Anticipated acquisition by Hitachi Rail, Ltd of Thales SA's Ground Transportation Systems Business

Provisional findings report

8 June 2023

The Competition and Markets Authority has excluded from this published version of the provisional findings report information which the inquiry group considers should be excluded having regard to the three considerations set out in section 244 of the Enterprise Act 2002 (specified information: considerations relevant to disclosure). The omissions are indicated by [✂]. Some numbers have been replaced by a range. These are shown in square brackets. Non-sensitive wording is also indicated in square brackets.

Contents

Page

Appendices

Summary

General overview of our findings

1. The Competition and Markets Authority (**CMA**) has provisionally found that the anticipated acquisition (the **Merger**) by Hitachi Rail, Ltd. (**Hitachi**) of Thales SA's Ground Transportation Systems business (**Thales**) (together the Parties) may be expected to result in a substantial lessening of competition (**SLC**) in:

   (a) the supply of digital mainline signalling systems and related services (digital mainline signalling systems) in Great Britain (**GB**); and

   (b) the supply of communications-based train control signalling systems and related services (**CBTC systems**) in the United Kingdom (**UK**) (ie the type of signalling used on metro systems like on some lines of the London Underground).

2. The report and its appendices, which will be published shortly after this summary, constitute the CMA's Provisional Findings. We invite any interested parties to make representations on these provisional findings by no later than by 17:00 (UK time) on **29 June 2023**.

3. We will take all submissions received by this date into account in reaching our final decision. Interested parties should refer to the notice of provisional findings for details of how to do this.

4. In our Notice of possible remedies, published alongside our Provisional Findings, we have set out possible options to remedy the provisional SLC: prohibition of the merger, full or partial divestiture of one of the Parties' signalling businesses, or behavioural commitments by the Parties. We also invite submissions from interested parties on these initial views by **17:00 (UK time) on 22 June 2023**.

Why and how are we reviewing this Merger?

5. Hitachi announced in August 2021 that it had agreed to acquire Thales for a purchase price of €1.66 billion. The Merger was conditional on receiving merger control clearance from different competition agencies, including the CMA.

6. Hitachi is a provider of transport solutions, including rail signalling systems, worldwide. Thales (ie the ground transportation systems business of Thales SA) is active in the supply of rail signalling solutions and ancillary activities,

worldwide. The Parties have competed in the past for the supply of digital mainline signalling systems in GB and for the supply of CBTC signalling systems in the UK.

7. While Hitachi and Thales are not headquartered in the UK, the question for the CMA is whether the Merger may have an impact on competition in the UK. This link to the UK can be established based on the turnover of the business being acquired in the UK (ie whether the UK turnover of that business is more than £70 million). In this case, we concluded that the CMA had jurisdiction to review this Merger because Thales significantly exceeded the turnover threshold in the 2021 financial year.

8. In deciding whether a merger may be expected to result in an SLC, the question we are required to answer is whether there is an expectation, ie it is more likely than not, that the Merger will result in an SLC within any market or markets in the UK.

9. Railway signalling is a significant market in GB. A recent report by the British rail regulator, the Office of Rail and Road (**ORR**), estimated that the market for signalling systems in GB for mainline railways alone is worth £800-900 million annually.

10. We have focused on two ways, or 'theories of harm', in which the Merger could give rise to an SLC.

    (a) The first considers whether the Merger may be expected to substantially lessen competition by eliminating the rivalry between the Parties in the supply of digital mainline signalling systems in GB (see paragraph 29 about the effects of the Merger in Northern Ireland).

    (b) The second considers whether the Merger may be expected to substantially lessen competition by eliminating the rivalry between the Parties in the supply of CBTC signalling systems in the UK.

11. As part of our investigation, we have gathered information from a wide variety of sources, including: (i) the Parties' submissions and evidence voluntarily provided by the Parties; (ii) a large number of internal business documents from the Parties gathered using our statutory powers; (iii) evidence from third parties, including other suppliers of mainline and urban signalling, Network Rail, Transport for London and other customers who procure and use mainline and urban signalling in the UK and outside the UK; and (iv) evidence from ORR.

12. To determine the impact that the Merger is likely to have on competition, we have considered what is likely to happen absent the Merger. This is known as

the counterfactual. In this case, we have provisionally found that the most appropriate counterfactual against which to assess the Merger is the prevailing conditions of competition.

13. Our assessment of the effects of the Merger is forward-looking. We took into account the future evolution of competitive conditions when assessing each of the theories of harm set out above. This includes developments in the Parties' competitive offerings and the competitive offerings of third parties.

Supply of digital mainline systems in GB

Overview

14. Mainline signalling projects involve the installation of mainline signalling systems on a railway network. Mainline signalling systems are fundamental to the safe and efficient operation of modern railways, directing traffic and keeping trains apart to prevent collisions. Conventional and digital signalling systems use different technologies, are subject to different standards and have different functionalities.

15. There are two types of suppliers involved in the delivery of digital mainline signalling projects (i) original equipment manufacturers (**OEMs**), which own the signalling technology used for a particular project, and (ii) integrators, which can play a variety of roles in relation to integrating that technology into a signalling renewal project. OEMs collaborate in different ways and to different extents with integrators in the delivery of digital mainline signalling projects, for example by forming a joint venture or partnership, or by using integrators as subcontractors in carrying out mainline signalling projects. Integrators may also sometimes license relevant signalling technology from OEMs in order to deliver signalling projects themselves.

16. While there is some convergence and standardisation at European level, mainline signalling systems require adaptation to national standards and suppliers would need to obtain approval before deploying their technologies in GB (ie homologation). The process of adaptation and homologation for a new national market requires significant investment and time. There are operational and technical requirements with which all signalling systems installed on GB mainline railways must comply.

17. While we have focused on competition in the national market for mainline signalling in GB, we recognise that there is also an important global element to competition in mainline signalling. The main competitors operate and compete on a global basis using the same core systems. Suppliers can use

digital mainline signalling projects outside GB as references and their effectiveness as competitors in GB may be influenced by their experience both inside and outside GB. In addition, suppliers may invest in innovation for the benefit of their global businesses and in response to global competition.

Focus of our investigation

18. There are plans to deploy digital signalling systems across significant parts of the GB rail network in the next few years.

19. The shift from conventional to digital mainline signalling systems has the potential to increase capacity, lower unit costs, reduce disruption and, overall, lead to improvements in the way the railway operates.

20. Historically, two suppliers, Siemens and Alstom, have been the primary suppliers of mainline signalling in GB. A market study carried out by ORR in 2021 made recommendations aimed at widening the pool of signalling suppliers in the UK and reducing Network Rail's dependency on incumbent suppliers. ORR found that the digitalisation of the mainline network will provide an opportunity to broaden the current supplier base. A number of ORR's recommendations in the same study were reflected in the design of Network Rail's ongoing tender for a major signalling framework agreement, the Train Control Systems Framework (the **TCSF**), which seeks to select four suppliers for future digital mainline signalling projects.

21. The pre-qualification stage (**PQQ**) of the TCSF was launched on 17 March 2023 and the invitation to tender stage (**ITT**) is expected to start in early July 2023. Responses to the ITT will be due around the end of September and the final TCSF award is expected to take place around January 2024.

22. In the Phase 1 Decision, the CMA found that, given Siemens' and Alstom's significant incumbency advantages with respect to the supply of conventional mainline signalling and the transition towards digitalisation of the signalling infrastructure, there was no realistic prospect of an SLC within that market. We have not received any evidence to justify reopening this theory of harm during our investigation. We have, therefore, focused our investigation on the supply of digital mainline signalling systems to Network Rail, as it is the largest procurer of mainline signalling in GB. We have also considered the TCSF in some detail since the outcome of the ongoing tender for the TCSF will likely influence the conditions of competition for future digital mainline signalling procured by Network Rail and other GB customers as it will provide an opportunity for new suppliers to enter GB. However, while the immediate context for our investigation is the TCSF, our competition assessment is

relevant to the supply of digital mainline signalling more widely than the competition for the TCSF.

23. The TCSF consists of two lots: Lot 1 for the supply of conventional mainline signalling projects (with an expected value of £1 billion), and Lot 2 for the supply of digital mainline signalling projects (with an expected value of £3 billion) (**Lot 2**). While some uncertainty remains around the timing, implementation, and value of Lot 2 of the TCSF, the most recent tender documentation set out that the tender will include an initial award of a guaranteed workbank that will be split into portions of declining size to be allocated to first, second, third and fourth place, respectively. In addition, the suppliers selected through this tender will have the opportunity to bid for additional projects that will be allocated through mini-competitions. Successful bidders will receive funding from Network Rail towards the product development and adaptation costs of digital mainline signalling technology.

24. We have assessed how closely the Parties compete with each other and whether the removal of the constraint that they would have placed on each other, absent the Merger, may be expected to lead to an SLC in the supply of digital mainline signalling systems in the GB market. We have also assessed the competitive constraints likely to be placed on the Parties by other suppliers that may bid for digital mainline signalling projects. We have taken into account the evidence on the Parties' plans, and the plans of other suppliers, to bid for Network Rail's TCSF.

25. Suppliers can flex their offer when bidding depending on the degree of competitive constraint they anticipate they will face from other bidders. In our competitive assessment, therefore, we seek to analyse the closeness of competition between the Parties and the other suppliers which are likely to be perceived as potential competitors for the TCSF.

26. The evidence we gathered consistently indicates that competition for the supply of digital mainline signalling systems in GB will likely reflect several aspects of suppliers' offerings: (a) *technological capabilities*, including their capability to homologate their signalling products to GB standards and achieve open interfaces; (b) *experience and expertise in successfully undertaking digital signalling projects* to the required standard and needs of the customer, either in GB or in Europe, including experience in homologation of digital mainline signalling technology; (c) *experience in GB mainline signalling*, including suppliers' capabilities to deliver the volume of signalling infrastructure under the TCSF (eg deploying the necessary workforce) and experience of working with Network Rail; (d) ability to *drive down costs and introduce innovations* over time to meet Network Rail's cost reduction targets;

(e) *financial standing and size* to handle the associated commercial and financial risks of the contract; and (f) *price* (considered at ITT stage).

27. We note that our Merger assessment is independent from Network Rail's tender evaluation process and is in no way determinative of the outcome of that process and we have not sought to reproduce or anticipate Network Rail's assessment in our Merger assessment.

28. We also note that we are limited in what we can disclose publicly in this document, given the confidential nature of the TCSF tender, including in this summary.

29. The Parties have not competed in the past for the delivery of digital mainline signalling projects in Northern Ireland and there are currently no plans for a future digital tender in Northern Ireland.[1] Therefore, we currently propose to focus our investigation on the impact of the Merger in the supply of digital mainline signalling systems in GB.

Are the Parties likely to be close competitors in the supply of digital mainline signalling in GB?

30. The evidence we gathered indicates that the Parties, absent the Merger, would likely be two of the few OEMs who are well placed to bid for of Lot 2 of the TCSF, and to win a place on that framework (on their own or in partnership with integrators), notwithstanding some level of uncertainty around the timing, implementation, and value of the TCSF.

31. We consider that the Parties are credible competitors. The Parties are the second and fourth largest suppliers by value of digital mainline signalling contracts won in Europe, with a combined share of supply of [40–50%], with a significant increment of [10–20%] resulting from the Merger. The Merger would create the largest digital mainline signalling supplier in Europe. The Parties' shares of supply are significant in a highly concentrated market, in which the top four suppliers account for [90–100%] of supply. Siemens ([30–40%]) and Alstom ([20–30%]) are the only other suppliers with a share of supply of over 5%. We consider that the Parties' shares of supply in Europe are indicative of their strength and technical capabilities as digital mainline signalling providers. Given Network Rail's TCSF is designed to bring new suppliers into GB mainline signalling, we consider that suppliers that have demonstrated their competitive strengths in supplying digital mainline

[1] Railway network regulations differ between GB and Northern Ireland and authorisation is required by the Department of Transport in Northern Ireland to place mainline signalling products into service in Northern Ireland.

signalling systems in other markets are also likely to be the most credible options for Network Rail.

32. The Parties' competitive strengths with respect to management and technical expertise in undertaking digital mainline signalling projects are demonstrated by each of their track records in Europe. Taken overall, Thales has more experience than Hitachi and is matched only by Siemens and Alstom. Only the Parties, Siemens and Alstom have experience in delivering large digital projects (with a value over £100 million). Assessed on the number of countries in which this experience has been gained (markets entered and technologies homologated, ie approved for deployment in the local market), the position is similar, albeit Siemens and Alstom appear to have stronger track records than Hitachi.

33. Both Parties are able to provide a full suite of digital mainline signalling technology and have experience deploying their technology solutions in numerous digital mainline signalling projects. Given their strong technological solutions and extensive experience and track record of delivering mainline signalling projects, including adapting their systems to multiple national markets, both Thales and Hitachi are at a very substantial advantage to the other OEMs that are not currently active in GB mainline digital signalling in seeking to enter and expand in the GB market.

34. The Parties have less local experience in GB mainline signalling than the incumbent OEM suppliers, Siemens and Alstom. Hitachi, having won a place on the most recent procurement framework for signalling, has had more success and more experience than Thales. Hitachi also won the first ever digital mainline signalling project tendered in the UK (the Cambrian Line project). Thales has been active in GB mainline signalling as a supplier of axle counters and as a provider of traffic management systems. Thales and Hitachi may choose to partner with or subcontract to one or more integrators in order to reduce any differences in their respective levels of experience in mainline signalling in GB.

35. With respect to local capacity, we currently understand that all OEMs, apart from Siemens and Alstom, would likely need to increase their UK labour capacity and aspects of their local capabilities to be able to meet the TCSF requirements. The Parties, like other OEMs (see below), can use integrators to address gaps in local capabilities, which they have done in previous tenders.

36. Overall, our provisional view is that, taking all of the evidence in the round, the Parties are likely to be close competitors for the TCSF. While the two differ in terms of their strengths and experience, both can provide a complete suite of

signalling technology and can draw on a strong portfolio of management experience from digital projects across a range of countries. This differentiates them substantially from those other OEMs that are not currently active in the GB mainline signalling market.

Are the remaining rivals likely to be sufficient to offset the loss of competition resulting from the Merger?

37. We have found that there are a limited number of credible competitors that would be likely to constrain the Parties following the Merger.

38. The evidence we gathered shows that Siemens and Alstom are stronger than, or at least as strong as, the Parties against each of the assessed competition parameters. Both Siemens and Alstom benefit from strong incumbency advantages and both will likely be strong competitors for the TCSF and exercise a competitive constraint on the Parties. The Parties' internal documents reviewed to date indicate that they considered each other, Siemens, and Alstom as their main potential competitors for past signalling digital tenders in the UK and for the TCSF.

39. The evidence we have considered, including in relation to shares of supply, indicates that the other OEMs present in Europe are CAF, AZD Praha, Indra, Mermec and Progress Rail. CAF is the supplier with the higher share among these OEMs, but none of these players has a share of supply higher than 5%.

40. The evidence indicates that of these potential competitors, apart from Alstom and Siemens, only CAF is likely to exercise a relevant constraint on the Parties (even if a weaker constraint than the Parties pose on each other).

41. CAF is able to provide a full suite of technology, given that it has experience in delivering digital mainline signalling projects, although more limited when compared to Thales and, to a lesser but still significant extent, Hitachi. Although CAF is not active in signalling in GB and does not have previous experience collaborating with Network Rail, it can (as can other OEMs) bid in partnership with and/or subcontract UK-based integrators. This would allow CAF to benefit from the integrators' capabilities and experience of operating in the UK and with Network Rail.

42. Other OEMs have significantly less experience in delivering digital mainline signalling projects and in homologating their technology in different countries. The evidence we have received to date also indicates that other OEMs may have to rely on multi-supplier technological solutions in which different subsystems of a digital mainline signalling system are provided by different suppliers. Such a solution is likely to increase interfacing and delivery risks.

43. The evidence we gathered also consistently shows that, while some integrators do have material experience in delivering mainline rail projects, their only feasible option to compete for digital mainline signalling projects is to partner with an OEM that holds the necessary technology.

44. Only Siemens, Alstom and to lesser extent CAF match the Parties' strengths across all of the parameters of competition considered in our assessment and would likely exercise a constraint on the Parties. We have provisionally found that these rivals, together or in isolation, are not likely to be sufficient to offset the loss of constraint that will result from the Merger.

45. In a bidding process with up to four winners and a limited number of potential suppliers, the loss of a credible supplier would have a material impact on the intensity of competition for the TCSF tender.

46. Based on our provisional assessment, we consider that the Merger is likely to result in the removal of a direct and significant constraint on each of the Parties. We consider that overall, the remaining constraints post-Merger from Siemens, Alstom and CAF are not likely to be sufficient to offset the loss of competition brought about by the Merger. Therefore, we have provisionally found that the Merger may be expected to result in an SLC in relation to the supply of digital mainline signalling systems in GB.

The harm resulting from the Merger

47. The substantial loss of competition resulting from the Merger is likely to lead to a worse outcome in the initial TCSF tender and future mainline signalling tenders in GB. The Merger could result in reduced choice for Network Rail in terms of the strength and number of bidders and could lead to fewer than four suppliers being appointed in the current tender process and thus available to bid, should they so choose, in future mini-competitions within the TCSF.

48. Overall, we currently consider that the Merger could lead to adverse effects in the supply of digital mainline signalling systems to infrastructure managers in GB through higher prices, reduced innovation, worse terms and/or worse performance levels relative to the situation absent the Merger.

Supply of CBTC systems in the UK

Overview

49. Urban signalling systems are railway signalling systems used for local passenger rail transit, such as metro networks, of which the largest in the UK

is the London Underground, and are designed to ensure safety on urban rail networks by preventing collisions and excessive speeds, as well as to improve and increase network capacity. Urban signalling systems typically support much higher train frequencies than mainline signalling systems and, as a result, are generally more complex and more costly.

50. Urban signalling systems are based on either conventional or CBTC technologies. Unlike conventional systems, CBTC systems rely on continuous radio-based communication between the train and the tracks to precisely identify, at all times, the location of a train on the tracks. CBTC signalling works can be either ‘greenfield’ or ‘brownfield’, depending on whether the works are on an active railway.

51. As for the supply of digital mainline systems, the supply of CBTC systems is also characterised by both national and global elements of competition.

Focus of our investigation

52. There is a limited number of CBTC projects expected in the UK in the next 10–15 years; however, the size of each individual project is expected to be substantial. TfL is expected to tender for the resignalling of the Piccadilly and Bakerloo lines on the London Underground with CBTC by around 2035. We have not taken into account in our current assessment potential CBTC tenders for other lines that may occur well after 2035 because of the uncertainty of predicting competitive conditions in this market so far into the future. In addition, we have not identified other projects that are planned in the UK in this time period. We have, therefore, focused our assessment on the competition for the resignalling of the Piccadilly and Bakerloo lines. We assessed whether the Merger is likely to result in the removal of competition between the Parties in these future CBTC tenders and whether that loss of competition would likely lead to an SLC.

53. While there are uncertainties in relation to the design of TfL’s future CBTC tenders for the Piccadilly and Bakerloo lines and the capabilities of suppliers at the time of these tenders, we do not have to predict the specific tender outcomes but rather assess the likely applicable conditions of competition on the basis of all the available evidence.

54. Based on an assessment of competition for past projects, we currently consider that competition for the resignalling of the Piccadilly and Bakerloo lines with CBTC is likely to take place across several aspects of suppliers’ offerings: (a) *CBTC signalling solutions* and ability to meet the technological requirements set out by TfL; (b) *experience in undertaking CBTC projects* on metro systems that have at least some comparable characteristics to the

upcoming projects on the London Underground and in particular complex projects involving the resignalling of existing networks; (c) *local knowledge and capacity*, including experience and knowledge of London Underground systems as well as existing capacity in the UK; and (d) *price*, although safety critical factors are expected to be more important.

55. In our competition assessment, we consider how closely the Parties and their competitors will compete against these parameters.

Is the supply of CBTC systems to the London Underground contestable by new entrants?

56. One of the defining features of competition for the future London Underground tenders is the specialised nature of CBTC projects. Metro systems that are more complex bring greater delivery risks and experienced suppliers are generally better placed for such an undertaking. Complexity in this context ranges from low to high. The London Underground is regarded as being towards the more complex end of this spectrum, owing to the sprawling nature of an aged network that has been in existence for over a century with its multiple lines, intersections, junctions, and narrow deep tube tunnels. The network is used by hundreds of millions of passengers each year with trains operating at speed and high frequency matched by few other networks.

57. Given this complexity, existing suppliers are expected to benefit from a competitive advantage, potentially a significant one, when the future London Underground CBTC contracts come up for tender. They have deployed their technology on the network and have well established relationships with the customer, TfL. They may also have the benefit of being able to draw on a existing workforce and facilities for future projects without the need for considerable further investment. Overall, incumbents' previous experience would likely lower the costs of familiarisation with the network, the customer and the technologies and, potentially, provide those suppliers with the ability to deploy their solutions more rapidly (compared to new entrants). All of these factors indicate that barriers to entry on the London Underground are high. At present, there are only two suppliers that have delivered CBTC signalling projects on the London Underground: Thales and Siemens.

58. However, the fact that there are only two suppliers currently operating on the London Underground does not necessarily imply that competition is not important or necessary in this market. Although there have been very few tenders for the supply of CBTC systems, the past competitive interactions indicate that TfL has considered suppliers other than its current providers. TfL

told us that previous London Underground experience was neither ‘essential nor preferred’ for future tenders.

59. While there are material incumbency advantages, overall, we consider that the evidence received to date indicates that future London Underground major resignalling projects will be open to competitive tender and that new entrants appear likely be able to compete and act as a constraint on incumbent suppliers, depending on their global experience and overall capabilities as a CBTC supplier.

Is Hitachi likely to bid for complex brownfield CBTC projects in the future?

60. We cannot predict with certainty whether Hitachi will bid for future CBTC tenders for the Bakerloo and Piccadilly lines, absent the Merger. Such uncertainty is an inherent part of the forward-looking assessment that we must conduct. While Hitachi has less experience in delivering complex brownfield CBTC projects than Thales, Hitachi is currently delivering several brownfield projects globally. Hitachi has strong capabilities and increasing experience in brownfield CBTC projects (see below). Therefore, our starting point (subject to evidence to the contrary) is that Hitachi would likely continue to bid for brownfield CBTC projects on a case-by-case basis and be perceived as a potential, and credible, competitor for future CBTC tenders in the London Underground, absent the Merger.

61. We currently consider that the evidence we have received to date is not sufficient to provisionally conclude that, in the absence of the Merger, and despite Hitachi's capabilities and the experience acquired from previous complex brownfield CBTC projects, Hitachi would not bid for future CBTC systems in the London Underground.

Are the Parties likely to be close competitors in future CBTC tenders for the London Underground?

62. According to the CMA’s Merger Assessment Guidelines, when competition mainly takes place among few firms, any of these firms would normally be sufficiently close competitors that the elimination of competition between them would raise competition concerns, subject to evidence to the contrary.

63. Thales is the supplier of CBTC systems in around 60–70% of the London Underground. Hitachi and Thales are two of only four other major suppliers of CBTC systems that operate in Europe and across the world (Thales, Siemens, Alstom and Hitachi). We currently consider that the Parties’ shares of supply

across Europe and in the rest of the world are a good indicator of their strength and technical capabilities as CBTC suppliers and show that the Parties have vast experience in delivering CBTC projects across the world.

64. The Parties' tender data shows that Hitachi and Thales bid against each other relatively frequently and have won CBTC contracts when in direct competition with each other, but on a smaller number of occasions than they bid and lost contracts to Siemens and Alstom.

65. From a technological perspective, both Parties have access to a core CBTC system and have deployed it across a wide portfolio of projects. Thales is likely to benefit from a competitive advantage over Hitachi when competing for London Underground CBTC contracts, given its experience in deploying its technology and having developed a certified solution on the London Underground.

66. Our assessment of Hitachi's management experience and technical expertise indicates that Hitachi is an experienced supplier that is undertaking a number of high-value CBTC brownfield projects, including BART in San Francisco, which Hitachi has described as the second largest brownfield CBTC project in the world. Our analysis also shows that Hitachi has expanded its portfolio of brownfield projects and pool of CBTC brownfield references since TfL's last tender for CBTC systems in 2016. By the time of the next London Underground tender, Hitachi is expected to have completed (or near completed) brownfield projects in Ankara, Philadelphia, Glasgow, Brussels, Baltimore, Paris and San Francisco.

67. Taking all of the evidence in the round, we consider that Hitachi is likely to have the relevant management experience and technical expertise to undertake complex brownfield projects and to compete for future London Underground contracts.

68. Overall, our provisional view is that the Parties are likely to be close competitors for the supply of CBTC systems on the London Underground. Hitachi's lack of previous experience on the London Underground means that it may not be the closest competitor to Thales but nonetheless it could exercise a credible constraint on Thales in the next London Underground tenders, given the limited number of rivals for these tenders.

Are the remaining rivals likely to be sufficient to offset the potential loss of competition resulting from the Merger

69. The evidence shows that Siemens is at least as strong as Thales against each of the assessed competition parameters, and stronger than Hitachi.

Alstom, although it does not have previous experience on the London Underground, is a strong global CBTC supplier with considerable experience and technical capabilities. Siemens and Alstom will likely be strong competitors for future London Underground tenders and exercise a competitive constraint on the Parties.

70. Other CBTC suppliers such as Stadler and Mitsubishi have only recently developed or are developing the full functionality for their CBTC technologies and are significantly further behind than the Parties. These suppliers also have limited track record or experience in undertaking brownfield projects and are likely to exercise only a weak or very weak constraint on the Parties.

The harm resulting from the Merger

71. Based on our provisional assessment, we consider that the Merger is likely to result in the removal of a constraint on Thales as the CBTC market leader in the London Underground and that overall, the remaining constraints post-Merger from Siemens and Alstom are not likely to be sufficient to offset the loss brought about by the Merger. Therefore, we have provisionally found that the Merger may be expected to result in an SLC in relation to the supply of CBTC signalling systems in the UK.

72. We consider that the Merger could lead to adverse effects in the supply of CBTC in the UK through higher prices, reduced innovation, worse terms and/or worse performance levels relative to the situation absent the Merger.

Are there any factors that might prevent or mitigate against the SLCs arising?

73. Once we have decided that a Merger could give rise to an SLC, we also consider whether there are any factors that might prevent or mitigate against that SLC from arising.

74. We currently consider that it is not likely that entry or expansion of sufficient scale would occur in a timely manner in order to prevent or reduce the impact of the SLCs we have provisionally found in the supply of digital mainline signalling systems in GB and in the supply of CBTC systems in the UK.

75. The Parties claimed that efficiencies arising from the Merger would create a stronger competitor to Siemens and Alstom globally and in the UK. The evidence submitted by the Parties to date does not indicate that these efficiencies could only be achieved through the Merger. We do not consider that these efficiencies would be timely, likely and sufficient to prevent the

SLCs we have provisionally found in the supply of digital mainline signalling in GB and in the supply of CBTC systems in the UK.

Provisional findings

1. The reference

1.1 On 23 December 2022, the Competition and Markets Authority (**CMA**) in exercise of its duty under section 33(1) of the Enterprise Act 2002 (the **Act**), referred the anticipated acquisition by Hitachi Rail, Ltd (**Hitachi**) of Thales SA's Ground Transportation Systems Business (**Thales**) (the **Merger**) for further investigation and report by a group of CMA panel members (the **Inquiry Group**). Hitachi and Thales are referred to collectively as **the Parties** or, for statements referring to the future, the **Merged Entity**.

1.2 In exercise of its duty under section 36(1) of the Act, the CMA must decide:

(a) whether arrangements are in process or contemplation which, if carried into effect, will result in the creation of a relevant merger situation (**RMS**); and

(b) if so, whether the creation of that RMS may be expected to result in a substantial lessening of competition (**SLC**) within any market or markets in the United Kingdom (**UK**) for goods or services.

1.3 In assessing the competitive effects of the Merger, we must decide whether the Merger may be expected to result in an SLC (ie whether it is more likely than not that an SLC will result).

1.4 We are required to publish our final report by 11 August 2023.

1.5 Our terms of reference, along with information on the conduct of the inquiry, are set out in Appendix A and Appendix B respectively.

1.6 This document, together with its appendices, constitutes the CMA's provisional findings published and notified to the Parties in line with the CMA's rules of procedure.[2] Further information relevant to this inquiry can be found on the CMA case page.[3]

[2] CMA rules of procedure for merger, market and special reference groups (CMA 17), Rule 11.
[3] Hitachi / Thales case page.

2. The Parties and the Merger

2.1 This chapter sets out:

(a) an overview of the Parties; and

(b) the background to the Merger, including the Parties' stated rationale for the Merger.

The Parties

Hitachi

2.2 Hitachi is a provider of transport solutions, such as rolling stock, rail signalling systems and related services and maintenance, globally (including the UK).[4]

2.3 Hitachi is a wholly owned subsidiary of Hitachi, Ltd (**Hitachi Group**), the ultimate parent entity of a multi-national conglomerate headquartered in Tokyo and listed on the Tokyo and Nagoya Stock Exchanges.[5]

2.4 Hitachi Group's total worldwide turnover in the 2021 financial year was approximately £[✂] billion, of which £[✂] million was generated in the UK.[6] Hitachi's turnover for the 2021 financial year was £528 million.[7]

2.5 In the Hitachi's financial year ending on 31 March 2023, Hitachi's revenue generated in rail control amounted to approximately €[✂] billion worldwide. This revenue was generated by Hitachi's activities in signalling, traffic management and their associated servicing and maintenance, accounting for approximately [✂]% of its revenue derived from its overall activities in the rail sector worldwide.[8]

2.6 In 2015, Hitachi acquired a 40% stake in Ansaldo Signalling and Transportation Systems (**Ansaldo**), a supplier of signalling systems.[9] Hitachi acquired the outstanding shares in Ansaldo over time, concluding in 2019 when it gained full ownership of the business.[10]

---

[4] Final Merger Notice, 13 October 2022 (**FMN**), Sections 1-10, paragraph 3.
[5] FMN, 13 October 2022, Sections 1-10, paragraph 2.11.
[6] FMN, 13 October 2022, Sections 1-10, Table 2.
[7] FMN, 13 October 2022, Sections 1-10, Table 2.
[8] Hitachi site visit presentation, 9 February 2023, slide 6, updated based on Hitachi's internal figures for its 2022/23 financial year. The remaining [✂]% of Hitachi's revenue for the 2022/23 financial year was derived from its activities in the manufacture of rolling stock and its associated servicing and maintenance.
[9] 'Sale of Ansaldo Breda and Ansaldo STS to Hitachi completed', last accessed on 7 June 2023. Hitachi acquired a 40% stake for €761 million, valuing the entire Ansaldo business at approximately €1.9 billion.
[10] 'Ansaldo STS to become fully owned by Hitachi and delisted', last accessed on 7 June 2023.

Thales

2.7 Thales (ie the ground transportation systems (**GTS**) business of Thales SA) is active in the supply of rail signalling solutions and ancillary activities, globally (including the UK) across four business lines: (i) mainline signalling (see paragraph 4.2); (ii) urban rail signalling (see paragraph 4.21); (iii) integrated communications and supervision solutions (ie solutions which aim to provide operational efficiency and to ensure passenger safety and comfort in stations and on-board trains; and (iv) revenue collection systems in the transport sector.[11]

2.8 In addition to its ground transportation systems business, Thales' parent company, Thales, is also active in: defence and security, aerospace and space, and digital identity and security.[12] Thales SA is headquartered in Paris and listed on the Euronext Paris.[13]

2.9 Thales' total worldwide turnover in the 2021 financial year was approximately £[✂] billion of which £[✂] million was generated in the UK.[14]

The Merger

The Merger transaction

2.10 On 3 August 2021, Hitachi entered into an option agreement with Thales SA to acquire Thales for €1.66 billion. Hitachi and Thales SA subsequently executed a Sale and Purchase Agreement (**SPA**) on 10 February 2022.[15] Pursuant to the SPA, Hitachi has irrevocably committed to acquire, at a purchase price of €1.66 billion, [✂].[16]

2.11 The Parties informed the CMA that the Merger, in addition to the CMA, is subject to review by various competition authorities, including the European Commission.[17]

The Parties' rationale for the Merger

2.12 Hitachi submitted that the rationale for the Merger is to:

---

[11] FMN, 13 October 2022, Sections 1-10, paragraph 5.
[12] 'About Thales | Thales Group', last accessed on 7 June 2023.
[13] FMN, 13 October 2023, Sections 1-10, paragraph 2.27.
[14] FMN, 13 October 2022, Sections 1-10, Table 2.
[15] FMN, 13 October 2022, Sections 1-10, paragraph 2.1; and FMN Annex Q2.001.
[16] FMN, 13 October 2022, Sections 1-10, paragraphs 2.1 and 2.29.
[17] FMN, 13 October 2022, Sections 1-10, paragraph 2.31-2.32.

(a) Provide Hitachi with additional resources to position itself as a more credible supplier, offering a broader and deeper portfolio of signalling solutions, and expanding its customer base and credentials;

(b) enable Hitachi to benefit from economies of scale, improved procurement processes, optimised engineering capabilities and enhanced production process, for the benefit of its customers;

(c) [✂]; and

(d) provide Hitachi with an opportunity to expand its signalling portfolio into growing markets and technologies through digital solutions (Mobility as a Service), thereby creating new opportunities for customers.[18]

2.13 Hitachi further submitted that Thales would become part of an 'integrated rail player' (with both signalling and rolling stock capability), which would foster its value delivery for customers.[19]

2.14 Hitachi's public statements and internal documents are broadly consistent with its stated rationale. These submissions are considered in our assessment of countervailing factors, in paragraphs 11.5 to 11.65, where we assess the efficiencies resulting from the Merger.

2.15 Thales told us that [✂].[20] Thales' internal documents show that [✂][21] and allowing it to focus on the digital identity, defence and aerospace industries, as the more profitable parts of its business.[22] [✂].[23]

[18] FMN, 13 October 2022, Sections 1-10, paragraphs 2.33-2.39.
[19] FMN, 13 October 2022, Part II, paragraph 2.40.
[20] Thales' response to Phase 2 RFI 2, Q 3.
[21] FMN Annex T.Q9.014, slide 9; and FMN Annex T.Q9.023, slide 18.
[22] FMN Annex T.Q9.018, slide 4. In the context of the wider Thales Group, had historically been the smallest business segment, contributing 10% of global revenues in 2020. In addition, Thales' profitability had been below the Thales Group average for a number of years: Thales Group earned an average EBIT margin (excluding Thales) of 8% in 2020 and 12% in 2019. By contrast, Thales earned an EBIT margin of 5% in 2020 and 3% in 2019. See, 'Thales Group Integrated Report 2020', page 6, last accessed on 10 May 2023; and 'Thales Group consolidated financial statements at 31 December 2020', page 12, last accessed on 10 May 2023.
[23] [✂].

3. Relevant merger situation

3.1 Section 36(1) of the Act and our terms of reference require that we investigate and report on two statutory questions:

(a) whether arrangements are in progress or in contemplation which, if carried into effect, will result in the creation of an RMS; and

(b) if so, whether the creation of the RMS may be expected to result in an SLC within any market or markets in the UK for goods or services.

3.2 We address the first of the statutory questions in this section.

Enterprises ceasing to be distinct

3.3 Section 23 of the Act provides that an RMS will be created if, as a result of the Merger, two or more enterprises cease to be distinct and the turnover test and/or share of supply test is satisfied.

3.4 Section 26 of the Act provides that any two enterprises cease to be distinct if they are brought under common ownership or common control.

3.5 Hitachi and Thales are 'businesses' within the meaning of the Act[24] and their activities, which include the delivery of digital mainline signalling and urban signalling systems (see paragraphs 4.2 and 4.22 below), constitute 'enterprises' in accordance with the Act.[25]

3.6 Hitachi will acquire full control of Thales pursuant to the SPA (see paragraph 2.10). Therefore, on completion of the Merger, Thales will be under the common ownership and control of Hitachi and the two enterprises will cease to be distinct.

3.7 We have therefore provisionally found that arrangements are in progress or contemplation which, if carried into effect, would result in Hitachi and Thales ceasing to be distinct enterprises under the Act.

[24] Section 129(1) of the Act.
[25] Section 129(1) of the Act.

Turnover test

3.8 The second element of the RMS test seeks to establish whether the Merger has sufficient connection with the UK on a turnover and/or share of supply basis to give the CMA jurisdiction to investigate.[26]

3.9 The turnover test in section 23 of the Act is satisfied where the value of the turnover in the UK of the enterprise being taken over exceeds £70 million.[27] As noted in paragraph 2.9 above, Thales' revenue in the UK exceeds £70 million and therefore the turnover test is met. As such, we are not required to consider whether the share of supply test is met.[28]

Provisional conclusion on the RMS

3.10 In light of the above, we have provisionally found that the Merger constitutes arrangements in progress or in contemplation which, if carried into effect, will result in creation of a RMS. This means that the CMA has jurisdiction to review the Merger. As a result, we must consider whether the creation of that situation may be expected to result in an SLC within any market or markets in the UK for goods or services.[29]

[26] Section 23 of the Act.
[27] Section 23(1)(b) of the Act.
[28] We also note that the Merger has not yet completed and as, such, the four-month time limit for a RMS in the Act is not engaged in the present circumstances (see section 24 of the Act). Furthermore, we currently consider that applicable statutory time limits in relation to this reference have been complied with by the CMA (see sections 34ZA and 73A(1) of the Act).
[29] Section 36(1)(b) of the Act.

4. Industry background

4.1 As set out in Chapter 2, the Parties are active in the supply of mainline and urban signalling projects.

Mainline signalling

Signalling subsystems

4.2 Mainline signalling projects involve the installation of mainline signalling systems in a railway network, which in turn comprise multiple subsystems.[30] Mainline signalling systems are fundamental to the safe and efficient operation of modern railways, directing traffic and keeping trains apart to prevent collisions. These systems are deployed on all the UK's major train routes, such as the East Coast Mainline and West Coast Mainline, as well as smaller local routes. The purpose of a signalling system is to determine the position of trains on the track, control their direction and signal to the driver when it is safe to proceed to the next section of track. Signalling systems also have a role to play in increasing capacity on the network, by allowing more trains to run safely.[31]

4.3 Mainline signalling comprises several subsystems. These are set out below.

4.4 Train protection systems (**TPS**) consist of both trackside and on-board components (installed on the rolling stock) that interface with the interlockings.[32] The automatic train protection (**ATP**) is one of the various types of TPS[33] used in the UK which continuously ensures that the train does not exceed the safe speed and provides relevant information to support the train driver, by displaying movement authorities and speed limits on an in-cab display.[34] There has been standardisation of ATP at European level as a result of the European Rail Traffic Management System (**ERTMS**), outlined in paragraph 4.13. An ATP using the European Train Control System (**ETCS**), Level 2 and in the future Level 3 (see paragraph 4.14) has a radio block centre (**RBC**), which is a device used as a centralised safety unit, which uses radio connection via GSM-R to receive train position information and send movement authority and further information required by the train for its

[30] In general, the delivery of signalling projects involves project-specific engineering, development and project management, procurement of the necessary equipment, installation, testing, commissioning and, in most cases, maintenance. See, FMN, 13 October 2022, Chapter 1, paragraph 13.7.1.
[31] Office of Rail and Road, 'Signalling market study - Final Report', last accessed on 10 May 2023, paragraph 3.3.
[32] FMN, 13 October 2022, Chapter 1, paragraphs 12.14-12.15.
[33] FMN, 13 October 2022, Chapter 1, paragraphs 12.14.1-12.14.2.
[34] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.12.

movement. The RBC interacts with the interlocking (see below) to obtain signalling-related information, route status, etc. An RBC is also able to manage the transmission of selected trackside data and communicate with adjacent RBCs.[35]

4.5 **Interlockings** are the principal safety critical component of mainline rail signalling systems. Interlockings are lineside systems (ie installed adjacent to the tracks)[36] which prevent trains from carrying out unsafe movements by permitting them to proceed past a signal only once routes are set, locked and detected in safe combinations.[37] Interlockings can be divided into two categories, conventional and digital.

4.6 Conventional interlockings are a type of computer-based interlocking[38] that generally predate and are not designed to be compatible with ETCS.[39]

4.7 British Rail developed a computer-based interlocking – the Solid State Interlocking (**SSI**) – for use in mainline railways in Great Britain (**GB**) in the mid-1980s.[40] Following the privatisation of British Rail, the rights to develop and deploy the SSI passed to Siemens, Alstom and their predecessor companies.[41] Other companies have independently developed computer-based interlockings, derived from solutions in other countries.[42]

4.8 Digital interlockings are modern computer-based interlockings that have been designed to work with the RBC (see paragraph 4.4). A digital interlocking must be provided with a communications link, protocol and software capability to communicate with an RBC.[43] While the hardware used in both digital and conventional interlockings is very similar,[44] digital interlockings generally utilise a more streamlined and less complex application logic than conventional interlockings and are less reliant on the signals delivered to train

---

[35] 'Subsystems and Constituents of the ERTMS (europa.eu)', last accessed on 17 May 2023.
[36] Lineside, trackside, and wayside relate to the area adjacent to a railway track and are used interchangeably.
[37] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.5.
[38] Computer-based interlockings are a type of electronic interlocking that have been in use for over 30 years. Non-electronic interlockings, such as mechanical-based interlockings using analogue levers or relay-based interlockings that use electromagnetic relays to control sections of the railway pre-date the development of SSI in the mid-1980s. Such non-electronic interlocking technologies are outdated and being phased out in the UK. For the purpose of these Provisional Findings, any references to interlockings refer exclusively to computer-based interlockings. See, Parties' response to RFI dated 23 December 2022, Q 5.
[39] Parties' response to RFI dated 23 December 2022, Q 5.
[40] See paragraph 4.20 for the difference between the operational and technical requirements in GB and Northern Ireland.
[41] FMN, 13 October 2022, Chapter 1, paragraph 12.43.
[42] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.7.
[43] 'What is Digital Ready? – Rail Engineer', last accessed on 17 May 2023.
[44] Parties' response to RFI dated 23 December 2022, Q 5.

drivers, as information and movement authorities are transmitted wirelessly directly to the train.[45]

4.9 The European Initiative Linking Interlocking Systems (**EULYNX**) is aimed at standardising the interfaces in relation to interlockings (see paragraph 4.5 and 4.8).

4.10 Operation and Control Systems **(OCS)** are IT solutions that aid signallers in setting routes and assist in the overall management of railway networks. OCS comprise monitoring and command components for signalling subsystems. The OCS receive information across a network of interlockings and relay this to a central control centre.[46]

Conventional versus digital mainline signalling systems

4.11 Conventional mainline signalling systems are mainline signalling systems developed to conform to national operating rules and technical requirements.[47] In the UK, the relevant conventional interlocking is the SSI technology.

4.12 Digital mainline signalling refers to the signalling element of what Network Rail calls 'Digital Railway', an umbrella term that describes the modern signalling systems and train control technologies that lessen the need for fixed lineside infrastructure.[48] Unlike conventional mainline signalling systems, digital mainline signalling systems are designed to be interoperable across national borders. The key standardisation initiatives in this regard are: (i) the ERTMS and (ii) the EULYNX.

ERTMS

4.13 In 1996, the European Union introduced changes to standardise the safety components for all high-speed lines in Europe through the introduction of ERTMS.[49] The aim of ERTMS is to replace the different national train control and command systems in Europe. ERTMS has two basic components:

(a) The ETCS, an ATP system to replace the existing national ATP systems; and

---

[45] Parties' response to RFI dated 23 December 2022, Q5.
[46] FMN, 13 October 2022, Chapter 1, paragraphs 12.19-12.20.
[47] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.6.
[48] Office of Rail and Road, 'Signalling market study - Final Report', page 7.
[49] 'History of ERTMS', last accessed on 17 May 2023.

(b) GSM-R, a radio system for providing voice and data communication between the track and the train, based on standard GSM using frequencies specifically reserved for rail application with certain specific and advanced functions.[50]

4.14 The replacement of legacy ATP systems with ETCS (Level 2 and above)[51] removes the need for colour light signals to issue movement authority to train drivers.[52] Instead, the interlockings communicate with an on-board European Vital Computer (**EVC**) via an RBC using GSM-R radio signals to relay signal and speed information to the driver.[53] Interlockings remain the critical safety component of the mainline signalling system.[54]

EULYNX

4.15 EULYNX is a European initiative aiming to reduce the cost and installation time of signalling equipment by virtue of standardisation, encompassing 14 European infrastructure managers, including Network Rail in GB.[55] The EULYNX project seeks to standardise the interfaces in relation to interlockings and their components.[56] This initiative is still ongoing and interlocking interfaces are not yet fully standardised.

GB railway standards

4.16 The standardisation initiatives described above in paragraphs 4.13 to 4.15 relate to the interface between trains and trackside equipment. It remains the

---

[50] ETCS is used throughout these Provisional Findings to refer to refer to both systems of the ERTMS, unless specified to the contrary.
[51] ETCS has three levels that are defined based on the wayside equipment and the way the information is transmitted to the train. There are currently two levels of ETCS in operation, both working with the same on-board equipment. A new ETCS level is under development. See, FMN, 13 October 2022, Chapter 1, paragraph 12.33. ETCS Level 1 involves continuous supervision of train movement (ie the onboard computer is continuously supervising the maximum permitted speed and calculating the braking curve to the end of movement authority) while non-continuous communication occurs between train and trackside, generally through Eurobalises. Lineside signals are necessary. Train detection and train integrity checks (ie the train is complete and has not been accidentally split) are performed by the trackside equipment beyond the scope of ERTMS. ETCS Level 2 involves continuous supervision of train movement with constant communication via GSM-R between the train and trackside. Lineside signals are optional in this case, and train detection and train integrity checks are performed by the trackside equipment beyond the scope of ERTMS. ETCS Level 3 involves continuous train supervision with continuous communication between the train and trackside. The main difference with Level 2 is that train location and integrity are managed within the scope of the ERTMS system, ie there is no need for lineside signals or train detection systems on the trackside other than Eurobalises. Train integrity is supervised by the train. See also, 'ETCS Levels and Modes', last accessed on 10 May 2023.
[52] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.14.
[53] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.14.
[54] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.14.
[55] 'EULYNX Landing Page'; Office of Rail and Road, 'Signalling market study - Final Report'; and Office of Rail and Road, 'Signalling Market Study update Annex A - Glossary', last accessed on 16 May 2023. Network Rail together with nine other infrastructure managers across Europe launched EULYNX in Spring 2014. The aim of EULYNX is to standardise interfaces, including by agreeing a common programme for interface definition. This should also include the standardisation work itself, and the related test and approval phases and tool development.
[56] FMN, 13 October 2022, Chapter 1, paragraph 12.39.

case that GB has operational and technical requirements with which all signalling systems installed on GB mainline railways must comply. Each signalling subsystem requires certification and authorisation in GB.

Interoperability between conventional and digital mainline signalling systems

4.17 Subsystems of either digital or conventional mainline signalling must interface with each other. Importantly, interlockings must interface with both trackside components and control systems.[57]

4.18 In addition to the interfaces between signalling subsystems, there will also be projects where the (new) digital signalling assets will need to interface with the installed base, ie mainlines where there will be both conventional and digital signalling.[58] We consider the interfacing risks between conventional and digital signalling systems, and between the different subsystems, in particular with interlockings which are the key component of a subsystem, in Chapter 8.

Customers of mainline signalling in the UK

4.19 Network Rail, as the main customer and infrastructure manager of the rail network in GB, is the organisation responsible for overseeing the approval, installation and maintenance of mainline signalling systems in GB. The other customers of mainline signalling systems in the UK are: High Speed One (HS1) Limited (**HS1**), High Speed Two (HS2) Ltd (**HS2)** and the Tyne and Wear Passenger Transport Executive (**Nexus**) (see paragraphs 8.40 to 8.43).

4.20 We understand that GB and Northern Ireland have different regulations, operational and technical requirements for mainline signalling systems (see paragraphs 8.27 and 8.31). The Northern Irish rail network is integrated with the railway network in the Republic of Ireland. The infrastructure manager for Northern Ireland is Translink.

Urban signalling

4.21 Urban signalling systems are railway signalling systems used for local passenger rail transit, encompassing metro networks, of which the largest in the UK is the London Underground, and Light Rail and Tram (**LRT**) networks. Like mainline signalling systems, these are designed to ensure safety on urban rail networks by preventing collisions and excessive speeds, as well as to improve and increase network capacity. Urban signalling systems typically

[57] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.15.
[58] Office of Rail and Road, 'Signalling market study - Final Report', paragraph 3.16.

support much higher train frequencies than mainline signalling systems and, as a result, are generally more complex and more costly.[59]

4.22 In a similar manner to mainline signalling, interlockings are a critical safety component. Interlockings work by dividing up tracks into blocks or sections, which vary from a few hundred metres to several kilometres. Interlockings are designed to prevent more than one train occupying the same block at the same time.[60]

4.23 Urban signalling systems are based on either conventional or 'communication-based train control' (**CBTC**) technologies, which differentiate how this system of blocks operates:

(a) Conventional urban rail signalling systems were developed and deployed based on a 'fixed block' system. The track is divided into consecutive blocks and sensors detect whether a block is occupied by a train. A block may be occupied by only one vehicle at any given time and the system recognises that a block is occupied but does not know where the vehicle is within the block. A train will only be authorised to move once the blocks ahead of it are clear. This system creates a safety buffer between trains to avoid them colliding by ensuring that a train cannot enter a block occupied by another train. Devices such as axle counters or track circuits are used to detect where trains are located on the network.[61]

(b) CBTC systems are based on so-called 'moving blocks', which are determined based on the actual position of the trains and the required braking distance, plus a safety buffer. Unlike conventional systems, CBTC systems rely on continuous radio-based communication between the train and the tracks to precisely identify, at all times, the location of a train on the tracks.[62] CBTC systems create a safety buffer between trains to avoid them colliding by ensuring that there is always sufficient distance between trains to allow for safe stopping. In the UK, CBTC systems are used only for metros.[63]

4.24 CBTC is a technological evolution of transmission-based train control (**TBTC**), using more modern communications technology in place of cabling to improve reliability and performance, as well as reduce maintenance costs. Most large signalling suppliers can provide radio based CBTC, moving away from TBTC technologies. The CBTC system of 'moving blocks' allows for a reduction of

---

[59] FMN, 13 October 2022, Chapter 2, paragraphs 12.2-12.3, and paragraph 15.25.
[60] FMN, 13 October 2022, Chapter 2, paragraph 12.9.
[61] FMN, 13 October 2022, Chapter 2, paragraph 12.10.
[62] FMN, 13 October 2022, Chapter 2, paragraphs 12.11, and 12.16.
[63] TfL response to RFI dated 30 September 2022, paragraphs 10-11.

the distance or 'headway' between trains on the network, thereby increasing network capacity.[64]

Interoperability

4.25 Unlike mainline signalling, many urban signalling systems do not have interoperability requirements with the other metro systems in a specified country. For example, the signalling used on the London Underground differs from the signalling used for the Glasgow Metro. Furthermore, within metro networks, many trains run on self-contained lines that maintain specific signalling standards for that line (eg the Northern Line of the London Underground). Interoperability may, however, be required when different lines within the same metro network interface with each other.

Customers of CBTC in the UK

4.26 In the UK there are two metro systems that use urban signalling systems:

(a) one in London (encompassing the London Underground, London Overground, DLR and Elizabeth line) which is managed by Transport for London (**TfL**), and

(b) one in Glasgow, which is managed by the Strathclyde Partnership for Transport (**SPT**)

4.27 Across these metro networks, a mixture of CBTC and conventional and are used, but conventional systems are expected to be upgraded to CBTC.

(a) In London, all lines already use CBTC or are expected to be upgraded to CBTC when funding allows.[65]

(b) In Glasgow, signalling is currently being upgraded to CBTC (see paragraphs 9.4 to 9.7).

---

[64] FMN, 13 October 2022, Chapter 2, paragraph 12.11.
[65] The Bakerloo, Central, Waterloo & City and Piccadilly Lines have yet to be upgraded. See, 'DEEP TUBE PROGRAMME IN DOUBT', last accessed on 10 May 2023.

5. Counterfactual

Introduction

5.1 The counterfactual is an analytical tool used to help answer the question of whether a merger gives rise to an SLC.[66] Applying the SLC test involves a comparison of the prospects for competition with the merger against the competitive situation without the merger. The latter is called the counterfactual.[67]

Framework for assessment of the counterfactual

5.2 The counterfactual is not intended to be a detailed description of the conditions of competition that would have prevailed absent the merger.[68] The assessment of those conditions is better considered in the competitive assessment.[69] We also seek to avoid predicting the precise details or circumstances that would have arisen absent the merger.[70]

5.3 At phase 2, we select the most likely conditions of competition as the counterfactual against which to assess the merger.[71] For anticipated mergers, the counterfactual may consist of the prevailing conditions of competition, or conditions of competition that involve stronger or weaker competition between the merger firms than under the prevailing conditions of competition.[72]

5.4 In our assessment of the counterfactual, we may need to consider multiple possible scenarios, before identifying the relevant counterfactual.[73] As part of this assessment, we will take into account whether any of the possible scenarios makes a significant difference to the conditions of competition,[74] and if they do, we will ultimately select the most likely conditions of competition absent the merger as the relevant counterfactual.[75] Counterfactual assessments will often focus on significant changes affecting competition between merger firms, such as entry into new markets in

---

[66] CMA129, paragraph 3.1.
[67] CMA129, paragraph 3.1.
[68] CMA129, paragraph 3.7.
[69] CMA129, paragraph 3.7.
[70] CMA129, paragraph 3.11.
[71] CMA129, paragraph 3.13.
[72] CMA129, paragraph 3.2.
[73] CMA129, paragraph 3.13.
[74] CMA129, paragraph 3.13.
[75] CMA129, paragraph 3.13.

competition with each other, significant expansion by the merger firms in markets where they are both present, or exit by one of the merger firms.[76]

5.5 We may examine several possible scenarios to determine the appropriate counterfactual, one of which may be the continuation of the prevailing conditions of competition. An example of a situation where we may select a counterfactual different from the prevailing conditions of competition is where the target is likely to exit the market absent the transaction under review. Another scenario in which we may consider an alternative counterfactual to the prevailing conditions of competition is where one of the merging parties would have entered or materially expanded its presence in a market absent the transaction.[77]

5.6 Further, the time horizon we consider in our assessment of the counterfactual will depend on the context and will be consistent with the time horizon used in the competitive assessment.[78]

The Parties' views

5.7 The Parties submitted that the relevant counterfactual is the prevailing conditions of competition, and that 'there is no evidence to suggest that the CMA should depart from its default counterfactual of prevailing conditions of competition in this case'.[79]

5.8 However, the Parties submitted that, in considering the prevailing conditions of competition, the CMA must have regard to alternative plausible scenarios for the counterfactual, other than the adoption and implementation of the Train Control Systems Framework (**TCSF**) as currently envisaged by Network Rail (see paragraphs 7.19 to 7.21).[80]

5.9 The Parties told us that the ultimate form and implementation of the TCSF was uncertain, and that Network Rail's proposed specifications should not be treated as a 'de facto counterfactual representing the prevailing conditions of competition', nor the only context in which the Merger is assessed,[81] for the following reasons:

(a) The structure of the TCSF is highly uncertain, due to the current uncertainty around the nature of its implementation, scope, the size of the

---

[76] CMA129, paragraph 3.8.
[77] CMA129, paragraph 3.16.
[78] CMA129, paragraph 3.15.
[79] FMN, 13 October 2022, Chapter 1, paragraph 11.1.
[80] Parties, Submission on Competitive Conditions, dated 17 March 2023 (**Submission on Competitive Conditions)**, paragraph 1.9.
[81] Parties, Submission on Competitive Conditions, paragraph 1.8.

guaranteed work and the split between digital and conventional works. The Parties told us that the design of the TCSF is expected to change prior to the awarding of contracts to suppliers.

(b) [✂] was first presented to potential suppliers in July 2022, which may lead to insufficient incentives for new entrants to compete for the TCSF.

(c) The timing of digital signalling procurement within the TCSF will favour the incumbent UK suppliers of digital signalling in the UK, Siemens and Alstom.

(d) [✂].[82]

Our assessment

5.10 In making our counterfactual assessment, we do not seek to describe in detail the conditions of competition that would prevail absent the merger nor to ossify the market at a particular point in time. Our counterfactual assessment can reflect that, absent the Merger, each of the Parties would have continued making investments to improve their products and services, innovate and/or introduce new products and services.[83]

5.11 We agree with the Parties that, as regards mainline signalling, any uncertainty around the design and implementation of the TCSF is part of the prevailing conditions of competition. We are of the view, however, that the assessment of any uncertainties relating to the TCSF is best carried out as part of our competitive assessment (see paragraphs 7.28 to 7.42).

5.12 Further, while we understand that [✂].[84] [✂].[85] Given the uncertainty around the eventual purchaser(s) of the Thales' business, there is no basis on which to assess whether the sale of Thales to an alternative buyer would make a material difference to our competitive assessment, relative to the prevailing conditions of competition.

5.13 Therefore, our provisional conclusion is consistent with the Parties' view that the most appropriate counterfactual to assess the merger is the prevailing conditions of competition.

---

[82] Parties, Submission on Competitive Conditions, paragraph 1.7.
[83] CMA129, paragraph 3.3.
[84] [✂]. We also note that [✂]. [✂].
[85] FMN Annex T.Q9.025, slide 3. [✂].

6. Structure of our assessment of the theories of harm and approach to the evidence

6.1 Theories of harm describe the possible ways in which an SLC may be expected to result from a merger and provide the framework for analysis of the competitive effects of a merger.

6.2 We focused our competition assessment on the unilateral horizontal effects of the Merger in the supply of: (i) digital mainline signalling systems and related services (**digital mainline signalling systems**) in GB; and (ii) CBTC signalling systems and related services (**CBTC systems**) in the UK.

6.3 No evidence has been submitted to justify investigate further the theories of harm that the CMA found would not give rise to a realistic prospect of an SLC following its phase 1 investigation.[86]

6.4 Unilateral effects can arise in a horizontal merger when one firm merges with a competitor that would otherwise have provided a competitive constraint, allowing the merged entity profitably to raise prices or degrade non-price aspects of its competitive offering (such as quality, range, service and innovation) on its own and without needing to coordinate with its rivals.[87]

6.5 Our assessment of mergers is generally forward-looking and we will seek to account for the future evolution of competitive conditions when assessing this theory of harm.[88] This includes developments in the Parties' competitive offerings and the competitive offerings of third parties, taking into account a range of evidence (and not just evidence of historical market performance, such as shares of supply and tender data, which in this case primarily relates to the supply of conventional mainline signalling systems in GB).

6.6 We gathered evidence from a wide range of different sources as part of our inquiry. In considering the weight to be placed on each piece of evidence, we have taken into account factors such as the robustness of the data/methodology adopted, the interests of the party that provided the information or view, the age of the information or document, the context, author and recipient of a document, and the purpose for which it was produced.

---

[86] In the Phase 1 Decision, the CMA found that, given Siemens' and Alstom's significant incumbency advantages with respect to the supply of conventional mainline signalling and the transition towards digitalisation of the signalling infrastructure, there was no realistic prospect of an SLC within that market. We have not received any evidence to justify reopening this theory of harm during our investigation.
[87] CMA129, paragraph 4.1.
[88] CMA129, paragraph 4.16.

6.7 We have not relied on any one specific piece of evidence in isolation to inform our decisions as to whether the Merger may be expected to result in one or more SLCs; rather, we have assessed all of the evidence in the round in order to reach our decisions.[89] As part of this, we have given due regard to the extent to which our view on the interpretation of a piece of evidence is corroborated (or not) by other evidence available to us. There is no set hierarchy between different types of evidence, and the CMA may attach greater weight to one type of evidence or another based on its relative quality.[90]

6.8 When considering the weight to attach to submissions from third parties we have taken into account the extent to which they may have an interest in the outcome of our Merger investigation, and whether the submissions are consistent with other evidence we have received.[91] In particular, we note that the assessment of a merger's impact on competition is not driven solely by customer views but instead takes into account the (typically wider) range of evidence that is available to the CMA in a given case.

6.9 Where internal documents support claims being made by the Parties, the CMA may be likely to attach more evidentiary weight to such documents if they were generated prior to the period in which those firms were contemplating or aware of the merger, or if they are consistent with other evidence.[92]

6.10 Our assessment of the theories of harm set out in paragraph 6.2, is organised as follows:

(a) In relation to the supply of digital mainline signalling systems in GB, we consider in turn:

(i) the nature of competition and our approach to the competition assessment; and

(ii) our competition assessment of the effects of the Merger.

---

[89] The approach followed by the CMA in relation to the assessment and weighting of the evidence is consistent with the framework for the CMA's assessment of the evidence set out in the CMA's Merger Assessment Guidelines (CMA129, paragraphs 2.19-2.25). In particular, paragraph 2.23 states: 'The CMA does not normally consider specific pieces of evidence in isolation when considering the question of an SLC, although it is common for the CMA to weight pieces of evidence differently'.
[90] CMA129, paragraph 2.25. See also, Aberdeen Journals v OFT [2003] CAT 11, at paragraph 128 ('there is in our view no rule of law which requires the Director to base his case on consumer surveys and market studies if he considers that his case is sufficiently proved by other evidence' and 'In deciding whether the evidence is sufficient, the Tribunal will pay attention to evidence about the attitudes of consumers or users, or the absence thereof, but that is only one element of the Tribunal's assessment of the evidence as a whole').
[91] CMA129, paragraph 2.29(a).
[92] CMA129, paragraph 2.29(a).

(b) In relation to the supply of CBTC systems in the UK, we consider in turn:

(i) the nature of competition and our approach to the competition assessment; and

(ii) our competition assessment of the effects of the Merger.

(c) We then assess whether efficiencies arising from the Merger are likely to enhance rivalry with the result that the merger does not give rise to an SLC.

7. Digital mainline signalling systems: Nature of competition and approach to competition assessment

7.1 This chapter sets out our assessment of the nature of competition between the Parties and their competitors in the supply of digital mainline signalling systems in GB. In particular, we have set out and considered:

(a) an overview of mainline signalling projects in GB;

(b) what opportunities exist for competition between the Parties and their competitors for future mainline signalling contracts;

(c) the economic framework for assessing competition between the Parties and their rivals;

(d) the parameters of competition for future contracts; and

(e) the approach to the competition assessment.

7.2 This chapter provides important context for our competitive assessment of whether the Merger has resulted, or may be expected to result, in an SLC in the delivery of mainline signalling projects in GB.

Overview of mainline signalling in GB

7.3 Mainline signalling projects are procured by several customers in the UK, including Network Rail, HS1, HS2, Nexus and Translink (see paragraphs 8.40 to 8.43). As explained in the Background section, Translink is the infrastructure manager responsible for railway signalling in Northern Ireland. For the reasons explained in the market definition section, we consider that the Merger is not likely to impact competition for the supply of digital mainline signalling systems in Northern Ireland.

7.4 Railway signalling is a significant market in the UK. The market for signalling systems in GB for mainline railways alone is worth £800–900 million annually.[93]

7.5 Network Rail is the largest procurer of mainline signalling projects in GB and the competition for future Network Rail mainline signalling contracts is the focus of our competition assessment.[94] We explain below in paragraphs 7.108

[93] Office of Rail and Road, 'Signalling market study - Final Report', page 1.
[94] We explain in paragraphs 8.37 to 8.43 why the focus of our investigation is on the opportunities for competition for the supply of mainline signalling projects procured by Network Rail.

and 8.37 why the focus of our investigation was on the supply of digital mainline signalling to Network Rail.

7.6 The Parties are two signalling suppliers that are active and experienced in both conventional and digital signalling systems. There are two types of suppliers involved in the delivery of digital mainline signalling projects (i) original equipment manufacturers (**OEMs**), which own the signalling technology used for a particular project, and (ii) integrators, which can play a variety of roles in relation to integrating that technology into a signalling renewal project. OEMs collaborate in different ways and to different extents with integrators in the delivery of digital mainline signalling projects, for example by forming a joint venture or partnership, or by using integrators as subcontractors to carry out mainline signalling projects. Integrators may also sometimes license relevant signalling technology from OEMs in order to deliver signalling projects themselves (see further explanation in paragraphs 8.219 to 8.222).[95] The Parties have previously bid for digital and conventional mainline signalling projects in GB and have partnered with integrators or subcontracted services to integrators.

7.7 We have assessed whether the Parties and their competitors (ie OEMs and integrators) will compete for the digital projects that will be procured through the TCSF in more detail in Chapter 9. We have also investigated the role of integrators in more depth, including the extent to which they can act as independent competitors in relation to the TCSF and the extent to which they provide complementary services to support the bids of OEMs, in our competitive assessment.

Network Rail's historic approach to procurement

7.8 Since 2004 (ie CP3 onwards), most of Network Rail's signalling projects have been conventional and have been procured through framework agreements. Suppliers are generally only eligible to supply mainline signalling projects to Network Rail if they first win a place on a framework agreement, with the most important being Network Rail's major signalling frameworks.

7.9 Table 1 provides a summary of Network Rail's last three major signalling framework agreements.

[95] FMN, 13 October 2022, Chapter 1, paragraph 15.20.

Table 1: Summary of Network Rail's major mainline signalling frameworks

Framework	*Period*	*Geographic*	*Framework value*	*Signalling system*	*Bidders*	*Winners*
CP5 – Major Signalling Renewals and Enhancements Framework (**MaSREF**)	2014-2019	9 lots	£1.4 billion	Conventional	Atkins Invensys Rail (now owned by Siemens) Signalling Solutions (now owned by Alstom) [✂]	Invensys Rail (now owned by Siemens) Signalling Solutions Limited (now owned by Alstom) Atkins
CP6 – Major Signalling Framework (**CP6**)	2019-2024	5 lots	£1.3 billion	Conventional	Alstom Siemens Hitachi [✂]	Alstom Siemens Hitachi/ Linbrooke
East Coast Development Programme – Train Control Partner (TCP) framework (**ECDP**)	2019 onwards	East Coast Main Line§	£0.9 billion	Digital	Alstom/Jacobs Hitachi/Ove Arup/Amey Atkins/Thales Siemens	Siemens

Source: CMA analysis.
For CP5, Siemens bid as Invensys and won four lots as a primary supplier and three as a secondary; Alstom bid as Signalling Solutions Limited (now wholly owned by Alstom) and won three lots as a primary supplier and five as a secondary supplier; and Atkins was awarded two lots as a primary supplier. The lot value by geographic region is as follows: Lot Value: Scotland £167 million; Central (West) £391 million; Central (East) £150 million; Wales & West £93 million; Great Western (Inner) £56 million; Great Western (Outer) £197 million; Anglia & Kent £147 million; Sussex & Wessex £206 million; and Thameslink £nil.
For CP6, Alstom and Siemens won two lots each (which were also the most valuable lots), while Hitachi in partnership with Linbrooke won the fifth (and least valuable) lot. The lot value by geographic region is as follows: Lot Value: Eastern £542 million; North West & Central £63 million; Scotland £348 million; Southern £312 million; and Wales & Western £nil.
* Carillion was liquidated in 2018 and 2019. See, 'Carillion Group', last accessed on 6 June 2023.
† ORR response to RFI dated 11 May 2023, 'CMA – CP5 MASREF edits'. The major signalling framework was divided in eight geographic lots during CP5 and not all of these suppliers bid for each of them.
‡ Network Rail Internal Document, 'Major Framework GW4 CP6', page 3.
§ Digital signalling will be introduced on the Northern City Line, between Finsbury Park and Moorgate. It will then be rolled out on the southern section of the East Coast Main Line (between London King's Cross and the Stoke Tunnels, near Grantham. See, 'East Coast Digital Programme – Network Rail', last accessed on 6 June 2023.
¶ Office of Rail and Road, 'Signalling market study - Final Report', footnote 61.

7.10 Previously, Network Rail has attempted to encourage competition by capping the number of lots that a supplier can win within a framework to two lots per supplier. Despite these restrictions, Siemens and Alstom have established themselves as the two main suppliers of conventional mainline signalling in GB and have approximately 97% of the conventional installed base.[96] We consider the potential impact of Siemens' and Alstom's strengths in conventional mainline signalling, along with the strengths of integrators with GB experience such as Atkins, on competition for digital mainline signalling systems in our competitive assessment.

7.11 Network Rail has procured four main digital mainline signalling projects to date: (a) the East Coast Mainline; (b) a pilot ETCS Level 2 project on the

[96] Office of Rail and Road, 'Signalling market study - Final Report', page 7.

Cambrian Line in 2006, which was awarded to Hitachi;[97] (c) the installation of ETCS Level 2 technology on the Thameslink line which was awarded to Siemens; and (d) the installation of ETCS Level 2 on Crossrail West, which was awarded to Alstom.[98] We consider these tenders in more detail below in paragraphs 8.153 to 8.194.

7.12 Before considering the details of Network Rail's TCSF tender, the next section provides a short summary of the key findings from the Office of Rail and Road (**ORR**) market study into the supply of rail signalling systems in GB (**ORR market study**).[99]

ORR market study

7.13 ORR is the economic regulator for railway infrastructure in GB and its responsibilities include, among other things, regulation of mainline railway signalling in GB.[100] In November 2020, ORR opened a market study into the supply of rail signalling systems in GB to ensure the signalling supply chain is 'fair and competitive'. The study focused on: (i) the 'supply chain for the delivery of significant 'major' signalling projects'; (ii) the 'strength of competition for tenders and incentives to compete in the market'; (iii) whether there are any 'barriers to innovation, or market entry and the introduction of new technology'; and (iv) 'the ability of the supply chain to build up capacity for the rollout of the digital railway'.[101]

7.14 In November 2021, the final report of the ORR market study found that there were reasonable grounds to suspect that features of the mainline signalling markets in GB prevent, restrict, or distort competition. ORR considered that the statutory test to make a reference to the CMA for an in-depth investigation was met. ORR's findings are summarised below:

(a) **Duopoly in signalling in GB:** There are essentially two main players in the GB market for major signalling projects, namely Siemens and Alstom. In recent years these two companies have accounted for an increasing share of Network Rail's major signalling spend. The combined share of Siemens and Alstom has increased from c. 70% in 1999-2004 to a projected c. 90% in 2019-2024'. The rights to SSI are now owned by

---

[97] Network Rail also designed and commissioned an ETCS National Integration Facility, in order to carry out testing of suppliers' technology and develop operational scenarios without the need for access to the operational railway, reducing project risk and cost.
[98] This was awarded to Alstom.
[99] ORR, ORR Market Study.
[100] ORR's strategy and duties involve regulating the rail industry's health and safety performance, holding Network Rail and other rail infrastructure networks to account and ensuring that the rail industry is competitive and fair. See, 'About ORR | Office of Rail and Road', last accessed on 6 June 2023; and 'Market study into rail signalling systems opened | Office of Rail and Road', last accessed on 6 June 2023.
[101] 'Market study into rail signalling systems opened | Office of Rail and Road', last accessed on 6 June 2023.

Siemens and Alstom (see paragraph 4.7) and 'suppliers' shares of the installed base of interlockings show that no alternatives to SSI have gained significant traction'.

(b) **High entry barriers:** ORR found that 'lack of a sufficiently visible pipeline with committed funding, the use of frameworks with no guaranteed work banks, and any significant increases to the size and scope of frameworks could inhibit potential competitors from entering the market and growing organically'. Competitors to Siemens and Alstom told ORR 'that it is difficult to establish a business case to compete for GB frameworks or develop technology without a long term/certain pipeline of work in which to recoup investment'. ORR also found that '[of] the modest number of renewal projects that have been carried out involving new technologies, a noticeable proportion appear to have encountered at least some interface issues, which, while technically resolvable, usually lead to higher costs'. ORR found that 'while the time and cost involved in developing a product for the GB market is significant, alternative suppliers have told us that they would be willing to develop products for the GB market, as long as there was the chance of recovering investment through future signalling work'.

(c) **Uncompetitive prices:** Based on an analysis of Network Rail's spend on signalling, ORR found that 'average prices were lower when projects were competitively tendered as opposed to directly awarded to framework holders'. In ORR's view, 'healthy pressure to compete on cost, quality and innovation, can make a key contribution towards meeting the value for money challenge'.

(d) **Digitalisation as a way forward to reduce entry barriers**: The Digital Railway (see paragraph 4.12) and the introduction of new signalling technologies, has the 'potential to address some of the barriers' ORR identified but not 'in isolation', with the 'key risk' to the rollout being 'the need for suppliers to develop capability in the GB market'.[102]

7.15 ORR set out several demand-side remedies and recommendations predominantly for Network Rail, with the aim of reducing the barriers to entry and expansion that it had identified in its study. The primary recommendations were for Network Rail to:

[102] ORR, ORR Market Study, Summary, page 10.

(a) take a 'pro-competitive approach to procurement' which would encourage entry, for example by engaging 'with the largest possible pool of suppliers for top tier work';

(b) encourage 'open interfaces', by 'requiring cooperation and compelling suppliers to work with each other';

(c) work to achieve a 'balance between long term competition and reliance on existing technology', for instance, by developing 'proposals to reform its performance monitoring regime of the regions to encourage the cultivation of new suppliers and technologies'; and

(d) make alterations to the funding of mainline signalling projects, to provide 'greater certainty to suppliers' regarding 'future signalling volumes'. In particular, ORR recommended that Network Rail consider implementing a 'minimum value of work for each winning supplier' and 'establish a centralised research and development fund […] from which new entrants and suppliers working on innovative projects may draw'.[103]

7.16 In February 2022, Network Rail responded to the ORR market study by committing to making changes to its procurement processes. These changes are aimed at improving incentives for Network Rail's suppliers by sharing the costs of bidding and technology development and by providing contractors with more certainty over their future workbank.[104]

7.17 ORR reviewed progress against its proposed remedies and published its conclusions on Network Rail's progress in April 2023 (the **Remedies Monitoring Report**).[105] Overall, ORR considered the majority of its recommendations were addressed either to completion or to an extent that there was no need for continued close regulatory oversight.[106] In particular, ORR considered that:

(a) the TCSF addressed 'the underlying issue of an overly narrow supply base by committing to engage a minimum number of suppliers for both conventional and digital signalling renewals'.[107]

---

[103] ORR, ORR Market Study, paragraph 10.66.
[104] 'Network Rail response to the ORR market study into the supply of signalling systems - Letter dated 10 February 2022', last accessed on 6 June 2023.
[105] The Remedies Monitoring Report was published on 21 April 2023. ORR also published an update describing the progress that has been made following the publication of its signalling market study final report in November 2021 on 26 July 2022. ORR, Remedies Monitoring Report, dated 21 April 2023; and ORR, Signalling Market Study July 2022 update, dated 26 July 2022.
[106] ORR considered that close monitoring was still required in relation to (i) education and cultural change; and (ii) performance measurement.
[107] ORR, Remedies Monitoring Report, paragraphs 3.4-3.7.

(b) the TCSF's 'contract project allocation mechanisms' which reduce 'the extent of tendering "from scratch"' and Network Rail's 'contribution to the costs of developing digital signalling products' mitigate ORR's concerns in relation to barriers to entry.[108]

(c) open interfaces were more straightforward in relation to the delivery of digital mainline signalling projects because, based on the TCSF documentation, 'all suppliers have to comply with [ETCS] specifications'.[109] ORR noted that under the TCSF 'suppliers will be contractually obliged to cooperate with other suppliers particularly in regard to technology interfaces'.[110] In addition, the TCSF evaluation criteria 'will reward suppliers showing commitment to, and making proposals for, the strengthening of cooperation in particular around interfacing'.[111]

(d) it would monitor the 'trajectory' of Network Rail's 'unit costs', including 'cost trends', which would become visible after a number of mainline signalling projects have been completed.[112]

Competition for Network Rail's TCSF

7.18 Network Rail is subject to the Utilities Contracts Regulations 2016 (**UCR**), as well as its network licence and the obligations and requirements which result from being a non-departmental public body, including Managing Public Money. Network Rail is regulated on its delivery, financial and competitive behaviour by ORR.[113] The UCR require that (subject to very limited exceptions) Network Rail conducts a formal competitive tender process for the award of contracts.[114]

7.19 Network Rail's TCSF is the major mainline framework agreement through which the Parties and their competitors will be able to compete for major mainline signalling projects in GB, for the period 2024–2033.[115] Framework suppliers will be appointed through a competitive tender process, which was

---

[108] ORR, Remedies Monitoring Report, paragraphs 3.8-3.11.
[109] ORR, Remedies Monitoring Report, paragraphs 3.26-3.27.
[110] ORR, Remedies Monitoring Report, paragraphs 3.28-3.29. The Remedies Monitoring Report also notes the introduction of 'alliance contracting' which encourages suppliers to 'work together by requiring them to participate in an incentivisation regime where suppliers share equal responsibility for the delivery of the project such that, for example, any penalties for under-performance will be borne equally by all parties in the contract'. See, ORR, Remedies Monitoring Report, paragraph 3.30.
[111] ORR, Remedies Monitoring Report, paragraph 3.19.
[112] ORR, Remedies Monitoring Report, paragraph 4.6.
[113] Network Rail questionnaire response, Q 1.
[114] The Utilities Contracts Regulations 2016 (**UCR**).
[115] That is, for the next two control periods: CP7 (2024–2029) and CP8 (2029–2034).

launched on 17 March 2023 and is expected to conclude through an award of contracts in January 2024.[116]

Design and scope of the TCSF

7.20 Network Rail published its pre-qualification (**PQQ**) documentation in March 2023. The main features of the design and scope of the TCSF, as defined in the tender documents published on 17 March 2023, are as follows:[117]

(a) Two separate lots within the TCSF for conventional mainline signalling (**Lot 1**) and digital mainline signalling works (**Lot 2**). Network Rail will appoint 'up to' four suppliers for each lot.

(b) For Lot 2, there will be a guaranteed workbank accounting for 55% of Lot 2's value, split into portions of declining size to be allocated to first, second, third and fourth place, respectively. The percentage of the awarded workbank (ie of the 55%) that each supplier receives will depend on their ranking in the tender: the highest-ranking bidder will receive 39.5%, the second 30%, the third 19.5%, the fourth 11%.

(c) The remaining 45% of the digital mainline projects under the TCSF will be 'awarded through mini-competition'.

(d) Funding towards the product development and adaptation costs of digital mainline signalling technology will be available to the framework suppliers (50% of development costs, up to a total of £4 million per supplier). Financial support is not available for conventional signalling technology.

(e) Network Rail will be subject to a penalty (of up to £5 million per supplier), if it fails to award the proportions committed in the TCSF.

7.21 Network Rail currently expects to contract £3 billion of digital works through the TCSF over the next two control periods. [✂].[118] Network Rail submitted that [✂].[119]

---

[116] The current expected timetable for the TCSF procurement, after the launch of PQQ on 17 March 2023 is the following: (i) notification of the outcome of pre-qualification, 26th June 2023; (ii) invitation to tender (**ITT**) launch event and publication of ITT, 3rd July 2023; (iii) tender response deadline, 22nd September 2023; and (iv) framework award, January 2024. See Network Rail, Instructions to Participants, 17 March 2023, paragraph 5.11.

[117] 'Train Control Systems Framework [Tender Notice] (bidstats.uk)' last accessed on 7 June 2023; and Network Rail, Instructions to Participants, 17 March 2023, page 11.

[118] [✂].

[119] Network Rail questionnaire response, Q 7.

Network Rail's objectives

7.22 From Network Rail's submissions to us, we understand its objectives for the tender process to be three-fold:

(a) Increase capacity. Network Rail told us that 'there is insufficient capacity to deliver future volumes of [digital] activity' in the long run.[120] While Network Rail said that it 'could deliver at CP7 volumes of activity without expanding the supplier base', it would need to start 'investing and developing [suppliers] now' to be able to deliver the volumes of projected work in CP8.[121]

(b) Reduce its reliance on the current two main suppliers. Network Rail submitted that the 'UK signalling supplier market is widely known to be dominated by two main suppliers; one of the objectives of the TCSF is to increase the number of suppliers willing and able to operate within the UK to supply digital signalling'.[122]

(c) Reduce cost of signalling. Network Rail submitted that the 'target rate' it is 'aspiring to achieve' in relation to the delivery of digital mainline signalling projects is £190k per signalling equivalent unit (**SEU**) 'or better'.[123]

7.23 Network Rail has sought to achieve these objectives through the design of the TCSF by:

(a) Increasing the number of framework suppliers to up to four per lot. Network Rail told us, however, that the choice of four framework suppliers for Lot 2 was 'driven by the volume of work' it would have available to 'support' the development of ETCS suppliers during CP7.[124]

(b) Awarding a longer framework agreement (ten years) to support the development of suppliers' products and capabilities and by providing financial support for product development. Suppliers would develop their technology and capabilities during the first few years of CP7 before taking on a higher volume of work in CP8.[125]

(c) Facilitating entry from outside GB. Network Rail submitted that it was seeking to appoint suppliers who have 'relevant experience and capability from both within the UK and outside of the UK'.[126] Relevant UK

---

[120] Network Rail call transcript, 24 January 2023, page 18.
[121] Network Rail call transcript, 24 January 2023, pages 17-18.
[122] Network Rail questionnaire response, Q 13.
[123] Network Rail Internal Document, 'TCSF Supplier Launch Event March - Transcript', page 17.
[124] Network Rail call transcript, 24 January 2023, page 20.
[125] Network Rail call transcript, 24 January 2023, pages 17-19.
[126] Network Rail questionnaire response, Q 13.

experience is neither mandatory nor required to compete for the TCSF (see paragraph 7.84 below).

Uncertainty of future Network Rail demand

Parties' views

7.24 The Parties told us that there was considerable uncertainty surrounding the TCSF and the procurement of digital signalling works by Network Rail and that this 'will impact the entry decision of any possible challenger of the current UK duopoly'.[127] They submitted that, as a result of the uncertainty, industry participants may 'lack confidence' in Network Rail's ability to deliver sufficient digital projects to provide 'enough revenue in the next ten years' (especially early on), which reduces the incentives for the Parties and other new entrants to enter the UK.[128] In particular, the Parties submitted that [✂].[129]

7.25 The Parties identified a number of related concerns, including what they described as the 'very significant risk' that the scope of digital signalling works within the TCSF would be reduced further.[130] The Parties referred to the ORR market study which indicated there has historically been a significant shortfall between Network Rail's signalling forecast volumes and outturn volumes, with around 55% of the planned signalling work not being released to the market between 2006 and 2021.[131] As supporting evidence, the Parties noted that Network Rail has already reduced the value of digital works within the TCSF by around 10%, since Network Rail's July 2022 procurement launch.[132]

7.26 The Parties also submitted that the funding for CP8 was not confirmed and that the large majority of digital signalling projects within the scope of the TCSF would be procured during CP8.[133] The Parties argued that Network Rail was 'severely resource-constrained' and was subject to 'important competing priorities' that would divert resources from the TCSF.[134]

---

[127] Parties, Submission on ETCS ATP wayside resignalling projects, 24 March 2023 (**Submission on ETCS ATP wayside resignalling projects**), paragraph 1.3. The Parties also made the following submissions regarding uncertainty: Parties, Submission on Competitive Conditions; Thales' email to the CMA, dated 23 May 2023; and Hitachi's email to the CMA, dated 24 May 2023.
[128] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.10.
[129] Parties' response to the Annotated Issues Statement (**AIS**) and Working Papers (**WP**) (**Parties' response to the AIS and WP**), 2 May 2023, paragraph 6.13.
[130] Parties' response to the AIS and WP, paragraph 6.13; and Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.9.
[131] ORR, ORR Market Study, paragraph 7.13; and Parties' response to the AIS and WP, paragraphs 6.13(b)-(c).
[132] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.8.2; and Parties' response to the AIS and WP, paragraph 6.9.
[133] Parties' response to the AIS and WP, paragraph 6.13(c).
[134] Parties' response to the AIS and WP, paragraph 6.13(d).

7.27 The Parties submitted that Network Rail's previous attempts to digitalise have failed. In the Parties' view, there was a material risk that Network Rail would 'reduce the workbank of digital projects for the TCSF still further in favour of conventional projects'.[135]

7.28 The Parties submitted that, as set out in the ORR's Remedies Monitoring Report, Network Rail was considering the introduction of a second framework to give suppliers that were not successful in winning a place on the TCSF another opportunity to enter the GB mainline sector. The Parties submitted that, given Network Rail's budget was fixed, the introduction of a second framework would reduce the value of works that would be allocated under the first framework and thereby create further uncertainty.[136]

7.29 Following the publication of Network Rail's strategic business plan for CP7,[137] Thales submitted that [✂].[138] Hitachi submitted that the Network Rail's strategic business plan for CP7 supports statements made in previous submissions from the Parties that a 'significant proportion of the procurement of digital projects will be beyond the timeframe of CP7 and CP8 within the TCSF, and may be more likely in CP9 and CP10 (ie, from 2034 onwards, well beyond any reasonable period of assessment)'.[139]

Our assessment

7.30 As set out in paragraph 7.23, Network Rail's decision to appoint up to four suppliers was taken on the basis of the volume of work that would be available during CP7. Network Rail reiterated this point at the 10 March 2023 TCSF launch event and re-emphasised its commitment to deliver the digital works to the expected timing and volume of the workbank. Network Rail told suppliers that it had the 'strategic funding, stability and directional ability' to deliver the ETCS plan.[140]

7.31 Network Rail told us that the digitalisation of the GB railway was on 'the big picture of priorities for DfT' and was identified explicitly in the Secretary of State's 2022 'Railways high level output specification'.[141] Network Rail's commitment to digital technology was also set out in Network Rail's CP7 business plan, which noted that 'by committing to and supporting a long term

---

[135] Parties' response to the AIS and WP, paragraph 6.13(c); Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.7; and Parties, Submission on Competitive Conditions, paragraph 2.8.
[136] Parties' response to the AIS and WP, paragraph 2.1(c).
[137] Network Rail, England & Wales Strategic Business Plan Control Period 7 (**Network Rail's business plan for CP7**), dated 19 March 2023, page 119.
[138] Thales' email to the CMA, dated 23 May 2023.
[139] Hitachi's email to the CMA, dated 24 May 2023.
[140] Network Rail Internal Document, 'TCSF Supplier Launch Event March – Q&A', page 3.
[141] Network Rail call transcript, 22 March 2023, pages 18-19.

plan to deploy ETCS, we can provide continuity to our supply chain, enabling our suppliers to invest in developing a digital skills pipeline improving capability in the UK workforce'.[142] It also noted that 'replacing conventional signalling with digital signalling, is the most cost-efficient option in CP7 and beyond'.[143]

7.32 Network Rail told us it would receive funding for between £800 million and £1 billion for CP7. While funding could not be confirmed for CP8, Network Rail told us that it could predict asset deterioration reliably and would 'within a relatively tight bandwidth' estimate the expenditure required to maintain the asset condition. Network Rail told us that it was 'confident' that it would receive funding from the government to meet its licence obligations.[144]

7.33 In response to the challenge about previous shortfalls between expectations during procurement and eventual digital signalling spend, Network Rail noted that the lower spend was generally due to changes in prioritisation of projects, not reductions in funding.[145]

7.34 To the concerns on whether digital works would be substituted for conventional signalling, Network Rail told us that, while this was not impossible, it was not 'likely' either, because the TCSF workbank commitments reflect the published level of funding available to Network Rail; and there was an overriding government commitment to digital signalling.[146] Network Rail's business plan for CP7 set out that '[w]ith around a third of the network likely to need some level of intervention in the next 12 years (another half in the ten years after that) the need to migrate to ETCS in CP7 is becoming even more critical'.[147] Based on the business plan, the volume of ETCS projects is expected to double in CP8 as compared to CP7.[148] The business plan also noted that, 'life extensions' for 'aging signalling assets' into CP8 may increase 'the risk to performance and safety […] across the network as a larger proportion of assets reach the end of their design life, as well as create a larger bow wave of signalling renewals in the future'.[149] Given the importance of signalling performance and safety, we consider that it is very unlikely that Network Rail will be able to significantly delay replacing these signalling assets.

---

[142] Network Rail, Network Rail's business plan for CP7, page 11.
[143] Network Rail, Network Rail's business plan for CP7, page 119.
[144] Network Rail call transcript, 22 March 2023, pages 18-19; page 21; and page 22.
[145] Network Rail call transcript, 22 March 2023, page 20.
[146] 'Railways Act 2005 statement: high level output specification 2022 – GOV.UK', last accessed on 6 June 2023, paragraph 34; and Network Rail call transcript, 22 March 2023, pages 18-19.
[147] Network Rail, Network Rail's business plan for CP7, page 119.
[148] Network Rail, Network Rail's business plan for CP7, figure 10.7.
[149] Network Rail, Network Rail's business plan for CP7, page 120.

7.35 We also note that ORR in its Market Study recommended that Network Rail should aim to build confidence by providing suppliers with a guaranteed pipeline of work and to make funding available for R&D.[150] In its Remedies Monitoring Report, ORR stated that while it remained the case that the proportion of the workbank that would be awarded by Network Rail was not contractually guaranteed, it was satisfied that Network Rail's proposed approach was a reasonable response to ORR's recommendation. In this light, ORR closed its monitoring of this recommendation.[151]

7.36 We note that Network Rail has made some changes to the design and scope of the TCSF since its initial presentation in July 2022, partly as a result of feedback from suppliers, and there has been a delay in starting the TCSF procurement.[152] Network Rail has, however, as set out in paragraphs 7.19 to 7.22, has introduced several measures aimed at building confidence and reducing uncertainty, including by introducing a longer ten-year framework agreement and penalties for Network Rail if it fails to meet the committed workbank targets. We consider in the competitive assessment the extent to which any uncertainty may affect suppliers' incentives to bid for the TCSF (see 'Suppliers' incentives').

7.37 Regarding Hitachi's submission that a significant proportion of the procurement of digital projects will be in CP9 and CP10, this may not add significant uncertainty for the TCSF as the ongoing digitalisation of GB signalling was always intended to continue beyond the TCSF.

7.38 In relation to the likelihood and impact of a second framework, as raised by the Parties, remain very unclear at this time. Network Rail submitted that '[h]aving a second framework is always a possibility, but we cannot say now, today, whether that is something we will look to do or not – it is something that is open to us to do in the future if necessary, if and when the circumstances exist to need it'.[153]

7.39 ORR told us that it was not aware of any Network Rail plans to launch a second framework at this stage, and it did not believe there would be an intention to divert work from the existing framework (TCSF) to any second framework. ORR noted that it was unlikely that there would be more signalling projects and that a second framework does remains a possibility, and could

[150] ORR, ORR market study, pages 95-97.
[151] ORR, Remedies Monitoring Report, paragraph 3.47.
[152] ORR, Remedies Monitoring Report, paragraph 2.10.
[153] Network Rail response to RFI dated 19 May 2023.

be triggered by significant changes to, for example, the competitive landscape or funding situation (probably in CP8).[154]

7.40 Evidence from ORR and Network Rail does not suggest that the implementation of any second framework would mean a reduction in the TCSF workbank for digital mainline signalling.

7.41 We currently consider that the possibility that there might be an additional framework would not materially reduce the incentives for suppliers to bid for a place on the TCSF. Should an additional framework be implemented, incumbents in the GB market may be better placed to bid for it and, again, this would make bidding for the TCSF attractive for anyone wishing to enter the GB market.

7.42 Although the immediate context for our investigation is the TCSF, we consider that our analysis of the evidence in Chapter 8 and approach to assessing closeness of competition between the Parties (and other potential suppliers) is relevant and applies in relation to the supply of digital mainline signalling more widely than the competition for the TCSF.[155] We note that the conditions of competition for any future tenders for digital mainline signalling systems may be affected by any incumbency advantages that the suppliers that win a place in the TCSF may develop.

Economic framework for competition assessment

7.43 Network Rail will select its framework suppliers through a formal competitive tender. In this section, we consider the nature of this competitive process and how that impacts on the economic principles underpinning our assessment. Our framework for the assessment considers the evidence in relation to the TCSF in some detail as it is a current and significant tender. For the reasons set out in paragraph 7.42, however, our approach to assessing closeness applies more widely than the competition for the TCSF.

7.44 With this context in mind, we first consider the tender structure and the rules of the bidding process. We then consider the framework by which to assess the closeness of competition in this bidding market taking into account the Parties' submissions.[156]

---

[154] ORR, call note, 2 May 2023.
[155] We note that shares of supply and bidding analysis demonstrate that the conditions of competition in Europe and globally have been fairly consistent between 2012 and 2021, with four main suppliers accounting for the vast majority of digital mainline signalling projects.
[156] The Parties submitted an economic analysis of the competitive effects of the Merger prepared by the Parties' economic advisers. We refer to this analysis as the Parties' submissions. See Parties, Submission on competitive effects of the Merger on the TCSF, 4 April 2023 (**Submission on Competitive Effects**).

Tender structure

7.45 Network Rail submitted that the TCSF procurement process was a single stage sealed bid process.[157] Network Rail confirmed that bidders' identities would not be revealed to other bidders through the procurement process but Network Rail indicated that the identity of suppliers that have passed PQQ informally becomes public knowledge.[158] Network Rail noted that suppliers would not have the opportunity to change their final bids[159] but indicated that there would be rounds of clarification in which questions and answers would be generally shared with all suppliers, which would enable bidders to develop their approaches over a period of time before submitting final bids.[160]

7.46 At the time of this report, the PQQ phase of the procurement has begun but the ITT criteria has not been finalised. The ITT stage is expected to start in July 2023. Based on the draft ITT criteria, Network Rail will evaluate suppliers on their technical and commercial offerings, with a weighting of 70% and 30% respectively for each criterion (see 'Parameters of competition' for more detail).

7.47 As set out in paragraph 7.20, Network Rail will award 55% of the digital mainline projects directly to the four framework suppliers, with higher placed suppliers receiving a greater volume of work. The remaining 45% would be subject to further competition between the framework suppliers, and these competitions would likely take place in the latter part of the framework once new entrants have developed their products and capabilities.[161]

Our assessment

7.48 Predictions about the effect of a merger on suppliers' optimal bidding behaviour differ depending on the structure of the auction. The above evidence indicates other bidders may be able to identify which of their competitors may bid for the ITT stage of the TCSF tender based on their market intelligence. However, the structure of the tender means that they are unlikely to know the nature of competitors' bids and will have to form expectations of how others have bid. Suppliers face the threat of elimination at the PQQ/ITT stage and in competing for different slots. The 'best' (up to four) bids will win and the bidders that win a place in the TCSF must deliver

[157] Network Rail questionnaire response, Q 4.
[158] Network Rail questionnaire response, Q 5(a). ORR submitted after Network Rail provides supplier feedback on PQQ submissions, the outcomes of the PQQ stage tends to informally become public knowledge. See ORR response to RFI dated 23 May 2023. (ORR RFI response dated 23 May 2023).
[159] Network Rail questionnaire response, Q 5(d).
[160] Network Rail call transcript, 24 January 2023, pages 11-12.
[161] Network Rail questionnaire response, Q 3(c).

based on the cost and other terms submitted at ITT. In auctions of this type, all credible competitors may be important in exercising a competitive constraint (and the extent of their importance depends on their relative strength and the number of other strong competitors).

7.49 The Parties make a similar point in their submission that 'in any auction/tender, having more credible bidders would generally equate to more competitive bids (and better outcomes for the auctioneer)'; and 'conversely, having fewer credible bidders would equate to less competitive bids (and worse outcomes)'.[162] However, the Parties contended that it was wrong to focus solely on the number of bidders and instead highlighted the importance of closeness (or lack thereof) between the Parties and the potential for the Merged Entity to compete more strongly with the incumbent suppliers as a result of the Merger.

7.50 For the reasons explained above and in the context of there being only a few players likely to contest the TCSF, we currently consider that the number of credible competitors is likely to influence the degree of competition to some extent. We agree with the Parties that closeness is important in understanding the likely extent of the impact of the Merger on competition for the TCSF and we will conduct our own assessment of closeness between the Parties and other suppliers in the competitive assessment. We evaluate the potential for the Merger to lead to efficiencies in the Chapter 11.

7.51 When discussing how to model the potential for increased rivalry for higher placed slots as a result of the Merger, the Parties made a further submission about the nature of the TCSF and its implications for the relevant economic framework. They submitted that '[m]ost standard economic models assume common knowledge of the economic environment, such as the auction/tender rules and the probability distribution over the capabilities of rival bidders. In such models, bidders are assumed to have correct beliefs on average'. They highlighted some potential differences of the TCSF to this scenario, specifically that 'the TCSF was a new framework for the introduction of new technology' and that there would be 'no prospect of learning from repeated bidding, that could justify use of a framework in which bidders were assumed to know one another's costs and bidding functions'. The Parties submitted that 'in such circumstances, neck-and-neck competition' between suppliers would be a 'realistic possibility' and would drive bids down to 'highly competitive levels'.[163]

---

[162] Parties, Submission on Competitive Effects, paragraph 3.49.
[163] Parties, Submission on Competitive Effects, paragraph 3.57.

7.52 We agree with the Parties that the TCSF has some differences from previous tender processes run by Network Rail and is intended to induce entry by new suppliers. As discussed above, however, we also consider that suppliers are likely to have a common understanding of the relevant tender rules and that they would likely have considerable information about each other's technical capabilities and historic bidding behaviour, including from a small number of digital tenders in GB (see paragraph 8.160) as well as a larger number of digital tenders in Europe. In addition, while they may lack detailed information on other suppliers' costs of supplying the TCSF, the evidence set out in our competitive assessment suggests that suppliers have a good understanding of the investment and homologation costs required to enter the GB market.[164] As such, we currently consider that suppliers will be in a position to form realistic expectations of other suppliers' bids and that this will inform their own bidding strategies. In this regard, in our view the TCSF is unlikely to meet the specific criteria put forward by the Parties for 'neck-and-neck' competition.

Framework for assessing the impact of the Merger on competition for places on the TCSF

7.53 We have also considered whether the fact that there are four places available on the TCSF, of varying size, has an impact on the nature of competition and the framework discussed above.

7.54 In principle, the varying slot size should preserve the incentives of suppliers to compete vigorously, ie bidders would have an incentive to try to win the highest slot possible. We acknowledge, however, that there is likely to be some differentiation between suppliers, and that the constraint that each supplier places on each of the others will likely vary depending on suppliers' respective capabilities and strengths and how other bidders perceive those strengths. In practice, there may be limitations to the size of slot that bidders target, either because:

(a) they form an expectation that they are not sufficiently likely to win a higher slot to make it worthwhile to make a competitive bid for that slot. If they judge their competitors' bids are likely to be significantly stronger than even their most competitive bid, they may be better off making a less competitive (more profitable) bid to target a smaller slot; or

(b) they do not want to win a higher slot because of capacity constraints.

[164] See *Access to technology* section. Suppliers estimated the average cost of homologation was around £14.6 million.

7.55 In this case, given Network Rail's evaluation criteria (as set out in paragraphs 7.82 to 7.95), bidders would likely have to form expectations about other bidders' technical and commercial offerings. As discussed above, suppliers would likely have some (albeit not perfect) information about other bidders' cost and bid functions for the competition for a place on the TCSF. Suppliers could flex their submissions on either the technical or price parameters when bidding depending on the degree of competitive constraint they will (or anticipate they will) face from other bidders. In our competitive assessment, therefore, we seek to analyse the closeness of competition between the Parties and the other suppliers likely to compete for the TCSF based on these parameters (see 'Parameters of competition' for more detail).

7.56 The Parties' submissions on the framework for assessing the effects of the Merger on competition also focused on the closeness of competition between the Parties and other suppliers. However, there are three areas of divergence with our approach.

7.57 First, the Parties focus on the places within the TCSF which suppliers may target and present their views on which suppliers are likely to be strong competitors for which slots. For example, they consider that some suppliers are more likely to target first and second place; and others are likely to target third and fourth place. The Parties submitted that the closeness between the Parties would be determined by the difference in bidder strengths for these competitions.[165] The Parties further submitted that if the CMA's phase 1 approach was correct and that the Parties were likely to target third and fourth place, the potential anti-competitive effect resulting from the Merger would be determined by:[166]

(a) the smaller the difference in bidding strength between the third and fourth placed bidders (ie the closer the competition for third place), the closer competitors the Parties will be for the TCSF;

(b) the larger the difference between the second and third strongest bidders (ie the less likely the third strongest bidder would attempt to target second place), the closer competitors the Parties will be (assuming they are targeting third and fourth places); and

(c) the larger the difference between the fourth strongest bidder and the fifth strongest (ie the first unsuccessful) bidder (ie the lower the competition for

[165] Parties, Submission on Competitive Effects, paragraph 3.32.
[166] Parties, Submission on Competitive Effects, paragraphs 3.30 and 3.32.

fourth place), the closer competitors the Parties will be and the less likely other competitors will pose a constraint on the Parties.[167]

7.58 As noted above, we agree with the Parties that closeness matters for competition in the auction framework described above and that some suppliers may not target first place but may target a lower slot (or slots) based on their perception of their likely prospects of winning, and the likely profitability of winning these different slots. We have taken this into account in our competitive assessment; however, we have assessed closeness in the round based on all the evidence available to us, rather than focusing our assessment on competition for particular slots on the TCSF, which seems to us both difficult to predict and neither necessary nor essential in determining whether the Merger may be expected to result in an SLC.

7.59 Second, while the Parties acknowledge that a supplier's 'bidding strength' in the TCSF will depend on its ability to score well on cost, delivery and technical aspects,[168] the closeness assessment conducted by the Parties focuses mainly on profitability which relates only to the first of these criteria. The Parties submitted that profitability was a function of the supplier's (i) 'need for upfront investment to qualify the ETCS technology'; and (ii) 'the timing and value of projects (ie, revenue generation)'.[169] Based on this profitability metric, the Parties categorised potential suppliers into three groups:

(a) **Group one**: Suppliers with approved conventional and digital products, or suppliers that would, with a relatively small incremental investment, be able to develop ETCS technology qualified for the UK. According to the Parties, Siemens, Alstom, Atkins[170] and Hitachi belonged in this group.

(b) **Group two:** Suppliers with no conventional or digital signalling products approved in the UK. These suppliers were at a 'significant cost disadvantage' compared to the suppliers identified above. Thales and other European OEMs such as CAF, Stadler and Indra belonged to this group.

(c) **Group three:** Integrators (in particular Amey, Linbrooke and VolkerRail) were likely to be in 'an intermediate position between these two groups.'

---

[167] Parties, Submission on Competitive Effects, paragraph 3.32.
[168] Parties, Submission on Competitive Effects, paragraph 3.31.
[169] Parties, Submission on Competitive Effects, paragraph 3.37.
[170] In the Parties' Submission on Competitive Effects, the Parties group Atkins with the other integrators in group three but note that 'Atkins is in a unique position as it has a licence to an UK-approved conventional interlocking that is also compatible with ETCS applications.' Because the Parties consider Atkins' access to technology to be more like that of those in group one than that of the other integrators in group three, we have interpreted the Parties submission as they consider Atkins as being a group one supplier, ie competing for the higher valued slots. See Parties, Submission on Competitive Effects, paragraph 3.42.

Integrators lacked the signalling technology but had 'significant delivery capabilities in certain local areas', 'local capabilities and manpower', and 'familiarity with managing Network Rail's signalling projects and stakeholders'. The Parties argued that integrators 'would be able to procure signalling technology' without any investment in product approval (through licensing or partnership with OEMs) and would therefore be able to 'compete aggressively for the TCSF'.[171]

7.60 The Parties submitted that Hitachi and Thales would be in different groups (one and two respectively) and their closest competitors would be other suppliers in their own group, not each other. [✂].[172]

7.61 Our view is that, while investment costs may play a role in suppliers' determination of the commercial aspects of their bid (in particular, as they are one element in determining the expected returns and therefore the attractiveness of bidding for the project), this is unlikely to be the sole determinant of their positioning on the commercial aspect, which will also be influenced by the extent of the competition they expect to face on this, and other aspects of the tender criteria. We also note that, in the ITT as currently drafted, the commercial aspects of potential suppliers' bids only account for 30% of their final score. We therefore consider that it is important to assess closeness between potential suppliers based on their strengths against the various parameters of competition in the round, as we have done in our competitive assessment.

7.62 Third, the Parties note that that even a small increase in the likelihood of the Merged Entity being able to offer stronger competition to the incumbent suppliers would outweigh any negative effects on competition due to the loss in rivalry between them. They submitted that the structure of the TCSF would enhance this effect since 'the TCSF guarantees more work for higher-placed bidders, so increased rivalry for larger slots is worth more (in terms of its pro-competitive effects) than any hypothesised reduced rivalry for smaller slots'.[173]

7.63 In relation to the Parties' argument that the greater value of the higher slots makes a given increase in rivalry for those slots more valuable than the same decrease in rivalry for a lower slot, we note that this relies on the Merger leading to competition enhancing effects. As set out in Chapter 11, the Parties have not provided evidence of significant competition enhancing effects. Even if it were the case that there was an increase in rivalry for higher slots, there is

[171] Parties, Submission on Competitive Effects, paragraphs 3.38-3.39, and 3.42.
[172] Parties, Submission on Competitive Effects, paragraph 3.43.
[173] Parties, Submission on Competitive Effects, paragraphs 3.56 and 3.63.

no reason to assume this would result in a net benefit for competition; we would need to assess the extent to which the increase in rivalry for higher slots more than outweigh the loss of rivalry for lower slots.

Framework for assessing the impact of the Merger on mini-competitions

7.64 We have also assessed the potential for the Merger to affect competition for the TCSF mini-competitions and consider it could do this in two ways. First, if the Merger results in three rather than four suppliers being appointed to the TCSF, the Merger would reduce the number of potential competitors in subsequent mini-competitions by one.

7.65 Second, even if the Merger results in four suppliers being appointed, as discussed in the competitive assessment, bidders for the TCSF are likely to pose varying constraints on the Parties. While the guaranteed workbank would enable less strong suppliers to build capacity and experience in GB, they could still potentially be at a competitive disadvantage when competing for mini-competitions due to starting from a substantially weaker position than their competitors.

7.66 The Parties submitted that, for an SLC to arise with respect to mini-competitions, the supplier that would replace the weaker Party as a result of Merger would exercise a weaker constraint on competition than the weaker Party in the counterfactual scenario.[174] The Parties also noted that Network Rail's intention was for all qualified suppliers in the TCSF to be 'considered on an equal level in mini-competitions, ie, their initial ranking in the bidding would not matter in the subsequent award of projects via mini-competitions. Consequently, a change to the identity of one supplier should make no difference' as the new fourth supplier would be capable of winning mini-competitions.[175]

7.67 As we set out above, we consider that the Merger may affect mini-competitions if it results in fewer than four suppliers being appointed, or if it results in a less strong supplier being appointed as part of the four designated TCSF suppliers.

7.68 As noted above the competition for the TCSF will determine the competitor set for the mini-competitions and the terms offered for the whole framework. To the extent that the conditions of competition vary for the mini-competitions, we will consider this as part of our competitive assessment.

---

[174] Parties, Submission on Competitive Effects, paragraph 4.4(c).
[175] Parties, Submission on Competitive Effects, paragraph 4.8(b).

Provisional view on the appropriate economic framework

7.69 Network Rail's objectives in expanding the number of suppliers for digital works are threefold: to address the capacity constraints in the market (given the expected digital mainline signalling workload, especially in CP8); to reduce its reliance on Siemens and Alstom; and to reduce the cost of signalling. The transition to digital railways provides that opportunity, as it facilitates entry of suppliers that would previously not have been able to enter GB.

7.70 While there is some uncertainty around precise details of the design and scope of the TCSF (see paragraphs 7.24 to 7.42), there is more clarity on how competition will take place (see paragraphs 7.43 to 7.45. Competition for the supply of mainline signalling projects procured by Network Rail will be manifested directly through the competitive tender for the TCSF. It will not only determine the award of significant volume and value of digital projects through the award of the initial workbank, but it will also determine which suppliers will be able to compete for the remaining (ie those not directly awarded) digital projects that will be procured by Network Rail by mini-competition for ten years from 2024.[176]

7.71 Other bidders may be able to identify which of their competitors may bid for the ITT stage of a tender based on their market intelligence. However, the structure of the tender means that they are unlikely to know nature of competitors' bids and will have to form expectations of how others have bid. Suppliers would also face elimination and the 'best' (up to four) bids will win. This being the case, we believe that all credible competitors (not just the closest competitors) are likely to play a role in adding to the competitive constraint, and hence the more credible competitors there are in the market the stronger competition for the TCSF is likely to be. In the competitive assessment therefore, we will consider evidence on the closeness of competition between the Parties and their competitors currently and in the future.

7.72 Linked directly to the outcomes of competition for the TCSF is the impact of the Merger on the structure of the market for digital signalling projects in the long run. The argument that the Merger will result in a third player with a stronger ability to compete with Siemens and Alstom has to be considered alongside consideration of the potential for the Merger to dampen the Merged

[176] As noted in paragraph 7.28, the Parties have submitted that Network Rail was considering the introduction of a second framework to give suppliers that were not successful in winning a place on the TCSF another opportunity to enter the GB mainline sector. As noted in paragraph 7.37, the details of any such framework are very unclear.

Entity's incentives to compete due to the loss of a close competitive constraint. In the competitive assessment we will therefore make a dynamic assessment of competition that looks at the current and potential strengths and capabilities of the suppliers competing for the TCSF.

Parameters of competition

7.73 This section considers the parameters of competition on which suppliers will compete to supply digital mainline signalling systems to Network Rail. Given the importance of the TCSF for competition in mainline signalling in GB in the coming years, we have focused on the key factors that will determine how the Parties will compete with each other and their competitors for the TCSF tender.

7.74 We have considered the Parties' views on what they consider to be the most relevant capabilities required to compete for digital mainline signalling projects in GB. We have also considered which factors are relevant for Network Rail's assessment of suppliers' strength in the TCSF and sought information from competitors on the relevant parameters of competition in this market.

7.75 As mentioned above in paragraph 3.10, our investigation considers whether the Merger may be expected to result in an SLC in relation to the delivery of digital mainline signalling projects in GB. Our assessment does not aim to assess the strength of each supplier against each of Network Rail's TCSF PQQ and ITT criteria, although we have drawn on what Network Rail has said about the assessment framework for the TCSF to inform our views on the relevant parameters of competition in this market.

Parties' views

7.76 The Parties submitted that new entrants would need to demonstrate:

(a) ETCS capabilities, with solutions deployed in other European countries;

(b) A digital interlocking adapted to UK specification; and

(c) Local resources and capabilities.[177]

7.77 The Parties told us that UK customers would consider suppliers' global references (consistent with the PQQ criteria). In the Parties' view, non-UK

[177] Parties' response to the Issue Letter, 23 November 2022, paragraph 2.9.

digital mainline signalling experience (and implicitly references from global customers) matters.[178]

7.78 The Parties also submitted that the tender process for mainline signalling projects typically includes an assessment of the financial credentials and risk profile of potential bidders.[179]

7.79 The Parties submitted that a supplier's 'bidding strength' was determined by the supplier's ability to score well on Network Rail's criteria, which included commercial ('cost'), delivery (including project behaviour) and technical aspects.[180] As explained above, the Parties' analysis focused primarily on the commercial offerings of suppliers and how those would affect Parties' incentives to bid and the competitiveness of any bids they submit.

Network Rail's views

7.80 We asked Network Rail to identify the factors that it considered were most important when deciding which supplier to appoint onto the TCSF for digital works. Network Rail submitted that it would set out in its PQQ and ITT evaluation criteria the factors that it considers the most important when selecting suppliers.[181] The relevant weighting given to each question indicates the level of importance that Network Rail places on each factor, aligned to the objectives of the TCSF procurement.[182]

7.81 Network Rail noted further that it was not able to comment on any alternative factors outside the questions and evaluation criteria set out for the TCSF.[183] We consider the PQQ and ITT evaluation criteria in more detail below.

PQQ evaluation criteria

7.82 The TCSF tender involves two phases: PQQ and ITT. At the PQQ phase, Network Rail will evaluate bidders' financial standing and other general information on a 'pass/fail' basis, and score suppliers' technical capabilities against a set of weighted criteria.[184] Table 2 below summarises the technical criteria and the corresponding weights that Network Rail attaches to them at PQQ.

---

[178] FMN, 13 October 2023, Section 17, paragraph 21.4.1.
[179] FMN, 13 October 2022, Chapter 1, paragraph 15.33.2.
[180] Parties, Submission on Competitive Effects, paragraph 3.31.
[181] Network Rail questionnaire response, Q 10.
[182] Network Rail questionnaire response, Q 10.
[183] Network Rail questionnaire response, Q 10.
[184] At PQQ stage, Network Rail required bidders to provide financial information on various financial ratios, including measures of liquidity, solvency, and balance sheet resilience. See Network Rail response to RFI dated 23 March 2023, 'TCSF29248 – Criteria & Scoring Lot 2', page 5.

Table 2: TCSF tender criteria, PQQ technical envelope

Criterion	*Description*	*Weight (%)*
Project delivery	Delivery into Operation on a Live Railway Environment. Bidders need to describe their ability to have delivered mainline signalling projects similar to those anticipated to be delivered under the TCSF, providing detail on (i) responsibility for design, build and maintenance and organisational structure, (ii) measures taken to mitigate safety, performance and integration risks, and (iii) how interfaces were managed across different parties (20%).	38
	Design Management. With reference to previous clients' business requirements (eg capacity and headway), bidders need to describe the methodology they applied to develop a detailed design for mainline signalling projects (10%)	
	Successful integration. Bidders need to showcase their ability to integrate with existing legacy systems as well as integrating both the trackside and trainborne elements of ETCS (10%), referring to mainline signalling projects they previously delivered similar to those anticipated to be delivered under the TCSF.	
Product development	Bidders need to provide up to three examples of developing signal control products (incl. interlockings) to meet national requirements. The examples must include the development methodology applied.	14.25
Collaboration	Bidders need to submit at least 3 examples of collaborative culture, describing the key lessons they learnt in relation to eg risk mitigation.	14.25
Capability development	Bidders need to comment on their supply chain management and ability to allocate resources, demonstrating for example how in each case they successfully maintained their ability to meet the requirements throughout the project.	9.5
Maintainability and obsolescence	Bidders need to explain their capability, experience, understanding of issues and systems to support equipment post commissioning.	9.5
Health & Safety	Health Safety and Familiarisation. Bidders need to set out their training and risk management planning (5%).	9.5
	Health Safety and Continuous Improvement. Bidders need to identify the top three re-occurring Health & Safety risks they identified in the framework of previous projects of a similar nature and scale to those anticipated to be delivered under the TCSF (5%).	
Sustainability	Bidders must confirm they have a valid, certified ISO 14001 environment management system that covers the range of services required by the contract. If not, they must demonstrate that the organisation is aligned to the principles of ISO 14001. Bidders must also provide copies of their current social value strategy and any relevant associated policies.	5
Total		**100**

Source: Network Rail response to RFI dated 23 March 2023, 'TCSF29248 - Criteria & Scoring Lot 2', page 5

7.83 In addition, there are some pass/fail criteria at the PQQ stage, for example, suppliers that do not meet Network Rail's financial stress tests will not pass the PQQ stage.[185]

7.84 Network Rail told us that at the PQQ stage it assessed suppliers' experience in delivering similar scale activity and whether they have the technological capability and maturity to deliver digital mainline signalling projects.[186] Network Rail told us that 'if a supplier has been able to demonstrate they […] can successfully […] deliver in, say, Holland or France or Germany, that is a good indicator that they will be able to do the same in the UK'.[187] Network Rail

[185] Network Rail response to RFI dated 23 March 2023, 'TCSF29248 – Criteria & Scoring Lot 2', page 5.
[186] Network Rail call transcript, 6 February 2023, page 25.
[187] Network Rail call transcript, 6 February 2023, page 22.

clarified that the process to carry out the national adaptations for digital mainline signalling was fundamentally the same as in other nations[188] because the mainline signalling product has to meet: (i) a common core of standard specifications; and (ii) national specific requirements which are similar in each country.[189]

7.85 The PQQ instructions state that respondents must provide at least one case study of a previous project they have successfully delivered (the example does not need to be in GB). Some of the PQQ questions requested up to three case studies, which would allow respondents to provide the requested information across multiple case studies. Respondents would not score more points for providing three different case studies.[190]

7.86 Based on the above evidence on the PQQ criteria, a supplier's management and delivery experience, financial credentials and technological capabilities are important factors influencing how Network Rail will assess and ultimately appoint framework suppliers.

ITT evaluation criteria

7.87 At the ITT stage, Network Rail will evaluate bidders on their commercial and technical capabilities, attaching weights of 30% and 70% respectively. As described later in paragraph 7.94. Network Rail also includes a commercial element in its technical envelope which relates to Network Rail's T190 target, although this focuses on methodologies to reduce costs in the long run and can be seen as an indirect pricing criterion.

7.88 For the commercial component, bidders will be required to submit pricing information on: (i) overheads and profits (as a percentage) for varying types of works and categories of costs; (ii) rates for staff, labour and various plant item costs; and (iii) composite rates for varying common work activities.[191] Network Rail collects a range of price and cost information, and awards an aggregated score out of 30 for each supplier. At a high-level, suppliers that submit the lowest price/cost bids will receive the highest score for the commercial envelope.[192]

---

[188] Network Rail call transcript, 22 March 2023, page 11.
[189] Network Rail call transcript, 22 March 2023, page 11.
[190] Network Rail response to RFI dated 23 March 2023, TCSF PQQ (Lot 2) Questions 6.3.1 Delivery into Operation on a Live Railway Environment; see 'notes to the candidates' at the top of each PQQ question.
[191] Network Rail questionnaire response, Q 5(c).
[192] For each component of the submitted price information, which may include several hundred components, suppliers would be scored relative to the lowest submitted price/cost. For example, the price information that respondents to ITT will submit will include the rate for the project manager work: if supplier A bids £10/hour and supplier B bids £15/hour, Network Rail would use the lowest bid (in this case, supplier A) as the base to score the

7.89 For the technical component, Network Rail will assess suppliers against six categories, which require the suppliers to set out their plans and capabilities to deliver digital mainline signalling projects in the future.[193] Table 3 below summarises the technical criteria and the corresponding weight Network Rail will attach to each criterion.[194]

Table 3: Provisional TCSF tender criteria, technical envelope (ITT phase)

Criterion	*Description*	*Weight (%)*
Approach to Phase 2 delivery	Bidders need to show (i) how they expect to achieve open interfaces (7.5%), (ii) their plan for workforce deployment (5%), (iii) their cyber security processes (2.5%), and (iv) their management of Reliability, Availability, Maintainability and Safety (2.5%).	17.5
Behavioural	Contains three equally scored elements of (i) bidders' approach to collaboration within the framework, (ii) interviews with project teams, and (iii) interviews with corporate teams.	15
Commercial	Bidders need to set out how they intend innovate to achieve the £190k per ETCS SEU requirement, namely the T190 target.	10
Health and safety	Bidders need to set out their approach to ensure physical safety (5%) and wellbeing of their staff (5%).	10
Social value	Bidders need to explain their approach to address (i) inequalities and rail risks (unauthorised access, noise, and air pollution) (5%), and (ii) environmental sustainability (5%).	10
Product development	Bidders need to show how they will secure approval for their ETCS products on the GB rail network (including current status and expected timeline).	7.5
Total		**70***

Source: Network Rail response to RFI dated 13 January 2023, 'TCSF 29248 - ITT Technical Questions Lot 2'.
* The remaining 30% of the ITT evaluation criteria is attributed to the commercial envelope as discussed in paragraph 7.87.

7.90 The 'product development' criterion will assess suppliers' ability to show how they will secure approval for their ETCS products on the GB rail network. Network Rail told us '[w]here a supplier has a product for a country where the signalling principles and project delivery methodology/processes are similar to the UK, then generally that supplier will find it easier to adapt to the UK market'.[195]

7.91 For the 'Approach to phase 2 delivery' and 'Behavioural' criteria, Network Rail will evaluate, among other things, suppliers' approach to collaboration (with Network Rail and other suppliers) and their ability to provide open interfacing. Suppliers' bids in relation to these criteria may be aided by previous experiences, either with Network Rail or other infrastructure managers that had similar requirements.

---

other bidders (score for the other supplier = variance/base). In this example, supplier A would receive 100 marks; and supplier B would receive 50 marks (Δ £5/£10 x 100). See Network Rail call transcript, 24 January 2023, pages 2-14.
[193] Network Rail call transcript, 6 February 2023, page 25.
[194] Network Rail response to RFI dated 23 March 2023, 'TCSF 29248 – ITT Technical Questions Lot 2'.
[195] Network Rail questionnaire response, Q 14.

7.92 Network Rail will evaluate suppliers' abilities to establish a local workforce as a sub-criterion within the 'Approach to phase 2 delivery' criterion. This sub-criterion is weighted at 5% of the total ITT evaluation score.[196] Network Rail expects bidders to explain how they aim to identify the resource requirements for the TCSF work and how they intend to build, deploy, and maintain these resources throughout the duration of the framework. Network Rail submitted that it was not expecting all bidders for the TCSF to have UK experience without partnering with other suppliers, and therefore partnerships/consortia would be welcomed by Network Rail.[197]

7.93 Suppliers will be assessed against their approach to relevant health and safety legislation and social values required to deliver mainline signalling projects in GB.

7.94 Under the LTDP, Network Rail was set a target to reduce the price per SEU from £415k to £190k by 2029 (the 'T190 target'). Network Rail has assigned 10% of the total technical score on a supplier's ability to deliver this target. Network Rail expects bidders to submit action plans setting out innovations and efficiencies they intend to introduce to meet this target.[198]

7.95 Based on the above evidence, important factors to be assessed by Network Rail at the ITT stage in the appointment of framework suppliers are: experience in delivering digital mainline projects; experience in adapting technologies to Network Rail's requirements; ability to access a local workforce; and ability to innovate and drive cost efficiencies.

Competitor views

7.96 We asked integrators and OEMs to outline the most important competitive factors in the bidding process for Network Rail's TCSF.

7.97 All five integrators that responded in full to our questionnaire identified access to technology (either having an approved product in the UK or having the ability to develop and obtain an approved product in the UK) as a key competitive factor.[199] OEM respondents also indicated the importance of technology as a parameter of competition.[200] Suppliers have submitted that

---

[196] Network Rail response to RFI dated 4 January 2023, 'TCSF PQQ & ITT Questions & weighting – Digital Lot.pdf,' pages 1 and 12.
[197] Network Rail call transcript, 6 February 2023, page 22.
[198] 'Digital Railway Long-Term Deployment Plan Technical Report Executive Summary', page 4, last accessed on 7 June 2023.
[199] Amey questionnaire response, Q7; Colas Rail questionnaire response, Q7; Linbrooke questionnaire response, Q7; VolkerRail questionnaire response, Q7; and Atkins questionnaire response, Q 7.
[200] Siemens questionnaire response, Q10; Stadler questionnaire response, Q10; and Resonate questionnaire response, Q10.

interlockings and ETCS ATP wayside technologies are the most important components of the signalling systems and that, given the standardisation of ETCS wayside, the degree of differentiation is likely to be most significant between suppliers' interlockings.[201]

7.98 OEMs identified a number of factors that relate to the suppliers' experience in undertaking mainline signalling projects, which we have categorised together as 'management experience'. These factors' cover a broad range of a supplier's offering, including but not limited to the ability to:[202]

(a) Demonstrate a good safety record.[203]

(b) Cooperate with Network Rail's project team or with other suppliers during project execution.[204,205]

(c) Homologate products and demonstrate success in the company's technology.[206]

7.99 Both OEMs and integrators submitted that the bidders' capacity and UK presence were important and highlighted that the suppliers' need to have manpower, scale economies and logistic facilities to be able to deliver the equipment.[207] Integrators specified that, as far as capacity is concerned, having a workforce with experience of working in the UK is likely to matter in the TCSF tender. For example:

(a) Atkins told us that suppliers without a UK presence were likely to face difficulties in delivering the mainline signalling work because they would lack familiarity with Network Rail's processes and requirements. Atkins told us that it was 'point of contact for the Network Rail team' when it had partnered with OEMs that had little experience working in the UK;[208]

(b) Another integrator, Linbrooke, told us it was planning to use its UK presence in its bidding strategy to differentiate itself from suppliers without UK presence.[209]

---

[201] We will set out the evidence in more detail in the competition assessment.
[202] Siemens questionnaire response, Q 12; Stadler questionnaire response, Q 12; and Indra questionnaire response, Q 12.
[203] Siemens questionnaire response, Q 8.
[204] Siemens questionnaire response, Q 8.
[205] Indra call transcript, 27 January 2023, page 27.
[206] Stadler questionnaire response, Q 8.
[207] Siemens questionnaire response, Q 12; CAF questionnaire response, Q 12; Indra questionnaire response, Q 12; Stadler questionnaire response, Q 12; Resonate questionnaire response, Q 12; Atkins questionnaire response, Q 12; and Linbrooke questionnaire response, Q 12.
[208] Atkins call transcript, 2 February 2023, page 15.
[209] Linbrooke questionnaire response, Q 7.

7.100 Five suppliers identified either price or the ability to drive cost efficiencies (or both) as competitive factors for the TCSF.[210] CAF submitted that delivering the T190 target will be a 'differentiating factor between suppliers'.[211] Amey, an integrator, indicated that one of the key competitive factors in the TCSF tender will be 'bringing the price point down to £190k / SEU.[212]

7.101 Three OEMs submitted that a supplier with financial standing and scale would have an advantage.[213] In particular, Siemens submitted that, for larger projects, a supplier with financial standing and scale may be better able to assume the high levels of project risk within NR's standard suite of contracts. Linked to financial strengths, one OEM submitted that a supplier that could demonstrate a significant and continued interest in the UK through its investment in technology, processes, digitalisation, training, and upskilling of UK staff to meet the future digital signalling requirements and objectives would have a competitive advantage.[214]

7.102 Another OEM referred to Network Rail's ITT criteria in the TCSF as the relevant competitive factors. This OEM submitted that differentiation will result from a bidder's ability to address Network Rail's needs in each area of evaluation: [✂].[215]

7.103 Based on the above evidence, competitors considered that the following factors are the most important when bidding for the TCSF: (i) access to and/or development of digital mainline signalling technology; (ii) management experience and expertise; (iii) experience in GB mainline signalling; (iv) financial standing and scale; (v) price; and (vi) innovation to meet to the T190 target.

Our assessment

7.104 There is a considerable degree of alignment across the industry – the Parties, Network Rail and competitors – regarding the factors that will determine the outcome of the TCSF process, and so the wider competitive conditions. This is in part due to Network Rail setting out clear decision-making criteria in the lead up to the TCSF. The evidence at this stage indicated that competition for the supply of digital mainline signalling systems in GB, including the

---

[210] Amey questionnaire response, Q7; Linbrooke questionnaire response, Q7; Alstom questionnaire response, Q7; Siemens questionnaire response, Q7; and CAF questionnaire response, Q7.
[211] CAF questionnaire response, Q7.
[212] Amey questionnaire response, Q7.
[213] Siemens questionnaire response, Q15; Indra questionnaire response, Q15; Stadler questionnaire response, Q15.
[214] Siemens questionnaire response, Q8.
[215] [✂].

7.105 competition for Lot 2 of the TCSF, will likely take place across several aspects of suppliers' offerings:

(a) **Access to technology:** suppliers will compete based on their technological capabilities and the ease with which they can homologate to GB standards. Suppliers that demonstrate their plans to achieve open interfaces will receive higher scores in the TCSF evaluation.

(b) **Management experience and expertise:** suppliers will compete on the basis of their experience and expertise in undertaking digital signalling projects, either in GB or in Europe. This parameter is likely to cover several dimensions including but not limited to experience in homologation of digital technology and successfully delivering digital mainline projects to the required standard and needs of the customer.

(c) **Experience in GB mainline signalling:** suppliers will compete on their ability to deliver the digital mainline signalling workload specified in the TCSF, which requires both workforce available to work on digital mainline signalling projects in GB and production capabilities to deliver the volume of signalling infrastructure under the TCSF. Experience of working with and understanding the processes of Network Rail is likely to confer some competitive advantage.

(d) **Innovation:** Network Rail's T190 target will require significant savings in costs from the current level of expenditure. Suppliers will compete on their ability to drive down costs and introduce innovations and efficiencies over time to meet Network Rail's cost target.

(e) **Financial standing and size:** Network Rail has in place minimum financial standing requirements for participation in the TCSF to ensure that prospective suppliers can perform the contract and handle the associated commercial and financial risks.

(f) **Price:** suppliers will compete on price during the competition for the TCSF, as it comprises 30% of the overall ITT score.

7.106 In our competition assessment, we considered how closely the Parties compete with each other and their competitors against these parameters.

Approach to the competition assessment

Approach to evidence and the focus of our assessment

7.107 As explained in the market definition section below, we are considering the effects of the Merger on the supply of digital mainline signalling systems in GB.

7.108 We are taking particular account of Network Rail's ongoing tender for the TCSF.[216] This tender is very significant for competition in mainline signalling in GB because it will both determine which suppliers are eligible to deliver the major digital mainline projects for around ten years in GB and potentially give suppliers for the TCSF an incumbency advantage when bidding for digital mainline tenders after CP7 and CP8.

7.109 In relation to our approach to the assessment of the evidence, we note the following:

(a) **Tender and share of supply analysis**. Since the previous tenders for mainline signalling systems have been for conventional signalling systems, there have been a limited number of tenders for digital mainline signalling systems in GB to date.[217] As such we have analysed the evidence from past competitive interactions for digital mainline signalling systems in Europe where deployment of digital signalling systems is more extensive, such as bidding data, shares, and references. We consider that this evidence provides insight into suppliers' technical experience and expertise in digital mainline signalling and in homologating to different national standards and would likely provide more insight with respect to current and future competitive conditions than relying solely on GB evidence. We have also assessed the participation of the Parties and their competitors in past digital mainline signalling tenders as a factor in our analysis of the Parties' and other suppliers' experience in the supply of digital mainline signalling in GB.

(b) **Parties' submissions, third-party evidence and internal documents**. We have taken this evidence into account both in our assessment of the incentives of the Parties to bid for digital mainline signalling projects in CP7 and CP8 and in our assessment of the closeness of competition between the Parties and the competitive constraints from other suppliers

---

[216] We did not focus our assessment on the effects of the Merger in Northern Ireland, for the reasons explained in the geographic market definition section. See paragraphs 8.40 to 8.43 in relation to our assessment of the effects of the Merger in the supply of digital mainline signalling systems to other customers in GB (Nexus and HS2).
[217] See paragraph 8.27 and 8.31 about the differences in operational and technical requirements for mainline signalling systems between GB and Northern Ireland.

against the relevant parameters of competition. In assessing this evidence, we note that the TCSF tender is ongoing at the time of our investigation of the Merger. We have taken into account how that may have influenced the evidence we received from the Parties and third parties, in terms of incentives to provide evidence, given their potential concerns about whether the views expressed and information provided in our investigation might impact the ongoing tender. We have also taken into account, in the case of the Parties, whether internal documents contemporaneous with the Merger were affected by the contemplation of the Merger.[218]

7.110 In our assessment of the evidence, we have taken into account Network Rail's stated desire to develop a wider range of credible suppliers for digital mainline signalling projects in GB and the opportunity provided by the TCSF to achieve this.

7.111 We have assessed whether the Merger may be expected to result in an SLC in relation to the supply of digital mainline signalling systems in GB by assessing the closeness of competition between the Parties and whether sufficient effective alternatives will remain after the Merger. We note that our Merger assessment is independent of Network Rail's tender evaluation process and is in no way determinative of the outcome of that process. We have not sought to reproduce or anticipate Network Rail's assessment in our Merger assessment.

7.112 Our views in relation to the impact of the Merger on the supply of digital mainline signalling systems in GB are not intended to influence the outcome of the ongoing TCSF tender. Network Rail will conduct its own independent assessment of the bidders to the TCSF based on their tender responses in accordance with the applicable regulations.

7.113 We also note that we are limited in what we can disclose publicly in this report, given the confidential nature of the TCSF tender.

Timeframe of our assessment

7.114 The time period over which the CMA considers a merger depends on the specific facts and circumstances of each case. The CMA's guidance does not set out a specific period for the assessment, although it does confirm that a

[218] CMA129, paragraph 2.29.

merger assessment involves the CMA assessing the likely development of the markets several years into the future.[219]

7.115 The time period we have adopted for the assessment of the Merger aligns closely with Network Rail's TCSF procurement (ten years). The effects of any loss of competition are not limited to competition for the TCSF tender but would likely impact competition for the digital projects that will be procured through the TCSF.

7.116 In our view, a timeframe that covers the duration of CP7 and CP8 represents a reasonable time horizon over which to assess the effects of the loss of rivalry. In addition to the current competition for the TCSF, given the expected timetable for CP7 and CP8 digital mainline signalling projects, a number of mini-competitions for digital mainline signalling projects in this framework are expected occur within ten years (see paragraphs 7.20 and 7.21 about the design of the TCSF and mini-competitions).[220]

7.117 As the TCSF tender process is ongoing, our assessment is subject to a degree of uncertainty, for example, around the timing, implementation, and value of the digital lot of TCSF, which may affect suppliers' incentives to bid (see paragraphs 7.24 to 7.42).

7.118 Uncertainty does not, by itself, reduce the likelihood that a merger could give rise to competition concerns, and the presence of some uncertainty therefore does not in itself preclude the CMA from finding competition concerns on the basis of all the available evidence where the CMA is satisfied that the relevant standard of proof is met.[221] As mentioned in the Counterfactual chapter, we have not sought to predict the precise details or circumstances that would have arisen absent the Merger.[222] Based on the evidence in the round, we assessed whether the Parties would likely have bid for Lot 2 of the TCSF. We also looked at the evidence available to us to inform our assessment of the likely design and TCSF implementation period and of the likely conditions of competition.

7.119 As mentioned above in paragraphs 7.110 to 7.112, the TCSF tender is ongoing during our investigation (see the dates of the main milestones in the TCSF procurement process in paragraph 7.19). This has been taken into account both with respect to the type of evidence we have collected and the manner in which we have assessed it (see paragraph 7.109(b)7.109(b)).

---

[219] CMA129, paragraph 2.27.
[220] Network Rail, TCSF 29248 – Instructions to Participants, page 14.
[221] CMA129, paragraph 2.10.
[222] CMA129, paragraph 3.11.

8. Supply of digital mainline signalling systems

8.1 The Parties have both competed in the past for the provision of digital mainline signalling systems in GB (see Table 8).

8.2 Translink, the Northern Ireland infrastructure manager, has not yet introduced digital mainline signalling to Northern Ireland and has currently no plans to issue future tenders for digital mainline signalling.[223] Hitachi is not active in Northern Ireland [✂].[224] Thales has limited activities in Northern Ireland and supplies primarily conventional mainline products.[225] As explained in paragraphs 8.31 and 8.36 below, Northern Ireland and GB are separate geographic markets.

8.3 We have assessed how closely the Parties compete with each other and whether the removal of the constraint that they would have placed on each other, absent the Merger, would lead to an SLC in the supply of digital mainline signalling systems in the GB market. We have also assessed the competitive constraints likely to be placed on the Parties by other suppliers that may bid for digital mainline signalling projects. We have taken into account the evidence on the Parties' plans, and the plans of other suppliers, to bid for Network Rail's TCSF.

8.4 The remainder of this chapter is structured as follows:

(a) Market definition;

(b) Competition assessment;

(c) Our provisional assessment;

(d) Entry and expansion; and

(e) Provisional conclusion.

Market definition

8.5 Market definition provides a framework for assessing the competitive effects of a merger.[226] Within that context, the assessment of the relevant market(s)

[223] Translink response to RFI dated 28 March 2023.
[224] FMN, 13 October 2022, Chapter 1, paragraph 15.2.
[225] FMN, 13 October 2022, Chapter 1, paragraph 15.2.
[226] CMA129, Chapter 9.

is an analytical tool that forms part of the analysis of the competitive effects of a merger and should not be viewed as a separate exercise.[227]

8.6 The boundaries of a market do not determine the outcome of the analysis of the competitive effects of a merger, as the CMA may take into account constraints outside the relevant market, segmentation within the relevant market, or other ways in which some constraints are more important than others. We have taken these factors into account in our competitive assessment.[228]

Product market

8.7 The Parties have both competed in the past for the provision of digital mainline signalling systems, which we take as our starting point for determining the relevant product market.

8.8 The boundaries of the relevant product market are generally determined by reference to demand-side substitution. However, the CMA may widen the scope of the market where there is evidence that firms routinely use their production assets to supply a range of products and where the conditions of competition for those products are similar.[229]

Parties' views

8.9 The Parties submitted that mainline and urban signalling projects are distinct, since the projects were used by different customers that have different requirements and the projects use different technologies and apply different standards.[230] The Parties also considered the distinction made in previous cases reviewed by the European Commission[231] between mainline signalling and urban rail signalling to be relevant to their activities.[232]

8.10 Within mainline signalling, the Parties noted that, in its previous decisions,[233] the European Commission has identified the following subsystems within the mainline signalling projects sector: (i) ATP; (ii) interlockings; and (iii) OCS.[234]

---

[227] CMA129, paragraph 9.1.
[228] CMA129, paragraph 9.4.
[229] CMA129, paragraph 9.8.
[230] FMN, 13 October 2022, Chapter 1, paragraphs 13.4-13.5.
[231] The Parties cited Case COMP/M.8677 – Siemens/Alstom, 2 August 2019 (*Siemens/Alstom*), paragraph 620 (*Siemens/Alstom*) and COMP/M.9779 – Alstom/Bombardier (*Alstom/Bombardier*), 22 February 2021, paragraph 755. FMN, 13 October 2022, Chapter 1, paragraphs 13.7 and 20.59.
[232] FMN, 13 October 2022, Chapter 1, paragraph 13.5.
[233] The Parties cited *Siemens/Alstom* paragraph 647 and *Alstom/Bombardier*, paragraph 760. FMN, 13 October 2022, Sections 1-10, paragraph 13.10.
[234] FMN, 13 October 2022, Chapter 1, paragraph 13.10.

The Parties also distinguished between conventional and digital mainline signalling projects as two separate markets.[235]

8.11 In the context of the competition for the TCSF, the Parties submitted that, if suppliers cannot single-handedly supply all elements required in digital mainline signalling projects, suppliers can form consortia or use sub-contracting arrangements to deliver a complete digital mainline signalling system.[236]

8.12 The Parties submitted that OCS (one of the subsystems in mainline signalling systems) comprises two components: (i) signalling control systems (**SCS**), which are deployed on top of interlockings (and referred to as 'local control'); and (ii) traffic management systems (**TMS**), a system architecture that integrates several local signalling control components and presents the route to the signalling operator through a single interface (referred to as 'central control').[237]

8.13 We assess below whether it is appropriate to distinguish as separate product markets between (i) digital and conventional mainline signalling systems; (ii) the subsystems of mainline signalling systems (eg interlockings, ATP, OCS) and (iii) mainline signalling systems and TMS.

Third-party views

8.14 Network Rail submitted that it typically purchases signalling subsystems (see 'Industry Background' for more detail about signalling subsystems) as a bundle, as it is the 'most effective and efficient way of delivering projects that contain these multiple elements: it provides clarity and makes the management of interfaces between the varying system elements easier, which can otherwise be challenging'.[238] Lot 2 of the TCSF relates to the delivery of bundled digital mainline signalling projects.[239]

---

[235] Parties' response to the AIS and WP, paragraph 4.20.
[236] The Parties submitted that cooperation between industry participants was a common and viable option under any future framework tenders. See Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 6.4.
[237] Parties' response to Issues Letter, 23 November 2022, paragraph 8.2.
[238] Network Rail questionnaire response, Q 9.
[239] 'Train Control Systems Framework [Tender Notice]', last accessed on 6 June 2023. This source notes that, 'Lot 2: TCS Framework - Digital: Digital signalling (either ETCS or related technologies). Framework Suppliers will be required to provide a range of works and/or services covering design, build and ETCS maintenance support.' The tender document setting out the scope of Lot 2 of TCSF states: 'Phase 2 involves Suppliers delivering projects allocated to them and covering signalling renewals and/or enhancements on the live GB rail network, including ETCS resignalling and associated interlocking renewals and recontrol'.

8.15 Third-party evidence also indicates that the competitor set for TMS is broader than for signalling projects.[240]

Our assessment

8.16 Network Rail, the largest procurer of mainline signalling systems in GB, has historically procured conventional mainline signalling but is moving towards digitalisation of its signalling infrastructure, as reflected in the design and scope of the TCSF (see *Nature of competition* section). The most likely substitute to digital mainline signalling that infrastructure managers could use is conventional mainline signalling. We consider that the trend towards digital mainline signalling combined with government commitment to digitalising GB mainline signalling[241] means that substitution of conventional for digital mainline signalling is likely to be limited. We also note that conventional and digital signalling systems use different technologies, are subject to different standards and have different functionalities (see paragraphs 4.11 and 4.12).

8.17 We do not consider that switching to CBTC signalling is a potential alternative given the differences in how each of these signalling systems operates and the operating standards they are designed to meet (see paragraphs 4.11 to 4.16).

8.18 On this basis, we consider that there are limited demand-side factors to consider, as infrastructure managers are unlikely to switch away from their demand for digital mainline signalling to other forms of signalling systems.

8.19 We have also considered whether there should be further segmentation of digital mainline signalling systems into the respective subsystems.

8.20 The evidence indicates that Network Rail will procure digital mainline signalling systems rather than individual subsystems from different suppliers. TCSF suppliers for Lot 2 will be required to provide a bundled mainline signalling offer (including all the signalling subsystems and a range of works and/or services covering design, build and ETCS maintenance support). On this basis, we consider that it is not appropriate to segment by subsystem, ie to have separate product markets for each subsystem. We have, however, taken into account any differences in the supply of the different signalling subsystems in the competition assessment below.

---

[240] Network Rail submitted that the market for TMS services is more diverse and with a greater range of suppliers than the market for signalling works. While many signalling works suppliers also have TMS systems, there are additional suppliers who either supply or are prepared to develop and supply TMS systems. Network Rail questionnaire response, Q 32.
[241] 'Digital Railway Strategy - Network Rail', last accessed 11 May 2023; and 'Digital Railway long-term deployment plan – Network Rail', last accessed 11 May 2023.

8.21 The supply of TMS is not within the scope of the TCSF.[242] Based on the third-party evidence set out in paragraph 8.15, we currently consider that it is not appropriate to include TMS as part of the market for the delivery of digital mainline signalling projects.[243]

Provisional conclusion on product market

8.22 Based on the above evidence, we have provisionally concluded that the relevant product market is the supply of digital mainline signalling systems.

Geographic market

8.23 Similar to product market definition, in general the boundaries of geographic market definition are determined primarily by reference to demand-side substitution.[244] In certain circumstances, we may aggregate markets based on considerations about the response of suppliers to changes in price. For this, we would require evidence that (i) firms routinely use their existing production assets to supply products between different geographic markets and that firms shift their existing capacity between these geographic markets depending on demand for each; and (ii) the same firms compete to supply in each of these geographic markets and the conditions of competition between the firms are the same in each geographic market.[245]

8.24 Below, we consider the evidence with respect to supply side substitution in more detail, in the context of the framework set out in paragraph 8.8.

Parties' views

8.25 The Parties agreed that the demand requirements (including homologation and local experience) and competitive landscape in the UK differ very significantly from the rest of Europe and require specific consideration.[246]

Third-party views

8.26 As explained in paragraphs 7.105(a) and 8.212 to 8.218 suppliers are required to conform to national operational and safety standards and follow

[242] Network Rail, 'TCSF 29248 - Framework Scope Lot 2', page 7.
[243] Our current view is that the Merger does not appear to raise competition concerns in relation to the supply of TMS in GB. Therefore, we will not consider the effects of the Merger in the supply of TMS in GB further.
[244] CMA129, paragraph 9.13.
[245] CMA129, paragraph 9.14.
[246] Parties' response to the AIS and WP, Section A, paragraph 3.2.

national authorisation processes. These national adaptation costs appear to be significant.

8.27 Railway network regulations differ between GB and Northern Ireland.[247] Translink, the infrastructure manager for Northern Ireland, told us that the approval process for Northern Ireland was governed by the Rail Interoperability Regulations 2011, and the Department for Infrastructure in Northern Ireland would provide the required 'authorisations to place' mainline signalling products into service in Northern Ireland.[248]

8.28 Translink submitted that there were no tenders for digital mainline signalling in the past and that there are currently no plans for a future digital mainline signalling tender in Northern Ireland.[249]

Our assessment

8.29 The evidence, at this stage, indicates that the product market for the supply of digital mainline signalling systems is national in scope. Network Rail's business plan for CP7 indicates that, notwithstanding the UK's exit from the European Union, it is committed to and supports a long-term plan to deploy ETCS.[250] ORR stated that it 'understands that Brexit does not affect Network Rail's participation in EULYNX'.[251] However, all mainline signalling systems still require adaptation and homologation on a national basis (see paragraphs 4.16 and 7.105(a)).

8.30 From a supply-side perspective, there is evidence that suppliers not currently located in GB may be able to compete for tenders in GB and that suppliers can use international projects as references for GB tenders (see paragraphs 8.238 to 8.240). However, those suppliers would need to invest in or secure local capacity to be able to deliver projects in GB (eg through partnering with integrators). There is little evidence to suggest that suppliers have been, or would be capable of, routinely shifting capacity from other geographic markets to meet demand in GB (see paragraphs reliance on integrators' workforce).

---

[247] The Railways Infrastructure (Access, Management and Licensing of Railway Undertakings) Regulations (Northern Ireland) 2016 is applicable in Northern Ireland, while The Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2016 is applicable in GB.
[248] Department for Infrastructure response to RFI dated 3 April 2023.
[249] Translink response to RFI dated 28 March 2023.
[250] Network Rail, Network Rail's business plan for CP7, page 11. We note that ETCS standards are used in other countries outside the European Union such as in Australia. See, 'ERMTS Second Work Plan of the European Coordinator, page 27, last accessed on 6 June 2023.
[251] ORR, ORR Market Study, page 36.

8.31 Based on the evidence set out above in paragraph 8.27, we consider that GB and Northern Ireland are separate geographic markets (see paragraph 8.36) on why we are focusing our assessment on the effects of the Merger in GB).

8.32 Notwithstanding the evidence that there are certain national dynamics of competition and that there are some barriers to entering in GB, our competitive assessment also takes into account the fact that the Parties and their main competitors operate and compete on a global basis using the same core systems (see paragraph 8.199). We consider that some elements of their offering such as innovation and product development may be determined by competition outside, as well as inside, GB420. We also recognise that suppliers can use digital mainline signalling projects outside GB as references for digital mainline signalling tenders and that their effectiveness as competitors in GB may be influenced by their experience both inside and outside GB.

8.33 Given this, we consider the appropriate starting point for our assessment is the GB market. However, we will also consider in our competitive assessment the potential constraint from suppliers outside GB, as well as the impact of broader global competitive dynamics, in particular in relation to innovation and product development and the importance of experience outside GB on competition in GB.

Provisional conclusion on geographic market definition

8.34 For the reasons set out above, we have provisionally concluded that the relevant geographic market is GB, with some important global aspects of competition which affect the competitive strength of suppliers in digital mainline signalling systems in GB.

Provisional conclusion on market definition

8.35 We have provisionally concluded that the relevant market is the supply of digital mainline signalling systems in GB, with some important global aspects of competition which affect the competitive strength of suppliers in digital mainline signalling systems in GB.

8.36 While GB and Northern Ireland are separate geographic markets, we are not considering the impact of the Merger in the delivery of mainline signalling projects in Northern Ireland. Based on the evidence received to date, the Parties have not competed in the past for the delivery of digital mainline signalling projects in Northern Ireland and there are no current plans for a future digital tender in Northern Ireland. We currently propose to focus our

investigation on the impact of the Merger in the supply of digital mainline signalling systems in GB.

Competition assessment

8.37 We have focused our investigation on the supply of digital mainline signalling systems to Network Rail, as it is the largest procurer of mainline signalling in GB and because the outcome of the TCSF will likely influence the conditions of competition for future digital mainline signalling procured by Network Rail and other GB customers.

8.38 We note the Parties' submission that the CMA should consider the Merger 'against current competitive conditions, as well as plausible scenarios for future competition which may include, but must not be solely focussed on, its understanding of the TCSF as currently envisaged'. As discussed in paragraph 7.117, we have taken account of the likely degree of uncertainty with respect to the design and implementation of the TCSF in our competitive assessment. We further note that Network Rail has expressed its intention to broaden its supplier base and increase its expenditure on digital mainline signalling. There is no reason to think that these intentions apply solely to the TCSF as currently envisaged.

8.39 While the immediate context for our investigation is the TCSF, our analysis of the evidence and approach to analysing closeness in this section is relevant and applies to competition for the supply of digital mainline signalling more widely than the TCSF.

8.40 One potential GB customer is Nexus, the transport authority responsible for the management of the Tyne and Wear 'metro' ('Tyne and Wear'). Tyne and Wear currently operates on a conventional mainline signalling system.[252] Nexus told us that it was planning to upgrade Tyne and Wear in or around 2029. Nexus told us that it was open to what type of signalling system it would use, identifying both CBTC and mainline signalling systems as options.[253]

8.41 One third party told us that Tyne and Wear was a 'commuter railway, so it applies its signalling principles more like a mainline route rather than a metro'. It submitted that the resignalling work for Tyne and Wear was expected to be closer to the type of resignalling projects procured by Network Rail than the

[252] Nexus response to RFI dated 11 January 2023; and Nexus response to RFI dated 24 November 2022.
[253] Nexus response to RFI dated 11 January 2023.

resignalling projects procured for the London Underground.[254] Another third party told us [✂].[255]

8.42 While it is not clear which system Nexus will upgrade to, third parties indicated that it was more likely that Tyne and Wear would continue to use a mainline signalling system, and potentially a digital mainline signalling system akin to the projects procured by Network Rail. To the extent that Nexus uses a digital mainline signalling system, we consider that our analysis of the evidence in the competition assessment section below in relation to the supply of digital mainline signalling systems in GB will also likely apply to Tyne and Wear. Therefore, our provisional finding on whether the Merger is likely to result in a SLC in the supply of digital mainline signalling in GB includes the effect of the Merger on competition for future digital mainline signalling tenders such as a future tender by Nexus.

8.43 HS2, another GB mainline signalling customer, launched a tender for digital mainline signalling in 2021. This tender is ongoing. [✂]. We have taken account of evidence from the HS2 signalling tender in our competition assessment and considered the extent to which that evidence is relevant for the assessment of the effects of the Merger in the supply of digital mainline signalling systems in GB.[256]

8.44 In assessing the unilateral horizontal effects of the Merger in the supply of digital mainline signalling systems in GB, we have considered in turn:

(a) the suppliers' bidding incentives;

(b) shares of supply;

(c) suppliers' strengths by reference to evidence on past and future digital mainline signalling tenders;

(d) suppliers' characteristics by reference to the relevant parameters of competition; and

(e) other evidence on suppliers' competitive strengths.

---

[254] Alstom call transcript, 8 February 2023, page 22.
[255] Stadler call transcript, 23 February 2023, page 25.
[256] FMN, 13 October 2022, Chapter 1, paragraph 15.8.1. HS1 holds the 30-year concession through to 31 December 2040 to operate, maintain and renew the 109-kilometre high-speed rail line connecting London's St Pancras International station to Kent, and international passenger destinations in Europe – Paris, Brussels, and Amsterdam – via the Channel Tunnel. No tender for digital mainline signalling is expected to occur during the concession. Accordingly, we have not taken a potential tender (in the mid-2040s) to supply digital mainline signalling systems to HS1 into account in our current assessment of the competitive effects of the Merger because of the uncertainty of predicting competitive conditions in this market so far into the future.

Suppliers' bidding incentives

8.45 In this section, we consider the evidence on bidding incentives. We consider the Parties' submissions on their respective incentives to respond to the PQQ and to compete for the digital element of the TCSF, absent the Merger, as well as evidence from internal documents. We also consider the incentives of other suppliers to compete for a place within Lot 2 of the TCSF.

8.46 Our assessment is not dependent on whether the Parties actually responded to the PQQ or on whether they will respond to the ITT for Lot 2 of the TCSF. It assesses the Parties' incentives to bid for this opportunity, absent the Merger, having in mind that the Parties' decisions to bid may be influenced by the Merger and our investigation.

Parties' incentives to bid for Lot 2 of the TCSF

8.47 [✂].[257] We understand that:

(a) [✂].

(b) [✂].[258]

8.48 The Parties both told us that [✂].[259]

8.49 Thales told us that, as currently envisaged, the TCSF opportunity [✂].[260] It added that there was considerable uncertainty associated with the delivery of the TCSF and that [✂].[261]

8.50 Hitachi told us that [✂].[262] It told us that [✂].[263]

8.51 We assess below Thales' and Hitachi's incentives to bid for the TCSF. In doing so, we note that the TCSF is being procured while our investigation of the Merger takes place. Our assessment therefore includes consideration of whether and how the Parties' submissions and internal documents (which discuss incentives to bid for Lot 2 of the TCSF) may be affected by the Merger and our investigation.

---

[257] Hitachi response to RFI dated 2 May 2023; and Thales response to RFI dated 2 May 2023.
[258] [✂].
[259] Parties' response to the AIS and WP, paragraph 6.17; and Thales, Main Party Hearing transcript, 2 May 2023, page 16.
[260] Parties' response to the AIS and WP, paragraphs 6.2-6.4.
[261] Parties' response to the AIS and WP, paragraph 6.2.
[262] Parties' response to the AIS and WP, paragraph 6.17.
[263] Parties' response to the AIS and WP, paragraphs 6.17-6.18.

Thales' incentives to bid for Lot 2 of the TCSF

8.52 In this section, we assess Thales' incentives to bid for Lot 2 of the TCSF. In doing so, we consider Thales' submissions on its incentives and assess relevant internal documents.

8.53 Our assessment is set out below.

- *Thales' submissions*

8.54 We consider Thales' submissions and the evidence it submitted in relation to the following topics:

(a) Thales' internal profitability requirements and its bid approval process;

(b) Thales' analysis of the TCSF opportunity;

(c) Examples of recent market entry opportunities pursued by Thales; and

(d) Thales' submissions on uncertainty and opportunity costs.

- *Thales' profitability requirements and bid approval process*

8.55 Thales told us that it follows [✂]. It told us that it [✂].[264] Table 4 below shows the profit margin targets applied in Thales' initial financial assessments.

Table 4: Thales' initial profitability assessments: [✂]

[✂]

Source: Thales response to RFI dated 3 May 2023, page 4.

8.56 Thales told us that the conditions associated with entering a new market [✂]. [✂].[265]

8.57 Thales further told us that [✂].[266] [✂].

8.58 [✂], Thales told us that [✂]. It told us that business cases [✂] assess the Net Present Value (**NPV**), Internal Rate of Return (**IRR**) [✂].[267]

[264] Thales response to RFI dated 3 May 2023, paragraph 3.1.
[265] Thales response to RFI dated 3 May 2023, paragraph 3.1.
[266] Thales response to RFI dated 3 May 2023, paragraph 3.2.
[267] Thales response to RFI dated 3 May 2023, paragraph 3.5.

8.59 When preparing a business case, Thales submitted that [✂].[268,269,270]

8.60 Thales added that [✂]. However, it also told us that [✂].[271]

- *Thales' assessment of the TCSF*

8.61 Thales provided a draft business case [✂].[272] Thales told us the purpose of the business case was to assess the [✂] of participating in the TCSF [✂].[273] As this business case was prepared following the announcement of the Merger and during the course of our merger investigation, we may place less weight on it as compared with earlier documents (unless supported by other evidence), in accordance with our usual practice.[274]

8.62 Thales told us that it had considered [✂]:

(a) [✂]; and

(b) [✂].

8.63 Thales told us that [✂]. Thales submitted that [✂].[275]

8.64 The results of Thales' analysis are shown in Table 5 below. Thales told us that, [✂].[276]

Table 5: Thales' business case [✂]

[✂]

Source: Parties, Submission on Competitive Effects, page 16.

8.65 Under all scenarios, [✂].

8.66 Thales told us this was the [✂].[277,278]

---

[268] We note that Thales told us it usually uses a discount rate of [✂]% in calculating the NPV of projects. [✂]. Thales told us that it nonetheless requires an IRR greater than [✂]% and that IRR hurdle rates [✂]. See Thales response to RFI dated 11 and 12 April 2023, paragraphs 4.2 and 5.1. We note that any projects generating returns [✂].
[269] Thales response to RFI dated 3 May 2023, paragraph 3.4; Thales response to section 109 notice dated 9 March 2023, paragraph 5; and Parties, Submission on Competitive Effects, paragraph 3.13.
[270] Thales response to RFI dated 3 May 2023, paragraph 3.4.
[271] Thales response to RFI dated 3 May 2023, paragraphs 3.1-3.5.
[272] Parties, Submission on Competitive Effects, paragraph 3.11.
[273] Thales' email to the CMA, dated 5 April 2023.
[274] CMA129, paragraph 2.29(a).
[275] Parties, Submission on Competitive Effects, paragraph 3.12.
[276] Parties, Submission on Competitive Effects, paragraph 3.15.
[277] Thales told us that it [✂] in the period before Network Rail awarded the majority of digital projects and that this created a [✂]. Parties, Submission on Competitive Effects, paragraph 3.39; and Thales, Main Party Hearing transcript, page 47. As explained in footnote 354, the [✂].
[278] Parties' response to the AIS and WP, paragraph 6.2; Parties, Submission on Competitive Effects, paragraph 3.16; and Thales response to s109 Notice of 9 March 2023, paragraph 9.

8.67 As a result, Thales told us that, [✂].[279]

- *Thales' recent market entry examples*

8.68 Thales provided details of geographic markets in which it had recently entered (or sought to enter) and in which it was required to gain approval for its digital mainline signalling systems, as would be the case in the UK. It stated that recent opportunities [✂].[280]

8.69 However, Thales also told us that it had recently submitted bids [✂]:

(a) [✂].[281]

(b) [✂].[282]

8.70 [✂].[283,284] Thales' participation in these tenders is discussed in further detail in paragraphs 8.156 to 8.194. For the purposes of assessing Thales' incentives to bid, we note here that its contemporaneous financial assessments showed that [✂].[285]

8.71 Thales submitted that [✂].[286] It told us it considered [✂].[287]

8.72 As regards to the ECDP tender, Thales told us that it participated with Atkins in order to [✂].[288]

- *Thales' submissions on uncertainty and opportunity costs*

8.73 In addition to its submissions on the TCSF investment case, Thales told us [✂].[289,290] [✂], Thales told us that [✂].[291]

---

[279] Parties' response to the AIS and WP, paragraphs 6.4-6.10.
[280] Thales response to RFI dated 25 April 2023, paragraph 3.1.
[281] Thales response to RFI dated 25 April 2023, paragraph 1.6.
[282] Thales response to RFI dated 11 and 12 April 2023, paragraph 3.12; and Thales response to RFI dated 25 April 2023, paragraph 3.2.
[283] We note that Thales partnered with Costain in bidding for MaSREF CP6.
[284] Thales partnered with Atkins for the ECDP tender.
[285] Thales response to RFI dated 11 and 12 April 2023, Annex T.Q2.001 [✂]; and Annex T.Q2.002 [✂].
[286] Thales, Main Party Hearing transcript, page 23-24.
[287] Thales, Main Party Hearing transcript, page 23.
[288] Thales response to RFI dated 27 April 2023, paragraph 2.3.
[289] Parties, Submission on Competitive Effects, paragraph 5.4.
[290] We set out the Parties' submissions on uncertainty surrounding the TCSF in further detail in paragraphs 7.24 to 7.42 above.
[291] Parties, Submission on Competitive Effects, paragraph 3.18.

8.74 Thales submitted that it would give preference to opportunities [✂]. Thales cited various countries in which this was the case and told us that markets like [✂].[292] Thales told us that this added uncertainty as to whether it [✂].

- *Thales' internal documents*

8.75 Thales' internal documents, including those prepared prior to the Merger, potentially provide additional evidence on Thales' interest in the GB market and its incentives to bid for a place on the TCSF framework.

8.76 We discuss evidence from our review of Thales' internal documents in this section. Our assessment is structured as follows:

(a) First, we discuss internal documents prepared prior to the TCSF, which comment on the attractiveness and importance of the UK market to Thales generally.

(b) Second, we discuss internal documents in which Thales reviewed the TCSF opportunity specifically.

- *Thales documents prepared prior to the TCSF*

8.77 In this section, we discuss two 'strategic reviews' of the UK market opportunity carried out by Thales in 2018 and 2019.[293] Both documents were prepared by Thales' UK Head of Mainline Signalling (in one case, with assistance from the [✂] Key Account Manager) and presented to the Mainline Signalling Executive Committee, [✂].

8.78 We note that Thales submitted that these documents [✂].[294] While we consider this relevant context, and that such presentations may contain a degree of optimism bias, we also consider that the UK team would nonetheless be incentivised to portray realistic outcomes in discussions with its Mainline Signalling Executive Committee.[295] In the following paragraphs, we set out the content of these documents. We then interpret the evidence from these documents in the round alongside other evidence as part of our assessment.

---

[292] Parties' response to the AIS and WP, paragraph 6.12; and Thales response to RFI dated 11 and 12 April 2023, paragraph 6.1.
[293] Thales response to RFI dated 23 December 2023, Annex T.Q12.002; and Annex T.Q3.001.
[294] Parties' response to the AIS and WP, Annex B, paragraphs 4-5.
[295] Thales response to RFI dated 6 September 2022, Annex T.Q12.001. We note that, in response to Network Rail's CP7 'Market Sounding Questionnaire' on whether suppliers were interested in tendering for and delivering digital signalling for Network Rail as a 'direct (tier-1) supplier or as a member of the supply chain', Thales submitted that [✂].

8.79 In its 2018 review, Thales stated [✂].[296] The review sets out [✂]:

(a) [✂].

(b) [✂].

(c) [✂].[297]

(d) [✂].

8.80 As part of its 2018 review, Thales therefore [✂].[298]

8.81 [✂].[299]

8.82 Of those opportunities identified in Thales' 2018 UK market review, the [✂].

8.83 In its October 2018 [✂] review [✂],[300] [✂].

8.84 The review recommended [✂]. In particular, Thales identified that:

(a) [✂]; and

(b) [✂].[301]

8.85 The review shows that Thales considered that [✂], the UK entry case remained 'very strong' and 'the overall investment position has not changed'.[302]

8.86 [✂] specifically, the review stated that [✂].[303] Thales also stated that [✂].[304,305]

8.87 [✂].[306]

8.88 Its ECDP opportunity review document shows that Thales [✂]. In addition, Thales stated that [✂].[307,308]

---

[296] Thales response to RFI dated 23 December 2023, Annex T.Q12.002, slide 3.
[297] Thales response to RFI dated 23 December 2023, Annex T.Q12.002, slides 3-4.
[298] Thales response to RFI dated 23 December 2023, Annex T.Q12.002, slide 6.
[299] Thales response to RFI dated 23 December 2023, Annex T.Q12.002, slide 3. We note that this document was [✂].
[300] Thales response to RFI dated 18 May 2023, page 1.
[301] Thales response to RFI dated 23 February 2023, Annex T.Q26.002, slides 5-6.
[302] Thales response to RFI dated 23 February 2023, Annex T.Q26.002, slide 8.
[303] Thales response to RFI dated 23 February 2023, Annex T.Q26.002, slides 8-9.
[304] [✂].
[305] Thales response to RFI dated 23 February 2023, Annex T.Q26.002, slide 8.
[306] Thales response to RFI dated 23 February 2023, Annex T.Q26.002, slide 12.
[307] We note that this included [✂]. [✂].
[308] Thales response to RFI dated 23 February 2023, Annex T.Q26.002, slide 12.

8.89 As above, [✂].[309] In its [✂].

8.90 [✂].[310,311]

8.91 Finally, we note that in a presentation (prepared by Thales' UK Head of Mainline Signalling in October 2019) [✂].[312] This presentation stated that the [✂].[313]

- *Thales' internal reviews of the TCSF*

8.92 We provided an overview of Thales' [✂] business case assessment of the TCSF opportunity in paragraphs 8.61 to 8.66 above. Our review of Thales' internal documents identified that it carried out similar assessments in [✂]. We note that Thales told us these documents [✂].[314,315] We provide a brief summary of these documents in this section, as well as additional detail on its review of the TCSF as of [✂].[316]

8.93 In [✂], Thales carried out [✂] review of the TCSF, [✂]. Thales noted that, through the framework, Network Rail aimed to increase supplier capacity and competitiveness in the UK and to reduce barriers to entry for new suppliers. It considered that [✂].[317]

8.94 Thales' [✂] opportunity review [✂] of the work to be procured by Network Rail [✂].[318] [✂].[319]

8.95 In addition, [✂].[320,321] [✂].[322]

8.96 [✂].[323]

8.97 The document continued [✂].[324] We also note that Thales appeared to [✂].[325]

---

[309] Thales response to RFI dated 23 December 2023, Annex T.Q3.001, slides 4-8.
[310] [✂]. Thales response to RFI dated 23 December 2023, Annex T.Q3.001, slides 13-14.
[311] We note that Thales submitted the [✂]. See Parties' response to the AIS and WP, Annex B, paragraphs 4-5. [✂] and that it [✂]. See paragraphs 8.158 to 8.194 for further detail. [✂].
[312] Thales response to RFI dated 18 May 2023, page 2.
[313] Thales, Annex THALES-CMA-00034357, slide 27.
[314] [✂].
[315] Thales response to CMA RFI dated 18 May 2023, page 2.
[316] Thales provided submissions on the relevance and reliability of these documents.
[317] Thales, Annex T.Q1.005, slide 2.
[318] Thales, Annex T.Q1.005, slide 22.
[319] Thales, Annex T.Q1.005, slide 38.
[320] Thales, Annex T.Q1.005, slide 11.
[321] Thales, Annex T.Q1.005, slide 18.
[322] Thales, Annex T.Q1.005, slide 22.
[323] Thales, Annex HTH-000001189, '[✂]', slide 3.
[324] Thales, Annex HTH-000001189, '[✂]', slide 18.
[325] Thales, Annex HTH-000001189, '[✂]', slide 2.

8.98 In its [✂] update, Thales [✂]. [✂].[326]

8.99 Thales also noted that, [✂].[327] [✂].[328] [✂]:

(a) [✂]; and

(b) [✂].

8.100 Thales concluded that it [✂].[329]

8.101 Overall, our review of Thales' internal documents indicates that, for a number of years, Thales has identified the UK as a market in which it is seeking to grow its presence and that, with changes to Network Rail's procurement approach, it considers the UK an attractive investment proposition.

8.102 Thales' internal documents also demonstrate active monitoring and appraisal of the TCSF opportunity, [✂]. As above, we note that the Merger has been planned since August 2021 and that these documents were prepared during the course of our investigation. In particular, we note that Thales' reviews of the TCSF opportunity of [✂] were prepared after the Merger was referred to a phase 2 investigation by the CMA. As set out in our guidance, where documents are prepared after the period in which the Merger was under contemplation, we may attach less evidentiary weight to such documents (unless supported by other evidence).[330]

- *Our assessment of Thales' incentive to bid*

8.103 Thales has submitted that [✂]. [✂].[331]

8.104 In the sections above, we set out evidence as regards the application of Thales' internal profitability requirements. We first note that the evidence shows these thresholds are [✂]. In the recent past, Thales has pursued a number of entry opportunities which [✂] (see paragraph 8.69 above), including [✂] (see Thales' submission in paragraph 8.71).

8.105 Thales also told us that bidding decisions include an assessment of the strategic importance of an opportunity. Its internal documents indicate the strategic value of the UK market to Thales, having identified the UK as a significant opportunity for a number of years. Its documents further show that

---

[326] Thales, Annex THALES-CMA-00272875, slide 3.
[327] Thales, Annex THALES-CMA-00272875, slide 3.
[328] Thales, Annex THALES-CMA-00272875, slides 10, and 16.
[329] Thales, Annex THALES-CMA-00272875, slide 26.
[330] CMA129, paragraph 2.29(a).
[331] Parties' response to the AIS and WP, paragraphs 6.2, and 6.12-6.13.

Thales recognises the TCSF as a significant entry opportunity and [✂] (see paragraph 8.93 above).

8.106 Further, Thales' documents appear to recognise that initial TCSF framework suppliers would be well-placed to compete for future digital projects beyond the TCSF (see paragraph 8.94 above). In short, the TCSF provides a gateway to a significant market opportunity and [✂]. Indeed, Thales stated as recently [✂] (see paragraph 8.95) and that it is a credible competitor [✂]. Its internal documents also appear to [✂] (see paragraph 8.97).

8.107 While later internal documents [✂], they nonetheless maintain that [✂]. As set out above in paragraph 8.102, we also consider that some caution should be applied in interpreting these documents, given that they were prepared in the context of reviews of the Merger by the CMA and other competition authorities.[332]

8.108 While we consider that the TCSF is likely to represent a significant strategic opportunity for Thales, we also note its submissions that [✂] (paragraph 8.60 above). In this context, we carried out high level analysis of Thales' business case submissions and found that the outputs of its analysis (ie NPV, IRR and [✂]) are highly sensitive to the assumptions chosen. Our analysis showed that, when applying different assumptions, there are a range of realistic scenarios in which Thales' profitability requirements ([✂]) can be comfortably met.[333]

8.109 Moreover, we note that Thales told us it usually uses a discount rate of [✂]% in calculating the NPV of projects and that '[✂]'.[334] While Thales told us that it requires an IRR greater [✂]% and that IRR hurdle rates are based on [✂],[335] we note that its target IRR is [✂] and that any projects that generate returns [✂]. We consider that this, at least in part, also explains why [✂].

8.110 Significantly, we also note that Thales' business case assessment considers [✂].[336] The consequence is that Thales' financial models do not take account of future signalling opportunities for which the TCSF can be viewed as a

---

[332] CMA129, paragraph 2.29(a).
[333] We note in particular that Thales' financial modelling assumed: [✂]. Taking each of these in turn: Network Rail told us that previous shortfalls between expected and eventual signalling spend were due changes in prioritisation ([✂]) and that, given there is a government commitment to digital signalling, it did not expect its prioritisation of digital signalling to change (see paragraphs 7.31 and 7.32). We have therefore tested the effect of including the full Network Rail workbank [✂]. [✂]. Thales' [✂] financial modelling [✂]. We have therefore tested the effect of including lower development cost assumptions in Thales' financial models. As to general and administrative (G&A) and corporate costs, we note that [✂] and it is not clear that the costs included in Thales' financial modelling represent the true extra expenses that would be incurred, were it to win a place on the TCSF. We have therefore tested the effect of including lower G&A and corporate costs in Thales' financial models.
[334] Thales response to RFI dated 11 and 12 April 2023, paragraph 5.1.
[335] Thales response to RFI dated 11 and 12 April 2023, paragraph 4.1; and Annex HRL0004544.
[336] Parties, Submission on Competitive Effects, Annex 1.1; and Annex 1.2.

gateway, despite its internal documents recognising that [✂] (paragraph 8.94). We consider the fact that the TCSF can be viewed as a gateway for future digital mainline signalling opportunities in GB strengthens Thales' incentives to bid for Lot 2 of the TCSF only (and not Lot 1). As Thales itself recognised in [✂] (paragraph 8.99 above).

8.111 As regards Thales' submissions on uncertainty surrounding the TCSF, we set out Network Rail's response to each of these points in paragraphs 7.24 and 7.42 above. We also note that Thales appeared to take any uncertainty into account as part of its business case assessment, [✂]. Even in such a scenario, the CMA's analysis shows that there are a range of potential outcomes [✂]. We also note that, were Thales to assume that Network Rail would award the full workbank as currently planned (and retain all other assumptions in its March financial models), the IRR would be as follows, [✂]:

(a) [✂].

(b) [✂].

(c) [✂].[337]

8.112 As to Thales' submissions on opportunity costs, the extent to which resources would be diverted away from other bids (if Thales were to bid for the TCSF) remains unclear. We note in particular that Thales has told us that other opportunities, [✂], do not require significant further investment in product development (paragraph 8.748.73). Further, we understand that Thales would not be required to incur product development costs in relation to the TCSF until after it was awarded a place on the framework.[338] As regards the resources required to prepare for bid submissions, even if there are likely to be capacity constraints, we consider that a large and sophisticated business such as Thales is likely to be able to balance and manage its resources to prepare for and pursue significant opportunities in parallel, and in particular for large, strategic opportunities such as the TCSF.

8.113 For the reasons outlined above, we consider that, absent the Merger, Thales would likely have strong incentives to compete for digital signalling projects within the scope of the TCSF.

---

[337] CMA analysis based on Submission on Competitive Effects, Annex 1.1; and Annex 1.2. To model these outcomes, the CMA assumed that Network Rail will award the full amount of projects currently planned within the mini-competition process.
[338] FMN, 13 October 2022, Sections 17 to 29, paragraph 21.3.1.

Hitachi's incentives to bid for Lot 2 of the TCSF

8.114 In this section, we assess Hitachi's incentives to bid for Lot 2 of the TCSF. In doing so, we consider Hitachi's submissions on its incentives and assess relevant internal documents.

8.115 Our assessment is set out below.

- *Hitachi's submissions*

8.116 Hitachi told us that [✂].[339] Hitachi told us that [✂].[340]

8.117 [✂], Hitachi told us that [✂][341] and that Hitachi expected [✂].[342]

8.118 Hitachi told us that [✂].[343] Hitachi told us that [✂].[344,345]

- *Hitachi's internal documents*

8.119 Our review of Hitachi's internal documents identified a number of documents which relate to recent UK mainline signalling tenders (other than the TCSF), and which indicate an intention to expand its presence in UK signalling.

8.120 For example, an internal briefing form[346] prepared to discuss [✂].[347]

8.121 We note that Hitachi has submitted that, [✂].[348] We consider that the document remains relevant to our assessment, as it informs an understanding of Hitachi's view of the potential UK market opportunity. We interpret this document in the round alongside other evidence as part of our assessment.

8.122 Another internal document, prepared by Hitachi's UK Sales Manager in relation to the HS2 tender, stated [✂].[349]

8.123 We note that Hitachi told us this document was a draft response to questions sent by a communications consultancy when discussing a communications

---

[339] Parties' response to AIS and WP, paragraph 6.18; Parties, Submission on Competitive Effects, paragraph 3.21; and Hitachi, Main Party Hearing transcript, 26 April 2023, page 13.
[340] Hitachi, Main Party Hearing transcript, 26 April 2023, page 13.
[341] Parties, Submission on competitive effects, paragraph 3.21.
[342] Parties, Submission on competitive effects, paragraph 3.43(a).
[343] Hitachi, Main Party Hearing transcript, 26 April 2023, page 25.
[344] Parties' response to the AIS and WP, paragraph 6.19. Hitachi told us that [✂].
[345] Parties' response to the AIS and WP, paragraph 6.19.
[346] Hitachi response to CMA RFI dated 24 May 2023. Hitachi told us that this document was prepared by its Head of Sales (Signalling) for the UK and Ireland and was also intended to be submitted at a later stage to the Hitachi Senior Executive Committee.
[347] Hitachi, Annex H.109.Q2.124 HS2CCS PG2NF, page 2.
[348] Parties' response to the AIS and WP, Annex A, page 5.
[349] Hiatchi, Annex H.109.Q2.053; and Parties' response to the AIS and WP, Annex A, page 5.

campaign [✂]. Hitachi told us that [✂].[350] While we consider this context relevant to the weight that we are able to place on the document, we nonetheless note Hitachi's statements about the importance of its global references and about the fact that it [✂]. As above, we interpret this document in the round alongside other evidence as part of our assessment.

8.124 As regards the TCSF specifically, [✂] internal presentation in [✂] for an opportunity review meeting.[351] As part of this presentation, Hitachi highlighted the importance of the TCSF and stated that the project provided an opportunity for consistent revenue over ten years and [✂].[352]

8.125 Hitachi told us that it had 'become increasingly clear that the ultimate structure of the TCSF will differ from that envisaged' in July 2022. Hitachi submitted that [✂].[353] We note that recent changes to the design of the TCSF do not appear to materially change the two specific points mentioned in Hitachi's [✂] presentation: the TCSF still provides an opportunity for consistent revenue over ten years and still presents [✂].

- *Our assessment of Hitachi's incentive to bid*

8.126 As above, Hitachi told us that [✂] (paragraph 8.116 above).

8.127 However, Hitachi also recognised that the investment case for it to participate in the digital element of the TCSF was attractive and [✂] (paragraph 8.1188.1188.1188.1188.118).

8.128 Further, Hitachi's internal documents noted the size and strategic importance of the TCSF and that it presents an opportunity to grow its share in one of the largest rail markets in the world (and a market which Hitachi would otherwise be locked out of for the next ten years)8.124. More generally, its documents indicate an intention for Hitachi to expand its presence in UK signalling and that it has been discussing TCSF [✂] internally (paragraphs 8.119 to 8.125)8.120.

8.129 Given the evidence outlined above, we consider that, absent the Merger, Hitachi would likely have strong incentives to compete for digital signalling projects within the scope of the TCSF.

---

[350] Parties' response to the AIS and WP, Annex A, page 5.
[351] Hitachi told us that this document was prepared for the purposes of an opportunity review meeting (**ORM**) but that it was not shared at the ORM. Hitachi response to RFI dated 24 May 2023, page 2.
[352] Hitachi, Annex HRL0004544, slides 1, and 3.
[353] Hitachi, Annex HRL0004544; and Parties' response to the AIS and WP, Annex A, page 8.

Other suppliers' bidding incentives

8.130 [✂].[354]

8.131 Our competitive assessment, set out in the following sections, [✂].

8.132 It is typically not known publicly which suppliers have responded to the PQQ. Suppliers that have not responded may still potentially constrain bidders, at least up until the PQQ stage. As set out in paragraph 7.48, the suppliers that have pre-qualified typically becomes public knowledge, at which stage, it is likely only those suppliers would exercise a constraint. We consider any perceived constraint that suppliers other than those that are participating in the TCSF may impose, as part of our competitive assessment.

8.133 We consider that the suppliers which submitted responses to the PQQ are likely to have strong incentives to pursue a bid for Lot 2 of the TCSF through the ITT stage given that:

(a) the GB rail network is one of the largest in the world and Network Rail aims to invest significantly in digital transformation over the coming years as one of its priorities;

(b) the TCSF represents an opportunity to earn significant revenue over a ten-year period with a minimum guaranteed share of the signalling workbank;

(c) the TCSF acts as a gateway to a future pipeline of work in GB, both during and beyond the TCSF period; and

(d) it is likely that GB entry barriers after the TCSF period would be significant as, at that time, up to four suppliers would have approved digital signalling technologies and would have gained considerable experience in deploying digital projects in GB (see section on 'Entry and expansion' for further details).

8.134 We note, however, that the suppliers who have responded to the PQQ for Lot 2 may not pass the PQQ stage and that, even if they do, they may not respond to the ITT. This means that there may be fewer than [✂] bidders competing for the places in the TCSF.

8.135 Our analysis of whether the Merger is likely to result in an SLC in the supply of digital mainline signalling systems in GB assumed that all the current respondents to the PQQ respond to the ITT. If one or more of the current

---

[354] [✂].

rivals of the Parties in the TCSF no longer competes for a place in the TCSF after PQQ that might aggravate further the effects of the loss of competition arising from Merger. Given the evidence on the Parties' incentives to bid for a place in the TCSF set out above and their competitive strength, we consider, at this stage, that it would be likely that, absent the Merger, they would both respond to the ITT, if they passed the PQQ stage.

Shares of supply

8.136 To assess the effects of the Merger, we sought to estimate shares of supply to help understand the relative strengths of digital mainline signalling suppliers, in GB and Europe. We note that the GB digital mainline sector is still in its early stages of development and GB customers have procured only a small number of digital mainline signalling projects to date. With this context in mind, and because the TCSF is designed to facilitate entry from suppliers outside GB that have experience and technical expertise in delivering digital mainline signalling projects, we have focused our assessment on how suppliers have competed against each other in Europe, where the deployment of digital signalling is further advanced than in GB.

Parties' views

8.137 The Parties submitted GB shares of supply estimated using their own data (see Table 6 below). They submitted that these show that the GB is 'dominated' by Siemens and Alstom, whereas the Parties' presence in GB mainline signalling is 'virtually non-existent'.[355,356]

8.138 In response to our analysis of European shares of supply, the Parties submitted that there are 'very' significant differences between the UK and the rest of Europe. The Parties submitted that, as such, their shares of supply in Europe are not indicative of their credibility in the TCSF process.[357] The Parties also submitted that Thales' European share fails to reflect the substantial entry barriers that Thales faces in the GB market.[358]

[355] The Parties' submissions refer to UK shares of supply. However, we note that the Parties' UK shares of supply do not include any digital mainline projects from Northern Ireland, as no tenders for digital mainline signalling has been run in Northern Ireland in the past (see paragraphs 8.27 and 8.36) We therefore refer to the Parties' estimated shares of supply as GB shares.
[356] Parties' response to the AIS and WP, paragraphs 5.2-5.3.
[357] Parties' response to the AIS and WP, Section A, paragraph 3.2.
[358] Parties' response to the AIS and WP, paragraphs 3.11, and paragraphs 5.2-5.3.

Evidential value of shares of supply

8.139 We consider that shares of supply provide useful evidence when assessing closeness of competition[359] and provide useful information about the current size, strength, and relative importance of suppliers. In markets where experience matters, shares of supply can be a relevant indicator of strength and ability to win future contracts.

8.140 Shares of supply capture the winners of tender processes, not the closeness of competition during tenders. However, we currently consider that shares of supply will reflect a competitor's past experience and therefore its credibility as a future competitor, which means that shares of supply provide a meaningful insight, providing they cover a sufficiently large number of contracts.

8.141 We acknowledge that European (including GB) shares of supply do not correspond with our GB market definition and are mindful of the differences in the conditions of competition between the GB market and other European markets (see paragraph 8.30). Nevertheless, we consider that European shares of supply provide useful insights for three reasons:

(a) First, Network Rail intends to bring in new suppliers for the TCSF (see paragraph 7.22). It will consider experience in and references from comparable digital mainline signalling projects in Europe (see the PQQ and ITT criteria in paragraphs 7.84 and 7.90, see also paragraphs 8.238 and 8.241).

(b) Second, the TCSF will use ETCS (see the PQQ and ITT criteria in Table 1 and Table 2) which is a European standard technology (see paragraph 4.13). European experience is likely to correlate with experience of ETCS.

(c) Third, as there were over 300 digital projects in Europe between 2012 and 2021, European shares of supply are likely to be representative of the strength of competitors' technology and management experience.

8.142 We have also considered shares of supply in GB but note that there have been relatively few digital GB tenders. This means that GB shares of supply are likely to be 'lumpy', disproportionately affected by a few contracts and not representative of suppliers' potential competitive strengths.

[359] CMA129, paragraph 4.14.

Shares of supply estimates

8.143 The tables below present shares of supply on a GB basis, as estimated by the Parties, and on a European basis (including GB), estimated using data we have collected. For the reasons given in paragraphs 8.141 and 8.142, we currently put more weight on the European shares of supply.

8.144 The tables show shares of supply both including and excluding non-contestable contracts. Non-contestable contracts are awarded directly, often to incumbents. We currently consider that shares including non-contestable projects better proxy management experience and we have therefore put more weight on the shares which include non-contestable projects.

GB shares of supply

8.145 The Parties calculated GB shares of supply for digital mainline signalling projects between 2012 to 2021 (see Table 6).

8.146 We currently consider that GB shares of supply demonstrate that Siemens has been successful in the limited number of digital mainline signalling opportunities so far, but that this is not a good indicator of likely competition for the TCSF for the reasons described in paragraph 8.141. Further, as described below in paragraph 8.160, not all the ten observations were digital mainline signalling projects. In addition, we note that the ECDP project accounts for nearly 90% of the GB shares of supply. Furthermore, data from Siemens leads us to believe that the Parties have overestimated the value of ECDP.

Table 6: Parties' calculations of shares of supply for digital mainline signalling projects (GB, 2012-2021)

(%)

Supplier	*All digital mainline signalling projects*	*Contestable digital mainline signalling projects*
Hitachi*	[0-5]	[0-5]
Thales	0	0
Combined	[0-5]	*[0-5]*
Siemens	[90-100]	[90-100]
Alstom	[0-5]	[0-5]
Others†	[0-5]	[0-5]
Total	€1,119m	€1,117m

Source: Parties' response to the AIS and Working Papers, Table 1.
* As noted in paragraph 7.11, Hitachi won the Cambrian Line in 2006.
† Includes Atkins and Infrasig.
Note: The Parties' data can identify the conventional/digital split of mainline projects only for those in which they won/participated. For other projects won by competitors, the analysis assumes these projects are conventional and therefore excluded from the analysis. The analysis covers SCS for digital projects, ETCS ATP wayside and digital interlockings.
The Parties calculated their shares of supply for digital mainline signalling projects in GB in Euros.

European shares of supply

8.147 We calculated European (including GB) shares of supply based on project value of digital mainline signalling contracts won by suppliers operating in Europe (see Table 7 and associated notes). This data recorded contracts won and started between 2012 and 2021.[360]

Table 7: Digital mainline signalling shares of supply by project contract value, in Europe (including GB), 2012 – 2021

	All digital mainline signalling projects		*Contestable digital mainline signalling projects*	
Supplier	*Value (£m)*	%	*Value (£m)*	%
Hitachi	[✂]	[10-20]	[✂]	[5-10]
Thales	[✂]	[20-30]	[✂]	[20-30]
Combined	[✂]	*[40-50]*	[✂]	*[30-40]*
Siemens	[✂]	[20-30]	[✂]	[30-40]
Alstom	[✂]	[20-30]	[✂]	[20-30]
CAF	[✂]	[0-5]	[✂]	[0-5]
AZD Praha	[✂]	[0-5]	[✂]	[0-5]
Indra	[✂]	[0-5]	[✂]	[0-5]
Mermec	-	-	-	-
Progress Rail*	[✂]	[0-5]	[✂]	[0-5]
Stadler	-	-	-	-
Total	[✂]	[✂]	[✂]	[✂]

Source: CMA calculations using data from OEMs.
Notes: [1] Value is the stated contract value at the date of award. [2] Where contracts were undertaken by a consortium, the value is the respective supplier's value within the consortium, not the overall project value. [3] Some value estimates include maintenance, but we consider that in most instances this will be a small proportion of the value. [4] Where not indicated, projects were assumed to be contestable.
* Data for Progress Rail covers contracts signed in the period 2017-2021.

8.148 We currently consider that these shares show that:

(a) The market is highly concentrated with the top four suppliers (including the Parties) supplying [90–100%] of all digital mainline contracts and each having shares above 10%. All other suppliers' shares are below 5%.

(b) The Parties' combined share of supply was [40–50%] ([30–40%] for contestable projects[361]), with an increment of [10–20%] ([5–10%] for contestable projects) as a result of the Merger.

8.149 We also note that, although Mermec did not supply[362] any European digital mainline signalling contracts between 2012 and 2021, it was awarded digital mainline signalling projects in 2022. This was a large zero-value framework contract. While the Mermec projects are not reflected in the European share of supply estimates, overall conditions of competition remain the same, ie the

[360] Data for 2022 is not included due to incomplete datasets.
[361] See paragraph 8.409.
[362] Mermec questionnaire response, Q 1(ii).

four largest providers account for the vast majority of deployments across Europe.

8.150 No evidence has been provided by the Parties or integrators to suggest that integrators have routinely won digital mainline projects as standalone bidders.[363]

Provisional conclusion on shares of supply

8.151 We note that Thales, and to a lesser extent Hitachi, have a very limited current presence in GB digital mainline signalling. At European level, the shares of supply show that there are four main suppliers (Siemens, Alstom and the Parties). The remaining competitors have substantially lower shares, with none having a share above 5%, and account, on aggregate for less than [5–10%] of the overall market. We currently consider that the Parties' shares of supply in Europe indicate their strength and technical capabilities as digital mainline signalling providers. Given the TCSF is designed to bring new suppliers into the GB mainline signalling, we consider that suppliers that have demonstrated their competitive strengths in Europe are also likely to be credible competitors for the TCSF.

8.152 We consider that the Parties have significant shares in a highly concentrated segment, which indicates they are likely to be close competitors to one another. The Merger involves the second and fourth largest suppliers in Europe (Thales and Hitachi respectively).

Competition in previous digital mainline signalling tenders in GB

8.153 The Parties submitted that, to assess the competitive strengths in the GB digital mainline signalling market, we should analyse the shares of supply resulting from all previous digital mainline signalling tenders in GB rather than in Europe.[364] The Parties told us it is unclear how the Parties' strengths in Europe could provide any meaningful insight in the GB market.[365]

8.154 While we consider that the Parties' and other suppliers' strengths in Europe are a relevant indicator of suppliers' competitiveness for the supply of digital signalling in GB (see paragraphs 8.139 to 8.141), we have also given

[363] Atkins has won a contract in relation to the delivery of Network Rail's National ETCS TVV&I Laboratory, ie a testing centre to be used for CP7 and CP8. Atkins told us that the contract it won is for the provision and management of the test facility to ISO/IEC 17025 Laboratory. The scope of this contract is a laboratory testing services agreement and contains no operational and live digital mainline signalling system delivery scope.
[364] Parties' response to the AIS and WP, paragraph 5.1.
[365] Parties' response to the AIS and WP, paragraphs 5.3-5.4.

consideration to how suppliers have competed in previous GB digital mainline signalling tenders.

8.155 We consider the evidence on the 11 'digital mainline signalling' tenders that the Parties indicate have taken place in GB in the last ten years and assess the extent to which they are reliable indicators for competition for the TCSF. For the reasons set out below in paragraphs 8.158 to 8.194, we consider the competition for the ECDP and HS2 tenders in more detail, including evidence from the Parties' internal documents.

Previous digital mainline signalling tenders in GB

Parties' views

8.156 As noted above (see paragraph 8.145), the Parties submitted shares of supply based on ten digital mainline signalling projects tendered in GB since 2012 which were all tendered outside of any major CP framework agreement.[366] Eight of the ten projects were awarded via a competitive tender. The Parties submitted that this showed Siemens was a clear leader with a [90–100%] share of supply, followed by Alstom with [0–5%], and Hitachi with [0–5%] (see Table 6).

8.157 The Parties submitted that Thales did not win any of the digital mainline signalling projects [✂] to date and, as such, was 'at best' a weak competitor in the GB digital mainline signalling market.[367] The Parties submitted that 11 GB digital mainline signalling projects (that is, those ten projects included in their shares of supply plus the in-progress HS2 tender) provided a sufficient sample size to demonstrate this.[368] The Parties told us that Thales' limited customer relationship with Network Rail placed it in a similar position to other new entrants.[369]

Our analysis of the 11 digital mainline signalling projects

8.158 We have assessed these 11 digital mainline signalling projects. We have first considered whether they are sufficiently similar to upcoming digital mainline signalling tenders to provide useful information. Where they do provide useful information, we consider what they tell us about the likely bidders and their relative strengths.

---

[366] Although the Parties identified 11 digital mainline signalling tenders in GB since 2012, HS2 was excluded from their analysis as it is in progress. Parties' response to the AIS and WP, paragraph 3.10.
[367] Parties' response to the AIS and WP, paragraph 3.10.
[368] Parties' response to the AIS and WP, paragraph 3.10.
[369] Parties' response to the AIS and WP, paragraph 3.11.

8.159 Table 8 below presents details provided by Thales on the 11 digital mainline signalling projects in GB to date. As noted above (paragraph 8.157), the Parties submitted that Thales [✂] but, as Table 8 shows, Thales responded to the PQQ for the ECDP and HS2 tenders [✂].

Table 8: Thales' submission: Digital mainline signalling projects in GB since 2012

Project	*Start date*	*Services provided*	*Winner(s)*	*Competitors*	*Selection Process*	*Value (£)*
ETCS Level 2 Framework Phase 2	2013	ETCS ATP wayside re-signalling	Siemens, Alstom, Hitachi, and Infrasig	[✂]	Competitive bid	[✂]
Ferriby to Gilberdyke re-signalling	2016	Interlockings	Hitachi	[✂]	Competitive bid	[✂]
RIDC test facilities	2016	ETCS ATP wayside re-signalling	Alstom	[✂]	Competitive bid	[✂]
CP6 Major Signalling Renewals Framework	2019	Interlockings	Hitachi	[✂]	Framework agreement/call off	[✂]
East coast digital programme train control framework (ECDP)	2019	ETCS ATP wayside re-signalling	Siemens	Alstom, Hitachi, Siemens, and JV Thales-Atkins	Competitive bid	[✂]†
Devon and Cornwall	2020	Interlockings	Siemens	[✂]	Framework agreement/call off	[✂]
Ferrybridge to Goole	2020	Interlockings	Alstom	[✂]	Competitive bid	[✂]
Cambrian ETCS upgrade	2020	ETCS ATP wayside overlay	Hitachi	[✂]	Private negotiation	[✂]
HS1 fringe update Kings Cross	2021	Interlockings	Hitachi	[✂]	Private negotiation	[✂]
Testing, validation, verification and integration (TVV+I) facility	2022	Interlockings	Atkins	[✂]	Competitive bid	[✂]
HS2	Ongoing	ETCS ATP wayside re-signalling	Undecided	Alstom, Siemens, and Thales ‡	Competitive bid	[✂]

Source: Thales' response to RFI dated 3 May 2023, Annex RFI MPH T.Q6_Q7.
† We note the Parties' valuation of the ECDP tender is overstated compared to the value submitted by the winner of the tender, Siemens, of £[✂] million.
‡ Hitachi was not identified as a competitor for HS2 by Thales, however we note that it was public knowledge that Hitachi was one of the four shortlisted for the tender.

8.160 First, we note that at least five of the tenders identified by the Parties were not for digital mainline signalling projects but were in fact conventional mainline signalling projects. On this basis, these five tenders are not relevant to the assessment and have not been assessed further. The five tenders were:

(a) Ferriby to Gilberdyke re-signalling (2016): Hitachi submitted that this project did not include ETCS wayside elements.[370]

(b) The CP6 Major Signalling Renewal Framework (2019): The CP6 MASREF framework was for the supply of conventional mainline signalling projects.[371]

(c) Devon and Cornwall (2020): Siemens, the winner of the Devon and Cornwall tender, told us that this project was for interlockings which interacted with conventional wayside technology and therefore was not digital mainline signalling project.[372]

(d) Ferrybridge to Goole (2020): Alstom, the winner of the Ferrybridge to Goole tender, told us this project was for interlockings which interacted with conventional wayside technology and therefore was not digital.[373]

(e) HS1 fringe update Kings Cross (2021): Hitachi submitted that this project did not include ETCS wayside elements.[374]

8.161 Second, we note that the Parties' data on digital mainline signalling tenders in GB since 2012 is not complete, as it excludes the Cross Rail West and Thameslink tenders. As set out in paragraph 7.11, these tenders were won by Alstom and Siemens respectively.[375]

8.162 Third, of the remaining six 'digital' tenders set out in Table 8, we note that:

(a) Two of the six tenders related to testing facilities and not digital mainline signalling projects. Both projects were valued at less than £14 million. The lack of interest from non-GB suppliers is unlikely to be indicative of those non-GB suppliers' competitive strength for the TCSF, given the small value and different scope of projects being contested.

(b) Two of the remaining four tenders had a contract value of under £2 million, which is considerably lower than the average homologation costs of £14.6 million (see paragraphs 8.212 to 8.218). As a result, suppliers from outside GB that would have needed to invest in product

[370] Hitachi, RFI response dated 31 May 2023.
[371] See Table 1.
[372] Siemens response to RFI dated 18 January 2023.
[373] Alstom response to RFI dated 7 February 2023.
[374] Hitachi response to RFI dated 31 May 2023.
[375] Network Rail told us that Cross Rail West was an ongoing project which was contracted as a directly awarded contract with Alstom under the expired ETCS framework agreement which was in place at the time (first row of the Table 1. Thameslink was awarded to Siemens.

development would have no or very limited incentives to bid for these projects.

(c) ECDP and HS2 were the only two opportunities that shared some of the characteristics of the TCSF, that is they were large (more than £250 million), multi-year projects, which were competitively tendered. In our view, these projects are more similar to the TCSF than the other projects set out in Table 8. In that light, we consider the ECDP and HS2 tenders in more detail below.

8.163 Based on the above evidence, Siemens, Alstom and Hitachi won the main digital mainline signalling projects (including the two projects not included in the Parties' analysis). Thales has not bid for [✂] but did respond to the [✂] HS2 – [✂]. Integrators did not bid on a standalone basis for any of the digital mainline signalling systems tenders (see Table 8, together with paragraphs 8.160 to 8.162).

Assessment of the main tenders for the supply of digital mainline signalling systems in GB

8.164 ECDP and HS2 are the two largest digital mainline signalling projects procured in GB to date. For further details on these tenders see Table 8 above.

8.165 In the following subsections we consider the Parties' views on the ECDP and HS2 projects. We then set out how the customers scored applicants for each of these projects. We also consider the Parties' internal documents prepared in the context of ECDP and HS2 tenders and other digital signalling opportunities in GB in which they assess their own competitive positions relative to those of their perceived rivals.

- *Parties' views*

8.166 The Parties submitted that it was unclear why we did not look at the shares of supply in GB but nevertheless considered bidding patterns in two GB digital mainline signalling tenders.[376] The Parties told us that in the absence of any comparative analysis of the incentives for new entry in the context of ECDP and HS2 and the capabilities of new entrants at the time of those tenders versus the TCSF, it is not possible to draw any conclusions from the competitor set for those previous tenders.[377]

[376] Parties' response to the AIS and WP, paragraph 5.4.
[377] Parties' response to the AIS and WP, paragraph 4.22(c).

8.167 The Parties submitted the following in relation to Thales' involvement in the ECDP and HS2 tenders:

(a) [✂];[378]

(b) Alstom and Siemens' participation in these tenders provided the 'key' competitive constraint on the Parties, as opposed to the constraint the Parties imposed on each other;[379] and

(c) The tenders do not evidence a commitment by Thales to enter the GB market or bid for the TCSF, or that Thales acts as a material competitive constraint on other suppliers. [✂].[380]

8.168 The Parties submitted that [✂].[381] With regards to HS2, the Parties explained that [✂].[382] Thales explained that [✂].[383]

- *ECDP*

8.169 For the ECDP, the deadline for PQQ submissions was 1 October 2018, and PQQ respondents were informed of the outcome of their submissions on or before 22 October 2018. [✂]. The deadline for the first stage of the ITT was 4 January 2019. [✂].[384]

8.170 The Parties, Alstom, and Siemens were the only competitors for the ECDP tender. [✂].[385]

8.171 As set out in paragraph 7.45, bidding processes in this market are not fully transparent. Suppliers may, however, be able to access some information about potential ITT bidders, which may influence bids at the ITT stage. Although Network Rail does not publish the outcomes of PQQ stages, Network Rail informs those suppliers that responded to the PQQ of the outcome of their own submissions and 'informally it [the outcome of the PQQ]

[378] Parties' response to the AIS and WP, paragraph 5.4(a).
[379] Parties' response to the AIS and WP, paragraph 5.4(a).
[380] Parties' response to the AIS and WP, paragraph 5.4(c).
[381] Thales response to s109 Notice dated 8 September 2022, Annex T.Q1.003; Network Rail response to RFI dated 27 October 2022, 'ECML TCP GW4 & Appendicies - June 2019'; and Parties, Submission on ETCS ATP wayside resignalling projects (**Submission on ETCS ATP wayside resignalling projects**), 24 March 2023, paragraph 4.14.
[382] Parties response to RFI dated 6 September 2022, paragraph 5.1.
[383] Parties response to RFI dated 6 September 2022, paragraph 5.1.
[384] Network Rail response to RFI dated 27 October 2022, 'ECML TCP GW4 & Appendicies - June 2019'.
[385] Network Rail response to RFI dated 27 October 2022, 'ECML TCP GW4 & Appendicies - June 2019'.

tends to become "public" knowledge at that point'.[386] Therefore, at the ITT stage of the EDCP, suppliers are likely to have known who passed the PQQ.

8.172 [✂]. However, there is evidence suggesting [✂] (see paragraph 8.183(b)).

8.173 Following the ITT, Network Rail ultimately awarded the ECDP contract to Siemens.

- *HS2*

8.174 For the HS2 signalling tender, the deadline for PQQ submissions was 7 July 2020,[387] and PQQ respondents were informed of the outcome of their submissions in January 2021.[388] By 4 March 2021, HS2 Ltd had publicly announced the shortlisted companies for the tender, which included Thales and Hitachi.[389] The first stage of the ITT was launched on 23 September 2021.[390] [✂].[391] The deadline for the first stage of the ITT was 6 June 2022. [✂].[392]

8.175 The Parties, Alstom, Siemens, [✂] submitted responses to the PQQ of the HS2 tender. At the PQQ stage, HS2 considered both [✂].[393] We note that [✂] were the lowest ranked applicants and scored substantially lower than Thales.[394] Neither [✂] passed PQQ.

8.176 Nearly a year after passing the PQQ, [✂].

8.177 The HS2 tender process is ongoing and the outcome of the ITT is unknown.

- *Parties' internal documents about past digital mainline signalling tenders in GB*

8.178 We consider below internal documents from the Parties assessing competition for past digital mainline signalling opportunities in GB, including

---

[386] ORR response to RFI dated 23 May 2023. ORR submitted that Network Rail does not formally publish the outcomes of the PQQ stage; however after Network Rail provides supplier feedback on PQQ submissions, the outcomes of the PQQ stage tends to informally become public knowledge.
[387] 'Control, Command, Signalling and Traffic Management (CCS and TM) Systems (Phases One, 2a and (In Two… [Notice]', accessed 1 June 2023.
[388] HS2 response to questionnaire dated 30 January 2023, '[✂]'; and Hitachi, Annex H.109.Q2.078.
[389] 'Shortlisted unveiled for HS2 signalling and control systems', accessed 1 June 2023.
[390] Hitachi response to RFI dated 1 June 2023.
[391] Thales response to s109 Notice dated 28 September 2022, Annex T.Q2.066.
[392] Hitachi response to RFI dated 1 June 2023.
[393] HS2 response to RFI dated 6 March 2023, 'EMS Tender Recommendation Report, Appendix C': and HS2 response to RFI date 6 March.
[394] HS2 RFI response dated 7 February 2023, 'Tender List Recommendation Report for Control, Command, Signalling and Traffic Management (HRS23)'. Alstom, Siemens, Hitachi, and Thales passed PQQ and have been Invited to Tender. [✂] and [✂], however, scored the lowest at the technical and professional ability stage and therefore were not Invited to Tender.

the ECDP and HS2 tenders, in which they assess their own competitive position relative to that of their perceived rivals.

- *Thales' internal documents*

8.179 In late 2018, Thales' Senior Market Analyst and the Capture Leader prepared a document which reviewed the competitive environment for the ECDP for the Thales GBU and the Urban Signalling Executive Committee. The aim of this document was to understand 'how the Thales/Atkins offer would be seen by Network Rail when compared to the likely offerings from the competitors [✂]. [✂].[395] [✂].

8.180 Thales' documents regarding HS2 show that it considered [✂] Hitachi to be strong competitors, [✂]:

(a) [✂], a Thales internal document was prepared by the Senior Market Analyst and the Bid Programme Manager for Thales' local UK team to facilitate a simulation exercise regarding the HS2 tender.[396] It reviewed the [✂]. It considered [✂]. In its analysis, [✂]. [✂].[397]

(b) In March 2021 (ie around the time the outcome of the PQQ was announced), the Head of the UK mainline business at Thales prepared a pre-ITT presentation for Thales' GBU and the Mainline Signalling Executive Committee in relation to the HS2 tender. [✂].[398]

8.181 As mentioned above (see paragraphs 8.79 to 8.82), Thales conducted a 'strategic review' in 2018 of opportunities presented by the UK market.[399] In this review, Thales considered future digital mainline signalling opportunities in the UK in general, [✂]. Thales noted that [✂]. We note that [✂].[400]

8.182 Thales' Network Rail Key Account Manager produced a presentation on 4 April 2020 for preparation of a meeting between the Vice President of Thales' mainline signalling business [✂]. In this presentation, [✂].[401] [✂].

(a) [✂].[402]

(b) [✂].

---

[395] Thales, Annex THALES-CMA-00207759, slides 26, 45, 62, and 79.
[396] Thales response to RFI dated 18 May 2023, page 3. [✂]
[397] Thales response to s109 Notice dated 23 December 2022, Annex s.109 T.Q14.004, slide 3.
[398] Thales, Annex HTH-000000596, '[✂]', slides 5, and 15.
[399] Thales response to RFI dated 23 December 2023, [✂].
[400] Thales response to RFI dated 23 December 2023, Annex T.Q12.002, slides 4, and 8.
[401] Thales, Annex THALES-CMA-00203853, slide 17.
[402] [✂].

(c) [✂].

(d) [✂].

(e) [✂].

- *Hitachi's internal documents*

8.183 In relation to the ECDP tender, Hitachi identified the suppliers that it considered had prequalified:

(a) Hitachi submitted a Phase Gate 1 internal document dated 25 October 2018 [✂].[403] Hitachi told us that [✂].

(b) Another document prepared by Hitachi's bidding team, dated 18 December 2018, to seek a decision on whether to respond to ITT ([✂]) [✂].[404]

8.184 Hitachi documents from different stages of the HS2 tender process show it considered [✂] Thales to be strong competitors, [✂]:[405]

(a) In one document produced in October 2021 (ie before the outcome of the PQQ was known) by Hitachi's Sales Manager for the Sales Director,[406] Hitachi listed the following suppliers [✂]. [✂]. It also noted [✂].[407]

(b) In a December 2021 document (ie during the first stage of the ITT),[408] in which Hitachi sought approval to continue to the ITT stage of the HS2 tender after PQQ, [✂]. This document shows that Hitachi considered Thales to be a strong competitor [✂].[409] Hitachi continued to assess its strengths and weaknesses as set out in paragraph 8.184(a) above. [410]

(c) In January 2022 (ie during the first stage of the ITT), [✂], Hitachi's Sales Manager and the Head of Sales-High Speed prepared another presentation with an assessment of Hitachi's competitors in the HS2

---

[403] Hitachi, [✂]. [✂].
[404] Hitachi, Annex HRL0004679.
[405] Thales, Annex HTH-000000596, 'Internal Executive Summary (Detailed Pack) for HS2', page 24. The HS2 signalling project and the TCSF have different features in terms of value and technical requirements (eg the HS2 is a greenfield). We still consider these documents to be relevant for our assessment to the extent they refer to the capabilities of each supplier in general. We note, in this respect, that Hitachi stated that 'Alstom and Hitachi see HS2 as CP7 Market Entry'.
[406] Hitachi response to RFI dated 18 May 2023, page 2.
[407] Hitachi, Annex HRL0016463, slides 29-30.
[408] Hitachi response to RFI dated 18 May 2023, page 2. Hitachi was unable to identify the author of this specific version. Hitachi submitted the Sales Manager was expected to have had overall responsibility for the final version. The document was produced for Hitachi's senior management.
[409] Hitachi, Annex H.109.Q2.043, slide 20.
[410] Hitachi, Annex H.109.Q2.043, slide 22.

tender, for discussion at the Phase Gate 2 meeting. This presentation also set out Hitachi's bid strategy.[411,412] [✂].[413] [✂]. This document suggests that Hitachi [✂] consider the [✂] in its analysis [✂].

8.185 Hitachi internal documents considered competitors for other digital tender opportunities in GB, including the [✂] line project from 2021. In its assessment of this opportunity, prepared in December 2021 by the Head of Sales and Sales Director for its senior management,[414] Hitachi identified [✂]. [✂]. The document [✂].[415]

8.186 In relation to Hitachi's documents considered above, Hitachi submitted that an assessment of competition between rail signalling providers is typically tender-specific.[416] In assessing these documents, we took into account that the considerations about each of the Parties' competitors in these documents are, to some extent, tender specific. We consider, however, that the Parties' evaluations of their competitors, even if these are made in the context of a specific tender, provide a helpful indication of the Parties' perception of their key competitors' strengths across different capabilities more generally. A competitive assessment in the context of one tender provides a snapshot of the market at that moment.

8.187 These documents show that Thales and Hitachi regularly monitor each other in relation to specific tenders and suggest that Thales and Hitachi consider each other as strong competitors. Although both Parties seem to consider Siemens and Alstom as stronger competitors overall, they see each other as having a strong technical offer and many ETCS references outside the UK. While CAF, Indra and CRSC are identified as possible competitors in some documents, they appear to be perceived as much weaker competitors in Europe by both Parties.

- *Our assessment*

8.188 As mentioned in paragraph 8.162(c), of the previous GB digital mainline signalling tenders to date, we consider that the ECDP and HS2 tenders are the most similar to the TCSF in terms of size and scale. However, we note

---

[411] Under Hitachi's approval process in place before April 2022, generally at the end of the Phase Gate 2 meeting, a decision would be taken on whether to approve the bid strategy, the bid cost budget and bid organisation. The purpose of the Phase Gate 2 meeting was to discuss, among other things, the project outline, costs, contractual arrangements, potential business partners, measures for risk mitigation and the necessity of product development.
[412] Hitachi response to RFI dated 18 May 2023, page 3.
[413] Hiatchi, Annex H.109.Q2.078, slides 16-17.
[414] Hitachi response to RFI dated 18 May 2023, page 2.
[415] Hiatchi, Annex H.109.Q3.009, slides 15-16.
[416] Parties' response to the AIS and WP, Annex A, page 2, and pages 11-12.

that neither of these tenders included some of the design features of the TCSF, including a firm commitment of future workbank and financial support to develop digital technology.

8.189 [✂]. Hitachi may have considered Thales as potential bidder for the ITT [✂].

8.190 [✂].

8.191 [✂].

Our provisional conclusion on suppliers' strengths based on digital GB tenders

8.192 The evidence on the mainline signalling tenders shows that several of these contracts were, in fact, not digital tenders. Others were testing facilities or very small and unlikely to attract non-GB bidders. [✂].

8.193 Regarding the two tenders that are most similar to the TCSF, the evidence shows that the Parties viewed each other as potential bidders for the ECDP and HS2 tenders. We consider this would have been the case at the PQQ stage and [✂]. The Parties viewed Siemens and Alstom as credible competitors for the ECDP and HS2 tenders.

8.194 Overall, the evidence on GB digital tenders is based on a relatively few tenders and is unlikely to provide a more reliable source of evidence on the Parties' relative strengths and competitiveness for the TCSF than the Parties' track record in delivering digital tenders in Europe.

Suppliers' characteristics

8.195 In this subsection, we consider the evidence on the suppliers' characteristics and, in particular, the extent to which the Parties and their rivals have assets or underlying capabilities that may make it more or less likely that they will be able to compete effectively. In particular, we consider suppliers' underlying strengths in relation to their access to technology, management and technical expertise, local presence and capacity in GB, their ability to innovate and their financial standing and size. All of these characteristics were identified as important factors by which suppliers will compete for the supply of digital mainline signalling projects in GB. We assessed the relative closeness between the Parties and their rivals by reference to these parameters.

Access to technology

8.196 Suppliers identified access to technology as a key parameter of competition in the mainline signalling market (see paragraph 7.97). In this section, we assess: (i) the closeness of competition between the Parties and their rivals in

relation to access to digital mainline signalling technology; and (ii) their ability to obtain approval from Network Rail for those technologies ('**homologation**').

8.197 Network Rail procures interlockings, ATP wayside and SCS subsystems as a bundled product (see paragraph 8.21). Network Rail told us that it would continue with this procurement strategy as bundling was 'the most effective and efficient way of delivering projects' and made the management of interfaces easier.[417]

8.198 Typically, OEMs develop and supply technological solutions while integrators provide installation and integration services for those solutions.[418] The Parties told us that it is the case that some integrators (or OEMs without access to the full suite of mainline signalling technology) may be able to compete with the technology providers, either through the development of their own solution, or by securing licensing or partnership agreements with a technology provider.[419]

8.199 We note that the development of technology can take place at a global or local level depending on the capabilities of each OEM. For instance, as set out below, the Parties rely on their global resources to develop a subsystem[420] whereas CAF's R&D investment efforts are fully carried out in Spain.[421]

8.200 In the following subsection, we consider: (i) the Parties' submissions on access to technology; (ii) whether the Parties are close competitors in relation to access to the technology required to deliver digital mainline signalling projects in GB, and how their position compares with the other OEMs; (iii) the estimated costs of homologation; (iv) the evidence on integrators' ability to access technology; and (v) the potential risks of providing a digital mainline signalling solution comprised of multiple suppliers' technologies.

Parties' views

8.201 The Parties submitted that most OEMs have access to the full suite of digital mainline signalling technology.[422] For those suppliers that do not have access

---

[417] Network Rail questionnaire response, Q 9(a). Network Rail submitted that it would purchase all subsystems together as bundling is 'the most effective and efficient way of delivering projects' and that it 'provides clarity and makes the management of interfaces […] easier.'
[418] Amey call transcript, 21 February 2023, page 3; Atkins call transcript, 2 February 2023, page 3; and Linbrooke call transcript, 21 February 2023, page 4.
[419] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.2.
[420] Hitachi owns various R&D centres that undertake development work for its signalling business and its R&D function primarily sits in Japan. Hitachi does not develop mainline subsystems specifically for UK projects eg it would use the same interlocking technology in various countries. See, Hitachi response to RFI dated 4 May 2022, Q 9, Q 12, and Q 15. Thales' mainline signalling systems can be developed by various of its R&D centres. In this regard, Thales submitted that, [✂]. See, Thales response to RFI dated 4 May 2022, Q 11.
[421] 'R&D – CAF Signalling', last accessed on 6 June 2023.
[422] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 4.22(a).

to all the subsystems, the Parties submitted that access to signalling technology could be obtained through:

(a) Licensing, citing Atkins as an example of an integrator that has access to an interlocking that was obtained through a licence from Alstom. The Parties told us that incumbents – Siemens and Alstom – have historically licensed their technology and would be incentivised to license their digital technology to integrators, as it would provide an additional revenue stream.[423] Thales, however, told us that [✂].[424] We consider the Parties' submissions in relation to Atkins and licensing in more detail below, see paragraph 8.220(d).

(b) Partnering with other technology providers.[425] The Parties submitted that partnerships between suppliers were common practice in the GB mainline signalling market.[426] The Parties told us that it was not unusual for an integrator to provide in its scope of work some of the key technologies (such that the integrator's role goes beyond simply providing delivery capability) in partnerships/consortia.[427] In addition, the Parties submitted that OEMs such as Siemens were 'regularly' mandated by Network Rail to subcontract other OEMs (Resonate) to provide the SCS subsystem.[428]

8.202 The Parties submitted that integrators could exercise a meaningful competitive constraint and that integrators' ability to access technology should not be underestimated.[429] In support of integrators' ability to access technology and compete on a standalone basis, the Parties provided examples of projects in which integrators have successfully bid as 'lead partners':[430]

(a) Atkins' National ETCS Test Verification Validation and Integration ('TVV&I') Laboratory that would be used for CP7 and CP8;

(b) Linbrooke's West Hampstead recontrol project where it was the lead contractor, using Siemens' control system technology;

[423] Parties' response to the AIS and WP, 2 May 2023, paragraph 4.4; and Thales, Main Party Hearing transcript, 5 May 2023, page 44.
[424] Thales, Main Party Hearing transcript, 5 May 2023, page 44.
[425] Parties' response to the AIS and WP, paragraphs 3.3 and 4.18.
[426] Parties' response to the AIS and WP, paragraph 4.18.
[427] Parties' response to the AIS and WP, paragraph 4.5.
[428] Parties, Submission on ETCS ATP wayside resignalling projects, paragraphs 6.3.14-6.3.15.
[429] Parties' response to the AIS and WP, paragraph 4.4.
[430] Parties' response to the AIS and WP, paragraph 3.3; and paragraphs 4.3-4.4.

(c) VolkerRail's re-signalling and re-control project for the Hope Valley Railway Upgrade (in 2020), where it was the lead supplier using licenced technology from Alstom-Bombardier and Resonate; and

(d) Atkins' 2017 contract for the re-signalling of the Norwich-Yarmouth Lowestoft route, using Alstom – Bombardier's interlocking technology.[431]

8.203 The Parties also submitted that interfacing between subsystems of different suppliers within a partnership/consortium did not pose a significant risk and the introduction of EULYNX would further reduce any interfacing risks.[432] The Parties identified six examples of partnerships/consortia where mainline signalling technology was combined to offer a complete mainline signalling solution:[433]

(a) The Roma-Napoli project. Hitachi partnered with Alstom who supplied interlockings and RBC technologies, respectively. This project entered 'revenue service' in 2005.[434]

(b) The TransPennine Route Upgrade tender involved bidders' RBC technology interfacing with Siemens' and Alstom's interlockings, and with Siemens' and Resonate's SCS.

(c) The Atkins-led consortium comprising Atkins and Thales for the ECDP tender involved a bid where [✂].

(d) In the context of the Italian rail signalling network upgrade to ERTMS, Hitachi partnered with Progress Rail and Mermec. Hitachi will supply [✂] technology, and both Progress Rail and Mermec will supply [✂].

(e) Hitachi won two ETCS contracts in Germany, for which its ETCS ATP wayside technology must interface with the Thales' and Siemens' interlockings.

(f) Kombud (interlockings) and CAF (providing ETCS ATP wayside) formed a partnership in Poland in 2021. The partnership has since developed a lab demo based on Kombud's interlocking and CAF's RBC.

---

[431] Parties' response to the AIS and WP, paragraphs 4.4; and Parties' response to RFI dated 27 April 2023, paragraph 2.5.
[432] Parties' response to the AIS and WP, paragraphs 2.7; and paragraphs 4.20-4.21.
[433] Parties' response to the AIS and WP, 2 May 2023, paragraph 4.20; and Hitachi's response to RFI dated 3 May 2023, Q 11(ii).
[434] Parties' response to the RFI dated 3 May 2023, paragraph 11.4.

8.204 The Parties submitted that they were in 'significantly divergent positions' [✂]:[435]

(a) [✂].[436]

(b) [✂].[437]

8.205 Hitachi told us that [✂]. The Parties therefore submitted that Thales would not exercise a competitive constraint on Hitachi.[438]

8.206 However, the Executive Director for Rail Control and Corporate Officer of Hitachi told us that [✂] in the context of CP6 would [✂].[439]

Closeness of competition between the Parties and their rivals on access to technology

8.207 To compete for Lot 2 of the TCSF, suppliers must have access to digital mainline signalling technology, but this technology does not need to be GB approved prior to bidding.

8.208 Industry feedback suggested suppliers who had access to GB approved mainline signalling technology have a competitive advantage when bidding for Lot 2 of the TCSF.[440]

8.209 Table 9 provides details on digital mainline signalling subsystems that suppliers who have responded to the PQQ for Lot 2 of the TCSF have access to, as well as whether those subsystems have been approved for deployment on the GB railways.

Table 9: Suppliers' access to digital mainline signalling technology and GB approval

[✂]

Source: CMA analysis.

---

[435] Parties' response to the AIS and WP, paragraph 5.6.
[436] Parties, Submission on Competitive Effects, paragraph 3.38.
[437] Parties' response to the AIS and WP, paragraph 5.7.
[438] Parties, Submission on Competitive Effects, paragraph 3.43(a).
[439] Hitachi Main Party Hearing transcript, 26 April 2023, page 13, and pages 28-29.
[440] Network Rail submitted that the latest generation of interlockings for conventional mainline signalling are on a technological level the same as for digital mainline signalling (Network Rail call transcript, 6 February 2023, page 13). [✂]. Hitachi's response to RFI dated 23 March 2023, Q 3. Furthermore, the majority of the OEMs and integrators that responded to our questions submitted that a supplier with experience in conventional signalling in the UK would have an advantage when bidding for the TCSF. See Amey questionnaire response, Q 12; Alstom questionnaire response, Q 12; CAF questionnaire response, Q 12; Costain questionnaire response, Q 12; EQUANS questionnaire response, Q 12; Indra questionnaire response, Q 12; Linbrooke questionnaire response, Q 12; Mermec questionnaire response, Q 12; Stadler questionnaire response, Q 12; and Volker Rail call transcript, 15 February 2023, page 21.

8.210 We provide further detail on each of the suppliers' digital mainline signalling technological solutions below:

(a) [✂].[441,442,443,444]

(b) [✂].[445]

(c) [✂].[446,447,448]

(d) [✂].[449,450]

8.211 Given suppliers would need to have GB approved technology to deliver digital mainline signalling projects, and most potential competitors for the TCSF would need to undergo the GB approval process, we have assessed the estimated costs of the GB homologation process.

The estimated cost of homologation to GB technical requirements

8.212 We asked the Parties, Network Rail, and suppliers to provide estimates for the cost and time required to complete the GB product approval process for digital mainline signalling solutions.

8.213 Thales estimated that [✂].[451] Thales submitted that its estimated homologation costs [✂][452] [✂].[453]

8.214 Hitachi submitted that it would need to invest approximately [✂].[454] The Parties submitted that the approval process would take between [✂] years.[455]

8.215 Suppliers submitted estimates to obtain GB product approval for digital interlockings, ETCS ATP wayside level 2, and SCS subsystems. On average, the suppliers estimated the GB product approval process for all three subsystems at approximately £14.6 million over a four-year period. The investment requirements submitted by suppliers for interlockings ranged

---

[441] [✂].
[442] [✂].
[443] [✂].
[444] [✂]
[445] [✂]. [✂]. [✂].
[446] [✂].
[447] [✂].
[448] [✂]. [✂]. [✂]. [✂].
[449] [✂]. [✂]; [✂]; [✂]. [✂]. [✂]; [✂]. [✂]. [✂].
[450] [✂].
[451] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 4.12; and footnote 31. We note that Thales did not [✂]. See paragraph 8.210(a) for more detail. Parties, Submission on Competitive Conditions, paragraph 4.6(a).
[452] Thales' response to RFI dated 23 December 2022, Q 12, and Q 24.
[453] Parties' response to the AIS and WP, footnote 110.
[454] Parties, Submission on ETCS ATP wayside resignalling projects, paragraphs 1.7(b), 3.38, and 4.12.
[455] Parties, Submission on Competitive Conditions, paragraph 4.6(a).

between £3.7–10 million. For ETCS ATP wayside, the investment requirement ranged between £1.5–10 million, and for SCS, the investment requirement ranged between £3–5 million. Five of the seven respondents (including the Parties) submitted that that the process would take three years or less.[456]

(a) [✂].[457]

(b) Amey submitted that its digital interlockings were currently undergoing the UK approval process but that it would need an 18-to 24-month investment of £6–8 million to develop a EULYNX compatible full system.[458]

8.216 [✂].[459]

8.217 Thales' product approval cost estimate [✂] provided by suppliers and Network Rail's estimate. As mentioned in paragraph 8.213, Thales explained that [✂].[460] [✂].

8.218 We consider that any competitive advantage that Hitachi may have from [✂] is likely to be small.[461] [✂]. [✂].[462]

Access to technology by integrators

8.219 In relation to the Parties' submissions that integrators could access technology and compete for the TCSF, we note:

(a) [✂];

(b) No integrator has obtained a licence for digital mainline signalling technology to supply signalling subsystems for the TCSF; and

(c) [✂].

8.220 Further, the Parties' submissions are broadly inconsistent with the evidence we have received from third parties, namely:

(a) Network Rail submitted that suppliers without access to technology would be limited in their ability to compete for digital mainline signalling projects

---

[456] CMA analysis of competitor questionnaire responses.
[457] [✂]. [✂]. [✂]. [✂].
[458] [✂].
[459] [✂]; [✂].
[460] Thales' response to RFI dated 23 December 2022, Q 12 and Q 24; and Parties' response to the AIS and WP, footnote 110.
[461] We note that Hitachi's [✂].
[462] Thales, Main Party Hearing transcript, page 27.

in GB, and this would limit the number of potential bidders for Lot 2 of the TCSF.[463]

(b) Resonate told us that its lack of access to the full suite of mainline signalling technology – among other factors – means it has no direct route to market. Resonate added that integrators without access to the full suite of digital mainline signalling technology – such as Amey – would be unable to bid for Lot 2 of the TCSF without an OEM partner.[464]

(c) Four of the seven integrators that responded to our questionnaire submitted that they would be open to entering licensing agreements to obtain access to digital mainline signalling technology but that the OEMs would be unwilling to grant licences, as this would strengthen their competitors.[465]

(d) Atkins told us its ElectroLogIXS interlocking (which is licensed from Alstom) was not ETCS level 2 compliant and therefore would not be ready to use for digital mainline signalling projects. Atkins explained that it would be feasible to obtain digital compliance but indicated that Alstom has not been prepared to work with Atkins to undertake this development.[466] Atkins told us that in previous bids, it had 'struggled to receive timely and/or competitive sub-contractor responses from Siemens and Alstom'.[467]

(e) ORR told us that integrators would face significant challenges in bidding for the TCSF on a 'level footing with the OEMs'.[468]

8.221 With regard to the examples provided by the Parties in which integrators were the lead bidder and/or bid without the support of an OEM, the integrators told us that none of the opportunities identified by the Parties referred to digital mainline signalling projects.[469]

8.222 Based on the above evidence, we do not consider that integrators would be able to compete on a standalone basis, and partnering with an OEM appears

---

[463] Network Rail call transcript, 6 February 2023, page 11.
[464] Resonate call transcript, 14 February 2023, page 5, and Resonate call transcript, 14 February 2023, page 15.
[465] Atkins response to RFI dated 4 May 2023, Q 2; Colas Rail questionnaire response, Q 10; Linbrooke questionnaire response, Q 10; and VolkerRail questionnaire response, Q 10. The other three integrators told us they would not enter licensing agreements. Costain explained this was because it did not believe it would offer good value for the client; EQUANS submitted that it did not intend to enter the UK market and so therefore had not considered licensing; and Amey did not provide a rationale. See, Costain questionnaire response, Q 10; EQUANS questionnaire response, Q 10; and Amey questionnaire response, Q 10.
[466] Atkins response to RFI dated 4 May 2023, Q 2.
[467] Atkins call transcript, page 12.
[468] ORR's submission to the CMA, paragraph 16.
[469] Atkins response to RFI dated 4 May 2023; and VolkerRail response to RFI dated 4 May 2023.

to be the only feasible option available for integrators to compete for digital mainline signalling projects.

Interfacing digital mainline signalling technology within partnerships/consortia

8.223 OEMs told us suppliers that could offer a full suite of digital mainline signalling technology would have a competitive advantage compared to partnerships/consortia that offer a technical solution comprised of multiple suppliers' technologies.[470] OEMs submitted that a single supplier solution reduced the number of interfaces required, which in turn reduced costs and risks, and enabled suppliers to deliver digital mainline signalling projects with more efficiency.[471] CAF explained that these interfacing risks were most prevalent when the digital interlocking and RBC are provided by different suppliers.[472] Indra considered a single supplier that had access to all the digital mainline signalling subsystems (and therefore a pre-interfaced system) would have advantages over consortium suppliers, as the 'pre-designed integration procedures' would reduce time and cost.[473]

8.224 These suppliers also told us that it was common practice to interface their interlockings with other suppliers' SCS subsystems to form a mainline signalling solution. In GB, Network Rail has often procured SCS subsystems via a separate tender exercise or mandated that SCS subsystems were contracted to designated suppliers.[474] As a result, most suppliers considered interfacing SCS subsystems with other digital mainline signalling technology would likely present limited risk.[475]

8.225 ORR told us that historically there appear to have been some perceived risks linked to using technology from different suppliers for each signaling subsystem.[476]

8.226 The introduction of a mandatory EULYNX requirement could reduce interfacing risks for partnerships/consortia and therefore offset the competitive advantage providers of the full suite of mainline signalling technology hold. While ORR said that this might work in principle, it considered that there

[470] CAF response to RFI dated 23 March 2023, Q 2; Indra questionnaire response, Q 11; Indra response to RFI dated 29 March 2023, Q 5; Mermec questionnaire response, Q 11; and Progress Rail questionnaire response, Q 11.
[471] Alstom questionnaire response, Q 11; CAF questionnaire response, Q 11; Indra questionnaire response, Q 11; Mermec questionnaire response, Q 11; and Progress Rail questionnaire response, Q 11.
[472] CAF response to RFI dated 23 March 2023, Q 2.
[473] Indra questionnaire response, Q 11.
[474] CAF response to RFI dated 23 March 2023, Q 2; and Resonate call transcript, 14 February 2023, page 5.
[475] CAF response to RFI dated 23 March 2023, Q 2, and Q 3(a).
[476] ORR call transcript, 27 March 2023, pages 20-22.

would always be risk and raised doubts about the viability of multi-supplier solutions, in particular with reference to interlockings and RBC.[477]

8.227 With regards to the Parties' submission that it was common for suppliers to interface mainline signalling technology within partnerships/consortia (see paragraphs 8.201(b) and 8.203), our review found that only one of the Parties' six examples - the Roma-Napoli project (see paragraph 8.203(a) – related to a project where the interlocking and RBC were provided by two different suppliers. We note that this project took place more than 18 years ago in 2005. In relation to the Parties' other five examples, we note:

(a) The TransPennine route upgrade was cancelled by Network Rail prior to commencement, ie the multi-supplier signalling system was not deployed;

(b) [✂];

(c) Hitachi's Italian framework agreement related to overlay projects, in which Hitachi's ETCS was required to interface with another supplier's interlocking rather than being an example of a partnered signalling solution;[478]

(d) Hitachi's two ETCS contracts in Germany related to overlay projects, in which Hitachi's ETCS was required to interface with another supplier's interlocking rather than it being an example of a partnered signalling solution; and

(e) CAF and Kombud's joint digital mainline signalling solution in Poland was developed for a laboratory demonstration and has not been deployed on a live railway environment.

8.228 We consider that the above examples do not provide strong evidence that the interfacing of subsystems within partnerships/consortia is 'common' practice. Other third-party evidence indicated that digital mainline signalling solutions comprising multiple suppliers' technology interfaced within partnerships/consortia presents risks. [✂] would be expected to compete closely in this regard.

[477] ORR call transcript, 27 March 2023, page 20.
[478] Hitachi response to RFI dated 3 May 2023, Q 11(i).

Provisional conclusion on suppliers' access to technology

8.229 Access to technology is a key parameter of competition for the TCSF. Based on the evidence above, suppliers without access to technology would be unable to compete for Lot 2 of the TCSF as single entities. [✂].

8.230 Suppliers with access to their own full suite of digital mainline signalling technology would be likely to have a competitive advantage. These suppliers would have fewer interfaces and would face lower interfacing risks. Suppliers indicated that these risks were particularly prevalent in multi-supplier solutions where different suppliers supplied the interlocking and RBC subsystems.

8.231 Both Parties have access to the full suite of digital mainline signalling technology that has been deployed and homologated in many digital mainline signalling projects in Europe (see *Management experience* section). [✂]. It is, however, not clear that [✂] would lead to Thales being a less strong supplier for Lot 2 of the TCSF, particularly given Hitachi would still [✂] and would not be able to deliver digital mainline signalling projects materially in advance of Thales. Based on the evidence above, we consider that the Parties are likely to be close competitors with regards to the access to technology parameter of competition.

8.232 Alstom and Siemens would likely be strong competitors in relation to the access to technology parameter, as both these suppliers have GB product approval for digital mainline signalling systems or would do with limited further modification. [✂].

Management experience and technical expertise

8.233 We have identified 'management experience and technical expertise' (**'management experience'**) as one of the parameters by which suppliers compete for digital mainline signalling projects. Management experience is relevant for a number of criteria against which Network Rail will conduct its tender evaluation, including project delivery, product development, collaboration and capability development (see *Parameters of competition* section for more detail). The Parties submitted that we have ignored the management experience and technical expertise of integrators in our assessment, but as we explain below, this section considers the experience of suppliers that have undertaken digital mainline signalling projects.[479] The evidence we have received to date suggests integrators have limited if any track record of winning and undertaking digital mainline signalling projects.

[479] Parties' response to the AIS and WP, paragraph 4.17, and 4.22(b).

We note, however, that integrators have other strengths, and we consider those capabilities in more detail in the *Experience on the GB mainline* section.

8.234 In this section, we consider the importance of, and suppliers' relative strengths in relation to:

(a) Experience in undertaking digital mainline signalling projects; and

(b) Experience in homologating technologies in different countries.

Experience in undertaking digital mainline signalling projects

8.235 We first set out the evidence in relation to the importance of this parameter. We then assess suppliers' strengths in undertaking digital mainline signalling projects in Europe.

- *Importance of experience in undertaking digital mainline signalling projects*

  - *Parties' views*

8.236 The Parties submitted that our assessment in the working papers overstated the importance of management experience and technical expertise. The Parties agreed that Network Rail would take European references into account but submitted that GB project references would be likely to carry more weight.[480] The Parties submitted that suppliers would only need to provide one appropriate reference.[481]

8.237 The Parties submitted that suppliers would submit references that they consider to be the most similar to the project being tendered and the only determinative variants of references are likely to be the size of the project and whether the project was brownfield or greenfield.[482]

  - *Third-party views*

8.238 Network Rail submitted that it would evaluate suppliers based on their previous experience of delivering similar scale activity and similar levels of technology development and maturity.[483] Network Rail would require suppliers to submit up to three examples of previous mainline signalling projects [✂]. Network Rail told us that the key factor regarding the relevance of reference

[480] Parties' response to the AIS and WP, paragraph 4.22(b).
[481] Hitachi's response to RFI dated 23 December 2022, Q 16.
[482] Parties' response to the AIS and WP, paragraph 4.13.
[483] Network Rail call transcript, 6 February 2023, page 24.

projects was whether the technology used on that project aligned with the technical criteria set out in the TCSF tender documents.[484]

8.239 Network Rail told us that it considered previous experience to assess whether suppliers were able to:[485]

(a) Demonstrate as an international organisation that they have the experience of going through the 'maturity curve' in the development of digital mainline signalling technology; and

(b) Explain how their technology would integrate in GB.

8.240 OEMs and integrators submitted that suppliers with more experience in delivering digital mainline signalling projects would have a greater likelihood of undertaking projects of a similar scale and scope to those procured via the TCSF and would therefore have a competitive advantage when bidding for Lot 2 of the TCSF.[486] Competitors told us that experience in undertaking projects would provide references to support tender bids (as explained by the Parties). Competitors also indicated that, by undertaking more digital mainline signalling projects, they would learn how to improve technical and operational efficiencies. More experienced suppliers would also be better placed to be able to identify risks in advance and to avoid repeating past mistakes.[487] Siemens, one of the leading suppliers, submitted that, like other 'big' companies, it would share and spread information across the company to improve the organisation's experience.[488]

- *Our provisional assessment*

8.241 In summary, based on the evidence above, suppliers with a larger portfolio of projects and broader level of experience would be better placed to provide references in response to Network Rail's tender evaluation. Network Rail considers in its tender evaluation whether suppliers can demonstrate going through the 'maturity curve'. The evidence suggests that more experienced suppliers would be better placed to troubleshoot potential issues that Network Rail might face in future, as they would have a higher likelihood of having undertaken projects similar to Network Rail's TCSF projects. Suppliers with more experience would also likely benefit from technical and operational

[484] Network Rail questionnaire response, Q 12(iii).
[485] Network Rail call transcript, 6 February 2023, pages 21-22; and page 23.
[486] CAF questionnaire response, Q 13(b); Costain questionnaire response, Q 12(d); Indra questionnaire response, Q 12; Mermec call transcript, 14 February 2023, pages 13-14; and Stadler questionnaire response, Q 13(b).
[487] Siemens call transcript, 6 February 2023, page 17.
[488] Siemens call transcript, 6 February 2023, page 18; and Indra questionnaire response, Q12.

efficiencies and be better equipped to identify and tackle project risks than those suppliers with more limited digital mainline signalling project experience.

- *Suppliers' strengths in undertaking digital mainline signalling projects in Europe*

8.242 To assess the relative strength of suppliers' management experience, we first considered evidence from the Parties and third parties and then undertook our own analysis on suppliers' relative strengths. Our analysis compares the number and size of digital mainline signalling projects that each supplier has undertaken in Europe (including GB) between 2012 and 2021, and compared those projects won against the size of projects that would be procured via Network Rail's Lot 2 indicative workbank.[489]

- *Parties' views*

8.243 The Parties submitted an analysis of the number of European digital mainline signalling projects (either interlockings as a standalone project or purchased together with ETCS Wayside) that each European supplier (excluding Siemens and Alstom) has undertaken to date. The results were as follows:[490]

(a) Thales had the most digital mainline signalling projects in Europe ([✂]) out of the suppliers included in the analysis;[491]

(b) Hitachi had the second most references with [✂];[492]

(c) Enyse had the third most references with [✂];

(d) CAF had the fourth most references with [✂], obtained in Spain, Bulgaria and Slovenia; and[493]

(e) The 14 other suppliers identified in the Parties' analysis had no more than 10 references each; Indra and Mermec had [✂] and [✂] references respectively.

---

[489] We collated project win data from seven European OEMs: the Parties, Alstom, CAF, Indra, Mermec and Siemens. The values stated are the total contract value.
[490] Parties' own calculations based on their data for digital mainline signalling (encompassing digital interlockings, ETCS ATP wayside and digital SCS) in EEA+UK+CH in the period 2012-2022. The European OEMs identified by the Parties were AZD-Praha, CAF, CRRC, CRSC, Enyse, HollySys, Indra, Kombud, Mermec, Mersen, Mipro, Pesa, Pintsch, Progress Rail, Scheidt & Bachmann, Stadler, Terna, and Wabtec. Parties' response to RFI dated 24 November 2022, Annex Q.4.
[491] Thales had [✂] references and Hitachi had [✂].
[492] The Parties later submitted that Hitachi's references total [✂] but have not provided any evidence to support this change.
[493] While we note that Parties identified that CAF was active in Slovenia, CAF submitted that [✂]. CAF questionnaire response, Q 2, and Q 4.

8.244 The Parties also noted that, even when considering OEMs' references alone, a number of new entrants have sufficient prior experience to satisfy this PQQ criterion.[494]

8.245 The Parties' analysis shows that Thales had substantially more references than the European OEMs included in the analysis (noting that they excluded Siemens and Alstom), in terms of experience in undertaking digital mainline projects, Hitachi has a lower number of references than Thales, but higher than CAF and, by a large distance, than Indra and Mermec. We have constructed our own dataset of digital mainline signalling projects delivered by each supplier, including Siemens and Alstom (see paragraphs 8.250 and 8.251).

- *Third-party views*

8.246 Network Rail submitted that the Parties, Alstom and Siemens had significant experience in delivering large scale digital mainline signalling projects and that their experience would make them strong competitors for the TCSF.[495] In Network Rail's view, there were few differences in the 'ultimate capability' of the Parties, Siemens, and Alstom.[496] Network Rail considered that CAF and Indra did not hold the same 'dominant' position in Europe as the Parties, Alstom and Siemens.[497]

8.247 ORR told us that on a European-wide basis it was not 'aware of any strong credentials in shares of supply terms outside the European "big four"' and that the 'lack of overall market share could have significant implications for such players' product portfolio, capacity levels and ability to supply credentials to Network Rail'.[498] ORR submitted that the Parties were comparable regarding their significant European market shares.[499] ORR believed that, given the relatively small pool of players which Network Rail has historically relied on and the significant global signalling credentials of both of the Parties, the Merger would have implications for Network Rail in its efforts to broaden its pool of suppliers.[500]

---

[494] The PQQ criterion referred to here by the Parties was Project Delivery, see Table 2 for more detail on this criterion. Parties' response to the AIS and WP, paragraph 4.22(b).
[495] Network Rail questionnaire response dated 4 January 2023, Q 11; and Network Rail call transcript, 6 February 2023, page 14.
[496] Network Rail call transcript, 6 February 2023, page 16.
[497] Network Rail added that Indra 'might have undertaken one or two' digital projects that have gone into service. Network Rail call transcript, 6 February 2023, page 16.
[498] ORR submission to the CMA, paragraph 13.
[499] ORR call transcript, 16 February 2023, page 26.
[500] ORR submission to the CMA, paragraph 8.

8.248 This view was broadly shared by the competitors that spoke to us.[501] Competitors identified the Parties, Alstom and Siemens – owing to their experience in undertaking digital projects in Europe – as the 'big four'.[502] Competitor feedback indicated that CAF, Indra and Mermec had less digital mainline signalling experience than the 'big four'.[503] Alstom suggested that CAF had the most references out of the other OEMs; Alstom told us that while CAF had some 'interesting' references in Spain, these were not equivalent to the 'big four'.[504]

- *Analysis of digital mainline signalling projects undertaken by suppliers in Europe*

8.249 We consider that an aggregate assessment based on size and number of projects undertaken by suppliers is a reasonable indicator of suppliers' general experience. Based on the evidence in paragraphs 8.238 and 8.241, we consider that suppliers with more experience in delivering digital mainline signalling projects (including outside GB) may be better placed to resolve localised specific problems and better able to identify industry best practices, as those suppliers would be able to draw on a wider pool of projects and would have a higher likelihood of having faced similar issues in the past.[505]

8.250 For the reasons set out above in paragraph 8.249, we have focused on those suppliers that have won and undertaken digital mainline signalling projects. No evidence has been provided by the Parties or integrators to suggest that integrators have routinely won digital mainline projects as standalone bidders.[506] We consider integrators' project delivery and other experience in the 'GB mainline sector' section below.

8.251 Figure 1 presents the volume and value of digital projects the European OEMs have undertaken in Europe (including GB) between 2012-2021.

---

[501] Siemens call transcript, 6 February 2023, page 18; Alstom call transcript, 8 February 2023, page 11; CAF call transcript, 13 February 2023, page 8; VolkerRail call transcript, page 14; and Resonate call transcript, 14 February 2023, page 15. Overall, competitors stated that the Parties are credible bidders for the TCSF Lot 2 (see 'Other evidence on the suppliers' strengths' section).
[502] Alstom call transcript, 8 February 2023, page 5. In addition, CAF described the Parties, Siemens, and Alstom as 'the usual big companies.' CAF call transcript, 13 February 2023, page 10.
[503] Alstom call transcript, 8 February 2023, page 13; Alstom call transcript, 8 February 2023, pages 14-15; and Siemens call transcript, 6 February 2023, page 19.
[504] Alstom call transcript, 8 February 2023, page 14.
[505] Network Rail was unable to define the scope of its future digital projects. Our analysis is focused on the number and size of projects undertaken and does not reveal other factors of experience that may be of interest in Network Rail's assessment of suppliers' strengths, such as specific examples of how suppliers have solved particular problems in particular circumstances.
[506] Atkins has won a contract in relation to the delivery of Network Rail's National ETCS TVV&I Laboratory, ie a testing centre to be used for CP7 and CP8. Atkins told us that the contract it won is for the provision and management of the test facility to ISO/IEC 17025 Laboratory. The contract is a laboratory testing services agreement and contains no operational and live digital mainline signalling system delivery scope. Atkins' email to the CMA, dated 10 May 2023.

Figure 1: Volume and value of digital projects the European OEMs have undertaken in Europe (including GB) between 2012-2021

[✂]

Source: CMA bidding data analysis.
[✂].

8.252 Figure 1 shows that:

(a) Thales is the second largest competitor in Europe by value and volume of digital contracts won.

(b) Hitachi is the fourth largest competitor in Europe by value and volume of digital contracts won.

(c) Siemens is the largest competitor in Europe by value and third largest by volume of digital contracts won.

(d) Alstom is the third largest competitor in Europe by value and largest by volume of digital contracts won.

(e) CAF and Indra are substantially smaller than the Parties in Europe, especially Thales. Indra has undertaken one more digital project compared to CAF, but cumulatively these projects have a lower value than the six undertaken by CAF.

8.253 The analysis shows that the Parties, Siemens and Alstom have significantly more experience in undertaking a large number of large scale digital signalling projects than CAF and Indra. This analysis is consistent with the views of Network Rail and competitors that the Parties are two of four major suppliers in Europe. In terms of experience, the Parties are close competitors and have developed considerable experience in delivering digital mainline signalling projects.

8.254 Figure 2 below compares the number of projects undertaken by European OEMs in Europe (including GB) between 2012-2021, segmented by the project categories used by Network Rail (ie £15–49 million, £50–99 million; and £100 million plus).

Figure 2: Volume of digital projects the European OEMs have undertaken by value in Europe (including GB) between 2012-2021

[✂]

Source: CMA bidding data analysis
[✂].

8.255 Figure 2 shows that:

(a) The Parties have delivered a substantial number of digital projects across each of the value categories.

(b) Only the Parties, Siemens and Alstom have experience in delivering high value digital projects over £100 million.

(c) Indra has [✂].

8.256 Our analysis shows that the Parties have experience in delivering high value digital mainline signalling projects which are likely to be comparable to the projects that will be commissioned during Network Rail's TCSF.

8.257 As mentioned in paragraph 7.21, Network Rail does not intend to commission digital mainline signalling projects with a project value less than £15 million. Table 10 below presents the volume of digital projects the European OEMs have undertaken in Europe (including GB) between 2012-2021 with a value greater than £15 million.

Table 10: Volume of digital projects the European OEMs have undertaken in Europe (including GB) with a value greater than £15 million between 2012-2021

Supplier	*Number of digital projects undertaken with a value equal to or greater than £15 million*
Thales	[✂]
Alstom	[✂]
Siemens	[✂]
Hitachi	[✂]
CAF	[✂]
Indra	[✂]

Source: CMA bidding data analysis.
[✂].

8.258 Table 10 shows that:

(a) Thales has undertaken a similar number of digital projects that are comparable to Network Rail's indicative workbank as Alstom and Siemens.

(b) Hitachi has undertaken substantially more digital projects that are comparable to Network Rail's indicative workbank than CAF and Indra and less than Siemens, Thales and Alstom.

(c) CAF and Indra have very limited experience in undertaking digital projects that are comparable to Network Rail's indicative workbank.

8.259 CAF and Indra's limited available reference projects of a similar size and scope to the anticipated digital projects within the TCSF puts them at a significant disadvantage compared to the Parties, Alstom, and Siemens.

8.260 In summary, our analysis shows that the Parties are close competitors in relation to their experience in delivering digital projects in Europe. Both Hitachi and Thales have undertaken numerous large scale, high value digital mainline signalling projects that are of a similar size to those digital projects that will be procured through the TCSF.

8.261 Our analysis also shows that Alstom and Siemens have more experience in undertaking digital mainline signalling projects than Hitachi but have broadly similar levels of experience to Thales. By contrast, CAF and Indra have significantly less experience in undertaking digital mainline signalling projects than the Parties. CAF and Indra have limited portfolios of projects that are similar in size to the projects that will be procured by Network Rail, with CAF having three projects over £15 million, and Indra one. Neither CAF nor Indra has undertaken any digital project with a value of £100 million or greater, and Indra has no project over £50 million while CAF has two such projects within its portfolio. While CAF is marginally stronger than Indra in this regard, by comparison to the Parties, Siemens, and Alstom, each of CAF and Indra has significantly less management experience. The Parties, Siemens and Alstom have demonstrated a range of project experience – in particular in relation to larger scale projects – that are more aligned to the variety and scope of the projects so far identified by Network Rail for inclusion in the TCSF than is shown by the smaller OEMs.

- *[✂]*

8.262 The Parties submitted [✂].

(a) Thales submitted that [✂]. [✂].[507]

(b) Hitachi submitted that [✂].[508]

8.263 [✂].

- *Internal documents about the competitive strength of digital mainline signalling suppliers*

8.264 We assessed the Parties' internal documents in which each of the Parties assesses its own and its rivals' strengths in relation to the delivery of digital mainline signalling projects in general.

---

[507] [✂].
[508] [✂].

8.265 Each of the Parties submitted a small number of strategic documents in which each assesses the technical capabilities of the main global competitors in the delivery of digital mainline signalling projects. For example:

(a) One strategic document prepared by Hitachi's Chief Strategy Officer for Hitachi's senior management in October 2019 set out an analysis of its main competitors as part of a strategy refresh document. In this document, Hitachi [✂]. [✂].[509] Hitachi submitted that [✂]. For the reasons explained above, we consider that Hitachi's views of its competitors in Europe are informative about the capabilities and credibility of these players in supplying mainline signalling systems in GB.[510]

(b) One strategic document prepared by Thales' former VP Sales of ground transportation systems for potential purchasers of Thales in May 2021 provided an overview of each business line's performance.[511] [✂].[512] Thales submitted that [✂].[513]

8.266 In assessing these documents, we took into account that they consider European market dynamics and do not specifically relate to GB. For the reasons set out at paragraph 8.249, we consider that experience in undertaking digital projects and homologating technologies outside GB are reliable indicators of suppliers' ability to compete for digital mainline signalling projects in GB. These documents indicate that Thales and Hitachi perceive each other among their main competitors, with strong technical capabilities and a strong presence in Europe, alongside Siemens and Alstom. They also suggest that other competitors such as CAF are viewed by the Parties as being technically weaker than the Parties, Siemens and Alstom.

8.267 Hitachi and Thales' internal documents are also informative about the importance of their own global management experience in relation to the GB digital mainline signalling market.

8.268 In relation to Hitachi, an internal document prepared in July 2022 by Hitachi's Sales Manager responding to questions sent by a communications consultancy for the purposes of assisting Hitachi's signalling commercial campaign to outline Hitachi's unique selling proposition. [✂]. The Parties told us that, given the purpose of this document, its aim was to embellish Hitachi's experience and ambitions for the UK. While we believe that the context in which the document was produced is important, Hitachi's statements about

---

[509] Hitachi, Annex H.109.Q5.002, slides 21.
[510] Parties' response to the AIS and WP, Annex A, page 11.
[511] Thales' response to CMA RFI dated 18 May 2023.
[512] Thales, Annex T.Q9.016, slide 43.
[513] Parties' response to the AIS and WP, Annex B, paragraph 30.

the importance of global references, the UK footprint and resource capability remain valid.[514]

8.269 In relation to Thales, one marketing document prepared by the Head of the UK mainline business at Thales in the context of the HS2 tender (date unknown)[515] includes lines to take to counteract the perception [✂]. This document states that 'Thales are the world's largest supplier of ETCS signalling [✂]. This document also shows that Thales considers its work on [✂] as relevant to UK mainline signalling to demonstrate knowledge and experience of UK signalling and delivery capability.[516] Thales submitted to us that it remains a [✂] in mainline signalling in the UK, [✂].[517] Despite the small presence of Thales in GB, this document suggests that Thales considers having global references and managerial experience and technical expertise is relevant when bidding for the supply of digital mainline signalling systems.

- *Provisional conclusion on experience in undertaking digital projects*

8.270 Based on the current draft ITT, management experience is relevant for a number of criteria against which Network Rail will assess suppliers at the TCSF tender evaluation, including project delivery, product development, collaboration and capability development. Network Rail told us that it was looking for suppliers that have the experience of going through the 'maturity curve'.

8.271 Suppliers with a larger portfolio of projects and broader level of experience have a wider pool of projects from which to select case studies for their tender evaluation submissions. More importantly, suppliers with more experience are likely to have developed more institutional knowledge in the delivery of complex and challenging projects. Suppliers with that higher level of experience told us that they have used their knowledge gained from past projects to improve their technical and operational capabilities and avoid repeating past mistakes. The more projects a supplier undertakes, the more likely it is that it would have confronted a problem that may arise in future for Network Rail. Overall, the evidence suggests strongly that experience in undertaking digital mainline projects is likely to be an important distinguishing factor in suppliers' competitive strengths.

8.272 The Parties, Siemens and Alstom have considerably greater experience in undertaking large scale digital mainline signalling projects than other potential

---

[514] Hitachi, Annex H.109.Q2.053; and Parties' response to the AIS and WP, Annex A, pages 5-6.
[515] Thales response to RFI dated 18 May 2023, page 4.
[516] Thales, Annex T.Q2.019.
[517] Parties' response to the AIS and WP, Annex B, paragraph 33.

GB entrants. Thales has more experience than Hitachi and is closer to Siemens and Alstom. The Parties are close competitors in this regard. CAF and Indra have considerably less experience than the Parties and would be less well-placed to meet Network Rail's requirements. They are not able to draw on the institutional knowledge that either Party currently possesses.

8.273 No evidence has been provided to suggest that integrators bid for or win digital mainline signalling projects using their own their technology. We consider integrators' project delivery and other capabilities in more detail in paragraphs 8.314 to 8.326.

Experience in homologating technologies in different countries

8.274 At paragraphs 7.90, 7.97 and 7.105(b), we explain that management experience is a relevant parameter of competition and that experience in homologation forms an important part of that experience. We first consider the evidence on the importance of experience in homologating in different countries by reference to evidence from the Parties and third parties. We then assess the suppliers' strengths in relation to this by comparing the number of countries in which each supplier has undertaken digital mainline signalling projects, and by extension, the number of countries they have entered and in which they have homologated their technologies.

- *Parties' views*

8.275 The Parties submitted that their respective experiences of homologating products in Europe was of limited value in assessing their competitive positioning for the TCSF.[518]

8.276 The Parties further submitted that given homologation is entirely country-specific, homologation experience in a greater number of European countries provides no material competitive advantage.[519]

- *Importance of experience in homologation in different countries and ability to enter new markets*

8.277 As set out in the 'Parameters of competition' section, Network Rail will evaluate suppliers' ability to homologate technology to GB technical standards at both the PQQ and ITT stages of the TCSF tender.

---

[518] Parties' response to the AIS and WP, paragraph 5.12.
[519] Parties' response to the AIS and WP, paragraph 4.17(d).

8.278 Network Rail submitted that suppliers with products and delivery experience in countries with similar signalling principles to GB would find it easier to adapt to the GB market.[520] Network Rail explained that where suppliers had experience in other countries (eg Holland, France or Germany), it would be a good indicator that they would be able to do the same in the UK.[521]

8.279 Network Rail submitted that while it would not take into account the number of countries that a supplier had previously entered (and homologated technology in), Network Rail considered that a supplier with more experience would be able to draw on more examples, and maybe provide more specific relevant examples than those suppliers with less experience.[522]

8.280 Competitors submitted that experience in homologating technologies in other countries would aid the GB homologation process and suppliers with more experience would have a competitive advantage.[523,524] Competitors told us that the overall homologation processes between countries for ETCS technology was similar, given the standardised nature of ETCS technology and similarity in specific tests undertaken. Suppliers with more homologation experience would be better placed to identify risks and undertake an efficient homologation process when entering a new geographic market.[525] Suppliers also indicated that previous experiences in homologation and working with other infrastructure managers would help support the tender bids.[526]

8.281 The evidence from Network Rail and competitors indicates that experience in homologating technologies in different countries is important in the tender evaluation for Lot 2 of the TCSF.

- *Suppliers' strengths of experience in homologation in different countries and ability to enter new markets*

8.282 In the following subsection, we assess suppliers' strengths in relation to experience homologating digital mainline signalling technology in different countries. Table 11 below presents the number of European countries

[520] Network Rail questionnaire response, Q 14. We asked both Network Rail and ORR to identify countries with similar signalling principles to the UK, but they were unable to do so. ORR call transcript, 27 March 2023, page 6.
[521] Network Rail call transcript, 6 February 2023, page 21. See Table 2 and Table 3 for more information on the TCSF product development criteria.
[522] Network Rail call transcript, 22 March 2023, page 9.
[523] Alstom call transcript, 8 February 2023, pages 17-18; Costain call transcript, 20 February 2023, pages 26-27; Mermec call transcript, 14 February 2023, page 16; and Stadler questionnaire response, Q 8.
[524] Stadler questionnaire response, Q 8.
[525] Siemens call transcript, 6 February 2023, page 23; and Alstom call transcript, 8 February 2023, page 17.
[526] Amey call transcript, 21 February 2023, page 17.

(including GB) in which suppliers have undertaken digital mainline signalling projects.[527]

Table 11: Number of European countries (including GB) in which suppliers have undertaken digital mainline signalling projects

Supplier	*Number of European countries where the supplier has undertaken digital projects*
Alstom	15
Siemens	15
Thales	14
Hitachi	5
CAF	2
Indra	1

Source: CMA bidding data analysis
Note: Mermec did not undertake digital mainline signalling projects between 2012 and 2021.
Thales told us that it is active in 16 European countries. Our analysis is based on the number of countries that Thales has undertaken digital mainline signalling projects between 2012 and 2021.

8.283 Table 11 above shows that:

(a) Thales has delivered digital mainline signalling projects in at least 14 different countries during this period. Thales' experience in entering jurisdictions and homologating technology is likely to be matched by only Siemens and Alstom.

(b) Hitachi has entered five countries in total and therefore is likely to have less experience than Thales, Siemens, and Alstom. However, it has more experience than the other potential entrants CAF and Indra.

(c) Siemens and Alstom have the most experience with regards to homologation, with each supplier having undertaken digital projects in 15 European countries during this period.

(d) CAF has entered only one other country (Bulgaria) outside of its home country (Spain) and Indra has not homologated its digital mainline signalling solutions outside of Spain.[528,529]

- *Provisional conclusion on suppliers' relative strengths in homologation*

8.284 Based on the evidence above, Thales, Siemens and Alstom have extensive experience in entering new markets and homologating their technologies in other markets. Hitachi, although with less experience than those three

[527] We assume that in each country a supplier has undertaken a digital mainline signalling project, the supplier homologated its technology to national standards.
[528] We note that CAF is active in the supply of conventional not digital interlockings in Slovenia. CAF questionnaire response, Q 2, and Q 4.
[529] We note that although Mermec is not included in this data set due to its lack of digital mainline signalling projects in the relevant period, it told us on a call that it had only homologation experience in Italy and Poland. Mermec call transcript, 14 February 2023, pages 4, and 16.

suppliers, has entered new markets and developed its homologation experience. It is currently in the process of obtaining GB approval for its conventional technologies in GB (see paragraphs 8.204 to 8.206) and potentially has an advantage in this regard over Thales and the other potential entrants.

8.285 Siemens and Alstom's existing presence in GB confers a significant advantage over all other suppliers with regards to conforming to GB standards, as they will require less investment and less time to meet Network Rail's requirements. CAF and Indra have limited experience in homologating their digital technologies in other markets. We consider in more detail (in paragraphs 8.304 and 8.333) whether [✂] would be able to address some of their gap in homologation experience by partnering with GB integrators and whether their TCSF partnerships with [✂] can offset, in full or partially, the evident differences in capabilities that exist between them and the Parties, Siemens and Alstom.

Provisional conclusion on management experience and technical expertise

8.286 The Parties are close competitors in relation to management experience and technical expertise. The Parties' track records in Europe show that Thales has more experience than Hitachi and is matched only by Siemens and Alstom, based on the number of mainline signalling projects won and markets in which each has entered and had to homologate mainline signalling technology. Hitachi has experience of entering several European countries, although a smaller set of jurisdictions than any of Siemens, Alstom or Thales.

8.287 Other rivals, such as CAF and Indra, have significantly less experience than the Parties, both in undertaking digital mainline projects (in particular high value projects) and in homologating their technologies in other countries. Given the very significant gap in experience between CAF and Indra and the Parties, we consider that the Parties would be better placed to meet Network Rail's requirements to have an international supplier that has gone through the 'maturity curve'.

Experience in GB mainline signalling

8.288 In this section we discuss first OEMs' experience in GB mainline signalling and second to what extent partnering with an integrator might help OEMs to overcome any lack of GB experience.

OEMs' experience in GB mainline signalling

8.289 As noted in *the Parameters of competition* section, we consider that experience in GB mainline signalling is likely to be important for suppliers bidding for the TCSF. Although it may be possible for OEMs without significant GB mainline signalling experience to bid successfully for the TCSF, having GB experience could be an advantage. For example, in PQQ and ITT responses it may be easier for suppliers with GB experience to evidence their ability to:

(a) implement their workforce deployment plan because they already have GB employees (assessed at ITT under 'approach to Phase 2 delivery');

(b) work with Network Rail and meet its delivery requirements (not a standalone assessment, but could affect scores in categories such as 'project delivery', 'collaboration', 'behavioural' and 'health and safety'); and

(c) interface their digital mainline signalling with existing infrastructure (assessed at PQQ under 'project delivery').

- *Parties' views*

8.290 The Parties submitted that they both 'lack meaningful presence' in UK.[530] The Parties noted that Hitachi and Thales currently have relatively few UK mainline signalling employees ([✂] and [✂] respectively).[531]

8.291 The Parties submitted that, while limited compared to Siemens and Alstom, Hitachi has some UK mainline signalling experience (CP6 MaSREF supplier, Cambrian Line) and [✂]. The Parties stated that Thales has no experience of being a major signalling framework supplier.[532] In addition, the Parties submitted that Hitachi has experience of GB digital mainline signalling while Thales does not.[533] However, Thales has undertaken some work in adjacent markets such as axle counters and TMS solutions.[534]

8.292 The Parties submitted that Siemens and Alstom (in addition to Hitachi) currently hold places on the CP6 framework.[535] They also submitted that Siemens' and Alstom's incumbency advantages mean that they are expected

---

[530] Parties, Submission on ETCS ATP wayside resignalling projects, page 4.
[531] Parties, Submission on ETCS ATP wayside resignalling projects paragraphs 4.6-4.7.
[532] The Parties submitted that Thales' experience is limited to the [✂] of TMS contracts, [✂]. Parties' response to the AIS and WP, paragraph 5.14.
[533] Parties' response to the AIS and WP, paragraphs 3.10-3.11.
[534] Parties' response to RFI dated 6 October 2022, Q 1; and Parties' response to the Issues Letter, 23 November 2022, paragraph 8.7.1.
[535] Parties' response to RFI dated 23 February 2023, paragraph 4.7.

to ‘remain the dominant players’ in CP7 and CP8 (including for digital signalling)[536] and would be the strongest competitors for the contestable portion of the Lot 2 (digital) workbank.[537] The Parties also submitted that, Siemens and Alstom ‘hold a strong position’ in a competitive market for recruiting skilled staff.[538]

8.293 Regarding the ability to interface with existing infrastructure, the Parties submitted that current interlocking providers (particularly Siemens and Alstom) and current SCS providers (Siemens, Alstom and Resonate) have incumbency advantages.[539] In particular, they also submitted that Siemens’ and Alstom’s signalling subsystems already have the relevant interfaces to the installed interlockings.[540] The Parties also told us that Siemens and Alstom have historically licensed their technology to integrators such that integrators have an understanding and experience of interfacing with the installed base of interlockings in the UK.[541]

- *Third-party views*

8.294 Network Rail has explicitly stated that, in order to induce entry, UK experience was not included in the tender criteria and that suppliers would be able to demonstrate their capabilities in product and system development outside of the UK.[542] Suppliers must demonstrate their ability to tailor their mainline signalling solution to meet Network Rail’s business requirements and demonstrate and explain their approach to collaboration (but do not need explicit UK experience).[543]

8.295 Evidence from some suppliers implied that TCSF bidders who have previously worked with Network Rail would be better able to demonstrate the ability to collaborate with Network Rail and understand its requirements.[544] In particular, institutional knowledge about working in the UK may confer an advantage to those suppliers when bidding for the TCSF.[545]

8.296 Submissions from Siemens and Alstom confirmed that they have significant GB mainline signalling experience. Siemens described itself as having a

---

[536] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.12.
[537] Parties, Submission on ETCS ATP wayside resignalling projects, paragraph 3.14.
[538] Parties, response to the AIS and WP, paragraph 3.5.
[539] Parties, Submission on ETCS ATP wayside resignalling projects, paragraphs 3.11-3.12; and Parties, Submission on OCS projects, 28 March 2023, paragraph 3.3.3.
[540] Parties, response to the AIS and WP, paragraph 3.5.
[541] Parties, response to the AIS and WP, paragraph 4.3.
[542] Network Rail call transcript, 22 March 2023, pages 8-9.
[543] Network Rail questionnaire response, ‘TCSF PQQ & ITT Questions & weighting – Digital’.
[544] Stadler questionnaire response, Q 14; Mermec questionnaire response; and Resonate questionnaire response Q 14.
[545] Siemens questionnaire response, Q 12.

'complete conventional and digital signalling solution' and 'extensive' UK experience.[546] Alstom described itself as having a large installed base in the Eastern, Southern and Western regions and as being a major signalling framework holder in the Eastern and Southern regions.[547] Siemens and Alstom currently have large mainline signalling workforces based in the UK ([✂] and [✂] employees respectively).[548]

8.297 CAF and Indra confirmed that they did not have GB mainline signalling experience. CAF submitted that it has no previous contractual relationship with Network Rail and has in the past only supplied ETCS on-board units (the customers are train operating companies).[549] Indra submitted that it was not a supplier of technology in the UK and that its [✂] but told us that it had provided consultancy services to Network Rail in 2019 in relation to TMS.[550] CAF and Indra have no UK mainline signalling employees.[551]

8.298 Regarding interfacing with existing technology, the ORR market study found no clear evidence that interfacing issues had 'very often' deterred companies from bidding or been 'determinative' in Network Rail's contract award decisions. However, ORR found evidence of 'suppliers withdrawing from a major signalling project tender as a result of concern about interfaces and access to control centre technology' and that interfacing issues led to cost escalation.[552] ORR submitted that in areas where interfacing is required it 'always' causes problems.[553]

8.299 Some third parties considered that new suppliers face obstacles when seeking to interface their technology with the existing signalling solutions:

(a) Mermec told us that 'despite all the efforts (ie EULYNX interfaces) there are no universal solutions [to interfacing], so every time there are two different supplier[s] connecting two different subsystems, instead of just one supplier, there are increasing costs and risks'.[554]

(b) CAF told us that interfacing with installed signalling systems of other OEMs was not a technical barrier but more a legal barrier because the interfaces were 'proprietary'.[555]

---

[546] Siemens response to RFI dated 18 October 2022, Q 2.
[547] Alstom response to RFI dated 18 October 2022, Q 2.
[548] Alstom response to RFI dated 16 February 2023, Q 1; and Siemens response to RFI dated 16 February, Q 2.
[549] CAF response to RFI dated 18 October 2022, Q 1.
[550] Indra call transcript, 27 January 2023, page 4, and page 9; and Indra questionnaire response, Q 14.
[551] CAF response to RFI dated 16 February 2023, Q 1; and Indra responses to RFI dated 16 February 2023, Q 1.
[552] ORR, ORR Market Study, paragraph 7.46.
[553] Note of a call, ORR, 27 March 2023, paragraph 26.24.
[554] Mermec questionnaire response, Q 11.
[555] CAF call transcript, 13 February 2023, page 27.

(c) Resonate also told us, while it was not technically difficult to establish the interface, both Siemens and Alstom have proprietary interfaces and can (and do) block access to the necessary proprietary information.[556]

8.300 In its Remedies Monitoring Report, ORR noted that in the TCSF suppliers would be contractually obliged to cooperate particularly in regard to technology interfaces.[557] When launching the TCSF, Network Rail noted that suppliers would be 'obliged to observe fair conduct rules including to co-operate and engage in good faith with a proprietary works supplier […] in order to ensure the successful and safe delivery of works'.[558] In our view, this is significant to the extent third-party evidence indicates that interfacing issues are not primarily technical, but more related to accessing proprietary information.

- *Our provisional assessment*

8.301 We currently consider that Siemens and Alstom have extensive experience in GB mainline signalling. This is likely to mean that they could demonstrate their ability to meet the TCSF PQQ and ITT criteria using GB evidence. They would also have clear advantages in demonstrating their ability to interface with existing GB signalling technology.

8.302 All other OEMs (including the Parties) have substantially less GB experience than Siemens and Alstom. Hitachi has some previous GB experience in CP6, having carried out two projects: the Cambrian Line and CP6 MaSREF. Thales has not won a place on any previous Network Rail framework but has undertaken some work in adjacent markets, ie as a supplier of axle counters and as a provider of TMS solutions.[559] [✂].

8.303 However, as discussed in more detail in the next section, these OEMs can partner with an integrator to demonstrate their ability to meet the PQQ and ITT criteria where GB evidence is advantageous.

8.304 We currently consider that any other OEMs potentially participating in the TCSF (other than Siemens and Alstom) would face some obstacles to interfacing with existing GB signalling technology, but we have not seen

---

[556] Resonate call transcript, 14 February 2023, pages 12-13.
[557] ORR, Remedies Monitoring Report, paragraphs 3.26-3.27, and paragraph 3.30. The Remedies Monitoring Report also notes the introduction of alliance contracting which encourages suppliers to work together by requiring them to participate in an incentivisation regime where suppliers share equal responsibility for the delivery of the project such that, for example, any penalties for under-performance will be borne equally by all parties in the contract.
[558] 'View Notice – Sell2Wales', last accessed 12 May 2023, section II.2.4.
[559] Thales response to s109 Noticed dated 23 December 2022, Q 2; and Thales to partner with Network Rail to enhance track safety at UK level crossings | Thales Group, last accessed 23 May 2023.

evidence that these obstacles would differ between these OEMs (other than Siemens and Alstom). Furthermore, these obstacles are unlikely to be insurmountable from a technical perspective, and Network Rail has a vested interest in helping successful bidders to overcome them in order to facilitate entry. While not removing interfacing barriers entirely, EULYNX is likely to simplify interfacing to some extent.

The ability of integrators to complement OEMs' experience in GB mainline signalling

8.305 [✂].

8.306 In this section, we first consider the potential benefits of partnering with an integrator, then describe the current position in terms of which OEMs are likely to partner with which integrators for the TCSF before going on to assess the strengths of different integrators.

- *The benefits of partnering with an integrator*

8.307 The Parties told us that they expect European OEMs to partner with integrators and that integrators can provide local knowledge and have mature relationships with Network Rail.[560] The Parties submitted that integrators did not simply provide staffing for projects undertaken by other suppliers but that they also led their own signalling projects and were responsible for project delivery and, as such, could provide relevant references showing project delivery capabilities, including in GB.[561] For the TCSF, the Parties submitted that integrators would be better placed to bid than new entrants alone, as 40% of the technical criteria at PQQ would be awarded to 'project delivery', and 35% of points at ITT focus on non-technical criteria (health & safety, social value, and behavioural).[562] [✂].

8.308 The ORR market study noted that, since 2012, fewer major signalling framework bids had been submitted by integrators.[563] However ORR's Remedies Monitoring Report stated that the importance of the integrators as a route to market remains strong.[564] ORR told us that this statement meant that integrators could play a useful role in providing a route for new entrants.

[560] Parties, response to the Issues Letter, 23 November 2022, paragraph 6.9.
[561] Parties, Response to the AIS and WP, paragraphs 4.17, and 4.22(b).
[562] Parties, Response to the AIS and WP, paragraphs 3.3 and 4.22(b).
[563] ORR, ORR Market Study, paragraph 6.11.
[564] ORR, Remedies Monitoring Report, paragraph 3.4.

Integrators could bid for the TCSF if they were supported by a cooperating OEM.[565]

8.309 Regarding bids for the TCSF involving integrators, Network Rail told us that it was 'not expecting that every organisation will currently have that UK experience' and that bids from consortiums or joint ventures 'are […] to some degree actually welcomed'.[566] When asked whether a consortium bid might close the gap in the UK resources required to deliver UK digital mainline signalling projects, Network Rail submitted that the [✂] because [✂].[567]

8.310 Competitors also thought that integrators' operational experience with Network Rail could support potential new entrants. For example:

(a) [✂].[568]

(b) VolkerRail stated that partnering with an integrator could 'absolutely' provide new entrants with knowledge of the UK market.[569]

(c) [✂].[570]

- *Partnerships between OEMs and integrators for the TCSF*

8.311 [✂]:

(a) Hitachi submitted that, [✂].[571] [✂], Hitachi submitted that [✂].[572]

(b) [✂].[573] [✂]. Thales submitted that [✂].[574]

8.312 Regarding the other Lot 2 TCSF PQQ respondents, Siemens and Alstom each submitted a response individually, but kept open the possibility of subcontracting to an integrator. The other respondents to the PQQ for Lot 2, were submitted jointly by an integrator and an OEM:

(a) [✂]. [✂].[575]

---

[565] Note of a call, ORR, 28 April 2023; and ORR's email to the CMA dated 11 May 2023.
[566] Network Rail call transcript, 6 February 2023, page 22.
[567] Network Rail call transcript, 6 February 2023, page 18.
[568] [✂].
[569] VolkerRail call transcript, 15 February 2023, page 26.
[570] [✂].
[571] Hitachi's response to RFI dated 23 February 2023, Q 15.
[572] [✂].
[573] [✂]. Thales, Main Party Hearing transcript, 2 May 2023, page 22.
[574] [✂], [✂].
[575] [✂]. [✂].

(b) [✂].[576] [✂].[577] [✂]:

(i) [✂].

(ii) [✂].[578]

8.313 As discussed above, [✂]; however there are at least nine integrators available as main or supplementary partners for bidders.[579] Network Rail noted that subcontracting arrangements must be reflected within suppliers' contracts; however, it recognises that subcontracting arrangements may be subject to change and therefore may not be finalised until a later date. Suppliers who wish to make changes to subcontracting arrangements indicated in their PQQ response must notify Network Rail of any changes and can make changes until the contract is awarded.[580] Therefore, suppliers still have the option to bring on board one or more integrators to improve the strength of their bids.

- *The strengths of different integrators*

8.314 Some signalling integrators were among Network Rail's top 20 suppliers in the financial year 2021-22, though we note this is not limited to signalling spend with some of the integrators (Amey, Colas, Balfour Beatty, Atkins and VolkerRail).[581]

8.315 Regarding the relative strengths of individual integrators, the Parties submitted that, in order of size of Network Rail's signalling spend, Atkins, VolkerRail, Linbrooke and Colas each accounted for a higher proportion of Network Rail's spend than each of the Parties over the period 2021 to 2022.[582]

8.316 The Parties also submitted that Atkins, Linbrooke, VolkerRail and Amey have successfully bid in the UK as lead partners (see paragraph 8.202).

8.317 The Parties submitted they are already aware that [✂] are likely to partner for the TCSF, as well as [✂].[583]

---

[576] [✂].
[577] [✂].
[578] [✂].
[579] We note that six of these nine integrators have GB mainline signalling experience.
[580] Network Rail response to RFI dated 23 March 2023, 'TCSF 29248 - Instructions to Participants', paragraph 7.5.2.
[581] 'Top 20 Network Rail Suppliers by Spend 2021-22', last accessed on 17 May 2023.
[582] Parties' response to the AIS and WP, paragraph 4.8.
[583] Parties' response to the AIS and WP, paragraph 4.19.

(a) Regarding [✂], the Parties submitted that it, 'in particular', is 'well placed to compete for TCSF' and it has a 'unique position' as an integrator with an exclusive licence to a conventional interlocking that is compatible with ETCS and approved for use in the UK.[584] They also submitted that [✂] is the second most experienced supplier for ETCS in the UK after Siemens and has significant delivery experience.[585]

(b) Regarding [✂], the Parties submitted that it has grown its UK experience rapidly in recent years and is expected to be a strong contender [✂].[586]

8.318 Six integrators have told us that they have experience of working in mainline signalling in GB, [✂] (Amey, Atkins, Colas, Costain, Linbrooke, and VolkerRail).[587] In addition, Network Rail submitted that 12 other integrators have expressed interest in subcontracting on the TCSF.[588]

8.319 Several integrators have been awarded signalling contracts under the most significant signalling frameworks since CP3, see Table 12. This includes Atkins, Colas, Linbrooke and VolkerRail but not Amey.

Table 12: Signalling contracts awarded by to integrators from CP3 to CP6

Integrator	*CP3**	*CP4 & CP5†*	*CP6 Major Signalling Framework‡*	*CP6 Signalling and Telecoms Framework†*
Atkins	X	Two primary awards – total value £35 million		Value £291 million
Babcock				Value £291 million
Colas				Value £125 million
Linbrooke			Value £0 million (in partnership with Hitachi)	Value £261 million
Signalling Solutions Limited§	X	Three primary awards – total value £403 million Five secondary awards – total value £1,004 million		
VolkerRail				Value £216 million

Source: CMA analysis of Signalling market study update - Annex C - Procurement of signalling (May 2021).
* Contract values not available.
† The main signalling framework in CP4 and CP5 was the MaSREF. There were nine geographic lots and two suppliers per lot – a primary award and a secondary award. The values in this table are for the value of the whole lot, not apportioned between the primary and secondary award.
‡ The Major Signalling Framework is the top tier framework for CP6. The S&T Framework sits below the Major Signalling Framework. The values in this table are for the whole lot, not just the signalling element.
§ An Alstom and Balfour Beatty joint venture.

8.320 When asked to note who would be a potential bidder for the TCSF:

(a) several OEMs and integrators named Atkins:

---

[584] Parties' response to the AIS and WP, paragraph 4.9.
[585] Parties' response to the AIS and WP, paragraph 4.10.
[586] Parties' response to the AIS and WP, paragraph 4.19.
[587] Amey call transcript, 21 February 2023, page 24; Atkins call transcript, 2 February 2023, page 4; Colas' response to RFI dated 4 January 2023, Q 21; Costain call transcript, 20 February 2023, page 11; Linbrooke call transcript, 21 February 2023, page 7; and. VolkerRail call transcript, 15 February, page 6.
[588] Network Rail response to RFI dated on 14 February 2023, 'Preliminary Market Consultation Report for Digital Signalling Procurement, ETCS from CP7 onwards', Table 1.

(i) Alstom described it as a 'digital systems integrator for East Coast Mainline and F/Bane in Denmark', but noted that it had 'no [signalling] products'.[589]

(ii) Siemens described it as an 'integrator' with a 'licensed conventional signalling solution' and 'some UK delivery experience'.[590]

(iii) Amey described it as not having a 'complete solution' but having 'engineering resources and experience'.[591]

(iv) Colas Rail described it as a 'previous SSI provider and license holder for Electrologxs interlocking (conventional signalling system)' with 'limited recent experience in UK market'.[592]

(v) Costain said it believed that Atkins is 'partnering with another supplier possibly CAF/Stadler although those OEMs have a long way to go to get a [product accepted] system working with an RBC'.[593]

(b) Two other integrators were named by just one respondent:

(i) Amey: Siemens described it as having no 'in house solution', but 'some UK delivery experience'.[594]

(ii) VolkerRail: Amey described it as 'not an OEM', so it 'will have to be part of a joint bid to be compliant'.[595]

(c) Finally, the combination of Atkins and CAF was identified as a potential bidder by Amey, which said that 'they both have mature technology, but they have not been integrated'.[596]

8.321 In relation to the relative strength of integrators, we note that Linbrooke told us that it considered itself to be on a par with VolkerRail and Atkins, based on their past relationships with OEMs and participation in past mainline signalling frameworks in GB. Linbrooke noted that Amey might but did 'not tend' to compete as an integrator with Linbrooke for mainline signalling frameworks. Linbrooke also noted that 'Costain bid for the CP6 MaSREF, supported by Thales, and did not win it'.[597]

---

[589] Alstom response to RFI dated 18 October 2022, Q 17.
[590] Siemens response to RFI dated 18 October 2022, Q 17.
[591] Amey response to RFI dated 18 October 2022, Q 17.
[592] Colas Rail response to RFI dated 18 October 2022, Q 17.
[593] Costain response to RFI dated 18 October 2022, Q 17.
[594] Siemens' response to RFI dated 18 October 2022, Q 17.
[595] Amey response to RFI dated 18 October 2022, Q 17.
[596] Amey response to RFI dated 18 October 2022, Q 17.
[597] Transcript of call with Linbrooke, page 18.

8.322 ORR market study noted that Atkins had had 'considerable success in obtaining work in major signalling frameworks' up to and including CP5. It was able to do this by accessing the SSI interlocking technology owned by Westinghouse/Invensys and GEC/Alstom.[598]

8.323 The integrators that responded to our question submitted that they had between 100 and 300 UK mainline signalling staff. Amey and Linbrooke each had 100 to 150 staff; VolkerRail had 200 to 250 staff; and Atkins and Costain each had 200 to 300 staff.[599] We do not see these differences as a material differentiator between them, given they all have substantial numbers of UK mainline signalling staff and would have time to increase their numbers to meet future digital mainline signalling needs.

8.324 A report prepared for Hitachi's sales team to its UK executive team in July 2021, [✂]. The document [✂].[600] [✂].[601] [✂].[602]

8.325 Thales' assessment of the TCSF opportunity prepared [✂],[603] mentioned above in paragraphs 8.98 to 8.100, includes [✂]. [✂].

(a) [✂].[604]

(b) [✂].[605]

(c) [✂].

8.326 In summary, this evidence provides a mixed picture of the strengths of integrators. Various evidence sources point to Atkins being a strong partner with significant GB signalling experience. Amey, VolkerRail and Linbrooke also emerge as relatively strong partners based on competitor views, experience with Network Rail and the Parties' internal documents.

- *Our provisional assessment*

8.327 We currently consider the fact that, other than Siemens and Alstom, [✂] shows the role integrators can play in the supply of GB mainline signalling. The evidence suggests that bidding as a partnership between an integrator

---

[598] ORR, ORR Market Study, paragraph 6.8.
[599] Atkins response to RFI dated 17 February 2023, Q 1; Colas Rail response to RFI dated 17 February 2023, Q 1; Costain response to RFI dated 17 February 2023, Q 1; Linbrooke response to RFI dated 17 February 2023, Q 1; Resonate response to RFI dated 17 February 2023, Q 1; and Amey's email to the CMA dated 23 March 2023.
[600] Hitachi, Annex HRL0000162, slide 16.
[601] Hitachi, Annex HRL0000162, slide 16.
[602] Hitachi, Annex HRL0000162, slide 17.
[603] Thales, Annex THALES-CMA-00272875, page 17.
[604] [✂]. [✂].
[605] [✂]. [✂]. [✂].

and OEM would not, by itself, be a disadvantage and that the involvement of an integrator is important to complement the offer of some OEMs, which would be much weaker competitors on a standalone basis for major contracts.

8.328 We currently consider that [✂] is likely to be the strongest integrator in the context of the TCSF. For example, it was [✂], and it has significant GB experience. Regarding the remaining integrators, we have not seen evidence suggesting significant differences in their capabilities. We also note that based on the data considered in its market report in relation to Network Rail's expenditure in mainline signalling in CP3, CP4 and CP5, ORR noted that [✂].[606]

8.329 We do not see differences in the size of integrators' current UK staff as a material differentiator between them, given they all have substantial numbers of UK mainline signalling staff and would have time to increase their numbers to meet future digital mainline signalling needs.

Provisional conclusion on experience in GB mainline signalling

8.330 Based on the evidence above, we consider that the Parties are likely to compete closely with one another in respect of experience in GB mainline signalling. Hitachi has had more experience with Network Rail as a CP6 provider and has undertaken a digital mainline signalling project in GB. While Thales has had less GB mainline signalling experience than Hitachi, we note that it has been active in GB mainline signalling as a supplier of axle counters and as a provider of TMS solutions. [✂].

8.331 We currently consider that Siemens and Alstom have significant advantages in terms of their respective GB based workforces, their experience of working with Network Rail on mainline signalling and the fact that, having supplied a large volume of existing GB signalling infrastructure, interfacing will be easier for them.

8.332 [✂].

8.333 Regarding interfacing with existing GB signalling technology, we currently consider that potential bidders for the TCSF (other than Siemens and Alstom) will face some obstacles, but these obstacles are not insurmountable from a technical perspective.

---

[606] [✂].

Other parameters of competition

Innovation

8.334 As part of the TCSF ITT criteria, bidders will need to set out how they intend to innovate to achieve the £190k per ETCS SEU requirement (the T190 target, see paragraph 7.94).

8.335 Network Rail will assign 10% of the overall ITT score to suppliers' ability to apply a combination of innovation and efficiency measures to reach the T190 target. This is in addition to the 30% weight that Network Rail assigns to the commercial criteria. Network Rail will assess suppliers' plans to reach the T190 target, their unit cost glide paths, and consider assurances that these can be achieved. Suppliers' responses regarding the T190 target will form commitments within Network Rail's framework agreements with successful suppliers.[607]

8.336 The responses we have received from third parties indicate that SEU is a UK-specific concept which is highly complex and has no common industrywide definition.[608] Given this, we have not assessed suppliers' current prices per SEU.

8.337 Regarding suppliers' plans to achieve the T190 target, the current draft ITT evaluation framework is not yet published, so some suppliers said they have not yet considered their plans to reach the T190 target.[609] Where suppliers have started to consider their plans, the information they have provided to us is not sufficient for us to differentiate between their respective abilities to meet the T190 target. Some suppliers identified Network Rail as the key enabler to reach the T190 target as Network Rail's plans and processes also affect the cost per SEU.[610]

8.338 We consider, therefore, that it is not currently possible to assess potential bidders' ability to meet the T190 target. However, to the extent there are differences in the strengths of suppliers' ability to innovate, we consider that suppliers with more experience in delivering digital mainline signalling projects are likely to be better placed to introduce efficiencies and process

---

[607] Network Rail's response to RFI dated 13 January 2023, 'TCSF PQQ & ITT Questions & weighting – Digital Lot', page 16.
[608] ORR, Alstom and Siemens said that there are many SEU types with a large number of factors determining each type and that it is specific to Network Rail and the UK. Alstom response to RFI dated 16 February 2023, Q 4, and Q 5; and Siemens response to RFI dated 16 February, Q 5, and Q 6.
[609] Thales response to RFI dated 16 February, Q 14; Indra response to RFI dated 16 February, Q 4; Thales response to RFI dated 16 February 2023, Q 14; Indra response to RFI dated 16 February 2023, Q 4.
[610] Alstom response to RFI dated 16 February 2023, Q 5; CAF response to RFI dated 16 February 2023, Q 5; and Hitachi, Main Party Hearing transcript, 26 April 2023, page 41.

improvements than smaller OEMs that have less management experience (see paragraphs 8.233 to 8.287).

Financial size and standing

8.339 We identified the financial size and standing of a company as one of the parameters of competition in paragraph 7.105(e).The financial credentials of prospective suppliers are typically assessed as part of the Network Rail procurement process to ensure that bidders can perform the contract and handle the associated commercial and financial risks.

8.340 We understand that Network Rail will focus on the liquidity and solvency positions of prospective bidders during the PQQ phase of the procurement and that prospective TCSF suppliers are able to rely on the financial position of their parent company for the purposes of demonstrating financial robustness.[611]

8.341 [✂]:

(a) [✂];[612] and

(b) [✂].[613]

8.342 We consider that each of the companies identified above is likely to meet the financial standing and stability requirements set by Network Rail at PQQ stage, such that financial standing is not a significant differentiating factor.

8.343 However, related to financial standing is the size of a company's revenue in the relevant activities. Even where firms are able to meet those financial requirements considered as part of the tender process, procuring authorities such as Network Rail may request further financial information at any stage of the procurement cycle[614] and may assess annual turnover in the relevant activities. Third parties told us that in their experience prospective bidders are typically required to meet certain minimum revenue thresholds.[615]

8.344 In this context, we note that Network Rail asked prospective bidders to provide annual revenue figures for works similar in scope to Lot 2 of the

---

[611] Provided that the parent company guarantees contracts awarded to its subsidiaries. See, Network Rail questionnaire response, 'Supplier Financial Capability Model'.
[612] [✂].[✂].
[613] [✂]. [✂]. [✂]. [✂]. [✂].
[614] Network Rail questionnaire response, 'Instructions to Participants: Train Control Systems Framework', paragraph 6.4.3.
[615] CAF questionnaire response, Q 15; and Indra questionnaire response, Q 15.

TCSF, as part of its preliminary market consultation.[616] Figure 3 below compares the revenue figures provided by each of the companies that responded to the PQQ.

Figure 3: Estimated revenue from work similar in scope to Lot Two of the TCSF

[✂]

Source: Network Rail response to RFI dated on 14 February 2023, 'Preliminary Market Consultation Report for Digital Signalling Procurement, ETCS from CP7 onwards'. Note: Revenue figures for [✂]

8.345 Figure 3 shows that [✂].

Price

8.346 Network Rail will assess price as part of its 'commercial criteria', which has 30% weighting at the ITT stage of the TCSF tender (see paragraphs 7.46, 7.87 and 7.88). Network Rail will assess suppliers' bids on operational costs, and not on upfront investment costs.[617]

8.347 In the following subsection we consider the Parties' views in relation to the price parameter of competition and provide our assessment.

- *Parties' views*

8.348 As discussed in paragraph 7.79, the Parties submitted that a supplier's 'bidding strength' in the TCSF would depend on its ability to score well on cost, delivery and technical aspects.[618] However, the Parties' assessment of closeness of competition for the TCSF focuses mainly on profitability which relates only to the first of these criteria.

8.349 The Parties submitted that profitability was a function of the supplier's (i) 'need for upfront investment to qualify the ETCS technology'; and (ii) 'the timing and value of projects (ie revenue generation)'.[619]

8.350 The Parties stated that due to possessing ([✂]) approved GB digital mainline signalling technology, Alstom, Siemens, Atkins, and Hitachi would find the TCSF a more profitable (and more attractive) opportunity than would Thales and other potential entrants.[620] As a result, the Parties considered that [✂]

---

[616] Network Rail response to RFI dated on 14 February 2023, 'Preliminary Market Consultation Report for Digital Signalling Procurement, ETCS from CP7 onwards', pages 4-5.
[617] The pricing estimates which ITT bidders will submit to Network Rail will be affected by both the components bidders intend to use to deliver the output and the prices of these components. Network Rail call transcript, 26 January 2023, pages 24 -25.
[618] Parties, Submission on Competitive Effects, paragraph 3.31.
[619] Parties, Submission on Competitive Effects, paragraph 3.37.
[620] Parties, Submission on Competitive Effects, paragraph 3.40.

competitors such as Siemens, Alstom, [✂], with the advantages listed above, and therefore would not compete closely with the latter set of suppliers.[621]

- *Our assessment*

8.351 The Parties' submissions in relation to the respective profitability of the TCSF for Hitachi and Thales are based primarily on the difference in the upfront investment costs between Hitachi and Thales (see paragraphs 8.213 and 8.214). The Parties have argued that these differences in investment costs and profitability of the investment is likely to affect each Party's incentives to bid for the TCSF. The Parties have not presented evidence to indicate that Hitachi would be better placed to bid more strongly than Thales in relation to the operational costs being assessed by Network Rail.

8.352 While the Parties considered that access to approved GB digital mainline signalling technology will lead to lower costs and prices (see paragraph 8.205), ORR stated that when projects were competitively tendered, suppliers competed on costs and this resulted in lower average prices. Therefore, we consider that competition can play an important role in reducing the overall cost of signalling and that the extent of that competition between suppliers would be determined by a range of other factors other than primarily the fixed costs of homologating their technology in GB.

8.353 Given the lack of previous GB digital mainline signalling framework agreements, we have not been able to consider suppliers' relative pricing strategies nor is there any realistic way for us to assess future pricing.

8.354 We currently, therefore, have not attempted to differentiate between potential bidders with respect to price.

Internal documents about the TCSF

8.355 We have considered internal documents produced by the Parties and third parties which assessed their perceptions of possible bidders for Lot 2 of the TCSF.

Thales' internal documents in relation to the TCSF

8.356 In the section about *Suppliers' bidding incentives*, we discussed two internal documents in which Thales assessed the TCSF as an investment opportunity: Thales' September 2022 and March 2023 reviews of the TCSF. In addition to

[621] Parties, Submission on Competitive Effects paragraphs 3.42(a), and 3.43(b).

analysing the TCSF investment case, these documents included an assessment of the potential competitor set, were Thales to decide to bid. In paragraphs 8.78 and 8.92 we provide details about the authors and purpose of these documents, as well as the Parties' submissions on their relevance to our assessment.

8.357 We note that Thales' assessment of the TCSF opportunity [✂] included a 'competitive outlook for the UK market' and stated that:

(a) [✂].

(b) [✂].

(c) [✂]:[622]

(i) [✂].

(ii) [✂].

(iii) [✂].

8.358 We note that, according to Thales' classification above – where 'Tier 1' suppliers are those with an existing presence in UK mainline signalling – Thales would not be a Tier 1 supplier.

8.359 Thales' [✂] assessment of the TCSF opportunity, [✂]. Thales stated that [✂]. We note that [✂].[623]

8.360 [✂].

8.361 [✂].[624]

8.362 We consider that Thales' assessment of the potential competitor set for the TCSF shows that it views both itself and Hitachi as credible competitors for Lot 2.

8.363 [✂].

8.364 Overall, Thales' documents about competition for the TCSF are consistent with the other evidence we have considered in our investigation.

---

[622] Thales, Annex T.Q1.005, [✂], slides 13-14. See also Thales, Annex THALES-CMA-00203853, [✂] slide 15, [✂].
[623] Thales, Annex THALES-CMA-00272875. As set out above, [✂].
[624] Thales, Annex THALES-CMA-00272875. As set out above, [✂].

Hitachi's internal documents in relation to the TCSF

8.365 Hitachi produced a very limited number of documents relating to its assessment of the TCSF. The documents produced before the TCSF was launched do not appear to include an assessment of Hitachi's possible competitors for this opportunity.

8.366 In a presentation prepared for an [✂],[625] Hitachi [✂]. Hitachi noted that [✂].[626] [✂].[627] [✂].[628]

8.367 In relation to its own capabilities, Hitachi noted, in the same presentation, [✂]. The document [✂]. [✂].[629]

8.368 We note that this document was produced during our investigation and after Hitachi received our AIS and Working Paper.[630] As such we are placing limited weight on it, in particular in relation to Hitachi's assessment of its potential competitors, where Hitachi's assessment is not corroborated by other evidence. Nevertheless, we note that this document highlights Hitachi's strong capabilities. It shows that Siemens and Alstom are perceived by Hitachi as its stronger competitors and that Thales is among the other few possible competitors for the TCSF.

8.369 This internal document is broadly consistent with Hitachi's internal documents relating to past mainline signalling opportunities in GB, which show that Hitachi considers Siemens, Alstom and Thales as its stronger competitors for digital mainline signalling projects and that Hitachi considers itself a credible competitor for digital mainline signalling projects in GB, including (among other strengths) its experience in delivering ETCS globally.

Third-party internal documents

8.370 We asked suppliers to provide internal documents that assess the TCSF opportunity. We received documents that had been prepared by [✂] by February 2023 concerning the expected competitors for the TCSF opportunity.

8.371 [✂].[631]

(a) [✂].

---

[625] Parties' response to CMA RFI dated 18 May 2023, page 4.
[626] Parties' response to AIS and WP, paragraph 4.6(b).
[627] Parties, Annex Mainline H.WP.002 [✂], slides 6, and 10.
[628] Parties, Annex Mainline H.WP.001, [✂].
[629] Parties, Annex Mainline H.WP.002, [✂], slide 10.
[630] CMA129, paragraph 2.29.
[631] [✂]; [✂].

(b) [✂].[632] [✂].[633]

(c) [✂].[634]

8.372 Other suppliers' internal documents identify Hitachi and Thales as credible competitors for the TCSF. [✂] identified CAF and Indra as potential entrants. [✂] considered OEMs as partners rather than competitors and identified all of the potential bidders except Indra as potential partners.

Third-party evidence

8.373 We considered evidence from third parties (competitors, Network Rail and ORR) on the competitive strength of digital mainline signalling suppliers and the effect of the Merger on competition.

8.374 We provide additional detail in Appendix C about the customers that we contacted and which provided views as part of our inquiry.

8.375 Consistent with our approach in other cases, and given limited sample sizes, we have interpreted third-party evidence qualitatively, rather than drawing firm quantitative conclusions, and have assessed it alongside other evidence.

8.376 The weight given to third-party evidence is likely to vary from case to case, depending on factors such as any additional evidence provided to support that position and any other factors that might influence the customer's views.

8.377 As in any merger inquiry, we also recognise that some third parties may have an interest in its outcome. Therefore, when using third-party views as evidence, we have given due regard to a range of factors including: (i) the incentives of the party giving that view and the extent to which it may have been influenced by the TCSF tender; and (ii) the extent to which the view was corroborated by other evidence available to us.

Third-party views on the strength of digital mainline signalling suppliers

8.378 Network Rail submitted:

(a) The Parties would be [✂] for the TCSF as '[✂]'.[635] Network Rail added '[t]here is no reason to believe that either company could not adequately bring their products to the UK specification. They both have demonstrated the ability to take their product to country specific specifications in other

---

[632] [✂].
[633] [✂].
[634] [✂].
[635] Network Rail call transcript, 6 February 2023, page 15.

European countries.'[636] Further, Network Rail submitted that the Parties are comparable with Siemens and Alstom in terms of their 'ultimate capability' and that '[w]hilst Siemens and Alstom are the dominant providers in the UK, if you were to go to some alternative countries in Europe for example, it could be Thales that is the dominant provider'.[637]

(b) Siemens and Alstom had a strong dominant position in terms of UK provision of resources, capability, and experience.[638]

(c) CAF, Indra and Mermec did not hold the same scale of portfolios of work and dominance as the Parties, Siemens, and Alstom in Europe. Network Rail considered that CAF had more experience in delivering digital mainline signalling than Indra and Mermec, who would have delivered one or two projects.[639]

8.379 Network Rail did not identify integrators as independent competitors for the TCSF.

8.380 ORR submitted that it was not aware of any strong credentials in market share terms outside the Parties, Siemens and Alstom and that this lack of overall market share could have significant implications for such players' (i) product portfolio, (ii) capacity levels, and (iii) ability to supply credentials to Network Rail.[640] ORR submitted integrators would face significant challenges in bidding for the TCSF on a level footing with the OEMs [✂]. ORR considered that integrators would provide new entrant OEMs a route to the mainline signalling market in GB.[641]

8.381 Overall, competitors submitted that the Parties were two of the four largest players in Europe with clear and established track records in undertaking digital mainline signalling projects. Siemens considered that Hitachi would be a strong competitor for the higher placed positions on the TCSF because [✂].[642] Other suppliers, including [✂], indicated that Hitachi would not be able to secure either of the first two positions and that it would likely compete closely with Thales for the third or fourth place on the TCSF.[643] Alstom told us

---

[636] Network Rail call transcript, 6 February 2023, page 16.
[637] Network Rail call transcript, 6 February 2023, page 17.
[638] Network Rail call transcript, 6 February 2023, page 13.
[639] Network Rail call transcript, 6 February 2023, page 17.
[640] ORR's submission of 13 March 2023, paragraphs 13-14.
[641] ORR, call note, 28 April 2023.
[642] Siemens call transcript, 6 February 2023, page 12.
[643] Alstom noted that, based on the TCSF criteria, it appears that Network Rail [✂], and that, therefore, [✂]. Alstom call transcript, 8 February 2023, pages 6-7; CAF call transcript, 13 February 2023, page 8; and Mermec call transcript, 14 February 2023, page 20. Mermec mentioned Hitachi has the knowledge and the skilled staff that is required. Resonate call transcript, 14 February 2023, page 15; Atkins call transcript, 2 February 2023, page 10; Costain call transcript, 20 February 2023, page 25; and Linbrooke call transcript, 21 February 2023, page 16. Linbrooke submitted that [✂].

that 'from their existing capability in other countries, Hitachi and Thales would be equivalent'[644] while CAF submitted that both Hitachi and Thales could become framework suppliers if they bid for the TCSF given each of the Parties' worldwide capabilities.[645]

8.382 All suppliers that we spoke to identified Siemens and Alstom as the strongest suppliers for the TCSF, in the light of their current UK experience, relationships with Network Rail and their track records in Europe,[646] and would most likely compete for first and second place.[647]

8.383 Suppliers identified other OEMs as potential bidders for the TCSF. CAF was generally identified as the strongest of these suppliers.[648] [✂].[649] According to [✂], Indra was smaller than [✂] and was [✂] while Mermec was [✂].[650]

8.384 All the integrators that told us that they could consider bidding for Lot 2 of the TCSF mentioned that they would be able to do so by securing a partnership with an OEM.[651] [✂].[652] Integrators told us that, for a digital mainline signalling project, they can provide workforce and experience,[653] project management across a broader spectrum of rail disciplines (eg delivering track, overhead line, civils, cabling, and signalling),[654] installation management and installation delivery.[655,656]

8.385 Based on the evidence above, Network Rail, ORR and competitors consider that the Parties are likely to be close competitors for the TCSF, along with Siemens and Alstom, given these suppliers' capabilities and experience in Europe. Other OEMs were identified as potential competitors for the TCSF, such as CAF, Indra and Mermec, but all were considered to be less strong competitors for the TCSF. Integrators were not identified as standalone

---

[644] Alstom call transcript, 8 February 2023, page 11.
[645] CAF call transcript, 13 February 2023, page 8.
[646] Mermec call transcript, 14 February 2023, pages 9-10; and Resonate call transcript, 14 February 2023, page 15, line 11 and page 21.
[647] Indra call script, 27 January 2023, page 13; Mermec call transcript, 14 February 2023, pages 9-10; Resonate call transcript, 14 February 2023, page 15, and page 21; Atkins call transcript, 2 February 2023, page 10; Alstom call transcript, 8 February 2023, page 6; and Siemens call transcript, 6 February 2023, page 10.
[648] Alstom call transcript, 8 February 2023, page 6; Resonate call transcript, 14 February 2023, page 15; Siemens call transcript, 6 February 2023, page 20; [✂].
[649] [✂].
[650] [✂].
[651] [✂].
[652] [✂].
[653] VolkerRail call transcript, 15 February 2023, page 4.
[654] Amey call transcript, 21 February 2023, page 11, and page 5; and Costain call transcript, 20 February 2023, page 8.
[655] Costain call transcript, 20 February 2023, page 8; and Linbrooke call transcript, 21 February 2023, page 4.
[656] For instance, Linbrooke explained how the Hitachi/Linbrooke consortium works in the context of CP6. Linbrooke helps Hitachi to [✂] given Hitachi's very limited delivery capability in the UK (eg Hitachi does not have a big local team, including project managers, commercial managers, planners, engineers, that would deliver a signalling project). Linbrooke call transcript, 21 February 2023, page 6.

competitors but were considered as potential partners with the OEMs for the TCSF.

8.386 In line with the considerations set out above paragraph 8.376, we currently consider that only limited weight can be given to this evidence.

Competitor scores on suppliers' strengths

8.387 We asked competitors to list the suppliers that they would consider credible in relation to the delivery of digital mainline signalling projects under the TCSF and to indicate the strength of each supplier on a scale from 1–5 (where 1 is not very strong and 5 is very strong).[657]

8.388 For the reasons set out in paragraphs 6.8, 7.109(b) and 8.385, we currently consider that only limited weight can be given to this evidence. In particular, as mentioned above, the competitor scores might have been affected by respondents' own incentives regarding the merger and respondents may have a historical performance bias rather than a forward-looking perspective when rating suppliers (given the changes brought about by the TCSF and the increase in digital mainline signalling projects). Data quality issues also limit the extent to which reliable conclusions can be made from this data. To the extent that conclusions may be drawn, the data indicates that the Parties, CAF and Atkins are perceived to be the most credible bidders for the TCSF after Siemens and Alstom.[658] We note, however, that despite the data drawbacks, these scores align with our other findings.

8.389 In response to the AIS, the Parties did not contest that limited weight should be placed on the competitors' scores. The Parties submitted that the scoring indicated that a range of suppliers was identified as potential competitors for the TCSF, including CAF and Atkins that scored only slightly below Thales.[659]

8.390 Table 13 below summarises the results.

---

[657] We received supplier strength scores in relation to this question from 11 competitors: Alstom questionnaire response, Q 17; Amey questionnaire response, Q 14; Atkins questionnaire response, Q 14; CAF questionnaire response, Q 17; Colas Rail questionnaire response, Q 14; Costain questionnaire response, Q 14; Indra questionnaire response, Q 17; Mermec questionnaire response, Q 17; Siemens questionnaire response, Q 17; Stadler questionnaire response, Q 17; and VolkerRail questionnaire response, Q 14. We received supplier strength scores in relation to this question from 11 competitors: Alstom questionnaire response, Q 17; Amey questionnaire response, Q 14; Atkins questionnaire response, Q 14; CAF questionnaire response, Q 17; Colas Rail questionnaire response, Q 14; Costain questionnaire response, Q 14; Indra questionnaire response, Q 17; Mermec questionnaire response, Q 17; Siemens questionnaire response, Q 17; Stadler questionnaire response, Q 17; and VolkerRail questionnaire response, Q 14.

[658] Two respondents included Hitachi/Thales as a Merged Entity. One of these respondents included ratings of anticipated joint ventures. As this respondent provided the scores for the joint venture suppliers as single entities in addition, we have excluded the joint venture ratings.

[659] Parties' response to the AIS and WP, paragraph 5.5.

Table 13: Summary of competitor scoring of the strength of suppliers

Supplier	*Number of respondents*	*Average rating (out of 5)*
Siemens	10	5.0
Alstom	10	4.2
Hitachi	**10**	**3.4**
Thales	**7**	**3.0**
CAF	5	2.4
Atkins	5	2.0
AZD-Praha	3	2.0
Mermec	3	2.0
Progress Rail	2	1.5
Amey	1	1.0
Hima-Sella	1	1.0
Indra	1	1.0
VolkerRail	1	1.0

Source: CMA analysis of response to questionnaire by competitors.

8.391 The results showed that:

(a) Competitors identified Siemens, Alstom, and Hitachi most frequently (ten times each) and gave them an average rating of 5, 4.2, and 3.4 respectively;[660]

(b) Thales was identified seven times and was given an average score of 3, while CAF and Atkins were identified five times each, with each receiving a score of 2.4 and 2; and

(c) Seven other competitors were identified three or fewer times, all of which received an average rating of 2 or below.

8.392 Overall, the results show that competitors considered the Parties to be the strongest suppliers after Siemens and Alstom. CAF and Atkins were the only two other suppliers that were identified as credible bidders by five or more respondents. We have, however, placed limited weight on quantitative results from the competitor questionnaire for the reasons set out above.

Third-party views on the Merger

8.393 [✂]. [✂].[661]

8.394 ORR submitted that the Merger was likely to lead to a lessening of competition on a forward-looking basis, as it would eliminate an existing or potential competitor to Hitachi. ORR added that [✂]. ORR also submitted that

[660] These are the average ratings are not weighted by the number of respondents that identified the supplier as a credible bidder. The instances where suppliers scored themselves have been removed.
[661] [✂].

the Merged Entity could be in a stronger position to compete against Siemens and Alstom for larger TCSF framework positions.[662]

8.395 A total of eight OEM and integrators raised concerns with the Merger over the reduction in number of (i) credible suppliers of digital mainline signalling projects[663] or (ii) OEMs interested in partnerships and subcontractor relationships.[664] For example, Alstom submitted that [✂].[665] Mermec submitted that the Merger would lead to fewer competitors in the market and might also 'raise the bar' for references requested in projects, potentially creating a barrier to entry for smaller firms.[666] CAF considered it was 'highly probable' that the Parties would be awarded places on the TCSF framework 'because of their portfolios and worldwide positioning'. It considered that the Merger would effectively reduce the number of participants in the TCSF and hinder competition within the framework.[667]

8.396 Six suppliers (including integrators and OEMs) did not raise concerns about the Merger (Siemens and two integrators),[668] or submitted that the Merger would benefit the delivery of digital mainline signalling in the UK because the Merged Entity would be a more effective competitor when competing against Siemens and Alstom (a non-GB OEM and an integrator),[669] or that the Merger would result in synergies (an integrator).[670] Similarly, the Railway Industry Association did not raise concerns about the Merger because there would be competition in the supply of digital mainline signalling projects going forward with or without the merger.[671]

8.397 The Parties submitted that Network Rail – the sole customer for mainline signalling projects in GB – did not raise any concerns about the Merger, which supports their conclusion that there could be no plausible outcome in which an SLC would arise.[672]

8.398 As mentioned above in paragraphs 6.7 and 6.8, the assessment of a merger's impact on competition is not driven solely by customers' views but rather

---

[662] ORR submission of 13 March 2023, paragraphs 51-55.
[663] Alstom questionnaire response, Q 34; CAF questionnaire response, Q 34; Indra questionnaire response, Q 34; Resonate response to questionnaire, Q 35; Amey questionnaire response, Q 29; and Mermec questionnaire response, Q 34.
[664] Atkins questionnaire response, Q 30; Resonate questionnaire response, Q 35; and Equans questionnaire response, Q 29.
[665] Alstom questionnaire response, Q 34.
[666] Mermec questionnaire response, Q 34; and Mermec call transcript, 14 February 2023, pages 21-22.
[667] CAF questionnaire response, dated 4 January 2023, Q 34.
[668] Siemens questionnaire response, Q 34; Colas Rail questionnaire response, Q 29; and Progress Rail questionnaire response, Q 34.
[669] Mipro's submission of 16 January 2023, and VolkerRail questionnaire response, Q 27.
[670] Stadler questionnaire response, Q 34.
[671] The Railway Industry Association questionnaire response, Q 10.
[672] Parties' response to AIS and WP, paragraph 2.2.

takes into account the (typically wider) range of evidence available to the CMA. The weight given to customer views is also likely to vary from case to case and the weight given to the views of each third party is likely to depend on various factors, including whether that view is supported by other evidence.

8.399 Network Rail is in the middle of a tender process, the TCSF, that is directly affected by the Merger. It therefore faces strong reputational incentives to avoid disrupting the procurement and to avoid the perception of having preconceived views about the competitiveness of potential bidders in the TCSF. We have considered Network Rail's views against this backdrop.

8.400 Network Rail's view about the Merger appear to be based on the current conditions of competition and, [✂], Network Rail also told us that there were few differences in the ultimate capabilities of the Parties, Siemens, and Alstom.[673] Network Rail further submitted that regarding their ETCS infrastructure works, CAF's, Indra's and Mermec's scale of portfolios of work is smaller than that of the Parties, Siemens and Alstom (see paragraph 8.246 above).

8.401 The TCSF was designed to increase the number of suppliers of mainline digital signalling in GB. As the TCSF represents a potential structural change in the market and in the way mainline signalling systems are procured, competition conditions are expected to change. We, therefore, must consider the Merger in light of those changed conditions of competition, while recognising that the ultimate implementation of the TCSF may evolve over time.

Overall assessment of third-party evidence on suppliers' strength and the effect of the Merger on competition

8.402 Based on the evidence above, the Parties are likely to be close competitors for the TCSF. Thales monitored and considered Hitachi as a direct competitor for the TCSF. Siemens and Alstom identified both Parties as competitors for the TCSF, while [✂].

8.403 The evidence above indicates that Siemens and Alstom are likely to be strong competitors for the TCSF because of their general capabilities and experience of GB mainline signalling. Other European OEMs were identified as potential competitors, with CAF appearing to be strongest of that group of suppliers. Integrators were not identified as independent competitors but consistent with other evidence in our competition assessment, they were identified as

[673] Transcript of call with Network Rail, 6 February 2023, page 16.

potential partners. Network Rail, the major customer for digital mainline signalling, did not express concerns about the Merger but identified that the Parties were likely to be close competitors.

8.404 Overall, the evidence in this section is broadly consistent with other evidence such as shares of supply and suppliers' characteristics that the Parties are likely to be two of a limited set of competitors for the TCSF, and likely to be close competitors for that tender.

Provisional competition assessment

8.405 Network Rail's TCSF is the major signalling framework agreement through which most, if not all, future digital signalling projects will be procured over the ten year period from 2024 to 2033 in GB. The TCSF also marks a point of transition, as Network Rail seeks to upgrade its conventional signalling infrastructure to the more advanced and cost-effective digital signalling solutions. In order to digitalise its signalling infrastructure, Network Rail expects, and is reliant on, suppliers to enter the GB signalling sector to address capacity constraints and to diversify its supply base to reduce its dependency on the two major incumbent suppliers, Siemens and Alstom. Digitalisation and the concomitant contractual provisions of the TCSF offer the opportunity for new suppliers to enter the GB market.

8.406 Based on the evidence set out above, we have assessed how closely the Parties are competing with one another in the supply of digital mainline signalling systems in the GB market. We have also assessed the current competitive constraints placed on the Parties by other suppliers that may bid for future digital mainline signalling projects to determine whether the removal of the constraint that they would have placed on each other would lead to an SLC in this market.

8.407 Even if some level of uncertainty remains around the timing, implementation, and value of Lot 2 of the TCSF, [✂] [✂] there is a strong likelihood that, absent the Merger, both Parties would bid for Lot 2 of the TCSF. [✂]. Third-party evidence also indicates that both Hitachi and Thales are likely bidders for the TCSF.

8.408 The evidence indicates that the Parties, absent the Merger, are likely to be two of at most six OEMs that are expected to bid for Lot 2 of the TCSF, on their own or in partnership with integrators. Based on the evidence set out in the competition assessment, we consider that the Parties are credible competitors and absent the Merger, both Parties would have competed closely to gain a place on the TCSF.

8.409 The Parties are the second and fourth largest suppliers by value of digital mainline signalling contracts won in Europe, with a combined share of supply of [40–50%], with a significant increment of [10–20%] as a result of the Merger. The Merger would create the largest digital mainline signalling supplier in Europe. The Parties' shares of supply are significant in a highly concentrated market, in which the top four suppliers account for [90–100%] of supply. Siemens ([20–30%]) and Alstom ([20–30%])are the only other suppliers with a share of supply of over [0–5%]. We consider that the Parties' shares of supply in Europe are indicative of their strength and technical capabilities as digital mainline signalling providers. Given Network Rail's TCSF is designed to bring new suppliers into GB mainline signalling, we consider that suppliers that have demonstrated their competitive strengths in supplying digital mainline signalling systems in other markets are also likely to be the most credible options for Network Rail.

8.410 The Parties' competitive strengths with respect to management and technical expertise in undertaking digital mainline signalling projects are demonstrated by each of their track records in Europe. Taken overall, Thales has more experience than Hitachi and is matched only by Siemens and Alstom. Only the Parties, Siemens and Alstom have experience in delivering large digital projects (with a value over £100 million). Assessed on the number of countries in which this experience has been gained (markets entered and technologies homologated), the position is similar, albeit Hitachi has entered a smaller set of jurisdictions than any of Siemens, Alstom or Thales.

8.411 Both Parties are able to provide a full suite of digital technology and have experience deploying their technology solutions in numerous digital mainline signalling projects. [✂]. However, while [✂], we consider that this is likely to confer only a small competitive advantage in terms of entry costs and does not mean that Thales would not be able to compete closely with Hitachi for the TCSF. Thales has significant experience in deploying its technological solutions in numerous countries across Europe. In this regard, Thales and Hitachi are at a very substantial advantage to the other OEMs that are not currently active in GB mainline digital signalling.

8.412 The Parties have less local experience in GB mainline signalling than the incumbent OEM suppliers, Siemens and Alstom. Hitachi, having won a place on the CP6 framework, has had more success and more experience than Thales. Hitachi also won the first ever digital mainline signalling project tendered in GB (the Cambrian Line project). Thales has been active in GB mainline signalling as a supplier of axle counters and as a provider of TMS solutions. The Parties can partner with a GB-based integrator to bid for the TCSF to address some of the gaps in their experience with Network Rail. We consider that [✂].

8.413 With respect to local capacity, we currently understand that all OEMs, apart from Siemens and Alstom, would likely need to increase their UK labour capacity and aspects of their local capabilities to be able to meet the TCSF requirements. Although integrators cannot effectively compete on their own to secure a position on the TCSF, new OEM entrants, including the Parties, plan to use integrators to address gaps in local capacity, as they have done in previous tenders. [✂].

8.414 The Parties, along with Siemens and Alstom, were the only suppliers to compete for both the ECDP and HS2 projects, the two largest and most significant digital mainline signalling projects that have been tendered in GB. [✂]. The evidence indicates that the Parties competed closely for both of these high profile digital mainline signalling contracts [✂].

8.415 The Parties are also both close competitors in relation to their innovation capability and financial strength.

8.416 Overall, our provisional view is that, taking all of the evidence in the round across the set of competitive parameters, the Parties are likely to be close competitors for the TCSF. While the two differ in terms of their strengths and experience, both can provide a complete suite of ETCS technology and can draw on a strong portfolio of management experience from digital projects across a range of countries. This differentiates them substantially from the other OEMs that are not currently active in the GB mainline signalling market [✂].

8.417 The evidence shows that Siemens and Alstom are stronger than, or at least as strong as, the Parties against each of the assessed competition parameters. Both Siemens and Alstom benefit from strong incumbency advantages and both will likely be strong competitors for the TCSF and exercise a strong competitive constraint on the Parties. The Parties' internal documents reviewed to date indicate that they considered each other, Siemens, and Alstom as their main potential competitors for past signalling digital tenders in the UK and for the TCSF.

8.418 [✂]. [✂] to demonstrate their capabilities in relation to some of the competition parameters, but less so on others.

8.419 [✂].

8.420 With respect to management experience and technical expertise in delivering digital mainline signalling projects, [✂] are considerably weaker than the Parties. [✂].

8.421 [✂]. [✂] integrators will bring their capacity and experience of operating in GB and with Network Rail. [✂].

8.422 Based on the above evidence, it is our view the [✂].

8.423 While the evidence received to date indicates that the [✂], neither of these competitors, together or in isolation, is likely to offset the loss of constraint that will result from the Merger.

8.424 Only Siemens, Alstom and to lesser extent [✂] match the Parties' strengths across all of the parameters of competition considered in our assessment.

8.425 In a bidding process with up to four winners and a limited number of potential suppliers, the loss of a credible supplier would have a material impact on the intensity of competition for the TCSF tender, and would, in effect, reduce the number of suppliers that could exercise a constraint on the Parties from [✂]. We currently consider that the constraint from [✂] is likely to be weaker than the constraints of Siemens, Alstom and the Parties. The loss of the additional constraint may lead to a significant softening of competition, particularly given, as discussed above, that the Parties are likely to be close competitors for the TCSF.

8.426 Based on our provisional assessment, we consider that the Merger is likely to result in the removal of a direct and significant constraint on each of the Parties and may be expected to result in an SLC in relation to the supply of digital mainline signalling systems in GB. We consider that overall, the remaining constraints post-Merger from Siemens, Alstom, the [✂] are not likely to be sufficient to offset the loss brought about by the Merger.

8.427 The substantial loss of competition resulting from the Merger is likely to lead to a worse outcome in the initial award of the TCSF tender. The Merger could result in a reduced choice for Network Rail in terms of the number and strength of the bidders and could potentially lead to fewer than four suppliers being appointed in the current tender process and thus available to bid, should they so choose, in future mini-competitions within the TCSF.

8.428 We also consider that the Merger is likely to affect the competitive outcome of the mini-competitions expected to account for 45% of the total TCSF workbank. The Merger could also reduce the number of potential competitors in subsequent mini-competitions by one, as only the bidders selected for the TCSF can participate in these mini-competitions. [✂], if selected for the TCSF, is also likely to exercise an improved but weaker constraint for subsequent mini-competitions. Given our provisional assessment [✂] are likely to be weaker competitors for the TCSF than the Parties, we consider that they may also present an improved but weaker constraint for subsequent

mini-competitions. While the guaranteed workbank would enable [✂] to build capacity and experience in delivering digital mainline signalling projects in GB, such that it would be in a stronger position to compete by the time of the mini-competitions, [✂] could still potentially be at a competitive disadvantage due to starting from a position of substantially less management experience in delivering digital mainline signalling projects than the Parties, Siemens and Alstom.

8.429 Hitachi and Thales, as a result of their significantly greater management experience, may be better placed to introduce innovation and efficiencies to the delivery of digital mainline signalling projects than the smaller OEM consortia, including [✂]. Eliminating one of the four stronger suppliers with regards to experience and technical expertise potentially may negatively impact rivalry on innovation and process improvements, as a smaller OEM [✂] – without the depth of institutional knowledge – may offer a less effective challenge the other TCSF suppliers in relation to this dimension of competition.

8.430 Overall, we currently consider that the Merger could lead to adverse effects in the supply of digital mainline signalling systems in GB through higher prices, reduced innovation, worse terms and/or worse performance levels relative to the situation absent the Merger.

Entry and expansion

8.431 As set out in the CMA's Merger Assessment Guidelines, any analysis of a possible SLC includes consideration of the direct responses to the merger by rivals, potential rivals, and customers. If effective entry and/or expansion occurs as a result of the merger and any consequent adverse effect (for example, a price rise), the effect of the merger on competition may be mitigated. In these situations, the CMA might conclude that no SLC arises as a result of the merger.[674]

8.432 The CMA considers that entry and/or expansion preventing an SLC from arising would be rare.[675]

8.433 The CMA will seek to ensure that the evidence is robust when confronted with claims of entry or expansion being timely, likely, and sufficient to prevent an SLC from arising. It is likely to place greater weight on detailed consideration

[674] CMA129, paragraph 8.28.
[675] CMA129, paragraph 8.29.

of entry or expansion and previous experience of entry and expansion (including how frequent and recent it has been).[676]

Parties' views

8.434 The Parties submitted that 'Network Rail intends to support UK entry and expansion' and 'given this commitment and the proportion of contestable workbank available for allocation (both initially and subsequently based upon performance) it is highly unlikely that there would be no participation by one or more credible alternative suppliers, acting alone or in consortia with a local integrator, such as Atkins, or another OEM. Examples of such potential participants include AZD Praha, CAF, Atos, Hima-Sella, Indra, Mermec, CRRC, Stadler, and Progress Rail (ECM). While these potential participants have had limited success to date in the UK, they have started to make inroads in the more mature European sector – the TCSF should further encourage their UK entrance'.[677]

8.435 At the same time, the Parties also submitted that '[n]ew entrants (including the Target) may have insufficient incentives to compete for Lot 2 [the TCSF digital lot]'.[678] More specifically, the Parties told us that:

(a) '[✂] levels of development funding, [✂]; and

(b) '[✂], which further reduces the likelihood of digital signalling projects being procured within the TCSF (and therefore the probability that new entrants will recover the costs of entry)'.[679]

8.436 The Parties further submitted that the 'decrease in the value of digital work expected under the TCSF may lead to insufficient incentives for new entrants to invest in competing for the TCSF'.[680]

8.437 The Parties also told us that, if the TCSF were to successfully encourage bidding by Thales, it would likely also do so for other new entrants[681] and that 'the TCSF will not be the sole source of supply in the next 10 years … that opportunities will remain for additional suppliers and new entrants'.[682]

---

[676] CMA129, paragraph 8.30.
[677] Parties' Letter to the CMA, dated 13 January 2023.
[678] Parties, Submission on Competitive Conditions, paragraph 5.2(b).
[679] Parties, Submission on Competitive Conditions, paragraph 5.2(b).
[680] Parties, Submission on Competitive Conditions, paragraph 1.7(b).
[681] Parties' response to AIS and WPs, Section A, paragraph 2.1(d).
[682] Parties' response to AIS and WPs, Section A, paragraph 2.1(e).

Network Rail's views

8.438 Network Rail submitted that the TCSF is intended to incentivise entry in the UK by providing greater visibility over future work, providing guaranteed minimum volume commitments to framework suppliers and making a financial contribution to the cost of developing products to meet UK specifications.[683]

8.439 Network Rail told us that its intent 'is very much to change the perceived height of the barriers', but the design of the TCSF does not totally remove them: 'there are still some barriers there, but [the aim is] to change them such that new providers are interested in bidding and, ultimately, delivering works in the UK'.[684]

ORR market study

8.440 The ORR market study found that the supply of mainline signalling in GB is characterised by high barriers to entry (see paragraph 7.14(b)) and made a number of recommendations with the aim of reducing the barriers it had identified (see paragraph 7.15).

8.441 As discussed in paragraph 7.17, ORR produced a Remedies Monitoring Report in April 2023 to update on progress made since the publication of its market study. In its Remedies Monitoring Report, ORR stated that the majority of its recommendations had been addressed by Network Rail, either to completion or to an extent that there was no need for continued close regulatory oversight.[685]

Our assessment

8.442 In the competition assessment above, we considered the possible constraint on the Merged Entity arising from entry or expansion which would have occurred irrespective of the Merger.[686]

8.443 The evidence set out in the competitive assessment indicates that the entry barriers for digital mainline signalling projects in GB are high. These barriers have historically related to incumbency advantages (see finding of the ORR market study above). The design of the TCSF, in line with recommendations

---

[683] Transcript of hearing with Network Rail, 6 February 2023.
[684] Transcript of hearing with Network Rail, 6 February 2023, page 7.
[685] ORR considered that close monitoring was still required in relation to (i) education and cultural change; and (ii) performance measurement.
[686] CMA129, paragraph 4.16.

by ORR, aims to lower some of the historical barriers to entry, especially in relation to digital signalling.

8.444 As we explain above, the TCSF is the main route to enter the digital mainline signalling market in GB for the next ten years and aims to broaden the pool of suppliers with experience delivering digital projects for Network Rail. Under Network Rail's current plans, unsuccessful bidders for the TCSF would not be able to enter the GB mainline sector for at least the duration of the TCSF (ie ten years).

8.445 In our view, entry into the GB market is likely to be even more difficult following the TCSF period. At that point, there will be a greater number of incumbent suppliers, with ten years of experience in delivering digital projects for Network Rail, a track record of delivering safety-critical systems, a pool of GB project references, local resources (or relationships with local subcontractors and integrators) and an established relationship with the customer. For this reason, we consider that new entrants (ie suppliers which do not win a place on the TCSF) are likely to face significant challenges in competing in GB in the future, such that entry would not be likely to prevent an SLC from arising in this case. We also have not received evidence indicating that entry or expansion is likely to occur as a result of the Merger.

8.446 We note again that the Parties have submitted that Network Rail was considering the introduction of a second framework to give suppliers that were not successful in winning a place on the TCSF another opportunity to enter the GB mainline sector. As noted in paragraph 7.38, we understand that Network Rail has no specific plans at present to introduce a second framework (although it is potentially open to Network Rail to do so in future) and, as we set out in paragraph 7.41, we consider that incumbents may be better placed to bid for any second framework.

8.447 For these reasons, our view is that it is not likely that entry or expansion of sufficient scale would occur in a timely manner in GB in order to prevent or reduce the impact of the SLC we have provisionally found in the supply of digital mainline signalling systems in GB.

Provisional conclusion

8.448 For the reasons set out in this chapter, our provisional conclusion is that the Merger may be expected to result in a SLC in the supply of digital mainline signalling systems in GB.

9. CBTC systems: Nature of competition and approach to competition assessment

9.1 This chapter sets out our assessment of the nature of competition between the Parties and their competitors. In particular, we have considered:

(a) an overview of the demand for CBTC signalling systems in the UK;

(b) what opportunities exist for competition between the Parties and their competitors for future London Underground contracts;

(c) the parameters of competition for these future contracts; and

(d) the approach to the competition assessment.

9.2 This chapter provides important context for our competitive assessment of whether the Merger may be expected to result in an SLC in the supply of CBTC signalling systems in the UK.

Overview of CBTC signalling systems in the UK

9.3 As explained below paragraphs 10.22 to 10.24, the supply of CBTC systems has both national and global dimensions of competition, eg suppliers' local capacity and global experience are both relevant parameters of competition (see paragraph 9.39).

9.4 There are two customers for CBTC signalling systems in the UK at present, as there are two metro networks that use CBTC signalling: Glasgow Subway and London (Underground, Overground and DLR).[687]

9.5 SPT – the transport authority responsible for the Glasgow Subway – completed the procurement of CBTC signalling for its metro system in 2016. The project is due to be completed in [✂].[688] SPT told us that the new signalling system has a projected lifespan of over 30 years and that it would not have to resignal the Glasgow Subway for 'a very long time'.[689] We have not taken a potential tender for the supply of CBTC to the Glasgow Subway (in the mid-2050s) into account in our current assessment of the competitive effects of the Merger because of the uncertainty associated with predicting competitive conditions in this market so far into the future. We have however taken account of evidence from the past tender for the Glasgow Subway

[687] See paragraphs 8.40-8.42 in relation to Tyne and Wear 'metro', which is in fact a suburban rail network.
[688] Hitachi response to RFI dated 15 March 2023, Q 34.
[689] SPT email to the CMA dated 15 September 2022.

system in our competition assessment and considered the extent to which that evidence is relevant for the assessment of the effects of the Merger in the supply of CBTC systems for future projects in the UK.

9.6 As explained above in paragraph 4.26(a), TfL is responsible for the London Underground. We have focused our analysis on the supply of CBTC systems for future projects in the London Underground because TFL is likely to tender for future CBTC projects in the London Underground within around the next 10 to 12 years (see paragraphs 9.44 to 9.56).

9.7 Other than tenders for CBTC signalling systems by TfL and a possible tender for CBTC signalling systems by the Glasgow Subway in around 30 years (see paragraph 9.5), there are no other relevant tenders for CBTC systems currently planned elsewhere in the UK.

9.8 The Parties agreed with our assessment that future CBTC signalling projects in the UK will be in London.[690]

Competition for London Underground CBTC systems

9.9 TfL organises the procurement of CBTC resignalling tenders such that it is compliant with all relevant public laws, including the Public Contracts Regulations 2015 and Utilities Contracts Regulations 2016.[691]

9.10 TfL submitted that its CBTC signalling contracts can be categorised as:[692]

(a) **Upgrades:** Modifications to improve the safety or performance of the signalling system, including network extensions. For example, Thales, as the incumbent supplier, undertook the Northern Line extension to Battersea Power Station, which started in 2017.[693]

(b) **Renewals:** The replacement of existing signalling hardware to maintain the safety and performance of the signalling system. For example, [✂] is expected to start work on the [✂] track renewal in [✂].[694]

(c) **Resignalling**: Replacement of existing signalling hardware and software with an entirely new system. For example, Thales won the tender for the Four Lines Modernisation (4LM) project which covers the resignalling of

[690] Parties, submission on CBTC signalling projects for metros in the UK, 23 March 2023, paragraph 6.1.
[691] TfL questionnaire response, Q 1.
[692] TfL questionnaire response, Q 7.
[693] TfL questionnaire response, Q 2.
[694] TfL questionnaire response, Q 7.

the Circle, District, Hammersmith & City and Metropolitan lines. The project started in 2015.[695]

9.11 TfL told us that CBTC technology did not follow a standard set of principles and that, unlike mainline signalling, suppliers do not follow a standardised approach.[696] TfL told us that in fact the same supplier operating multiple lines in one metro system can have very different systems in use in each line.[697] TfL told us that both upgrade and renewal works were 'inherently' undertaken by the incumbent supplier due to the intellectual property rights of existing systems on the line.[698]

9.12 TfL submitted that it issues competitive tenders for CBTC resignalling projects as resignalling covers the complete replacement of both the software and hardware of an old signalling system so these projects are subject to competition.[699] These are also typically the highest value signalling projects.[700]

9.13 This being the case, we focused our assessment on CBTC resignalling systems. CBTC projects works can be either 'greenfield' or 'brownfield', depending on whether the works are on an active railway.

9.14 Third parties have told us that the competitive conditions for resignalling projects on brownfield and greenfield sites are quite different.[701] We understand that the tender criteria and reference requirements for brownfield projects (such as the 4LM project) will likely be different from those for greenfield projects (such as the Elizabeth Line project). We have taken the differences between greenfield and brownfield CBTC resignalling projects into account in our assessment.

Previous TfL tenders

9.15 TfL has undertaken a limited number of resignalling projects on the London Underground. Its most recent projects were the 4LM project involving the resignalling of the Circle, District, Hammersmith & City and Metropolitan lines,

[695] TfL questionnaire response, Q2.
[696] TfL call transcript, 8 February 2023, page 20.
[697] TfL call transcript, 8 February 2023, page 13.
[698] TfL call transcript, 8 February 2023, pages 7 and 19.
[699] TfL call transcript, 8 February 2023, page 8.
[700] TfL questionnaire response, Q2.
[701] Alstom call transcript, 26 January 2023, page 18, and page 13; and Siemens call transcript, 6 March 2023, pages 10-11.

which was tendered in 2015; and the Victoria line, Northern line and Jubilee line, which were all contracted for in 2003.[702]

9.16 TfL has also undertaken two other recent procurement exercises:

(a) First, the Sub Surface Railway (**SSR**) in 2009, which was subsequently cancelled after it became apparent that 'the [Bombardier] system needed very substantial development before it could be applied in the [London Underground] environment' and that the contract was 'certain to fail'. (This project covered the same lines as the 4LM).[703]

(b) Second, the Deep Tube Upgrade Program (**DTUP**) in 2016, in which the procurement process progressed until the PQQ stage before it was cancelled because of a lack of funding. The tender covered the resignalling of the Piccadilly, Bakerloo, Central and Waterloo and City lines.[704]

9.17 TfL initiated a review of its procurement processes after the cancelled SSR contract; this review was undertaken by KPMG. In June 2014, TfL published KPMG's review, which made a number of recommendations to TfL (**KPMG report**), including that in future tenders, TfL should:

(a) conduct a PQQ process prior to ITT;

(b) allocate a higher weighting to suppliers' technical and delivery capabilities rather than to pricing and commercial criteria;

(c) conduct a more rigorous technical assessment; and

(d) ensure that suppliers' case studies more closely reflect the conditions of the London Underground.[705]

9.18 TfL accepted KPMG's recommendations and, we understand, has subsequently implemented KPMG's main recommendations.[706] For example,

---

[702] The Elizabeth line also underwent procurement in 2012, this was organised by Crossrail ltd, not TfL. The Victoria, Northern and Jubilee line contracts were also awarded by London Underground Limited's contractor. TfL response to RFI dated 22 February 2023, Q1. Note of call with TfL, 9 August 2022, page 15.
[703] Sub-Surface Upgrade Programme Automatic Train Control Contract – Lessons Learnt', paragraphs 3.3 and 3.4, and slide 6.
[704] TfL response dated 27 January 2023, 'NTfL-2344.4.5-LUL-RPT-00054-02 - NTfL_CBTC_PQQ_Evaluation_Report_and_Recommendations v2.0 Issued for Approval, paragraph 1.1.
[705] 'Sub-Surface Upgrade Programme Automatic Train Control Contract – Lessons Learnt', slide 11. A further recommendation stated that an option for TfL could be to stick with 'proven' London Underground suppliers in the future to reduce risk that would permit better identification of shortcomings and to identify appropriate risk mitigation strategies. TfL was warned, however, that such an approach would restrict the level of competition and risk poor value for money outcomes.
[706] TfL response dated 27 January 2023, 'NTfL-2344.4.5-LUL-RPT-00054-02 - NTfL_CBTC_PQQ_Evaluation_Report_and_Recommendations v2.0 Issued for Approval, paragraph 7.2.

the 4LM tender included both PQQ and ITT stages and for the ITT, TfL's evaluation criteria attached 70% weight to suppliers' technical and delivery capabilities and 30% to suppliers' commercial offerings.[707] TfL has indicated that it will continue to devote greater weight to suppliers' technical capabilities than to their commercial offerings.[708] Historically, suppliers' technical capabilities have been assessed through case studies of previous signalling works undertaken by the supplier.[709]

Upcoming CBTC resignalling tenders on the London Underground

9.19 TfL told us that it plans to start the procurement for the resignalling of the Piccadilly and Bakerloo lines before 2035 (see more details in paragraphs 9.44 to 9.56).[710]

9.20 TfL told us that [✂].[711] While the Waterloo & City line was included as part of the DTUP tender, TfL told us that it did not have any current plans to procure resignalling for that line.[712] In relation to Crossrail 2, TfL submitted that the funding was going to be a 'long way' away, it indicated that it would be 'surprised if it was within the next ten years'. TfL told us that the project was seen as 'an aspiration'.[713] We would also expect TfL to conduct resignalling tenders beyond 2035, as the CBTC systems installed in the early 2000s will ultimately need to be replaced at some stage.[714] We have not taken into account in our current assessment of the competitive effects of the Merger potential CBTC tenders for other lines that may or not occur much later than 2035 because of the uncertainty associated with predicting competitive conditions in this market so far into the future.

9.21 CBTC systems can be procured either as a standalone project or bundled as part of a wider project, including rolling stock. CBTC systems can also be purchased as turnkey solutions, typically for greenfield projects. While many large resignalling projects procured by global urban transport authorities use a

---

[707] TfL weighted Envelope B covering Technical Confidence, Schedule Confidence and Delivery Confidence as 70% of the total evaluation score and weighted envelope C covering its financial assessment as the remaining 30%. Envelope A covered 8 discretionary Pass/Fail criteria including Health, Safety and Environmental response. Thales response to RFI dated 17 April, Annex T.Q5.001, paragraph 4.4.
[708] TfL call transcript, 8 February 2023, page 25.
[709]TfL response dated 27 January 2023, 'NTfL-2344.4.5-LUL-RPT-00054-02 - NTfL_CBTC_PQQ_Evaluation_Report_and_Recommendations v2.0 Issued for Approval, paragraph 1.1. paragraph 4.3; and TfL response to RFI dated 21 March 2023, 'CBTC_PQQ_Instructions_Final' pages 24-27.
[710] TfL response to RFI dated 23 March 2023, Q 4. See, 'TfL 2023 Business Plan', last accessed 31 May 2023, pages 23 and 43.
[711] TfL call transcript, 8 February 2023, page 17.
[712] TfL response to RFI dated 22 February 2023, Q 2.
[713] TfL call transcript, 8 February 2023, page 33.
[714] TfL (or its contractors) awarded the upgrade of the Northern, Jubilee and Victoria lines in 2003 and the DLR originally in 1995. We have been told both by TfL that its signalling systems are designed to achieve a minimum of 40 years in operation. TfL questionnaire response, Q 1, and Q 4.

bundled approach to procurement, TfL has historically favoured procurement of its signalling solutions on a standalone basis.[715] TfL submitted that it has done this to ensure it receives both the best quality signalling product and the best quality rolling stock product.[716] On this basis, we expect TfL will likely procure its CBTC systems for the Bakerloo and Piccadilly lines as a standalone project(s).

Tender structure

9.22 As described in paragraph 9.18, TfL procurement will likely involve PQQ and ITT stages and the tender evaluation will focus primarily on the suppliers' technical and delivery capabilities, as well as a financial assessment.

9.23 In the past, TfL has used a single round sealed bid tender process, in which the procurement process did not reveal the identity of bidders or the nature of their bids. Siemens and Alstom told us that TfL did not reveal the identity of other bidders.[717] It may be the case that bidders may be able to identify which of their competitors may bid for the ITT stage based on their market intelligence but assuming TfL follows the same process in future, bidders would be unlikely to know the nature of their competitors' bids and will have to form expectations of how they have bid. Suppliers face the threat of elimination at the PQQ stage and the 'best' bid wins during the ITT stage (paragraph 7.48). This being the case, we believe that all credible competitors (not just the closest competitor) are likely to play a role in adding to the competitive constraint, and hence the more credible competitors there are in the market the stronger competition for future London Underground tenders there is likely to be. In the competitive assessment therefore, we will consider evidence on the closeness of competition between the Parties and their competitors currently and in the future.

Parameters of competition

9.24 This section considers the relevant parameters of competition for the supply of CBTC signalling system to TfL for the London Underground. Given that the Piccadilly and Bakerloo lines are the only tenders that are likely to be tendered before 2035, we have focused on the factors that are likely to determine how the Parties will compete with each other and their competitors for these tenders.

[715] TfL call transcript, 8 February 2023, page 12
[716] TfL call transcript, 8 February 2023, page 12
[717] Siemens questionnaire response, Q 5; and Alstom questionnaire response, Q 5.

9.25 We have considered the Parties' views on what they consider to be the most relevant capabilities required to compete for CBTC signalling projects on the London Underground. We have also considered how TfL may be expected to evaluate suppliers' bids for the Piccadilly and Bakerloo lines, based on its approach to previous tenders, and sought information from competitors on the factors they consider to be important for competition in this market.

Parties' views

9.26 The Parties submitted that the London Underground is a uniquely complex brownfield environment and that to compete for projects on the system, suppliers would need to demonstrate:[718]

(a) **Sufficient technical capability.** Suppliers would need to have a proven track record of successfully delivering comparably complex brownfield projects. Owing to the particular complexities of the London Underground, in practice, suppliers would need to have London references to compete credibly for TfL tenders; other global references are ineffective in practice.

(b) **Suitable logistic capacity**. Suppliers would need to be able to deliver projects within short periods of time (typically [✂] hours at night) and [✂].

(c) **Adequate local deployment and commissioning resources**. Suppliers would need to have local personnel, signalling equipment and related resources (ie vans and training facilities) to meet TfL's demands.

(d) **Appropriately qualified and certified staff**. TfL requires suppliers to have appropriate qualifications and certifications for personnel working on CBTC signalling projects for metros.

(e) **Having an existing relationship with TfL** can also be an advantage when competing for resignalling projects.[719]

9.27 The Parties submitted that examples of specific complexity factors associated with the lines of the London Underground include: the total ridership of the line; the hours in which the line operates; the number of junctions on the line;[720] the headway required, the age of the line, the number of stations and the length of underground tunnels on the line.[721]

[718] Parties' submission dated 23 March 2023, paragraph 4.3.
[719] Parties' submission dated 23 March 2023, paragraphs 1.2, 4.3, and 9.4.
[720] Parties' response to Issues Letter, 23 November 2022, paragraphs 11.2-11.3.
[721] Parties, submission on CBTC signalling projects for metros in the UK, paragraph 7.5.

9.28 The Parties also submitted that the DTUP PQQ criteria demonstrated the requirements that suppliers would need to meet to compete for future brownfield CBTC signalling projects on the London Underground. The Parties stated that '[i]t is reasonable to assume that future tenders to resignal these lines will be subject to a comparable competitive framework'.[722]

Third-party views

9.29 We asked TfL to identify the factors that it considered were most important when deciding to which supplier to award a CBTC resignalling contract.

9.30 Since it has not yet scoped the Piccadilly and Bakerloo lines tenders, TfL submitted that it would be 'difficult to say what criteria we may use to assess the suitability of a reference site'.[723] As set out at paragraphs 9.37 and 9.38, assuming that TfL follows the same approach as it has taken in previous tenders, it is likely that TfL would continue to assess suppliers' technical and commercial offerings and apply a greater weight to the technical criteria. The technical criteria can cover a number of parameters including suppliers' ability to adapt their CBTC product to meet TfL's technical requirements and previous experience in undertaking projects that are similar in nature to the specifications specified in the London Underground tender.

9.31 In response to our question whether TfL had a preference for suppliers with UK experience, TfL submitted that UK experience was 'neither essential nor preferred' and that what was important was 'the operational and technical experience of the supplier and relevance in relation to a given procurement'.[724] TfL told us that a supplier would be able to demonstrate its ability to resignal a line on the London Underground by using either domestic or international reference projects.[725]

9.32 In relation to price, TfL told us that it would not expect the lowest tendered price to necessarily result in the lowest cost to TfL as this may be a result of a supplier not understanding the complexities and technical requirements of the project.[726] TfL told us that the 'best and final offer' would likely be largely irrelevant. TfL would be more interested in the fees and rates offered by the supplier, as these factors have more influence on the overall target cost.[727]

---

[722] Parties, submission on CBTC signalling projects for metros in the UK, paragraph 4.4.
[723] TfL response to RFI dated 22 February 2023, Q 3.
[724] TfL response to questionnaire, Q 9(e).
[725] TfL response to questionnaire, Q 9(d).
[726] Transcript of hearing with TfL, 8 February 2023, pages 28, and 3.
[727] Transcript of hearing with TfL, 8 February 2023, pages 31-32.

9.33 We also gathered evidence from competitors on what they consider to be the parameters of competition for future TfL resignalling projects.

9.34 Both Siemens and Alstom told us that TfL's assessment would consider the technical solution of the supplier. Alstom also told us that TfL would look at whether the supplier can offer the 'same flavour' of CBTC technology required for the project and assess, based on references whether a supplier can 'deliver the migration or the upgrade of the line, without interrupting service'.[728]

9.35 Third-party suppliers also told us that TfL was likely to consider several delivery criteria in its assessment of references, such as:

(a) Demonstration of a supplier's ability to deliver projects successfully and on time.[729]

(b) Having a reference from delivering a project somewhere in the world with similar complexities to the London Underground.[730]

(c) Demonstrable approach to health and safety, sustainability and social value.[731]

(d) The ability to deliver the upgrade of the line without interrupting service.[732]

9.36 Alstom told us that TfL would also assess knowledge and knowhow of the local environment and any particular local standards.[733] It told us that having a reference in the country showing the ability to develop an experienced local workforce is a competitive strength.[734] Siemens told us that a client (such as TfL) would consider the technical solution, the ability of the bidder to actually deliver the project successfully on time, and the commercial elements associated with that, such as price. Other factors considered by customers were health and safety approach, approach to sustainability, and social value elements.[735]

DTUP criteria

9.37 In the PQQ of the DTUP tender, TfL assessed bidders by reference to certain 'pass and fail' criteria in relation to the financial standing of the bidders and

---

[728] Alstom call transcript, 26 January 2023, page 18.
[729] Siemens call transcript, 16 February 2023, page 17.
[730] Alstom call transcript, 26 January 2023, page 17.
[731] Siemens call transcript, 16 February 2023, page 17.
[732] Alstom call transcript, 26 January 2023, page 18.
[733] Alstom call transcript, 26 January 2023, page 17.
[734] Alstom call transcript, 26 January 2023, page 14.
[735] Siemens call transcript, 16 February 2023, page 17.

several criteria against which TfL assessed the technical capability and experience of the bidder, primarily using case studies. These criteria include: (i) 'customer and business management' (10%); (ii) 'organisation, people and resources' (10%); (iii) 'supply chain/partnership' (5%); (iv) 'relevant experience & system delivery' (30%); (v) 'systems engineering and integration capability' (8%); (vi) 'product & certification' (15%); (vii) 'Quality' (6%); (viii) 'RAM' [reliability, availability & maintainability] (8%); and (ix) 'maintenance' (6%).[736] We note that 'relevant experience & system delivery', including 'capability to deliver a CBTC system of similar scope and with the characteristics' required by TfL, was the criterion with the highest weighting.

9.38 Although the tender was cancelled during the ITT stage, TfL prepared a draft set of ITT criteria and issued to pre-qualified suppliers. These criteria were split into two broad categories: 'technical' (weighted 60%) and 'commercial' (weighted 40%). The technical criteria covered; 'design and system solution' (42%), 'delivery – implementation services' (45%) and 'delivery – operational services' (13%). The commercial criteria covered: 'implementation target price – Piccadilly line' (50%), 'implementation target price – all other lines' (25%) and 'operational services' (25%).[737]

Our assessment

9.39 Based on the evidence set out above, our view is that competition for the resignalling of the Piccadilly and Bakerloo lines will take place across several aspects of suppliers' offerings:

(a) **Access to technology**: suppliers will compete on the basis of their CBTC signalling solutions and ability to meet the technological requirements of the specific project set out by TfL.

(b) **Experience in undertaking CBTC resignalling projects**: suppliers will compete on the basis of their experience and expertise in undertaking CBTC projects on metro systems that have at least some comparable characteristics to the upcoming projects on the London Underground. This will cover various dimensions including, among others, whether the reference projects are greenfield or brownfield; the age of the metro system; the operating hours of the line and passenger throughput; operational factors, such as the ability to avoid disruption (eg line closures); and other parameters of complexity.

[736] TfL response dated 27 January 2023, 'DTUP PQQ Evaluation Report and Recommendations', paragraph 6.5.
[737] TfL response dated 1 June 2023, 'IFT Appendix B valuation Questions and Guidance'.

(c) **Local knowledge and capacity**: having experience and knowledge of London Underground systems as well as existing capacity in the UK is likely to be advantageous to a bidder's chances of selection. Having an existing relationship with TfL, specifically through supplying signalling but also to a lesser extent through the supply of other services, may confer upon a supplier a competitive advantage. While the Parties submitted that, in practice, a supplier would need references on the London Underground in order to credibly compete for future TfL tenders, based on the evidence from third parties, and in particular evidence from TfL that it would accept references from outside the UK, we do not consider that London Underground references are essential for a bidder.

(d) **Price**: suppliers will compete on their ability to offer competitive fees and rates, but safety critical and operational factors are expected to be more important.

9.40 In our competition assessment, we will consider how closely the Parties and their competitors are expected to compete against these parameters.

Approach to the competition assessment

Approach to evidence and the focus of our assessment

9.41 As explained at paragraph 9.6, our competition assessment will focus on future TfL CBTC resignalling projects for the Piccadilly and Bakerloo lines.

9.42 In relation to our approach to the assessment of the evidence, we note the following:

(a) **Tender and share of supply analysis**: We have considered evidence from past tenders for CBTC resignalling projects by TfL and shares of supply in the UK. Given the limited number of tender observations, we have also analysed the evidence from past competitive interactions in Europe and globally such as bidding data, shares, and references. Despite the specific characteristics of the London Underground, we consider that this evidence provides insight into suppliers' technical experience and expertise in delivering CBTC projects and into the likely competitive conditions for future CBTC projects in the UK.

(b) **Parties' submissions, third-party views, and the Parties' internal documents**: We took this evidence into account in assessing Hitachi's incentives to bid for future CBTC projects in the London Underground, whether and the extent to which the incumbent suppliers to the London Underground would have an advantage in future CBTC projects in the

London Underground, and the extent to which Hitachi and other entrants are credible competitors for CBTC projects in these lines, in addition to the incumbents Thales and Siemens (see paragraph 10.30).

9.43 In our assessment of the evidence, we adopted the general principles set out in paragraphs 6.5 to 6.9.

Timeframe of our assessment

9.44 As noted above, our assessment focuses on the procurement for the resignalling of the Bakerloo and Piccadilly lines which may not take place until as late as 2035. The Parties submitted that the procurement for these projects is both uncertain (being subject to business justification and funding constraints) and distant (being expected to be procured in over a decade's time). The Parties consider that the assessment of any supplier's trajectory over a period of ten years is extremely speculative, and that it is difficult to see how that assessment could meet the relevant threshold for a finding of SLC on the balance of probabilities. The Parties believe that it is not possible to predict based on the evidence available if any of Hitachi, CRSC or other new entrants could become credible competitors for the London Underground in this timeframe.[738]

9.45 With respect to the timing and certainty of the procurement for the resignalling of the Piccadilly and Bakerloo lines, TfL submitted that these projects are part of TfL's business plan and are expected to commence procurement prior to 2035, although this would be subject to business justification and funding constraints.[739] This is consistent with repeated references to the resignalling of the Piccadilly line in TfL's published business plans, including its most recent 2023 business plan.

9.46 Since TfL's investment plans depends on the availability of government funding and the funding and timescales for future TfL projects have not yet been decided,[740] it is not possible to determine the exact timing of procurement.

9.47 However, based on TfL's evidence on the estimated remaining useful life of urban signalling systems and its business plans, it is likely that both the Piccadilly and Bakerloo lines will require resignalling and that tenders for

[738] Parties' response to the AIS and WP, paragraph 5.2.
[739] TfL response to RFI dated 23 March 2023, Q 4(a).
[740] DfT response to RFI of 20 February 2023, Q 4.

those projects will be launched within the next 10–12 years.[741] In particular, TfL told us that the cost of maintaining the legacy signalling system on the Bakerloo line will eventually become uneconomical. TfL told us that while the system would not 'necessarily stop functioning, it just costs you a lot continuing' and that 'actually it may get to a point where we stop running the Bakerloo line because the cost becomes prohibitive'.[742] TfL also told us that 'in some cases where components have gone well beyond their actual design life, then we have to look very carefully about whether, for example, structurally they can continue to safely operate'.[743]

9.48 The projected timelines for the resignalling of the Piccadilly and Bakerloo lines [✂].[744]

9.49 We currently consider, therefore, that the evidence indicates that the procurement of the Piccadilly and Bakerloo lines is likely to occur within 10–12 years.

9.50 A timeframe of up to 12 years inevitably results in some uncertainty as to how competition in the market will develop by the time that these tenders take place. We note that the CMA's Merger Assessment Guidelines indicates that '[m]erger assessments involve the CMA assessing the likely development of markets several years into the future'.[745] The Guidelines also state that '[w]hilst the degree of uncertainty will be appropriately weighted in the CMA's assessment of whether the relevant standard of proof is met, uncertainty will not in itself preclude the CMA from concluding that the SLC test is met on the basis of all the available evidence'.[746]

9.51 We consider that the main uncertainties relevant to our assessment are around:

(a) the design of TfL's tender process for the Piccadilly and Bakerloo lines, as this may influence the extent of incumbency advantage and barriers to entry; and

(b) the capabilities of potential suppliers at the time these tenders are likely to be launched, including: (i) which suppliers will have the capabilities to

---

[741] TfL told us that 'Typically, a signalling system has a 40-year life span. Over those 40 years, TfL ensures the system is safe and reliable. Therefore, it has support contracts for components and maintenance.' See, TfL, call note, 9 August 2022, paragraph 26. The signalling system in the Piccadilly Line was updated around 1980s and TfL told us that 'trains' in the Bakerloo Line are '50 years old'. See, Transcript of call with TfL, 8 February 2023, page 18; and TfL response to RFI dated 22 February 2023, Q 1.
[742] Transcript of hearing with TfL 8 February 2023, page 18.
[743] Transcript of hearing with TfL 8 February 2023, pages 18-19.
[744] Parties, Submission on CBTC signalling projects for metros in the UK, dated 23 March 2023 (**Submission on CBTC signalling projects**), paragraph 6.2.
[745] CMA129, paragraph 2.27.
[746] CMA129, paragraph 2.10.

compete for complex brownfield CBTC projects at the time these projects are tendered; and (ii) whether new CBTC suppliers that currently have no or limited relevant experience in undertaking brownfield CBTC projects would be able to enter and become credible competitors for future London CBTC projects.

9.52 We have considered each of these questions in our competitive assessment based on evidence available to us.

9.53 We note that the shares of supply and bidding analysis demonstrate that the conditions of competition in Europe and globally have been fairly consistent between 2012 and 2021, with four main suppliers accounting for the vast majority of CBTC signalling projects (see paragraph 10.201). While a small number of suppliers have recently entered or are aiming to enter in the supply of CBTC systems in Europe (eg CAF and Stadler), no new supplier has attained a significant foothold in Europe and globally (see below Table 16 and paragraph 10.199).

9.54 We consider that evidence such as shares of supply and bidding analysis can provide information on the nature and extent of competition between the Parties and other suppliers in the recent past and may provide useful insights into the likely extent of competition between them in the future. This is particularly the case in a market which is relatively stable and has high barriers to entry as discussed below. We have also considered evidence from the Parties, the Parties' internal documents, and third parties in order to get as complete a picture as possible of the likely future dynamics of competition, including whether entry and expansion would be timely, likely, and sufficient to prevent an SLC from arising taking into account when future CBTC tenders for the London Underground are likely to occur.

9.55 We have assessed whether the evidence, in the round, indicates that the supply of CBTC systems in a complex metro environment is likely to remain highly concentrated, with high barriers to entry and expansion. In such circumstances, the loss of a rival imposing even a limited constraint could result in an SLC.

9.56 Accordingly, we have assessed the likely applicable conditions of competition on the basis of all the available evidence, rather than seeking to predict specific outcomes.

10. Supply of CBTC systems

10.1 The Parties have in the past competed for the provision of CBTC systems procured by UK transport authorities, [✂] for CBTC systems on the London Underground.

10.2 In our assessment below, we have considered how closely the Parties compete with one another and whether the removal of the constraint the Parties place on each other is likely to lead to an SLC in the supply of CBTC signalling systems procured by UK transport authorities. As part of this assessment, we have also considered the competitive constraints placed on the Parties by other CBTC suppliers that may bid for future UK transport authority CBTC signalling contracts.

10.3 The remainder of this chapter is structured as follows:

(a) Market definition;

(b) Competition assessment;

(c) Our provisional assessment;

(d) Entry and expansion; and

(e) Provisional conclusion.

Market definition

Product market

10.4 The Parties overlap in the supply of CBTC systems in the UK, which we take as our starting point for determining the relevant product market.

10.5 The boundaries of the relevant product market are generally determined primarily by reference to demand-side substitution. However, the CMA may widen the scope of the market where there is evidence that firms routinely use their production assets to supply a range of products and where the conditions of competition for those products are similar.[747]

[747] CMA129, paragraph 9.8.

Parties' views

10.6 As mentioned above in paragraph 8.9, the Parties submitted that the distinction between mainline and urban signalling projects is appropriate.[748]

10.7 The Parties submitted that CBTC signalling systems and conventional signalling systems for urban metro rail were distinct. The Parties submitted that CBTC systems were more advanced than conventional urban systems and it was, therefore, unlikely that a customer that already uses CBTC systems would switch back to conventional urban signalling. For instance, CBTC systems are characterised by higher automation than conventional signalling systems for metros, allowing precision stopping at platforms, automatic door operation and automatic turnback at terminals, and in some circumstances the operation of fully driverless trains.[749] The Parties also submitted that CBTC provides performance benefits where the network requirements justify the additional investment needed to upgrade to CBTC.[750]

10.8 The Parties also submitted that, unlike ETCS mainline signalling systems, CBTC signalling systems are generally based on the supplier's bespoke technology that is non-standard and does not easily interoperate with the CBTC signalling technology of other suppliers. The CBTC signalling supplier also customises its solution to meet each customer's requirements and the needs of each specific deployment. Different suppliers therefore offer different CBTC solutions, and it is difficult 'for one CBTC signalling supplier to modify or extend the CBTC system installed by another supplier'.[751]

Third-party views

10.9 TfL submitted that it would procure CBTC systems for future London Underground resignalling projects (see section above *Upcoming CBTC resignalling tenders on the London Underground*).

Our assessment

10.10 In this case, on the demand-side, transport authorities are unlikely to switch away from their demand for CBTC signalling to other forms of signalling systems, for example, to conventional urban signalling or any type of mainline signalling. We considered the degree of supply side substitution in relation to the supply of CBTC, in the context of the framework set out in paragraph 8.8.

---

[748] FMN, 13 October 2022, Chapter 1, paragraphs 13.4-13.5.
[749] FMN, 13 October 2022, Chapter 1, paragraph 13.11.6.
[750] Parties, Submission on CBTC signalling projects, paragraph 1.1.
[751] Parties, Submission on CBTC signalling projects, paragraph 2.3.

10.11 Based on the evidence from the Parties and previous findings of the European Commission,[752,753] we consider that there is very limited demand-side substitutability between mainline and urban signalling systems, since the projects are used by different customers that have different requirements and the projects use different technologies and apply different standards.

10.12 The evidence from the Parties, TfL and previous findings from the European Commission[754] indicate that CBTC is a new generation of urban signalling and uses different technologies to conventional urban signalling systems, with improved functionalities, improved security and typically higher costs. TfL has used CBTC systems in its most recent resignalling tenders and intends to procure CBTC systems for its future London Underground resignalling projects. On that basis, we consider that substitution of conventional urban signalling systems for CBTC systems is likely to be limited. We therefore consider that CBTC and conventional urban signalling systems are separate product markets.

10.13 We considered further possible distinctions within CBTC signalling projects (eg possible segmentations based on the type of CBTC technology, the type of urban rail transport using the CBTC technology (eg Light Railway Trams (LRTs or metro) and the level of complexity of the project). As explained in the Background chapter, all CBTC systems rely on continuous radio-based communication between the train and the tracks to precisely identify the location of a train on the tracks. The evidence indicates, however, that CBTC technology does not follow a standard set of principles and that the technology is bespoke for each metro system, and potentially for different lines within the same metro system (see paragraph 10.49). Transport authorities, therefore, typically have bespoke requirements for their metro system.

10.14 We note that the level of complexity of CBTC signalling projects varies on a spectrum and in relation to a number of different dimensions (eg age of the metro system, the tunnel size etc). We therefore currently consider that any differences in the conditions of competition between CBTC signalling projects according to their levels of complexity are better taken into account in the

---

[752] FMN, 13 October 2022, Chapter 1, paragraph 13.2.1 and 13.5. The Parties cited *Siemens/Alstom*, paragraphs 620 and *Alstom/Bombardier* 31 July 2022, paragraphs 755.
[753] The Parties cited *Alstom/Bombardier*, paragraphs 1139.
[754] The Parties cited *Alstom/Bombardier*, paragraphs 1146 and noted that, in *Alstom/Bombardier,* the European Commission found that the market for CBTC signalling projects for metros was distinct from that for conventional signalling for metros due to factors such as CBTC's additional functionalities, improved energy efficiency, increased security, and higher cost. Nevertheless, the European Commission left the exact delineation of the metro signalling markets open as the Merger did not give rise to competition concerns under any possible market definition. FMN, 13 October 2022, Chapter 2, 13.10.

competition assessment, as part of the assessment of CBTC suppliers' experience, than by distinguishing between separate product markets.

10.15 Our competition assessment focuses on assessing which are the most likely, credible competitors for future CBTC signalling tenders in the London Underground, taking into account the characteristics of the projects we expect to be procured.

Provisional conclusion on product market definition

10.16 Based on the above evidence, we have provisionally concluded that the relevant product market is the supply of CBTC signalling systems.

Geographic market

10.17 Similar to the product market definition, in general the boundaries of geographic market definition are determined primarily by reference to demand-side substitution. In certain circumstances, we may aggregate markets based on considerations relating to the response of suppliers to changes in price.[755] Below, we consider the degree of supply side substitution in the supply of CBTC systems in Europe in more detail, in the context of the framework set out in paragraph 8.8.

Parties' views

10.18 The Parties submitted that the geographic market for CBTC signalling projects should be Europe-wide, because suppliers active in European countries would generally be able to compete for projects across the continent, including the UK. The Parties submitted that, while CBTC solutions generally need to be adapted for any given project based on the customers' requirements, there has also been an increase in standardisation of CBTC.[756]

10.19 The Parties also submitted that TfL requires staff working on the London Underground to obtain the appropriate qualifications and certifications before undertaking work on CBTC signalling projects, in particular, an IRSE Licence. Obtaining such licences requires a period of training and time and cost.[757] IRSE licences were also required for working on the [✂] (see *Experience on the London Underground*).[758]

---

[755] CMA129, paragraph 9.7.
[756] FMN, 13 October 2022, Chapter 2, paragraph 13.21.
[757] Parties, submission on CBTC signalling projects, paragraph 4.3(d); and Hitachi, Main Party Hearing transcript, 26 April 2023, page 65.
[758] Hitachi, Main Party Hearing transcript, 26 April 2023, page 64.

Our assessment

10.20 As mentioned above in paragraph 4.26(a), TfL is responsible for procuring signalling systems for the London Underground and each CBTC signalling tender will have bespoke requirements (see paragraph 10.13).[759]

10.21 From the demand-side perspective, TfL told us that UK experience is neither 'essential nor preferred' for suppliers to win CBTC signalling projects on the London Underground.[760] However, the Parties' submissions indicate that UK transport authorities do require staff to be licensed and qualified to operate on UK metro systems.[761]

10.22 From a supply-side perspective, while there is evidence that suppliers not currently active in the UK may be able to enter and compete for tenders in the UK, those suppliers would need to invest in local capacity to be able to deliver projects in the UK, for example, hire local staff with the appropriate licences and qualifications to operate on UK metro systems. As explained below in paragraph 10.98, the hiring of staff can be costly and time-consuming. Entry into the UK is therefore likely to involve some effort and investment. There is little evidence to suggest that suppliers have been, or would be capable of, routinely shifting capacity from other geographic markets to meet demand in the UK.

10.23 Notwithstanding the evidence that there are certain national dynamics of competition and that there are some barriers to entering the UK, in our competitive assessment we have also taken into account the fact that the Parties and their main competitors operate and compete on a global basis, using the same core systems. We consider that some elements of their offerings such as innovation and product development may be determined by competition outside, as well as inside, the UK (see, for example, the evolution of the (CBTC) technology that Hitachi is currently developing, described in paragraph 10.229(a)). We also recognise that suppliers can use CBTC projects outside the UK as references for UK CBTC tenders and that their effectiveness as competitors in the UK may be influenced by their experience both inside and outside the UK.

10.24 Given this, we consider the appropriate starting point for our assessment is the UK market. However, we will also consider in our competitive assessment the potential constraint from suppliers outside the UK as well as the impact of broader global competitive dynamics – in particular in relation to innovation

---

[759] See also paragraph 9.6, where we explain that where we explain that the focus of our investigation are future CBTC projects in the London Underground within around the next 10–12 years.
[760] TfL questionnaire response, Q 9(e).
[761] Parties, submission on CBTC signalling projects, paragraph 4.3(d).

and product development and the importance of experience from outside the UK – on competition in the UK.

Provisional conclusion on geographic market definition

10.25 For the reasons set out above, we have provisionally concluded that the relevant geographic market is the UK, with some important global aspects of competition which affect the competitive strength of suppliers in future CBTC systems in the UK.

Provisional conclusion on market definition

10.26 We have provisionally concluded that the relevant market is the supply of CBTC signalling systems in the UK, with some important global aspects of competition which affect the competitive strength of suppliers in future CBTC systems in the UK.

Competition assessment

10.27 Thales is the largest supplier of CBTC signalling for the London Underground (see paragraphs 10.70 and 10.195). We have assessed whether Hitachi is a potential challenger for future CBTC signalling contracts. In this chapter, we assess the closeness of competition between the Parties and whether alternative constraints would offset the loss of competition resulting from the Merger.

10.28 As described in more detail below, the supply of CBTC systems to the London Underground is highly concentrated and there are currently two suppliers operating on the London Underground that likely benefit from material incumbency advantages. Hitachi [✂] and is an important supplier of CBTC systems globally.

10.29 As set out in the CMA's Merger Assessment Guidelines, where evidence indicates that 'competition mainly takes place among a few firms, any two would normally be regarded as sufficiently close competitors that the elimination of competition between them would raise competition concerns, subject to evidence to the contrary. The smaller the number of significant players, the stronger the *prima facie* expectation that any two firms are close competitors. In such a scenario, we would require persuasive evidence that

the merger firms are not competitors to allay any competition concerns'.[762] This would appear to be a particularly relevant consideration in this case.

10.30 With this context in mind, we have investigated the following three key questions to assess the evidence on the likely effects of the Merger on competition in relation to the supply of CBTC services:

(a) Whether future London Underground projects are contestable, given the strong incumbency advantages of existing suppliers (see 'Incumbency on the London Underground');

(b) Whether Hitachi would likely bid for complex brownfield CBTC projects in the future. As explained below in the section about 'Hitachi's participation in future London Underground CBTC tenders', Hitachi submitted on 23 March 2023 [✂].[763] [✂][764] [✂];[765] and

(c) Whether the Parties are close competitors and whether constraints from other CBTC suppliers would offset the potential loss of competition that the Parties would have exercised on each other in future CBTC tenders for the London Underground. To assess CBTC suppliers' actual and potential strengths, we have considered a range of evidence, including shares of supply, bidding analysis, suppliers' access to technology and their management expertise and technical expertise in undertaking CBTC projects (see 'Shares of supply', 'Bidding analysis', 'Suppliers' characteristics' and 'Third-party evidence').

Incumbency on the London Underground

10.31 The Parties and their competitors have told us that the London Underground is one of the most complex metro systems in the world.[766] The Parties told us that incumbent suppliers are considered to have a significant competitive advantage because:

(a) incumbents have a strong operational knowledge of the network which reduces the delivery risk;

---

[762] CMA129, paragraph 4.10.
[763] Parties, Submission on CBTC signalling projects, paragraph 8.2.
[764] Hitachi letter to CMA, dated 3 May 2023, page 2.
[765] Parties' response to the AIS and WP, Section B, paragraph, 4.14. [✂], with further support to the statement that [✂].
[766] Alstom call transcript, 26 January 2023, page 19; Siemens call transcript, 6 March 2023, page 10; and Parties, Submission on CBTC signalling projects, paragraph 4.2.

(b) incumbents may have a lower cost of familiarisation and potentially a lower cost of technology adaptation; and

(c) London Underground references are required to demonstrate the characteristics required to meet TfL's criteria; these are less common with non-London references.[767]

10.32 Thales is the largest supplier on the London Underground; once the 4LM project is complete it will signal approximately 60–70% of TfL's network.[768] Thales has signalled seven different lines that were awarded through three separate contracts. Siemens is the only other CBTC supplier currently operating on the London Underground and has signalled three different lines that were awarded through three separate contracts.[769]

10.33 In this section, we consider whether the incumbency advantages held by Thales and Siemens heighten entry barriers to such an extent that future CBTC resignalling projects on the London Underground would not be contestable for suppliers without previous experience in London. We assess the incumbency advantages against each of the following parameters:

(a) Access to technology;

(b) Management experience and technical expertise; and

(c) Local knowledge and capacity.

Access to technology

10.34 We assess whether existing suppliers have an incumbency advantage with respect to their access to technology. We consider the evidence in relation to any incumbency advantages that may arise from the need to interface with the technology of incumbent suppliers in the 'Local knowledge and capacity' section.

Parties' views

10.35 The Parties submitted that both Thales and Siemens had CBTC systems that were tailored to TfL's bespoke standards.[770] According to the Parties, this provides scope for [✂]. The Parties cited the efficiencies that Thales had

[767] Parties' response to the AIS and WP, 2 May 2023, Section B, paragraphs 3.16 and 4.1-4.13.
[768] TfL, call note, 9 August 2022, paragraph 1(b). Thales signals the DLR, Jubilee and Northern lines (JNUP) and Circle, District, Hammersmith & City and Metropolitan lines (4LM).
[769] Siemens signals the Central line, Victoria line and Elizabeth line. TfL in-house technology is used to signal the Piccadilly, Bakerloo and Waterloo & City lines. TfL response to RFI dated 22 February 2023, Q 1.
[770] Parties' response to the AIS and WP, Section B, paragraph 3.3.

generated in project delivery [✂]. The Parties submitted that [✂]. The Parties stated that the reduced duration [✂].[771]

10.36 The Parties submitted that Hitachi did not have detailed knowledge of TfL's specifications for its CBTC system and that it had not developed any specific CBTC solution for TfL.[772] The Parties submitted that rather than access to technology, the key distinguishing factor when competing for CBTC projects in London was the supplier's ability to adapt its technology to meet TfL's 'complex specifications'.[773] In the Parties' view, such capabilities could only be acquired through experience and conferred incumbents with a significant advantage.[774]

10.37 The Parties considered that TfL's assessment that CBTC technology is rapidly changing (see paragraph 10.38 below) was speculative and instead explained that, in their experience, CBTC technology had 'remained fundamentally the same since the 1980s'.[775]

Third-party views

10.38 TfL submitted that CBTC systems installed on different lines on the same metro system could be significantly different from each other, even if installed by the same provider. For example, TfL indicated that the Metropolitan line (part of the 4LM project) has a section which runs alongside the Jubilee line but that the lines use two significantly different technologies, even though both lines were signalled by Thales.[776] Specifically, the Jubilee line system uses inductive cables, whereas the Metropolitan line system is radio based despite both using the same track to reach Neasden depot.[777] This suggests that there have been changes in technology since the 1980s.

10.39 TfL also submitted that the Piccadilly and Bakerloo lines use very old legacy systems and that each line was operated separately. TfL did not consider that an incumbent on the London Underground would necessarily have a technological advantage for resignalling either line.[778]

---

[771] Parties' response to the AIS and WP, Section B, paragraph 3.4.
[772] Parties' response to the AIS and WP, Section B, paragraph 3.4.
[773] Parties' response to the AIS and WP, Section B, paragraph 3.5.
[774] Parties' response to the AIS and WP, Section B, paragraph 3.6.
[775] Parties' response to the AIS and WP, Section B, paragraph 3.6.
[776] TfL call transcript, 8 February 2023, page 14.
[777] TfL response to RFI dated 23 March 2023, Q 2(a). The Jubilee line was originally upgraded using transmission-based train control (TBTC) and the Metropolitan line using CBTC. See, TfL, call note, 9 August 2022, paragraphs 7-8. CBTC is a technological evolution of transmission-based train control (TBTC), using more modern communications technology in place of cabling to improve reliability and performance, as well as reduce maintenance costs.
[778] TfL call transcript, 8 February 2023, page 12 to page 13.

10.40 TfL submitted that the challenge for a bidder was how it would configure and deploy its system to meet TfL's operational and infrastructure requirements.[779]

10.41 Alstom told us that most suppliers have competing technical capabilities.[780] Alstom also noted that there was an 'important difference between an OEM who has already installed the signalling technology, and an OEM who has never installed the signalling technology' in a particular metro network.[781]

10.42 [✂].[782]

10.43 Siemens explained that there would be a 'one-time effort' to 'adapt your existing software to the needs of TfL … if you did that once, you have all this knowledge already, and you have adapted your software already to the needs of the customer … some very highly sophisticated customers that have a lot of wishes on functionalities and how they would want a system'.[783]

DTUP tender evaluation documents

10.44 We reviewed the tender evaluation documents from the 2016 DTUP which was TfL's most recent procurement process in which it assessed suppliers' technology offerings. As explained in paragraph 9.16(b), the DTUP tender was cancelled after PQQ stage and therefore, the available PQQ scores do not reflect a full evaluation of suppliers' capabilities. We also note that [✂]. With regard to the 'Access to technology' parameter, the DTUP tender provides contemporaneous evidence of TfL's assessment [✂]. The core section of TfL's evaluation of suppliers' technological offerings was covered in 'C6: Product and Certification'. Table 14 provides detail of TfL's assessment.

Table 14: Product and Certification scoring for the DTUP PQQ

[✂]

Source: [✂].

10.45 [✂].[784]

10.46 [✂].[785,786,787]

---

[779] TfL, call note, 9 August 2022, paragraph 4.
[780] Alstom call transcript, 26 January 2023, page 11.
[781] Alstom call transcript, 26 January 2023, pages 26-27.
[782] [✂]
[783] Siemens call transcript, 16 February 2023, page 10.
[784] We note that [✂], which we address in the 'Management experience and technical expertise' section.
[785] TfL response dated 17 April 2023, [✂], page 2. New Tube for London (**NTfL**) is an alternative name for the DTUP.
[786] TfL response dated 17 April 2023, [✂], page 2.
[787] TfL response dated 17 April 2023, [✂] pages 19-20.

10.47 [✂].[788,789]

Our provisional assessment

10.48 Based on the above evidence, we consider that having an existing technological solution used on the London Underground may confer a competitive advantage as incumbents would have been able to demonstrate their previous ability to meet TfL's requirements. New entrants would likely face challenges in adapting their core product to the specific requirements of TfL and the London Underground including, potentially, higher costs and longer approval and deployment timescales. Incumbents will have an advantage in relation to these challenges and would have the benefit of being able to rely on the learning from previous projects.

10.49 TfL indicated that there are different systems on different lines, and that incumbents would not necessarily have a significant advantage from a technological perspective. The evidence from the DTUP PQQ supports this view. [✂]. We consider that new entrants would likely be able to compete with the incumbent suppliers against the technological parameter of competition in future London Underground tenders.

Management experience and technical expertise

10.50 We assess whether existing suppliers have an incumbency advantage with regard to their management experience and technical expertise.

Parties' view

10.51 The London Underground is one of the most complex metro systems in the world. The Parties told us that there is a variety of challenges associated with the signalling on the London Underground that include:

(a) the age of the network; it is the oldest metro system in the world at 160 years old;

(b) the long operating hours, meaning that suppliers [✂] to complete works;[790]

(c) the requirement to interface with legacy systems on other lines;

---

[788] [✂].
[789] [✂].
[790] Parties, Submission on CBTC signalling projects, paragraph 4.3(b).

(d) the number of lines;

(e) the intricate junctions; and

(f) the narrow tunnels.[791]

10.52 The Parties submitted that suppliers would need to have London references to compete credibly for resignalling projects on the metro system and that any global references, regardless of comparability in terms of complexity, are unlikely to be as relevant as having London CBTC experience and were 'ineffective in actuality'.[792]

10.53 The Parties submitted that, against the backdrop of Bombardier's failure to deliver the SSR programme, a supplier without a proven track-record, local capabilities and expertise to deliver a project in London was 'highly unlikely' to be a strong competitor for a TfL tender. In the Parties' view, the past experience with Bombardier shows the inherent challenges of delivering a London Underground project and that it could only be addressed by 'very experienced suppliers' that could provide 'mature, flexible solutions tailored to the complex operational and spatial environment found in London'.[793]

10.54 In addition, Hitachi submitted that [✂].[794,795] The Parties submitted that [✂].[796]

10.55 Hitachi submitted that it '[✂]'.[797]

Third-party views

10.56 TfL submitted that previous UK experience was neither 'essential nor preferred' for London Underground signalling projects, and that a supplier would be able to demonstrate its ability to resignal a line on the London Underground by using either domestic or international reference projects.[798] The ability to 'demonstrate successful implementation of a system in an environment comparable to TfL's would be a very valid reference'.[799]

10.57 However, TfL also submitted that any newcomer would need to become familiar with its standards and that and that each of its lines had 'their own

---

[791] Parties, Submission on CBTC signalling projects, paragraph 4.2.
[792] Parties, Submission on CBTC signalling projects, paragraph 4.3(a).
[793] Parties' response to the AIS and WP, Section B, paragraph 4.5.
[794] Parties' response to the AIS and WP, Overview, paragraph 1.6(c); and Section B, paragraphs 3.15(a), and 4.1.
[795] Parties' response to the AIS and WP, Section B, paragraph 3.15(a).
[796] Parties' response to the AIS and WP, Section B, paragraph 4.1.
[797] Parties response to RFI dated 11 July 2022, Q 17.
[798] TfL questionnaire response, Q 8, and Q 9.
[799] TfL, call note, 9 August 2022, paragraph 15(e).

operating practices'. TfL also described itself as 'quite a difficult client to get to understand'.[800]

10.58 [✂].[801]

10.59 In the KPMG report commissioned by TfL, KPMG stated that a lower risk procurement option for TfL would be to stick with 'proven' London Underground suppliers in the future but that such an approach would restrict the level of competition and risk poor value for money outcomes.[802]

10.60 Competitors also indicated that having previous experience was beneficial in competing for projects on the London Underground and that suppliers that did not have experience were likely to be at a disadvantage. In particular:

(a) Alstom told us that the history and experience that sits with Thales and Siemens from work in previous projects with the London Underground means that they were better positioned for future projects in the London Underground.[803]

(b) Siemens told us that the London Underground was 'one of the most complex metros you could think of' because it operated 'in a very old environment'. It requires 'experienced people to understand the situation, and then also to adapt your existing software to the needs of TfL', which represents 'quite a one-time effort' (see paragraph 10.42). Siemens stated that, as a result, [✂] in the London Underground and understands the customer requirements.[804]

(c) Stadler told us that Thales 'will always have the advantage' in projects in the London Underground because Thales 'would know the existing system', the customer and its operational needs.[805]

10.61 We also received evidence that some of the smaller CBTC suppliers may be less well-placed to compete for the London Underground because they lack experience on the London Underground and in undertaking CBTC projects in general:

(a) Stadler told us that, if TfL's requirements were not strict with respect to references, or if TfL was 'more focused on the technology', it would participate in tenders for the London Underground, but if TfL 'closes the

---

[800] TfL call transcript, 8 February 2023, pages 24-25.
[801] [✂].
[802] 'Sub-Surface Upgrade Programme Automatic Train Control – Lessons Learnt', slide 11.
[803] Alstom call transcript, 26 January 2023, page 25.
[804] Siemens call transcript, 16 February 2023, page 10.
[805] Stadler, call transcript, 23 February 2023, page 9.

door because of references and other things', Stadler would not be able to compete.[806] Stadler told us that it did not have the required experience to compete for the London Underground based on supplying one CBTC contract (Basel), and that it would require different references to be able to compete for the London Underground.[807]

(b) Mitsubishi told us that it was planning to enter the European market in the next ten years. It also submitted that while it was 'very interested in entering in the London Underground', this would depend on the scope of the tender.[808] A Mitsubishi CBTC 'roadmap' document from April 2023 indicates that it would not be in a position to win its first project in Europe before 2030 and before the 'establishment or approval of GoA4[809] operation' in 2028.[810] In this scenario, we do not expect Mitsubishi to be able to compete credibly for the London Underground shortly after entering into Europe. Mitsubishi also submitted that it currently needs to partner with other companies to provide a complete signalling solution.[811] Mitsubishi submitted that Hitachi, Thales, Siemens and Alstom all have the capability to supply a total CBTC system package.[812] Despite only having won CBTC tenders in Japan before,[813] Mitsubishi was recently awarded one project to supply CBTC systems in New York (in which it subcontracted some services to a third party) (see paragraph 10.226 about Mitsubishi's CBTC project in New York).

(c) Chinese suppliers CRSC and CRRC have not responded to our questionnaire. We note, however, that neither CRSC nor CRRC have won any CBTC projects in Europe in the past ten years (based on the Parties' market share data). The San Francisco Municipal Transportation Agency (**SFMTA**) told us that [✂].[814] This suggests that neither supplier may be well placed to compete for the London Underground in the near future.

(d) CAF submitted that it was not active in the supply of CBTC solutions and did not have commercial references for CBTC projects.[815] CAF submitted

---

[806] Stadler, call transcript, 23 February 2023, page 17.
[807] Stadler call transcript, 23 February 2023, page 17.
[808] Mitsubishi response to RFI dated 9 May 2023, Q 7.
[809] GoA4 stands for the highest level of railway automation is known as Grade of Automation Level 4. No driver or on-board attendant is required. See 'All systems go for driverless metros | Thales Group', last accessed on 4 June 2023.
[810] Mitsubishi Internal Document, 'GoA4 development road map for discussion 20230417', slide 3; and Mitsubishi response to RFI dated 9 May 2023, Q 7 and Q 9.
[811] Mitsubishi response to RFI dated 9 May 2023, Q 7.
[812] Mitsubishi response to RFI dated 9 May 2023, Q 9; and Mitsubishi Internal Document, 'GoA4 development road map for discussion 20230417', slide 2.
[813] 'Mitsubishi to supply CBTC equipment to New York City Transit', last accessed 5 June 2023.
[814] SFMTA call transcript, 4 May 2023, pages 24-25.
[815] CAF questionnaire response dated 13 January 2023, Q 3.

[✂][816] [✂].[817] CAF explained that the only option available for CAF to take part in CBTC projects was by partnering with CBTC suppliers (such as Thales) in bundled contracts, in which it would provide the rolling stock component of the tender.[818] It described the entry barriers for the CBTC market as 'very high' because of the need to provide commercial references to win signalling contracts. For highly complex systems like the London Underground, the requirement to demonstrate experience of signalling metro systems with similarly complex characteristics is a further barrier that requires a new entrant to build its portfolio of references over time.[819]

TfL's assessment of bidders in previous tenders

10.62 The three previous completed competitive tenders on the London Underground have been awarded to three different suppliers: 4LM (Thales, 2015), Elizabeth line (Siemens, 2012) and SSR (Bombardier, 2011). Notably, in 2011, Bombardier (subsequently acquired by Alstom) was awarded the SSR project, a tender that it won in competition with Siemens, despite having no previous experience on the London Underground.[820] TfL cancelled the contract, after having concerns regarding Alstom's ability to deliver the objectives set out in the contract. As set out in more detail in paragraph 9.17, KPMG undertook a review of TfL's procurement process and in respect of SSR recommended that TfL should conduct a more rigorous technical assessment and allocate a higher weighting to suppliers' technical and delivery capabilities rather than pricing and commercial criteria. While we note the Parties' submissions in relation to the SSR in paragraph 10.53, and while we expect TfL to conduct a more thorough technical assessment in the future, this evidence does not indicate that TfL was misguided in introducing a new supplier but that future assessments should place greater weight on the technical capabilities of a supplier than on price.

10.63 TfL's most recent procurement process shows that a new entrant in the supply of CBTC systems to the London Underground scored highly without London references. TfL started the procurement process for the DTUP in

[816] CAF questionnaire response dated 13 January 2023, Q 6.
[817] CAF questionnaire response dated 13 January 2023, Q 3.
[818] CAF questionnaire response dated 13 January 2023, Q 7.
[819] CAF questionnaire response dated 13 January 2023, Q 6.
[820] The SRR is expected to be a more complex project than the Piccadilly or Bakerloo lines. The 4LM has been described as the most complex brownfield signalling project in the world as it covers four highly interconnected lines, the 4LM was a scoped down version of the SSR. By contrast, the Piccadilly and Bakerloo lines are single line tenders.

2016 but cancelled the tender at PQQ stage because of a lack of funding.[821] We reviewed TfL's PQQ feedback and found:

(a) [✂].

(b) [✂].[822]

(c) [✂].[823]

10.64 As set out in paragraph 10.44, the DTUP tender was cancelled after PQQ stage and therefore, the available PQQ scores do not reflect a full evaluation of suppliers' capabilities. Notwithstanding this, we consider that the evidence from the DTUP PQQ evaluation provides insight on how TfL and suppliers took into account the importance of London Underground references. The evidence indicates that a new entrant scored well against TfL's evaluation criteria without having any references in the London Underground and was able to outscore one of the two incumbent suppliers. This evidence suggests while new entrants may have been disadvantaged by not having London Underground references, that disadvantage was not so severe that new entrants could not be competitive.

10.65 Regarding the performance of incumbent suppliers in delivering CBTC systems for TfL, KPMG's recommendations to TfL state that recent delivery of signalling systems on the London Underground 'has not been good … delivery has been late, there has been cost escalation, and there have been numerous operational problems and in-service failures'. KPMG provided examples of these performance issues on the DLR and Jubilee lines (both Thales) and the Victoria line (Siemens).[824]

Internal documents

10.66 One presentation from the Thales UK TfL account manager to the urban signalling Business Line Executive Committee [✂][825] [✂].[826]

10.67 Another Thales presentation from the UK Vice President of Thales GTS to the UK Chief Executive Officer and Chief Operating Officer in June 2021,

---

[821] The DTUP was launched after KPMGs recommendations.
[822] [✂].
[823] [✂].
[824] See Sub-Surface Upgrade Programme Automatic Train Control, slide 7.
[825] We note that Thales has not contested our interpretation of this document in relation to the statement that [✂]. See, Parties' response to the AIS and WP, Annex D. [✂].
[826] Thales, [✂].

provides an overview of UK urban signalling activity and performance. It stated that [✂].[827]

10.68 It is also relevant for our assessment of the extent of any incumbency advantages to understand which suppliers Thales has viewed as possible competitors for future CBTC tenders in the London Underground.

10.69 There are only a limited number of documents that discuss specifically the possible competitors for future CBTC projects in the London Underground. One presentation prepared [✂]. [✂].[828]

10.70 In relation to Thales' capabilities, this presentation noted that [✂].[829] This document also noted that [✂].

10.71 Another presentation prepared by the Vice President of Thales UK commercial to provide the CEO and COO an introductory overview of the UK business' activity and performance, [✂]. This document [✂].[830]

10.72 Thales submitted [✂]. Thales also noted that [✂].[831]

10.73 We note that the above documents relate to a CBTC project that is several years away. Even if these presentations do not include an assessment of potential competitors for the resignalling of the Piccadilly line, they do show that, despite the incumbency advantages identified in these presentations, Thales anticipated that it would face competition beyond Siemens, identifying [✂] as potential competitors. We have assessed these documents taking into account the context in which they were produced and alongside other evidence (see section about *Suppliers' characteristics*).

Our provisional assessment

10.74 We have considered whether suppliers that have not supplied CBTC systems to the London Underground are likely to be able to compete credibly for future CBTC projects. The starting point for our assessment is that TfL is required to issue a competitive tender for the future Piccadilly and Bakerloo line projects (see paragraph 9.12).

10.75 In response to the Parties' submission that London Underground is uniquely complex, we first note that the future tenders relate to the Piccadilly and Bakerloo lines, and not to the whole London Underground system. As we set

---

[827] Thales, [✂].
[828] Thales, [✂]
[829] [✂]
[830] [✂]
[831] [✂]

out in more detail in the *Suppliers' characteristics* section below, other metro systems have been considered as 'comparable' to the London Underground, and other brownfield projects that Hitachi has undertaken share some of the characteristics that make the Piccadilly and Bakerloo line projects particularly challenging. The complexity factors are not unique to London and suppliers such as Hitachi and Alstom without experience in London have undertaken brownfield projects that give them relevant experience. While there may be some unique combinations of these factors in London, TfL has told us that demonstrating implementation of a CBTC system in London is not a requirement to compete for London tenders (see paragraph 10.56). To the contrary, the Parties' contention is linked closely to their second submission – only London Underground references are credible – which we consider below.

10.76 We consider that incumbent suppliers are likely to benefit from a competitive advantage when bidding for future London Underground tenders. The relevant question, however, is whether other suppliers could compete credibly and exercise a competitive constraint on the incumbent suppliers. Based on the above evidence, we consider that suppliers that have established track records and capabilities in delivering other CBTC projects with relevant characteristics (we discuss these features in the *Suppliers' Characteristics* section) could demonstrate the management experience and technical expertise required to compete for future CBTC contracts on the London Underground. We note that suppliers without previous experience in London [✂] and have scored well in previous tenders; additionally, TfL has not indicated a preference to rely solely on existing suppliers.

10.77 We also note that our bidding analysis shows that new entrants have been able to win CBTC contracts in metro systems outside of London (see Table 19 in the Bidding analysis section). While we note that the London Underground is complex and few brownfield projects share all its complex characteristics, the bidding analysis evidence suggests that it is relatively common for suppliers to win brownfield contracts on metro systems in which they have no previous experience. For example, the following brownfield CBTC projects were won by new entrants, without prior experience with the respective customer: (i) Hitachi won CBTC contracts in Brussels (2016) and San Francisco (BART) (2020); (ii) Siemens won the CBTC contract for the Milan metro; and (iii) Thales won CBTC contracts in Toronto (2021); and Singapore (2012).

10.78 [✂].

10.79 Smaller CBTC suppliers such as Stadler, Mitsubishi, CAF, CRSC and CRRC, with limited relevant experience in undertaking brownfield CBTC projects globally or in Europe, are likely to be significantly less well-placed to compete

for projects on the London Underground; neither is it likely that they will develop the track record or capabilities by the time the Piccadilly or Bakerloo lines are tendered, as they are significantly behind the Parties, Siemens and Alstom (see the '*Management experience and technical expertise*' section).

Local knowledge and capacity

10.80 In this section, we assess whether existing suppliers benefit from incumbency advantages arising out their existing capacity and knowledge of the customer and the London Underground infrastructure, including any related interfacing risks in the future Piccadilly and Bakerloo line tenders.

Parties' views

10.81 The Parties submitted that in order to compete credibly for CBTC signalling projects on the London Underground, a supplier must demonstrate that it has suitable logistical capacity and appropriate local deployment and commissioning resources. In the Parties' view, Hitachi does not have such capacity and resources.[832]

10.82 The Parties argued that Thales and Siemens were better placed than non-incumbents to compete for future CBTC signalling contracts because of their existing workforce and capacity. The Parties submitted that [✂].[833]

10.83 Thales also submitted that [✂],[834] indicating that [✂]

10.84 The Parties submitted that it was more difficult for suppliers without an established local presence to recruit experienced staff:

(a) TfL requires personnel working on the London Underground to have an IRSE licence, which can take a large amount of time to obtain.[835]

(b) Thales and Siemens were better positioned to attract additional staff than non-incumbent suppliers because of their track record in London.[836]

10.85 The Parties also told us that the Piccadilly line shares some infrastructure with the Metropolitan line, currently being resignalled by Thales as part of the 4LM project. In the Parties' view, it would be difficult, if not impossible, for one supplier to modify or extend the CBTC system installed by another supplier

[832] Parties' response to the AIS and WP, 2 May 2023, Section B, paragraphs 3.7-3.8.
[833] The Parties submitted that Thales UK has [✂]. Parties' response to the AIS and WP, 2 May 2023, Section B, paragraphs 3.13-3.14.
[834] Transcript of Main Party Hearing with Thales, page 71.
[835] Parties' response to the AIS and WP, 2 May 2023, Section B, paragraph 3.14 (a).
[836] Parties' response to the AIS and WP, 2 May 2023, Section B, paragraph 3.13.

because CBTC signalling systems deploy a supplier's bespoke technology. The Parties submitted that these [✂].[837] As mentioned above in paragraph 10.35, [✂].

Third-party views

10.86 We asked competitors how challenging it would be to establish personnel with relevant expertise and the appropriate infrastructure for a metro system in which it had no prior experience.

10.87 In relation to establishing a local workforce with the necessary expertise, Alstom submitted that this would not be a challenging aspect of undertaking brownfield resignalling projects [✂].[838] Alstom also told us that it had [✂] in the UK and that, in general, its availability of workforce was one of the factors that is weighted in the decision to bid for a certain project.[839]

10.88 Siemens submitted that in complex projects such as those in the London Underground a supplier could 'only be successful' if it had 'the best-qualified people on the ground sitting with the customer', noting that it would be 'helpful to have people close to the customer'.[840] Siemens also noted that finding the appropriate personnel and infrastructure can be 'somewhat challenging' but submitted that this was a common challenge across the industry.[841] Siemens also noted that the requirement to [✂].[842] Siemens also suggested that, when assessing whether to bid for the DTUP, [✂].[843]

10.89 In relation to having the necessary knowledge of the London Underground infrastructure, Alstom noted that the Piccadilly line runs alongside Metropolitan line infrastructure (being signalled by Thales), which created an entry barrier for new entrants to resignal the line.[844] Alstom told us that, [✂]. Alstom also told us that 'whenever TfL is issuing an RFP to an existing line', it would assess, in detail, what are the technical difficulties that it might face in interfacing whatever solution it proposes with the existing system. Alstom's decision on whether it would bid for future CBTC projects in the London Underground 'would depend on the condition and the outcome of the

[837] Parties' response to the AIS and WP, 2 May 2023, Section B, paragraph 3.11.
[838] Alstom response dated 16 February 2023, Q 2.
[839] Alstom call transcript, 26 January 2023, page 7.
[840] Siemens call transcript, 16 February 2023, page 13.
[841] Siemens response dated 28 February 2023, Q 3.
[842] Siemens call transcript, 16 February 2023, page 15.
[843] Siemens call transcript, 16 February 2023, page 12.
[844] Alstom call transcript, 26 January 2023, pages 8-9.

assessment it would undertake based on an understanding of the project issued by TfL'.[845]

10.90 Siemens explained that the Piccadilly line is brownfield and raised 'complexity and interface challenges' (although it did not refer specifically to the interfacing with the Metropolitan line); it also told us that it would [✂].[846]

10.91 Stadler told us that it would be 'a bit more complicated' for a new entrant to interface with Thales' CBTC system in the Piccadilly line, which would give Thales an advantage when competing for that line. Stadler told us that it had developed interfaces with CBTC systems from other suppliers for other customers, but the interface developed in one project was not scalable to other projects.[847]

10.92 CAF told us that, in general, one source of incumbency on urban signalling was the fact that there were no standard interfaces. CAF did not comment specifically on the interfacing required in the Piccadilly and Bakerloo lines.[848]

10.93 As mentioned above, TfL told us that, despite any advantages that existing suppliers may have, suppliers that have a product that can assure 'safety, reliability and operability and maintainability' would not be precluded from entering into TfL's network.[849] In particular, TfL indicated that the Piccadilly line was part of the DTUP procurement, and that that tender was structured such that any supplier would be able to interface with the incumbent supplier. TfL's procurement of the Piccadilly line would be prepared in such a way to ensure equal opportunity for the market.[850] TfL also submitted that the Piccadilly and Bakerloo lines use very old legacy systems and since each line is operated separately, it did not consider that an incumbent on the London Underground would necessarily have a technological advantage for the resignalling of either line.[851]

Internal documents

10.94 One presentation prepared by Thales' TfL account manager to the urban signalling Executive Committee [✂], stated that it considered that one of Thales' strengths [✂].[852]

---

[845] Alstom call transcript, 26 January 2023, page 8.
[846] Siemens call transcript, 16 February 2023, pages 12 and 20.
[847] Stadler, call transcript, 23 February 2023, page 24.
[848] CAF, call transcript, 30 January 2023, page 13.
[849] TfL call transcript, 8 February 2023, page 13.
[850] TfL call transcript, 8 February 2023, page 14; and TfL response to RFI dated 15 March 2023, question 1(b).
[851] TfL call transcript, 8 February 2023, page 12-13.
[852] [✂].

10.95 In March 2022 (ie after the announcement of the Merger), Thales' Technical & Assurance Director in the UK carried out a review of both Thales' and Hitachi's solutions (including in CBTC) [✂]. The review stated that, [✂].[853] This statement suggests that the interfacing between Piccadilly and the Bakerloo lines and the rest of the London Underground network would not be an unsurmountable barrier. This document also [✂]. This suggests that Thales considers that TfL may not necessarily use the approved CBTC technology of the incumbent suppliers in future CBTC projects.[854,855]

10.96 This document is consistent with Thales' statement that 'through the 4LM project, TfL have been very deliberate in making sure that the [✂].[856]

Our provisional assessment

10.97 The evidence set out above indicates that the knowledge that Thales and Siemens have gained through a close relationship with TfL, and the experience they have developed in relation to the London Underground through the different CBTC projects they have implemented, represent important advantages that are difficult, but potentially possible, for new entrants with the relevant experience and capabilities to overcome.

10.98 In relation to the Parties' submissions about workforce capacity, the evidence from competitors indicated that it would be important to recruit staff that had experience of working on the London Underground and to build a relationship with the customer, TfL. The evidence indicates that having a core competence of locally experienced and trusted staff is likely to be valued by TfL and confer a competitive advantage to Thales and Siemens, who have each built up considerable London Underground experience.

10.99 Nonetheless, if there is a significant gap between the expected completion dates of current projects and the start dates of future tenders on the London Underground, then any winner, be it an existing supplier or a new entrant, would likely need to identify and scale its capacity to deliver the project. Suppliers may be able to contract or hire employees that have experience of working on the London Underground. It is not clear that incumbent suppliers will continue to enjoy the scale of advantage they currently have over potential

---

[853] [✂].
[854] [✂].
[855] Thales does not contest our interpretation of this document in relation to our assessment of Thales' incumbency advantage. Thales notes, however, if the next TfL tender takes place as late as 2035, it is not possible to predict based on the evidence available if any of Hitachi, Mitsubishi or the other new entrants could become credible competitors for the London Underground. See, Parties' response to the AIS and WP, Annex D. We consider the extent to which new entrants, other than Hitachi and Thales, can credibly compete for future projects in the London Underground in the section about 'Suppliers' Characteristics'.
[856] Transcript of Thales Main Party Hearing, 2 May 2023, page 70.

rivals in terms of the workforce and capacity that would be required to re-signal the Piccadilly and Bakerloo lines.

10.100 In relation to the specific interfacing issue on the Piccadilly line, the evidence from competitors indicated that there would likely be interfacing challenges for new entrants. The extent of those challenges would depend on how TfL ultimately scopes the project.

10.101 Based on evidence from TfL and the Parties' internal documents, we understand that the Piccadilly line can be competitively tendered despite the interfacing requirements. While Thales is likely to enjoy some advantage from its own technology being deployed on a small section of the line, we do not expect the advantage to be substantial enough to prevent other suppliers bidding for this project. The Bakerloo line project appears to have fewer interfacing issues, as it is largely disconnected from the other lines on the London Underground, in the light of TfL's statements.

Provisional conclusion on experience on the London Underground

10.102 Based on the above evidence, there are likely to be high entry barriers for new suppliers of resignalling projects on existing lines on the London Underground and, as a result, incumbent suppliers are likely to benefit from a competitive advantage, potentially a significant one.

10.103 However, we do not consider that this would mean that new entrants with the necessary experience and capability would be unable or unwilling to compete for future CBTC contracts.

(a) Both new and existing suppliers would likely need to adapt and develop their CBTC technology to meet TfL's requirements. Entrants that can demonstrate an ability to adapt their technological provision scored well in relation to this criterion at PQQ in the DTUP. However, such new entrants are likely to incur costs and other challenges in adapting their technology that will be higher than the costs faced by incumbent suppliers. This suggests that there are some technological entry barriers such that incumbents will likely have a competitive advantage.

(b) TfL has told us expressly that previous UK experience is neither preferred nor required. Past competitive interactions for resignalling on the London Underground, albeit limited in number, have indicated that a supplier ([✂]) without any prior experience won a competitive tender (albeit did not successfully deliver the project) and scored well [✂] at PQQ stage in the most recent DTUP procurement process.

(c) The evidence set out above indicates that the knowledge that Thales and Siemens have, the close relationship with TfL and the experience they have developed of the London Underground through the different CBTC projects they implemented gives them an important advantage. Workforce capabilities also may confer some competitive advantage on the incumbent suppliers. While it is likely most suppliers, including existing suppliers, would need to address capacity gaps by the time the two tenders are issued, incumbent suppliers appear likely to retain a core capability which would potentially give them some advantage. TfL told us, however, that any advantages that existing suppliers may have 'wouldn't preclude [new entrants] from entering into the market and winning the work', as long as these suppliers can provide assurance on key factors such as the 'safety, reliability and operability and maintainability' of their CBTC offerings.[857]

10.104 Overall, we consider the evidence demonstrates that entry barriers in the supply of CBTC projects in the London Underground are high. However, based on the evidence we currently have, they appear likely to be surmountable for entrants that can demonstrate the requisite skills, experience and track record on complex brownfield projects and the relevant capabilities and resources to complete projects in London.

10.105 Nonetheless, given the effect of the remaining entry barriers, the demanding credentials that any new entrants would need to demonstrate, and the concentrated nature of the industry globally, it is expected that only a small number of major suppliers are likely to consider bidding for the resignalling of either Bakerloo or Piccadilly lines along with the current incumbent suppliers.

Hitachi's participation in future London Underground CBTC tenders

Overview

10.106 Hitachi submitted that [✂].[858]

10.107 Hitachi told us that [✂].[859]

10.108 Hitachi submitted that [✂].[860]

---

[857] TfL call transcript, 8 February 2023, page 13.
[858] Parties, Submission on CBTC signalling projects for metros in the UK, paragraph 8.2; and Hitachi letter to CMA, dated 3 May 2023.
[859] Hitachi letter to CMA, dated 3 May 2023; and Parties' response to AIS and WP, Section B, paragraph 2.1.
[860] Hitachi letter to CMA, dated 3 May 2023; and Parties' response to AIS and WP, Section B, paragraph 2.5.

10.109 We provide further detail on Hitachi's submissions in the following section. In order to evaluate Hitachi's submissions, we examine its internal assessments of recent CBTC opportunities. Our review of its internal documents informs an understanding of Hitachi's bidding strategy in relation to brownfield CBTC opportunities and whether it would likely bid for complex brownfield CBTC projects in the future.

10.110 Given Hitachi's competitive capabilities, past tendering behaviour ([✂]) and increasing experience in brownfield CBTC projects (see section on 'Suppliers characteristics' below), our starting point is that (absent evidence to the contrary) Hitachi would likely continue to bid for brownfield CBTC projects and be perceived as a potential, and credible, competitor for future CBTC tenders in the London Underground, absent the Merger.

Hitachi's submissions

Hitachi's corporate strategy

10.111 Hitachi told us that its evaluation of CBTC projects takes account of the following priorities:[861]

(a) **Priority 1**: [✂].

(b) **Priority 2**: [✂]

(c) **Priority 3**: [✂].[862]

10.112 Hitachi told us that it assesses each project [✂].[863] It told us that [✂].

10.113 Hitachi submitted that, [✂].[864]

Hitachi's profitability requirements and financial performance in past brownfield projects

10.114 Hitachi told us that its overriding financial objective [✂].[865]

10.115 As supporting evidence of its recent focus on profitability, Hitachi provided a 2022 email from its Chief Financial Officer (CFO), in which guidance was provided on financial thresholds to be considered when bidding for projects.

---

[861] Hitachi letter to CMA, dated 3 May 2023, page 2.
[862] Hitachi letter to CMA, dated 3 May 2023; and Parties' response to AIS and WP, paragraph 2.2.
[863] Parties' response to the AIS and WP, Section B, paragraph 2.3.
[864] Hitachi letter to CMA, dated 3 May 2023.
[865] [✂] Parties' response to AIS and WP, Section B, paragraph 2.4.

We note that the same email also stated that these financial thresholds should be considered [✂].[866]

10.116 Hitachi submitted that its bidding approach was nonetheless heavily influenced [✂]:

(a) [✂].[867]

(b) [✂].[868]

10.117 Hitachi told us that [✂].[869]

Recent 'no bids' in brownfield CBTC opportunities

10.118 Hitachi told us that [✂].[870]

10.119 Hitachi told us that it had declined to bid for projects [✂].[871]

10.120 Similarly, Hitachi told us that it declined to participate in a tender for the [✂]. It told us that [✂].[872] Hitachi also provided [✂].[873]

10.121 Hitachi also told us that it had declined to bid for [✂]. Hitachi told us [✂].[874]

Hitachi's internal documents

10.122 In view of Hitachi's submissions that it lacked the incentive and intention to bid for complex brownfield CBTC projects (following recent negative experiences), we have reviewed internal Hitachi documents related to past CBTC tenders.

10.123 Our review of Hitachi's internal documents is structured as follows:

(a) First, we discuss internal documents that summarise upcoming CBTC opportunities and discuss Hitachi's CBTC strategy. These documents provide insight into Hitachi's approach to CBTC resignalling projects.

---

[866] Hitachi, Annex HRL0020242, 16 June 2022.
[867] Parties' response to the AIS and WP, Section B, paragraph 4.12; Parties response to RFI dated 27 April 2023, Q 3' Hitachi letter to CMA, dated 3 May 2023, page 3; and Annex CBTC H.WP.011.
[868] Parties' response to the AIS and WP, Section B, paragraph 4.12; Parties response to RFI dated 27 April 2023, Q3, Hitachi letter to CMA, dated 3 May 2023, page 3; and Annex CBTC H.WP.007.
[869] Hitachi letter to CMA, dated 3 May 2023.
[870] Hitachi's response to the AIS and WP, Section B, paragraphs 2.5, and 4.14.
[871] Hitachi letter to CMA, dated 3 May 2023, page 4.
[872] Hitachi letter to CMA, dated 3 May 2023, page 4.
[873] [✂].
[874] Hitachi letter to CMA, dated 3 May 2023, page 5.

(b) Second, we discuss internal documents that review Hitachi's performance [✂]. These documents inform our understanding of the issues faced by Hitachi in delivering these projects and its internal response.

(c) Third, we discuss internal documents that outline 'no bid' decisions taken by Hitachi [✂] (ie in the period during which Hitachi told us it had tightened its bid selection process). These documents inform our understanding of the development of Hitachi's strategy in brownfield CBTC projects.

(d) Fourth, we discuss internal documents that relate to brownfield CBTC bids that Hitachi has pursued [✂]. These documents similarly inform our understanding of its strategy in CBTC.

(e) Fifth, we discuss internal documents that refer specifically to London Underground projects.

Hitachi's corporate strategy documents

10.124 We requested that Hitachi provide documents that reflect its strategy in the supply of CBTC systems.

10.125 In response, Hitachi told us that it did [✂].[875]

10.126 Nevertheless, Hitachi provided a number of documents which it told us 'provide[d] an insight into its global CBTC strategy'.[876] We summarise the key documents provided by Hitachi in this section.

10.127 In October 2021, Hitachi's Head of Market Strategy prepared a White Paper for discussion with members of the Hitachi Executive Team. The White Paper included an overview of signalling opportunities in Europe, the Middle East and Africa (**EMEA**) for the years [✂]:

(a) [✂].[877]

(b) [✂].[878]

10.128 The document stated that [✂].[879] We note that this document appears to support Hitachi's submissions regarding its [✂].

---

[875] Hitachi response to RFI dated 29 March 2023, paragraph 2.
[876] Hitachi response to RFI dated 29 March 2023, paragraph 3.
[877] Hitachi, [✂].
[878] Hitachi, [✂].
[879] Hiatchi, Annex H.Q10.012.

10.129 Hitachi also produced similar White Papers which covered opportunities in Asia (prepared in April 2022) and in North America (prepared in February 2021).

10.130 As regards its strategy in Asia, Hitachi told us that [✂].[880] We note, however, that the document states that Hitachi's analysis [✂].[881]

10.131 As regards North America, Hitachi's White Paper assessed opportunities for [✂].[882,883] [✂].[884] [✂].[885]

10.132 In addition to its White Papers, Hitachi also provided a 'strategic business overview', dated September 2019, and a 'strategic business plan' dated August 2021. While neither of these documents focuses specifically on Hitachi's strategy in CBTC, we note that they each identify a range of CBTC opportunities (including brownfield projects) across various geographies.[886]

10.133 We also note that Hitachi produced a 'Mid-Term Management Plan' in March 2023, which discussed performance across the business. [✂].[887,888] [✂].[889] [✂].[890]

- *Summary*

10.134 Hitachi has provided a limited set of documents that inform an understanding of its strategy in CBTC. While some of the documents provided indicate a [✂], they do not indicate that Hitachi has [✂].

10.135 Hitachi's EMEA White Paper shows that it [✂]. [✂] shows that it is applying lessons from legacy brownfield projects to future bidding opportunities.

[✂]

10.136 As above, Hitachi told us that it had incurred [✂] in undertaking brownfield [✂] and had adopted [✂].

---

[880] Hitachi response to RFI dated 29 March 2023, paragraph 10.
[881] Hitachi, [✂].
[882] Hitachi, [✂].
[883] Hitachi, [✂].
[884] Hitachi, [✂].
[885] Hitachi response to RFI dated 29 March 2023, paragraph 11.
[886] Hitachi's September 2019 Strategic Business Overview [✂]. Hitachi Strategic Business Overview (Annex CO S.5.4.A.29), slides 9 and 10. [✂]. Hitachi Strategic Business Plan (Annex H.Strategy.04), slide 12.
[887] We consider that this statement means that the [✂], page 3.
[888] Hitachi, Annex H.RFI8.001, slide 21.
[889] Hitachi, Annex H.RFI8.005, page 4.
[890] Hiachi, Annex H.RFI8.001, slide 11. In terms of investment in products, Hitachi's Mid-Term Management Plan stated [✂].

10.137 In this section, we set out evidence from Hitachi's internal documents which discuss the [✂] projects and the issues faced by Hitachi.

10.138 In June 2021, Hitachi carried out an internal audit in which it assessed various projects [✂].[891]

10.139 Subsequently, in September 2021, Hitachi's Risk Management Unit carried out 'deep dive reviews' of its performance in [✂]. These documents were presented to Hitachi's Audit and Risk Committee. [✂].[892] In relation to the [✂], Hitachi identified that projected costs had [✂]. [✂][893] [✂].[894] [✂]:

(a) [✂];

(b) [✂];

(c) [✂]; and

(d) [✂].[895]

10.140 With respect to each of the issues above, Hitachi sought to identify lessons learned for future projects to mitigate these risks. [✂]:

(a) [✂].

(b) [✂].

(c) [✂].[896]

10.141 In its review of the [✂], Hitachi similarly identified that cost expectations [✂].[897] [✂]:

(a) [✂];

(b) [✂]; and

(c) [✂].[898]

10.142 Hitachi accordingly identified a similar set of lessons learned from its experience [✂]. It stated that:

---

[891] Thales response to s109 Notice dated 23 December 2023, Annex HRL0003388, page 13; and Parties' response to AIS and WP, page 46-47.
[892] [✂]
[893] Hitachi separately submitted that [✂].
[894] Hitachi notes that [✂].
[895] [✂].
[896] [✂].
[897] [✂].
[898] [✂].

(a) [✂];

(b) [✂];

(c) [✂]; and

(d) [✂].[899]

- *Summary*

10.143 The above documents demonstrate that Hitachi faced considerable [✂]in carrying out the [✂] CBTC projects.

10.144 While this is the case, Hitachi's 'deep dive reviews' also show that it has evaluated its performance of these contracts in detail and sought to identify lessons from its experiences in [✂] that can be applied to future projects.

'No bid' decisions [✂]

10.145 As above, Hitachi told us that it had sought to adhere more closely to its project prioritisation policy [✂] following [✂][900] and [✂]. [✂].[901]

10.146 In this section, we set out evidence from Hitachi's internal documents which discuss its reasons for deciding not to bid in each of these tenders.

- *[✂]*

10.147 Hitachi provided minutes from its 'bid/no-bid' decision meeting in relation to a CBTC opportunity [✂].[902] The minutes [✂].[903]

10.148 As regards subsequent project opportunities in [✂], Hitachi provided internal correspondence from its Head of Sales for Central, Eastern and Southern Europe which discussed a potential project in 2021. Its internal correspondence indicated that [✂].[904]

---

[899] [✂].
[900] Hitachi letter to CMA, dated 3 May 2023, page 2.
[901] Parties' response to AIS and WP, Section B, paragraph 2.2 and 2.5.
[902] Hitachi was unable to identify the exact author, but it expects that the document was prepared by a member of the Phase Gate secretariat.
[903] Annex CBTC H.WP.003.
[904] Annex H.RFI8.009.

- *[✂]*

10.149 Hitachi provided internal correspondence between Hitachi's sales team and the bidding technical team which detailed its decision not to respond to the PQQ for a CBTC opportunity [✂]. Its internal correspondence [✂].[905]

10.150 Hitachi highlighted that the customer was procuring an interlocking system and CBTC in separate tenders [✂]. Hitachi stated that [✂].[906]

10.151 [✂].[907]

- *[✂]*

10.152 As regards its recent decision not to bid for CBTC upgrade work in [✂].

10.153 The record of Hitachi's discussion shows that it considered [✂][908]

10.154 [✂][909] [✂].[910]

- *Summary*

10.155 Consistent with Hitachi's submissions, we consider that the documents we have reviewed in relation to its decisions not to bid in [✂] indicate that Hitachi applies a rigorous approach in determining which brownfield CBTC projects to pursue.

10.156 In our view, these documents demonstrate that Hitachi has [✂] applied robust internal governance to its bidding processes but that it continues to assess a range of CBTC opportunities, including potentially complex projects. The above documents show that Hitachi faced specific issues in respect of each of these projects which contributed for the decision not to pursue potential bids [✂].

10.157 In the next section, we discuss those recent brownfield CBTC opportunities which Hitachi decided to pursue.

---

[905] Annex CBTC H.WP.004.
[906] Annex CBTC H.WP.004 and Annex CBTC H.WP.005.
[907] Annex CBTC H.WP.004.
[908] Annex CBTC H.WP.001.
[909] Annex CBTC H.WP.001.
[910] Annex CBTC H.WP.001.

Brownfield CBTC opportunities pursued by Hitachi [✂]

10.158 As above, Hitachi told us that it had sought to adhere more strictly to its project prioritisation policy [✂].[911] [✂], Hitachi has been awarded brownfield CBTC contracts in Paris (2018)[912] and for the San Francisco BART network (2020). [✂].[913]

10.159 We set out evidence from Hitachi's internal documents below, in which it set out its rationale for pursuing these opportunities.

- *Paris (2018)*

10.160 Hitachi's bid evaluation documents from November 2017[914] in relation to CBTC work in Paris (Line 6) indicate that it anticipated the [✂].[915] ✂].[916]

10.161 We note also that Hitachi told us that it had experience in Paris, having previously delivered its CBTC solution on the Paris metro (Line 3), and that its contract was a [✂], Hitachi told us that [✂].[917]

- *BART (2020)*

10.162 In 2020, Hitachi was selected to supply CBTC on the BART transport system. [✂].

10.163 Hitachi's bid evaluation document, prepared in February 2019, for consideration by Hitachi's Senior Executive Committee,[918] [✂]:

(a) [✂];

(b) [✂]; and

(c) [✂].[919]

10.164 Hitachi's view of the BART project as a [✂] a valuable reference [✂], was also evident from its financial consideration of the project and in its bidding strategy. Hitachi stated that [✂].[920]

---

[911] Hitachi letter to CMA, dated 3 May 2023, page 2.
[912] See Hitachi's response to question 21 of the s109 Notice of 23 December 2022.
[913] See Hitachi's response to RFI 9, question 7.
[914] We note that these documents were prepared by the bid manager for the project and approved by various senior executives within Hitachi.
[915] [✂].
[916] [✂].
[917] [✂].
[918] [✂].
[919] HRL0004736, page 2.
[920] HRL0004736, page 2.

10.165 We note also that Hitachi told us that the BART project would be considered a [✂]. It told us that [✂]. Our own assessment [✂].[921]

- *[✂]*

10.166 [✂]:[922,923]

(a) [✂];

(b) [✂]; and

(c) [✂].[924]

10.167 In a presentation dated [✂], prepared for initial assessment of the opportunity to bid for [✂], we note that Hitachi stated [✂].[925]

10.168 We also note that Hitachi's consideration of the [✂] cautioned that 'mass transit brownfield markets for signalling are particularly difficult and challenging in terms of profitability' but that the brownfield market was expected to grow in the coming years. The document shows that Hitachi intended to assess its capacity to enter (or not to enter) this part of the rail market and to verify its competitiveness.[926]

10.169 Similar to the BART project, Hitachi told us that it considered [✂] to be a [✂]' project, representing a brownfield opportunity [✂]. It told us that [✂] when identifying potential costs and considering contingencies, [✂].[927]

- *Summary*

10.170 Our review of internal documents related to the Paris, BART and [✂] tenders indicates that, while Hitachi is selective in deciding which CBTC opportunities to pursue ([✂]), it undertakes careful strategic analysis of the opportunities available, including the extent to [✂].

10.171 We note also that Hitachi's pursuit of opportunities in Paris and BART is reflective of the approach outlined by its CFO in 2022 (see paragraph 10.115): [✂]. Hitachi's pursuit of the Paris and BART projects demonstrates that it

---

[921] Hitachi response to RFI8, Annex Q7, page 4. See paragraph further details about the BART project.
[922] [✂].
[923] [✂].
[924] Annex H.109(2).Q24.023, page 3.
[925] Annex H.109(2).Q26.058, page 13.
[926] Annex H.109(2).Q24.023, page 5.
[927] Hitachi response to RFI8, Annex Q7, page 5.

considers the overall strategic value of projects before deciding whether to bid, including for projects [✂].

Documents that refer to London Underground projects

10.172 In this section, we describe internal documents produced by Hitachi that referred specifically to London Underground projects. While our review identified only a very limited number of relevant documents, we consider this is not unexpected, given that tenders for resignalling of the Piccadilly and Bakerloo lines are still some years away in the future.

10.173 Notwithstanding the above, we note that internal email exchanges between Hitachi's UK Head of Sales (Signalling and Turnkey) [✂].[928]

10.174 [✂].[929]

10.175 While we understand from the context of this email that these estimates tried to convey an optimistic view of the addressable market, we consider that this document indicates that the resignalling [✂] remains on Hitachi's radar as a potential project for which Hitachi can compete.[930]

Provisional conclusion on Hitachi's likelihood of bidding for future projects in the London Underground

10.176 As set out above, Hitachi submitted that London Underground CBTC projects did not fit with its corporate strategy and that, [✂].

10.177 As set out above in more detail, Hitachi made three key arguments in support of its submission:

(a) [✂]. [✂] CBTC projects.

(b) Previous difficulties in brownfield CBTC projects ([✂]) had motivated Hitachi [✂], and recent 'no bid' decisions provided evidence of its approach.

(c) Its decision making on potential bids was driven by an overall financial target [✂].

---

[928] Annex HRL0021639.
[929] Annex HRL0021639.
[930] We also note that this email chain is broadly consistent with a presentation prepared by Hitachi's Head of Sales (Signalling) UK and Ireland in June 2022, which discussed current projects and expected order intake (pipeline) for Hitachi's signalling business. This presentation stated: '[✂]' (see HRL0001472, slide 13).

10.178 In order to assess Hitachi's potential to bid for the Piccadilly and Bakerloo line projects, we have examined Hitachi's internal appraisals of recent brownfield CBTC opportunities, both for projects which it has rejected and those which it has pursued. We consider that the internal documentary evidence does not provide a clear picture as to whether Hitachi is likely to participate in future CBTC opportunities on the Bakerloo and Piccadilly lines. The evidence neither demonstrates a clear policy [✂], nor identifies a plan to bid for London Underground projects in the future (although this is not unexpected, given these tenders are expected to be initiated many years in the future). Rather, the evidence shows only that Hitachi reviews opportunities on a case-by-case basis and its reasons for rejecting and pursuing different opportunities are many and varied.

10.179 As to Hitachi's submissions that it faced [✂] in delivering previous brownfield CBTC projects [✂], we note that its submissions are supported by our review of its internal documents. However, its internal documents evidence that Hitachi has sought to learn (and apply) lessons from these past experiences, rather than determining not to pursue similar opportunities in the future. Its recent 'no bid' decisions demonstrate careful consideration of a range of brownfield opportunities and while [✂] each had specific challenges, the evidence from Hitachi's internal documents does not suggest Hitachi has taken a strategic decision [✂], nor indicate that Hitachi would not consider future resignalling opportunities on the London Underground specifically.

10.180 As to Hitachi's submissions on the interaction between the overall financial targets [✂] and its bidding strategy, we note that Hitachi pursued opportunities in Paris and BART [✂]. Further, Hitachi's CFO has stated that its financial thresholds for bidding opportunities [✂]. Hitachi's financial targets are not [✂] determinative of an intention to bid. We also note that Hitachi has [✂] financial target as relevant to its bidding strategy, although tenders for the Piccadilly and Bakerloo lines will not materialise for a number of years to come. The extent to which any potential bid for these projects might be affected by financial targets set by Hitachi's parent company is therefore unclear.

10.181 Based on the above, we find that there is insufficient evidence to provisionally conclude that, in the absence of the Merger, and despite Hitachi's capabilities and the experience acquired from previous complex brownfield CBTC projects, [✂].

10.182 While we cannot predict with certainty whether, absent the Merger, Hitachi will bid for future CBTC tenders for the Bakerloo and Piccadilly lines, such

uncertainty is an inherent part of the forward-looking assessment that we must conduct.[931]

10.183 Given Hitachi's competitive capabilities and increasing experience in brownfield CBTC projects (see section on *Suppliers' characteristics* below), we consider that Hitachi would likely continue to bid for brownfield CBTC projects on a case-by-case basis and, absent evidence to the contrary, is likely to be a credible bidder for future CBTC tenders in the London Underground.

Shares of supply

10.184 In assessing the effect of the Merger, we sought to estimate shares of supply to understand the relative strengths of CBTC suppliers. We consider that shares of supply within and outside of the UK will provide insight on suppliers' strengths and their ability to compete for London Underground CBTC contracts, as TfL considers suppliers' references from outside of the UK are relevant (paragraph 10.56).

Parties' views

10.185 The Parties submitted that it was not possible to draw reliable conclusions from the UK shares of supply because they are based on a very small number of tenders.[932] The Parties also submitted that shares of supply are distorted by the inclusion of a very large tender that Thales won in 2015, the 4LM project, which was valued at £[✂]million.[933] The Parties made the same argument with regards to shares of supply across Europe over the same ten year period (ie that these were also skewed by the inclusion of the 4LM project).[934]

10.186 In the Parties' view, Thales' success in winning the 4LM contract was not indicative of Thales' market position more broadly because Thales was not the original first choice supplier for the project when originally tendered as the SSR project.[935]

Evidential value of shares of supply

10.187 We note that this market is characterised by large, infrequent tenders and is one where the suppliers' offerings are differentiated. We concur with the

---

[931] CMA129, paragraph 3.14.
[932] Parties, FMN, 13 October 2022, Chapter 2, paragraph 14.18.
[933] Parties, FMN, 13 October 2022, Chapter 2, paragraph 14.10.
[934] Parties, FMN, 13 October 2022, Chapter 2, paragraphs 14.11-14.12.
[935] Parties, FMN, 13 October 2022, Chapter 2, paragraph 14.12.

Parties' view that the UK share of supply estimates (both by reference to five and ten year periods) include very few tenders and that Thales' 4LM contract win potentially overstates Thales' competitive position. Nevertheless, the evidence considered in the section about *Incumbency on the London Underground* shows that Thales and Siemens are the only CBTC suppliers on the London Underground.

10.188 Notwithstanding the issues relating to the small number of observations in the UK shares of supply, we consider that shares of supply can provide useful information on the underlying market structure, and in markets such as CBTC resignalling where experience matters, shares can be a relevant indicator of strength and ability to win future contracts. As set out at paragraph 10.24, given there are likely to be broader global competitive dynamics – in particular in relation to innovation and product development and the importance of experience from outside the UK, we consider that European and global shares of supply can provide relevant information on suppliers' capabilities. Further, the shares of supply from Europe and the rest of the world include more observations and are, therefore, less influenced by single contract wins than the UK shares of supply. Given this, we therefore consider that the shares of supply at European level, taken over the ten year period, and global shares of supply, are likely to provide more probative evidence of suppliers' strengths than the UK and five year estimates.

Shares of supply estimates

10.189 The Parties submitted shares of supply estimates based on total contract value of CBTC signalling projects won in the UK and Europe (including the UK) over a ten and five year period (2012-2021 and 2017-2021 respectively), including details of the underlying contracts that were used for these estimates.[936] We also collected data from Siemens, Alstom, CAF, Stadler and Mitsubishi on contracts won during the period 2017-2021.[937]

10.190 Using information from the Parties' contract list and values for the period 2012-2016 and our own dataset collected from suppliers for the period 2017-

---

[936] Parties' analysis of the consolidated database based on Thales' and Hitachi Rail's project lists. Shares of supply based on total value of order intake.

[937] CMA dataset compiled from the following RFIs: Hitachi response to RFI 3, Q34 and Q35; Thales response to RFI 3, Q37; Siemens response dated 28 February 2023, urban Q5 and Q6; Alstom response dated 3 March 2023, urban Q5 and Q6; CAF response dated 18 January 2023, Q1 and Q2, Stadler response dated 31 May 2023, and Mitsubishi questionnaire response dated 9 May 2023, Q1 and Q2. CAF and Mitsubishi have not won any CBTC signalling projects in Europe. The evidence from third-party suppliers, the Parties' own share of supply estimates and the Parties' internal documents in which they provide estimates of global shares of supply indicate that there are mainly four suppliers (the Parties, Siemens and Alstom) that supply all or most of the CBTC signalling systems in the UK and Europe. On this basis, we consider our share of supply estimates for the UK and Europe are likely to be complete and is unlikely to misrepresent the competitive strengths of the suppliers included in our analysis to a material extent.

2021, we have calculated five and ten year shares of supply estimates for the UK and Europe (see Table 15 and Table 16).[938]

10.191 Our review of the Parties' internal documents also identified global shares of supply estimates prepared by Thales for the period 2015-2020.

10.192 We present each of these share estimates below.

Our shares of supply estimates (based on the Parties' and suppliers' data)

10.193 Table 15 and Table 16 present our shares of supply estimates for the UK and Europe for the period 2017-2021 and 2012-2021.[939]

[938] When comparing the contract lists submitted by competitors with those submitted by the Parties, we found that the Parties' shares of supply estimates overstated the Parties' share of supply and understated Siemens' and Alstom's. This is because the Parties' estimates did not include a small number of rivals' contracts and underestimated the value of some of their rivals' other contract values. Although we were not able to verify the Parties' ten year share of supply estimates covering the period 2012-21, it is likely that those estimates would likely overstate the Parties' shares of supply and understate those of their rivals. As a result, we have a greater degree of confidence in the accuracy of the shares for the period 2017-2021 than the period 2012-2016.
[939] In these market shares and through this paper, a reference to Hitachi and the project it has won in some instances will reflect the projects of Ansaldo. Hitachi Rail acquired control over Ansaldo (active in the design and production of signalling systems and products, for both urban and mainline signalling) and AnsaldoBreda (active in the manufacture and supply of rolling stock, including high-speed, mainline and urban rolling stock) in 2015, with outstanding shares in Ansaldo subsequently acquired overtime, concluding in 2019. See Parties' response to RFI dated 6 September 2022, Q4.

Table 15: CBTC shares of supply by total contract value, in the UK

	2012-2021		*2017-2021*	
Supplier	*Value (£m)*	*%*	*Value (£m)*	*%*
Hitachi	[✂]	[0–5]	[✂]	[0–5]
Thales	[✂]	[90–100]	[✂]	[70–80]
Combined	[✂]	[90–100]	[✂]	[70–80]
Siemens	[✂]	[0–5]	[✂]	[0–5]
Alstom-Bombardier	[✂]	[0–5]	[✂]	[20–30]
Total	**[✂]**	**100**	**[✂]**	**100**

Source: The Parties' analysis of the consolidated database based on Thales' and Hitachi's project lists for the period 2012-2016. CMA analysis of contract data provided by the Parties and their rivals for the period 2017-2021. Shares of supply based on total value of order intake.

Table 16: CBTC shares of supply by total contract value, in Europe

	2012-2021		*2017-2021*	
Supplier	*Value (£m)*	*%*	*Value (£m)*	*%*
Hitachi	[✂]	[0–5]	[✂]	[0–5]
Thales	[✂]	[20–30]	[✂]	[0–5]
Combined	[✂]	[30–40]	[✂]	[5–10]
Siemens	[✂]	[30–40]	[✂]	[50–60]
Alstom-Bombardier	[✂]	[20–30]	[✂]	[20–50]
ASELSAN	[✂]	[0–5]	[✂]	[0–5]
Stadler	[✂]	[0–5]	[✂]	[0–5]
Total	**[✂]**	**100**	**[✂]**	**100**

Source: Due to rounding, shares do not sum to 100%. The Parties' analysis of the consolidated database based on Thales' and Hitachi's project lists for the period 2012-2016. CMA analysis of contract data provided by the Parties and their rivals for the period 2017-2021. Shares of supply based on total value of order intake.

10.194 Table 15 and Table 16 indicate that the Parties are two of a small number of suppliers that have won CBTC signalling contracts for metros in the past 10 years in the UK and Europe, based on our dataset. This is consistent with other evidence gathered from the Parties and third parties which suggests that these are the only four significant players in Europe. While both the Parties have relatively small shares of supply in Europe during the time period shown, evidence presented in the *Bidding analysis* section shows that their global experience is more substantial.

10.195 In the UK, the Parties have a very high combined share of [90–100%] across all tenders for the period 2012-2021, with an increment of [0–5%]. For the reasons set out in paragraph 10.187, the UK shares of supply may be a less reliable indicator of suppliers' ability to win CBTC contracts as the estimates are based on relatively few tenders including Thales' very large 4LM contract win. We believe that the UK shares of supply estimates are indicative of the market structure in the supply of CBTC in the London Underground, as London Underground represents the vast majority of the supply of CBTC in

the UK. TfL told us that Thales has a share of 60–70% in the London Underground.[940]

10.196 The Parties have a combined share by total contract value of [30–40%], with an increment of [5–10%] when considered over a ten year period for contracts won across Europe. The only four other suppliers to have won CBTC contracts during the period were Siemens ([30–40%]), Alstom ([20–30%]), ASELSAN ([0–5%]) and Stadler ([0–5%]).

10.197 For the 2017-2021 period, the Parties have a lower combined share of supply by total contract value of [5–10%]. Siemens has the largest share at [50–60%], and Alstom the second largest at [40–50%]. The significant drop in the shares for the five year estimates was because Thales' 4LM contract win was not part of this estimate, as it won the contract in 2016.[941]

Internal documents on global shares of supply

10.198 Our review of internal documents also found shares of supply estimates calculated by Thales over recent periods. While these internal documents give a strong indication of the global presence of different suppliers (outside of China), these share estimates are from Thales' internal documents and may not be fully accurate:

(a) A 2020 review of Thales' global strategy for urban rail signalling presented by the urban rail signalling Business Line Vice President of strategy, marketing and communications to Thales' GBU Executive Committee shows global CBTC market shares (excluding China) for the period 2014 to 2019. It shows that Thales [✂].[942] [✂].

(b) A subsequent review of the global market for urban rail signalling (excluding China) in 2021 by Thales' urban rail signalling Business Line Vice President of strategy, marketing and communications found that over the period 2015 to 2020, [✂].[943] [✂].

(c) A 2022 Thales review of the global market for urban rail signalling (excluding China) states that Thales' market share had decreased over the years. It shows that over, the period 2016 to 2021, [✂].[944]

---

[940] Note of call with a TfL dated 9 August 2022, paragraph 1b.
[941] Thales may also have had capacity constraints during this period. For example, it submitted that [✂], Thales' response to RFI dated 23 December 2022, Q33.
[942] [✂], slide 7.
[943] Thales, [✂], 15 March 2021, slide 18.
[944] Thales, [✂], 2023, page 23.

10.199 Thales' shares of supply estimates for 'brownfield projects' indicate that, based on order intake, Hitachi has a stronger position in the global market than the UK and European shares of supply suggest. These shares of supply also show that the global market is highly concentrated with only four major CBTC suppliers supplying around [90–100%] of the order intake across the globe.

10.200 In relation to the relevance of the global shares estimates in these documents, Thales submitted that London is a uniquely complex brownfield signalling environment such that global market shares or any potential ability to compete for other projects do not equate to an ability to credibly compete for a London tender.[945] We consider, however, that these documents provide insight into suppliers' technical experience and expertise in delivering CBTC projects and into the competitive conditions for future CBTC projects in the UK. As explained above in paragraphs 9.39(b), suppliers' experience and expertise are important factors to understand whether these suppliers can be credible competitors for future projects in the London Underground.

Provisional conclusion on shares of supply

10.201 The UK, European and global shares of supply show that the market for CBTC contracts is highly concentrated. The Merger involves the largest competitor (Thales) in the UK and one of only three other main CBTC suppliers that operate globally. We currently consider that the Parties' shares of supply across Europe and the rest of the world indicate their strength and technical capabilities as CBTC suppliers.

10.202 We currently consider that the Parties are two of very few suppliers of CBTC systems globally. This indicates that the Parties are likely to be close competitors to one another. In addition to the evidence from shares of supply, we consider other evidence to assess closeness, in particular with regard to the likely requirements of the London Underground.

Bidding analysis

10.203 We consider that suppliers' experience within and outside the UK will provide insight on suppliers' strengths and their ability to compete for future London Underground CBTC contracts (see paragraph 9.42(a)). It provides useful information in assessing the closeness of competition between the Parties and on suppliers' past bidding strategies.

[945] Annex D of the Parties' response to the AIS and WP.

10.204 The Parties provided data on all global CBTC tenders they competed for in the period 2017 to 2022.[946] Siemens, Alstom, Stadler, CAF and Mitsubishi also provided data on all CBTC tenders that they competed for in Europe (including the UK) and the five largest tenders outside of Europe for the period 2017 to 2022.[947] The suppliers submitted information on the scope of the services (including whether the project was greenfield or brownfield), whether the supplier had previous signalling experience with the customer, the selection process, the value of the contract, which competitors they believed bid for each tender and the winner of the contract. Where the contract included other services, such as rolling stock, the suppliers provided the value of the signalling component of the contract. Our bidding analysis only includes tenders that have undergone a competitive process.[948]

Parties' view

10.205 The Parties submitted that the tender analysis showed that Hitachi and Thales did not compete against each other for the same tenders, which is borne out [✂]. The Parties submitted that this evidence shows that the Parties did not exercise a significant competitive constraint on each other.[949]

10.206 The Parties also submitted that neither Party was in the 'same league' as the two largest suppliers, Siemens and Alstom, given that Siemens and Alstom compete for, and win a larger proportion of contracts they bid on than either Party.[950]

Our analysis of bidding data

10.207 In paragraph 10.207, we explained that we received bid data from suppliers on all European tenders that they competed for and partial information from Siemens and Alstom for their rest of the world bids. Since global projects can be used to evidence suppliers' experience against TfL's criteria, the analysis below is based on the global bid data. Given the global dataset may not include some tenders where Siemens and Alstom bid but the Parties did not (as Siemens and Alstom only provided details of their largest five tenders outside of Europe), the Parties' participation rates may be overstated, and

---

[946] Hitachi response to RFI 7, Q3; Thales response to RFI 7 Q2
[947] Siemens response dated 28 February 2023, Q6; Alstom response dated 3 March 2023, urban 6; CAF response dated 18 January 2023, Q2, Stadler response dated 23 January 2023, Q2 and Mitsubishi questionnaire response dated 9 May 2023, Q2. CAF, Stadler and Mitsubishi, either have not delivered any CBTC signalling projects, or have not provided a full response (ie project value is missing), therefore these have not been included in our bidding analysis.
[948] We have not included as part of our bidding analysis tenders awarded through 'mutual agreement', 'framework agreement', 'private negotiation', 'option', 'contract negotiation' or 'variation'.
[949] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 3.21.
[950] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 3.20.

Siemens and Alstom understated. In the following sections, we set out the tender analysis on the following bases:

(a) First, we set out an overview of the tenders in which suppliers bid and win;

(b) Second, we assess the participation and win rates of suppliers for the tenders in which each of the Parties bid; and

(c) Third, we assess participation and win rates for tenders in which the participant does not have previous signalling experience with the customer.

Overview of tenders contested and won

10.208 Figure 4 and Figure 5 below show the total number and value of tenders which the Parties and their rivals contested and won during the period 2017-2022, based on the data collected from the Parties and their competitors by the CMA.

Figure 4: Number of global tenders contested and won (2017-2022)

[✂]

Source: CMA analysis of data provided by the Parties, Siemens and Alstom.
Note: [✂].

Figure 5: Value of global tenders contested and won (2017-2022)

[✂]

Source: CMA analysis of data provided by the Parties, Siemens and Alstom.
Note: [✂].

10.209 Between 2017 and 2022, Siemens and Alstom were the two largest suppliers globally, followed by Hitachi in third and Thales in fourth place, both by the number and total value of tenders contested and won.

10.210 In addition, [✂]. We also understand that [✂].[951]

10.211 The four major suppliers have all won both brownfield and greenfield projects. By contract value, all four major suppliers have won a higher proportion of brownfield than greenfield projects, Hitachi won the highest proportion of brownfield projects ([✂]%), followed by Thales in second ([✂]%), Alstom in third ([✂]%) and Siemens winning the lowest proportion of brownfield projects ([✂]%). Both Parties were most successful in North America, winning [✂] projects each; Thales has won [✂] projects in any other continent during the

[951] Mitsubishi questionnaire response dated 9 May 2023, Q1.

period although it has contested a total of [✂] contracts outside of North America during the period 2017-2022. Hitachi has won [✂] projects in each of Europe and Asia, and [✂] in South America during the period.

10.212 At a European level, during the same period, Siemens and Alstom were again the largest two suppliers, with Siemens winning [✂] tenders worth a total of £[✂] million, and Alstom [✂] tenders worth a total of £[✂] million.[952] The Parties competed for and won [✂] tenders: Hitachi won [✂] tenders worth a total of £[✂] million; and Thales had [✂] wins. Combined, the Parties competed for contracts worth in excess of £1 billion.[953]

Participation and win analysis of the Parties' tender data

10.213 We conducted both a participation and win analysis on Hitachi's and Thales' tender data (see Table 17 and Table 18).

Table 17: Suppliers' global participation and win rates for tenders in which Hitachi bid (2017-2022)

Supplier	*Participation number*	*Participation rate (%)*	*Win Number*	*Win rate (%)*
Hitachi	[✂]	[✂]	[✂]	[✂]
Thales	[✂]	[✂]	[✂]	[✂]
Siemens	[✂]	[✂]	[✂]	[✂]
Alstom	[✂]	[✂]	[✂]	[✂]
Other	[✂]	[✂]	[✂]	[✂]

Table 18: Suppliers' global participation and win rates for tenders in which Thales bid (2017-2022)

Supplier	*Participation number*	*Participation rate (%)*	*Win Number*	*Win rate (%)*
Thales	[✂]	[✂]	[✂]	[✂]
Hitachi	[✂]	[✂]	[✂]	[✂]
Siemens	[✂]	[✂]	[✂]	[✂]
Alstom	[✂]	[✂]	[✂]	[✂]
Other	[✂]	[✂]	[✂]	[✂]

Source: CMA analysis of data provided by the Parties, Siemens and Alstom.
Note: 'Other' covers CAF, Mitsubishi, Nippon Signal, ASELSAN, CRRC, GCF, INEO, Kyosan, and Daido. These tables only include tenders that have undergone a competitive process.

10.214 Table 17 shows that Thales participated in [✂]% ([✂]) of the tenders in which Hitachi bid and won [✂]% ([✂]) of those tenders. Table 18 shows that Hitachi participated in [✂]% ([✂]) of all tenders in which Thales bid, and also won [✂]% ([✂]) of those tenders. Siemens and Alstom were the Parties' most-faced competitors, each meeting Hitachi in [✂]% of the tenders in which Hitachi bid, and Thales [✂]% and [✂]% respectively. Overall, the Parties' bid

[952] In this context, we define 'Europe' as the EEA and the UK.
[953] European bidding analysis excludes tenders which were awarded through mutual agreement, framework agreements, variation order or contract option. As a result, the tenders used in this analysis differ somewhat to those presented in the market shares section.

data indicates that Alstom and Siemens are each of the Parties' closest competitors globally and the Parties are each other's third closest competitor.

Previous experience with the customer

10.215 We conducted an analysis on the global bid data to assess the proportion of brownfield contracts that suppliers have competed on in which they had no previous signalling experience with the supplier, and how many of those contracts they won as non-incumbents.

Table 19: Suppliers global win and participation rates on brownfield projects, by previous experience with the customer (2017-2022)

	Previous experience with the customer			*No previous experience with the customer*		
Supplier	*Number of tenders*	*Number of tenders won*	*Win rate (%)*	*Number of tenders*	*Number of tenders won*	*Win rate (%)*
Hitachi	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Thales	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Siemens	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Alstom	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Other	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: CMA analysis of data provided by the Parties, Siemens and Alstom.
Note: Does not contain all global tenders in which competitors bid. This table only includes tenders that have undergone a competitive process.

10.216 Table 19 shows that all major suppliers other than Thales have demonstrated an ability to win brownfield contracts on metro systems where they have no previous experience with the customer. Notably, [✂] of the [✂] brownfield projects that Hitachi won were those in which it had [✂]previous experience with the customer.

10.217 Suppliers participate in a higher proportion of tenders where they have previous experience with the customer. All suppliers other than Hitachi also have higher win rates where they have previous experience with the customer. However, we note that this analysis was based on a limited number of observations and do not attempt to draw strong conclusions based on this evidence, other than to note that non-incumbents participate in and win brownfield tenders when they have not had previous experience with the customer.

Provisional conclusion on the bidding analysis

10.218 The bidding data supports the other evidence which shows that there are four major global suppliers. The Parties' tender data shows that Hitachi and Thales bid against each other relatively frequently albeit they have not won many contracts when competing against one other (one contract in each case). Siemens and Alstom are the Parties' most-faced competitors; both Siemens and Alstom also won a large proportion of those contracts in which they

competed with either of the Parties. The bidding analysis evidence indicates that Siemens and Alstom are the Parties' closest competitors. The Parties, Siemens and Alstom form a very small set of suppliers that compete for CBTC contracts globally. The bidding data also shows that, globally, it is common for suppliers to win brownfield tenders with customers with which they have no previous experience.

Suppliers' characteristics

10.219 In this section, we consider in more detail the evidence on the suppliers' characteristics and, in particular, the extent to which the Parties and their rivals have assets or underlying capabilities that may make it more or less likely that they will be able to compete on terms attractive to TfL (based on our consideration of TfL's assessment criteria). In particular, we consider suppliers' underlying strengths in relation to their access to technology, management and technical expertise, local knowledge and capacity and as well as their commercial offering (price).

Access to technology

10.220 As explained above, access to technology is a key parameter of competition in the CBTC signalling market (see paragraph 9.34 and 9.39(a)). We have considered below the Parties' and other suppliers' capabilities to adapt their CBTC technology for the London Underground.

Parties' views

10.221 The Parties submitted that all suppliers of CBTC signalling solutions could meet the technical requirements for a London Underground CBTC contract, with a greater or lesser degree of adaptation required, including suppliers such as Alstom, CAF, CRSC, Stadler, Nippon Signal, Hyundai Rotem, Kyosan and Mitsubishi.[954]

10.222 The Parties submitted that brownfield projects involve a degree of customisation to account for the metro system already in operation, meaning that a supplier's solution needs to be bespoke to each environment. In the Parties' view, it would be more difficult, unpredictable, time-consuming and expensive for non-incumbents to compete for CBTC signalling projects in a

[954] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 3.3.

brownfield environment like the upcoming projects on the London Underground.[955]

Third-party views

10.223 We refer to paragraph 6.8 in relation to the factors we consider when weighting submissions from third parties.

10.224 Siemens told us that [✂] a CBTC solution that it has deployed [✂].[956] Siemens stated that [✂].[957] Alstom told us that 'from a technical performance capability aspect… pretty much most suppliers have competing capabilities'.[958]

10.225 Stadler submitted that [✂].[959] It told us it could bring 'state of the art technology' to the London Underground[960] and that their concept and solution has the capability for 60-90 second headway.[961] However, it also told us that it did not have the experience to signal the London Underground.[962]

10.226 Mitsubishi submitted that its CBTC equipment was certified for use on the New York Subway. Mitsubishi also submitted that the 'essential functions' may have applicability for the London Underground but indicated that it would need to develop the appropriate functions for the London Underground, as it has 'unique and distinctive definitions'.[963] We note that Mitsubishi told us that there were differences in the CBTC technology at New York subway and European metro systems. In one of Mitsubishi's internal documents, it stated that, in order to enter Europe, its CBTC system would need 'to achieve GoA4[964] operation', as that was a requirement in recent European metro projects.[965] The Parties, Siemens and Alstom have access to GoA4 technology.[966]

---

[955] Parties, submission on CBTC signalling projects for metros in the UK, 23 March 2023, paragraphs 3.1 and 3.3.
[956] Siemens call transcript, 6 March 2023, page 5.
[957] Siemens call transcript, 6 March 2023, page 19.
[958] Alstom call transcript, 26 January 2023, page 11.
[959] Stadler questionnaire response, Q6 and Q7.
[960] Stadler call transcript, 23 February 2023, page 10.
[961] Stadler call transcript, 23 February 2023, page 4.
[962] Stadler call transcript, 23 February 2023, page 17.
[963] Mitsubishi questionnaire response dated 9 May 2023, Q5.
[964] GoA4 stands for the highest level of railway automation is known as Grade of Automation Level 4. No driver or on-board attendant is required. See All systems go for driverless metros | Thales Group.
[965] Mitsubishi questionnaire response dated 9 May 2023, annex 'GoA4 development road map for discussion 20230417', received 9 May 2023 slides 2-3.
[966] https://www.railtarget.eu/technologies-and-infrastructure/hitachi-rail-is-to-modernize-the-chennai-metro-4925.html; All systems go for driverless metros | Thales Group; https://railway-news.com/taiwan-siemens-to-provide-cbtc-signalling-for-kaohsiungs-first-driverless-metro-system/; and https://www.alstom.com/autonomous-mobility-future-rail-automated.

10.227 CAF submitted that [✂].[967] [✂].[968] [✂].

10.228 While we have not received evidence regarding the technological offerings of CRSC, Nippon Signal, or Hyundai Rotem Kyosan, we note that based on our bidding analysis Nippon Signal has deployed CBTC on underground metro systems and would likely have access to a core CBTC solution. SFMTA told us that [✂].[969]

Parties' internal documents

10.229 The Parties' internal documents indicate that Hitachi [✂], including on more complex brownfield lines.

(a) Hitachi's annual financial report of March 2020 identified the Core CBTC Dragon as a one of the 'strategic projects for the future development of the company' and describes it as a 'program, called DRAGON, on the evolution of the Communication based Train Control (CBTC) product that pursues the objectives of optimizing transport capacity, managing more complex lines, improving the operational flexibility of urban and brownfield metro lines (existing lines already in public operation with increased constraints) and to improve energy efficiency'.[970]

(b) A presentation prepared by Hitachi's Vice President and Executive Officer for the FY2023 Business Plan Review Meeting on 14 March 2023 stated that, in relation to the Railway Systems business unit, it is a priority for Hitachi [✂]. It stated that [✂].[971]

(c) A presentation prepared by Thales in March 2022, in the context of the Merger, reviews different aspects of Hitachi's and Thales' capabilities, [✂]. In this document, [✂].[972]

Provisional conclusion on access to technology

10.230 Based on our assessment of access to technology, the Parties both have access to a core CBTC product and have deployed it across a wide portfolio of projects. As set out in in the section about *Incumbency on the London Underground,* Thales is likely to benefit from a degree of competitive advantage over Hitachi when competing for London Underground contracts,

---

[967] CAF questionnaire response dated, 13 January 2023, Q4.
[968] CAF questionnaire response dated, 13 January 2023, Q6.
[969] Call with SFMTA dated 4 May 2023, 20:06-20:56.
[970] Hitachi, HRL0014928_T, page 40.
[971] Hitachi, Annex H.RFI8.001, page 11.
[972] Thales, THALES-CMA-00207002, page 38.

given its experience in deploying its technology and having obtained certification for its CBTC solution on the London Underground. A number of other CBTC suppliers such as Siemens, Alstom and Stadler also have access to a core solution (although the solutions of Siemens and Alstom have been widely deployed, whereas Stadler's has [✂]). Mitsubishi appears to have developed its CBTC technology for the New York metro system but has not developed all applicable functionality, including the technology for the highest level of automation – GoA4 – which is in demand for European tenders and most likely for future Piccadilly and Bakerloo line projects. CAF, [✂], is currently unable to compete for CBTC projects [✂]. We have received less information on the other CBTC suppliers identified by the Parties but note that Nippon Signal appears to have bid for and won CBTC contracts in Asia and potentially has access to a core CBTC product.

Management experience and technical expertise

10.231 In this section, we assess the management experience and technical expertise of CBTC signalling suppliers. Management experience and technical expertise is a phrase we have used to describe a supplier's experience in undertaking CBTC projects and in particular, experience in projects that may be suitable references for the London Underground.

10.232 In the remainder of this section, we assess:

(a) Suppliers' capabilities and experience in undertaking CBTC projects;

(b) Hitachi's brownfield CBTC projects and how they compare with the Piccadilly and Bakerloo lines; and

(c) Customer feedback on Hitachi.

Suppliers' capabilities and experience in undertaking CBTC projects

10.233 In this subsection, we assess the Parties' and other suppliers' global capabilities in delivering CBTC projects.

- *Parties' view*

10.234 Hitachi told us that it was 'indisputably a leader… in the CBTC market at a global level'.[973]

[973] Hitachi, Main Party Hearing transcript, 26 April 2023, page 10.

10.235 The Parties also submitted that while it may be possible for suppliers to demonstrate relevant capabilities using international references, any global reference, regardless of its comparability in terms of complexity, was unlikely to be as relevant as having London CBTC experience.[974]

10.236 The Parties submitted that Hitachi did not have global references that would be comparable to the future Piccadilly and Bakerloo line projects.[975]

- *Third-party views*

10.237 Third-party evidence indicates that Hitachi's experience in CBTC projects and the references that it could rely on may be relevant for the London Underground.

10.238 Siemens told us that Hitachi was a credible CBTC supplier globally. Siemens noted that, Hitachi's experience in urban signalling in the UK 'is limited', with only one reference which is Glasgow, 'despite them obviously, from global perspective, being very experienced'. Siemens stated that, as a result, Hitachi would need to use references from outside the UK.[976] Siemens also stated that Hitachi was 'present in only certain markets unlike global players such as Alstom, Thales or Siemens.[977] At the same time, Siemens indicated [✂].[978] Siemens told us that the BART and Toronto projects (see paragraph 10.77) that Hitachi had recently won could potentially be used as references, although Siemens indicated that it was ultimately up to the customer to decide which references were suitable.[979]

10.239 Alstom told us that [✂]. Alstom added, however, that [✂]. Alstom explained that [✂].[980] Alstom also told us that [✂].[981]

10.240 CAF also told us that [✂]. In CAF's view, [✂].[982]

10.241 Stadler told us that Hitachi had enough references, such as Brussels, Copenhagen, Paris, San Francisco (BART) and Taipei to be a competitor for a CBTC project for the Piccadilly line.[983]

---

[974] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 3.16.
[975] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 3.17.
[976] Siemens call transcript, 6 March 2023, pages 6, 7, 8.
[977] Siemens response to the CMA's questionnaire, Q8.
[978] Siemens call transcript, 6 March 2023, page 19.
[979] Siemens call transcript, 6 March 2023, page 19.
[980] Alstom, call transcript, 26 January 2023, pages 12-13.
[981] Alstom call transcript, 26 January 2023, pages 20-21.
[982] CAF call transcript, 30 January 2023, page 9.
[983] Stadler call transcript, 23 February 2023, page 16.

10.242 TfL told us that [✂].[984] TfL also stated that [✂].[985]

10.243 TfL also told us that [✂].[986] TfL told us that [✂].[987]

10.244 However, TfL submitted that it would not be able to make any assumptions on which suppliers were strongest. TfL told us that the choice of supplier would depend on several factors, including which London Underground line was being procured, the technical solution it was seeking and whether there were interfaces with other assets on the railway. TfL submitted that Siemens, Alstom, Thales and Hitachi could reference sites globally where they have successfully deployed those systems and all of them could demonstrate effective workable signalling solutions in a rail environment. TfL would test their capability and solution through its procurement. The market has also seen consolidation with a number of the above players getting stronger.[988]

- *Parties' internal documents*

10.245 Hitachi's documentation prepared for tenders outside the UK also suggests that Hitachi has significant global experience in the supply of CBTC systems, including on complex metro systems:

(a) In 2017, Hitachi's Paris Line 6 bid team prepared the 'technical and functional file' for its bid to supply CTBC solutions for the Paris metro. In that document, [✂].[989,990]

(b) In 2019, Hitachi's BART bid team prepared the 'technical package' which was a response to a request from the BART customer (see below paragraph see Table 20 and paragraph 10.163 for more detail on the BART system). [✂].[991,992]

10.246 Thales' internal documents also indicated that it considered Hitachi as a significant competitor for the supply of CBTC systems, including on complex metro systems:

---

[984] TfL call transcript, 8 February 2023, page 21.
[985] TfL call transcript, 8 February 2023, page 35.
[986] TfL call transcript, 8 February 2023, pages 21.
[987] TfL call transcript, 8 February 2023, page 35.
[988] Note of call with TfL, 9 August 2022, paragraph 14.
[989] Hitachi, FSL1_SLI_v2.pdf, 12 September 2017, page 6.
[990] Hitachi submitted that [✂]. Hitachi noted that [✂]. We have assessed this internal document taking into account the context in which it was produced and alongside other pieces of evidence.
[991] Hitachi, 06_Technical Package.pdf, 22 October 2019, page 1.
[992] Hitachi submitted that, as a document was produced in response to a request for proposal, it will put 'a positive spin' on Hitachi capabilities. Hitachi also noted that this is a [✂]. Hitachi also notes that [✂] (see Annex C of the Parties' response to the AIS and WP). We have assessed this [✂]. We also that, in another submission, Hitachi told us that [✂] (see Hitachi letter to CMA, dated 3 May 2023, page 2).

(a) A 2020 review of Thales' global strategy, mentioned above in paragraph 10.198(a), includes an assessment of the market position of its competitors worldwide ([✂]). In this document, [✂].[993,994]

(b) Thales' Vice President for strategy, marketing and communications in the urban signalling unit prepared a strategic document in March 2021 for the GBU Executive Committee which stated that [✂].[995]

(c) Thales' Vice President for strategy, marketing and communications in the urban signalling unit also prepared a strategic document in May 2021 in the context of the Merger for Thales GBU Executive Committee, which sets out the global competitive landscape in urban signalling.[996] This document, described the [✂].

10.247 Overall, the documents considered in this section indicate that Hitachi is among the main four suppliers of CBTC, alongside Thales, Siemens and Alstom and that it has been acquiring experience in delivering brownfield CBTC projects, among which the award of the BART CBTC is considered particularly significant by its main competitors.

- *Analysis of Parties' CBTC projects*

10.248 Figure 6 below presents an overview of the Parties' relevant CBTC signalling experience during the period 2000 to 2023, showing the Parties' global CBTC signalling contracts won by contract start date and value of signalling component, and whether the project was greenfield or brownfield.

Figure 6: The Parties' global CBTC signalling contracts

[✂]
Source: CMA analysis of data provided by the Parties.

10.249 Regarding the experience of the Parties, we observe that:

(a) Both Hitachi and Thales have [✂]. Most of these projects were [✂], but both have also [✂].

---

[993] Annex PNRFI2_Q18.4, slide 7.
[994] Thales notes that this document [✂] (see Annex D of the Parties' response to the AIS and WP). We consider, however, that this document by referring to Hitachi's global position provides insight into technical experience and expertise in delivering CBTC projects and into the competitive conditions for future CBTC projects in the UK. As explained above in paragraphs 9.39(b) and 9.42(a), suppliers' experience and expertise are important factors to understand whether these suppliers can be credible competitors for future projects in the London Underground.
[995] Thales, Annex T.Q10.084, slide 6.
[996] Thales, Annex T.Q9.016, 6 February 2023.

(b) Thales has won [✂] projects, [✂] of which were brownfield. Hitachi has won [✂] projects, [✂] of which were brownfield.

(c) Since the DTUP tender (2016), Hitachi has won more projects than Thales; Thales has won [✂] projects, of which [✂] were brownfield, whereas Hitachi has won [✂] projects of which [✂] were brownfield. Although the chart focuses on the Parties, both Siemens and Alstom have won more total projects and more brownfield projects during the same period. Siemens won [✂] projects, of which [✂] were brownfield, and Alstom won [✂] projects, of which [✂] were brownfield.

(d) Thales has won the [✂] project (4LM) of which we are aware and Hitachi the [✂] (BART), which was awarded in 2020 after the DTUP tender and Hitachi's acquisition of Ansaldo.

10.250 Since the DTUP, Hitachi has increased its pool of CBTC brownfield references. By 2028,[997] Hitachi is expected to have completed the following brownfield projects that it had not delivered at the time of the DTUP tender:[998] Ankara, ([✂], £[✂]), Philadelphia ([✂], £[✂]), Glasgow ([✂], £[✂]), Brussels ([✂], £[✂]), Baltimore ([✂], £[✂]), Paris ([✂], £[✂]) and BART ([✂], £[✂]).[999]

10.251 Hitachi also won the most recently awarded CBTC tender in the UK, the Glasgow Subway project in 2016. [✂].[1000]

- *Analysis of other suppliers' CBTC projects*

10.252 As set out in the 'Shares of supply' and 'Bidding analysis' sections, Siemens and Alstom are the two largest CBTC suppliers both in Europe and globally.

10.253 While the Parties, Siemens and Alstom are the four largest global suppliers by a significant margin, there are also some smaller suppliers that compete for and win CBTC contracts globally. Based on our dataset, Nippon Signal, ASELAN and Mitsubishi [✂].[1001] Mitsubishi submitted that it would not be able

---

[997] The last end date of Hitachi's current live projects.
[998] [✂]
[999] Hitachi response to RFI 3 of 23 February 2023, Q 21 and 23 (Annex Q34_35); Thales' response to RFI 3 of 23 February 2023 (Annex T.Q37.001 and updated T.Q21_23_25_30).
[1000] Email from SPT, dated 16 February 2023. As a bundled tender, a large part of the scoring was for the rolling stock element, we have been unable to differentiate the scoring of the signalling aspects of the tender with that of the rolling stock element.
[1001] [✂].

to win a CBTC project in Europe until at least 2030, mainly because of the need to develop its GoA4 technology.[1002]

10.254 Stadler was also awarded a CBTC signalling project in Basel started in 2019. It told us that the Basel tram is a simple line with higher head way.[1003] Additionally, Basel is a 'Greenfield' project. Stadler also told us that [✂].[1004]

10.255 CAF has not won any CBTC signalling projects. All these suppliers have substantially less management experience than the four largest suppliers and generally have a narrower geographic focus.

10.256 While these smaller suppliers (like the Parties, Siemens and Alstom) may also gain further experience before the Piccadilly and Bakerloo lines tenders, the evidence indicates that these suppliers have considerably less experience and are further down the learning curve than Hitachi and the other three major CBTC suppliers.

- *Our provisional assessment*

10.257 Based on the above evidence, Hitachi has won and delivered (i) a large number of contracts, (ii) high-value contracts and (iii) a significant number of brownfield contracts. The experience of Hitachi in delivering CBTC projects appears to be similar to that of Thales and, in recent years, Hitachi has won more global CBTC projects of a greater value than Thales. Hitachi recognises itself as a global CBTC supplier and Thales and competitors also consider Hitachi as a credible competitor for CBTC projects, including on brownfield projects. Based on their global experience and/or their experience signalling on the London Underground, Hitachi, Thales, Siemens and Alstom all appear to have the relevant management experience to compete for the Piccadilly and Bakerloo lines.

10.258 The smaller CBTC suppliers have significantly less experience than the Parties, Siemens and Alstom and currently have narrow geographic focus with no supplier, other than Stadler, having won a project in Europe. Stadler's single contract was to deploy CBTC technology on a tram in Basel, which is a relatively simple line and not for an underground metro system.

[1002] Mitsubishi response to CMA RFI of 27 April 2023, GoA4 development road map for discussion 20230417.pdf slide 3.
[1003] Stadler questionnaire response, Q6 and Q7.
[1004] Stadler call transcript, 23 February 2023, page 17.

Hitachi's brownfield CBTC projects

10.259 In this section, we assess the characteristics of Hitachi's CBTC brownfield projects in more detail and to what extent the experience acquired in these projects would be relevant for the future Piccadilly and Bakerloo lines projects.

- *Parties' views*

10.260 The Parties submitted that, even disregarding the requirement for local experience (see paragraphs 10.81 to 10.85), Hitachi did not have suitable references that demonstrate the necessary experience and technical expertise to deliver complex brownfield projects comparable to the London Underground.[1005] The Parties told us that Hitachi's CBTC references were not comparable to London in terms of size, complexity or installation constraints. The Parties submitted an assessment for a number of Hitachi's references and concluded that none was comparable to the London Underground:[1006]

(a) **Copenhagen metro**. Significantly less extensive than the London metro, the Copenhagen metro has only four lines and 39 stations. Its footfall is also considerably less than London: only 50 million passengers annually. Additionally, Hitachi's input on the Copenhagen metro has involved greenfield projects only.

(b) **Brussels metro**. The Brussels metro is less extensive than the London metro and comprises only six lines and 61 stations. The Brussels metro also has longer headways of 6–10 minutes between trains. Hitachi submitted that this project involved significant risks.[1007]

(c) **Paris Metro**. Operational since 1900, Paris has a similar number of metro stations to London (309 vs 272) and comparable ridership (over a billion annually). However, the lines in the London metro are deeply interconnected and share the same signalling infrastructure, such that any CBTC application needs to be integrated with the rest of the network. By contrast, the lines in Paris are generally more disconnected, allowing the possibility of 'standalone' CBTC applications from the rest of the network.

(d) **Thessaloniki metro**. The Thessaloniki metro consists of only two lines and 13 stations and is a greenfield project.

[1005] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraphs 4.8 and 4.11.
[1006] The Parties submission on CBTC signalling projects for metros, paragraph 7.5. We understand that these projects were chosen as they were mentioned in the CMA's decision at Phase 1. We have not assessed whether these are the most relevant or complex of Hitachi's CBTC projects.
[1007] Parties' response to RFI 8 - Annex Q7.

(e) **Ho Chi Minh City metro**. Construction of the Ho Chi Minh metro remains ongoing, but the project to date comprises only one line spanning 19.7km. There are 14 stations, only three of which are underground. Ho Chi Minh City metro is a greenfield project.

(f) **Taipei City metro.** The Taipei City metro comprises six lines and 131 stations over 131km. Annual ridership is also considerably lower than London: around 765 million. Hitachi provided the signalling system for the Circular Line, which was a greenfield project.

(g) **BART** was not an effective reference for a London project for five main reasons: BART is not a complex system; it has short traffic headways, it is closed at night, it has a low ridership compared to London and it is not yet complete.

10.261 In relation to the CMA's proposition that individual characteristics of some of Hitachi's projects taken together might show Hitachi as having the relevant experience for a London tender, the Parties submitted that TfL sets a limit on the number of references that could be used (three for the DTUP), meaning Hitachi would not be permitted to use a large number of references to evidence the relevant criteria.[1008]

10.262 The Parties also submitted that, while not strictly comparable, there were only a few metros that were closer the London Underground in terms of complexity. These were the New York City subway, Madrid metro and Seoul metro.[1009] Thales has experience providing signalling services on all of these metro systems, while Hitachi has not provided signalling services on any.[1010]

- *Assessment of the characteristics of Hitachi's brownfield CBTC projects*

10.263 Our current view is that the Parties' analysis of the characteristics of Hitachi's projects is based on two assumptions that we consider to be inappropriate or not supported by the evidence:

(a) First, that each of Hitachi's references would need to display most or all the characteristics of the London Underground. In practice, a supplier can use up to three case studies to demonstrate its capabilities to the criteria

[1008] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 4.9.
[1009] The Parties submission on CBTC signalling projects for metros in the UK, paragraph 7.4.
[1010] Thales response to RFI 3, Q 37, Thales Rail Signalling, last accessed on 2 May 2023.

being assessed, meaning that no single case study is needed to display all the characteristics required for a particular project.[1011,1012]

(b) Second, the Parties' analysis compares Hitachi's CBTC projects against the London Underground in its entirety (eg total ridership on the London Underground etc), whereas we expect TfL to assess suppliers based on the characteristics of the specific lines being tendered.

10.264 Nonetheless, we agree with the Parties that suppliers would need to have experience in undertaking CBTC projects that display some of the characteristics of the Piccadilly and Bakerloo lines to be a credible competitor for those projects. Table 20 summarises the analysis of the Parties in which they assessed eight characteristics (and by implication, factors that they considered would be important to TfL's assessment): length of the line, length of the section that is underground, headway (tph), number of stations, age, operational hours, number of junctions and ridership.

10.265 Table 20 below compares some of some of Hitachi's more complex CBTC projects with the Piccadilly and Bakerloo lines against the characteristics identified by the Parties (see paragraph 10.260).

[1011] [✂].
[1012] Thales' response to case study RFI dated 21 March, 'Case ME_6971_21 - Thales Response to CMA Request for Case Study Information (21 March 2023)'. Hitachi's response to case study RFI dated 20 March 2023, 'CASE ME_6971_21 - CBTC Reference RFI 15 March 2023 - CONFIDENTIAL(10254937224.3)'.

Table 20: The characteristics of Hitachi's CBTC projects

Metro System	*Length of line in km*	*Length of the section of line that is underground (km)*	*Peak time headway (minute)*	*Number of stations*	*First commissioning of the line*	*Weekday operational hours*	*Number of junctions (estimates)*	*Annual ridership by line (million)*
London Piccadilly line	148	estimate: 70-75	2.5	53	1906	05:09 – 01:13 (Mon - Thurs)*	20	220
London Bakerloo Line	46	estimate: 8	2	25	1906	05:39 – 00:42 (Mon – Fri)†	8	111
Brussels metro Line 5	17		1.5	28	1976	00:03 – 23:53	12	
Brussels metro Line 6	16		6-10	26	1988	00:09 – 23:59	18	
Paris line 3	12		2-7	25	1904	05:30 – 00:45	10	100
Paris line 6	14	6	2	28	1909	00:04 – 23:59	12	101
Thessaloniki metro line 1	10	[✂]	[✂]	13	2023		11	
BART Yellow line	88	[✂]	15	28	1973	04:40 – 23:52	17	
BART Red line	59	[✂]	15	24	1976	06:03 – 20:11	23	
Glasgow Subway	11	11	1.5	15	1896	06:30 – 23:40	0	8
Copenhagen Cityringen	23	16	[✂]	24	2019	24 hours	7	100

Source: The Parties' response to the AIS and Working Papers, 2 May 2023, Annex E – Metro System Comparison.
Note: All lines listed are brownfield projects, other than Copenhagen Cityringen and Thessaloniki line 1 which are greenfield. Where a cell is blank it is because the Parties did not provide a response.
* These times correspond to the first departure from Cockfosters, and the latest arrival at Heathrow Airport Terminal 5, Monday to Thursday. Times may vary for other stations.
† These times correspond to the first departure from Harrow & Wealdstone, and the latest arrival at Elephant & Castle, Monday to Friday. Times may vary for other stations.

10.266 Table 20 shows that Hitachi has references that have been either completed or are currently in progress that reflect one or more of the characteristics of the Piccadilly and Bakerloo lines. For example, the Paris Line 3 and Paris Line 6 are of a similar age to the Bakerloo line and have similar peak time headway, operational hours, number of junctions and ridership; the BART lines are of a similar length, number of stations and number of junctions.

10.267 In terms of the specified characteristics, we also note that all the characteristics listed in the table are met by at least one of Hitachi's listed projects. For example: BART lines display similar line length; Brussels and Paris display similar headways;[1013] Paris and Glasgow are of a similar age;

[1013] Hitachi told us that the Brussels metro had longer headways (Parties, submission on CBTC signalling projects, paragraph 7.5b), but data they submitted suggests that is not correct at least for lines 1 and 5, which have headways of 90 seconds.

almost all lines have not dissimilar operating hours; BART and Brussels have a similar number of junctions; and Paris and Copenhagen have a similar ridership.

- *Third-party views*

10.268 As noted at paragraph 10.260(g), the Parties submitted that the BART project was not complex. The SFMTA – the transport authority responsible for BART – told us that the BART project was 'extremely complex'. For example, SFMTA told us that BART has different source codes for track circuits and different suppliers in different segments, and it was going to be 'quite a feat to migrate the whole system over'. In addition, SFMTA told us that [✂].[1014] SFMTA also told us that [✂].[1015]

10.269 TfL told us that to its knowledge the metro systems in New York, Vancouver, Madrid, Paris (in relation to the line signalled by Thales), Toronto, Singapore and Hong Kong (although most projects in Singapore and Hong Kong tend to be more greenfield) all have similarities to the characteristics of the London Underground. TfL noted that it could not say whether Hitachi's CBTC projects in BART, Glasgow and Paris (line 6) would be a useful reference point in future TfL CBTC tenders, as TfL would have to investigate whether Hitachi's CBTC projects are similar in terms of size and complexity.[1016]

10.270 Alstom told us that [✂].[1017] In relation to [✂], Alstom stated that [✂].[1018]

10.271 Stadler stated that Thales, Alstom and Siemens were much stronger on the London Underground,[1019] but considered that Glasgow was 'a very good reference for Hitachi' because it is a brownfield resignalling project, in which the supplier has to deploy the new signalling solution, while keeping the metro in operation, as well.[1020] Stadler also noted that the BART project was a 'very complex, brownfield project'.[1021]

10.272 CAF told us that the Glasgow CBTC project was especially complex from the point of view of automation and that, as a result of its involvement and the adaptations it made for the UK market, Hitachi was in a better position to bid for future CBTC projects in the London Underground.[1022]

[1014] Transcript of Call with SFMTA dated 4 May 2023.
[1015] Transcript of Call with SFMTA dated 4 May 2023.
[1016] TfL call transcript, 8 February 2023, pages 22-23.
[1017] Alstom call transcript, 26 January 2023.
[1018] Alstom call transcript, 26 January 2023, pages 20-21.
[1019] Stadler call transcript, 23 February 2023, page 8 and 13.
[1020] Stadler call transcript, 23 February 2023, page 13.
[1021] Stadler call transcript, 23 February 2023, page 16.
[1022] CAF call transcript, 30 January 2023, pages 9-10.

- *Parties' internal documents*

10.273 The internal documents discussed above in paragraphs 10.163 and 10.245(b) suggest that Hitachi's experience in CBTC projects such as BART is relevant and that the experience that Hitachi is gaining delivering the BART project can be leveraged for its global growth in CBTC.

10.274 When considering the opportunity to bid for [✂], Hitachi considered that BART and some of its other projects would be relevant references. Thales, when assessing the competitive set [✂], also highlighted the BART reference as one of Hitachi's strengths:

(a) In a Thales' presentation prepared in 2021 by the capture leader for the GBU Executive Committee to review the opportunity to bid [✂]. [✂]. [✂]. [✂].[1023]

(b) As we identified in paragraph 10.167, Hitachi stated in an initial assessment of [✂] that it intended to leverage lessons learned from its past and ongoing brownfield projects [✂]. [✂].[1024]

10.275 [✂], these documents suggest that, in principle, Hitachi's experience in CBTC projects such as BART could be [✂] relevant references (see also paragraphs 10.287 and 10.288 about the feedback from [✂], the infrastructure manager for the [✂] metro).

10.276 We note that Hitachi's internal documents also describe Hitachi as being on a [✂] (see paragraph 10.179). These documents suggest that Hitachi is looking to learn from its [✂] experiences in [✂] to be a more capable supplier for complex brownfield projects in the future.

- *Our provisional assessment*

10.277 Based on our assessment of the characteristics of Hitachi's brownfield CBTC projects, we consider that Hitachi has a portfolio of brownfield projects that share one or more characteristics with future CBTC projects in the London Underground. Third parties have also indicated that some of Hitachi's portfolio of projects would be considered as comparable to the London Underground and the Parties' internal documents suggest that BART may also be an important reference for future CBTC brownfield projects.

10.278 While our assessment is not aimed at identifying the most appropriate case study references for future TfL tenders, the evidence above indicates that the

---

[1023] Thales, Oslo GBU Gate 2 exec summary-v05.pdf, 11 January 2021.
[1024] [✂] – Hitachi response to RFI of 15 March 2023.

Parties' assessment understates the potential value of Hitachi's portfolio, and that Hitachi could draw on one or more of these projects to demonstrate its capability in undertaking brownfield CBTC projects that have characteristics similar to those of the London Underground. Our assessment also shows that Hitachi's experience of resignalling in brownfield environments appears now to be materially stronger than it was at the time of the DTUP tender.

Customer feedback on Hitachi

- *Parties' views*

10.279 The Parties submitted that since the DTUP, Hitachi's recent experience providing brownfield CBTC signalling projects [✂].[1025] The Parties also described that Hitachi's [✂] projects were [✂] (see paragraphs 10.136 to 10.142). The Parties submitted that Hitachi's performance in the [✂] projects [✂].[1026]

10.280 The Parties also submitted that recent customer feedback indicated that Hitachi remained a weak contender for complex brownfield projects.[1027] The Parties submitted [✂]. [✂].[1028] The Parties stated that [✂].[1029]

- *Customer views on projects Hitachi has delivered since the DTUP tender*

10.281 We sought feedback from Hitachi's customers in relation to Hitachi's performance on their projects. We sent questionnaires out to several customers, including (but not limited to) STIB and SPT (the transport authorities responsible for the Brussels metro and Glasgow Subway) given the Parties' submissions on Hitachi's [✂] in both of these projects. In addition to STIB and SPT, of other customers that we contacted, only SFMTA, the customer for the BART project responded to our questionnaire. We set out these customers' views below.

10.282 STIB provided [✂] feedback on Hitachi's performance. It told us that Hitachi has 'a strong culture of railway expertise' and that it had 'senior technical staff with brilliant minds' and that its technology performance was as expected. However, STIB also indicated that [✂].[1030] In its feedback to Hitachi's tender submission for the Brussels metro, STIB stated that Hitachi presented 'a

---

[1025] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 4.12
[1026] Parties, response to the AIS and WP, 2 May 2023, Overview, paragraph 1.6b
[1027] Parties, response to the AIS and WP, 2 May 2023, Section B, paragraph 4.13 and Parties' submission dated 23 March 2023, paragraph 8.4.
[1028] Parties, submission on CBTC signalling projects for metros in the UK, 23 March 2023, paragraph 8.4
[1029] Parties, submission on CBTC signalling projects for metros in the UK, 23 March 2023, paragraph 8.5
[1030] STIB email to the CMA, dated 28 April 2023.

proven and robust solution to achieve STIB-MIVB's long-term' performance objectives, without compromising deadlines or commercial operation during all phases of system deployment'.[1031]

10.283 SPT submitted that [✂].[1032]

10.284 SFMTA, the customer for the BART project, which is the second largest brownfield resignalling project in the world,[1033] told us that, although the project was still at relatively early stages, it considered that Hitachi had 'started very well' and at this point of the project, was 'doing a very good job (8 or 9 out of 10)'. BART's infrastructure manager highlighted the complexity of this project. As noted earlier (paragraph 10.268), SFMTA also stated that this brownfield CBTC project is 'extremely complex', with different source code for track and various suppliers in different segments. SFMTA stated that it will 'be quite the feat to migrate the whole system' to the new CBTC system, including schedule constraints to conduct the migration works.[1034]

- *Customer feedback from Hitachi's performance* [✂] *tender*

10.285 In the light of the Parties' submissions in relation to [✂] tender, we have also considered the evidence [✂] to understand whether the Hitachi loss on [✂] suggests that it would not be a credible competitor for brownfield CBTC projects in the future.

10.286 The [✂] was the [✂], [✂].[1035] The main tender requirements for the [✂] project, as described by the Parties, suggest that this project involved some level of complexity.[1036] Suppliers had to demonstrate:

(a) the ability to accommodate capacity of up to 40 trains per hour;

(b) the ability to provide a long-term evolution (LTE) telecommunications solution; and

(c) proven level of maturity with respect to ability to minimise the impact on existing system/network during migration to the new signalling system, and ability to ensure fewer service interruptions under the new system.

[1031] HRL0020929.pdf, page 12.
[1032] SPT email to the CMA, dated 28 April 2023.
[1033] HRL0004699, page 9. Hitachi describes BART as 'the second largest brownfield resignaling project worldwide today'.
[1034] Transcript of call with SFMTA, of 4 May 2023, pages 24 and 26.
[1035] Siemens response to RFI dated 28 February 2023, Q5.
[1036] Thales references – Thales response to RFI of 15 March 2023.

10.287 Hitachi was eliminated from the [✂] tender at the first round of the ITT stage before the other three major competitors. [✂] feedback on Hitachi shows that it eliminated Hitachi for 'technical and commercial reasons' and that Hitachi provided only one example of a brownfield project that had been in operation and that project was only for one line and not comparable with the requirements of the [✂] tender in terms of 'scale, complexity or environment'.[1037] [✂] noted that '[✂]'. [✂] also stated that Hitachi's tender was viewed as '[✂]'.[1038]

10.288 [✂] noted, however, that all four suppliers that bid ([✂], [✂], [✂] and [✂]) would have been able 'to meet its requirements' from a technological perspective.[1039] It also noted that Hitachi was 'undoubtedly a highly reputable company, with a long track record of successfully delivering railway systems around the globe'.[1040]

10.289 [✂] feedback suggests that Hitachi's references at the date of the tender were not sufficient for Hitachi to demonstrate the required experience for [✂] metro CBTC project. We note, however, that the BART project was at a very early stage, which may have affected the weight that [✂] placed on this reference. One Thales' internal document discussing the [✂] metro tender from January 2020, indicates that [✂].[1041] This may have, in some way, affected Hitachi's performance in this tender.[1042] We note that [✂] acknowledges Hitachi's track record of successfully delivering railway systems around the globe and its technical capability.

- *Our provisional assessment*

10.290 Regarding the Parties' submissions on Hitachi's performances on brownfield projects since the DTUP tender, Hitachi has faced [✂] CBTC projects which led to [✂] (see paragraphs 10.115 and 10.135 to 10.144). [✂], the feedback from those customers on Hitachi's performance has been broadly positive.

10.291 The feedback from SFMTA, Hitachi's largest customer by [✂], was also broadly positive and indicates that Hitachi is performing well on a project that

---

[1037] [✂] RFI response.
[1038] HRL0021634.pdf, slides 10, 19.
[1039] [✂] RFI response.
[1040] HRL0021634.pdf, slide 42.
[1041] Thales, [✂], 11 January 2021.
[1042] We note that, as part of their learning curve, CBTC supplier may run into issues on particular projects that may affect their reputation. While these issues in specific projects may harm the reputation of these suppliers, in particular in relation to the same customers, these suppliers can still rely on the overall experience and track record in subsequent tenders and demonstrate how they intend to deal with the problems they faced in previous projects, as part of their learning curve.

the customer considers as complex. Although the project is still ongoing, the evidence does not indicate Hitachi's reputation [✂].

10.292 In relation to the [✂] tender, Hitachi performed less well than the other three bidders ([✂], [✂]) and the customer considered that Hitachi's references at the date of the tender were not sufficient to demonstrate the requisite experience. As explained in paragraphs 10.259 to 10.278, Hitachi is widening its portfolio of brownfield projects and would be able to provide more references than it was at the time of the [✂] tender to demonstrate its overarching capabilities in undertaking higher risk brownfield projects.

10.293 Overall, we consider that the evidence from Hitachi's customer feedback in previous brownfield CBTC projects indicates that Hitachi has experience in complex brownfield CBTC projects on which it will be able to demonstrate its capability in bidding for future complex CBTC projects. Based on this evidence, and notwithstanding [✂], Hitachi's [✂] does not seem to have been impacted in the way that the Parties have suggested. The feedback from infrastructure managers does not suggest that its [✂] with respect to these brownfield CBTC projects at this stage would prevent it from using these projects as references. While some of the brownfield CBTC projects are ongoing, Hitachi will have completed the projects by the time of the future tenders for the Piccadilly and Bakerloo lines.

Provisional conclusion on management experience and technical expertise

10.294 The evidence above indicates that Hitachi is an experienced supplier that has an established track record of undertaking high-value brownfield projects, including BART, which was described by a Hitachi Senior Vice President as the second largest brownfield resignalling project in the world. [✂], our assessment has found that Hitachi has since expanded its portfolio of brownfield projects and its pool of CBTC brownfield references. Before the next London Underground tender, Hitachi is expected to have completed the contracts for the following brownfield references that it had not delivered at the time of the DTUP: Ankara (£[✂], [✂]), Philadelphia ([✂], £[✂]), Glasgow ([✂], £[✂]), Brussels ([✂], £[✂]), Baltimore ([✂], £[✂]), Paris ([✂], £[✂]) and BART ([✂], £[✂]).

10.295 Hitachi's current portfolio consists of CBTC projects that appear to meet some or most of the characteristics that contribute to the complexity of a metro system. Given that suppliers can typically use multiple case studies to demonstrate they meet the criteria set out by transport authorities, Hitachi may be able to use some of these projects as references to display its competence in future tenders. We also spoke to international transport authorities that hold key contracts with Hitachi. Feedback from customers on

Hitachi's performance was largely positive, including on projects where the Parties have told us that Hitachi has [✂]. Hitachi appears to be using the lessons learned from these experiences in its bid selection and for operational efficiencies.

10.296 Based on the evidence above, we consider that Hitachi has the relevant management experience and technical expertise to undertake complex brownfield projects and be a credible competitor for future London Underground contracts.

10.297 Thales, Siemens and Alstom are also established CBTC suppliers with a track record of undertaking CBTC projects. Their track record and success in winning CBTC projects indicate that they are likely to compete strongly in relation to this parameter of competition.

10.298 Other smaller CBTC suppliers have won some projects, but each supplier individually has limited experience in undertaking CBTC projects or has a relatively limited focus, either geographically or on type of project (greenfield rather than brownfield). The evidence suggests none of these suppliers have the level of management experience and technical expertise to compete strongly with the Parties.

Local knowledge and capacity

10.299 In the 'Incumbency on the London Underground' section, we described the likely conditions of competition given the complexity of the London Underground and the likely high entry barriers.

10.300 Given that Thales and Siemens are the only two suppliers with experience of completing CBTC signalling projects on the network, we expect that both suppliers are likely to be strong competitors and will likely benefit from a competitive advantage when bidding for future London Underground tenders. These incumbency advantages may be realised through each supplier's:

(a) existing bespoke solution that is already in service on the London Underground and already meets TfL's requirements (see 'Access to technology');

(b) reference projects from the London Underground that are more likely than non-London references to have the characteristics TfL will require during its tender evaluation processes (see 'Management experience and technical expertise'); and

(c) access to at least some existing workforce that has experience delivering projects on the London Underground and an established relationship with TfL (see 'Local knowledge and capacity').

10.301 However, based on the evidence set out in these sections, we considered that while incumbents would benefit from a competitive advantage, the entry barriers would not necessarily be insurmountable for experienced CBTC suppliers that did not have prior experience on the London Underground.

10.302 The evidence set out in our competition assessment shows that both Hitachi and Alstom are expected to have the relevant track record and capabilities to be credible competitors for the Piccadilly and Bakerloo lines tenders. The evidence and our analysis also suggest that other, less experienced suppliers active in the global CBTC market are unlikely to have the relevant experience to overcome these entry barriers and compete strongly against the more established suppliers.

Price

10.303 TfL told us that [✂]. It indicated that [✂].[1043] For the 4LM tender, price accounted for only 30% of the ITT criteria.

10.304 Given the lack of evidence on suppliers' relative pricing strategies and assuming a continuation of the lower weighting of price to TfL's assessment, we have not considered suppliers' relative pricing strategies in detail.

10.305 As discussed in earlier sections, we understand that new entrants to the London Underground may find it more difficult, unpredictable, time-consuming and expensive to compete for CBTC signalling projects in a brownfield environment.[1044] This indicates that new entrants may face higher costs that could potentially impact price, although we do not expect this to be the only factor that would influence the price, as prices are also influenced by other factors such as competition. We note that in a highly concentrated market with substantial incumbency advantage, prices may already be above the competitive level such that new entrants may be able to compete effectively despite facing some investment costs associated with entry.

10.306 We currently, therefore, have not differentiated between different suppliers on their pricing.

[1043] TfL call transcript, 8 February 2023, page 28.
[1044] Parties, submission on CBTC signalling projects, paragraph 3.3.

Third-party evidence

10.307 This section considers evidence from third parties on the competitive strength of CBTC signalling suppliers and the effect of the Merger on competition. Third-party qualitative views on the strength of each CBTC system supplier are included in our assessment of the suppliers' characteristics.

10.308 For the same reasons set out in paragraph 8.377, we consider the evidence from third parties in the round and recognise that some third parties may have an interest in the outcome of the Merger inquiry. Therefore, when using third-party views as evidence, we have given due regard to a range of factors including: (i) the incentives of the party giving that view; and (ii) the extent to which the view was corroborated by other evidence available to us.

Competitor scores on suppliers' strengths

10.309 We asked competitors to list the suppliers that they would consider credible to compete for TfL CBTC contracts and to indicate the strength of each supplier on a scale from 1–5 (where 1 is not very strong and 5 is very strong). We received responses from five suppliers (Siemens, Alstom, Stadler, CAF and Mitsubishi).

10.310 We place limited weight on these supplier scores in our assessment because of the small sample size and scores potentially being skewed by suppliers not active in the market with limited knowledge of the competitive conditions (Stadler and CAF). We also note that, [✂].[1045] Overall, we have interpreted these scores in light of the qualitative submissions from the different CBTC suppliers about Hitachi's experience and references set out above in the section about 'Management experience and technical expertise'.

10.311 The results show that all five respondents identified Thales as a competitor, and it was given an average score of 4.8. Siemens and Hitachi were each identified four times and given average scores of 3.25 and 2.5 respectively. Alstom was identified three times and given an average score of 2. Both Stadler and CRSC we identified once and were each given a score of less than one.

10.312 Overall, the results provide a further indication that there are likely to be only four credible suppliers able to compete for London Underground projects and that Thales is the strongest supplier for such projects. As previously mentioned, we place limited weight on the supplier scores.

[1045] [✂].

Third-party views on the Merger

10.313 The general observations we made about the weight we can place on third-party views in paragraph 6.8 apply to our interpretation of third-party views on the Merger.

10.314 TfL submitted that [✂].[1046] TfL [✂] and it told us that [✂]. [✂]. TfL has told us that [✂]. [✂].[1047]

10.315 [✂].[1048]

10.316 Siemens submitted that [✂]. It believes that [✂].[1049]

10.317 Alstom submitted that [✂]. [✂].[1050]

10.318 Stadler submitted that [✂].[1051]

10.319 CAF submitted that [✂]:

(a) [✂];

(b) [✂]; and

(c) [✂].[1052]

10.320 Third-party suppliers provide different views on the Merger, with all bar Siemens expressing some form of concern regarding market concentration, barriers to entry or harm to innovation. We have considered third-party views in the context of the overall evidence considered above.

Provisional competition assessment

10.321 TfL is expected to tender for the resignalling of the Piccadilly and Bakerloo lines on the London Underground by around 2035 (see section on *Upcoming CBTC resignalling tenders on the London Underground*). We have not taken into account in our current assessment potential CBTC tenders for other lines that may occur well after 2035 because of the uncertainty associated with predicting competitive conditions in this market so far into the future. While there are uncertainties in relation to the design of TfL's future CBTC tenders

---

[1046] TfL call note, 9 August 2022, paragraph 29.
[1047] TfL call note, 9 August 2022, paragraph 30.
[1048] [✂].
[1049] Siemens questionnaire response dated, 17 January 2023, Q9.
[1050] Alstom questionnaire response, Q9.
[1051] Stadler questionnaire response, Q9.
[1052] CAF response to RFI dated 18 January 2023, Q9.

for the Piccadilly and Bakerloo lines and the capabilities of suppliers at the time of these tenders, we do not have to predict the specific outcomes but rather assess the likely applicable conditions of competition on the basis of all the available evidence.

10.322 We have, therefore, focused our assessment on the competition for the supply of CBTC systems for the Piccadilly and Bakerloo lines, in order to establish whether the Merger is likely to result in the removal of competition between the Parties for those projects and whether that loss of competition would likely lead to an SLC in the supply of CBTC signalling systems in the UK.

10.323 One of the defining features of the competition for the future CBTC tenders for the London Underground is the specialised nature of CBTC projects. Metro systems that are more complex bring greater delivery risks and experienced suppliers are generally better placed for such an undertaking. Complexity is not a defined concept and exists on a spectrum. The London Underground is regarded as being towards the more complex end of this spectrum, owing to the sprawling nature of an aged network that has been in existence for over a century with multiple lines, intersections, junctions, and narrow deep tube tunnels. The network is used by hundreds of millions of passengers each year with trains operating at speed and high frequency matched by few other networks, on all days of the week and for almost all hours of the day.

10.324 Because of this complexity, existing suppliers are expected to benefit from a competitive advantage, potentially a significant one, when the future London Underground resignalling contracts come up for tender. They have deployed their technology on the network and have well established relationships with the customer, TfL. They may also have the benefit of accessing workforce and facilities for future projects without the need for considerable further investment. Overall, incumbents' previous experience would likely lower the costs of familiarisation with the network, the customer and the technologies and, potentially, provide those suppliers with the ability to deploy their solutions more rapidly (compared to new entrants). All of these factors indicate that barriers to entry on the London Underground are high.

10.325 At present, there are only two suppliers that have successfully delivered CBTC signalling projects on the London Underground: Thales and Siemens. Thales is the more experienced of the two incumbents in London and will have signalled 60–70% of the London Underground at the conclusion of the 4LM project. Hitachi, the other Merger party, is one of the very few other CBTC suppliers that could potentially credibly compete for the London Underground by the time of the next tender.

10.326 Our assessment has, therefore, sought to answer three key questions: (i) first, in the light of the high entry barriers and resultant competitive advantages held by incumbents, whether the tender for future CBTC resignalling projects would be contestable by new entrants; (ii) second, whether Hitachi would likely bid for complex brownfield CBTC projects in the future, [✂]; and (iii) third, whether the Parties are close competitors and whether constraints from other CBTC suppliers would offset the potential loss of competition that the Parties would have exercised on each other in future CBTC tenders for the London Underground.

10.327 To the question of whether the London Underground tenders will be contestable for suppliers without previous experience, our starting point is that future London Underground major resignalling projects will be open to competitive tenders. Competition remains one of the most important tools at TfL's disposal to restrain the market power of its incumbent suppliers and to discipline those suppliers' performance levels. The fact that there are only two suppliers currently operating on the London Underground does not necessarily imply that competition is not important or necessary in this market.

10.328 Although there have been very few recent tenders, TfL in a previous tender awarded a CBTC contract to a supplier ([✂]) with no prior experience of the London Underground. While that procurement was ultimately unsuccessful as the supplier was assessed as being unable to reliably deliver the project,[1053] it has shown that TfL has considered suppliers other than its current providers. [✂]. TfL told us expressly that previous London Underground experience was neither 'essential nor preferred'.

10.329 While we acknowledge the likely presence of material incumbency advantages, overall, we consider that the evidence received to date indicates that future CBTC tenders for the London Underground will be open to competition and that new entrants appear likely be able to compete and act as a constraint on incumbent suppliers, depending on their global experience and overall capabilities as a CBTC supplier.

10.330 For the reasons explained at paragraphs 10.102 to 10.105, only experienced suppliers are likely to be capable of competing for future CBTC tender for the London Underground. Given this, we considered whether Hitachi could be a credible competitor by assessing its overall capabilities as a CBTC supplier, including its experience and technical capability, by reference to its position outside the UK.

[1053] See https://content.tfl.gov.uk/fpc-20140717-part-1-item10-sup-atc-lessons-learnt.pdf, slide 6, paragraph 5.5, accessed on 6 June 2023.

10.331 As part of our assessment of whether Hitachi will be a credible competitor for future London Underground tenders, we started by considering the Parties' submissions and other evidence on Hitachi's future plans, in particular [✂] and its stated position [✂].

10.332 While we cannot predict with certainty whether, absent the Merger, Hitachi will bid for future CBTC tenders for the Bakerloo and Piccadilly lines, such uncertainty is an inherent part of the forward looking assessment that we must conduct.[1054]

10.333 As described in more detail below, Hitachi has strong competitive capabilities and is increasing its experience in brownfield CBTC projects. Therefore, our starting point is that, subject to evidence to the contrary, Hitachi would likely continue to bid for brownfield CBTC projects on a case-by-case basis and would be considered by rivals as a potential and credible competitor for future CBTC tenders in the London Underground, absent the Merger.

10.334 We currently consider that the evidence we have received to date is not sufficient to provisionally conclude that, in the absence of the Merger, and despite Hitachi's capabilities and the experience acquired from previous complex brownfield CBTC projects, [✂].

10.335 Accordingly, we then assessed whether Hitachi has the capabilities to be a credible competitor for future CBTC tenders for the London Underground. The UK, European and global shares of supply show that the market for CBTC contracts is highly concentrated. The Merger involves the largest competitor (Thales) in the UK and one of only three other CBTC suppliers that operate globally. We currently consider that the Parties' shares of supply across Europe and the rest of the world indicate their strength and technical capabilities as CBTC suppliers. We currently consider that the Parties have a significant share of supply with few competing suppliers, which indicates they are likely to be close competitors to one another.

10.336 The Parties' tender data shows that Hitachi and Thales bid against each other relatively frequently albeit they have not won many contracts when competing against one other ([✂]). Siemens and Alstom are the Parties' most-faced competitors, and both won a large proportion of those contracts. The Parties, Siemens and Alstom form a very small set of suppliers that compete for CBTC contracts globally.

10.337 From a technological perspective, both Parties have access to a core CBTC product and have deployed it across a wide portfolio of projects. Thales is

---

[1054] CMA129, paragraph 3.14.

likely to benefit from a degree of competitive advantage over Hitachi when competing for London Underground contracts, given its experience in deploying its technology and having obtained a certified solution on the London Underground.

10.338 Our assessment of Hitachi's management experience and technical expertise found that Hitachi is an experienced supplier that has undertaken a number of high-value brownfield projects, including BART, which Hitachi has described as the second largest brownfield CBTC project in the world.[1055] [✂], our review has found that Hitachi has since expanded its portfolio of brownfield projects and therefore its pool of CBTC brownfield references. By the time of the next London Underground tender, Hitachi is expected to have completed (or near completed) the following brownfield references: Ankara ([✂], £[✂],), Philadelphia ([✂], £[✂]), Glasgow ([✂], £ [✂]), Brussels ([✂], [✂]), Baltimore ([✂], £[✂]), Paris ([✂], £[✂]) and BART ([✂], £[✂]).

10.339 Our assessment also found Hitachi's current portfolio consists of CBTC projects that meet some or most of the characteristics that contribute to the complexity of a metro system. Given that suppliers can use several case studies to display the criteria set out by transport authorities, Hitachi may be able to use some of these projects as references to display its competence in future tenders. We also spoke to international transport authorities that hold key contracts with Hitachi. Feedback from customers on Hitachi's performance was largely positive, including on projects where the Parties have told us that [✂].

10.340 Based on the evidence above, we consider that Hitachi has the relevant management experience and technical expertise to undertake complex brownfield projects and be a credible competitor for future London Underground CBTC contracts.

10.341 We have also considered other rivals' capabilities to assess whether there were any alternative constraints that would offset the potential loss of constraint that the Parties would have exercised on each other in future London Underground tenders. The evidence shows that Siemens is at least as strong as Thales against each of the assessed competition parameters, and stronger than Hitachi. Alstom, although it has not successfully delivered a CBTC signalling project on the London Underground, is a strong global CBTC supplier with considerable experience and technical capabilities. Siemens, and to a lesser extent Alstom, will likely be strong competitors for future

[1055] HRL0004699, page 9.

London Underground tenders and exercise a strong competitive constraint on the Parties.

10.342 Other CBTC suppliers such as Stadler and Mitsubishi have only recently developed or are developing the full functionality for their CBTC technologies and are significantly further behind than the Parties. These suppliers also have limited track record or experience in undertaking brownfield projects and therefore are likely to exercise only a weak or very weak constraint on the Parties.

10.343 Overall, our provisional view is that, taking all of the evidence in the round across the set of competitive parameters, the Parties are likely to be close competitors for the supply of CBTC systems on the London Underground. The market is highly concentrated, and the Parties are two of a small number of suppliers that could conceivably bid for future London Underground contracts.[1056] Hitachi's lack of previous experience on the London Underground will mean that it may not be the closest competitor to Thales but would exercise a credible constraint on Thales in the next London Underground tenders.

10.344 We consider that the Merger could lead to adverse effects in the supply of CBTC systems in the UK through higher prices, worse terms, reduction of innovation and/or worse service levels relative to the situation absent the Merger.

Entry and expansion

10.345 We refer to paragraphs 8.431 to 8.433 above, in which we set out the framework for our assessment of entry and expansion, as outlined in the CMA's Merger Assessment Guidelines.

10.346 We assess below whether entry and expansion is timely, likely, and sufficient to prevent an SLC from arising in relation to the supply of CBTC systems in the UK.[1057]

Parties' views

10.347 The Parties submitted that there are a range of competitors, such as CAF, Stadler, as well as potential competitors CRSC and CRRC that would be able to enter outside of London in the future. The Parties also submitted that

[1056] CMA129, paragraph 4.10.
[1057] CMA129, paragraph 8.30.

smaller UK metro systems do not have the same barriers to entry as the London Underground.[1058]

Our assessment

10.348 In the competition assessment above, we considered the possible constraint on the Merged Entity arising from entry or expansion which would have occurred irrespective of the Merger.[1059] The evidence set out in the competitive assessment indicates that the entry barriers in the CBTC market are high, due to the considerable time and cost associated with developing a CBTC solution (eg [✂][1060] and [✂][1061]) and, [✂].[1062] These entry barriers are exacerbated for more complex metro systems, like the London Underground, due to the additional requirement of references that display similarly complex characteristics (see section above *Incumbency on the London Underground*). The evidence considered in our competition assessment does not indicate that entry by CAF, Stadler, Mitsubishi, Nippon Signal, and CRSC in the supply of CBTC systems in the UK would be timely, likely, and sufficient to prevent an SLC from arising. While these potential entrants may build their experience by winning smaller CBTC projects over the next few years, it is likely that the Parties, Siemens and Alstom would also continue to build on their already strong portfolio of suitable references for the London Underground, and further increase entry barriers for the London Underground.

10.349 We also note that we have not received evidence indicating that entry or expansion is likely to occur as a result of the Merger. The evidence we gathered from third parties also does not support that any firms, including Mitsubishi, CAF, Stadler, would have the necessary capabilities or intention to enter or expand in the supply of CBTC systems in the UK (see paragraph 10.61 and 10.252 to 10.256) as a result of the Merger in a manner that would be timely, likely and sufficient to prevent the SLCs identified.

10.350 We, therefore, do not consider that entry of other CBTC suppliers will be timely, likely or sufficient to offset the provisional SLC arising in the supply of CBTC systems in the UK as a result of this Merger.

[1058] Response to issues letter, paragraph 11.22.
[1059] CMA129, paragraph 4.16.
[1060] [✂]
[1061] [✂].
[1062] Stadler told us that it does not have the required experience to compete for the London Underground based on supplying the Basel contract, and that it would require different references to be able to compete for the London Underground (Stadler call transcript, 23 February 2023, page 17).

Provisional conclusion

10.351 For the reasons set out in this chapter, our provisional conclusion is that the Merger is likely to result in a SLC in the supply of CBTC systems in the UK.

11. Countervailing factors: efficiencies

Introduction

11.1 The CMA's MAGs state that, in some instances, there may be countervailing factors that prevent or mitigate any SLC arising from a merger.[1063]

11.2 There are two main ways in which this could happen:

(a) **Merger efficiencies**: rivalry-enhancing efficiencies – that is, efficiencies that change the incentives of the merger firms and induce them to act as stronger competitors to their rivals – may prevent an SLC by offsetting any anticompetitive effects of a merger.[1064]

(b) **Entry and expansion**: the effect of a merger may be mitigated if effective entry and/or expansion by third parties occurs in reaction to the effects of a merger (eg a price rise).[1065]

11.3 We addressed entry and expansion as a countervailing factor in the respective chapters on the competitive effects of the Merger (see paragraphs 8.431 to 8.447 in relation to the supply of digital mainline signalling systems in GB and paragraphs 10.345 to 10.350 in relation to the supply of CBTC systems in the UK.

11.4 In this chapter, we consider merger efficiencies as a countervailing factor in relation to the SLCs that we have provisionally found in the supply of digital mainline signalling systems in GB and in the supply CBTC systems in the UK.

Merger efficiencies

Framework for assessment

11.5 Efficiencies arising from a merger can enhance rivalry with the result that a merger does not give rise to an SLC. In order for us to take efficiencies into account, efficiencies must:

(a) enhance rivalry in the supply of those products where an SLC may otherwise arise;

(b) be timely, likely and sufficient to prevent an SLC from arising;

[1063] CMA129, paragraph 8.1.
[1064] CMA129, paragraphs 8.3-8.4.
[1065] CMA129, paragraph 8.28.

(c) be merger-specific; and

(d) benefit customers in the UK.[1066]

11.6 The MAGs make it clear that merger firms who wish to make efficiency claims are encouraged to provide verifiable evidence to support their claims in line with the CMA's framework.[1067] The MAGs note that it is for the merger firms to demonstrate that the merger will result in efficiencies.[1068]

11.7 The Parties submitted that the Merger would give rise to a range of rivalry-enhancing efficiencies. The Parties' arguments can be categorised as follows:

(a) efficiencies that apply in digital mainline signalling;

(b) efficiencies that apply in CBTC systems; and

(c) overarching efficiencies that apply to both digital mainline signalling and CBTC systems.

11.8 In the following sections, we set out the Parties' submissions in detail and assess the evidence provided in support of rivalry-enhancing efficiencies. In doing so, we follow the structure outlined in paragraph 11.7 above.

Digital mainline signalling

Parties' submissions

11.9 The Parties submitted that the combined skills, knowledge, resources and experience of Hitachi and Thales would create a stronger competitor to Siemens and Alstom globally and in the UK.[1069]

11.10 The Parties told us that the merged entity would offer a broader portfolio of products and would benefit from a stronger combined supply chain, project portfolio and commercial infrastructure.[1070] In the UK specifically, the Parties told us that the merged entity would be able to compete more credibly for the digital element of the TCSF, and in subsequent mini-competitions.[1071]

11.11 The Parties told us that, [✂], the merged entity would be a stronger competitor than either Party individually, as it would be able to 'draw on the

---

[1066] CMA129, paragraph 8.8.
[1067] CMA129, paragraph 8.7.
[1068] CMA129, paragraph 8.15.
[1069] Parties' submission on the benefits of the merger, paragraphs 1.1-1.2.
[1070] Parties' submission on the benefits of the merger, paragraph 1.3.
[1071] Parties' response to AIS and working papers, paragraphs 7.3-7.4.

best skills, knowledge and experiences of both Parties'.[1072] The Parties submitted that as a consequence 'the merged entity will be better placed than Hitachi alone to bid effectively against Siemens and Alstom'.[1073]

11.12 The Parties told us that any increased tension in competing for the top two positions within the TCSF would have a 'very significant, positive effect' on competition, for two reasons:[1074]

(a) First, the incumbents (Siemens and Alstom) would face increased uncertainty in bidding against the merged entity and this should cause them to bid more competitively, resulting in better value for money for Network Rail. The Parties noted the ORR market study which found that the cost of signalling had increased between CP4 and CP5 and told us that an increase in competitive pressure on Siemens and Alstom would make these higher prices harder to sustain.[1075]

(b) Second, as the TCSF guaranteed more work for higher-placed bidders, the Parties told us that 'rivalry for larger slots is worth more (in terms of pro-competitive effects) than any hypothesised reduced rivalry for smaller slots'.[1076] The Parties submitted that it was 'hard to model such increased rivalry explicitly' but that 'neck-and-neck competition between the suppliers that will end up second and third [was] a realistic possibility'. The Parties told us that this same competitive tension would also increase pressure for the first place slot and in respect of mini-competitions.[1077]

11.13 As to specific factors which would make the merged entity a stronger competitor for the TCSF, the Parties submitted that the merged entity would have greater UK-based resources, as it would benefit from the addition of Thales' UK employees.[1078]

11.14 The Parties told us that, to the extent Thales' urban signalling employees agreed, [✂].[1079] We were told that [✂][✂][✂].[1080] The Parties added that, [✂].[1081]

[1072] Parties' submission on the benefits of the merger, paragraph 2.11 and Parties' response to AIS and working papers, paragraph 7.4.
[1073] Submission on competitive effects, paragraph 3.52.
[1074] Submission on competitive effects, paragraphs 3.53-3.57. See also Parties' submission on the benefits of the merger, paragraph 2.12 and Parties' response to AIS and working papers, paragraph 7.6.
[1075] Submission on competitive effects, paragraphs 3.53-3.55.
[1076] Submission on competitive effects, paragraph 3.56.
[1077] Submission on competitive effects, paragraphs 3.56-3.57 and Parties' submission on the benefits of the merger, paragraph 2.13.
[1078] Parties' submission on the benefits of the merger, paragraph 2.4.
[1079] Parties' submission on the benefits of the merger, paragraphs 2.6-2.8.
[1080] Parties' submission on the benefits of the merger, paragraph 2.7. [✂]. Parties' submission on the benefits of the merger, paragraph 2.8.
[1081] Parties' submission on the benefits of the merger, paragraph 2.9.

11.15 The Parties told us that this increased local presence in the UK would result in reduced costs (as the merged entity would be less reliant on support from non-UK teams) and greater levels of customer service and improved project management in the UK.[1082] The Parties told us this would allow the merged entity to [✂] and to provide more competitive pricing and services.[1083]

Third party submissions

11.16 In addition to the Parties, ORR, Network Rail and three competitors provided views relevant to our assessment of potential rivalry-enhancing effects of the Merger in mainline signalling.

ORR's views

11.17 ORR made a voluntary submission on key points for consideration as part of our investigation. In its submission, ORR provided views on the degree of complementarity between the Parties' offerings.

11.18 In terms of the Parties' products, ORR submitted that it was not aware of any strong evidence of product-related synergies arising from the Merger as:

(a) The Parties were likely to be self-sufficient across all key signalling products at the European level.

(b) While it may be the case that Hitachi's historic success on the GB mainline gives it an advantage over Thales when bidding for UK mainline signalling work, it is not clear that the merged entity would be stronger than a standalone Hitachi from this perspective.

(c) The cross-selling of non-bottleneck products[1084] does not have significant implications for the impact of the Merger and ORR is not aware of any historic instances where access to these products has been a key driver of signalling suppliers' project wins or losses.[1085]

11.19 In addition to assessing potential complementarity in the Parties' product range, ORR considered the skills and competencies of the Parties. It reviewed Network Rail's scoring of the Parties' bids for previous CP framework contracts to inform an understanding of the potential effect of combining the Parties' expertise.

[1082] Parties' submission on the benefits of the merger, paragraph 2.10.
[1083] Parties' submission on the benefits of the merger, paragraph 1.3 and Parties' response to AIS and working papers, paragraph 7.3.
[1084] Such as Hitachi's [✂] for GB mainline products.
[1085] ORR phase 2 submission, paragraphs 39-42.

11.20 ORR explained that it had carried out a 'simple backward-looking analysis' in which it awarded the higher of each of the Parties' scores across any price and non-price criterion [✂]. ORR found that [✂].[1086]

11.21 We note that in its November 2022 response to our invitation to comment, ORR similarly stated that:

(a) based on its [✂]; and

(b) based on its review of Network's Rail's CP6 framework scoring, ORR found [✂].[1087]

11.22 Notwithstanding the above, ORR also submitted that, given the evidence from its review of the different scores obtained by the Parties in previous CP tenders (which reduced the margin of loss to Siemens and Alstom), there was a 'plausible suggestion of some degree of complementarity' in the Parties' respective competencies. It further submitted that, while further consideration was needed, it may be the case that the merged entity 'will be in a stronger position to compete against Siemens and Alstom for some TCSF volumes than would be the case for either Hitachi or Thales individually', with the 'clearest example of such volumes' being 'the second largest framework lot'.[1088]

Network Rail's views

11.23 Network Rail did not make a specific submission on the benefits of the Merger but as noted in paragraph 8.393, Network Rail [✂].[1089]

11.24 We refer to our considerations around Network Rail's views (see paragraphs 8.399 and 8.400) and note that Network Rail had no access to data relating to potential synergies and/or cost reductions resulting from the Merger, nor information to assess whether any of these synergies are merger-specific.

Other competitors' views

11.25 We also noted in paragraph 8.396 that a number of competitors submitted that the Merger would benefit the delivery of digital mainline signalling in the UK or that the Merger would result in synergies. Specifically:

[1086] ORR phase 2 submission, paragraphs 43-47.
[1087] ORR response to invitation to comment, page 11.
[1088] ORR phase 2 submission, paragraph 55.
[1089] Network Rail questionnaire response, question 34.

(a) VolkerRail told us that combining the Parties' respective technologies would 'make both companies stronger… and enable them to compete more directly with… Siemens and Alstom'.[1090]

(b) Stadler told us that the Parties 'are likely to benefit from synergies' and that the merged entity would 'benefit from a stronger position combining conventional and digital solutions'.[1091]

(c) Mipro submitted that the merged entity would be a closer competitor to Siemens and Alstom and that competition for 'major tenders' could intensify.[1092]

11.26 Overall, third parties did not comment beyond the above statements regarding the timeliness, likelihood or sufficiency of any Merger benefits offsetting an SLC or of benefits to UK customers of the Merger.

Our assessment

11.27 In this section, we consider the Parties' claimed rivalry-enhancing efficiencies in relation to the factors set out in paragraph 11.5.[1093]

Merger specificity

11.28 In line with our guidance, we consider here whether the claimed efficiency is reliant on the Merger, or whether it would be brought about by other means.[1094] We also consider whether the Merged Entity has a greater incentive to achieve the same improvements absent the Merger than as a result of the Merger.[1095]

11.29 In Chapter 8, we found that the Parties are established digital mainline signalling providers and have each independently developed a full portfolio of technical solutions and have each gained considerable management experience and delivery capability over time. ORR expressed scepticism about the extent of complementarity between the Parties' product offerings[1096] and the Parties themselves have described rivalry-enhancing efficiencies from the Merger in very general terms only. The Parties did not provide specific details nor supporting evidence as to the types of product improvements that could be made as a result of the Merger, the timing of such improvements, the

[1090] VolkerRail's response to questionnaire, Q27.
[1091] Stadler's response to questionnaire, Q34.
[1092] Mipro's submission of 16 January 2023.
[1093] See also CMA129, paragraph 8.8.
[1094] CMA129, paragraph 8.16.
[1095] CMA129, paragraph 8.17.
[1096] See paragraphs 11.18 to 11.21.

likelihood of their success, nor the significance of the benefits to be expected. We therefore consider that the scope for complementarity and product-related synergies between the Parties as a result of the Merger is potentially limited.

11.30 The Parties' submissions on the creation of a stronger competitor in the UK (and specifically a stronger competitor to Siemens and Alstom for the TCSF) focus on the UK-based resources of the Merged Entity.

11.31 While both Parties may have a limited presence in the UK in mainline signalling and certain gaps in terms of local resources (see paragraph 8.412), it is not clear that the Merger would fill these gaps in a timely manner (see paragraph 11.37). In any event, we consider that the Parties would be able to fill these gaps through means other than the Merger; for example by partnering with a UK-based integrator. Accordingly, any efficiencies arising from an increase in UK-based resources are not merger-specific.

11.32 Further, we consider that the increased size and scale of the Merged Entity will not of itself lead to an increased incentive to innovate and to invest in developing new technology relevant for the competitiveness of the Merged Entity in the UK. This is particularly the case when competition between the Parties is reduced, and we have provisionally found that the remaining constraints post-Merger are not likely to be sufficient to offset the loss brought about by the Merger.[1097]

11.33 For these reasons, we consider that the Parties have not provided evidence that the claimed efficiencies are merger-specific, nor that the Merged Entity has a greater incentive to innovate and invest to compete against Siemens and Alstom than the Parties individually, absent the Merger.

Timeliness, likelihood and sufficiency

11.34 While we consider that the claimed efficiencies are not merger-specific, we nevertheless assessed the Parties' submissions in terms of timeliness, likelihood and sufficiency for completeness.

11.35 Our guidance includes that we will assess whether claimed efficiencies are to be realised within the same timeframe as the rest of our analysis and that efficiencies must be likely to be realised (ie that verifiable evidence is needed in support of efficiency claims), as well as sufficient to prevent an SLC (the greater the adverse effect, the greater the efficiencies must be).[1098]

[1097] See Chapter 8.
[1098] CMA129, paragraphs 8.12-8.14.

11.36 As to the matter of timeliness, the Parties have submitted that the Merged Entity would be better placed to bid against Siemens and Alstom for the top two positions within the TCSF. However, we note that internal documents prepared in anticipation of the Merger, in which the Parties planned for the carve out of Thales from Thales Group and its integration within Hitachi, stated that [✂].[1099]

11.37 [✂].[1100] It is therefore unclear whether and when any significant competitive improvements from combining the Parties' capabilities could be expected following the closing of the Merger. While there may be some benefits that could be achieved in relation to TCSF mini-competitions, the extent to which any purported benefits could provide a basis on which to compete more effectively for the guaranteed workbank within the TCSF (for which the ITT is expected to be initiated in July 2023, with responses due in September 2023) is more uncertain.

11.38 In this context, we note that Thales appeared to acknowledge uncertainties as to the impact of the Merger on competition for the TCSF at its main party hearing, stating that the Merger [✂].[1101]

11.39 We also consider there to be material uncertainties regarding the Parties' submissions that the Merged Entity would [✂]. The Parties themselves have acknowledged [✂].[1102] As such, we consider there to be considerable uncertainty as to whether the addition of Thales' employees to Hitachi's UK-based workforce is likely to result in rivalry-enhancing benefits in digital mainline signalling.

11.40 The Parties' submissions did not include verifiable evidence of the claimed efficiencies, which prevents a proper analysis of their timeliness, likelihood or sufficiency.

11.41 For these reasons, we consider that the Parties have not provided sufficient evidence to show that the criteria in paragraph 11.5 are met.

Provisional conclusion

11.42 Taking into account the available evidence and the considerations set out above, our provisional view is that the Parties have not demonstrated that merger-specific efficiencies (which would enable the Merged Entity to

---

[1099] Annex T.Q9.034, slide 44.
[1100] Annex T.Q9.034, slide 71.
[1101] Thales, Main Party Hearing transcript, 2 May 2023, page 81.
[1102] Specifically, the Parties told us that CBTC projects may be viewed [✂]. Parties' submission on the benefits of the merger, page 3, footnote 5.

compete more strongly with Siemens and Alstom) are likely to arise in a timely manner and be sufficient to prevent or mitigate the SLC we have provisionally found in the supply of digital mainline signalling in the UK, or benefit UK consumers.

CBTC systems

Parties' submissions

11.43 The Parties told us that Hitachi is a vertically integrated supplier of rolling stock and CBTC solutions but [✂].[1103]

11.44 In contrast, the Parties told us that Thales had experience of delivering complex brownfield CBTC signalling solutions, including in London, but is not vertically integrated.[1104]

11.45 The Parties submitted that the main efficiency of the Merger for urban signalling was the creation of a vertically integrated entity better able to compete with Siemens and Alstom ie the only two vertically integrated suppliers able to deliver complex brownfield CBTC signalling projects together with rolling stock in Europe and the UK.[1105] The Parties acknowledged this was not relevant in the UK as TfL has a practice of tendering separately for rolling stock and signalling.[1106] However, elsewhere in the world, the Merged Entity would be able to compete at a similar level to Siemens and Alstom and increase competition for the benefit of urban rail customers.[1107]

Third-party submissions

11.46 In addition to the Parties, TfL also commented on the [✂].

11.47 In paragraph 10.314, we noted that TfL stated that it [✂].[1108]

11.48 We note that TfL had no access to data relating to potential synergies and/or cost reductions resulting from the Merger, nor information to assess whether any of these synergies are merger-specific.

[1103] Parties' submission on the benefits of the merger, paragraph 2.16.
[1104] Parties' submission on the benefits of the merger, paragraph 2.16.
[1105] Parties' submission on the benefits of the merger, paragraph 2.17.
[1106] Parties' submission on the benefits of the merger, paragraph 2.17
[1107] Parties' submission on the benefits of the merger, paragraph 2.17.
[1108] TfL call note, 9 August 2022, paragraph 29.

Our assessment

11.49 In this section, we consider the Parties' claimed rivalry-enhancing efficiencies in CBTC systems by reference to those factors set out in paragraph 11.5, in line with our published guidance. We note that the efficiency claimed by the Parties relates to the creation of a vertically integrated entity better able to compete in tenders for bundled complex brownfield signalling projects and rolling stock.

11.50 For completeness, we note that in paragraphs 10.335 to 10.340, we have provisionally found that Hitachi is likely to have the relevant management experience and technical expertise to undertake complex brownfield projects and to be a credible competitor for future London Underground contracts.

11.51 Our guidance states that merger efficiencies must benefit customers in the UK.[1109] As the Parties recognised, TfL has an established practice of tendering separately for rolling stock and signalling. Given that future CBTC tenders in the UK are expected to be in London,[1110] benefits to UK customers from bringing together Hitachi's rolling stock business and Thales' CBTC business are likely to be, at best, very limited and considerably less significant in magnitude than the adverse effects in the UK arising from the Merger.

Provisional conclusion

11.52 For the reasons above, we consider that it is not likely that any efficiencies arising from the combination of the Parties' urban signalling and rolling stock operations will be of sufficient magnitude and benefit to UK consumers to prevent the SLC we have provisionally found in the supply of CBTC systems in the UK.

Overarching efficiency submissions

Parties' submissions

11.53 In addition to the above, the Parties' submissions included a range of efficiency claims which are applicable to both digital mainline signalling and CBTC systems.

11.54 Specifically, the Parties told us that:

[1109] CMA129, page 68.
[1110] See paragraphs 9.44 to 9.49.

(a) As a larger rail-focused company, the Merged Entity would be incentivised to:

(i) compete in tenders that neither Party would otherwise have considered (as it would have a higher confidence of winning);[1111] and

(ii) invest more in R&D, in order to compete more strongly with Siemens and Alstom at the global level.[1112]

(b) [✂] ([✂]) would result in reduced costs for the merged entity, which in turn would lead to better terms for customers, including in the UK.[1113]

11.55 In addition, the Parties also told us that the Merged Entity would be able to deliver a wider range of digital solutions for the rail sector, including [✂].[1114] The Parties told us that demand for MaaS – which would enable passenger journeys to be managed end-to-end through digital technology – [✂].[1115]

11.56 At its main party hearing, Hitachi told us that it had piloted MaaS-related ticketing and crowd management technology in Genoa [✂]. Hitachi submitted that [✂] [✂].[1116]

11.57 In the following section, we set out our assessment of the Parties' claimed efficiencies as outlined above.

Our assessment

11.58 The Parties' submissions include that the merged entity will be incentivised to compete in tenders that neither Party would contest individually and to invest more in R&D.

11.59 We first note that the Parties' claimed efficiency regarding bidding incentives appears to be predicated on the assumption that [✂]. Indeed the Parties told us that its submissions on this point were 'particularly relevant for the UK', given [✂] and the positions of Siemens and Alstom in the UK market.[1117]

11.60 In our competitive assessment (Chapter 8 and Chapter 10 above), however, we found that:

[1111] Parties' submission on the benefits of the merger, paragraphs 3.1-3.5.
[1112] Parties' submission on the benefits of the merger, paragraphs 3.6-3.8.
[1113] Parties' submission on the benefits of the merger, paragraphs 3.1-3.8 and 5.1-5.5.
[1114] Parties' submission on the benefits of the merger, paragraph 4.2.
[1115] Parties' submission on the benefits of the merger, paragraphs 4.1-4.4.
[1116] Hitachi, Main Party Hearing transcript, 26 April 2023, page 78.
[1117] Parties' submission on the benefits of the merger, paragraph 3.5.

(a) in relation to the supply of digital mainline signalling, the Parties (individually) have strong incentives to compete for digital mainline signalling projects in the UK; and

(b) in relation to the supply of CBTCs systems, Thales is already a strong supplier of CBTC in the UK and Hitachi is well placed to compete for future CBTC projects in London.

11.61 The SLCs that we have provisionally identified arise precisely because the Parties are expected to be credible competitors for major digital mainline and CBTC projects in the UK. We do not consider, therefore, that the Merged Entity is likely to compete in UK tenders that the Parties would not be able to credibly contest individually. Accordingly, our view is that the Merger could lead to adverse effects on competition (in both digital mainline signalling and CBTC systems in the UK), rather than producing rivalry-enhancing bidding incentives.

11.62 As to the incentives of the Merged Entity to invest in R&D, we explained in paragraph 11.32 above that the increased size and scale of the merged entity will not necessarily lead to an increased incentive to innovate and to invest in developing new technology relevant to its competitiveness in the UK. This is particularly the case when competition between the Parties is reduced, and we have found that the remaining constraints post-Merger are not likely to be sufficient to offset the loss brought about by the Merger. Further, the Parties have provided no verifiable evidence of the type and scale of product improvements that might be pursued as a result of the Merger. On this basis, we consider that the Parties' claimed efficiencies from greater R&D investment are not supported by sufficient evidence to satisfy the criteria set out in our guidance.

11.63 Regarding the Parties' submissions on procurement and supply chain efficiencies, we note that the Parties' submissions set out various cost reductions including in relation to: [✂].[1118] As set out in our guidance, we generally consider reductions in the merger firms' marginal or variable costs as being more likely to result in an incentive to reduce prices (or make short-run improvements in quality) than reductions in fixed costs.[1119] We also note that ORR stated that in-sourcing of products is not likely to have a significant impact on the merged entity, nor has ORR identified any historic instances where access to such products has been a key driver of the competitiveness of a signalling supplier. Given this, and in the absence of verifiable supporting evidence from the Parties, we do not consider that efficiencies deriving from

[1118] Parties, Submission on the benefits of the merger, paragraphs 5.2-5.3.
[1119] CMA129, paragraph 8.10.

procurement and supply chain synergies are likely to be of sufficient magnitude and benefit to UK consumers to satisfy the criteria outlined in paragraph 11.5.

11.64 Finally, as to the Parties' submissions regarding the development of MaaS, we note that Hitachi has described MaaS as a [✂].[1120] Given these uncertainties, it remains unclear how any efficiencies may be realised as a result of combining the digital capabilities of Hitachi and Thales and how great (or otherwise) the scale of any such benefits might be. Moreover, we note that Hitachi has been developing its MaaS technology for a number of years, has publicly discussed a plan to accelerate digitisation within the rail sector (independent of the Merger)[1121] and appears to consider that Hitachi Group capabilities can be leveraged in designing MaaS solutions.[1122] It also recognised at its main party hearing that [✂].[1123] Hitachi is not therefore reliant on the Merger to progress development of its MaaS solutions. For these reasons, we consider that the Parties' claimed efficiencies in this regard do not meet the criteria for assessing efficiencies outlined in our guidance.

Provisional conclusion

11.65 Taking into account the available evidence and the considerations set out above, our provisional view is that merger efficiencies claimed by the Parties are not likely to prevent or mitigate the SLCs that we have provisionally found in the supply of digital mainline signalling and CBTC systems in the UK.

[1120] Hitachi, Main Party Hearing transcript, 26 April 2023, pages 76-77.
[1121] Hitachi investor day presentation 2022: 'Green Energy and Mobility Sector', slide 32.
[1122] Hitachi's website: Rail Innovation, accessed 24 May 2023, states: 'Through the analysis of customer experience, we are studying and designing Mobility as a Service (MaaS) solutions to support the expansion of the passenger experience market, again taking advantage of Hitachi group capabilities'.
[1123] Hitachi, Main Party Hearing transcript, 26 April 2023, page 80.

12. Provisional conclusions

12.1 As a result of our assessment, we have provisionally concluded that the anticipated acquisition of Thales by Hitachi constitutes arrangements in progress or in contemplation, which if carried into effect, will result in creation of RMS.

12.2 We have also provisionally concluded that the creation of that situation may be expected to result in SLC in the supply of digital mainline signalling systems in the GB and in the supply of CBTC systems in the UK, in each case due to horizontal unilateral effects.