LMR Network Services Market Investigation

Profitability modelling and results

6 May 2022

This is one of a series of consultative working papers which will be published during the course of the investigation. This paper should be read alongside the issues statement and the other working papers which will be prepared in due course. These papers do not form the inquiry group's provisional findings. The group is carrying forward its information-gathering and analysis work and will proceed to prepare its provisional findings, which are currently scheduled for publication in June, taking into consideration responses to the consultation on the issues statement and the working papers. Parties wishing to comment on this paper should send their comments to MRN@cma.gov.uk by 20 May 2022.

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Introduction

1. This working paper is an update to the working paper published on 13 December 2021 (the **Profitability Methodology Approach Working Paper**) which set out the CMA's approach to the financial and profitability analysis of Airwave Solutions Limited (Airwave Solutions, or the Company).[1]

2. We invited Airwave Solutions and other interested parties to comment, providing supporting evidence and reasoning as appropriate, on the approach we set out in the Profitability Methodology Approach Working Paper.

3. As we explained in the Profitability Methodology Approach Working Paper, the information obtained from our profitability analysis will be used across two main areas:

   (a) Diagnosis: as part of our assessment of market outcomes which can help us determine whether there are any adverse effects on competition (AEC) in the market for the supply of land mobile radio (LMR) network services for public safety in Great Britain; and

   (b) detriment: as part of our assessment of the degree and nature of any detrimental effect on customers so far as it has resulted from, or may be expected to result from, any AECs.

4. In this working paper, we set out our updated approach to, and the preliminary results of, our profitability analysis of Airwave Solutions, based on the responses we received and further financial and other information obtained from Motorola.

Scope of our analysis

Business activities

5. LMR network services for public safety is defined in our Terms of Reference as follows:

> services provided through a secure private communications network, based on land mobile radio technology, that is used by personnel involved in public safety (namely the police, emergency

[1] Profitability Methodology Approach Working Paper, 13 December 2021

and fire services, and those who need to communicate with such services) when in the field.[2]

and ancillary services is defined in our Terms of Reference as follows:

> services that are interlinked with the provision of LMR network services for public safety and for which customers have limited alternative suppliers including for example services such as those provided at the testing facilities for radio terminals used by LMR network public safety users.

6. The only supplier of these services in Great Britain is Airwave Solutions, and thus our profitability assessment focusses on this company only.

7. Airwave Solutions' revenue streams comprise revenue from police contracts, the ambulance contract, and the Firelink contract, as well as revenue from contracts with non-emergency services users (for example the Highways Agency, RSPCA, DEFRA). Our starting point was Airwave Solutions' business activities in Great Britain, and we initially assumed that all revenue streams were linked to the provision of LMR network services for public safety (including all ancillary services).

8. Motorola told us[3] that we were correct to focus on Airwave Solutions' business activity, and that some parts of Airwave Solutions' activities went beyond the provision of LMR network services; specifically, the two software business lines (Pronto and CCCRS) were not integral to the provision of LMR; they were run separately by a different leadership team and their costs and revenues were also tracked separately. Motorola told us that it had already made adjustments to exclude these costs and revenues from the internal rate of return (IRR) model submitted to us in August 2021 (the August Model). Motorola told us that similarly, revenues associated with the Department of Health Bundle 2 contract (Ambulance Bundle 2) should be excluded as the contract covered the provision of control room services and terminals (including terminal support).[4]

9. We set out the adjustments we made to revenues and costs for those activities not relating to the provision of Airwave Solutions' network services from paragraph 43.

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[2] In this working paper, we refer to the secure private communications network, based on land mobile radio technology as the "Airwave Network", which can be distinguished from the ancillary and other services that may be included within the operations of Airwave Solutions which do not form an integral part of the Airwave network and which have been contracted for separately.
[3] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, section 2.
[4] [✂]

Time period under consideration

10. We aim to examine profitability over a time period that is sufficiently long to provide a representative picture of profitability and that is not unduly distorted by unusual macroeconomic conditions or one-off events. Our Guidelines recognise that the appropriate time period may vary depending on the specific market.[5]

11. We stated in the Profitability Methodology Approach Working Paper that we proposed to assess the profitability of Airwave Solutions over the period from 2000 to 2026,[6] as Motorola suggested, and that we also proposed to divide that period into two separate time periods: 2000 to 2019 and 2020 to 2026. We stated that this would allow us to understand the levels of profitability resulting from the original negotiation of the PFI Agreement and the subsequent negotiations to extend the Airwave Network beyond the original period. In interpreting the analysis, we stated that we would look at returns in the wider commercial context, that is, the circumstances of the original and subsequent negotiations.

12. Motorola disagreed[7] with the view that the various 'extensions' were not 'integral to the original PFI agreement'; the option for the Home Office of requiring continued provision of the Airwave Network existed only because of the investments made under the PFI Agreement, and the term 'extension' was itself a contractual misnomer. Motorola also stated that our analysis proceeded from the incorrect basis that the periods were split from a contractual standpoint whereas there was no such 'break'; the Home Office had an intention to shut down the Airwave Network at the end of 2019 but that this was never contractually certain and, in the event, the Home Office required the service to be provided for longer on pre-agreed terms.

13. Motorola submitted that it was artificial and not appropriate to split the original PFI contract period (2000-2019) from the extension period to look at profitability. In particular, Motorola submitted that:

    (a) the contract was never structured as an initial period of 2000-2019, at which point there was a full re-negotiation for the 'extension' period; any notional 'extension period' (a concept Motorola disagreed with) must have been set in 2016 when Motorola acquired Airwave Solutions;

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[5] CC3 (Revised) paragraph 121.
[6] We noted that a further extension of the Airwave contract(s) may be required if the replacement ESN system were not operational in time for all customers to transition away from Airwave by the end of 2026.
[7] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraph 14

(b) the terms on which the Home Office would require continued provision of service up to a national shut-down date (NSD) were fully agreed in 2016 when Motorola acquired Airwave Solutions; at this point the Home Office did not specify an end date and so Motorola took on the entire risk associated with the uncertain duration over which Motorola would be required to provide the Airwave Network, including making all requisite investments to ensure that the Airwave Network remained fit for purpose;[8]

(c) in economic or competition terms 2019 had no economic or competition relevance;

(d) Motorola never had the ability to walk away in 2019;

(e) Motorola stated[9] that "well-advised parties had agreed contractual terms with reference to an agreed fair internal rate of return (IRR) *for the life of Airwave,* [Motorola emphasis] whatever that would be."

(f) Airwave Solutions was a project company whose economic life was tied to the period for which the Airwave Network was required; the investments made by Airwave Solutions and the costs incurred over this period must be set against the revenues earned.

14. Regarding any potential extension beyond 2026, [✂]; for this reason, Motorola told us that it considered it unnecessary to assess any longer duration [✂], subject to any further changes requested by the Home Office. Motorola also stated that further changes created additional risks for Motorola that would need to be taken into account[10].

15. The Home Office told us[11] that it considered it key to assess the profitability of the extension period (from 2020) to understand the extent to which Motorola had had a position of unilateral market power since its acquisition of Airwave Solutions in 2016. This was because the contract terms of this period reflected the outcome of negotiations since Motorola completed the acquisition of Airwave Solutions and therefore inform as to whether, from this date, it held a position of unilateral market power: in other words, if Airwave Solutions were earning excess profits over this extension period, it could reflect its market power in contract negotiations for the extension.

16. We considered Motorola's and the Home Office's submissions. We did not agree with Motorola's statement that it was inappropriate to assess the

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[8] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraph 17
[9] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraph 3
[10] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022 paragraph 21
[11] Home Office's response submission to the CMA's profitability methodology working paper, 11 January 2022, paragraph 2

profitability of Airwave Solutions over two separate periods rather than simply assessing profitability over the 2000 to 2026 period as a whole.

17. We noted the following:

(a) There was an original period over which Airwave Solutions contracted with the various emergency services, which did not have a single end date but instead a 'ragged edge' of contract expiries between 2016 and early 2020.[12]

(b) The original PFI Agreement was priced and negotiated on the premise that the Airwave Network would be terminated around the end of 2019 or early 2020 and the Home Office's original intention was, as Motorola acknowledged, to shut down the Airwave Network at the end of 2019. The economic model in relation to the Airwave Network[13] (the **PFI Model**) only covered the period 2000 to 2019/2020, with assets due to be almost fully depreciated by the end of 2019/2020.[14]

(c) The 2002 NAO report and subsequent PAC hearings show that the expectation was that the contract would end by 2019: it was expected that the network would be operating for 15 years, with two years for decommissioning at the end.

(d) In 2016, towards the end of the original period, as the contract expiries with the various emergency services were approaching, Airwave Solutions and the Home Office negotiated terms on which those contracts would be extended beyond their original expiry dates.

(e) The PFI Agreement makes provision for the transfer of assets to the Authority (the Home Office) or an alternative service provider at the end of the contract (with Airwave Solutions being required under the PFI Agreement to prepare a Service Transfer Plan) at fair market value; and under the Public Contracts Regulations 2015, the underlying assumption

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[12] [✂].

[13] A financial model was created by British Telecommunications plc which set out the anticipated cashflows in relation to the Airwave Network at the inception of the PFI agreement. Motorola told us that a copy of the model was originally placed in escrow with a third party (Charterhouse) and was then transferred the law firm Linklaters in late 2000 / early 2001. In 2009, Airwave Solutions approached Linklaters for sight of the financial [✂]. Airwave Solutions therefore asked the National Policing Improvement Agency (NPIA) - then a Non Departmental Public Body of the Home Office - to share the financial model. Although a copy of the financial model was held in escrow, the NPIA also had custody of the model. On 11 December 2009, [✂] of the NPIA sent a copy of the financial model by email to Airwave, with a copy to [✂], also then of the NPIA and now of the Home Office's Airwave commercial team. Motorola told us that it had no reason to believe that the model provided to the CMA was in any way different to the copy placed in escrow. [✂].

[14] [✂] total forecast capex.

is that such a contract would be competed at the end of the term, unless exemptions applied (ie not simply extended as a matter of course).

18. We consider that Motorola's argument that Airwave Solutions could not 'walk away' from negotiations in 2019 potentially reflects a misunderstanding of the purpose of the profitability analysis. One concern being considered by the CMA is that prices – including those agreed in the 2016 negotiations – are the outcome of a negotiations process in which competition may have been restricted, distorted or prevented by features of the market. In that context, where the concern is that the Home Office was unable to negotiate prices down below those potentially supernormal levels, the relevant question is not whether Airwave Solutions could 'walk away' from the existing contract. The relevant question is whether Airwave Solutions could 'walk away' from negotiations by refusing to negotiate on prices below the level agreed in 2016, that level having been agreed in a negotiation that may have been affected by the features of the market currently under investigation.

19. We therefore considered that any continuation after 2019 was an extension to the original 2000-2019 PFI period, which was not factored into to the original financial model (given that the assets would have been fully paid for by that point and in light of the terms on which Airwave the Home Office/PIOT contracted). Given these circumstances, we considered that separate profitability analyses of the pre- and post-extension time periods may be informative in assessing the competitive conditions in which Airwave Solutions operated over these time periods.

20. The purpose of profitability analysis is to understand outcomes in the market, which may give insight into competitive conditions. In this context, the specific date on which various terms were negotiated is not relevant: our main concern is to identify the time period over which the results of those negotiations can be observed in profitability. Our current view is that this can most reliably be done from 2020 onwards.

21. We are primarily interested in recent and current competitive conditions in the market, rather than those which may have been present more than twenty years ago. A backward-looking profitability analysis for the original 2000-2019 time period does not necessarily provide a good indicator of potential market power and potential to negotiate supernormal prices at the time that the extension was agreed. Similarly, the profitability of the business over the whole 2000 to 2026 period would mix the picture from across the PFI and post-PFI periods and would risk masking the degree of profitability / market power enjoyed post-extension. For these reasons, we consider splits to be informative, dividing our profitability analysis into two separate time periods: 2000 to 2019, and 2020 to 2026, and are focussing on 2020 onwards.

However, as discussed below, we have also considered truncating the analysis as of 2016, ie splitting into a 2000 to 2015 period and a 2016 to 2026 period. This serves to increase the measured profitability in the latter period substantially on both an NPV and an IRR basis.

22. We note that, although [✂], if there is a delay to the beginning of the transition of users from the Airwave Network to ESN or the transition itself takes longer than currently expected by the Home Office, the Airwave Network switch-off date will be likely delayed beyond [✂]. We set out the effect of this on profitability at paragraph 98.

23. Motorola stated that[15] a key challenge when using the truncated IRR methodology was to establish the correct opening and closing values of assets for the specific period under investigation; and that there was a critical need to ensure the correct opening asset value since the notional extension period IRR was extremely sensitive to the change in this opening asset value. We discuss the opening and closing values of assets in the section on our assessment of asset valuation and carry out sensitivity analysis on those values in our profitability assessment (see Annex A).

Approach to profitability analysis

24. We set out our proposed approach to profitability analysis in our Profitability Methodology Approach Working Paper, which is to adopt the (truncated) IRR approach. The IRR is then benchmarked against the weighted average cost of capital (WACC) over the relevant periods of analysis. Our estimate of the WACC is set out in the working paper on the Cost of Capital.

25. Motorola stated[16] that it generally agreed with the use of IRR measures to establish profitability instead of the ROCE approach used by the CMA in its Consultation paper,[17] however it rejected the use of the truncated analysis, which it said was not justified in this case for the reasons set out in the section on time period under consideration.

26. Since the truncated IRR (TIRR) uses cash inflows and outflows relating to operating activities, and the assets at the beginning and end of the relevant periods, a simplifying assumption in carrying out the TIRR analysis is to treat all cashflows as though they happened at a single point in the year, either in the middle or at the end of the year. We note that where cash in and out-flows are distributed fairly evenly across the year, the middle of the year assumption

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[15] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraphs 19 and 20
[16] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraph 22
[17] CMA proposal to make a market investigation reference, 8 July 2021

will not result in any material distortion to the analysis. We invited Airwave Solutions and other interested parties to make submissions as to whether this assumption is reasonable in this case, or, to the extent that cashflows are not evenly distributed, to provide more detailed/granular cashflow data.

27. Motorola told us[18] that it considered the use of data matching the available accounting periods to be entirely appropriate, and that more detailed historical cash flow data was not available.

28. In light of the above, our current view is that the assumption to treat all cashflows as though they happen at a single point in the year is reasonable.

Benchmarking

29. In the Profitability Methodology Approach Working Paper we stated that we consider that broader price or margin benchmarking may provide useful insight into the extent to which Airwave Solutions' prices and/or profits reflect those that one would expect to see in a well-functioning market. We also recognised that price or margin benchmarking may have some limitations, and invited Airwave Solutions and other interested parties to make submissions on whether there were specific price/profit benchmarks from other countries and/or telecoms networks that we should consider and the extent to which these are comparable with the supply of LMR network services (and ancillary services) in Great Britain.

30. Motorola told us[19] that we did not need to carry out such an exercise since there was no reason for the CMA to believe that Airwave Solutions was making excessive profits, when measured against the metric chosen by the parties to the PFI Agreement which itself was recognised as an appropriate measure of profitability.

31. We disagree with Motorola's assertion that there was no reason for the CMA to believe that Airwave Solutions may be making excessive profits[20] and that this was a reason for not needing to carry out such an exercise. However, although we consider that price or margin benchmarking may provide useful insight, we note the difficulties with identifying suitable benchmarks against which to compare Airwave's prices or margins given the highly specific nature of the business.[21] Therefore, our current view is that such benchmarking is unlikely to

[18] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraph 23
[19] Motorola's response to the CMA's Working Paper on Profitability, 10 January 2022, paragraph 41
[20] Analysis contained in paras 1.69-1.85 of Market Investigation Reference Final Report
[21] [✂].

yield robust conclusions and we do not propose to pursue this avenue of inquiry further.

Profitability analysis

Introduction

32. As set out at paragraph 21, we decided to split the profitability analysis into two periods, 2000 to 2019 and 2020 to 2026. This section sets out the detailed inputs and assumptions we used to create two profitability models to analyse profitability.

33. As previously explained in the Profitability Methodology Approach Working Paper both models use a series of discounted cashflows to calculate an IRR and net present value of cashflows (NPV of cashflows). We compare the return on capital with an appropriate estimate of the cost of capital; we also examine whether excess profits, measured as the NPV of cashflows, are present, which are an indicator of limitations in the competitive process.

34. As a cashflow figure for each year for the Airwave Network was not available, we needed to carry out our own calculations and derivations from the financial information provided. We started with financial information, principally profit and loss accounts, provided by Motorola and made adjustments to arrive at economically meaningful measures of profitability for each model.

35. Our starting point for an appropriate measure of profitability was operating profit. We made various adjustments to the line items making up operating profit, which are explained in the section on adjustments.

36. We then made further adjustments to the adjusted profitability figure:

    (a) Firstly, adding back depreciation and amortisation as these are non-cash items, to arrive at a figure for funds generated by operations

    (b) Secondly, taking off capex and making an adjustment for working capital movement[22] in the year

    to arrive at an estimate of cashflows for each year.

[22] Note that the working capital adjustments contained in both models are sourced from the August Model. We noted that the figures in this case were relatively small and so any change required was unlikely to have a material impact on the results of our analysis.

37. We also estimated opening and closing (residual) values of assets, decommissioning costs, and the timing of those cashflows.

38. The cashflows for each year, with assumptions such as inflation and discount factors, are the inputs to the profitability (IRR) model.

39. The profitability models calculate an IRR and NPV of cashflows, and these results are shown at the end of the section for each model.

Profitability model 2020-2026

Sources of financial information

40. This section explains the sources of the financial information included in the profitability model.

41. For 2020, we used the profit and loss account and balance sheet information contained in Airwave Solutions' statutory accounts.[23]

42. For 2021 onwards, we used the financial information contained in a detailed template profit and loss account provided by Motorola, together with detailed schedules on revenues, cost of sales, staffing costs, operating expenses, capex, depreciation, and decommissioning costs. We also collected financial information in various RFIs over the course of the investigation so far, which we also used in our analysis.

Adjustments made to profit and loss information

Scope

43. We needed to make sure that the revenues and costs contained in the starting operating profit figure only related to the provision of Airwave Network services and nothing else. Pronto, CCCRS, Ambulance Bundle 2 (AB2) and interworking, although contained in Airwave Solutions' accounts, did not relate to the provision of Airwave Network services and thus all of the revenues and costs needed to be excluded.[24]

44. Motorola confirmed that the profit and loss account it had provided included revenues and costs relating to the four services. It provided a separate table which identified revenues and some, but not all, costs for these four services.

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[23] Airwave Solutions annual report and financial statements, year ended 31 December 2020
[24] Similarly, there are assets on Airwave Solutions' balance sheet relating to these four services. We have not made an adjustment to the opening and closing values of assets as our valuation relates only to the Airwave Network (see paragraph 76 onwards).

The table identified cost of sales for these four services, but administrative expenses for Pronto and CCCRS only. We removed revenues and cost of sales relating to these services, as these did not relate to the provision of the Airwave Network. In the absence of estimates from Airwave Solutions, we also needed to estimate an amount for administrative expenses for AB2 and interworking so that we could exclude them. We considered the most reliable means of doing this was to allocate administrative expenses between Airwave Solutions' various business lines on the basis of revenues.[25] Therefore, we calculated the proportions of AB2 and interworking turnover to total turnover, applied these proportions to the total administrative expense, and removed those estimates of administrative expense.

Inflation

45. Motorola had inflated its revenues and costs (with some exceptions, for example power included in site costs, and some line items left flat at 2021 figures) at [✂]% for 2022 and at [✂]% for 2023-2026.

46. CPI was forecast by the Bank of England in its quarterly Monetary Policy Report (MPR) in February 2022. The difference between RPI and CPI (known as the RPI-CPI inflation wedge) is estimated to be 1%,[26] with RPI running higher than CPI. Forecasts for RPI are not available.[27]

Table 1 Forecast summary for CPI and RPI

	2021	2022	2023	2024	2025	2026
CPI inflation	2.0%	5.7%	5.2%	2.0%	2.1%	1.6%
RPI inflation	2.9%	6.7%	6.2%	3.0%	3.1%	2.6%

Sources:
CPI: Conditioning assumptions, forecast summary, and indicative projections February 2022, table 2, published by the Bank of England February 2022 Monetary Policy Report - February 2022 - Bank of England
RPI: 2021: ONS RPI percentage change over 12 months - all services. 2022-2026: CMA calculations

[25] We note that, ideally, such expenses would be allocated by an approach such as activity-based-costing ("ABC") which reflects the principle of causality. However, we observed that the information required to apply an ABC approach is generally not available where the business itself does not seek to allocate overhead costs between business lines. Furthermore, we noted that the figures in this case were relatively small and so unlikely to have a material impact on the results of our analysis. Therefore, we did not seek to refine our analysis further in this respect. Finally, we observe that, to the extent that Airwave Solutions is able to earn super-normal profits on its LMR network activities, the allocation of certain overhead costs on the basis of revenues, is likely to result in a disproportionate amount of those overheads being allocated to the LMR network, reducing its observed profitability, ie our approach is likely to be favourable to Airwave Solutions, as compared with a volume-based approach (for example).
[26] Revised assumption for the long-run wedge between RPI and CPI inflation - Office for Budget Responsibility (obr.uk)
[27] Although the RPI (and its derivatives) no longer meet the required standard for designation as a national statistic, historical RPI measures continue to be published as they are tied to long-term contracts.

47. With respect to revenues, we noted that the contractual position contained in the PFI Agreement was that revenues [✂]. The Home Office told us that, [✂]. The effect of this is that [✂].

48. With respect to costs, we considered that these would increase in line with CPI (not RPI), so the [✂]% figure for 2022 overstated the position, the [✂]% figure for 2023 understated the position, and the [✂]% figure for 2024-2026 was approximately correct.

49. We decided not to make adjustments to Motorola's inflated revenues and costs as we considered that they would only make a very small difference to the overall profit and cashflow figures.

Revenues

50. Motorola made certain assumptions for revenues (in addition to the assumptions on inflation which were discussed above):

    (a) "Ambulance bundle 2 is reduced by 50% in 2023 and 100% in 2024 as new providers go-live on their delivery"

    (b) "Menu services reduce by 5% from 2023 onwards as customers transition over to ESN"

    (c) "Interoperability contract continues in 2023-2026"

- *Ambulance Bundle 2*

51. The revenues for AB2 were removed as part of the adjustment for scope of revenues (see paragraph 43 onwards), so we did not make a further adjustment in this respect.

- *Reduction in menu services*

52. For the reduction in menu services reducing from 2023, we considered that if transition were not to start until after 2023, then this revenue line would need to be adjusted. [✂].

- *Interoperability*

53. This is also known as interworking. We noted two different sets of figures for this: in the August Information[28] just over £[✂] was included per year (on average), but in Airwave's more recent submissions this has fallen to £[✂] per year. We excluded the figures for interworking because it does not form an integral part of the Airwave network operations (and has been contracted for separately).

- *Adjusted revenues*

54. Table 2 shows the adjustments we made from the turnover figure contained in Airwave Solutions' statutory accounts.[29]

Table 2 Summary of adjustments to turnover, 2020-2026, £m

	2020	2021	2022	2023	2024	2025	2026
Turnover in Airwave's accounts	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Remove out of scope activities:							
Pronto	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
CCCRS	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
AB2	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Interworking	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Total activities out of scope	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Turnover of Airwave Network	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Motorola, CMA calculations

Cost of sales

- *Depreciation*

55. First, we note that any adjustment to depreciation does not affect cashflow as it is a non-cash item. Depreciation is deducted as one of the expenses in a profit and loss account, but added back in a cashflow statement as it is a non-cash item. We note the following for completeness.

[28] The June Information and the August Information are the spreadsheets received from Motorola which we used to create the June Model and the August Model. The June Information was created for internal purposes by Motorola in June 2021. The August Information was created in response to an RFI in August 2021.
[29] Note: all figures in this paper are nominal unless otherwise stated.

56. Motorola set out the deprecation charge in the profit and loss account.[30] [✂]. We followed the same approach, including the same depreciation charges 2021-2025. However, we included an adjusted[31] depreciation charge in 2026, [✂].

- *MSI engineer (maintenance) costs*

57. Maintenance costs were approximately £[✂] in 2018 and 2019, rose to £[✂] in 2020, and were forecast to be approximately £[✂] by 2026. Included in the maintenance cost figures from 2020 to 2026 were costs recharges relating to MSI engineers. We considered that these amounts may have included a transfer of costs from Motorola to Airwave which was not reflective of the cost of any increased activity in this area. [✂] and Motorola told us that the cost transfer would continue to be included in future years.[32] We therefore deducted an annual amount of [✂] of maintenance costs across the years 2020-2026.

58. The reasoning behind this adjustment is discussed in greater detail in the Transfer Charges working paper.

- *Managed services*

59. Managed services comprise the costs incurred by third parties to operate services on Airwave's behalf and include the costs of outsourcing the AB2 bundle to Capita. We noted these costs declined over the period: [✂]. As set out in paragraph 44 above in the section on scope, we had already removed this cost as it did not relate to provision of the Airwave Network, so we did not need to make a further adjustment.

Operating expenses

- *All staffing costs*

60. Motorola included [✂] the level of staff costs in 2026 (also inflated from 2025) to assume [✂]. However, our current view is that (1) the cost differential

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[30] Motorola includes depreciation in cost of sales (not in operating expenses which is where depreciation is typically expensed). Motorola told us that the statutory accounts were prepared on the basis that everything to do with the network directly (assets, depreciation, maintenance, site rent/power, transmission) was cost of sales ie direct cost of delivering the network. People costs had been included in administrative costs as they supported the delivery of the service from office sites, rather than being located within the physical base station network itself (albeit many people are core to delivering the managed service package).
[31] The adjustment to depreciation in 2026 was necessary as we included adjusted capex figures. See paragraph 68 below. We decided not to reprofile the depreciation charge to take account of the adjusted capex figures across the years 2021-2025 as this was a non-cash item and thus had no impact on the cashflow.
[32] IRR model slide deck, 30 August 2021, Motorola

between redundancy cost and agency staff would be unlikely to be material, and (2) given that the on-going responsibilities of Motorola under ESN would be much reduced, there would be less opportunity for Motorola to redeploy Airwave Solutions staff to ESN.

61. Therefore, we did not make any adjustments to Motorola's assumption of [✂] in 2026 to [✂].

62. We noted that only including [✂] times the costs of staff in 2026 made a negligible difference to the IRR and increased the NPV of discounted cashflows by £[✂], compared to Motorola's assumption of [✂] staff costs in 2026.

- *Management charges*

63. The management charges include the parent company guarantee fee and the strategic support fee.

64. Motorola included approximately £[✂] of management charge in 2019 and 2020, and a flat charge of £[✂] from 2021. We considered that these amounts may have included a transfer of costs from Motorola to Airwave Solutions which was not reflective of arms-length level of costs in this area, and have deducted an annual amount of £[✂] of the management charge across the years 2020-2026.

65. The reasoning behind this adjustment is discussed in greater detail in the Transfer Charges working paper.

Adjusted profit and loss account

66. Table 3 below is a summary of the adjusted profit and loss account for 2020-2026.

Table 3 Adjusted Profit and Loss, 2020-2026, £m

	2020	2021	2022	2023	2024	2025	2026
Turnover	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cost of sales	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Operating expenses	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Operating profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: various Motorola, CMA calculations

67. Table 4 shows a reconciliation between Motorola's operating profit and the CMA's calculation of operating profit.

Table 4 Adjusted Profit and Loss, 2020-2026, £m

	2020	2021	2022	2023	2024	2025	2026
Operating profit (Motorola)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Turnover:							
Remove out of scope activities	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cost of sales:							
Depreciation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Maintenance (MSI engineers)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Remove out of scope activities	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Operating expenses:							
Management charges	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Remove out of scope activities	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Operating profit (CMA)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: various Motorola, CMA calculations

Adjustments made to arrive at cashflow

68. We made adjustments to the adjusted profit and loss to arrive at cashflow. The adjustments were adding back depreciation and amortisation (non-cash items), and removing spend on capex.

69. We also needed to add opening and closing values: an estimate of IRR requires an estimate of the value of the capital employed by investors at the beginning and end of the relevant period in order to estimate a cash outflow at the beginning of the relevant period and a cash inflow at the end of the relevant period, that is, 1 January 2020 and 31 December 2026.

Depreciation and amortisation

70. Depreciation (and amortisation), as they are non-cash items, must be added back to the profit and loss account. We added back the amounts included in the profit and loss account (see paragraph 54).

Capex

71. Motorola provided a detailed schedule showing planned additions to capex for the Airwave Network in the years 2021-2026.[33] It split out the spend by broad

[33] This was an amended schedule following the one provided in response to Q29 December RFI. Motorola explained that there had been changes to various line items, and that while the updated submission represented Motorola's current view of future capex requirements, it noted that global supply chain issues were driving increases in input costs across its portfolio that often exceeded inflation; to the extent that these cost increases persisted, they would inevitably result in higher capex than had been forecast based on cost increases experienced in the last ten years. Motorola told us that there were no cost increases assumed within the base forecast and we noted that the total net and gross spend over the years 2021-2026 was similar to the figures provided in December 2021. It provided a table showing the effect of cost inflation on capex spend, with a 5% inflation rate resulting in an increase in total capex spend 2022-2026 of £[✂].

categories: Magna (core transmission), control rooms, base station upgrades, ITT OSS/BSS infrastructure, cluster upgrades, London Underground, GBNr, 1.4GHz, Megastream, and fire hardware refresh. As well as a category of significant spend called “Other ANU”, it also included a category called “ANU wide capex risk / unknown budget”.[34] For each category, it split cost into insource labour, outsource labour, MSI equipment and labour, and external equipment, and for each of these categories, showed a net cost and a gross cost, the gross cost including a mark-up relating to MSI equipment and labour. A summary of this schedule is shown in table 5.

Table 5 Summary of capex additions 2021-2026

	Additions in 2021		Additions in 2022		Additions in 2023		Additions in 2024		Additions in 2025		Additions in 2026		Total 2021 - 2026		Total mark-up
	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	
Megastream Total	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Other ANU	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
GBNr	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cluster Upgrades	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
IT OSS/BSS & Infrastructure	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Control Room (DCS)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
1.4GHz	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Base station upgrades	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
London Underground	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Magna	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Fire Hardware Refresh Total	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
ANU Wide Capex Risk / Unknown	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Total Capex Spend (AW Network)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Motorola

[34] Airwave network upgrades

72. The amounts contained in this detailed schedule were similar, but not exactly the same, as the planned capex spend contained in a schedule in response to the December RFI, the line item labelled “New projection based on capex Q29”, which was provided at the same time as the detailed schedule. Also contained in this schedule was a line item labelled “Original [✂][35] projections” although it was not dated and different again to the amounts in the detailed schedule. We also saw different capex projections in the June Information and the August Information. A summary of the various capex projections is shown in table 6.

Table 6 Summary of Motorola capex projections, 2021-2026, £m

	2021	2022	2023	2024	2025	2026	Total 2021-2026
Detailed schedule							
Net	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net less “risk budget”	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross less “risk budget”	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Separate schedule							
Original [✂] projections	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
New projections based on capex Q29	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
August Information	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
June Information	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: various Motorola, CMA calculations

73. The totals 2021-2026 ranged between [✂] and [✂]. It was difficult for us to understand the reasons behind the differences between the various projections, in particular the differing projections provided at the same time in the same excel file. We considered that the capex figures in the June

[35] [✂]

Information were net of a mark-up, while the capex figures in the August Information included a mark-up.

74. At this stage for the purposes of the profitability analysis, we use forecasts for capex that reflect both a costing-based (lower figure) and a pricing-based approach (higher figure). That gives a wide range for forecast capex. The reasoning behind this approach is discussed in greater detail in the working paper on Transfer Charges.

Value of assets

Residual values: as at beginning 2020 and as at end 2026

75. As set out at paragraph 66 above, an estimate of an IRR requires an estimate of the value of the capital employed by investors at the beginning and end of the relevant periods in order to estimate a cash outflow at the beginning of the relevant period and a cash inflow at the end of the relevant period.

- *Opening value as at beginning 2020*

76. As we set out in the Profitability Methodology Approach Working Paper, in order to understand the economic rather than accounting profitability of the business, all assets should be recognised at their value-to-the-business ("VTB") at the start and end of any assessment periods.

77. In Annex A we set out our detailed consideration of the appropriate application of the VTB principles to estimate the value of the Airwave Network's assets as at the beginning of 2020. Our preliminary conclusion is that the Airwave Network's assets should be valued at their net realisable value (NRV) as opposed to their replacement cost or their value-in-use.

78. We observe that the NRV of the network's assets may be [✂] the residual value of the assets at the end of the period, ie £[✂] (as discussed from paragraph 82). However, it may also be [✂] the fair market value of the assets, as assessed by Deloitte in its 2016 report for Motorola (adjusted for subsequent capex and further obsolescence of the asset base between 2016 and 2019), ie [✂]. We have considered scenarios based on both of these values.

79. In addition, we have included net current assets of [✂],[36] in the opening asset valuation.

- *Closing / residual value*

80. We needed a value of the capital employed by investors as at 31 December 2026 in order to estimate a cash inflow at the end of the relevant period.

81. We asked Motorola what value it placed on the Airwave Network once customers had switched to ESN. Motorola told us that it had focused its efforts on the tower sites as they provided the biggest potential to be monetized upon customers' switch from Airwave's Network to ESN (estimated at [✂]% of 2020 NBV). It told us that the remaining fixed assets (such as, for example, furniture and fittings, motor vehicles, computer hardware and software, networking equipment and switches), were relatively low in value (especially with regard to re-sale value) and that a plan would be made in due course as to what would happen to these assets when the Airwave Network was shut down.

82. Motorola told us that each attractive tower site was valued at [✂], meaning a total value of approximately [✂] (based on [✂] attractive sites), and that this amount was gross of any fees that would be required to progress any transaction for example professional advisor fees, legal fees to transfer the leases.[37]

83. Motorola told us that a tower site would be deemed "attractive" if it was suitably located, which depended on:

    (a) [✂];

    (b) [✂].

84. In a later response, Motorola clarified that the value of [✂] was based on the discounted cashflow of the income the tower may receive, minus the opex (ie ground rent and maintenance costs) and minus the re-build capex (Motorola told us that the Airwave towers were generally too small to host mobile network operator (MNO) equipment). The valuation was prepared by Analysys Mason in a report entitled "Modern equivalent asset valuation of the Airwave network" and a supporting document entitled "Analysys Mason valuation commentary for the CMA process." The report and commentary set out two

[36] Being net operating assets as at end 2019, sourced from Motorola's August Model. This is slightly lower than the net current assets showing in Airwave Solutions' balance sheet as at end 2019 (£[✂]). We did not make an adjustment to this figure as it did not have a material impact on the results of our analysis.
[37] Motorola told us that the transfer of leases in some cases was subject to landlord consent which may impair the valuation to the extent a landlord does not consent to the transaction.

main potential use cases for the Airwave Network post NSD: option one was the carve-out and selling of the passive infrastructure for mobile towerco use, and option two was the reconfiguration of the network for private mobile radio (PMR) use. Option one would be the preferred option whereas option two would not make economic sense:

(a) In a divestment of the passive infrastructure, according to a detailed bottom-up geographic analysis, approximately [✂]% of Airwave's owned portfolio ([✂]) were in locations potentially attractive to MNOs in the market and could gain an MNO anchor tenancy. [✂], based on the present value of an attractive site's expected perpetual cashflow once capex had been recovered. Each site could provide a tower cashflow (revenue less ground-lease) of [✂].

There were some costs regarding the sale: in order to host an MNO anchor tenancy, the sites would need to be rebuilt which would incur significant capex [✂] per site); sites would also take time to be leased-up to MNOs, therefore providing negative cashflows until co-located in the absence of an Airwave anchor tenancy. The high capex requirement and lack of anchor tenancy positioned the sale more towards that of a portfolio of land banks as opposed to a tower sale and therefore would not command the same valuations seen for other portfolios in the market. Analysys Mason assumed that the rest of the portfolio would have to be decommissioned at NSD.

The value of the Airwave Network's physical infrastructure was also dependent on the timing of the sale; the portfolio was ideally positioned to enhance MNOs' rural coverage, which was of focus in the MNOs' shared rural network (SRN) initiative with the UK government. SRN deployment had already begun and was likely to run for the next ten years. The further out the sale of the Airwave Network's assets, the less of this SRN demand the portfolio would be able to capture. Assuming the sale of the portfolio did not occur until 2026, it was quite likely that a number of the attractive locations identified in Analysys Mason's report would have been overbuilt – reducing the number of sites that could be sold off and therefore the value of the portfolio.

(b) The network was a possible candidate for PMR use across the nation. However there was no significant demand for nationwide PMR use in the UK – this was apparently evident in the case of the Airwave Network which was originally built for PMR use but could not attract commercial customers. The commentary suggested the reasons why there may be little demand for PMR services for a repurposed Airwave network: firstly, mobile coverage was already very well established making it a cheaper

alternative to PMR and mobile could provide good enough coverage to compete with Airwave's nationwide PMR services. Secondly, where organisations existed that needed the type of PMR functionality provided by Airwave, the geographic scope of those organisations was much more limited. Thus the PMR requirement could be fulfilled through a dedicated private network in the specific location (e.g. London Bus, Heathrow Airport). These localised private networks were more cost effective that the full nationwide network that Airwave provided. In addition these private networks were already built (capex had been spent), so decommissioning the private network in favour of a PMR rental model with Airwave would not make economic sense.

85. Motorola told us that it expected the sites to be sold to an existing TowerCo (ie a company which strategically purchases cell towers).[38] Outside of either an existing or newer TowerCo, Motorola told us that it considered that financial sponsors in the form of private equity funds could also have an interest in Airwave's tower sites.

86. Motorola provided us with a 2015 report called "Project Panda II independent review" prepared by EY which estimated a range of [✂] for the sale of certain towers to a TowerCo. Management's estimate was lower [✂], primarily because of different assumptions. The report noted that any assessment of potential value was highly sensitive to a number of key factors.[39] The report also noted that, as other operators built out their own networks over the following 12-24 months, the potential value of the Airwave tower network to a TowerCo was likely to materially reduce. We asked Motorola if it could explain the difference between the valuation contained in the Project Panda II review ([✂]) and its estimate it provided in response to our RFI in December 2021 ([✂]). It told us that the value ascribed in the 2015 review was very sensitive to the assumptions made (in particular the number of tenants that might be achieved), and that this explained the large difference between the view expressed by EY (the party who conducted the review) and management at the time. Motorola suggested that the additional network build by MNOs and TowerCos that had taken place since 2015 would have in all likelihood reduced the number of sites that would be attractive sales targets and that this explained the reduction in the value attributed to the option of selling sites to TowerCos.

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[38] Motorola gave examples of TowerCos which it was aware were interested in Airwave's tower sites: [✂]
[39] Factors included terms of Airwave's leaseback of towers and length of anchor tenancy, achieving competitive tension around a sale process, bidders' view on multiple tenancy potential of towers, capex required to extend network life, linked to valuation term assumed, and operating costs avoided by Airwave in view of transfer of tower ownership.

87. We decided to use the residual value of [✂] as estimated by Motorola.

Decommissioning costs

88. We needed to take account of the costs necessary to decommission the Airwave Network once customers have switched to ESN.

89. Motorola included decommissioning costs of [✂] in the year ended 31 December 2017 in the August Information. We did not see a breakdown of this figure and it was not clear what costs were included, although we considered that [✂] redundancy costs may have been included. The June Information did not include any decommissioning costs.

90. We asked Motorola to estimate the costs required to decommission the Airwave Network. Motorola provided a review which it had performed in early 2021 for the preparation of statutory accounts for the year ended 31 December 2020 to assess the provision required for its asset retirement obligations. The total estimated cost in Motorola's written table summarising its calculations was £[✂]. Almost all ([✂]) of the estimated cost related to base sites and was based on an average of actual costs incurred from actual contractors for decommissioning base sites between 2017 and 2020. The remainder of the costs (relating to other site types) was estimated by the Airwave engineering team. Motorola told us that, although these estimated costs were not broken down separately, the major component would be related to the manpower needed to take out equipment and restore the sites, and other significant costs were for the equipment needed for site access (cranes etc) where needed.

91. The amount of [✂] shown in Motorola's summary table was described as "after estimated economies of scale / before discounting." The example given was the use of existing Airwave staff instead of contractors and potential volume discounts from subcontractors. However, the supporting spreadsheet showed a total of [✂]. First, we noted that two of the figures in the summary table (base sites – 3rd party tower and base sites - rooftop) making up this total had been included gross of economies of scale, whereas the other figures had been included net of economies of scale. Second, we noted that the summary table did not include [✂] which was included in the supporting spreadsheet as a provision for costs to support exit, described as an estimate for project management activity. We provisionally decided that this figure for project management activity would most likely already have been included in the staff costs for 2026.

92. To arrive at a figure for decommissioning costs to include in our model, we made two adjustments to the figure provided in the supporting spreadsheet. First, we took account of economies of scale for the two base site line items so

that they were consistent with the other items (the majority of which had been adjusted to take account of economies of scale) and then we excluded the [✂] project management activity so as not to double count staff costs which we considered were already included in the profit and loss account for 2026. The resulting total was [✂].

93. We noted that decommissioning costs were estimated in current cash terms and that the supporting spreadsheet spread the decommissioning costs evenly over four years, 2026 to 2029; this estimate was made in Q1 2021, [✂]. Assuming all the costs were incurred in 2027, we inflated the figure to a 2027 nominal cost. Using an assumed inflation rate of [✂]%, this resulted in a total cost of [✂].

- *Sensitivity analysis*

94. We noted that it was difficult to estimate costs related to carrying out a substantial one-off activity which is some years into the future. We carried out sensitivity analysis by halving and doubling the decommissioning costs. Neither change made any material difference to the IRR. Halving the costs increased the NPV of discounted cashflows by [✂]; doubling the costs decreased the NPV of discounted cashflows by [✂].

IRR model calculations – assumption on discount factor

95. We needed a discount factor in order to discount the real cashflows to a present value of cashflows as at the beginning of 2020. As set out in the working paper on the Cost of Capital, we estimated a cost of capital for the extension period of between 4.9% and 6.8%, the mid-point being 5.9%, which is what we used in the model.

IRR model results

96. We set out the calculations to arrive at the IRR model results in table 7, using the scenario of low capex and low asset value.

Table 7 Summary IRR calculations 2021-2026, £m

	beginning of term lump sums								end of term lump sums	End of term lump sums
	31/12/19	31/12/20	31/12/21	31/12/22	31/12/23	31/12/24	31/12/25	31/12/26	31/12/26	31/12/27
Revenues		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]		
Net margin % of revenues		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]		
Operating profit/(loss)		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]		
Add Depreciation		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]		
Add Amortization		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]		
Funds generated by operations		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]		
Capex, residual value and decommissioning costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Working capital adjustment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cumulative net cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Discount factor	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Discounted cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cumulative discounted cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: CMA calculations based on Motorola data

97. We set out the results for scenarios based on low and high asset values, and low and high capex spend, in table 8.

Table 8 IRR results 2020-2026, % / £m

	Low asset value		High asset value	
	IRR	NPV	IRR	NPV
Low capex	[200%-300%]	[£800m-£1bn]	[60%-80%]	[£600m-£800m]
High capex	[200%-300%]	[£800m-£1bn	[60%-80%]	[£600m-£800m]

98. We stated in paragraph 22 that if there were a delay to the beginning of the transition of users from the Airwave Network to ESN or the transition itself takes longer than currently expected by the Home Office, the Airwave Network switch-off date will likely be delayed beyond [✂]. The average annual NPV of operating cashflows (ie not including beginning and end lump sums) over the period 2020-2026 is [✂] [£100m-£150m].[40] Therefore we estimate that any additional year of delay of transition to ESN would result in approximately [✂] of excess profits.

99. Similarly, we note that if the 2000 to 2026 time period was divided as of 2015/6 rather than 2019, this serves to increase the estimated profitability of the "extension" period substantially on both an NPV and an IRR basis.

[40] Depending on the capex spend forecast. £[✂]is based on the high capex spend forecast; £[✂] is based on the lower capex spend forecast.

Profitability model 2002-2019

Sources of financial information

100. We noted that the figures previously provided by Motorola and reflected in a model it had provided (the August Model) had made certain adjustments to the profit and loss account of the statutory accounts for the years 2016 to 2020, and that Motorola had told us that it had done this in order to provide a true view of Airwave's financial statements as a standalone company. These adjustments were to turnover, depreciation, cost of sales relating to transfer charges from Motorola in respect of engineers and R&D, administrative expenses relating to stock compensation, and administrative expenses in relation to an MSI guarantee and support fee.

101. We used the financial information contained in the statutory accounts and did not make the adjustments processed by Motorola, for the reasons set out above relating to transfer charges.

Adjustments made to profit and loss information

Scope

102. We needed to make sure that the revenues and costs contained in the starting operating profit figure only related to the provision of Airwave Network services and nothing else. Pronto, CCCRS, Ambulance Bundle 2 (AB2) and interworking, although contained in Airwave Solutions' accounts, did not relate to the provision of Airwave Network services and thus all of the revenues and costs should be excluded. However, we only had revenue and costs relating to the four activities above going back to 2018, and limited balance sheet information. We considered that the four activities above did not exist for a large proportion of Airwave Solutions' existence from incorporation to 2019, and that any adjustment would not have a material impact on the results of our analysis. We therefore decided not to make any adjustment to the statutory accounts figures. We note that not excluding the activities out of scope (to the extent that those activities existed and were profitable) may overstate the operating profit figure.

Acquisition charges in 2016

103. There was a charge of [✂] to the profit and loss account in 2016 relating to the acquisition of Airwave Solutions by Motorola. We considered that this did not relate to the operation of the Airwave Network and therefore removed it.

Adjustments made to arrive at cashflow

104. As set out in paragraph 34, we made adjustments to the profit and loss account to arrive at cashflow. The adjustments were adding back depreciation and amortisation

(non-cash items), and removing spend on capex. The amounts we used for those adjustments were those contained in the statutory accounts.

Opening and closing values

105. We also needed to add opening and closing values. As set out at paragraph 67 above, an estimate of an IRR requires an estimate of the value of the capital employed by investors at the beginning and end of the relevant period in order to estimate a cash outflow at the beginning of the relevant period and a cash inflow at the end of the relevant period.

- *Opening value as at beginning 2002*

106. Airwave started operations in 2002 and thus had no value at the beginning of 2002, so we included a value of £0m.

- *Residual value as at end 2019*

107. The residual value as at end 2019 is the same as the opening value at the beginning of 2020, which we discuss from paragraph 76 onwards and in detail in Annex A. Our review of the evidence to date suggests an NRV of Airwave's assets of between [✂] and [✂] as of the end of 2019. We have considered scenarios based on both of these values.

108. In addition, we have included net current assets of [✂], in the closing asset valuation.

IRR model calculations – assumption on discount factor

109. We needed a discount factor in order to discount the real cashflows to a present value of cashflows. As set out in the working paper on the Cost of Capital, we estimated a cost of capital for the historic or 'PFI' period of between 7.9% and 9.6%, the mid-point being 8.7%, which is what we used in the model.

IRR model results

110. We set out the calculations to arrive at the IRR model results in table 9, using the scenario of low asset value.

Table 9 Summary IRR calculations 2002-2019 (cont'd below)

	31/03/02	31/03/03	31/03/04	31/03/05	31/01/06	31/12/06	30/6/08	30/6/09	30/6/10	30/6/11	30/6/12
Revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net margin % of revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Operating profit/(loss)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Add Depreciation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Add Amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Funds generated by operations	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Capex and residual value	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Working capital adjustment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cumulative net cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Discount factor	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Discounted cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cumulative discounted cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Table 9 Summary IRR calculations 2002-2019 (cont'd)

	30/06/13	30/06/14	30/06/15	31/12/15	31/12/16	31/12/17	31/12/18	31/12/19	31/12/19
Revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
Net margin % of revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
Operating profit/(loss)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
Add Depreciation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
Add Amortization	[✂]				[✂]	[✂]	[✂]	[✂]	
Funds generated by operations	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
Capex and residual value	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Working capital adjustment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cumulative net cash flows	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Discount factor	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: CMA calculations based on Motorola data

111. We set out the results for scenarios based on a low asset value and a high asset value in table 10.

Table 10 IRR results 2002-2019, % / £m

Low asset value		High asset value	
IRR	NPV	IRR	NPV
10.90%	£134.4m	11.3%	£168.1m

Source: CMA calculations based on Motorola data

Annex A: Identification and valuation of fixed assets

A-1 In this Annex, we first consider which assets Airwave employs in providing network services. We then set out our current consideration of how these should be valued.

A-2 Airwave employs a range of tangible fixed assets and current assets in providing its network services. These are recognised on its balance sheet and we consider that they should be included in its capital base.

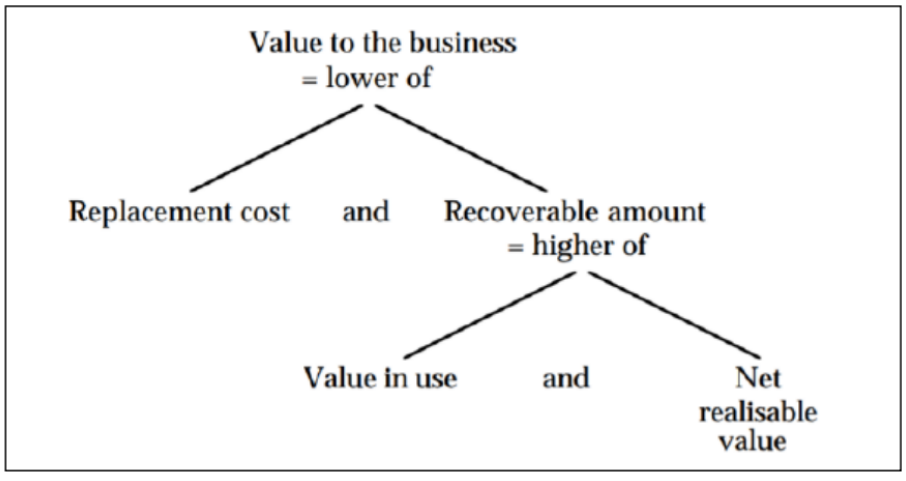
A-3 In response to our invitation to comment on whether there are any assets not included on the balance sheet that Airwave requires to provide its services, Motorola told us that it believed this question became irrelevant when opening asset values are established on the basis of a proper modern equivalent asset value ("MEAV") looking at replacement costs rather than assets listed on the balance sheet.[41] Therefore, we have focussed our analysis on the tangible fixed assets employed by the business.

A-4 We note that our analysis takes into account current assets and liabilities separately, as set out in paragraph 79 above.

Approach to fixed asset valuation

A-5 As we set out in the Profitability Methodology Approach Working Paper, in order to understand the economic rather than accounting profitability of the business, all assets should be recognised at their value-to-the-business ("VTB") at the start and end of any assessment periods. Figure 1 below sets out how the VTB is established.

Figure 1: Establishing which valuation basis for an asset gives its value to the business



[41] Motorola's Response to Profitability Working Paper, paragraph 34.

Parties' submissions

A-6 Notwithstanding Motorola's views on the appropriateness of splitting the financial performance of Airwave into sub-periods and calculating profitability separately for these sub-periods[42], it submitted that the key to obtaining any rational result under such an approach would be the correct calculation of the closing value of assets at the end of the first sub-period, which would then determine the opening value of assets at the beginning of the second sub-period. In this context, Motorola noted that it would be incorrect to take the net book value (NBV) of the assets – calculated as the difference between accumulated capex and accumulated *accounting* depreciation between 2002 and 2019 – as a 'reasonable estimate of the value to the business', stating that this is not the case and the results obtained from using NBV as a measure of VTB would be meaningless.[43]

A-7 Motorola told us that the most meaningful approach to establishing the replacement value of Airwave's assets on an MEA basis would be to calculate the cost of a replacement TETRA network, potentially combined with a new core network, as this would be consistent with the MEA providing the same services and with not requiring users to replace their terminal equipment. In this context, Motorola pointed out that other European countries are still deploying and upgrading TETRA for LMR for public safety. Motorola highlighted that valuing assets on an MEA basis introduces further complications. Specifically, if the services were provided over an optimally configured replacement TETRA network, much of the forecast capital expenditure needed to keep the actual Airwave network operational and to maintain the level of service would not be necessary.

A-8 At the same time, Motorola submitted that operating expenditure would be different, without it being clear whether it would be higher or lower than forecast. For example, operating expenditure may be lower if replacement components were more energy efficient, but on the other hand, the MEA design may involve a greater degree of sourcing of services from third parties (eg buying connectivity instead of constructing own network assets or renting tower space from established tower companies such as Cellnex, Cornerstone and WIG rather than constructing new towers). Overall, this means that in addition to establishing the opening value of assets on an MEA basis, one would also have to estimate future cash flows that are consistent with using the MEA replacement in the provision of services. Motorola submitted that this is not a straightforward task.

A-9 Finally, Motorola noted that this exercise effectively amounts to asking at what price a competing supplier, building a complete replacement for the Airwave Network from scratch, might be able to supply the Airwave service from the CMA's date (1 January

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[42] Motorola's views on this matter are set out in detail in paragraphs 12 to 14 above.
[43] Motorola's Response to Profitability Working Paper, paragraphs 6 and 7.

2020) to 31 December 2026. In Motorola's view, one should be able to conclude without much detailed analysis that this price would be substantially higher than the price the Home Office pays for the Airwave service given that they would need to permit the competitor to recover the considerable investments in an alternative, equivalent network over a short period of time. By implication, Motorola submits, the CMA's truncated IRR analysis, using a correct approach for establishing the opening value of assets, cannot find any excessive profitability. Motorola's believes that the replacement cost of assets at the beginning of the extension period considered by the CMA will be substantially higher than the NPV of cash flows, which Motorola submits would be confirmation according to the Oxera paper commissioned by the OFT that Airwave is not earning excessive profits.[44]

A-10 Following publication of our Profitability Methodology Paper, Motorola commissioned an expert report dated 28th February 2022 from Analysys Mason, which estimated the total replacement cost of the Airwave Network to be [✂]as of 1st January 2020, comprising [✂]of capex and [✂]of (preparatory) opex, ie opex required in the couple of years prior to the start of the period while the network is being built.

A-11 In addition to the standard profitability analysis, the Home Office proposed that the CMA undertake a supplementary piece of analysis, examining the expected profitability of the acquisition of Airwave by Motorola in 2016. The Home Office submitted that understanding the return that Motorola expected to make in 2016 would provide insights into its assumptions at the time on how long the contract would be extended. In other words, this would allow the CMA to assess whether Motorola expected to achieve an IRR higher than the benchmark WACC by the end of the original PFI contract period, or whether this depended on the terms under which it would agree extensions to Airwave. The Home Office submitted that this can provide indications of Motorola's ability to exploit its position of monopoly supplier of a critical infrastructure to extract supra-competitive rents during the extension periods. The Home Office explained that for this analysis, the CMA would need to look at the purchase price paid by Motorola in 2016 and estimates of financial forecasts for the years from 2016 onwards, and partition the analysis between the period of 2016–19,2020–26, and such additional periods the CMA considers necessary.[45]

Other evidence

A-12 In addition to the Analysys Mason report, we also collected information from Motorola – prepared prior to our investigation – on the potential value to the business of the assets of the Airwave Network. In particular, we considered:

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[44] Motorola's Response to Profitability Working Paper, paragraphs 29 to 33.
[45] Home Office Response to Profitability Working Paper, paragraph 18.

(a) An expert report, prepared by Deloitte for Motorola, on the fair market value of Airwave's assets. This report was dated 3 August 2016 and was prepared "to assist in estimating the fair value of certain intangible assets acquired and liability assumed from Airwave Solutions Ltd… for financial reporting purposes". This gave a "fair market value" of Airwave's assets of [✂].

(b) An internal Motorola email, dated 31 January 2017 and titled "Airwave Acquisition Valuation", setting out [✂] ([✂] Architect, Motorola) views on the replacement cost of the Airwave network assets. This suggested that the replacement cost at fair market value of the network's assets was [✂], or approximately [✂]at exchanges rates at that time.[46]

(c) The terms of the contracts between Airwave and the various emergency services, which provide for the purchase of Airwave network assets at their fair market value on termination or expiry of the original contracts.

(d) The purchase price of £[✂] paid by Motorola Inc. for Airwave in February 2016 and the returns expected by Motorola at that time.

Our assessment of asset valuation

A-13 We have considered the VTB of the Airwave Network's assets, taking into account the evidence set out above, from two different perspectives:

a. First, we have considered the various pieces of evidence on the likely replacement cost of the assets comprising the Airwave Network;

b. Second, we have considered what the recoverable amount of the Airwave Network might be expected to be in the context of a well-functioning market.

A-14 Our preliminary conclusion is that, in a well-functioning market, the value to the business of Airwave's assets would reflect their net realisable value (NRV) rather than their (new) replacement cost. Therefore, in our analysis, our base case profitability estimates are based on this NRV. We have, however, also considered sensitivities based on the assets (depreciated) replacement cost, taking into account the significant capex programme that is planned for the next few years.

A-15 Our assessment is set out in detail below.

[46] Exchange rate of $1.26 to £1 as of 31st January 2017.

Replacement cost estimates

Analysys Mason Report (2022)

A-16 Analysys Mason was commissioned by Motorola to develop a modern equivalent asset (MEA) assessment covering all aspects of the Airwave Network estate relevant to the supply of services to the UK emergency services. The MEA valuation considered the capex and opex expected to be incurred through deployment and operation of a modern equivalent Airwave network between the extension period of 01 January 2020 and [✂]. The report also considers potential use cases beyond the NSD and assumed a sale of useful passive assets (towers) to partly offset the decommissioning costs.

A-17 Analysys Mason explain that the MEA valuation requires costs to be modelled based on the principles of providing a replacement network with the same functionality and capacity, noting the following assumptions:

(a) TETRA technology provides the necessary quality for the contracted service and mitigates the need for end-user terminal replacements and re-training;

(b) the same number of base stations as utilised today is assumed, so as to offer the same nationwide voice coverage;

(c) all build capex is assumed to be incurred prior to operation on day one.

A-18 Analysis Mason's MEA results are shown in Figure 2 below.

Figure 2: Analysys Mason MEA assessment for Airwave capex and opex

[✂]

Figure 3: Analysys Mason break-down of capex estimate (total and 'other' capex)

[✂]

[✂]

A-19 Analysys Mason estimated total capex of £[✂] to replace the Airwave network, plus a further £[✂] of opex to be incurred during the set-up period, ie a total MEAV of £[✂]. Their analysis assumes that substantially no further capex is required after the initial set-up period until 2026. Of this £[✂] total, £[✂] was based on the gross book value ("GBV") of certain assets (IT assets, tools, spares etc), as set out in Airwave's Fixed Asset Register ("FAR").

A-20 With respect to opex, Analysys Mason estimates that this should be in line with Airwave's current opex forecasts for the period 2020 to 2026.

CMA discussion of Analysys Mason Report

A-21 We note that the Analysys Mason Report makes a number of assumptions that appear to us to be questionable. In particular, the CMA has concerns that:

(a) The assumption of TETRA as the replacement technology is likely to inflate the cost base materially in comparison with an LTE solution which would benefit from significant economies of scale;

(b) The active equipment cost estimates adopted by Analysys Mason appear high, with [✂]; and

(c) The opex costs, particularly the transmission costs, assumed for a new network appear high.

A-22 At this stage, we have not made any adjustments to the Analysys Mason figures. However, we propose to explore these points further in due course.

Deloitte Report (2016)

A-23 Deloitte produced estimates of the replacement cost new ("RCN") and the fair value of the base stations and switch sites of the Airwave Network. As of February 2016, these assets comprised around 85% of total assets employed by Airwave, as measured by original acquisition cost. It was directed by Motorola to assume that the fair value of the remaining assets (non-network assets and network assets to attributable to the base stations or switch sites) was equivalent to net book value.

A-24 On this basis, Deloitte estimated that RCN of the network assets to be [✂], and the fair value of these assets to be [✂]. This compares with a GBV of these assets of [✂] and a NBV of [✂].[47] Those assets which were not revalued by Deloitte had an acquisition cost of [✂]and a NBV of [✂]. Overall, therefore, Deloitte found the fair value of Airwave's assets to be [✂], compared with a total NBV of [✂].

A-25 Deloitte's report explains the valuation approach that it took to "personal property assets" as follows:

"We considered and evaluated the three traditional approaches to value the intangible asset: the income approach, the market approach, and the cost approach… We relied

[47] The gross book value of the assets will reflect the total cost incurred by Airwave in building/developing and maintaining the Airwave network from its inception to the date of the report, ie 2016. The net book value of the assets reflects a combination of the GBV and the depreciation policy selected by Airwave.

on the cost approach, specifically the replacement cost new ("RCN") approach because we believe

(1) this approach was appropriate for the valuation analysis, and

(2) sufficient information was available for its use.

We did not rely upon either the income approach or the market approach, because we did not consider it to be applicable to the analysis, and because we determined that the collected data was insufficient to achieve credible results.

The method was selected for the following reasons:

- *RCN data was readily available for the Personal Property Assets*
- *RCN is typically the starting point for the Cost Approach to value*
- *RCN is defined as the current cost of a similar new property having the nearest equivalent utility as the property being appraised. RCN incorporates such things as improvements in design, layout, process flow, or improved technology.*

RCN is typically the starting point for the cost approach because a prudent investor would not spend excess funds to simply duplicate the existing asset if the same utility can be obtained for less cost (ie, the principle of substitution)."

"After estimating an RCN, additional adjustments are necessary to account for other forms of depreciation resulting from physical deterioration, functional (or technical) obsolescence, and economic (or external) obsolescence. These are defined as follows:

- *Physical deterioration is the loss in value or usefulness of a property due to the using up or expiration of its useful life caused by wear and tear, deterioration, exposure to various elements, physical stresses, and similar factors.*
- *Functional obsolescence is the inability of the property to adequately perform the function for which it is utilized. Alternately, it is the loss in value or usefulness of a property caused by inefficiencies or inadequacies of the property itself, when compared to a more efficient or less costly replacement property that new technology has developed.*
- *Economic obsolescence, sometimes called "external obsolescence," is the loss in value or usefulness of a property caused by factors or economic forces external and unrelated to the property itself.*

RCN was developed using cost estimates for installed assets provided by Management. To arrive at an indication of value, the estimate of RCN for each asset was adjusted for physical deterioration and obsolescence."

A-26 The results of the Deloitte analysis are set out below for base station assets and switch sites. Figure 6 shows which of Airwave's assets Deloitte revalued and which were assumed to be carried at NBV.

Figure 4: Fair value analysis for Base Station Assets

[✂]

Figure 5: Fair value analysis: switch site assets

[✂]

Figure 6: Deloitte summary of asset values for Airwave

[✂]

A-27 The combined RCN for those assets that have been fair-valued and the GBV of those assets that have not been separately assessed by Deloitte, gives a total replacement cost of Airwave's assets of £[✂] as of 2016. However, we note that £[✂] of this sum is simply the historical acquisition cost of certain assets that have not been fair-valued and that many of the assets included in this figure are likely to have reduced significantly in price in the intervening years. For example, it includes [✂].

A-28 Between 2016 and the end of 2019, we note two potential offsetting effects on the valuation of assets. First, Airwave incurred a further £89m of capex over this period, which would have increased the fair value of the asset base, although would (presumably) not have affected the RCN. Second, the rest of the asset base would have continued to decline in value due to physical, technological and economic obsolescence, as set out by Deloitte in its report. We consider the net effect of this in paragraph A-34 below.

Motorola's internal email evidence

A-29 As part of our evidence gathering, we collected a large number of internal documents and emails from Motorola in relation to its investment in Airwave. One email, sent by [✂], Airwave Solutions Limited) and dated 31st January 2017 stated:

> *I have spoken to* [✂] *and* [✂] *- this is all they have from* [✂] *for the valuation of the Airwave network:*
>
> *<u>Replacement Costs (at FMV)</u>*
>
> *3800 base stations (MSI product) -->* [✂]

3800 base station sites (cooling, antenna, UPS & batteries, labour) --> [✂]

3600 dispatcher interfaces (CCI ports) --> [✂]

102 core switching zones (product & install) --> [✂]

TOTAL --> [✂]

They now need supporting price list/invoice evidence that comes back to these values. I am not sure how to proceed without [✂] and how he arrived at these valuations.

A-30 This email suggests a total replacement cost (at fair value) of the Airwave network of approximately £[✂]. This is significantly above the FMV estimated by Deloitte and significantly below Deloitte's estimate of the RCN of the Airwave Network. It is unclear what the basis of this estimate was or for what purpose these estimates were prepared. We have, therefore, placed limited weight on this evidence at this stage.

Our consideration of replacement cost evidence

A-31 We observe that the two reports (prepared by Analysys Mason and by Deloitte) provide broadly similar estimates of the ***new*** replacement cost of Airwave's assets (assuming that TETRA is the most appropriate MEA), ie around £[✂], while the Deloitte report also estimates the fair value of the asset base in its state as of mid-2016 to be £[✂].

A-32 We note that the Airwave Network is ageing and Motorola has submitted that it now requires significant investment in maintaining and replacing elements of it in order to ensure its continued functionality. For example, Airwave is forecasting [✂] of capital expenditure between 2020 and 2026. In keeping with these estimates, at the site visit, [✂] highlighted to the CMA the age and obsolescence of the Airwave Network and the technological challenges associated with maintaining the resilience of the network in that context.

Figure 7: Airwave site visit, slides on network issues

[✂]

[✂]

A-33 We note Motorola's submission that, notwithstanding that Motorola's position that there is no justification for undertaking a truncated IRR analysis and IRR should be calculated for the full period from 2020 to 2026, IRR for the truncated period should be calculated on the basis of the new replacement cost of the assets as of the end of 2019, with the subsequent removal of on-going capex and maintaining the existing

forecast level of opex. However, we do not agree that this approach is the most reliable in terms of understanding profitability for two main reasons:

(a) First, as the Deloitte report sets out, and Motorola's own evidence supports, the existing Airwave Network suffers from physical, technological and economic obsolescence. The fair value of such aged assets is significantly lower than the replacement cost of similar new assets given their limited lifespan;[48]

(b) Second, we note that Airwave will incur (significant) capex in maintaining and replacing elements of the network over the whole of the 2020 to 2026 period (and potentially beyond), as well as opex at levels determined by its existing asset base rather than the hypothetical MEA asset base. Replacing these actual / forecast cash flows predicated on the existing worn and aged asset base with hypothetical cash flows which might be incurred if the asset base were different results in IRR estimates that do not correspond with the returns actually being earned by the business. We consider that this would make the analysis less insightful. In particular, we note that Motorola's proposed approach (of effectively assuming a large up-front capex cost with reduced later spend) can be expected to reduce IRRs, as compared with the (actual) situation in which there is much lower up-front spend and greater spending over the following few years.

A-34 For these reasons, we consider it more valid to value Airwave's network assets in their existing state, drawing on the Deloitte report which was prepared for Motorola/Airwave in the normal course of business, and to use the associated opex and capex forecasts prepared by Airwave and based on the costs of running and maintaining the network that it has. This ensures consistency across all elements of our analysis. On this basis, we observe that the value placed on Airwave Network assets was around [✂] as of mid-2016. Between 2016 and 2019, Airwave Solutions incurred further capex of £89m, which should be added to the replacement cost of the assets as of the end of 2019. However, the existing assets would also have continued to depreciate in value due to physical, technological and economic obsolescence. For the purposes of our analysis, ie to come to a view on asset value as of the end of 2019, we have assumed that all existing and new assets are depreciated over a 10 year useful economic life. [✂]. This produces an asset value of approximately [✂] as of the end of 2019.

Recoverable amount estimates

A-35 As set out above, we have also sought to estimate the recoverable amount of these assets in a well-functioning market in order to understand how this might compare to the replacement cost. In carrying out this assessment, we have had reference to both

[48] We note that there is a second-hand market for many of the assets employed by the Airwave Network, including base stations, and the prices of such old equipment would be significantly lower on that market, reflecting its limited remaining useful economic life

our Market Investigation Guidelines in relation to the well-functioning market benchmark, as well as previous Government consideration of similar issues.

A-36 For example, we found the following paragraphs from the Byatt Report[49] to be particularly relevant given the context in which the Airwave Network operates:

"In measuring the continuing costs of supply the relevant prices are those that would be paid for resources purchased now in the normal course of business in competitive markets. Such competitive market conditions may result from the actual existence of competing producers or, more generally, from the threat of competition from potential producers entering the market. Even where competitive markets do not exist, it is necessary to estimate the effects that competition would have in order to measure the value of the resources used."

"The assumption of free entry into a market defines the level of profit required to cover the cost of capital, since no-one will enter unless they expect to recover this cost. ***The assumption of free entry also defines the value of existing assets to a business as equal to the amount a competitor would be prepared to pay for them in a competitive market****." (Emphasis added by the CMA)*

A well-functioning market

A-37 We note that the features of LMR networks – in particular, the very large, sunk costs associated with the development of such networks – are such that there is likely to be a single supplier and one or a small number of purchasers (who may group together).[50] In this context, we would not expect to see LMR networks being developed speculatively but rather we would expect to see the main purchaser(s) effectively commissioning a supplier to develop and operate a network and, in return, the purchaser would provide a high-level of security to the supplier in terms of demand / remuneration for the services provided. Indeed, this was the case with the Airwave network where PITO signed a long-term agreement with Airwave for the provision of services, under which revenues were largely guaranteed.[51]

A-38 In this context, ie where a supplier is provided with a guaranteed level of revenues to ensure it is able to recoup the significant initial outlay required to develop a network, in a well-functioning market, we would expect customers to enjoy material protection with respect to the pricing of LMR services in the event of requiring an extension of

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[49] Accounting for economic costs and changing prices: a report to HM Treasury, 1986. The Byatt Report, paragraphs 51-53.
[50] Although Airwave provides services to a couple of hundred organisations, ie the emergency services plus various "sharer" organisations, we note that only a small number of customers are of a sufficient scale to make it economic for them to commission this type of service. The other sharer organisations could be expected to find an alternative solution in the absence of an existing LMR network.
[51] The core service charge for the original PFI agreement was based on a baseline figure and adjusted each year to take account of indexation. The core service charge did not vary by volume once all the Police Forces were in receipt of the service, save for service charge credits which were applied, and in 2016 and 2018 the outcome of the negotiations was that revenue would be maintained until closure of the network, even as individual Police Forces move over to ESN. Menu charges do have a volume element in that they are levied on individual police forces depending on the level of coverage required locally. However, we understand that this coverage requirement does not vary materially from year to year.

services beyond the period originally envisaged. For example, we might expect the contract to provide effectively for the transfer of the network assets at the end of the contract period. That would allow for the re-tendering of the provision of services using that already built and paid for network. Specifically, we would expect pricing during such an extension period to be constrained at a level at which the supplier was, broadly, only able to recover the incremental investment in the network required to extend its life, its (efficient) operating expenses, and a reasonable return on its capital, taking into account the risks assumed by the supplier over the extension period.[52]

A-39 This benchmark would suggest that the sunk costs of the network, which have already been paid for by customers, should not influence pricing during an unexpected extension period. Put another way, we do not believe that in a well-functioning market, customers would, in effect, pay twice for the same assets if the life of the network were extended beyond the term originally envisaged when the LMR network was commissioned. We note that the replacement cost approach, which Motorola puts forward[53] as the appropriate benchmark (at least, in the context in which the profitability analysis is truncated) would result in such an outcome.

A-40 We note statements made by Motorola during our site visit about the original pricing of the network and the assets employed therein:

[✂] *The original PFI contract will have assumed the shutdown at 2019 and then network decommissioning taking place thereafter? The pricing for that contract will have built in that assumption?*

[✂]: *Yes.*

[✂]: *So, it will have assumed a complete amortised cost of everything by the end of the PFI contract?*

[✂]: *Yes.*[54]

A-41 We considered the most appropriate means of applying this benchmark in relation to the Airwave Network. In particular, we considered whether the well-functioning market benchmark meant that the assets should be valued at zero – on the basis that they

[52] We note that this constraint could be provided either by an effective contract, or by competition among several potential LMR network suppliers which were already operating in the market, ie who had already incurred the sunk costs of constructing a network.
[53] See paragraph A-33. By suggesting that the relevant competitive benchmark in terms of pricing for the extension of the contract would be that which the Home Office would incur if it sought to procure a replacement TETRA network for its sole use over a shortened time period, we consider that Motorola is seeking to "price in" the market power which it derives from the natural monopoly nature of Airwave. We do not accept that this reflects pricing in a well-functioning market.
[54] We note the following in a written response from the Home Office to the Public Accounts Committee: 'The Airwave contract payments are spread over 15 years for each force starting at the Ready for Service date. There was a planned progressive roll out starting in 2001 and the total life of the programme, including the roll-out and decommissioning phases, will be 19 years.'

had already been fully paid for – or whether it meant they should be valued at their net realisable value.

A-42 We noted two pieces of evidence that we considered relevant to this question:

(a) First, the PFI Model, which was submitted to us as providing the basis on which PITO and Airwave originally contracted, [✂]. This suggests that the originally pricing agreed between PITO and Airwave was considered sufficient to fully compensate Airwave for its investment in the network. In this context, one might expect ownership of the assets to transfer (at nil value) to the customer at the end of the contract;

(b) Second, and in contrast, the main contracts between Airwave and the emergency services contains provisions which allow/require PITO/the Home Office to acquire the assets at their fair market value if they wish to take control of them at the end of the original contract period. For example:

(i) The PSRCP Framework Agreement states that: [✂]

(ii) The Firelink Main Agreement states that: [✂]

(iii) The Ambulance Agreement states that: [✂]:

A-43 These contract terms suggest that part of the remuneration due to Airwave under the original PFI period included any residual value of the assets at the end of that period.

A-44 We note that these two approaches may converge, in effect, in a situation in which the residual value of the assets is relatively low.

A-45 However, in this context, we have taken the more conservative approach of assuming that the assets should be valued at their net realisable value. We note that this approach may allow some double-recovery of asset value in the sense that the PFI Model suggests that the full cost of the assets (and a return thereon) would have already been recovered within the original PFI period. However, it is consistent with the (original) contractual terms agreed between Airwave and the emergency services.

A-46 Next, we considered what the NRV of Airwave's assets was likely to be. The evidence on residual value, as set out in paragraphs 80 to 87 above, suggests that at the end of the useful economic lifetime of the Airwave Network, the NRV may be as low as [✂]. However, we note that Deloitte's report suggests that the fair market value of these assets as of 2016 may have been as high as [✂]. As set out in paragraph A-34, we estimate that this would have increased to around [✂] by the end of 2019. Therefore, we have considered a range of NRV of between [✂] and [✂] in our analysis. The upper end of this range is the same as our best current estimate of the depreciated replacement cost of the assets.

Assessment of Motorola's returns from 2016 onwards

A-47 Finally, we considered the Home Office's suggestion that we take the amount paid by Motorola for Airwave in 2016 and assess the returns that Motorola expected to earn on this to the end of 2019 and consider how expected returns change with the extension of the contract beyond 2019. We note that the February 2016 purchase price of [✂] by Motorola for Airwave should provide an upper limit to the recoverable amount[55] of those assets since it reflects what investors were prepared to pay for the business achieved via a competitive sales process. However, we note that this valuation may well exceed the recoverable amount in a well-functioning market since it can be expected to capitalise any monopoly rents that an investor may expect over the remaining life of the assets.

A-48 To the extent that recoverable amount has increased since 2016, this must be the result of the extension of Airwave Network and the potential to earn super-normal profits over that period, which represents a "windfall gain" and we do not consider that it would be appropriate to capitalise in the asset valuation as the would introduce a circularity to the analysis.

A-49 We have, therefore, compared this purchase price with the amounts recovered by Motorola between 2016 and the end of 2019. This suggests that Motorola recovered its investment, taking into account a nominal pre-tax WACC of 6-7% by the end of 2020, ie with only a one year extension. This analysis is set out in Table 1 below. It suggests that the VTB of the Airwave assets at the end of 2019 would have been relatively low in the absence of a material further extension and the ability to earn super-normal profits over that extension period. As noted above, we consider any such uplift in the recoverable amount of the Airwave assets from such an extension represents a "windfall gain", which should not be included in its asset base.

Table 1: Analysis of Motorola's returns on its investment in Airwave

	WACC	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20
Net Cash Flows		[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
DCF	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Cumulative	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
NPV	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

[55] In this case, this "recoverable amount" is the "value in use" of the assets.

Preliminary conclusions

A-50 Our preliminary assessment of the appropriate application of the VTB framework to the specific context of the Airwave network is:

(a) Airwave's assets must be valued with reference to the specific characteristics of the market for LMR services and against a well-functioning market benchmark;

(b) At the start of the extension period, the assets should be valued at their net recoverable amount rather than their replacement cost (or a zero valuation);[56]

(c) We note that this valuation basis appears to be reflected in the original contracts between Airwave and the various emergency services, in which the latter have the right on expiry of the contracts to purchase the assets of the business at their fair market value;

(d) Our review of the evidence to date suggests an NRV of Airwave's assets of between [✂] and [✂] as of the end of 2019;

(e) We note that the upper end of our NRV estimate is the same as our best current estimate of the depreciated replacement cost of the existing Airwave Network as of the end of 2019, ie both figures are drawn from the Deloitte Report;

(f) Finally, even if it were appropriate to adopt the replacement cost approach, we do not agree that with Motorola that it would be reasonable to use the "new" replacement cost of the network in our analysis together with existing opex figures and then exclude future capex flows as Motorola suggest. Such an approach results in an analysis which is divorced from the realities of the Airwave business in two key respects. First, it ignores the physical, technological and economic obsolescence of the existing Airwave network. The fair value of such aged assets is significantly lower than the replacement cost of similar new assets given their limited remaining lifespan. Second, it produces a theoretical set of cash flows which do not reflect the actual timing of cash flows into and out of the business (which is essential for a meaningful IRR estimate).

[56] We note that a credible well-functioning market benchmark is one in which the customer would have the right to request the extension of the contract on an incremental cost plus basis. In this case, the supplier would not be able to recover even the NRV of its existing asset base in the open market. Alternatively, in this scenario the NRV of the assets could be said to be zero at the point of extension. We have not considered a zero asset, consistent with this scenario, value at this stage.