barriers to environmental sustainability
Chapter 5 - Cost Assessment
We support HS1 Ltd's introduction of its 'cost policy' for renewals in CP5-CP11
We support the approach for splitting costs between variable and fixed (noting a small, 2%, adjustment towards variable costs)
There are opportunities to improve the 'cost policy' calculations at future periodic reviews (0.5% efficiency on station renewals, starting in CP5)
There are opportunities for efficiency through better 'base cost' data at future periodic reviews (4% efficiency on renewals, starting in CP5)
We support HS1 Ltd's own costs
We support the proposed criteria for pass-through costs
We support NR(HS) base costs for operations & maintenance (noting opportunities through efficiencies and markups, below)
We determined the efficient cost for operations and maintenance is c£3m/yr lower than HS1 Ltd's proposal. We identified opportunities to achieve this either through asset management maturity or through contracts
Chapter 6 - Charges
HS1 Ltd's annuity models were fit for purpose and aligned with good practice

We support HS1's traffic weighting adjustment to the route annuity and have applied a partial traffic weighting to stations annuity (£0.3m/yr reduced charges)

We have removed the underfunding factor from route annuity (£0.9m/yr reduced charges)

We have allowed small negative balances towards the end of the 40-year annuity model (£0.4m/yr reduced route charges; and £0.4m/yr for stations)

We have assumed restrictions on escrow returns will be addressed (£0.5m/yr reduced route charges; and £0.3m/yr for stations)

HS1 Ltd's charging models were fit for purpose and aligned with good practice

We have corrected for errors in cost of capital calculations (minimal impact on charges)

We have re-allocated fixed costs from freight to common costs, funded by passenger operators (£0.6m over 5 years reallocated)

Chapter 7 - Network Incentives

We have presented 25 proposals for changes to access terms, for consultation

We expect HS1 Ltd to lead a working group to review network incentive options with stakeholders in Year 1 of CP4

2. Background

The HS1 network

2.1 The HS1 network is a 109km high-speed rail line that connects London St Pancras through Kent to the Channel Tunnel.

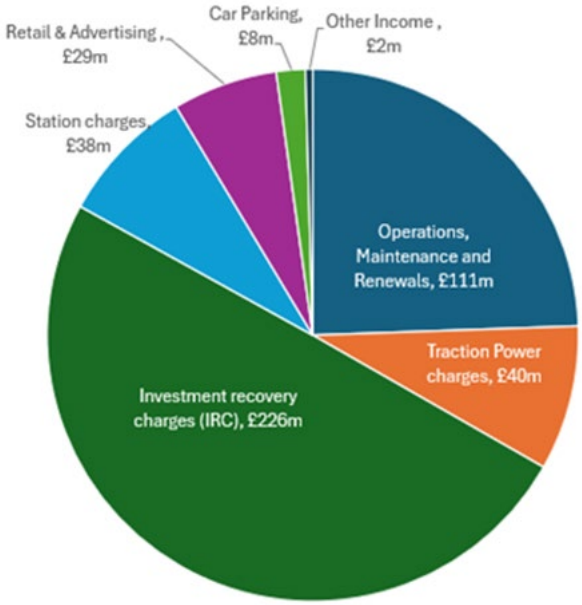
2.2 There are four stations on the line: London St Pancras, Stratford International, Ebbsfleet International and Ashford International.

2.3 The network is used by domestic services between London and Kent and within Kent; and international passenger and freight operations through the Channel Tunnel.

HS1 Ltd

2.4 HS1 Ltd holds a 30-year concession of the HS1 network until 30 December 2040, and concurrent leases for the four stations on the line. Some of its revenue comes from regulated access charges which are paid by train operators to use HS1 Ltd's track and stations. The company also receives further income, which is not regulated by ORR, to recover the long-term costs of the project; and from the provision of retail facilities and car parking at stations. Unlike Network Rail Infrastructure Ltd (NRIL), HS1 Ltd does not receive any UK Government network grants.

Figure 2.1 HS1 Ltd's expected income breakdown for April 2024 to March 2025



Source: HS1 Ltd 2024 annual lender presentation

2.5 Many of the functions which HS1 Ltd must perform as infrastructure manager under the Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2016 ("Access and Management Regulations"), such as operation, maintenance, renewal, signalling and timetabling, are contracted out to third parties.

2.6 HS1 Ltd also manages contracts for the provision of certain services, the costs of which are passed directly through to operators as part of their charges. For example, this includes electrical power supplied by UK Power Network Services.

Our role

2.7 We regulate the safety of the HS1 network under the Railways and Other Guided Transport Systems (Safety) Regulations 2006. HS1 Ltd also has safety obligations set out under the Concession Agreement and stations leases. Network Rail (High Speed) Ltd (NR(HS)) and ABM Facility Servies (ABM) also have safety obligations as the safety dutyholders for the railway, holding safety authorisations for the route and three stations, and Ashford International Station respectively.

2.8 We also have responsibilities to regulate HS1 Ltd's charging of operators under the Access and Management Regulations. These functions include: a pre-approval role for new and amended framework agreements; ensuring that charges for use

of the assets comply with the requirements of the Access and Management Regulations; and ensuring that HS1 Ltd is provided with incentives to reduce the costs of provision of infrastructure and access charges.

2.9 In addition, the Concession Agreement assigns duties to us in regulating HS1 Ltd to ensure that it is meeting its asset stewardship purpose. Similarly, the stations leases assign regulatory duties to us, to ensure HS1 Ltd's plans for each of its four stations meet the life cycle purpose for that station.

2.10 We have entered into a Memorandum of Understanding with the Secretary of State in respect of the performance of our roles on the HS1 network. Our overall approach to our economic regulation of the HS1 network is outlined in two regulatory statements published in 2009 and 2022. In particular, we are required by the Concession Agreement and stations leases to undertake periodic reviews of the asset management plans and the charges for using the network. Our 2024 Periodic Review of HS1 Ltd (PR24) covers the fourth control period of HS1 Ltd's concession and lease periods (referred to as "CP4"), covering 1 April 2025 – 31 March 2030. Table 2.1 below shows charges regulated by our periodic review.

Table 2.1 Charges regulated by ORR

Access to:	Regulated	Unregulated
Route	Operations, maintenance and renewals charge	Investment recovery charge
Stations	Renewals charge	Operations and maintenance charge (QX)

3. Introduction and Methodology

3.1 This document includes concise conclusions in its main body. Further technical information and detail behind our decisions is included in technical annexes.

3.2 Following the start of the PR24 process with the publishing of our approach and process document in January 2023, we began a robust regime of due diligence which built the breadth and depth of understanding which underpins this Draft Determination.

3.3 During 2023, in parallel with HS1 Ltd assuring NR(HS) and ABM's plans, we conducted extensive early engagement. We held around 50 meetings with stakeholders to understand positions, develop ideas and inform ourselves of the basis of the plans, as well as numerous site-visits. As it is our first review of HS1 stations we commissioned consultants to clarify and report on the contractual arrangements for the allocation of costs in the stations. Benchmarking studies on route and stations costs and NR(HS)'s Operations & Maintenance management fee were carried out by consultants hired by HS1 Ltd and NR(HS) respectively.

3.4 In February 2024, we received HS1 Ltd's draft Five Year Asset Management Statement (5YAMS) for its route, and a Life Cycle Report (LCR) for each station. We carried out a detailed review of these documents, along with the accompanying supporting documents, in particular NR(HS)'s plans as the operator of the network. We then provided feedback to HS1 Ltd and NR(HS) through detailed meetings on the individual areas.

3.5 After taking account of our feedback and that of other stakeholders through a consultation, HS1 Ltd submitted its final 5YAMS and LCRs to us in May 2024 and we continued our process of analysis, challenge and deliberation.

3.6 In total our scrutiny of the draft and final 5YAMS and LCRs comprised three days of site visits, eight deep dives into Specific Asset Strategy (SAS) areas during its development, eight further challenge sessions for each SAS; and five further deep dives into cross-asset programmes and subjects. Over 250 technical questions have been posed and responded to which form the basis of our evaluation. Queries were raised and answered as part of the progressive assurance of both the next control period's proposals and the 40-year asset plans. It has been both a bottom-up and top-down review.

3.7 Around 15 further deep-dive sessions and other follow-ups were then carried out with NR(HS) to ensure a detailed technical understanding of the issues. Final requests for evidence and clarification were also sent to HS1 Ltd over that time.

3.8 Over the course of 2024 we have also received stakeholder proposals for access terms changes where the HS1 system was unable to unanimously agree on a way forward. Following several rounds of engagement with stakeholders we have presented initial minded-to positions as part of this Draft Determination for further consultation.

3.9 The production of this Draft Determination marks the culmination of this stage of the PR24 process and will now lead to a consultation on the positions provisionally set out within it.

3.10 HS1 Ltd must then resubmit its amended 5YAMS to us by 30 November 2024, and we must then issue a Final Determination by 06 January 2025.

4. Asset Management Activity

4.1 This chapter covers our review of asset management *activity*, i.e. the frequency and type of renewals, maintenance and operations activities. Our review covers the HS1 route and stations.

4.2 The costs of these activities are then discussed in the next chapter.

Asset Management Strategies

Scope of our review

4.3 The Concession Agreement requires HS1 Ltd to manage the network efficiently and in line with best practice asset management. We have reviewed the asset management documents provided by HS1 Ltd and Network Rail High Speed ("NR(HS)" hereafter) and determined if they follow best practice. We make a judgement on 'best practice' by considering: the needs of the railway system; recognised standards and guidance (e.g. the ISO55000 series); and comparison against similar infrastructure managers.

4.4 HS1 Ltd's asset management planning starts from its asset strategies. These explain the decision-making process, including trade-offs between cost, risk and performance; and when to do inspections, maintenance or renewals. HS1 Ltd provided Specific Asset Strategies (SASs) for different asset groups, such as track, and signals and control system assets, as well as additional strategies for cross-cutting themes such as safety and environmental sustainability.

4.5 We reviewed these strategies to assess their level of maturity. Typically, more mature strategies are supported by appropriate data, modelling and decision-making tools. These allow a clear understanding of how different assets are performing and degrading; and also allow asset managers to optimise the plans for different scenarios – including making changes during the control period, e.g. for changes in traffic, or climate change.

4.6 Our review considered the following:

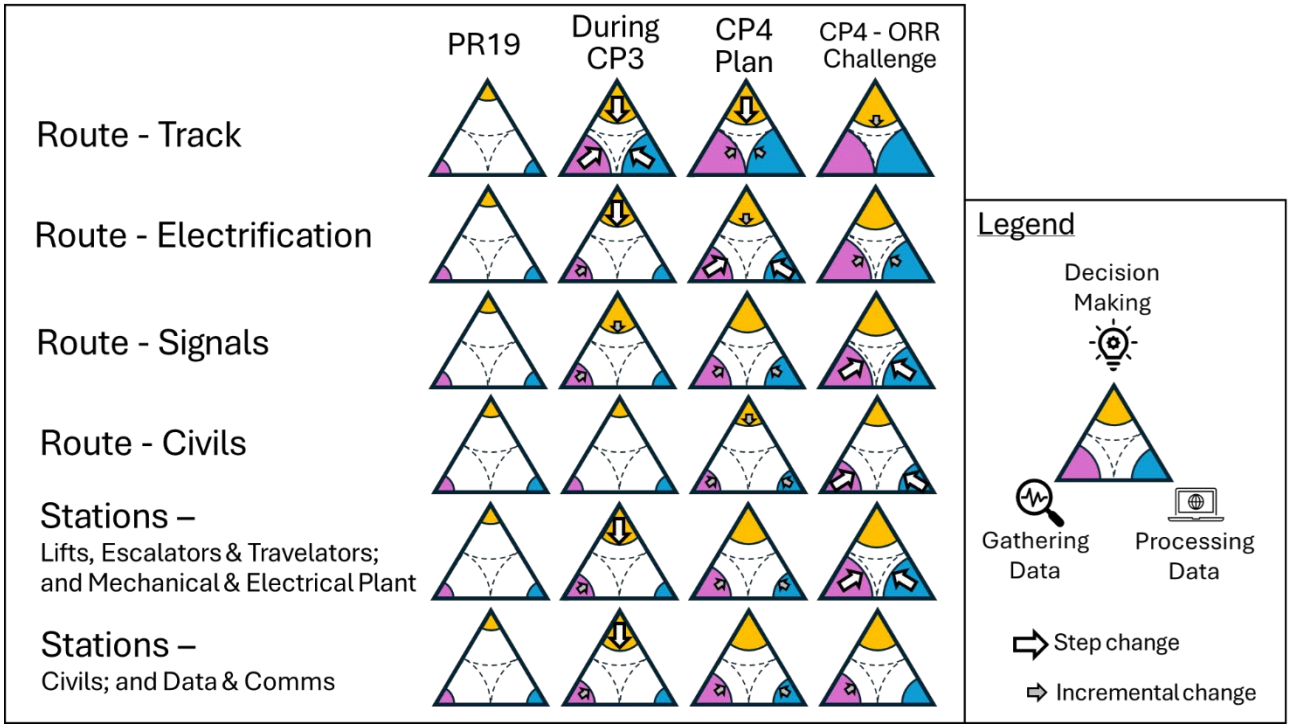
- whether NR(HS)'s SASs for each asset group are following best practice;
- whether the level of asset management maturity is proportionate to the criticality of the asset; and

- whether there are opportunities to increase maturity in CP4 that will provide material benefits e.g. more optimised plans or more resilience to change.

4.7 We assessed the maturity of the management of each asset group at four points in time: looking back five years (to PR19); changes made in CP3; changes we anticipate HS1 Ltd / NR(HS) will make in CP4, based on their plans; and where we concluded there were opportunities to go further in CP4. We have summarised our assessment graphically, as 'maturity triangles'.

4.8 Figure 4.1 summarises our maturity assessment for the different asset groups; what HS1 has proposed to achieve in CP4; and what we think that the company should be targeting to achieve in CP4. More details are also annexed, but our conclusions are set out in Figure 4.1.

Figure 4.1 Asset management maturity summary



Where we support HS1 Ltd's plans

Conclusion - the structure of the documents was in line with best practice

4.9 HS1 Ltd presented a clear, logical structure of asset management documents that is in line with best practice (as defined by the ISO55000 series of standards).

4.10 The SASs have improved since PR19. They now all have the same format which provides consistency and allows for clear benchmarking and sharing of good practices between the asset groups.

4.11 HS1 Ltd's asset management objectives are clearly linked to forecast use of the network and potential scenarios for growth. This is a major improvement since PR19 and is a useful tool for addressing uncertainty in recovery since the COVID-19 pandemic. This maps to best practice around strategy and planning in ISO55000.

Conclusion - Track and Electrification asset groups represent best practice

4.12 We concluded that the Track asset group has the most mature asset management systems and models, following a period of investment and delivery during CP3. We can clearly evidence the benefits of this mature strategy, because the 40-year renewal plan is more optimised and more efficient. For example, ballast, rail and sleeper campaigns have been spread over several control periods, based on different rates of degradation. We have also seen short-term benefits, in the optimisation of plant use for maintenance; and the ability to adapt quickly to unprecedented hot weather in CP3. This level of maturity sets the benchmark for other assets. The next step change in maturity in the management of track assets will come through practical experience of delivering large renewals in CP4.

4.13 The Electrification asset group is going through a step change in maturity at the end of CP3. Notably, research and development (R&D) projects have yielded technology that will allow camera-tracking of wire position and condition. This allows faults to be detected, and maintenance work done, before they impact performance. It also allows detailed data on asset degradation around the network. We expect to see this technology rolled out and used to build mature data models in CP4.

4.14 We concluded that more mature asset management, in particular of track and electrification assets, resulted in more concise, more effective SAS documents which clearly prioritised issues and were supported by robust data.

Opportunities for further improvement

Conclusion – There are opportunities to accelerate step changes in maturity in other asset groups

4.15 In the other asset groups, we concluded that there were opportunities to accelerate the rate of change in asset management maturity. In particular, the Signalling & Control Systems, Route Civils, Stations Lifts Escalators & Travelators

(LETs) and Mechanical & Electrical Plant (MEP) asset groups should accelerate plans for gathering and modelling data.

4.16 HS1 Ltd and NR(HS) have stated that maturity in these assets is not yet a priority, as there are few large renewals until later control periods. We concluded that there is an urgent need for a step change in maturity in CP4 because:

(a) data needs to be gathered now, to provide trends of degradation under different conditions, including traffic loading and weather conditions, so that this is available when HS1 Ltd plans large renewals in the future; and

(b) we have seen in the management of tract assets in CP3 that mature data models have short-term benefits. They allow asset managers to adapt to unexpected changes, model different scenarios effectively, understand the cause of faults, optimise maintenance and reduce train delays.

4.17 We would expect to see acceleration in the maturity of the management of these asset groups into the first half of CP4, yielding performance and cost benefits within the control period.

4.18 We concluded that there were fewer opportunities for a step change in modelling for Stations Civils and Digital & Communications assets, because most decisions in these asset groups will be made based on specialist assessments, rather than data trends.

4.19 Each SAS has a roadmap for asset management maturity improvement and all assets are part of an evolution programme in CP4. We support the intent of this evolution programme, to share resources and learning between asset groups. However, our review concluded that the most effective step changes in CP3 were all delivered as smaller, more agile changes, clearly defining a specific problem and creating a bespoke solution within an asset group.

4.20 HS1 is a relatively small railway, so it cannot achieve the same economies of scale as NRIL, for example. But HS1's size gives it the advantages of agility, and having a much smaller range of different components and local conditions. We concluded there were opportunities to accelerate the benefits of the asset-specific plans and the evolution programme, through a focus on rapid step changes, as has been done successfully in some assets in CP3.

Renewals

Scope of our review

All renewals (Route & Stations)

4.21 We determine an annuity charge, which is paid into an escrow account to fund future renewals. We consider when renewals will be needed over a 40-year period, to manage the assets efficiently and in line with best practice. Then we set the charge at a level which should provide sufficient funds in the escrow account to deliver these planned renewals.

4.22 If there is insufficient funding in the escrow account, it is likely that HS1 Ltd and its suppliers would seek to alter the asset management strategies, deferring or descoping renewals which could lead to a reduction in asset condition.

4.23 For renewals later in the 40-year period, there is a lot of uncertainty around the exact timing of renewals, the cost of the work, new technology, inflation and many other risks and opportunities. So, for renewals in CP5 onwards of the 40-year period, our review considered the following:

- whether the SAS for each asset type followed best practice and predicted the need for renewals efficiently over the 40-year period;
- whether the cost of those renewals has been estimated efficiently and in line with best practice;
- whether the strategies, renewals plans, operations & maintenance plans, and R&D initiatives were aligned to provide an efficient outcome for the railway system.

4.24 We note that five-yearly cycle of reviews allows us to take a balanced approach to uncertainty in the longer-term renewals: recognising that there will be opportunities to refine the plans at future periodic reviews (when more data will be available) before the renewals occur, while still ensuring the escrow balance will be sufficient over the 40-years for the forecast renewals. For renewals in CP4, we ensure there is sufficient funding in the escrow account to fund these renewals. Our review therefore considered the following for CP4 renewals:

- whether the SAS for each asset type followed best practice to determine the timing and scope of individual renewals projects;

- whether the cost of those renewals has been estimated efficiently and in line with best practice; and
- whether the processes to deliver the work are reasonable, i.e. access strategies, plant strategies, procurement, governance, competence of technical teams.

Additional considerations – for Stations only

4.25 Renewals at HS1 stations are undertaken by distinct zones. In some stations, there are different asset management requirements for international and domestic zones. In some stations (particularly St Pancras International), some zones are managed and funded by third parties while some zones are leased by HS1 Ltd to retailers, who fund some renewals and maintenance within their units.

4.26 PR24 is our first periodic review of stations, previous reviews of which were previously carried out by the Department for Transport (DfT). We have carried out a detailed review of the contractual arrangements for cost allocation at stations. We commissioned an external legal consultant (DAC-Beachcroft) to support our own review. A concise summary of the process for cost allocation at stations arising from this review is annexed.

4.27 Under the station leases, we only determine the renewals annuity charge for stations, known as the Long Term Charge (LTC). We do not determine charges for operations and maintenance at stations. These are calculated by HS1 Ltd through an annual review of actual costs, known as Qualified Expenditure (QX). This is similar to the mainline network, where most of the costs are charged through QX, with the exception of a management fee at NRIL's managed stations which we regulate.

4.28 Even though we do not determine QX, a summary of how it is allocated between parties is annexed, to provide transparency for stakeholders.

4.29 For all station renewals, our review considered all the items listed above for the route and stations. Additionally, for CP4 renewals our review looked at each individual project and considered:

- whether this item of infrastructure included on the list of station assets, in Schedule 10 of the station lease - *If not, then this should not be funded from LTC*;

- whether the infrastructure interacts with areas covered by other leases/sub-leases e.g. the Thameslink box, the business lounge, retail units - *if so, then we will consider some additional factors:*
  - whether the components within third party areas are only there to support a larger structure e.g. the foot of a large roof arch, which happens to land within a retail unit;
  - whether there is similar infrastructure within those other areas, already funded by third parties e.g. toilets within the Thameslink box which are renewed by a third party, NRIL;
  - whether the station renewal been 'over-specified', to the benefit of third parties e.g. are toilet renewals in St Pancras also renewing the toilets in the Thameslink box.

4.30 We reviewed each station renewal on a case-by-case basis. Each station and each project had complex interactions. So, we used the list of considerations above as a starting point, then we asked for additional clarifications specific to each project. In future periodic reviews we propose to use a similar set of 'core' considerations. But, because we will look at each project on a case-by-case basis, our specific conclusions for projects in PR24 cannot be used to pre-judge our conclusions on future projects.

Where we support HS1 Ltd's plans

Conclusion - we support the CP4 route renewals plans (noting deliverability challenges on one project)

4.31 HS1 Ltd presented a clear, logical process for how it has planned route renewals in CP4. There was evidence available to support the timing, scope and volume of these projects. Overall, we concluded that these plans were reasonable.

4.32 CP3 saw the first significant renewals on the HS1 network. During that control period, we raised concerns about HS1 Ltd's readiness to deliver this increase in renewals. HS1 Ltd responded to our challenge and quickly introduced leading indicators and improved governance. In CP4 there is forecast to be a further increase in the volume of renewals, but the governance in place gives us confidence that this increase is deliverable.

4.33 Within this increase in volume over CP4, there is a single programme which is by far the largest renewal to date on HS1. The mid-life ballast replacement programme will renew around half of the network track at a cost of approximately

£90m, and it will take several years to deliver. Our review has therefore focussed on this programme.

4.34 We concluded that the volume and type of renewal is appropriate, and we are satisfied that the cost estimate reflects the likely cost to deliver this work efficiently. HS1 Ltd and NR(HS) are engaging with possible suppliers and are following best practice in their planning. However, this planning process is still ongoing, and we consider that delivering this project in the proposed timeframe (years 4 and 5 of CP4) will be challenging and a strong indication the programme could run into later years. We set out how this should be taken into account below at para 4.42.

Conclusion - we support the CP4 station renewals plans (noting scope clarifications on a small number of projects)

4.35 HS1 Ltd's planning of station renewals was broadly consistent with its approach to the route. We concluded that the volumes, timings and costs of renewals were reasonable.

4.36 Our case-by-case review of stations renewals concluded that the vast majority of projects (28 out of 31) had no material issues, in terms of interactions with third parties. The remaining three projects had complex interactions. While these issues may not be significant in terms of overall funding, this is our first Periodic Review of stations renewals, so we want to provide maximum transparency about our expectations for these projects. We have discussed these below at para 4.47.

Conclusion - planning for renewals over 40 years has improved significantly since PR19

4.37 HS1 Ltd has followed a clear, logical process to identify when renewals will be required. The scope and timing of renewals is set out in the SAS for each asset type. We have noted that there were different levels of maturity between different asset types.

4.38 In PR19 we concluded that plans for track needed to move from a simple, cyclic model to a more mature approach, based on asset knowledge and degradation data. In PR19 we determined a 10% efficiency challenge on track renewals over the 40-year plan. In response HS1 Ltd introduced a step change in its data maturity and decision making for track during CP3.

4.39 Similarly, the Electrification asset group has seen a step change in its maturity during CP3, ready for the start of CP4.

4.40 NR(HS)'s 5YAMS states that through understanding the assets better, it has forecast £140m of savings over the 40-year renewals plan. This is equivalent to

approximately 9% of the total 40-year route renewals cost and more than 10% of track costs, so it exceeds the 10% efficiency we set as a challenge at PR19.

4.41 Based on the level of information currently available, the plans for all asset types are reasonable. But we have identified some opportunities to improve these plans in the future.

Opportunities for further improvement

CP4 route renewals

Conclusion – there are opportunities to review deliverability challenges for CP4 ballast renewal

4.42 There are still some significant challenges to be resolved for the mid-life ballast renewal (around £90m, starting in Year 4). These include securing a supplier for high-output plant; agreeing the detailed access plans with operators; and understanding the productivity and effectiveness of the plant on HS1 Ltd's track. We agree that the project should start in CP4 and that the volumes and costs are reasonable, but we concluded that the project programme is likely to slip.

4.43 Smaller track renewals in CP3 have been deferred or over-ran by approximately one to five years. Similarly, our experience of large track renewals on the mainline railway indicates that, even in teams with extensive experience of projects this size, projects are often delayed by several years due to supply chain issues, loss of access due to weather events and other issues which also exist on HS1.

4.44 We ran a simple sensitivity analysis, to test different scenarios where this programme started later or took longer to deliver, by roughly one to five years. Because renewals are funded over a 40-year period, this delay did not have a material impact on the annuity calculation.

4.45 However, a delay to the project would have other impacts on the HS1 network, for example, re-planning access and re-negotiating this with operators; or delays that may impact other renewals planned in later years.

4.46 We support the ongoing work by HS1 Ltd and NR(HS) to finalise plans for this renewal. But we recommend that HS1 Ltd considers more realistic delivery profiles and sets out the risks of delays in its final 5YAMS.

CP4 stations renewals

Conclusion – there are opportunities for efficiency through scope review on specific projects

4.47 Our case-by-case review identified a small number of projects at St Pancras International station, where there was a complex interaction between the scope of the project and other works funded by third parties. These are:

- Uninterruptible Power Supply (UP, Year 1, £1.6m estimated cost). Retail units pay for their own UPS and these do not appear to be in scope for this project. But interaction with NRIL is not clear, for example, UPS may be protecting engineering systems used by both HS1 Ltd and NRIL. The scope should consider whether this is allowing third parties to avoid planned works, in which case there may be opportunities to share savings.

- Heat pumps, to replace boilers and chillers (Year 2, £1.4m). These will provide heating and cooling in the station, but also in the Thameslink box managed by NRIL, and retail units. NRIL and some retail units with specific requirements fund their own their works relating to heating, cooling and ventilation. The scope should consider whether this allows third parties to avoid planned works, or makes them more efficient, in which case savings should be shared.

- Toilets and toilet vacuum pumps (Years 2-4, £1.1m). Retail units with toilets, and NRIL, pay for renewal of their own toilets, including connection to the common sewer. We also note examples of retail units paying for their own vacuum valves. This is a complex, interdependent system and the presence of vacuum pumps and valves implies a design issue with the invert level. The scope of station sanitary projects should consider system optimisation – with appropriate contribution from third parties.

4.48 We have reviewed these projects and concluded that there are likely to be opportunities for efficiency in the scope of these projects. We estimate the magnitude of this efficiency as less than 10% (higher for the heat pumps, followed by sanitary appliances, and minimal for the UPS). We have concluded that an efficiency challenge of 5% across these three projects (or £150k-£200k in total) is appropriate and we have included this adjustment in our annuity calculations.

4.49 We carried out a simple sensitivity analysis, which showed that an efficiency challenge on these projects does not have a material impact on the overall stations annuity charge. So, we are satisfied that this efficiency challenge does not risk underfunding the escrow account.

4.50 During a control period, each renewal project goes through a governance process before its funding is authorised. If projects need more funding than set out in the final 5YAMS, they can go through a change control process. This process involves HS1 Ltd reviewing suppliers' estimates and presenting assurance to DfT that costs are efficient. In this way, all projects should ultimately receive the correct level of funding. We propose that HS1 Ltd apply a 5% efficiency challenge to these three projects in its final 5YAMS. The projects will then either review their scope, considering interactions with third parties, and find efficiencies; or submit a change control requesting the full amount, with explicit evidence that the scope accounts for third party interactions.

4.51 This is our first periodic review including stations and we want to set out a clear expectation for future periodic reviews. At each periodic review we will review each forecast renewal for the next five years. We will consider the factors listed above as well as any specific issues on a case-by-case basis. For any renewals which interact with third parties, we will expect clear evidence that this interaction has been considered in the project scope. HS1 Ltd may wish to add this as a regular part of its governance for all station projects, to reassure its stakeholders.

Conclusion – there is an opportunity to improve estimating and governance

4.52 When we took over regulation of stations renewals, this presented an opportunity for us to ensure consistency between stations and route. We quickly identified that the governance of stations renewals is subtly different to that for route. Specifically:

- there are some older assets in stations, with a history of issues;
- station renewals typically have a more direct impact on operators, because they impact the experience of passengers around stations, for example, if lifts or toilets are temporarily unavailable. So operators need to be more involved in project planning and governance; and
- there is a complex history of different companies undertaking asset management, with different approaches to data and decision-making. We now have companies delivering projects which were planned and estimated by others, which has led to a lot of change controls.

4.53 We recognise these challenges and generally found that the stations teams in HS1 Ltd, NR(HS) and ABM are knowledgeable and competent.

4.54 During CP3 we have raised concerns about lifts and escalators not meeting availability targets; and about the number of change controls for stations renewals. We have concluded that there are opportunities to improve this going forward.

4.55 We recommend that HS1 Ltd accelerate gathering and use of data for lifts and escalators, and mechanical and engineering assets. This should help to improve estimating the timing, scope and cost of stations renewals.

4.56 We also recommend that the governance of stations renewals should be reviewed. This should include sharing best practice from route renewals, for example, better use of leading indicators and better packaging of works, to reduce the number of small change controls.

4.57 We concluded that the level of funding for stations renewals in CP4 was appropriate, with the exception of our efficiency challenge on the three specific projects noted above. However, we concluded that there is an opportunity to improve estimating and governance, to ensure work is done at the right time and to reduce unplanned outages.

Renewals in CP5 onwards

Conclusion – there is an opportunity for efficiency in 40-year renewals plans, through asset data maturity

4.58 We have noted that HS1 Ltd should accelerate data maturity and degradation modelling in several asset groups. We also noted that HS1 Ltd achieved around 9% of efficiencies in CP3 by moving from simple cyclic renewals to models based on asset condition data for the track asset group (and, to a lesser extent, overhead catenary system assets). We think that there are significant opportunities to make the 40-year plans more efficient in other asset areas, particularly route civils; signalling and telecommunications; station lift and escalators; and mechanical and electrical.

4.59 However, HS1 Ltd has stated during our review that it does not intend to fully optimise the maturity of civils and signalling and telecoms asset management until later control periods, in time for major programmes of renewals. We have two concerns with this approach:

- as well as the long-term savings over the 40-year plan, there are opportunities for short-term benefits. We have seen for the track assets in CP3, that more mature models are able to react optimally to sudden changes. These changes might include an increase in extreme weather events e.g. in CP3 we saw a sudden increase in insulation joint failures due

to hot weather; or sudden changes in traffic levels and/or rolling stock, for example, during the COVID-19 pandemic in CP3 or, in future, new operators joining the network; and

- renewals are funded looking forwards 40 years. So, relying on simple, cyclic plans now then reducing volumes later once the asset models become more mature, risks overcharging operators today, then undercharging future operators.

4.60 We therefore recommend that improvements in these other asset areas be accelerated; and that it is appropriate to assume a benefit from this in the 40-year plans now. Based on the efficiencies realised from track and the Overhead Catenary System in CP3, we propose a 9% efficiency adjustment (that is, a 9% reduction in renewals costs) on these other asset areas, from CP5 onwards. These assets make up a smaller portion of the total renewals costs so this equates to around a 3% efficiency on route renewals and around a 5% efficiency on station renewals.

4.61 We recognise that, even with some acceleration, these asset groups may not become as mature as the Track asset group within CP4. Management of these assets may not need to become as mature as that of track assets in CP4, but HS1 Ltd needs to make step changes in these assets during CP4 to start delivering short-term benefits. Then it needs to reach full maturity for these assets before the start of major renewals campaigns in future control periods. We are making the assumption now that maturity will improve and that this will bring down renewals costs later in the 40-year plan. We cannot wait for future periodic reviews to confirm that plans have become more efficient, as this would risk over-charging operators now.

4.62 We also recognise that these asset groups may not be able to achieve the same level of efficiency as those recognised in CP3. In particular, signals assets are expecting a major enhancement, which leaves relatively few renewals in the 40-year plan, although there will still be renewals of points equipment and telecoms assets. We are only proposing an efficiency on renewals in CP5 onwards.

Maintenance

Scope of our review

4.63 Stations maintenance is out of scope of this review as it is not regulated by ORR.

4.64 We determine an annual fixed cost for operations and maintenance of the HS1 route. So, we need to ensure that the level of maintenance activity, that is, the number and type of activities in the plans, is efficient and in line with best practice.

4.65 The effectiveness and efficiency of maintaining the network is a function of many factors including asset management maturity. More mature asset management will lead to more optimised and more efficient maintenance interventions. We need to consider how maintenance will be undertaken; developments planned for CP4; and how maintenance and renewals are traded off to arrive at an optimised asset management outcome.

4.66 Best practice asset maintenance, as set out in the ISO55000 standards, emphasises the importance of maintenance activities aligning with asset management strategies to ensure activity is undertaken that prevents, corrects or predicts failures.

4.67 If maintenance is incorrectly carried out, or not correctly resourced, there is the potential for an immediate impact on train operations and an increased risk of asset faults, which could impact asset performance and safety.

4.68 For the CP4 maintenance plans, our review considered the following:

- whether the SASs for each asset type are following best practice for planning and delivery of maintenance activities;
- whether the cost of maintenance has been estimated efficiently and in line with best practice;
- whether plans to integrate new technologies and move towards a data driven, efficient maintenance regime are sufficiently agile and ambitious; and
- whether all the various strategies, renewals plans, operations and maintenance plans and R&D initiatives are aligned to provide an efficient outcome for the railway system.

Where we support HS1 Ltd's plans

4.69 We support the plans for maintenance activity in CP4 (noting opportunities around efficiencies) HS1 Ltd presented clear, logical processes in its 5YAMS and SAS documents for how it intends to deliver the asset maintenance needs of the network through CP4. The organisational shape, level of resource, and access proposals all support the balance of maintenance and renewal needed to maintain overall asset performance.

4.70 HS1 Ltd's maintenance activities across all assets are carried out in different ways to suit the varied needs of each asset group. Each asset group's maintenance plans build on the approach of CP3 starting at similar levels of resource and evolving this through the control period.

4.71 Each SAS contains a roadmap for development of the asset management approach. These are useful guides to the plans on an asset-by-asset basis and represent clarity on how each asset team will step forward in its management of the relevant assets.

Conclusion - agile changes made in CP3 demonstrated best practice

4.72 HS1 Ltd's submission included a maintenance evolution programme. This contains all the features we would expect to be considered for a network like this. The plan at time of review is being developed and presents much opportunity.

4.73 Through CP3, the varied nature of each asset's criticality to train performance and safety has resulted in higher levels of maintenance efficiency for more critical assets. Assets with a higher level of asset management maturity have made the biggest advances in better targeting of maintenance resources. An example of this is the way in which volumes of tamping plant have been reduced by using the newly developed track asset deterioration model to better target resource. Plans to develop this further and build on this model for track maintenance are seen as best practice within the HS1 assets.

4.74 We saw several good examples of significant agility in asset management improvement in CP3. This showed that HS1 Ltd could respond to issues with asset performance. An example is the points resilience programme where significant delays caused by points failures were analysed and changes to maintenance, inspection and training were implemented and performance improved within a year. This approach shows the agility of the system to respond when under stress. We concluded there were similar opportunities in other asset groups, discussed below.

Opportunities for further improvement

Conclusion – there are opportunities to optimise maintenance strategies in less mature asset groups

4.75 CP4 plans to maintain the assets continue to be largely traditional and highly dependent on manual interventions. Volumes of maintenance activity have in some areas been refined to reduce costs and achieve efficiency targets. We concluded that there are opportunities to do more of this in CP4, going beyond the plans submitted by HS1 Ltd and accelerating the asset management maturity plans.

4.76 There are significant differences in the maturity of asset management by asset type. Further maturity will lead to better asset understanding and better balance and efficiency of resource use. Our review concluded that improvements in the approach to assets with lower asset management maturity could produce more optimised maintenance plans and reduce costs associated with maintenance.

Engineering access

Scope of our review

4.77 We have noted a significant increase in forecast renewals work in CP4, including the largest renewal so far on the network. Our review must consider whether these plans are efficient and in line with best practice. This involves checking whether there is sufficient engineering access to deliver these works efficiently, without unduly impacting train operations.

4.78 Our review covered the following:

- reviewing HS1 Ltd's estimates of the access it will need in CP4. This included analysis to validate the access required for the mid-life ballast renewal using benchmark productivity rates from NRIL;
- reviewing HS1 Ltd's processes for compensating operators, including processes for changing access plans during the control period; and
- engaging with operators to confirm the level of access is tolerable.

Where we support HS1 Ltd's plans

Conclusion - we are supportive of HS1 Ltd's access plans (noting deliverability challenges on one project)

4.79 We concluded that HS1 Ltd's estimates of access were reasonable. HS1 Ltd and NR(HS) had used a standard methodology to estimate access requirements.

4.80 The estimates use the volume of work from the renewals and maintenance plans, which we concluded were reasonable for CP4, and a productivity rate (the number of kilometres achievable per hour) for different activities. Our independent analysis looked at the mid-life ballast renewal, using average productivity rates for high-output ballast renewal from NRIL as a benchmark. We found that HS1 Ltd's estimates of total access required were towards the upper end of what we would expect on the mainline railway. We concluded this was reasonable, because this will be the first renewal of this size on HS1 and it will take time to optimise and achieve maximum productivity; and HS1 Ltd will be delivering smaller volumes in shorter possessions, which also impacts efficiency.

4.81 From our engagement with operators, we concluded that the access plans would be challenging in Years 4 and 5, but are achievable. We note that operators' main concern was changes to the access plans, especially where:

- changes are made at short notice; or
- changes push more work into Year 5 (or later years), creating an unmanageable demand for access in that year.

Opportunities for further efficiency

Conclusion – there is an opportunity to improve mid-life ballast plans, for deliverability

4.82 We concluded (at Para 4.46) that HS1 Ltd should consider a more realistic delivery profile (starting in Year 4 of CP4, but with work extending further into CP5) and set out any risks. Because of the operators' sensitivity to changes in the access plans, HS1 Ltd should consider how different delivery scenarios might impact access requirements; and how this could be accommodated by the system.

Research and Development (R&D)

Scope of our review

4.83 R&D is an important part of best practice asset management. In PR19 we proposed that HS1 Ltd introduce an R&D fund and governance structure, which it did. HS1 Ltd's PR24 submission proposes continuing the R&D fund. Our PR24 review considered the following:

- whether the level of R&D funding is efficient and in line with best practice;

- whether the proposed R&D projects are efficient and aligned with the rest of the plans; and
- whether the funding structure and governance of the R&D fund is appropriate.

4.84 Our conclusions are set out below.

Where we support HS1 Ltd's plans

Conclusion - we are supportive of HS1 Ltd's R&D fund

4.85 We concluded that the level of R&D funding is appropriate, at £4.0m. This is an increase of £1.4m compared to CP3. We concluded that the R&D delivered in CP3 delivered significant benefits relative to the cost and that increased R&D funding in CP4 would be appropriate to see future benefits.

4.86 The most effective use of R&D funding in CP3 was to support agile changes to asset management. For example: LiDAR and optical recognition in the Electrification asset group.

Conclusion - we are supportive of HS1 Ltd's proposed R&D funding mechanism and governance

4.87 At PR19, we proposed an R&D fund after our Draft Determination. HS1 Ltd chose to include it within its own costs, as part of the charge for operations and maintenance. In PR24, HS1 Ltd is proposing to make R&D funding part of NR(HS)'s costs so that NR(HS) can make small changes to project budgets without needing to go through formal processes to release funds from HS1 Ltd. However, R&D will be excluded from the outperformance mechanism between HS1 Ltd and NR(HS), so if the latter underspends the R&D budget each year, or at the end of the control period, the money will remain in the R&D fund for future years.

4.88 We concluded that this new arrangement is more efficient than in CP3, and ensures unspent funds remain within the R&D fund. HS1 Ltd has demonstrated that there would still be regular reporting and governance of funding, so that it and stakeholders will have visibility of any changes NR(HS) is making to projects. So, we support this proposal.

4.89 We recognise that operators are keen to be more involved in the governance of R&D, to ensure it is prioritising benefits to the railway system, rather than prioritising efficiencies which increase profits for NR(HS) and HS1 Ltd. Details of

the operators' role need to be agreed between HS1 Ltd and operators before the start of CP4; we welcome views on this as part of this consultation.

Opportunities for further efficiency

Conclusion – there is opportunity to prioritise R&D funding to accelerate asset data maturity

4.90 We have concluded that HS1 Ltd and NR(HS) could accelerate improvements to asset management maturity in some asset groups, which should deliver efficiencies and benefits earlier in CP4. This may involve re-prioritising R&D projects or reviewing their scope. We have concluded that there is sufficient R&D funding in CP4 and sufficient flexibility to support this acceleration.

Operations & Train Performance

Scope of our review

4.91 Operations on the HS1 route are funded through the annual charge for operations and maintenance. Operations is key to achieving good train performance, which impacts, among other things, HS1 Ltd's performance targets set out in its Concession Agreement. So, we review HS1 Ltd and NR(HS)'s operations plans as part of our periodic review. Our review included:

- an assessment of NR(HS)'s operations plans, comparing with our examples of good practice from NRIL;
- an assessment of how the operations strategy delivers on HS1 Ltd's strategic themes of people, customer, performance and productivity; and
- a review of the 'Rebuild' asset management objective scenario as set out in HS1 Ltd's submission.

4.92 Our conclusions are set out below.

Conclusion - we support the CP4 operations plans

4.93 Our review concluded that HS1 Ltd and NR(HS)'s operations plans were reasonable.

4.94 The submission provided strong evidence of a comprehensive review of the operating plans. It provided evidence of how all relevant factors had been considered, such as station operations, incident response, and service recovery. It gave an account of how it had engaged with stakeholders to develop its plans.

4.95 Central to the plans is the focus on the recovery of the train service after incidents. This has been raised by operators and HS1 Ltd as a priority issue following several incidents with stranded trains in 2023-24.

4.96 The approach is to introduce improved processes and increased resource. For example, the plan is to use best practice tools such as the Integrated Train Service Recovery programme, which has been used successfully on NRIL, and increased resource at Ashford Rail Operations Centre to support co-ordination during incidents. This improvement in recovery is vital for the HS1 system and we want to ensure it materialises.

Conclusion – there are opportunities for further improvement – we expect a commitment by HS1 Ltd to demonstrate improvements in operations, around managing recovery

4.97 NR(HS) has proposed that the increase in resource at Ashford Rail Operations Centre be offset by reductions in headcount elsewhere. We have identified risks to this approach. Based on our experience of the national rail network, we anticipate that it will be challenging to recruit, train and retain the additional staff for Ashford Rail Operations Centre. The new roles will be highly skilled positions, and those in post will have expertise that will be in demand across the network.

4.98 In addition, NR(HS)'s proposals are reliant on more efficient allocation of tasks, which would then lead to savings in station security staff. While we support this initiative and we welcome new approaches to improve efficiency, our experience of the national network suggests this might not be successful; there, we have found that reducing headcount in this way can often be expensive and time consuming.

4.99 Given the importance of improving recovery for the HS1 system, we expect a commitment by HS1 Ltd in its Final 5YAMS to demonstrate that the changes have been made and benefits are being realised by the end of CP4 Year 1; or else HS1 Ltd should propose an alternative means to achieve a similar benefit. Any additional funding to achieve this benefit will need to be found through savings elsewhere in the plan.

Safety

Scope of our review

4.100 HS1 Ltd contracts much of its operating, maintenance and renewal functions to NR(HS), except at Ashford International Station where it holds a contract with ABM Facility Services (ABM). NR(HS) and ABM therefore hold safety

authorisations under the Railways and Other Guided Transport Systems (Safety) Regulations 2006.

4.101 HS1 Ltd retains its own health and safety responsibilities, having an important role as both asset steward and client for works on its network, station and associated infrastructure.

4.102 Our review of the health and safety aspects of CP4 considered both HS1 Ltd's 5YAMS and Strategic Asset Management Plan (SAMP), as well as the detailed 5YAMS produced by NR (HS). This involved a review of the 15 specific appendices to the NR(HS) 5YAMS, including the dedicated safety strategy.

4.103 For the purposes of this document, any reference to safety should also be taken to include health and welfare, where appropriate.

Conclusion - we support the CP4 safety strategy

4.104 The HS1 Ltd network has historically seen low levels of incidents involving members of the public and the workforce. However, both the HS1 Ltd and NR (HS) plans have detailed proposals on how to continue to improve levels of safety performance by outlining specific programmes that focus on mitigating the health, safety and wellbeing risks to both workforce and rail users.

4.105 While HS1 Ltd's plans focus largely on the personal safety and wellbeing of HS1 Ltd workers and passengers, the NR(HS) safety strategy considers both the people and process elements of effective safety management. The strategy incorporates four pillars that include safety culture and leadership, health and wellbeing, safety management systems and safety by design. The strategy includes an appropriate level of focus on the challenges that the network is likely to face during CP4, with a particular emphasis on asset management, reflecting the change in asset maturity during the control period from a largely new piece of infrastructure to one where assets are either in need of renewal or reaching obsolescence.

4.106 There is a positive commitment to continuous improvement in health and safety risk control by both HS1 Ltd and NR(HS) through the continued use of our Risk Management Maturity Model (RM3) by both organisations.

4.107 It is reassuring to note that there is alignment between the NR(HS) safety strategy and the other SASs. Safety is considered an integral part of each asset area's strategy, rather than in isolation, with each asset discipline identifying specific proposals that can improve management of health and safety risks.

4.108 We also note that the R&D strategy includes a number of areas where the implementation of new technologies could have considerable benefits with regard to health and safety risk management.

Conclusion – there are opportunities for further improvement – commitment by HS1 Ltd to report on 'safety by design' in its CP4 annual reporting

4.109 The 5YAMS contains a considerable number of safety initiatives across a range of asset disciplines. It is important that these are coordinated and remain connected to the overall safety strategy during CP4.

4.110 The 5YAMS identifies the safety implications associated with asset management, and in particular the change required in risk management from managing new infrastructure to infrastructure where the assets are either approaching their first renewal, or in the case of signalling and control systems, reaching obsolescence. It is therefore important that both HS1 Ltd and NR(HS) maintain an appropriate level of focus on asset management and ensure that there are appropriate arrangements in place to manage the current and future safety associated with the changes in the overall asset life cycle across the HS1 asset base.

4.111 HS1 Ltd and NR(HS) both need to recognise their increasing opportunities to improve safety by design, as they start to undertake more design work in CP4. HS1 Ltd and NR(HS) should continue to look for opportunities to improve health and safety risk control through the adoption of new or improved technologies.

4.112 In conclusion, we are not proposing any changes to HS1 Ltd or NR(HS)'s safety strategies, but we want to ensure there is increased focus on safety by design throughout CP4. We expect a commitment by HS1 Ltd in its Final 5YAMS to report on any new initiatives or examples of safety by design, in its Asset Management Annual Statements throughout CP4.

Environmental sustainability

Scope of our review

4.113 The Concession Agreement does not explicitly state a duty for HS1 in relation to environmental sustainability. However, we deem that environmental sustainability is an essential part of delivering asset management efficiently and in line with best practice. Furthermore, the Railways Act 1993 requires that we exercise our functions in a manner calculated to "*contribute to the achievement of sustainable development*". So, we have considered environmental sustainability as part of PR24.

4.114 In 2023 HS1 Ltd published its updated corporate environmental strategy, which set out its high-level objectives. HS1 Ltd's 5YAMS included separate stations and route sustainability strategies which provided detail on its approaches to deliver climate change adaptation; low carbon energy; waste and resources; and biodiversity priorities. We have reviewed these documents, together with additional supporting information provided by HS1 Ltd in response to our clarificatory questions.

4.115 Our review of environmental sustainability has considered:

- whether there is alignment between strategies and plans, which is a core principle of asset management best practice;
- whether strategies are consistent with wider legislative requirements (Environment Act 2021 and Climate Change Act 2008); Government priorities (Environmental Improvement Plan 2023); and the Government's current environment policy for the railway (Rail Environment Policy Statement 2021);
- whether strategies are consistent with recognised best practice, such as the Science-Based Targets Initiative (SBTi) and the Institute of Environmental Management and Assessment's (IEMA's) Greenhouse Gas Management Hierarchy; and
- benchmarking HS1 Ltd's approach to environmental sustainability against comparators (specifically NRIL).

Conclusion - we support HS1 Ltd's priorities on environmental sustainability

4.116 Our review concluded that HS1 Ltd has adopted a logical process for setting out its environmental priorities for the next control period, which align at a high-level with its corporate environmental strategy. The themes of its environmental strategies broadly align with the key Government priorities set out in the Environment Act 2021, Climate Change Act 2008 and Environmental Improvement Plan 2023. Our review identified some specific areas where there may be opportunities to improve sustainability, discussed below.

Decarbonisation

4.117 We have identified some areas of good practice in decarbonisation. HS1 Ltd has robust plans for reducing its scope 1 and 2 emissions, aligned to SBTi targets, and supported by evidence on how energy efficiency and decarbonisation investments will support carbon reduction. We consider this to be good practice and supporting

the UK's climate change commitments. We have identified opportunities to improve its plans around zero-emissions vehicles, discussed below.

4.118 HS1 Ltd's plans for reducing scope 3 emissions do not yet include a specific target and glidepath to reduce scope 3 emissions over the control period. We challenged HS1 Ltd on this; in response it outlined its initiatives planned for CP4 and we concluded that these initiatives were reasonable.

Conclusion – there are opportunities to improve - we expect a commitment by HS1 Ltd to lead a working group with stakeholders, on barriers to environmental sustainability

4.119 We reviewed the alignment between HS1 Ltd's corporate environmental strategy and its detailed route and stations strategies. We identified some specific areas where detailed plans and targets were less ambitious than we would have expected and may not align to the ambitious objectives in the corporate strategy. We discussed these areas in detail with HS1 Ltd. It provided additional evidence, demonstrating that it is doing everything reasonably practicable to improve sustainability, but also explaining why its ability to make ambitious changes is limited by contractual arrangements with its suppliers and stakeholders.

4.120 We accept HS1 Ltd's position on this. But we concluded that the ambitious objectives set out in HS1 Ltd's corporate environmental strategy are unlikely to be delivered unless stakeholders in the HS1 system can work together to overcome key contractual challenges. Specifically, we identified:

- zero emissions vehicles: HS1 Ltd's current target to introduce electric vehicles (potentially including some hybrid vehicles) for its car and van fleet by 2035 is less ambitious than NRIL, which has agreed a target with the Government for all electric vehicles by the end of 2027. The key limitation appears to be the lack of charging infrastructure at the Singlewell depot. The depot is operated by NR(HS), owned by DfT, and HS1 Ltd is responsible for asset management under the Concession Agreement. All three parties need to work together to agree a plan for funding a solution, delivering the solution, and recovering the cost. There appear to be some additional challenges around procuring the right quantity and type of electric vehicles. Again, this would benefit from stakeholders working together to find a solution.

- renewable energy: HS1 Ltd previously completed a feasibility study for installing solar panels at stations and it is also looking into feasibility of wind turbines or hydroelectric generators. However, it appears unlikely that these initiatives will be delivered in CP4 because of a lack of agreement on

responsibility for funding, delivery and benefit realisation. We support these initiatives and we encourage HS1 Ltd, DfT and NR(HS) to discuss options and seek a mutually beneficial way forwards.

- circular economy: we concluded that HS1 Ltd's initiatives for circular economies at its stations and depot should be further developed to consider circular design and sustainable procurement. Again, this is contractually complex: HS1 Ltd has responsibilities to manage these initiatives but most of the changes need to be made by NR(HS) and further down the supply chain, which requires incentivising the right behaviours through contracts. Circular design initiatives may also require discussions with DfT as the asset owner.

- biodiversity: HS1 Ltd's approach to biodiversity in its corporate environment strategy is ambitious, and we would consider it class-leading. Its corporate objective of 20% biodiversity net gain over CP4 may be achievable, but robust details are not yet available on the glidepath and actions to be taken within the control period to achieve this. HS1 Ltd will need to work effectively with its stakeholders to agree actions, targets and roles. As well as HS1 Ltd's own corporate objectives, it may also need to consider priorities set in Local Nature Recovery Strategies; and the Government's Environmental Improvement Plan.

4.121 HS1 Ltd does not have the power to resolve these issues unilaterally, so we are not imposing a requirement on HS1 Ltd to resolve them through our PR24 determination. However, we expect a commitment by HS1 Ltd to lead a working group in Year 1 of CP4, with involvement from DfT, suppliers and other relevant stakeholders, to seek a way forward on the issues listed above.

4.122 We are also interested in hearing from stakeholders on any other barriers to environmental improvements which we have not listed here; or any proposed solutions.

Signalling Upgrade (ERTMS)

4.123 We reviewed the 5YAMS and 40-year work bank costings to establish if the proposed method of asset management to combat signalling obsolescence and life-expiry would facilitate the move to digital technology without a marked reduction in safety and performance.

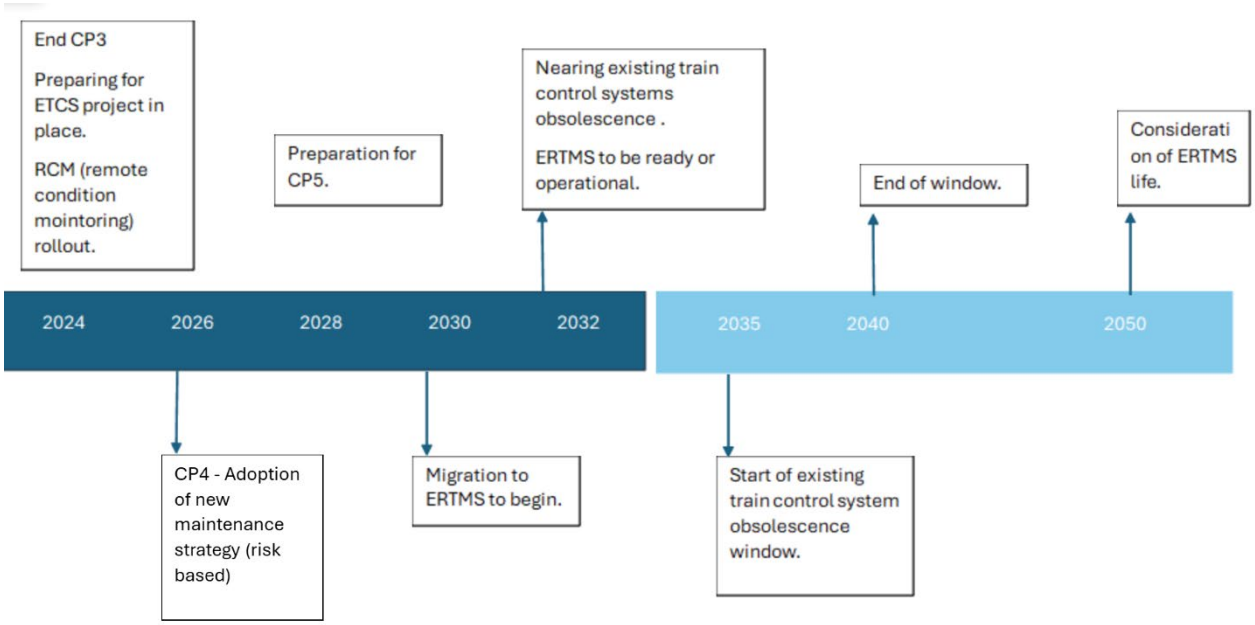
4.124 We did not have sight of any rolling stock fitment plans that would facilitate the move to the European Rail Traffic Management System (ERTMS), or its

equivalent, as this was not in the scope of the works. At PR19, we determined that should be funded as a specified upgrade under the Concession Agreement. Although therefore not in the renewals work bank, this project is a crucial aspect of HS1 Ltd's management of the asset, which is why this was reviewed for its appropriateness in terms of timeline and funding. We accept HS1 Ltd's proposals, having seen a good understanding of the condition of the assets and a clear demonstration of the reliability of key assets.

4.125 Signalling renewals should be planned around the performance of the asset in consideration with its life expiry or obsolescence status. This should be a rolling programme to ensure availability of product supply and resourcing to implement the renewals. There have been some shifts of renewals from CP3 to CP4 which may encounter risk if delayed further, such as the fixed signalling system in the throat of St Pancras station.

4.126 HS1 Ltd's plans also show a degree of whole system thinking about how its upgrade will interact with bordering infrastructure. Delays to other projects will need to be monitored for their impact on the introduction of ERTMS to HS1.

Figure 4.2 ERTMS timeline, subject to findings of planning and design works



5. Cost Assessment

5.1 The previous chapter looked at the frequency and type of asset management activities. This chapter covers the process of establishing the efficient costs of those activities.

5.2 These costs are then recovered through charges to the users of the network (train operators). The calculation of charges based on the efficient costs is described in the next chapter.

Renewals

Scope of our review

5.3 Our asset management review assessed the maturity of HS1 Ltd's approach in each asset group, then assessed the frequency and type of renewals in the 40-year plan.

5.4 HS1 Ltd must then estimate the cost of each renewal in order to calculate the funding required over the 40-year period. We reviewed this cost-estimating process.

5.5 Our review of cost estimates covered:

- cost estimating for CP4 renewals;
- cost estimating for renewals to be undertaken from CP5 onwards. This included consideration of HS1 Ltd's 'cost policy' for estimating costs for its long-term plans. We reviewed the base costs assumed at the start of the 40 years; and HS1 Ltd's methodology, including how it deals with uncertainty i.e. how costs might change over the 40 years.

Where we support HS1 Ltd's plans

Conclusion - we support the CP4 renewals costs

5.6 Our review concluded that the volume and scope of renewals in the CP4 plans were broadly reasonable, with a very small number of exceptions: deliverability of the ballast renewal; and the scope of specific stations projects.

5.7 Our review of HS1 Ltd's cost estimating concluded that the estimates were reasonable. Each project had a bottom-up cost estimate, based either on actual

data from previous HS1 projects (where available), or estimates provided by suppliers.

Conclusion - we support HS1 Ltd's introduction of its 'cost policy' for renewals in CP5 to CP11

5.8 Our review of HS1 Ltd's cost policy concluded that it followed a clear, logical methodology. The methodology was developed with input from specialists and it was generally consistent with best practice. We identified opportunities for further improvement to the methodology, which we have described below.

5.9 HS1 Ltd's cost policy does not generate a single answer – it creates a model, then allows HS1 Ltd to apply different levels of optimism (or conservativism) in the short-, medium- and long-term. HS1 Ltd's choice of inputs produced an output which was less optimistic in the short-term (CP5), increasing slightly in the medium-term (CP6-7), then becoming far more optimistic in the long term (CP8-11). We reviewed these decisions in detail and we concluded that these levels of optimism were appropriate, noting that they include more opportunities than risks in the longer term, which produces a stretching target and significantly reduces annuity charges now. Overall, HS1 Ltd's application of the cost policy reduced the charges in CP4 by approximately 35% for both the route and stations compared to its initial estimates before applying the cost policy.

5.10 We concluded that HS1 Ltd cost policy is a significant improvement on cost estimating at the previous periodic review. At PR19, HS1 Ltd simply assumed the unit rates for renewals would remain the same over 40 years, then applied inflation and risk overlays to the whole portfolio.

5.11 We support HS1 Ltd's use of the cost policy for PR24 and we have identified some opportunities to improve it further in future periodic reviews, described below at paras 5.17-5.20.

Conclusion - we support HS1 Ltd's approach for splitting costs between variable and fixed

5.12 HS1 Ltd's charging model splits renewals and maintenance costs between "wear and tear related" costs and "non wear and tear related". HS1 Ltd determined this split for different asset types based on engineering judgement. For example, ballast is treated as 100% wear and tear related, whereas telecoms assets set well back from the track are treated as 0% wear and tear related. We reviewed each asset type and provided our own engineering judgement on the split.

5.13 We concluded that, overall, HS1 Ltd's engineering judgements were reasonable. There were a small number of asset types where our independent judgement suggested slightly different proportions of wear and tear to HS1 Ltd. In summary:

- Underbridges and Embankments – we concluded that these assets were subject to more wear and tear than HS1 Ltd, on the basis that they will be degraded by traffic over the longer term, and we are considering renewals over 40 years;
- Acoustic barriers – we concluded that these assets were subject to less wear and tear than HS1 Ltd, on the basis that these should be designed to mitigate much of the impact of passing trains;
- Points operating equipment – we concluded that these assets were subject to slightly less wear and tear than HS1 Ltd, on the basis that interventions are more likely to be caused by obsolescence; and
- Contact wires – we concluded that these assets were subject to slightly less wear and tear than HS1 Ltd, on the basis that some damage will be caused by external factors (e.g. extreme weather).

5.14 Overall, our assessment resulted in a small (2%) shift towards more wear and tear related costs, which we have included when we calculated charges.

Opportunities for further efficiency

Conclusion – there are opportunities for efficiency (cost savings) through asset management maturity

5.15 Our review of asset management maturity concluded that the volume of renewals in the 40-year plan is likely to reduce as asset data and models become more mature in CP4. In para 4.60, we estimated this reduction in activity as approximately 9% in specific asset groups (route civils; signalling and telecommunications; station lift and escalators; and mechanical and electrical), based on efficiencies achieved since PR19 in more mature assets (mainly track). Reducing activity (volumes) will directly reduce costs in the 40-year plan, hence we have applied this 9% efficiency to renewals in these asset groups, starting in CP5.

5.16 We recognise that HS1 Ltd's cost policy includes a factor for 'deterioration confidence', which considers whether assets will expire earlier or later than the current plan. This may overlap to some extent with the opportunity we have identified. We recognise that HS1 Ltd's cost model has assumed some small

opportunities in the later time horizon for structures (within Civils) and stations MEP, but the cost policy did not address all the opportunities we have identified.

Conclusion – there is an opportunity to improve the 'cost policy' calculations at future periodic reviews

5.17 The areas of future variability identified by HS1 Ltd were informed by modelling based on an uncertainty of the impact of future events, however, there exists the possibility that not all the events will occur. We do not believe that this has been adequately catered for within the estimate and, as a result, the total risk and opportunity values are likely to be overstated.

5.18 HS1 Ltd's route cost policy identified more risk impacts than opportunities in the short- and medium-term. As a result of the skewing effect in the methodology, the cost estimates will be too high in these periods. However, HS1 Ltd identified more opportunity impacts than risks in the long-term (40 years), which skew the result in the opposite direction.

5.19 We carried out an analysis to test the magnitude of these skewing effects. We concluded that, for the route model, the skewing effects roughly cancel each other out. So, we are not proposing any adjustment to the route annuity, but we recommend the cost policy methodology is improved before the next periodic review to include probabilistic risk.

5.20 However, HS1 Ltd's stations cost policy did not identify so many opportunity impacts in the long term. Our analysis indicated that there was a small, but still material, skewing of the cost estimate, increasing it by approximately 0.5%. This skew does not affect costs in CP4, and we are assuming this skew will be corrected at future periodic reviews. So, our Draft Determination is applying a 0.5% reduction to station renewals costs starting in CP5, to correct for this skew effect.

Conclusion – there is an opportunity for efficiency through better 'base cost' data at future periodic reviews

5.21 The cost policy approach starts with base costs i.e. the cost of materials, plant and labour today, excluding any risk, profit margins or efficiencies. Then the policy adds overlays for risks, opportunities, profit margins and efficiencies to predict how the total costs might change over the 40 years.

5.22 We concluded that the biggest limitation of the cost policy is that little data exists for base costs on HS1, because most of the HS1 assets have never been renewed. HS1 Ltd and NR(HS) have followed a logical process to create base cost

data, for example by obtaining actual costs for similar work undertaken by NRIL; or asking the supply chain to provide estimates.

5.23 However, using this data as base costs is challenging, because it may already contain realised risk, inefficiencies and supplier costs, which are difficult to strip out. Our review concluded that base costs had not been 'cleaned' before they were used in the cost policy. We found several examples where base costs had been increased by approximately 3-5%, to include risks and challenges specific to the HS1 network. Using these types of data as base costs will create a double-counting of risks or other factors when these are applied later in the cost policy.

5.24 To understand the difference that this kind of adjustment can make overall, we analysed pre-efficient and post-efficient data for NRIL's Southern Region, which was part of our PR23 Periodic Review of NRIL and surrounds the HS1 network. Our analysis found a difference of 4-7%.

5.25 We recognise that good base cost data is not currently available for HS1 and we understand HS1 Ltd and NR(HS)'s approach to estimating base costs from other sources. However, we have concluded that the lack of accurate base cost data will have created some double-counting of factors applied later in the cost policy. We conclude that there is an opportunity to make the cost estimates more efficient at future periodic reviews by collecting HS1-specific data or improving the process to 'clean' data from other sources. This opportunity will only affect cost estimates for CP5 and beyond, which have gone through the cost policy. We estimate the size of this efficiency as approximately 4%, based on our analysis.

5.26 We have applied an efficiency adjustment (i.e. reduction in renewals costs) of 4% to all renewals, starting from CP5, on the assumption that better base cost data should allow HS1 Ltd to avoid double-counting of risks, inefficiencies or other factors in its cost policy at future periodic reviews. This assumption can be reviewed at PR29, when more data is available.

Operations & Maintenance

Scope of our review

5.27 HS1 Ltd charges train operators a charge to recover operations & maintenance costs for the route. This charge covers:

- HS1 Ltd's own costs for asset management and other support roles;

- pass-through costs e.g. electricity bought from the National Grid to power trains; and
- NR(HS)'s costs for maintenance and operations e.g. salaries for maintenance crews and staff in control centres; buying tools; renting vehicles.

5.28 HS1 Ltd's 5YAMS proposes annual costs of £95.4m in the first year of the control period, steadily reducing to £88.8m by the final year. HS1 Ltd and NR(HS) have provided detailed evidence setting out how they estimated this value. We have carried out a detailed, bottom-up review of all the elements which make up the estimate, including:

- base costs (e.g. unit rates for maintenance tasks; or headcounts and salaries for operational staff);
- risk allowances (e.g. potential impacts of extreme weather, trespassers etc);
- profit margins; and
- efficiencies, headwinds etc (e.g. planned improvements which should bring down costs; or foreseeable changes in the industry which will increase costs).

5.29 HS1 Ltd has a contract with NR(HS) named the Operator Agreement. We are not involved in this contract and we have no power to direct changes to it. However, it is important that we ensure that any costs passed on to train operators are efficient. We have reviewed how the contract deals with risk and uncertainty; and how it has incentivised behaviours in the HS1 system in CP3.

Where we support HS1 Ltd's plans

Conclusion - we support HS1 Ltd's own costs

5.30 We were provided with a detailed breakdown of HS1 Ltd's internal costs on which we raised questions and requested clarifications. Our review concluded that HS1 Ltd's own costs were consistent with its duties under the Concession Agreement.

5.31 Because HS1 Ltd has subcontracted much of the asset management to NR(HS), a key part of HS1 Ltd's role is its assurance of NR(HS)'s plans and performance. We concluded that HS1 Ltd's costs for this assurance in CP4 were reasonable.

5.32 During CP3, the COVID-19 pandemic led to large changes in traffic levels and complex negotiations within the system. HS1 Ltd's costs increased by up to 20%

(in 2022-23) for additional staff and consultancy to deal with these issues. These additional costs in CP3 were borne by HS1 Ltd. During our early engagement for PR24 we challenged HS1 Ltd to ensure that any cost increases relating to the COVID-19 pandemic had now been removed, so they would not be passed on to operators in CP4. In its 5YAMS HS1 Ltd's cost estimate for CP4 has returned to approximately the level it proposed at PR19, which we deemed to be efficient at that time.

Conclusion - we support the proposed criteria for pass-through costs

5.33 Pass through costs relate to activities contracted by HS1 Ltd on behalf of the system but over which it has no control, such as the provision of traction electricity. These do not receive any mark up and the associated costs are passed through directly to the operators. For CP4 the costs are budgeted at £122.2m which is £0.9m lower than the expected outturn for CP3. Our review concluded that these were reasonable.

Conclusion - we support NR(HS) base costs for operations & maintenance (noting opportunities in efficiencies and markups)

5.34 Our review concluded that NR(HS)'s base costs i.e. activity levels and unit rates at the start of CP4, were reasonable. These were based on HS1-specific information from CP3.

5.35 Risk allowances, profit margins and efficiencies had been estimated by NR(HS) using clear, logical processes. However, we identified opportunities for more efficiency and better incentives, discussed below.

Opportunities for further efficiency

Conclusions – there are opportunities for efficiency in operations and maintenance costs, through accelerating asset management maturity

5.36 Our review of asset management maturity concluded that there were opportunities to make the HS1 system more efficient through acceleration of changes in asset management maturity for route civils; and signalling and telecommunications in CP4.

5.37 We have discussed the qualitative benefits of better asset knowledge, including better train performance and more accurate future plans. Moreover, better understanding of assets could also generate savings to NR(HS) operations and maintenance costs within CP4 by, for example:

- delivering planned efficiencies earlier in CP4;

- reducing asset faults – and hence reducing reactive maintenance costs and costs to investigate incidents;
- reducing train delays caused by asset faults – and hence reducing delay payments (and performance risk funding that covers this); and
- reacting more efficiently to external changes, for example more frequent extreme weather events, or significant changes in traffic.

5.38 To quantify this opportunity for efficiency, we have looked back at what worked particularly well in CP3. We concluded that NR(HS)'s most effective initiatives were rapid, agile changes within specific asset areas, most obviously the track model at the start of CP3. Larger, less targeted initiatives (such as the target operating models and delivery integrator workstreams) provided some benefits and a lot of learning, but we have not seen evidence of a step change in efficiency.

5.39 At PR19, NR(HS) set out its efficiency targets, which increased steadily over the five years. In CP3, NR(HS) achieved its end-of-control-period efficiency targets in Year 1, then continued to increase efficiency every year. This led to underspends of £3.7m and £3.6m in the first two years of CP3. This was achieved despite a global pandemic and other major economic pressures, and despite not having the explicit funding for 'enablers' as has been included in the CP4 plans.

5.40 We concluded that NR(HS) could deliver rapid step changes in CP4 and that the benefits are likely to be of similar magnitude to those achieved through similar changes in other assets in CP3 (i.e. delivering end-of-control-period efficiencies early in the control period). Based on the actual underspends in CP3 and the planned efficiencies in CP4, we estimate NR(HS) could deliver approximately £2-3m per year more efficiency from its operations and maintenance spend.

5.41 We recognise that NR(HS)'s efficiencies include some 'stretch' efficiency (£0.5m in the last year of CP4), to seek further opportunities for efficiency during CP4. For the accelerations we are proposing to asset data maturity in route civils and signalling and telecommunications, NR(HS) has indicated that these are a lower a priority early in CP4 (as the large renewals are in later control periods). So, we deem it unlikely that NR(HS) would have delivered our proposals through its stretch efficiency. We support the inclusions of NR(HS)'s stretch efficiency as an incentive to continue seeking other opportunities which have not yet been identified, such as new technology which emerges during CP4, but this is different to our proposed acceleration.

5.42 Accelerating maturity will require some investment. We concluded that there is sufficient funding available through enabler funding and we support the re-prioritisation of R&D funding to aid this acceleration.

5.43 Better understanding of assets could also generate some efficiencies in HS1 Ltd's own costs in CP4 for example by:

- reducing fees for consultants to carry out detailed investigations following incidents; and
- clearer reporting could free up HS1 Ltd asset managers' time, to focus on tackling other issues in the HS1 system, or innovating.

Conclusion – there is opportunity for efficiency through contractual mechanisms

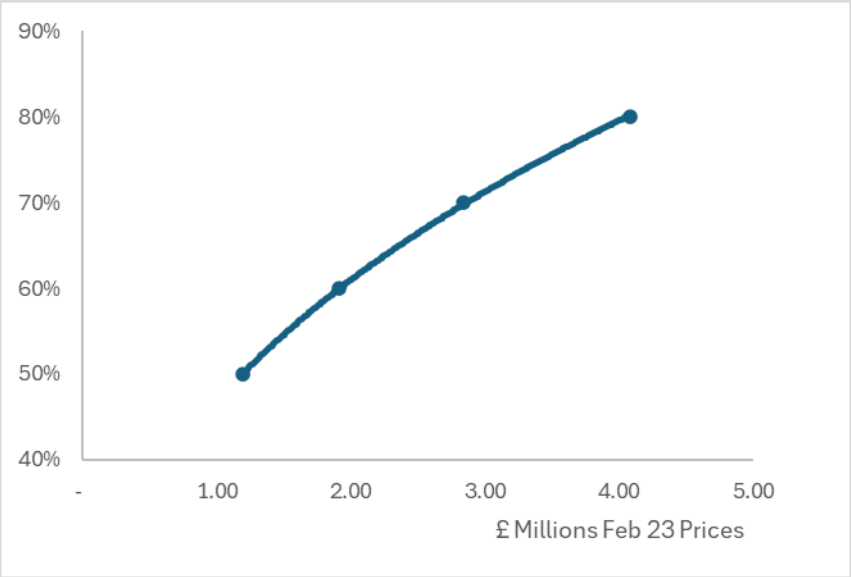
5.44 We reviewed the contracts around operations and maintenance in the HS1 system, in particular the Operator Agreement and the performance regime. Our review concluded that the current contractual arrangements are not incentivising efficient behaviours in the system. The main opportunities for efficiency were in the following areas:

Contract Risk:

5.45 It is best practice to include some level of risk funding within five-year settlements for operations and maintenance, to provide more certainty and avoid costly negotiations when unforeseen events occur. We reviewed NR(HS)' calculations of risk for CP4. This included 'cost risk' (e.g. if NR(HS) incurs labour or materials costs dealing with an extreme weather event) and 'performance risk' (e.g. if this extreme weather event delays trains, NR(HS) has to compensate operators for delays).

5.46 We concluded that NR(HS)'s methodology was reasonable and was based on available evidence. This evidence-based approach has allowed NR(HS) to reduce its five-year risk forecast by 36% from its equivalent provision at PR19, despite a pandemic and several high impact incidents. However, NR(HS)'s calculations produce a non-linear distribution for performance risk, as shown in Figure 5.1.

Figure 5.1 Performance risk distribution



5.47 The level of risk funding should be based on the cost that NR(HS) reasonably expects to bear, rather than covering it for all the risks that may occur. NR(HS) is requesting risk funding at P80 which means it will be covered for 80% of the cost impact for the risks it considered. We concluded that P50 funding would be too low, because just a small number of "low-likelihood, high-impact" events would consume the risk fund. However, we concluded that P80 is too high, as it is including a significant number of low-likelihood events – more than we would reasonably expect to occur. Our analysis indicated that the expected level of funding required is between NR(HS)'s P60 and P80 values, and that using this lower value would save more than £1.5m over CP4.

Outperformance mechanism:

5.48 The Operator Agreement has an 'outperformance' mechanism on operations and maintenance spend. If NR(HS) spends less than its annual budget, in the first two years of the control period, it keeps the unspent funds. In the later years, the unspent funds are split: 50% goes to NR(HS); 20% to HS1 Ltd; and 30% to the operators. We discussed this in detail with the stakeholders. Operators were concerned that this incentivises NR(HS) to underinvest in early years, then overspend in later years. Operators told us they would prefer not to receive the 30% return of unspent funds – but to have a more challenging target in the first place. NR(HS) and HS1 Ltd both told us that the outperformance mechanism has little impact on their decisions, i.e. it is not an effective incentive.

5.49 Furthermore, if NR(HS) spends more than its annual budget, then it bears 100% of the overspend. NR(HS) uses this imbalance in its pain/gain mechanisms as justification for higher profit margins (called the 'management fee' in the Operator Agreement). In 2023 NR(HS) hired the consultants Oxera to benchmark its profit margins. Oxera concluded that the mid-point of the range for relevant comparators was 6.6%; but because of the imbalance in the pain/gain share, the mid-point increases to 7.9%. NR(HS) used this as the basis for setting its margin at 8%.

5.50 We concluded that the outperformance mechanism is not incentivising efficient behaviours; and none of the stakeholders in the HS1 system are supportive of it. Instead, if 100% of the underspend was reinvested into the system through NR(HS), this would remove the imbalance and the reasonable profit margin could be reduced to 6.6%. This could reduce costs for operators by £3.7m over 5 years.

Protection from inflation:

5.51 NR(HS)'s contract inflates costs annually by RPI+1.1%. Our determinations for other infrastructure managers (in particular NRIL) inflate costs over five years by CPI plus 'input price effects' (approximately +0.5%, because we concluded that the actual products they are buying increase in price slightly faster than CPI – but less than RPI). In 2019 HS1 Ltd commissioned Pell Frischmann to review cost projections for HS1 stations, which recommended inflation at RPI. RPI is currently equivalent to CPI plus approximately 1%.

5.52 RPI+1.1% may have been appropriate when the HS1 contracts were first established (in the early 2000's), but RPI+1.1% now appears excessive based on recent evidence. CPI plus a factor for input prices is more appropriate and, based on the Pell Frischmann report, using CPI+1% (i.e. RPI) may be appropriate. Removing the +1.1% inflation on NR(HS) costs would reduce charges to operators by £2.9m over five years.

Enabler costs:

5.53 In its 5YAMS, NR(HS) is requesting to be funded for £14.7m of enablers for route operations and maintenance. This includes investment in software systems and hardware, as well as training costs.

5.54 We reviewed each of the enablers requested. We concluded that it is reasonable to pass on costs for software or hardware if ownership sits with HS1 Ltd, as these become assets which benefit the system going forwards.

5.55 We concluded it is not reasonable to pass on costs for training or developing people up to the standard already achieved by comparators (e.g. other NR(HS)

asset groups, or NRIL), as the benefits stay with NR(HS). It is normal practice for companies in the supply chain to absorb a certain level of training costs, to train their staff to the extent required to win competitive contracts. Based on our line-by-line assessment of the enablers, a total of £6.5m of enablers over the five years related to this type of training and should not be passed on to operators.

5.56 The Operator Agreement and performance regime are contracts between HS1 Ltd, NR(HS) and operators. We cannot instruct changes to the former contract in PR24, and would expect changes to the latter be done by agreement between the parties. However, we have concluded that the current contractual arrangements are generating approximately £14.7m of inefficiencies (around £1.65m of risk; £3.7m management fee; £2.9m inflation; £6.5m enablers) over CP4, or approximately £3m per year. This is 5.6% of NR(HS) costs and 3.2% of the total annual charge for operations and maintenance.

Our Draft Determination on operations & maintenance costs

5.57 We concluded that the efficient cost for operations & maintenance is approximately £3m per year lower than that proposed by HS1 Ltd. We have included this -£3m per year adjustment when we calculated charges.

5.58 We have identified several opportunities to achieve this, specifically:

- savings associated with accelerating improvements in asset management maturity, which would deliver planned efficiencies earlier; and also provide wider system efficiencies through improved asset performance and more resilience to external changes. If this acceleration is applied, then there may be justification for the higher contractual costs, e.g. higher enablers, higher levels of risk, to support the acceleration;
- addressing the contractual issues listed above (enablers; contract risk, inflation indices; and the management fee); or
- HS1 Ltd may choose to use a combination of these, or any other means to achieve a similar level of additional efficiency.

5.59 It is for HS1 Ltd to set out in its Final 5YAMS how it will meet the efficient cost.

6. Charges

6.1 The previous chapter determined the efficient cost of renewals, maintenance and operations.

6.2 This chapter covers the process of converting those costs into *charges for operators*.

Renewals charges (including annuity calculations)

6.3 Renewals are funded through an annual charge ('annuity') paid by train operators and based on average costs over a forty-year period. We are determining five annuities for CP4, one for the route and one for each of HS1's four stations (St Pancras International, Stratford International, Ebbsfleet International and Ashford International). These funds are held in escrow accounts and then drawn down to fund renewals as required.

6.4 This chapter covers the following:

(a) current position of the annuities and the escrow accounts in CP3;

(b) our review of HS1 Ltd's methodology for calculating the CP4 route and station annuities;

(c) our conclusions, including adjustments for:

(i) weighting the annuity by traffic;

(ii) escrow account balances;

(iii) escrow investment returns; and

(iv) other financial matters including the cost of capital.

6.5 In PR19 we set the route annuity at £34.0 million per annum for CP3 (in February 2023 prices). This was an increase from CP2 largely due to an increase in forecast renewals costs compared to PR14; and a separate adjustment to address previous underfunding.

6.6 The CP3 stations annuities were set by DfT at a total of £11.6 million (in February 2023 prices) split between the four stations with the majority accounted for by London St Pancras. Tables 6.1 and 6.2 below show the route and combined

stations escrow accounts in CP3 versus the PR19 forecasts. They both show that the escrow accounts are currently better funded than what was assumed at PR19 largely due to higher opening balances in CP3, higher inflation and, for route, lower than expected renewals.

Table 6.1 Route escrow account balances in CP3

£m, nominal prices	PR19 CP3 estimate	CP3 outturn forecast	Difference
Opening balance	75.4	91.3	15.8
Transfers in	144.7	152.9	8.2
Withdrawals	-87.0	-63.3	23.6
Interest earned	5.9	10.7	4.8
Closing balance	139.1	191.6	52.5

Source: HS1 Ltd 5YAMS

Table 6.2 Stations escrow account balances in CP3 (combined)

£m, nominal prices	PR19 CP3 estimate	CP3 outturn forecast	Difference
Opening balance	48.2	52.7	4.5
Transfers in	49.3	54.1	4.9
Withdrawals	-22.9	-26.8	-3.9
Interest earned	3.3	5.8	2.4
Closing balance	77.9	85.8	7.9

Source: HS1 Ltd 5YAMS

Conclusion - HS1 Ltd's annuity models were fit for purpose and aligned with good practice

6.7 HS1 Ltd's approach for calculating the annuities is broadly similar to the PR19 method as it based on a forty-year forecast of annualised renewals expenditure. However, HS1 Ltd has made some adjustments to the PR19 approach; and we have proposed some further adjustments which are explained below.

6.8 Important assumptions and decisions which affect the calculation of the renewals annuities include:

- the costs and volume of renewals expenditure over the forty years (explained in Chapter 4);
- the assumptions relating to efficiency and risk (explained in the chapter on asset management activity);
- weighting of the annuity calculation by forecast traffic; and
- financial assumptions about investment returns and inflation.

6.9 Our calculation of the five annuities is based on HS1 Ltd's models for both route and stations annuities. The route model was rebuilt during CP3 and for this reason we required HS1 Ltd to have the model audited, which was undertaken by the consultancy firm 'CPCS Transcom Limited'. Because the stations model is less complex, we are satisfied that HS1 Ltd's own assurance of this model is fit for purpose.

6.10 The rest of this chapter details the key matters that have informed our assessment of the CP4 route and stations annuities, some of which have resulted in changes to HS1 Ltd's proposals. These affect the charges that will be paid by operators.

Traffic weighting of the annuity

Background

6.11 Traffic on HS1 is an important driver of costs. The greater the number of services run on the rail network, the higher the wear and tear and associated renewals.

6.12 HS1 Ltd has produced traffic forecasts showing passenger traffic remaining broadly constant over CP4, and moderate growth over 40 years. HS1 Ltd consulted passenger operators on its forecast who agreed broadly with the CP4 forecast. However, operators considered the long-term forecast pessimistic, although did not supply evidence supporting this view. Freight traffic is also forecast to remain constant. We consider HS1 Ltd's traffic forecasts to be reasonable, but welcome operators' updated views on them.

6.13 HS1 Ltd's CP4 5YAMS included a weighting of the annuity by forecast rail traffic. This is a change from previous periodic reviews where no such adjustment was made. This means that costs are better allocated to those who cause them, so that if traffic changes over time, then future users of the railway would pay their appropriate share. This has the effect of lowering the CP4 route annuity by £4.5 million or 12% (because future traffic is forecast to be higher than current traffic).

6.14 HS1 Ltd's 5YAMS did not include a traffic weighting for the CP4 station annuities. HS1 Ltd's justification was that, because stations have a higher proportion of fixed assets, there is less of a clear link between traffic and costs.

Conclusion – we support HS1's traffic weighting adjustment to the route annuity and have applied a partial traffic weighting to the stations annuity

6.15 We support HS1 Ltd's proposal to apply a traffic weighting adjustment to the calculation of the route annuity. This adjustment means that the principle of 'user pays' is more strongly reinforced, so that as traffic, and associated wear and tear, grows, so does the annuity.

6.16 EIL and Southeastern in their response to the draft HS1 Ltd 5YAMS supported the move towards weighting the annuity by traffic. EIL questioned whether the adjustment should also be applied to the calculation of the stations annuities. We agree with this approach for route and we concluded that a similar approach should also be applied for stations because the stations have assets where costs are driven by traffic use (or at least passenger use such as lifts, escalators and toilet facilities).

6.17 Stations have a higher percentage of fixed assets than for route, e.g. the roof at London St-Pancras International. We concluded that traffic weighting should only be applied to station assets groups which are subject to more wear and tear, which are Lifts, Escalators & Travelators and Mechanical & Electrical; but excluding other assets such as civils (e.g. station roofing). These 'traffic dependent' asset groups account for approximately 25% of station renewals costs.

6.18 Table 6.3 below shows the impact of applying a partial weighting to the stations annuities versus HS1 Ltd's proposals.

Table 6.3 Impact of applying a traffic weighting for stations compared to HS1 Ltd's 5YAMS proposal

Traffic forecast	St Pancras	Ebbsfleet	Stratford	Ashford
Flat	5,729	1,543	1,365	617
Partial Weight (25%)	5,527	1,512	1,318	596
Difference (£)	- 0.20m	- 0.03m	- 0.05m	- 0.02m
Difference (%)	- 3.65%	- 2.05%	- 3.57%	- 3.52%

Source: HS1 Ltd 5YAMS and ORR analysis

Escrow account balances

Background

6.19 The five annuities are based on an average of long run renewals costs the forecast of which varies from year to year. This means that the balance on the five escrow accounts, as based on our financial modelling, can vary significantly, for example, in some years, the route escrow exceeds £100 million while in others it drops very low and negative (towards the end of the 40-year plan, in years where forecast renewals spend exceeds the forecast balance available).

6.20 At our last review we were concerned with the sufficiency of the escrow account, in particular the historic underfunding given low forecast of renewals in the past and the years where the account went negative as there would be insufficient funding for planned renewals. We made two adjustments to correct for this, an underfunding adjustment and a negative balances adjustment. As explained below, we concluded that these two adjustments are not needed for CP4.

Underfunding of the escrow account

6.21 In CP1 and CP2, HS1 Ltd underestimated the cost of renewals which meant that the route annuity was set too low and the escrow significantly underfunded. For example, at the end of CP1 it was calculated that the escrow was underfunded by £69 million (2023-24 prices, £50 million in 2012-13 prices).

6.22 In response, we increased the route annuity in CP2 and CP3 to 'catch-up' on the underfunding. In CP3 the annuity was increased by £1.2 million per year to address this shortfall. It is worth noting that the underfunding adjustment was only included in the route annuity. Station escrow accounts were better funded and no similar adjustment was made by the DfT for the CP3 stations annuities.

6.23 Now, in PR24, the HS1 Ltd 5YAMS included a £1.2 million underfunding adjustment in the proposed CP4 annuity, based on the same adjustment included in CP3. No similar adjustment was included for the stations annuities.

6.24 The CP4 opening balance on the route escrow is forecast to be £192 million which is higher than the PR19 forecast of £118m. This is due to lower-than-expected renewals expenditure in CP3, higher annuity payments due to higher inflation, higher investment returns, and a higher CP3 opening balance. HS1 Ltd's 5YAMS forecast is for a closing route escrow balance of £174 million after forty years.

Conclusion – we have removed the underfunding factor from the route annuity

6.25 We consider that the underfunding adjustments that we determined for CP2 and CP3, together with the beneficial movements to the escrow in CP3 have

addressed our previous concerns about historic underfunding of the escrow balance. Increased investment returns (detailed in 'Escrow investment returns' below) should also result in a higher escrow balance and therefore lower the contributions required from operators.

6.26 For these reasons we propose to remove the £1.2 million underfunding adjustment from the CP4 route annuity that was included in HS1 Ltd's 5YAMS. We support HS1 Ltd's decision not to include a similar adjustment for stations as the station escrow accounts are adequately funded.

Negative escrow account balances

6.27 Due to the uneven profile of renewals expenditure over the next forty years, HS1 Ltd's modelling shows some years where the escrow balance could turn negative. For CP3, the route and stations annuities were increased to avoid this, for example the routes annuity was increased by £0.4 million (in addition to the underfunding adjustment).

6.28 HS1 Ltd's current forty-year route renewals forecast has five separate years where the escrow balance turns negative, and a similar level for stations. The escrow cannot actually turn negative and so in these years HS1 Ltd would need to borrow to fund renewals. HS1 Ltd's adjustment to avoid negative balances results in a £0.5 million increase to the CP4 route annuity and £0.3 million for the combined stations annuity.

6.29 The financial modelling forecasts that the escrow balance will not turn negative for a number of years, not until 2044 for the route escrow and in the last four years from 2057.

Conclusion – we have allowed small negative balances towards the end of the 40-year annuity model

6.30 We are minded not to include a negative balance adjustment in the calculation of the CP4 route and stations annuities. This is because there is significant uncertainty around the profile of renewals and we would expect to see this profile 'smooth' and remove peaks in renewals spend as plans develop, which is what we have seen since PR19. So, we concluded that it is unnecessary to increase the annuity today for an event which is so uncertain.

6.31 There are also years where the escrow balance reaches low levels, again not for a number of years (for route, in 22 years or nearly 4 control periods from now). Over time, we expect that improved asset management planning should allow for a more efficient profile of renewals expenditure within the 40-year plan, that avoids

these negative balances. There will also be further chances to amend the annuity at future reviews if necessary. Following our proposed adjustments, both the route and stations annuity models indicate a balance of zero at the end of the 40 years.

Escrow investment returns

Background

6.32 HS1 Ltd is able to invest up to 90% of the escrow balances as specified in the Concession Agreement and station leases. The assumptions made around the level of returns are important because, all things being equal, higher returns result in a lower annuity payment by operators.

6.33 The Concession Agreement restricts HS1 Ltd on the types of financial instruments that it can invest in, which are generally low risk and short term. This means that level of returns achieved have been much lower than those achieved in the wider financial markets and not much higher than those received on its current account. This has an impact on the level of annuity paid by operators. We estimate that the annuity could have been around £15 million lower over CP3 if higher investment returns had been achieved in line with wider market returns.

6.34 Poor investment returns are a key issue which HS1 Ltd has acknowledged in its 5YAMS. Operators are currently paying a higher annuity as a result, and operators raised poor investment returns as a key issue in their consultation responses.

6.35 HS1 Ltd's 5YAMS assumed that it can achieve annual returns on its investments of 3.20% during CP4 rising to 3.30% from CP5 (to CP11). As per CP3, HS1 Ltd has assumed that 80% of the escrow is invested in low interest earning deposits, with 20% held in a current account for easy access to fund renewals (earning interest at 2% per year). The same assumptions are made for both route and stations escrow accounts.

Conclusion – we have assumed restrictions on escrow returns will be addressed

6.36 Our view is that HS1 Ltd should be able to generate greater returns on its route and stations escrow investments. In our calculation of the route and stations annuities we have increased the annual investment returns from 3.3% to 4.3%, over the 40-year period (in nominal terms) for the following reasons:

- HS1 Ltd is currently generating higher returns. For example, in June 2023 it invested £46 million at a rate of 6.16%. This is higher than the 3.20% it has included for CP4 and the 3.30% from CP5 onwards;

- HS1 Ltd's assumptions are lower than other recent regulatory decisions. As detailed in the July 2023 UK Regulators Network annual cost of capital report (real RPI terms, table 3) the total market return has ranged between 5-6% in recent regulatory decisions; and

- when calculating the annuity we need to make assumptions over forty years. We have concluded that it is reasonable to assume HS1 Ltd and DfT will find a solution to enable higher returns. For our Draft Determination, we have assumed this will happen from the start of CP4, but we are keen to discuss this assumption with stakeholders in our consultation.

6.37 HS1 Ltd's 5YAMS acknowledged the current limitations on what it can invest in under the rules of the Concession Agreement, and referred to a project to amend the Concession Agreement in CP4. Higher returns are only possible if the Concession Agreement is amended, which requires input from HS1 Ltd and DfT. This should be pursued as a matter of urgency in CP4 and we will provide support wherever possible.

6.38 HS1 Ltd's 5YAMS included £0.2 million of costs to implement the required changes to the Concession Agreement which are to pay for DfT and HS1 Ltd's external legal fees and ORR's regulatory fees. The efficient costs of implementing this change should be borne by operators as the users of HS1's infrastructure should benefit from any savings. However, we have seen limited evidence to explain the forecast cost for making this change to the Concession Agreement and we have requested further evidence prior to our Final Determination.

Other financial matters

Inflation in the annuity calculation

6.39 Inflation represents a significant cost over the forty-year renewals period and the choice of inflation index can make a difference to the annuity paid by operators, as it is used to uplift renewals costs each year.

6.40 In PR19, the retail price index (RPI) was used to uplift renewals costs, however economic regulators have largely moved away from its use in recent years.

6.41 HS1 Ltd's 5YAMS used the consumer price index (CPI) at 2% per annum over the forty-year period, in line with the Bank of England's inflation target. This is lower than the 3% typically assumed for RPI and results in a lower annuity. We estimate that HS1 Ltd's proposed CP4 annuity, calculated using CPI, is £0.3 million lower than using RPI.

6.42 We support this move towards using CPI in the calculation of the annuities. This is a more robust measure of inflation and is the same measure we use for NRIL.

Cost of capital

6.43 The weighted average cost of capital (WACC) reflects the cost to HS1 Ltd of raising financing across the business. The WACC is used by HS1 Ltd to:

- determine an even profile of charges (in real terms) to recover operating and maintenance costs where these vary across the control period; and
- recover the financing costs of 'specified upgrades' to the rail network.

6.44 In previous control periods the WACC was used to calculate the financing costs to HS1 Ltd in years where the escrow balance turned negative. As we explained in the annuity section above, we no longer expect this to be an issue for CP4 but it could be an issue in future depending on asset management and financial decisions.

Conclusion – we have corrected for errors in cost of capital calculations in CP4

6.45 HS1 Ltd's 5YAMS included a nominal pre-tax WACC of 7.45%. Our review found this to be excessive and we required further evidence from HS1 Ltd. In light of this, HS1 Ltd subsequently informed us that its 5YAMS value was incorrect and suggested a revised value of 6.40%. A pre-tax WACC is generally used in regulatory settlements where tax is funded through the WACC, which we do not consider relevant for this periodic review. As in PR19, we used a vanilla WACC, which has no tax adjustment on the equity return. HS1 Ltd recently submitted to us a proposed cost of capital for a specified upgrade project. For that project, HS1 Ltd proposed a real vanilla WACC of 2.48%. We note that our 2023 periodic review for NRIL set a real vanilla WACC of 3.35%. The UK Regulators Network (UKRN) annual cost of capital annual report also provides an overview of recent cost of capital decisions by other UK economic regulators. The latest UKRN report details a range of vanilla WACC decisions of between 2.7% and 4.6% (real, 2.0% inflation) with an average of 3.6% (see table 2 of the report). These provide meaningful benchmarks for HS1 Ltd's cost of capital.

6.46 Recognising that the value is broadly consistent with recent decisions, in our view HS1 Ltd should use its most up to date assessment of its own cost of capital, which is the 2.48% vanilla WACC that it has proposed for the specified upgrade. The CP4 WACC will only be used for CP4 charges and any additional specified upgrades and is not used in the calculation of the route and stations annuities, so will cover a similar period of funding as for the ERTMS upgrade.

Table 6.4 Draft Determination conclusions on HS1 Ltd CP4 weighted average cost of capital (WACC)

WACC category	HS1 Ltd	ORR view
Nominal vanilla WACC	5.53 %	6.07%
Nominal pre-tax WACC	6.40 %	6.59%
Real vanilla WACC	3.46 %	2.48%
Real pre-tax WACC	4.31 %	2.99%

6.47 The impact of revised cost of capital on HS1 Ltd's costs and charges is minimal with the change to the operations and maintenance charges being less than one percent.

Conclusion - the use of a bespoke WACC for specified upgrades should continue for large specified upgrades

6.48 HS1 Ltd undertakes specified upgrades to its rail network, which are then charged to operators through an additional investment recovery charge (IRC). The WACC is used to calculate HS1 Ltd's financing costs which form a component of the IRC.

6.49 HS1 Ltd's 5YAMS suggested that a single cost of capital value should be used for 'small specified upgrades' in CP4, and that a bespoke WACC would only need to be determined for larger upgrades based on each project's specific financing requirements. EIL and Southeastern responses to HS1 Ltd's draft 5YAMS consultation did not support this approach and instead proposed that all specified upgrades should have a bespoke WACC. DfT stated that a WACC should be calculated for each project in line with the prevailing market rate.

6.50 Our Draft Determination decision is that use of a bespoke WACC should continue for large specified upgrades. However, we agree with HS1 Ltd that it would be impractical for HS1 Ltd to create a bespoke cost of capital for smaller upgrades. For these smaller upgrades we agree that a single cost of capital should be set for CP4, consistent with the value in our determination. However, HS1 Ltd needs to be clearer about the criteria for what constitutes a smaller upgrade.

Conclusions – annuity payments

6.51 Renewals are funded through an annual charge ('annuity') paid by operators. The ORR calculates the annuity for each control period and bases it on the long run average renewals costs over a forty-year period.

6.52 The annuity payments, one for the route and one for each of HS1's four stations, are added to 'escrow' accounts and then drawn down to fund renewals. This is the first review where we have calculated the station annuities which were previously set by DfT.

6.53 Tables 6.5 and 6.6 below summarise HS1 Ltd's proposed CP4 annuities and our Draft Determination conclusions for both route and stations. Our adjustments result in a lower CP4 annuity for both route and stations.

Table 6.5 HS1 Ltd route and stations annuities

£m, February 2023 prices	CP3	CP4: HS1 Ltd proposal	CP4: ORR Draft Determination
Route	34.0	31.6	27.8
Station: St Pancras International	7.6	6.4	5.2
Station: Ebbsfleet International	1.6	1.6	1.3
Station: Stratford International	1.5	1.5	1.2
Station: Ashford International	0.9	0.7	0.5

Source: HS1 Ltd 5YAMS and ORR analysis

6.54 Our Draft Determination figures above reflect the following adjustments to HS1 Ltd's proposed CP4 annuities.

Table 6.6 ORR adjustments to HS1 Ltd CP4 annuities

£m, February 2023 prices	Route	Stations (combined)
HS1 Ltd CP4 proposals	31.6	10.2
Forecast asset spend adjustments	-2.0	-0.9
Stations traffic weighting	n/a	-0.3
Underfunding / negative balances adjustment	-1.3	-0.4
Investment returns	-0.5	-0.3
ORR Draft Determination	27.8	8.2

Determining charges for operators

6.55 In general, infrastructure charges are designed to recover the costs of operating, maintaining and renewing the infrastructure. However, these charges can also significantly influence how infrastructure is provided and utilised. They should therefore aim to encourage efficient resource use, both in terms of existing infrastructure needs, and the provision of new capacity, while also providing incentives to reduce costs where possible.

6.56 HS1 Ltd's Operations, Maintenance and Renewal Charges (OMRC) recover both fixed and variable costs, with the following components:

(a) variable costs are recovered through the OMRCA1 charge;

(b) fixed infrastructure costs are recovered through category OMRCA2;

(c) common costs, such as those for head offices, are covered through OMRCB;

(d) pass-through costs like insurance are recovered through OMRCC, with a separate charge for traction electricity; and

(e) station renewals costs are recovered through a Long-Term Charge (LTC).

6.57 HS1 Ltd's proposed charging structure and methodology remains largely the same as in PR19. The structure and methodology appear to continue to comply with legal requirements and are designed to send appropriate price signals. Our periodic review seeks to balance our statutory duties under the Railways Act 1993, particularly the need to consider the impact of charges on operators while ensuring HS1 Ltd can recover its efficient costs and meet its stewardship commitments under the Concession Agreement and stations leases.

6.58 This section sets out our proposed changes to those set out in HS1 Ltd's 5YAMS. All charges are presented in February 2023 prices, because this was the price base used in HS1 Ltd's 5YAMS.

Scope of our review

6.59 In considering whether the 5YAMS is consistent with HS1 Ltd's general duty, we:

- assessed whether the proposed charging structure is consistent with the relevant legislation and regulations;
- reviewed HS1 Ltd's proposals for the capacity reservation charge and carbon costs;

- considered HS1 Ltd's traffic forecast and proposals for volume reopener provisions; and
- considered views put forward by HS1 Ltd, operators and other stakeholders during the PR24 process.

6.60 In reaching our Draft Determination, we have sought to ensure that charges are cost-reflective and send the appropriate signals to users to ensure the appropriate use of the network; and at the same time enable HS1 Ltd to recover its full costs.

Conclusions on charges

Conclusion - HS1 Ltd's charging models were fit for purpose and aligned with good practice

6.61 We concluded that HS1 Ltd's charging models were clear and logical and they accounted for all the required variables. We have used HS1 Ltd's charging models to calculate the impact of our proposed adjustments on charges.

6.62 Our reviews of HS1 Ltd's asset management, cost estimating and annuity models resulted in the following changes to the costs on which charges are calculated:

(a) **Route operations and maintenance adjustment**: we have deducted £14.7m (or approximately £3m per year) to reflect our efficiency challenge.

(b) **Renewals cost adjustment:** adjusting input to the annuity model has lead to a roughly £3.8m reduction in renewal annuity payments, and a roughly £2m reduction in stations annuity payments.

(c) **Direct/ indirect cost split**: HS1 Ltd/NR(HS) made engineering judgements on the proportion of degradation which is traffic-dependent, for different asset types e.g. track assets are highly traffic-dependent, whereas earthworks set well back from the track are not traffic-dependent. We reviewed these judgements and proposed some minor reapportioning for underbridges, acoustic barriers, embankments, points operating equipment and contact wire. Details are annexed.

(d) **Common costs**: We reviewed £685k of freight specific fixed costs in HS1 Ltd's 5YAMS. We concluded that £596k of these costs are better defined as common costs, so should not be allocated to freight. This reduced the OMRCA2 charge to freight by £6.83 to £1.00 per train km. It also increased the OMRCB charge to domestic passenger operators by £0.07 per train minute and £0.06 per train minute for international.

(e) **Cost of capital:** We found HS1 Ltd's WACC to be excessive and inconsistent with regulatory best practice as outlined in the earlier discussion on the WACC. This resulted in a range of changes to the OMRC charges for all categories of traffic, as detailed in the following tables.

Conclusion - Passenger operator charges - Route

6.63 We have outlined our Draft Determination for charges in the following tables: Table 6.7 for international passenger operators, Table 6.8 for domestic passenger operators, and Table 6.9 for freight operators. These tables also highlight the adjustments we made to the charges proposed in the 5YAMS.

Table 6.7 Draft Determination of route charges adjustments for international passenger operators

February 2023 prices	5YAMS	Renewals	O&M	Direct indirect/ cost split	Cost of capital	Freight common cost	Draft Determination
OMRCA1 £ per train km	5.91	-0.67	N/A	0.28	0.12	N/A	5.64
OMRCA2 £ per train minute	12.42	-0.34	N/A	-0.35	-0.18	N/A	11.55
OMRCB £ per train minute	36.72	-0.63	-1.66	-0.32	-0.14	0.06	34.03
OMRCC £ per train minute	13.74	N/A	N/A	N/A	-0.01	N/A	13.73

Table 6.8 Draft Determination of route charges adjustments for domestic passenger operators

February 2023 Prices	5YAMS	Renewals	O&M	Direct indirect/ cost split	Cost of capital	Freight common cost	Draft Determination
OMRCA1 £ per train km	2.38	-0.27	N/A	0.12	0.04	N/A	2.27
OMRCA2 £ per train minute	2.79	-0.08	N/A	-0.08	-0.04	N/A	2.59
OMRCB £ per train minute	39.47	-0.71	-1.65	-0.4	-0.18	0.07	36.60
OMRCC £ per train minute	13.74	N/A	N/A	N/A	-0.01	N/A	13.73

Conclusion – maintain the suspension of the capacity reservation charge

6.64 In its 5YAMS HS1 Ltd proposes to maintain the capacity reservation charge suspension. The 2016 Regulations allow an infrastructure manager to levy a charge for capacity that is requested, but not used. In its 5YAMS HS1 Ltd said it reserved the right to reactivate the charge in CP4 under the following conditions:

- a potential new entrant planning to operate train services on its network;
- any material change in capacity usage; or
- a material increase in capacity reservation in comparison with current levels.

6.65 EIL stated it "does not think there is a strong case to justify reintroducing the capacity reservation charge in CP4". Southeastern stated that "the capacity reservation charge should be revisited as part of any Interim Review" if a new operator will commence services in CP4. HS1 Ltd stated that no new party has yet committed to starting operation on HS1 although significant interest exists from several prospective operators.

6.66 A capacity reservation charge disincentivises operators from reserving more capacity than they intend to use. As there is currently spare capacity on the

network, we are minded to accept HS1 Ltd's proposal to maintain the suspension of the capacity charge.

Carbon charge

6.67 HS1 Ltd can recover costs related to the Government's Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. As the scheme closed in 2019, HS1 Ltd are proposing removing this provision since it is no longer needed. Southeastern agreed to the removal of this provision and no other operators commented.

6.68 We note HS1 Ltd are progressing proposals to remove the recovery of carbon costs for the reasons provided by HS1 Ltd and Southeastern above.

Freight operator charges - route

6.69 HS1 Ltd's 5YAMS proposed the charges outlined in Table 6.9. The current freight operator's response to HS1 Ltd's draft 5YAMS indicated that freight costs would be unaffordable. In particular, HS1 Ltd indicated a reduction in fixed costs for freight in CP4. However, because the forecast number of freight trains had reduced from 454 to 200 per year, the fixed cost per train was forecast to increased dramatically.

Conclusion – we have re-allocated fixed costs from freight to common costs, funded by passenger operators

6.70 We reviewed the £0.69m of freight specific fixed costs in HS1 Ltd's 5YAMS. We concluded that £0.60m of these costs are better defined as common costs, so should not be allocated to freight. The items covered by the £0.69m were:

(a) £0.39m for connections at Dollands Moor and to the North London Line, which are not freight specific, so are common costs; and

(b) £0.30m for a proportion of HS1 Ltd staff and consultancy costs. Again, these are common costs apart from £0.09m for freight sidings at Ripple Lane. If freight ceased on HS1, these costs could be avoided (although we note that HS1 Ltd's contractual arrangements at Ripple Lane are complex). So, freight sidings at Ripple Lane are correctly categorised as freight avoidable costs.

6.71 Hence, we concluded that only £0.09m should remain in OMRCA2 for freight, with the remainder reallocated to common costs. This also impacts the common costs for passenger operators.

Table 6.9 Draft Determination for freight operator charges, showing adjustments

February 2023 prices	5YAMS	Freight common cost	Renewals	Direct indirect/ cost split	Cost of capital	Draft Determination
OMRCA1 £ per train km	7.06	0.002	-0.80	0.48	0.14	6.74
OMRCA2 £ per train km	7.83	-6.83	0.00	0.00	0.00	1.00
Total	**14.89**	**-6.82**	**-0.80**	**0.48**	**0.13**	**7.74**

Station Long Term Charge (LTC)

Conclusion – we have adjusted the station LTC

6.72 HS1 Ltd proposed a total charge of £10.17m per year to operators to recover the station LTC. We have reviewed HS1 Ltd's proposed life cycle costs and the resultant LTC and made adjustments reflecting our changes for traffic weighting, investment return on the escrow, cost of capital and scope efficiencies. As a result, the charge decreases to £8.23m per year over CP4. Table 6.10 shows our Draft Determination of the annual station long term charge, by station and by operator for the whole control period.

Table 6.10 Draft Determination for station LTC for the whole control period.

February 2023 prices £m	CP3	5YAMS	Draft Determination
St Pancras	37.8	31.9	25.9
Stratford International	7.7	8.2	6.5
Ebbsfleet International	8.1	7.4	6.1
Ashford International	4.4	3.5	2.7
Combined	**57.9**	**50.9**	**41.1**

February 2023 prices £m	CP3	5YAMS	Draft Determination
EIL	31.6	24.7	19.8
EMR	7.8	6.5	5.2
Southeastern	18.6	19.8	16.1
Combined	**57.9**	**50.9**	**41.1**

6.73 Stakeholders raised the following concerns around the LTC during the PR24 process:

(a) Operators supported HS1 Ltd's 'cost policy' and traffic growth weighting for the route annuity – but wanted a similar approach for stations. We have supported the cost policy concept for stations and we concluded that HS1 Ltd should introduce a traffic weighting factor for some stations assets.

(b) Operators want retailers and other third parties benefiting from station assets to contribute to HS1 renewals. We reviewed the contractual arrangements for stations and our position on cost allocations is annexed. We concluded that there were opportunities for small scope efficiencies on specific projects in CP4, where some of the project scope may fall outside of LTC and be funded by third parties.

Conclusion - Cumulative charges for route and stations

6.74 The cumulative effect of all our proposed adjustments across freight, passenger and stations are shown in Table 6.11.

Table 6.11 Impact on operators (total combined route OMRC, and Station LTC & QX)

February 2023 prices £m	CP3	CP4 5YAMS	CP4 Draft Determination	Change from 5YAMS	Change CP3 to CP4
EIL	338.5	329.5	312.3	-5.2%	-7.7%
Southeastern	517.0	485.5	461.2	-5.0%	-10.8%
EMR	48.5	51.5	50.0	-2.8%	3.2%

February 2023 prices £m	CP3	CP4 5YAMS	CP4 Draft Determination	Change from 5YAMS	Change CP3 to CP4
Freight	2.0	1.5	0.7	-54.7%	-66.0%
Total	**905.5**	**868.0**	**824.3**	**-5.0%**	**-9.0%**

6.75 Our determination only affects the station renewals charges paid by EMR and levied by HS1 Ltd, so there is no OMRC impact. EMR's charges have increased due to its QX charge increasing by more than the reduction in its LTC.

7. Network Incentives

7.1 Our decisions at PR24 will be implemented through contractual amendments to the Passenger Access Terms, Freight Access Terms and the framework agreements for EIL and Southeastern. These documents are annexed showing proposed changes in red line.

7.2 This chapter covers our review of whether costs/risks/incentives were correctly allocated between HS1 Ltd and operators.

Changes to Access Terms

7.3 Both HS1 Ltd and operators have submitted proposed changes to some of the terms of the PATs in respect of how HS1 Ltd recovers charges. These mainly concern changes to the traffic volume reopener (VRO) provisions, and the wash-up arrangements for certain charges. In this section we set out our response to their proposals.

7.4 HS1 Ltd has submitted proposed updates to the freight access terms (FATs) for the network to align them with the passenger access terms (PATs).

HS1 Ltd's proposed PAT changes

Defining chargeable journey distance

7.5 At PR19, we asked HS1 to ensure the compliance of its charging regime with the Commission Implementing Regulation (EU) on the modalities for the calculation of the cost that is directly incurred as a result of operating the train service 2015/909 (The Implementing Regulation, as retained). The Implementing Regulation requires direct costs of railway operations to be recovered on a per-km basis, and HS1 Ltd's charging model was updated to ensure that charges were calculated on this basis. However, subsequent changes to the PATs and framework track access agreements (FTAAs) were not made at that time.

7.6 As part of its update of the PATs at PR24, HS1 Ltd has proposed introducing the concept of chargeable journey distance to reflect its charging model's conversion of direct costs from a per-minute to a per-km charge.

Our position

7.7 We agree that the access terms should make it clear how direct costs are converted to the charges on operators, so propose approving this change to the PATs and FTAAs.

Volume reopener (VRO) provisions

7.8 HS1 Ltd's VRO proposals centred on three main areas:

- Subsequent VRO trigger;
- Simplifying the VRO definition; and
- VRO trigger for a scenario with zero freight.

Subsequent VRO trigger

7.9 HS1 Ltd proposes amending the definition of the trigger for a subsequent VRO to refer to the forecast volumes used at the previous VRO rather than the actual volume of trains that triggered the previous VRO (as is currently used).

7.10 This is to avoid situations such as arose during the COVID-19 pandemic whereby a VRO was triggered by very low volumes, which then meant that even small fluctuations in volumes during the post-COVID-19 pandemic recovery period triggered more VROs. Without its proposed change, HS1 Ltd argues there could be a perverse incentive for operators to forecast flat volumes, which presents a risk of under recovery of fixed costs. This may also lead to unnecessary subsequent VROs and adjustments to operators' charges if flat volumes are used but volumes actually grow or decline. EIL and Southeastern support this proposal in principle.

Simplifying the VRO definition

7.11 HS1 Ltd proposes clarifying the definition of a VRO event to make it simpler to understand. This includes changing 'Review Event' to 'Volume Event' and simplifying the descriptions in the definition of a Volume Event. This does not change the definition meaning or approach. Southeastern and EIL support this proposal in principle.

7.12 HS1 Ltd also proposes amending the wording around the process for apportioning costs to reflect that it recovers costs over the whole remainder of the Control Period (not the next timetable year only) and that HS1 Ltd includes the forecasts used to execute the VRO in the notice to operators. This reflects the approach to VROs followed by agreement between the parties in CP3.

Operators' proposals on VRO

7.13 Operators also proposed changes to the VRO mechanism, similar to those put forward by HS1 Ltd and as discussed above. Operators broadly agreed with HS1 Ltd's objectives behind the proposed changes and we consider that HS1 Ltd's proposals meet these objectives.

VRO trigger for zero freight circumstances

7.14 HS1 Ltd proposes to include an additional trigger in the access terms whereby, in the event that freight ceased operating, HS1 Ltd can reapportion the remaining fixed costs of freight to passenger operators, otherwise if freight ceased operating during a control period, some freight-related HS1 Ltd costs would be stranded.

7.15 There is broad agreement between HS1 Ltd and operators of the need to adjust the VRO definition and trigger mechanisms. EIL proposed a provision requiring HS1 Ltd to recalculate changes to fixed cost charges based on FWT and operator approved forecasts, instead of a loosely framed reference to expected train minutes.

7.16 However, there were a number of objections to parts of HS1 Ltd's proposals. EIL objected to the proposals for a VRO to be triggered by a performance regime recalibration. EIL also objected to a proposal to reallocate the remaining non-avoidable fixed costs to passenger operators if freight were to cease operating on the network. However, Southeastern considered this reasonable.

Our position

7.17 In respect of EIL's opposition to HS1 Ltd's proposals for the reallocation of non-avoidable fixed costs in the absence of freight, HS1 Ltd would still need to recover these fixed costs and this can only be from the remaining operators on HS1 Ltd.

7.18 Given the broad agreement between operators and HS1 Ltd about the need and objective of changes to the VRO mechanism, and that HS1 Ltd's proposals meet these objectives, we are minded to approve HS1 Ltd's proposed changes. At our request, legal drafting for the amendment relating to a performance regime recalibration reopener has been updated such that it can only be used in relation to the recalibration that has been deferred from PR24.

7.19 We also are minded to approve EIL's amendment to require HS1 Ltd to use forecasts from operators for the basis of recalculating changes to fixed costs allocations. Operators will have at least 20 working days to submit forecasts, although we welcome views on an appropriate timeframe. Where there is a

dispute around forecasts an operator will be expected to be able to evidence the basis for its forecast.

Pass through costs

7.20 HS1 Ltd proposed adding several costs to the category of pass-through costs, these are success fees in business rates; insurance broking fees and professional costs; management and bill checking fees for non-traction energy; and for Renewable Energy Guarantees of Origin (REGOs) in non-traction energy.

7.21 Also proposed was an update to include new pass-through cost categories for the Route Energy And Carbon Team schemes, N-1 scheme and the escrow investment project.

7.22 Operators agreed with the inclusion of REGOs costs but disagreed on the inclusion of the other costs listed above, arguing that these are costs within HS1 Ltd's control and as such the company should be incentivised to do so efficiently.

Our position

7.23 We agree with the principle that costs over which HS1 Ltd has control should not be treated as pass through costs and therefore are minded not to approve their inclusion. However, we recognise that there may be justifiable exclusions to this principle. Where operators either agreed with or did not object to a number of other HS1 Ltd proposals, we have approved these.

Operators' proposals

An annual fixed cost wash-up provision

7.24 Both EIL and Southeastern submitted proposals for an annual wash-up provision for fixed charges. EIL set a trigger of a +/-10% deviation from forecast traffic levels. Southeastern's proposal set no trigger. Both operators' stated objectives were to ensure operators pay the correct level of and fair allocation of costs. Operators consider an annual wash-up has become necessary because of the increased variability of traffic volumes.

7.25 HS1 Ltd disagreed with these proposals as both costly and an administrative burden without any benefit to HS1 Ltd.

Our position

7.26 We recognise the benefits of moving to an annual wash-up, as this brings actual and forecast operator charges more in line with the actual costs of operating on the network, assisting affordability as well as ensuring the right operator pays its

proportion of actual costs. We are however mindful that an annual wash-up adds complexity, additional administrative work and costs for HS1 Ltd.

7.27 On balance we are minded to approve the introduction of an annual wash-up mechanism and we have set out our initial drafting of how this might be put into effect. However, we recognise there are a number of issues where different approaches can be taken to how the wash-up operates in practice, for example the proportion of HS1's costs accounted for in the annual wash-up calculation recovered each year; or whether the wash-up should be undertaken annually or quarterly.

7.28 We therefore consider it appropriate that operators and HS1 have a further opportunity to discuss both the merits of introducing a wash-up and the details of how it should operate before reaching a final decision.

OMRCA1 wash-up mechanism for operator cancelled services

7.29 EIL proposed the introduction of a wash-up mechanism to refund OMRCA1 charges that are currently charged even if the train does not run. This occurs under two circumstances.

7.30 Firstly, where an operator cancels a service booked in the FWT. Or secondly in circumstances where, on a particular day, an operator replaces trains booked in the FWT with spot bids. For example, if it cancels a FWT service for operational reasons but then reinstates a service later that day, and so in effect operates the same number of trains as originally booked in the FWT.

7.31 Currently, HS1 only charges operators the net same amount of OMRCA1 charges as the original FWT under the following circumstances:

- the reinstated train is within the same service group (e.g. London to Paris is one service group, London to Brussels is another service group); and
- is reinstated on the same day.

7.32 Otherwise, HS1 Ltd will charge the operator for both the cancelled and the reinstated trains, even though the operator runs the same number of trains that day as originally booked.

Our position

7.33 OMRCA1 charges reflect the variable costs (i.e. direct costs) of operating trains on the network. In principle, operators should be charged based on the number of trains run.

7.34 However, although these charges reflect variable costs, HS1 Ltd's total variable costs are charged by NR(HS) on a fixed fee basis. HS1 Ltd and its suppliers need to plan and commit operating and maintenance resources, consistent with asset management policies, in advance, based on forecast traffic levels. Hence these costs cannot be escaped if actual traffic levels are lower than forecast. We therefore do not agree that OMRCA1 should be refunded when trains booked in the FWT are cancelled by an operator. There are a limited number of circumstances where operators are refunded OMRC1A when HS1 Ltd cancels a service, for example, for possessions.

7.35 We are however, minded to agree that operators should be refunded if there are changes to FWT but no net change in the total number of services run on a particular day, whatever service group these are operated in (for example, if two services in the FWT are cancelled, but two additional services are run as spot bids), although we welcome stakeholders' views on what would be an appropriate process to allow this to happen.

OMRC indexation floor

7.36 EIL proposed removing the floor to indexing OMRC by inflation which prevents deflation being applied to operators' charges.

7.37 HS1 Ltd disagreed with this change as it would not reflect the indexation position in the Operator Agreement, the costs of which account for the single largest component of OMRC.

Our position

7.38 We think that it is reasonable that operators should benefit from reducing costs due to negative inflation. We are therefore minded to approve this proposal.

Restricting wash-up arrangements for certain charges to indexation impacts only

7.39 EIL proposed amending the wording of the term within the wash-up mechanism that deals with wash-up arrangements for the investment recovery, additional investment recovery and pass-through costs charges (the differential referred to as "APA_t"), to refer only to the impacts of inflation on the amounts due at each wash-up. This is to clarify its purpose. HS1 Ltd opposed the change as it would restrict its ability to recover fixed costs on spot bids.

Our position

7.40 We are minded to approve EIL's proposals on the basis that it clarifies the purpose of the term. And because the proposal for an annual fixed cost wash-up provision allows for the recovery of fixed costs from spot bids.

Performance regime

7.41 HS1 Ltd's performance regime is designed to encourage all parties to minimise disruption and improve the performance of the HS1 network. The performance regime is set out in Section 8 of the Access Terms. The regime is based on:

- performance thresholds – the points at which performance payments are triggered; and
- payment rates – the amount per minute of delay that one organisation pays to another when performance differs from the threshold.

HS1 Ltd's proposal not to recalibrate the performance regime in PR24

7.42 HS1 Ltd has proposed not to recalibrate the performance regime as part of PR24. HS1 Ltd has said that the parameters of the regime should be calibrated on data which is representative of future operations, and that "extraordinary events throughout CP3 (COVID-19 pandemic, Brexit, significant industrial action) mean that demand, revenue and large parts of performance data from CP3 are unlikely to be representative for CP4" (Final HS1 Ltd 5YAMS, paragraph 18.1).

7.43 HS1 Ltd consulted train operators on its proposal. HS1 Ltd has said that stakeholders have agreed with the preferred approach to delay the PR24 recalibration to a time during CP4 when more representative data is available, and that it has received no objections to this plan.

7.44 HS1 Ltd proposes to begin the recalibration by 1 September 2025. HS1 Ltd says its proposal commits to a start date, rather than a completion date, because of the risks around satisfactory completion of the recalibration – it says these risks include lack of system-wide agreement and non-provision by operators of the necessary data. HS1 Ltd proposes that it can withdraw a proposal for change if it is not sufficiently supported by passenger and freight operators.

Our position

7.45 We note the agreement between HS1 Ltd and train operators not to recalibrate the performance regime as part of PR24. We agree that it is important for the regime to be recalibrated based on representative data; and we are content with HS1 Ltd's proposal to defer the recalibration. We are content with HS1 Ltd's commitment to begin recalibration by 1 September 2025.

7.46 Proposed changes to the PAT and FAT to accommodate recalibration of the performance scheme during CP4 are annexed to this document. The drafting

includes a provision that the recalibration may not be implemented if it is not sufficiently supported by operators. HS1 Ltd has said that it as infrastructure manager should be able to make a reasonable decision on this following discussion with the system stakeholders. We invite operators' views on whether they support this provision.

7.47 HS1 Ltd has said that it intends to explore new methods for recalibration, such as forward-looking modelling of asset performance. HS1 Ltd has also said that, following a request from an operator, it is working on provisions to compensate for reactionary delays incurred by operators on its network. We do not comment on these matters now as they are outside the scope of PR24, but we expect full consultation on methodology when recalibrations occur. Any recalibration would result in a contractual request for change that would be subject to ORR's review for approval

HS1 Ltd's further proposals for recalibrations during CP4

7.48 HS1 Ltd has made the following proposals relating to recalibrations that occur during CP4 (see Final HS1 Ltd 5YAMS, paragraph 18.1):

- HS1 Ltd has said that, when the performance regime is recalibrated during a control period, NR(HS) will need to update its Annual Fixed Price with the revised pricing of performance risk. HS1 Ltd has proposed that it should be allowed to adjust operators' OMR charges to reflect any changes to performance risk cost that result from recalibration. EIL disagreed with this proposal and said that any change in costs should be covered by the cost envelope determined as part of PR24.

- HS1 Ltd has also proposed a change to payment arrangements for performance scheme recalibration within control periods. It has proposed that the external cost of additional recalibrations, of which it expects there to be an increased number in CP4, should be borne by the party that requests the recalibration. EIL supported the principle of the proposal to reduce unreasonable requests, but asked that drafting specifically limited the costs to be recovered and allowed for review and approval. Southeastern disagreed with this proposal, suggesting that all affected parties should be liable for recalibration costs given that the performance regime in the Access Terms affects all parties.

Our position

7.49 Our position is that we agree that HS1 Ltd should be able to make a specific adjustment to operators' OMR charges following the planned performance scheme

recalibration, if the recalibration results in a revised pricing of performance risk. This is however limited to the recalibration that has been deferred from PR24 (and which will commence by 1 September 2025), as this is a known event that would typically have been part of PR24, but HS1 Ltd stakeholders have agreed to delay it due to special circumstances in CP3.

7.50 Our position is that changes to the pricing of performance risk resulting from unplanned recalibrations, which could arise from changes in circumstances during the control period, should be covered by the cost envelope we determined. There are already provisions in place that allow for charges to change in the event of a material change in circumstances.

7.51 Regarding payment of performance scheme recalibration costs, our position is that we do not agree that these costs should be recovered from the party that requests the recalibration. A mid-control period recalibration would result from a change in circumstances so it is, by its nature, likely to result in scheme parameters that are more representative of conditions in the remainder of the control period, and this accuracy benefits all parties.

7.52 The proposed Access Terms drafting that reflects these draft positions is annexed. Under the proposed drafting, recalibration results and resulting changes to access charges will be contained in a Proposal for Change that will be subject to ORR review and approval.

Possessions regime

7.53 HS1 Ltd's possessions regime compensates train operators for the direct costs, such as bus and taxi hire costs, that they incur as a result of possessions taken outside of a defined Possessions Allowance. The regime is intended to incentivise HS1 Ltd to plan possessions efficiently and minimise disruption. The possessions regime is set out in Section 4 of the Access Terms.

7.54 As part of PR24, NR(HS) has undertaken an exercise to determine the possession requirements required in CP4, which is reflected in the proposed Possessions Allowance. This is in the context of increased engineering access requirements in CP4. HS1 Ltd's Final 5YAMS set out the details of this exercise, which we have reviewed.

HS1 Ltd's proposals for CP4 Possessions Allowance

7.55 HS1 Ltd has made the following proposals for the Possessions Allowance in CP4 (HS1 Ltd Final 5YAMS, paragraph 18.2.1):

- Separation of the Possessions Allowance into a Standard Possessions Allowance, for routine and low-complexity renewals; and an Extended Possessions Allowance, for significant and complex renewals. HS1 Ltd said that this is due to the large number of heavy renewals scheduled in CP4, which it has not previously carried out in such volumes and which would make up the bulk of the Extended Possessions Allowance.

- An overall substantial increase in the volume of possessions to be carried out in the control period. HS1 Ltd has said that this increase is necessary due to the increasing age of its infrastructure and the interventions needed to keep assets in the required condition. It said that the number of possessions reflected steps taken by NR(HS) to optimise efficient delivery. It considered that the allowance provides a balance between giving sufficient access to undertake necessary works while incentivising NR(HS) to deliver these works efficiently. Operators told us that they recognised that an increase in possessions was necessary to maintain assets, but Southeastern said it would like to understand whether ORR is satisfied with the increase.

- Rollover of Extended Possessions Allowance from one year to the next within the control period, providing flexibility as to the year in which these possessions occur. Operators expressed significant concerns about rollover of all unused Extended Possessions Allowance – one operator said that such potentially high volumes of possessions could detrimentally impact on the ability to deliver its timetable.

Our position

7.56 Our position is that we are content with the separation of the Possessions Allowance into Standard and Extended Possessions Allowances, as it allows HS1 Ltd to differentiate between the former which cannot be rolled over, and the latter which can.

7.57 Regarding the rollover of Extended Possessions Allowance, we challenged HS1 Ltd and NR(HS) to propose reasonable limits on the rollover. HS1 Ltd has responded and proposed that possessions can only rollover if they are included in the Engineering Access Statement in force at the time in accordance with the HS1 Network Code. We welcome this revised proposal, which would ensure operators are properly consulted and would reduce the likelihood of a large, unintentional build-up of Possessions Allowance over the control period. This has been reflected in updated revisions to the Access Terms.

7.58 NR(HS) already tracks when possessions are taken, and issues are notified to operators when possessions occur. In addition, NR(HS) is undertaking always to make clear whether a possession falls within its Standard or Extended Possessions Allowance, and the duration of the possession. This will allow usage of each allowance to be accurately tracked. In addition, we are requiring that, when engaging stakeholders in the EAS process, NR(HS) includes a summary of the possessions taken in previous years for reference. This summary must allow parties to see whether a possession is within the current year's allowance or within the allowance rolled over from a previous year.

7.59 We have reviewed the volume of possessions and consider it to be set at an efficient level relative to the works that NR(HS) expects to carry out. The overall increase reflects the significant rise in renewals and maintenance interventions needed during CP4, given the age of the HS1 system and infrastructure deterioration.

7.60 In the Asset Management Activity chapter, we concluded that the large ballast renewal planned for years 4 and 5 will be challenging to deliver and there is a strong indication that the programme could run into later years. We are requesting that HS1 Ltd addresses the risk of this delay in its revised Final 5YAMS. We expect the Standard and Extended Possessions Allowances to be updated to reflect any changes in plans, and that this be reflected as necessary in updated drafting in the Access Terms.

7.61 Proposed changes to the Access Terms to accommodate changes to the Possessions Allowance during CP4 are annexed.

EIL's proposal to use the Delay Attribution Board for disputes

7.62 EIL proposed that the Delay Attribution Board (DAB) be used as the relevant dispute resolution body for delay attribution disputes to improve the efficiency and effectiveness of dispute handling. HS1 Ltd disagrees and views the current delay attribution process as sufficient. HS1 Ltd has cited concerns about the effectiveness and expertise of the DAB in handling HS1-specific issues. Additionally, HS1 Ltd states that implementing this change would require extensive amendments to various contracts and an agreement with the DAB.

Our position

7.63 ORR does not have a strong view either way on the merits of the DAB overseeing delay attribution on HS1, but because of the various complex contractual changes and potential consequential effects, if this were to go ahead, we would want it to be agreed by the system and taken forward by the Infrastructure Manager, HS1

Ltd. While this proposal is in scope of our review provisions, we would wish to see HS1 Ltd and its stakeholders agree on the right approach.

St Pancras International – contractual inconsistency

7.64 Our review of contractual arrangements for the funding of HS1 stations found some inconsistencies between the contractual arrangements for the St Pancras International station and the Thameslink Box, managed by NRIL. There are some key similarities and differences:

Similarities

- Some train services from the Thameslink box are in direct competition with services from the main St Pancras station. For example, Govia Thameslink Railways (GTR) and EMR both run services from St Pancras to Bedford. These have similar journey times and passengers buying tickets from a station kiosk on the day would pay a similar price and see the same station name. NRIL (as infrastructure manager) and GTR (as operator) manage and pay for renewals entirely within the Thameslink box area.

- EIL, EMR and Southeastern each pay a percentage of the renewals costs in St Pancras. The percentage accounts for the size of their exclusive areas, so this is equivalent to operators paying for renewals within their areas.

- Passengers interchange between different train operators (Thameslink, EMR, domestic HS1, international HS1) through a common concourse area. Passengers then pass through ticket barriers within each operator's exclusive area.

Differences

- EIL, EMR and Southeastern pay for renewals in common areas of St Pancras as well as paying for renewals in their exclusive areas. This includes flooring, wall and roof structures, lighting, heating, toilets and other facilities in the main concourse area.

- NRIL/GTR pay for renewals in their exclusive area (the Thameslink Box) but, unlike other operators, do not contribute to renewals in common areas of St Pancras.

- EIL, Southeastern and EMR have station access agreements with HS1 Ltd which include an obligation to pay a share of renewals in common areas of St Pancras.

- GTR does not have a station access agreement with HS1 Ltd, but with NRIL, which has a lease for the relevant platforms.

Conclusion - we expect HS1 Ltd to lead a working group to review network incentive options with stakeholders in Year 1 of CP4

7.65 We have considered these issues in the context of PR24. We concluded that there is an inconsistency in the charges between operators who run directly competitive services. We do not see it as integral to our determination under the current regime for periodic reviews, for us to resolve this matter in PR24.

7.66 However, we strongly recommend that these contractual inconsistencies are reviewed by the affected stakeholders (HS1 Ltd, DfT, NRIL and operators) to propose alternatives. While we cannot instruct a change as part of PR24, we expect HS1 Ltd to include a commitment in its final 5YAMS, to lead a working group with the relevant stakeholders in Year 1 of CP4.

8. Consultation and Next Steps

8.1 When ORR took on responsibility for the regulation of HS1 stations in 2022, ORR, DfT and HS1 Ltd agreed to align the timescales for the periodic reviews of route and stations. The respective documents and their publication requirements are found in Table 8.1.

Table 8.1 PR24 Timescales

	Concession Agreement requirement	Stations leases requirement	PR24 milestone
6 months before end of control period	ORR Draft Determination	ORR Draft Determination	30 September 2024
4 months before end of control period	HS1 Ltd revised Final 5YAMS, or additional information	HS1 Ltd revised Final LCRs, or additional information	30 November 2024
60 business days before end of control period	ORR Final Determination	ORR Final Determination	6 January 2025
15 business days after ORR Final Determination	None	HS1 Ltd revised asset management strategy (including life cycle budget)	27 January 2025
20 business days after ORR Final Determination	HS1 Ltd Revised 5YAMS	HS1 Ltd Revised LCRs	3 February 2025

8.2 We invite responses to any aspect of this document to PR24@orr.gov.uk, by 5pm on 11 November 2024.

8.3 If you send a response, please indicate if you wish all or part of your response to remain confidential. Otherwise, we expect to make it available in full on our website.

8.4 We will take all responses into account when reviewing HS1 Ltd's final 5YAMS and LCRs, and publishing our Final Determination.

8.5 Further to the conclusion of this process, we will work with HS1 Ltd on the implementation of the periodic review through changes to the passenger and freight access terms; access contracts; and station access conditions, by 1 April 2025.

This publication is available at orr.gov.uk

Any enquiries regarding this publication should be sent to us at orr.gov.uk/contact-us