Rail franchise mergers

Review of methodologies and guidance
Draft for consultation

Contents

1.   Introduction

1.1   Rail franchises are awarded following a procurement process. The programme of rail franchise awards is managed by the Department for Transport (DfT). The award of the ScotRail franchise is a devolved matter managed by Transport Scotland and the award of the Wales & Borders franchise in 2018 will be managed by the Welsh government.

1.2   The award of a rail franchise constitutes an acquisition of control of an enterprise under the merger control provisions of the Enterprise Act 2002 (the Act).[1] Where the relevant jurisdictional tests are satisfied,[2] the Competition and Markets Authority (CMA) may investigate whether the franchise award could give rise to competition concerns.

1.3   This guidance sets out key aspects of the competition assessment of a rail franchise award under the CMA's merger assessment framework. The focus of this guidance is on the methodological aspects of the assessment. It builds on previous commentary and on the CMA's experience[3] in the assessment of rail franchise mergers, in particular the developments in assessment methodology during and subsequent to the Arriva Rail North/Northern Phase 2 investigation (Arriva/Northern) and FirstMTR/South Western Phase 1 investigation (First/SW). This guidance supersedes the Competition Commission (CC) paper: *Review of methodologies in transport inquiries*.[4]

1.4   This guidance forms part of the advice and information published by the CMA under section 106 of the Act. This guidance should be read alongside the other detailed guidance that the CMA has published or adopted in relation to merger review and the CMA's procedures.

1.5   The guidance illustrates the CMA's approach to the efficient assessment of Rail Franchise mergers. However, the CMA recognises that the details of each franchise will differ and that markets evolve constantly. Therefore, the analysis conducted in any given case will depend on the circumstances of the franchise award and the nature of the available evidence.

1.6   Although the CMA will have regard to this guidance in handling rail franchise mergers under the Act, the CMA will apply this guidance flexibly and may

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[1] Section 66(3) of the Railways Act 1993.
[2] Where turnover in the UK attributable to the franchise exceeds £70 million, or where as a result of the award of the franchise, the merged entity will account for at least 25% of goods or services of any description supplied in the United Kingdom or in a substantial part of the United Kingdom.
[3] And that of its predecessor bodies, the OFT and CC.
[4] http://webarchive.nationalarchives.gov.uk/20140402220021/http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/our_role/analysis/review_of_methodologies_in_transport_inquiries.pdf.

depart from the approach described in the guidance where there is an appropriate and reasonable justification for doing so.

1.7   This guidance reflects the views of the CMA at the time of publication. However, the CMA expects that the approach to analysis will evolve over time, and the guidance may be revised from time to time to reflect changes in best practice, legislation and the results of experience, legal judgments and research. It may in due course be supplemented, revised or replaced. The CMA's webpages will always display the latest version of the guidance. Where there is any difference in emphasis or detail between this guidance and other guidance produced, or adopted, by the CMA, the most recently published guidance takes precedence.

2.   Engagement with the CMA

2.1   The CMA encourages all bidders to begin engagement as early as possible. In the CMA's experience, early interaction between a potential Franchisee and the CMA can help to ensure a smooth merger assessment process and minimise the burden on the Franchisee.[5] Where possible, the CMA aims to complete and publish its phase 1 merger assessment prior to commencement of the Franchise. Depending on timings, it may be possible to carry out this assessment after the announcement of the franchise winner, but in recent cases the CMA has engaged in prenotification discussions with multiple bidders, prior to this announcement, in order to ensure there is time to conduct the assessment prior to commencement.

2.2   The CMA encourages bidders to allow enough time for the collection of all relevant data. This can be a time-consuming exercise, but the provision of reliable data is vital to an efficient assessment process.

2.3   Data should be provided in a form that allows the CMA to verify easily how filters etc have been applied.[6] In particular, it is helpful to provide key data in spreadsheet form with filters applied using formulas. This will assist the CMA's verification that filters have been applied appropriately and reduce the time needed for review.

2.4   The CMA is happy to discuss the information required for individual cases. The information contained in Appendix I is intended to be a practical guide for parties to enable parties to self-assess.

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[5] This includes bidders who meet the jurisdictional thresholds for notification to the European Commission under the EU Merger Regulation (EUMR), since the CMA expects that there will be strong reasons for a referral of rail franchise mergers back to the UK if they may have a significant impact on competition.
[6] The CMA may need access to underlying data in some circumstances and parties should keep this in mind when collecting and assembling data.

3. Theories of harm relevant to Rail Franchise mergers

3.1 When examining Rail Franchise mergers, the CMA will consider the impact on competition on point-to-point journeys (ie travel from a specific point of origin to a specific point of destination) – each is referred to as a **flow**. Typically, in Rail Franchise mergers two situations may arise that could lead to competition concerns:

(a) The winning bidder (the **Franchisee**[7]) has existing rail operations in the area of the Rail Franchise that are not part of the Rail Franchise, and these operations overlap on one or more flow. These are referred to as **rail-rail overlaps**. The merger therefore leads to a situation in which the number of independent rail operators is reduced. For example, the Franchisee may be an open access operator on parts of the routes operated by the Rail Franchise or may operate a different franchise with some overlapping flows; and

(b) The Franchisee has existing bus (or coach) operations in the area of the Rail franchise and therefore overlaps in the supply of bus (coach) and rail services. These are referred to as **bus-rail overlaps**. The merger therefore leads to a situation in which the number of independent public transport operators in that area is reduced.

3.2 To assess these potential competition concerns, the CMA will consider one or more "Theory of Harm".[8]

3.3 The CMA's approach differs between rail-rail and bus-rail overlaps and this guidance deals separately with the analytical approach for each.[9] The lower degree of regulation governing bus services relative to rail services suggests that on bus-rail overlaps, any fare rises or service degradation is more likely to manifest on bus services than on rail services, and accordingly the CMA generally focuses on changes to bus services. However, the ability and incentive for the Franchisee to degrade its rail offer may also be considered during the competitive assessment of overlapping bus-rail flows.

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[7] If timing requires the CMA to engage with multiple bidders prior to the franchise award announcement, the identity of the winning bidder will not be known. The CMA will engage with each bidder as if it were the winning bidder, and so for simplicity this paper simply uses the term Franchisee.

[8] Theories of harm are drawn up by the CMA to provide the framework for assessing the effects of a merger and whether or not it could lead to an SLC. They describe possible changes arising from the merger, any impact on rivalry and expected harm to customers as compared with the situation likely to arise without the merger (the counterfactual). The CMA may revise the theories of harm as its assessment progresses. CC2, section 4.2.

[9] It is possible, but rare, to find flows where the merger creates an overlap with a competing rail service and a bus service which are both provided by the Franchisee. The CMA would expect to apply the principles described in this guidance, but the levels at which concerns could be dismissed may vary.

4.   Market definition

4.1   In this section, we set out the approach for market definition in Rail Franchise merger inquiries by the CMA. Market definition is a useful tool, but not an end in itself, and identifying the relevant market involves an element of judgement.[10] The boundaries of the market do not determine the outcome of the CMA's analysis of the competitive effects of the merger in any mechanistic way. In assessing whether a merger may give rise to a substantial lessening of competition (SLC) the CMA may take into account constraints outside the relevant market, or other ways in which some constraints are more important than others.[11]

4.2   In merger inquiries, the CMA defines a relevant product market to help it assess the impact of the merger on competition.[12] In Rail Franchise mergers there are two dimensions to market definition. First, the CMA considers which modes of transport to include in the relevant product market. Second, the CMA considers the relevant geographic market.

Product market

4.3   The CMA generally takes rail travel as a starting point and considers which other modes of transport to include in its market definition, ie which modes of transport impose a constraint on the modes of transport operated by the Franchisee (for example, travel by private car or walking). Some of the factors which the CMA has considered are:

(a) The cost of the journey;

(b) Journey time;

(c) Time spent travelling to and from the starting point of the journey (for public transport); and

(d) Frequency and waiting time (including that due to interchanges).

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[10] Market definition is centred on the products or services under investigation. Therefore, the CMA would not necessarily expect to define the same markets in a Rail Franchise merger as it would in, for example, a merger between bus companies.
[11] Competition Commission, *Merger Assessment Guidelines* (CC2), ¶5.2.2.
[12] CC2, section 5.1.

4.4   In general, the CMA has found that a service competes most closely with other services of the same mode, and secondarily with other modes of public transport.[13,14]

4.5   In previous Rail Franchise mergers, the CMA has not found it necessary to conclude whether a specific mode, other than public transport, is part of the relevant market, but instead took the mode into account in its competitive assessment.[15]

4.6   To assess the constraint imposed on public transport by private transport, the CMA generally looks for evidence of passenger switching from public transport to private transport in response to a small change in the offerings (eg fares and service quality). The CMA would consider a high degree of switching as indicative of close substitutability and a strong competitive constraint. Examples of useful evidence include:

   (a) Data showing public transport passengers switching to car in response to, say, fare rises;

   (b) Survey data showing which modes of transport passengers would use in response to, say, fare rises;

   (c) Internal documents showing that car usage is regularly taken into account by public transport operators when planning fare changes to public transport;

   (d) Internal documents showing that public transport operators benchmark their services against private transport.

4.7   Substitutability between modes of transport typically differs according to the characteristics of the local area. Therefore the most relevant evidence to assess the impact of a Rail Franchise merger on competition is specific to individual flows. Where evidence of a constraint from a different mode of transport (including private transport) is not available on a flow-specific basis, the CMA may consider broader evidence in the competitive assessment on a case-by-case basis.

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[13] This excludes taxi rides.
[14] Arriva/Northern Final Report ¶6.12.
[15] For example, on two neighbouring rail flows, passengers may be able to travel by bus on one flow but not the other. Therefore, concluding that bus travel is in the relevant product market would not be appropriate as a general proposition, whereas it might be appropriate for an individual flow.

Geographic market

4.8   Passengers travel between a specific point of origin to a specific point of destination (ie a point-to-point journey) and, as such, demand is for transportation between two points. We describe these journeys between start and end points as "flows". A flow may constitute an entire bus or train route or it may be only part of a longer route. The CMA and its predecessor bodies have defined the appropriate geographic markets in Rail Franchise mergers by identifying the Franchisee's overlapping flows. Overlapping flows will generally be defined as follows:

   (a) Rail services between the same two rail stations or the same two settlements.[16] For longer rail journeys, passengers may be willing to travel further to (or from) a station, and the CMA may consider whether two different stations on different lines could constitute alternatives for passengers.[17]

   (b) Bus and rail services where the catchment area of a rail service contains bus stops.[18]

   (c) Coach and rail services between the same two settlements.[19]

4.9   Defining the relevant geographic markets for (a) and (c) are straightforward to implement. However, (b) requires the CMA to define a catchment area for the identification of the origin point and destination point of flows. This assumes that passengers have a choice between transport options that are within a reasonable walking distance. Therefore, the catchment area definition in any given case depends on the services being considered and may also depend on the geographic setting (eg rural vs urban areas).[20] As a practical matter, it is necessary to establish catchment areas and overlaps early in the process. In the phase 1 process, the CMA will adopt a cautious approach by using a

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[16] A settlement can generally be understood as a town or city, and encompasses all rail stations that residents of the settlement may use. In instances where a settlement has more than one station, the stations are combined. For example, travel between Reading and London is possible from two different London stations (Paddington and Waterloo), and so Reading-Paddington and Reading-Waterloo may be assessed as a single Reading-London flow.

[17] The CMA expects that passengers would be more willing to travel further to (or from) an alternative station if that journey is short/cheap relative to the time/expense of the onward rail journey.

[18] Or vice versa. In Arriva/Northern and First/SW, the CMA has defined a catchment area for rail stations and identified bus stops within that catchment area, since rail catchments are expected to be larger than bus catchments.

[19] NEG/Greater Anglia (National Express Group plc and the Greater Anglia franchise, CC 2004). The report does not use the term "settlement", but in this case, the CC's survey found that less than 20 per cent of passengers on the main rail and coach flows between London and Norwich, Ipswich and Colchester walk to the stations or coach stops they use, and that the catchment areas can therefore be wide. It also noted that the origins and destinations of users may also potentially be served by a number of stations or coach stops.

[20] "Catchment areas are a pragmatic approximation for a candidate market …" CC2, ¶5.2.25.

uniform distance for all flows and all franchises in the absence of clear flow specific evidence to the contrary.[21]

4.10   The CMA's usual approach to catchment areas in local markets is to use an area within which 80% of customers for the product or service in question are located. In the case of Rail Franchise mergers, the CMA uses National Travel Survey (NTS) data to identify how far passengers walk to rail stations, as the basis for identifying overlapping bus and rail services. The NTS data shows that, although there is variation between regions, walking distances are generally shorter for shorter rail journeys. In particular, across the country as a whole, 80% of passengers making short rail journeys walked 0.5 miles (approx. 800 metres) or less to the station.[22] In addition, most bus routes are relatively short. As a result, when considering bus-rail competition, the CMA will typically focus on those flows with a shorter journey distance.[23] Accordingly, the CMA's starting point will be to assess catchment areas for all Franchises on the basis of a **walking distance** of 800 meters.[24] Further details are contained in Appendix II.[25]

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[21] In recent decisions (eg Arriva/Northern), the CMA has decided not to vary the catchment areas on the basis of a distinction between urban and rural areas because of the lack of robust data and practical issues around classifying flows as urban or rural (see Appendix II).
[22] Using an 80% catchment area is consistent with the CMA's usual practice for catchment areas in local markets.
[23] However, this would not apply to coach or rail journeys which have longer journey times.
[24] This is generally smaller than an 800m straight line distance.
[25] This approach has developed over time. The CMA first used NTS data in Arriva/Northern, and found similar results for First/SW. However, the CMA has subsequently review its approach and focussed on the walking distances associated with relatively short rail journeys. Accordingly, the size of the catchment area proposed here is smaller than in those two cases.

5. The counterfactual and the identity of the winning Franchisee

5.1 As in all merger inquiries, in order to establish whether the merger may be expected to result in an SLC, the CMA needs to consider what may be expected to happen in the absence of the merger. In many cases, the counterfactual is the existing pre-merger conditions. In certain circumstances, however, the CMA may need to take into account other factors such as expected changes in the structure of the market, or alternative developments that may be expected in the absence of the merger. This is in order to reflect as accurately as possible the CMA's expectation of the process of rivalry which will occur in the absence of the merger.

5.2 Transactions involving the award of a rail franchise are an example of where the pre-merger situation has not been found to be the correct counterfactual.[26] This is because the current franchise agreements will terminate and therefore there could not be an expectation that the current operator would continue to operate the franchise.

5.3 The CMA's Merger Assessment Guidelines state that it will treat the counterfactual in Rail Franchise mergers as the award of the Franchise either to a firm that raises no competition concerns, or if there is no alternative bidder that does not raise competition concerns, to a hypothetical bidder, with any competition concerns being remedied through behavioural remedies. In practice, both alternatives have the same effect, namely a counterfactual that does not involve any competition issues.[27]

5.4 However, the wording in the Merger Assessment Guidelines concerning behavioural remedies has led parties to suggest that a more detailed analysis should be carried out in assessing the sort of remedies that might be put in place under the counterfactual.[28] The CMA considers that speculation as to the precise nature of remedies that might be put in place under a counterfactual is not appropriate. Accordingly, in assessing the effects of a

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[26] See OFT 1254/CC2 CC2 ¶4.3.28-29.

[27] In FirstGroup/GWR, the CC concluded that 'the appropriate counterfactual to the merger was the award of the franchise either to a firm that raises no competition concerns, or, if there is no alternative bidder that does not raise competition concerns, to a hypothetical bidder, with any competition concerns being remedied through behavioural remedies.' The effect of both alternatives would be the same and in FirstGroup/GWR the CC took as the counterfactual that the services would be operated by another TOC raising no competition problems. The CMA has followed the same approach in several subsequent cases.

[28] In Arriva/Northern, Arriva argued that the other shortlisted bidders also had overlaps with the Northern franchise and would raise competition issues, and that therefore the counterfactual involved some degree of compromise, for example because behavioural remedies are subject to a proportionality assessment. The CMA considered this argument and concluded that the Merger should be assessed against a counterfactual whereby the Franchise is awarded to a train operating company that raises no competition concerns.

Rail Franchise merger, the CMA will use a counterfactual whereby the Franchise is awarded to a Train Operating Company (TOC) that raises no competition concerns. The following provision supersedes paragraph 4.3.29 of the Merger Assessment Guidelines.

> 4.3.29 The Authorities will treat the appropriate counterfactual as the award of the Franchise to a firm that raises no competition concerns.

5.5   The CMA's ability to observe competition under this counterfactual is affected by whether the winning Franchisee was also the incumbent (or whether the incumbent may have had similar overlaps to the Franchisee). This affects the competitive assessment in two ways.

5.6   First, the CMA's analysis will refer to fare rises or quality deterioration *relative to the counterfactual*. Some of the evidence for the assessment is necessarily based on prices and service quality in the previous franchise period:

(a)   If the Franchisee was not the incumbent, the theory of harm will generally be that prices may rise, or quality of service deteriorate, compared to the previous franchise period;

(b)   If the Franchisee was the incumbent, the theory of harm will generally be that under another franchisee, prices may have fallen, or quality of service improved, compared to the previous franchise period.

5.7   Second, if the Franchisee was not the incumbent, the CMA may be able to place greater reliance on internal documents of both the Franchisee and the previous franchise holder as to the competition, or absence thereof, between them in the previous franchise period.[29]

5.8   Finally, the CMA has observed that some successful Franchisees have been a joint venture (JV), for example between a company with other relevant rail franchises or bus operations in the UK (an "overlapping company") and a company without any relevant overlapping operations. This affects the types of analysis described in this guidance in two ways.

5.9   First, it may affect the ability of the overlapping company to influence the JV's operation. The overlapping company may have the incentive to increase fares on the franchise because some passengers would divert to that company's other services, whereas the non-overlapping company would not wish that price rise to occur. In these circumstances, the CMA would wish to

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[29] For example, the CMA found this to be useful evidence when looking at rail-rail competition in First/SW.

understand in detail the extent to which the overlapping company can set fares and aspects of quality on the franchise independently of its JV partner. For example, rail pricing decisions are typically very detailed: on a single service, there may be a range of different advance fare levels and the number of seats available at each fare level may vary.[30]

5.10 Second, it may affect the incentives of the overlapping company. If the JV partner were to increase fares on its overlapping rail or bus services, and passengers switched to the Franchise, the JV partner would gain only a share of the profits from this, corresponding to its interest in the JV. Whilst this would diminish the JV partner's incentives to raise prices (as compared with a situation where it owned the Franchise outright), it would not eliminate them.[31]

5.11 The CMA would wish to understand fully how the JV operates on a case-by-case basis. The CMA envisages that the analysis required in relation to a JV Franchisee could be incorporated within the framework set out in this guidance where appropriate.

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[30] In First/SW the CMA found that First, as 70% owner of the South Western Franchise, was likely to be able to give direction to the pricing team, and therefore the joint venture arrangements did not materially affect First's ability to raise fares.

[31] In First/SW, it was argued that if First were to increase fares on its overlapping rail or bus services and passengers switched to the Franchise, First would only gain 70% of the profits from this. The CMA accepted this argument and took this into account in relevant calculations. However, the CMA noted that this diminished First's incentives to raise prices, rather than removed them. The relevant comparison was between a counterfactual where First received no profits on the Franchise and a merger situation where it received 70% of Franchise profits; and not between 100% of Franchise profits and 70% of Franchise profits.

6. Filters

6.1 The CMA applies filters to the overlapping flows in order to prioritize the analysis on the overlapping flows that are more likely to lead to an SLC. This approach is particularly relevant in cases where a large number of overlap flows require significant quantities of data for assessment. Filtering is a useful tool for focusing the analysis on those overlapping flows that are more likely to result in an SLC. However, this is not a purely mechanistic analysis. Where other evidence, such as internal documents or comments from third parties, suggests that competition concerns may arise on a flow that would otherwise have been filtered out, such flows should be carried through to the more detailed competitive assessment.

6.2 This section sets out the CMA's current view of appropriate filters for future Rail Franchise merger inquiries based on experience of assessing rail-rail and bus-rail overlap flows.[32]

Data requirements

6.3 The CMA will apply a number of different filters in its assessment, based on the circumstances of the case and on the availability of relevant data. In order to minimise the data collection burden on the Franchisee, the CMA will apply those filters that require the least data first, and other filters sequentially.[33]

6.4 A broad set of different categories of data may be relevant to an assessment of the competitive effects of a Rail Franchise merger. This might include fares and frequencies at various times of day, weekdays and weekends. In practice, the CMA will seek to be pragmatic about the data it will use for filtering purposes, based on the operating principles of the Franchisee. For example:

   (a) If bus fares are the same throughout the day, and the operator earns the large majority of its revenue from the peak period (under its own definition[34]), the CMA may focus on data in that peak period.

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[32] See in particular Arriva/Northern and First/SW. As at the date of this guidance, the CMA has not looked at coach-rail overlaps in recent inquiries, but would expect the same general principles to apply.
[33] The order used in this guidance represents the order that has been found to be useful by the CMA in past cases. The CMA is open to a Franchisee applying them in a different order depending on data availability, because the ordering should not affect the set of flows that remain for further analysis.
[34] If the Franchisee defines a peak period and operates services in the same way throughout that period, the CMA is likely to view this as an appropriate definition. In First/SW, the peak period was broad and the CMA was able to focus on this period as the main revenue driver.

(b) If the off-peak period also contributes substantial revenue, and conditions of competition differ significantly from the peak period **or** fares vary between those periods, the CMA may also wish to look at off-peak data.

(c) Similarly, for rail, where peak and off-peak services are often well-defined for fare purposes, the CMA will focus on those periods and ticket types that account for the majority of revenue, but may also look at other periods if they are significant. Where relevant, the CMA would aim to ensure consistency in the data (eg using peak frequencies when looking at peak fares).

(d) The CMA may look at single fares, return fares, or both, depending on their relative importance to the Franchisee.

6.5 Franchisees are encouraged to engage with the CMA at an early stage to determine what data is necessary. It will usually be possible to determine this based on high level statistics rather than individual routes or flows, although the CMA reserves the right to request this data for individual routes/flows if it appears appropriate.

6.6 For bus data, the CMA will wish to understand how the Franchisee is reimbursed for concessionary travel. This affects the analysis in the following ways:

(a) If concessionary passengers are not charged for travel, the Franchisee's incentive to change fares is not affected by concessionary passengers (unless this caused the local authority to change concessionary arrangements). Therefore, it may be appropriate to exclude concessionary passengers and revenue from the data used for filtering.

(b) If in addition the Franchisee is compensated for concessionary travel with a lump sum unrelated to regular fares, the merger is not likely to affect the Franchisee's incentives. In this case it may be appropriate to exclude concessionary passengers and revenue from the data used for filtering.

(c) However, if the Franchisee is reimbursed for "lost revenue", then any bus fare rise would increase the Franchisee's revenue from concessionary passengers (subject to a local authority response). In this case it may be appropriate to include concessionary passengers and revenue.

Types of filters

6.7 This section describes the types of filters that will generally be used in assessing Rail Franchise mergers. The types of filters used may evolve over time in light of the CMA's developing experience in this area. These filters

vary according to whether the assessment relates to bus-rail overlaps or to rail-rail overlaps.

Bus-rail overlaps

6.8   This section sets out the filters that the CMA will generally adopt when assessing bus-rail overlaps.

6.9   The CMA will typically apply filters based on revenue data first (significance of overlap and small flows filters), since this is generally the easiest data to compile. Further data, which may be more difficult to obtain, can then be collected only for flows that remain.[35] This approach reduces the burden and time involved in data collection.

6.10   Bus operators may think about services at the level of the end-to-end route as well as all of the individual flows that fall within that route, and some decisions (such as bus frequency or the quality of vehicles) can be varied primarily or only at the route level. Therefore, the use of filters is particularly helpful in refining the flows for more detailed analysis where it suggests that none of the overlapping flows on a particular route raise concerns. If only a part of the overlap can be filtered out, the CMA may retain concerns about the route as a whole.

Tendered route filter

6.11   The CMA will filter out flows/routes where passengers do not pay a fare to the Franchisee's bus service.[36]

6.12   Bus operators may win contracts from local authorities to operate, wholly or partially, tendered bus routes, including school buses. Depending on the terms of the contract for the tendered routes, the bus operator may or may not charge passengers for tickets. If passengers do not pay a fare, and provided that the terms of the tender prevent the service from being terminated or the frequency significantly reduced or otherwise degraded, then it is unlikely that the Franchisee could cause those passengers to switch to rail (where they would need to pay a fare), and the merger should not cause any change in behaviour. In contrast, if the Franchisee operates the bus service as normal, with passengers paying fares but the tendering authority paying some kind of

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[35] For example, in Arriva/Northern, frequency information on the Franchisee's and competitors' bus services, which TOCs have suggested is difficult to collect, was collected only for the subset of flows that remained after applying the revenue based filters.
[36] In Arriva/Northern, a filter excluding tendered flows/routes was considered but was not relied upon as none of the routes met the relevant criterion. Instead, information on tendered routes was used in the competitive assessment.

subsidy to the service operator, then the Franchisee may have an incentive to increase fares or degrade quality on the bus service in response to the merger.

Route revenue filter

6.13   The CMA, as a first step, will apply a filter excluding each individual bus route with a *total revenue* of less than £500,000 per year.[37] Using this as the first filter avoids the need to identify revenues derived from flows overlapping with rail at this stage (see *Overlapping bus revenue filter* below). The advantage of such a filter is that it removes a number of flows without the need for extensive data collection by the Franchisee.

6.14   The CMA considers that this is an appropriate threshold since even with significant price increases, the maximum gains available to the Franchisee are modest on routes where the bus revenue from flows overlapping with the Franchisee is less than £500,000. The CMA also notes that fare increases would need to ensure consistency across bus routes and between flows, which may limit the ability and/or incentive to increase fares on individual routes or flows (unless the merger creates incentives across many routes/flows).[38] Whilst this need for consistency would not necessarily prevent a fare increase on overlapping flows, it could limit the level of fare increase which the Franchisee may have the incentive to implement. Whilst in theory any positive incentive could be enough for firms to change their behaviour, firms will take action only where the incentives are sufficiently large. Hence the CMA does not expect material competition concerns to arise on such routes.

6.15   However, where two or more bus routes overlap, looking at individual routes may understate the potential revenue gain; and if enough routes are affected by the merger, there could be an incentive to increase zone-based fares. Therefore:

(a)   For multiple bus routes with *significant overlap*, and where that overlap also overlaps with the Franchise, the CMA may adopt a cautious approach and combine the revenues of the bus routes before applying

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[37] In both Arriva/Northern and First/SW, the CMA considered the possible effect on the Franchisee's profits from plausible bus fare rises when the constraint from rail was removed (see Appendix IV). The CMA found that even with significant price increases, the maximum gains available to the Franchisee are modest on routes where the bus revenue from flows overlapping with the Franchise is less than £500,000.

[38] For example, in recent cases including Arriva/Northern and First/SW, the CMA found that bus operators typically seek to apply simple zone-based fares, rather than optimising fares on individual routes or flows. Secondly, bus operators typically offer passes or travelcards covering multiple journeys in a given period which may not be much more expensive than individual tickets.

this filter.[39] It may be possible to determine this on the basis of route maps prior to collecting detailed information.

(b) Where the routes that would be filtered out on this basis together account for a large amount of revenue, either in absolute terms or relative to all routes in the area (ie those used for fare zones), the CMA may consider whether incentives for fare increases could remain.

6.16 For overlapping flows that remain after applying this filter for competitive assessment in the round, the CMA will require details of all of the bus services operating on those flows, even if some of those routes have been filtered out.

Small flows (rail revenue)

6.17 The CMA will filter out rail flows with less than £20,000 revenue per annum. [40]

6.18 The CMA considers that the Franchisee is likely to have limited incentive to increase fares or degrade service quality on the bus services on overlapping flows where rail revenues are low. If rail revenue on an overlapping flow is low, this may suggest that few passengers view rail services as a viable transport option on the flow. On such flows, a degradation in bus service quality or an increase in fares is less likely to result in passengers diverting from bus to rail. Therefore, the Franchisee has a reduced incentive to degrade its bus offer.

Overlapping bus revenue filter

6.19 The CMA will apply a filter excluding each individual bus route with a total *overlapping revenue* of less than £500,000 per year. Following on from the route revenue filter above, which filtered out all individual bus routes with **total** revenue of less than £500,000, once more information is gathered on the remaining routes it should be possible to identify routes where bus revenue from **flows that overlap** with the Franchise is less than £500,000. As noted in

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[39] For example, some bus routes are highly similar and have variants of the same number to indicate this (eg 7, 7A, 7B, 7C). These may run an identical service for the majority of the route and be viewed as interchangeable by many passengers. The CMA would wish to combine these routes for the purpose of most filters. Other routes may overlap for only one or two flows. The CMA may wish to combine these for individual flows, but generally not for the purposes of a route-based filter.

[40] A small flows filter of various kinds has been used in cases including NEG/Greater Anglia (coach-rail), FirstGroup/GWR (bus-rail), and Arriva/Northern. In the latter case, the CMA adopted a rail threshold of £10,000 per annum. Based on further work to understand both the incentive to increase fares, and the potential effect on passengers from any plausible fare increase, in First/SW the CMA found that competition concerns are unlikely to arise on flows of less than £20,000. This filter was referred to as "de minimis" in cases prior to First/SW. This terminology may cause confusion with the exception to the duty to refer a merger in markets of insufficient importance (also known as the "de minimis exception", see CC2 ¶2.8), which is a criterion applied to all markets affected by a merger rather than individual markets. Therefore, this guidance refers instead to "small flows".

paragraph 6.14, the CMA does not expect material competition concerns to arise on such routes. The CMA will generally apply a filter excluding these flows – again, subject to the caveat in paragraph 6.15 that significantly overlapping bus routes should be combined for these purposes.

6.20   The CMA notes that for many bus operators, bus revenue is not captured on a flow-by-flow basis, and revenue may need to be allocated using sensible and conservative principles. The CMA is happy to discuss this with individual bidders.

Significance of overlap filter

6.21   The CMA will generally filter out flows that, when combined, account for less than 10% of the overall bus route revenue. [41]

6.22   Where the overlapping flows on a route account for a small proportion of the route revenue, the incentive for the Franchisee to degrade the bus fare or service offering is likely to be diluted. Some aspects of bus service offer, such as frequency and fare stages, are set at the route level. Changing these aspects of the bus offer at the flow level in response to the merger might therefore mean changing the offer for the route as a whole, which may affect the revenue generated on the non-overlapping flows of the route as well. Therefore, degrading the bus service offering in response to the merger may lead to losses on the non-overlapping section of the route, which are not recaptured by the merger.

6.23   Based on this reasoning, the CMA considers that if the revenue generated on the overlapping flows accounts for a small proportion of route revenue, it is unlikely that the bus operator would have an incentive to degrade the bus service offering on the whole route. This is because the potential losses on the non-overlapping part of the route would exceed the gains on the overlapping flows of the route. Therefore, if the combined revenue from overlapping flows represent an insignificant share of the route, in this instance

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[41] The significance of overlap filter has been applied in the following merger inquires: FirstGroup/ScotRail (FirstGroup plc / ScotRail franchise, OFT (2005), https://assets.publishing.service.gov.uk/media/555de458ed915d7ae2000127/scotrail.pdf.); FirstGroup/ Greater Western (see both FirstGroup plc / Greater Western Passenger Rail Franchise, OFT (2005), https://www.gov.uk/cma-cases/firstgroup-plc-greater-western-passenger-rail-franchise, and Greater Western Passenger Rail Franchise, CC (2006), https://www.gov.uk/cma-cases/greater-western-passenger-rail-franchise-merger-inquiries-cc); National Express Group/Greater Anglia (National Express Group plc / Greater Anglia rail franchise merger inquiry, CC (2004), https://www.gov.uk/cma-cases/national-express-group-plc-greater-anglia-rail-franchise-merger-inquiry-cc); Arriva/Northern; and First/SW. In all cases, if the sum of revenue (or passengers) on overlapping flows on a bus route was less than 10% of the overall bus route revenue or passengers, that route was removed from the competition assessment.

below 10% of the overall bus route revenue, the CMA considers that those flows are unlikely to give rise to an SLC.

Small flows plus (bus revenue)

6.24 The CMA will generally filter out flows which have both less than £20,000 revenue per annum and a cumulative share of 10% of revenue on the relevant route.

6.25 On overlap flows where the annual bus revenue is low, the incentive to flex fares or service quality is likely to be relatively low, since the gain from any such flex would be small, and the CMA recognises that there are costs involved in flexing. The second part of this condition reflects that the Franchisee could have many small flows on a route which, cumulatively, give a merger-related incentive to change fares or quality (see also significance of overlap filter above).[42]

Revenue increment filter

6.26 The CMA will generally filter out flows where rail revenue is no more than 5% of combined bus and rail revenue on the flow.

6.27 In instances where the merger results in a small increase of overlapping flow revenue, the CMA considers it unlikely that the Franchisee's incentives with regard to the larger flow will be significantly changed post-merger. Therefore, competition issues are less likely to arise on such flows.[43]

Effective competitor filter

6.28 The CMA will generally filter out flows where a competitor bus service on the flow runs with a frequency of at least 50% of the Franchisee's bus service.

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[42] A small flows filter has been applied a number of cases (see footnote 40). In most of these cases, the CC adopted a threshold of £10,000 revenue a year and concentrated initial analysis on routes with at least one overlap flow above £10,000. Although these flows are considered individually as "small", their sum could potentially represent significant revenue, and/or a significant proportion of route revenue.[42] For this reason, in Arriva/Northern, the CMA applied a small flows threshold of £10,000, subject to the additional condition that flows on a route add up to no more than 10% of route revenue, as the Franchisee would have only limited incentives to increase fares or reduce service quality on flows of this size. Further work undertaken on the profitability of fare rises in Arriva/Northern and First/SW suggests that competition concerns are unlikely to arise on flows of less than £20,000, consistent with the small flows (rail revenue) filter above. The filter at this level was applied in First/SW, again subject to the 10% cumulative share condition.

[43] In Arriva/Northern, flows were excluded from further analysis where the increment to the Franchisee's revenue on a flow from the merger is 5% or less. This was done by comparing revenues from each of the Northern Franchise's rail flows to Arriva's corresponding pre-merger bus and rail revenue. First/SW followed the same approach, and clarified that this is based on the increment from rail revenues, not the increment from bus revenues, consistent with the CMA's general view that the more likely theory of harm is a worsening of bus services.

Competitors should be identified on the basis of an 800m walking distance from the station, consistent with the Franchisee's own bus services.

6.29 Where, on a flow, the Franchisee faces an existing effective bus competitor, it is likely that this effective competitor would exert sufficient competitive pressure to render a post-merger degradation of service unprofitable. Therefore, the CMA will use an effective competitor filter to focus analysis on flows where such third-party competitors do not exist or where they provide a small constraint.[44,45]

6.30 The CMA has generally considered transport providers within the same mode of transport as the closest competitors to one another. This means that a rival bus service is likely to be a closer competitor to the Franchisee's bus service than is the rail service provided by the Franchise itself, other things being equal.[46]

6.31 When defining an effective competitor filter, it is important to consider the availability and ease of collection of data, particularly in a Phase 1 assessment. Whilst it is possible that competitors' revenue or passenger data offers a better insight into the pre-merger competitive environment, this information may be difficult for the Franchisee or the CMA to obtain within the constraints of the phase 1 process, and so it may be more practical to use frequency data.

6.32 The CMA seeks to use a measure of frequency that is representative (since frequency may vary by day or time of day). In the first instance, the CMA will generally use peak weekday frequencies, and may also consider as a sensitivity using for example off-peak and/or weekend frequencies.[47] Where

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[44] An effective competitor filter has previously been applied in FirstGroup/ScotRail, FirstGroup/ICEC (FirstGroup/ICEC merger inquiry: commentary on issues statement, CC 2005), FirstGroup/GWR, and Arriva/Northern.

[45] The CMA may consider whether there is an effective rail competitor as well. A rail competitor may make diversion to rail unprofitable if there is significant diversion to the rail competitor. However, as stated in the next paragraph, the CMA considers a competitive constraint from within mode as stronger. Therefore, an effective rail competitor should be no less competitive compared to the Franchisee's bus offer.

[46] The appropriate definition of an effective within-mode competitor has differed between previous transport inquiries because the effectiveness of competition is dependent on the specific geographic characteristics of the flows or routes in each case. The CC and the CMA have previously applied the following definitions of an effective competitor:
- In FirstGroup/ScotRail, competition was considered effective if competitors offered a comparable frequency of service.
- In FirstGroup/GWR, the CC defined an effective competitor as one that provided a service with at least 50% of the frequency of the Franchisee.
- In Arriva/Northern, the CMA defined an effective competitor as a competing bus service operating with at least 50% of the frequency of the Franchisee's service.

[47] The CMA will be more likely to consider sensitivities where (a) peak weekday results are marginal, (b) peak weekday does not account for the majority of revenue/passengers, or (c) third parties or internal documents suggest that other times are important.

more than one bus service from the same operator is active on a flow, the CMA will generally combine the frequency of those buses.[48]

Rail-rail overlaps

6.33 This section sets out the filters that the CMA will generally adopt when assessing rail-rail overlaps.

Implausible flows

6.34 The CMA will filter out flows where it is clear that the Franchisee's rail services are not plausible alternatives for passengers. Although rare, the CMA may sometimes identify services that are not plausible alternatives for passengers (where the journey characteristics of the rail options are so different that the consumer is unlikely to consider both options when deciding how to make their journey) and will filter them out of the analysis without the need to collect further information on them. The CMA is likely to accept this as a filter only where it is clear-cut. In particular, the CMA will consider whether passengers may be willing to trade off large differences between rail services, such as a longer journey time being compensated by a lower fare price.[49]

Small flows (rail revenue)

6.35 The CMA will generally filter out rail flows with less than £20,000 revenue per annum.

6.36 On overlap flows where the annual revenue is low, the incentive to flex fares or service quality is likely to be relatively low, since the gain from any such flex will be small (see also ¶6.18).[50]

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[48] This applies both to the Franchisee and to individual competitors, but not to combining the frequencies of buses from different competitors.

[49] For example, in Arriva/Northern, the CMA decided to exclude flows between York and Tyne and Wear because the CMA considered that using a Northern rail service would not be a plausible alternative to the other (direct) Arriva services. In that case, completing a journey between these points on Northern services required a significant diversion via the West Coast and Carlisle or using third party operators for part of the journey, but fares were the same. It was unlikely that consumers would consider the two journey methods as viable alternatives when considering travel options. As such, there was unlikely to have been competition between two TOCs on the flow pre-merger.
By contrast, the CMA did not use this filter in First/SW even though some overlaps flows had significant differences in travel times. The CMA preferred to assess them using GJC.

[50] A small flows (or "de minimis") filter has previously been applied ina number of cases (see footnote 40). In most cases, the CC and the CMA adopted a threshold of £10,000 revenue a year. Based on further work to understand both the incentive to increase fares, and the potential effect on passengers from any plausible fare increase, in First/SW the CMA found that competition concerns are unlikely to arise on flows of less than £20,000 (as with the bus-rail small flows filter).

Regulated and inter-available fares

6.37   The CMA will generally filter out flows where <u>both</u> (i) inter-available fares account for 100% of revenues and (ii) regulated fares account for more than 80% of revenues. The definition of inter-available fare for the purposes of this filter is at ¶6.41 below.

6.38   TOCs can compete on flows by setting unregulated fares. Many fares are valid on any service, but some are not. For example, a TOC may use a specific fare allowing travel only on a particular service, to attract passengers away from other TOCs. For flows where travel is predominantly on fares valid on any service – "inter-available fares" – there is limited price competition and so little scope for a loss of competition. The CMA will also take into account the extent to which fares are regulated on the flow. These considerations are complex and may vary by franchise, and so the CMA will generally take a relatively conservative approach to using such considerations in a filter (but will fully consider them as part of the competitive assessment).[51]

6.39   The CMA will generally take into account three factors in an inter-available or regulated fares filter:

(a)   If no dedicated fares are available, then there may be (currently) no price competition. The CMA would consider whether this might change in the future in the counterfactual.

(b)   If dedicated fares are available but little-used, it may be that they are constraining inter-available fares (ie dedicated fares would attract more passengers if inter-available fares rose) and therefore such fares are more important to competition that their usage suggests.

(c)   Concerns that dedicated fares may be constraining inter-available fares will be relieved if all or most inter-available fares are regulated.

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[51] An inter-available or regulated fares filter was applied in the following cases:
- FirstGroup/ICEC where the CC did not make a distinction between fully and routed inter-available fares (see paragraph 6.40 for a definition): the CC found that where a significant proportion (over 90%) of tickets were inter-available, it was likely that there was little price competition on the flow.
- Arriva/Northern excluded flows where fully and routed inter-available fares account for 100% of revenues and regulated fares account for more than 80% of revenues. For the purpose of the inter-available fares filter, fully and routed inter-available tickets were combined in the revenue share calculation.
- First/SW took into account further evidence to relax the criteria in Arriva/Northern slightly, as described in more detail below.

Types of inter-available fare

6.40 The CMA distinguishes between two different types of inter-available fares (fully inter-available fares and routed inter-available fares) as well as dedicated fares.[52]

   (a) Fully inter-available fares: a fare is fully inter-available if, on a flow, a passenger is allowed to travel on any TOC on any permitted route. These fares are set by the lead operator on the flow.[53]

   (b) Routed inter-available fares: a fare is routed if, on a flow, a passenger is allowed to travel on any TOC but on a specific route. For example, on the flow from A to B, it is possible to travel through either one of two intermediate stations, C or D. A routed fare might specify that a passenger has to travel via C, but may travel on any TOC that services the route via C.

   (c) Dedicated fares; those fares are specific to a TOC. For example, on the flow from A to B, a passenger can only use the TOC issuing the dedicated fare.[54]

6.41 For the purposes of merger assessment, routed inter-available fares can be treated in the same way as fully inter-available fares if the Franchisee's overlapping services run on the same route; if they run on different routes, routed inter-available fares can be treated as dedicated fares. Therefore, in the remainder of this guidance, and in practice, the CMA will use the following terms:[55]

   (a) A **dedicated fare** is one that is specific to a TOC, or is a routed inter-available fare that is only valid on one of the Franchisee's overlapping services;

   (b) An **inter-available fare** is one that is either fully inter-available, or a routed inter-available fare that is valid on both/all of the Franchisee's overlapping services.

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[52] This approach was first used in Arriva/Northern.
[53] This is usually, but not always, the operator with the most services on the flow.
[54] Those may be walk-up fares or advanced fares.
[55] Other specific restrictions may apply to various fares (eg on time of day). The CMA may deviate from these definitions if a more complex scenario arises, but will aim to be consistent with the principles set out above.

6.42   The CMA may consider whether it is appropriate to vary the criteria for this filter, if this can be done in a simple way consistent with the principles of the filter in question. This section discusses relevant considerations. If the evidence is not sufficiently straightforward or clear-cut to modify the filter, the CMA will instead take these considerations into account in the competitive assessment.

6.43   First, the CMA may consider lowering the inter-available threshold if the evidence demonstrates that this is appropriate. For example:

(a)   Some dedicated fares are available for only very limited times of day, or are available only as first class upgrades. As these fares are generally of less relevance to competition, the CMA may treat some flows with these limited dedicated fares as being 100% inter-available.[56]

(b)   If dedicated fares are offered only by the lead operator, then the dedicated fares are unlikely to be constraining the level of inter-available fares because the lead operator sets both fares.[57] However, the CMA may still be concerned that the lead operator would remove those dedicated fares as a result of the merger, in which case filtering out these flows would not be appropriate if they represent material revenue. The Franchisee may be able to address this concern in circumstances where its internal documents show that the purpose of dedicated fares is to attract new passengers to rail or to manage demand, rather than to attract passengers from the other franchise.

6.44   Secondly, the CMA may also consider lowering the regulated fares threshold if there is appropriate evidence that new dedicated fares would not be introduced in the counterfactual. Appropriate evidence may include internal documents from all relevant TOCs. The CMA will generally give more weight to this in a situation where, pre-merger, different TOCs operate the overlapping services, ie the CMA can effectively observe a plausible counterfactual with competition.[58] If the same TOC operated the overlapping services pre-merger,[59] the CMA will consider whether more price competition would have taken place in the counterfactual, ie where a competing TOC

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[56] This approach was adopted in First/SW, where these dedicated fares accounted for a very small proportion of revenue.
[57] This was the case on some flows in First/SW. Conversely, if the non-lead operator offers dedicated fares, the CMA may be concerned that (a) these may be removed as a result of the merger, and (b) they may be constraining the inter-available fare set by the lead operator.
[58] This will generally be the case when the franchise has not been awarded to the incumbent TOC.
[59] This will generally be the case when the franchise has been re-awarded to the incumbent TOC.

operates the franchise.[60] This may be more appropriately done as part of the competitive assessment if it is not sufficiently clear-cut to use as a filter.

Effective competitor

6.45   The CMA will filter out flows where at least one third party rail operator has a revenue share of at least 50%. On overlap flows where third party rail operators have a significant share of revenue (or passengers),[61] incentives for the Franchisee to degrade fares or service quality are likely to be diluted if a significant proportion of passengers have alternative operators to which they may divert in such an event. For example, if the Franchisee increased rail fares, a portion of passengers would be likely to divert to third party rail services (providing they offer a similar level of service), reducing the profitability of doing so. Flows that are subject to competition from third parties can be filtered out on this basis.[62] Since revenue information is generally easily available, the CMA will usually use this to measure the strength of competitors.[63]

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[60] For example, on some flows in First/SW, GWR (operated by First) was competing with South Western (operated by Stagecoach pre-merger), and the CMA was able to use internal documents from both TOCs to examine whether the limited use of dedicated fares was constraining inter-available fares, and whether either had considered introducing more extensive dedicated fares. These documents suggested that dedicated fares did not play an important role in competition (ie the pre-merger situation was representative of the counterfactual on those flows), and the CMA was able to clear them even though the proportion of regulated fares was relatively low (ie regulated fares accounted for well below 90% of revenue on these flows).

[61] Usually there is at most one third party competitor on a flow. If there is more than one, but none with more than 50%, the CMA will wish to consider whether third party competition is effective.

[62] An effective competitor filter was applied in the following cases: FirstGroup/ICEC, Arriva/Northern Rail and First/SW. In these cases, an effective competitor was defined as:
- a third party rail operator that provides at least 50% of the number of services, or has at least 50% of revenue/passengers on the flow (FirstGroup/ICEC).
- a third party rail operator with a revenue share of 50% on a flow (Arriva/Northern Rail and First/SW).
  There are generally few barriers for customers to switch between TOCs and the CMA has seen no evidence that consumers have brand loyalty, as long as the competitors provide comparable services; and a high revenue share indicates a credible alternative.

[63] This may not be readily available to the Franchisee in granular form if more than one third party offers services on the flow. This situation is relatively rare. If it arises, the CMA may be able to obtain the necessary data from third parties, or an alternative measure could be used.

7.   Competitive assessment

7.1   This chapter describes the CMA's approach to further assessment of flows that do not pass the filters described in the previous chapter. This chapter first describes the approach to bus-rail overlaps, and then the approach to rail-rail overlaps.

7.2   For both types of overlap, after carrying out a filtering exercise, the CMA may find that there are certain overlapping flows which can be cleared without further information.[64] For example, where one service is extremely infrequent, or where the historical data provided do not reflect the situation in the counterfactual (eg because a route has changed), and where there are no aggravating factors, the CMA may decide that no more information is needed to carry out a simple "in the round" assessment. The CMA would expect this to apply only where the assessment would be relatively clear-cut.

Assessment of bus-rail overlaps

7.3   In this section, we set out the competitive assessment of bus-rail overlaps. The assessment focuses on the question whether the Rail Franchise merger has resulted in or may result in an increase in fares and/or a degradation of non-price aspects (including journey time, frequency of service and service quality) of the Franchisee's bus and rail services on the overlapping flows.

7.4   For reasons discussed above,[65] the following sections predominantly discuss the analysis of the Franchisee's bus services. However, the ability and incentive for the Franchisee to degrade its rail offer should also be considered on a case by case basis.[66,67] Important factors to consider are the regulation of rail fares on an overlapping flow, and the franchise agreement obligations, specifically relating to the frequency of services and the quality of rolling stock.[68]

7.5   This theory of harm is assessed by establishing whether the Franchisee would have the ability and incentive to increase fares or offer a lower quality

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[64] For example, this was done in First/SW.
[65] Paragraph 3.2.
[66] An assessment of the franchise agreement should inform which aspects of the rail service are flexible and which are fixed. In Arriva/Northern, the CMA was satisfied that the franchise agreement covered a wide range of rail service aspects and focused its analysis on changes of service levels for buses.
[67] In particular, open access operators are generally not so tightly regulated, and so the CMA may look more closely at non-fare theories of harm if the Franchisee has overlapping open access operations.
[68] See Arriva/Northern ¶¶8.35-65.

service, relative to the counterfactual. In this section we address how the CMA expects to analyse ability and incentive.

Ability

7.6   Bus passengers may be presented with alternative ticket types that will allow travel on the same flow. For example, a ticket might allow unlimited travel within a city. Those types of tickets may provide a constraint on the ability of the bus operator to increase individual flow-specific fares. Below we discuss different ticket types and how they may constrain fare increases on individual bus flows.

Zonal fares

7.7   Zonal fares offer passengers unlimited travel for a set period of time within a defined geographical boundary on a specific bus operator. If the Franchisee offers a zonal fare that includes an overlapping bus flow under investigation, that zonal fare may act as an upper bound on any increase in the normal fare for that flow. A rational consumer would not purchase a flow-specific fare if there is an eligible zonal fare that allows the same journey at a lower cost. The constraint from zonal tickets can be assessed by calculating the headroom, ie the difference between eligible zonal fares and the relevant corresponding fares on the overlapping flow. For example, where a bus fare (return) for a flow is £2 and passengers also have the choice to use a zonal ticket for the same flow at £2.50, the headroom is £0.50.[69]

7.8   In assessing the possible effects of the merger, both the size of the headroom and the number of tickets sold should be taken into account. A flow with small headroom, but a large number of passengers affected, could suffer high overall detriment.

7.9   As the zonal fare is set by the bus operator (ie the Franchisee), the CMA also considers the potential for the Franchisee to raise the fare of zonal ticket(s) in order to allow greater headroom for an increase in fares on the overlapping flows. If the revenue of the relevant overlap flows combined is a small proportion of the revenue of each corresponding zonal fare, it is unlikely that the merger creates a sufficiently strong incentive for the bus operator to increase zonal fares.

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[69] The headroom of a single ticket is the difference between the zonal fare and twice the single fare. A single ticket may also be constrained by the return fare. However, because, by assumption, the return ticket fare can also be increased up to the level of the zonal fare, the single ticket should be compared to the zonal fare.

Multi-operator tickets

7.10   Multi-operator tickets offer passengers unlimited travel for a set period of time within a defined geographical boundary, across multiple transport operators. The arguments above as to why zonal tickets may constrain the Franchisee's ability to raise fares also apply to multi-operator tickets. Again, the headroom can be assessed following the reasoning set out in paragraph 7.8. Additionally, any changes to the terms of eligibility or pricing of multi-operator tickets generally require agreement between all participating Franchisees. This makes flexing those fares less likely, and so such fares are more likely to be a firm constraint.

Fare stages

7.11   Graduated fare stages are often employed by bus operators across routes and geographical areas. Graduated fare stages generally follow a logical fare structure whereby the cost of travel increases as the bus journey becomes longer. If a bus operator were to break its graduated fare structure by raising a fare above the price of the next fare stage, passengers might start purchasing the ticket for the additional fare stage. Hence there is a limit to which a bus operator can increase fares within the fare schedule. This will likely pose a constraint on the Franchisee's ability to raise fares on such flows. However, while there might be costs associated with adjusting a fare schedule, a bus operator may have the incentive to do so if the gain from adjusting the fare schedule outweighs the costs.[70]

7.12   The CMA will therefore seek to understand fares on an overlapping flow within the wider context of the graduated fare stage on the route. In order to assess the degree to which such fare structures may pose a constraint on the Franchisee's ability to raise prices, it is possible to calculate the difference between the applicable fare stage on an overlapping flow and the next fare stage on the route.[71] This assumes that the overlap flows form a sufficiently small proportion of relevant revenue that the Franchisee would not have an incentive to make changes to the structure or level of pricing at the fare stage.

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[70] In Arriva/Northern, the CMA did not see evidence of costs of adjusting a fare schedule.
[71] For example, if the fare to the passenger's destination is £1.50, while the fare to the next stop is £2, the bus operator can increase the fare by £0.50 to £2. If the fare increases to more than £2, the passenger would buy the £2 fare instead.

Incentive

7.13 On the flows where operators have the ability to increase price or otherwise degrade service offering, we next assess the incentive to do so. The CMA also assesses possible countervailing factors, such as the potential for entry.[72]

7.14 Below we list different indicators that may be used in this assessment.

Substitutability and closeness of competition

7.15 The CMA will use a Generalised Journey Cost (GJC) approach to assess the substitutability between different public transport services. The CMA will generally not find a competition problem on flows with a GJC difference of more than 25%, but flows with a greater difference may still be assessed further if other evidence suggests that the services were competing closely or there are concerns at route level.

7.16 When assessing the unilateral effects of a merger, the CMA evaluates the closeness of substitution between the Franchisee's services, ie between rail and bus in rail franchise cases. Services that are perceived as close substitutes by passengers are more likely to engage in competitive behaviour under separate ownership, and so the merger may have greater effects. Therefore, identifying overlapping bus and/or rail services that are close substitutes allows the CMA to focus on those flows where an SLC is most likely to arise as a result of the merger.

7.17 When choosing between different transport services – either different modes, or two different services on the same mode – a passenger may take into account the different characteristics of those modes. The characteristics affect the total costs of the journey. The different characteristics that may influence the decision of a traveller include:[73]

(a) Fares; fares are an important consideration in the choice of passengers. If all the other factors of a service are the same, one would reasonably expect that, on average, passengers choose the cheaper transport option.

(b) Journey Time; shorter journey times are generally preferred.

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[72] CC2, Section 5.9.
[73] The list is not exhaustive. We provide more detail on how to include additional factors in the GJC in Appendix III.

(c) Frequency; the less frequent a service is, the greater are the expected waiting costs. For frequent services, this may be in the form of time spent waiting at the station or bus stop; for infrequent services, it may be in the form of travelling at a less favoured time of day.[74]

7.18 The CMA assesses closeness of competition between bus and rail services on overlapping flows by considering the similarity of services in terms of fares, frequency, journey times, whether services are direct and any other relevant flow-specific considerations. In the assessment, the different characteristics are weighed against each other, according to expected passenger behaviour.

7.19 To weight the flow characteristics, one approach used by the CMA is to calculate the GJC of each of the overlapping services.

7.20 The GJC is a measure of the overall cost of a journey to the passenger which can be used to combine observed flow characteristics into a single number for easier comparison. The GJC provides a weighting of the different mode characteristics, including fares, journey time and frequency, based on econometric estimates of passengers' preferences. If the GJCs of the overlapping services are very different, this will suggest that the services do not compete closely. A similar GJC does not necessarily mean that the two compete closely, but the CMA would not be able to rule out competition concerns on such flows on this basis. The CMA would however take into account the differences between the services in a more detailed assessment. The technical details of the GJC calculation are described in Appendix III.[75]

7.21 A caveat to this approach is that the GJC may not take into account all the service characteristics (for instance, one service may be more crowded and less attractive). A second is that the GJC may represent an "average" passenger, but different passengers have different preferences (for example, commuters and leisure passengers may place different values on fares and

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[74] Where more than one service operates on the same flow, it may be appropriate to combine the frequency of those services if passengers are likely to view them as substitutes (eg assuming that fares and journey times are similar). This could be applied as a sensitivity.

[75] In Arriva/Northern the CMA used GJC twice to assess whether, on a flow, bus and rail are close substitutes. The CMA prioritised flows with a difference in GJC of less than 25% (using bus GJC as the denominator, and based on single fares). This meant that all flows with a GJC difference above 25% were not subject to further analysis in the absence of exacerbating factors. The 25% threshold was chosen on a cautious basis because it is used to prioritize the analysis on potentially problematic flows.

In First/SW, the CMA used the same approach for both bus-rail and rail-rail overlaps, focussing on single fares since they were the most-used fare type. The CMA also looked at return fares as a sensitivity since on some flows these tickets were often used.

journey time[76]), and so a similar GJC on average does not mean that individual passengers consider the services to be close substitutes.

7.22 The GJC does not take into account the distance between rail station and bus stop, which may be an important factor for consumers. This is partly for technical reasons,[77] and partly because this would vary between consumers depending on the ultimate start and end point of each individual's journey (eg home and work). However, if there is evidence that the majority of passengers start or end their journey close to one stop or station, the CMA will take this into account in its assessment.

Profitability analysis

7.23 For remaining flows, the CMA may seek to estimate the size of the profitability of increasing fares by using financial modelling, using the constraints discussed under "Ability" above.[78] The CMA will generally not find a competition problem on an overlap flow where the profit incentive is less than £10,000, unless there is a higher profit incentive when taking into account a number of overlap flows on the same route or a combination of overlapping routes.[79]

7.24 If potential profits are negative, or are low relative to the costs of changing fares,[80] then this may indicate either that harm is unlikely to arise or that the magnitude of harm would be small. However, the reliability of these models will depend on the robustness of their underlying assumptions, in particular diversion ratios and the assumed increase in fares.[81] Whilst in theory any positive incentive could be enough for firms to change their behaviour, the CMA recognises that firms will take action only where the incentives are sufficiently large.

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[76] Commuters are usually more time sensitive and leisure travellers more fare sensitive.
[77] PDFH notes that "Important as they are, access and egress time does not enter the GJT measure. It is not valid to simply add terms to the GJT equation, such as measures of reliability or access and egress times, whilst retaining the GJT elasticities recommended." See PDFH v5.1 (April 2013) Chapter B4, *Journey Time, Frequency and Interchange*, page 2.
[78] Because we use a financial model, the model does not attempt to estimate the profit-maximising fare increase on a flow.
[79] For example, in Arriva/Northern and in First/SW the CMA decided to combine several adjacent flows on a route when calculating the profitability of a fare rise.
[80] The CMA welcomes evidence on the costs of changing fares.
[81] This section refers to an increase in fares. As discussed in Section 5 above, if the incumbent retains the Franchise, a price increase might not be expected. Instead, this section could be thought of as assessing a possible reduction in fares if a competitor with no overlapping bus services won the Franchise.

Assessment of rail-rail overlaps

7.25   In this section we set out the assessment of the competition effects on overlapping rail services of a Rail Franchise Award. We address how the ability and incentive to increase fares and/or reduce service quality on a rail flow can be analysed.

7.26   The discussion below focuses on fare-related theories of harm. However, there are non-fare aspects of a flow or route that might be important in the assessment of the merger effects. There are, in principle, various aspects of rail quality that could be varied (to reduce costs), such as service frequency or the quality of rolling stock, and in some cases the CMA may consider these as further Theories of Harm. However, these are generally a secondary consideration. First, in most cases it is difficult to vary quality on an individual flow without affecting the entire route, and most rail-rail overlaps only take up a subset of the route; therefore the incentive to vary quality is reduced. Second, in the assessment of the ability and incentive of a TOC to behave in a particular manner, conditions of the franchise contract should be taken into account.[82,83] The CMA will also consider the impact of regulation of quality and compliant monitoring by DfT in carrying out its assessment.[84]

Ability

Headroom to increase fares

7.27   Rail fares can be distinguished between regulated and unregulated fares. TOCs are obliged to follow fare regulation for regulated fares. Moreover, all increases in regulated fares are set by a formula, which is set by the DfT and based on RPI. This suggests that TOCs do not have the ability to adjust regulated fares in response to a merger.[85] Therefore, when assessing the Theory of Harm for each flow the CMA assesses the ability and then the incentive to adjust unregulated fares.[86]

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[82] One case where a service quality related theory of harm might become more important is if the Franchisee is also an open access operator on the relevant flows.

[83] In the case of Arriva/Northern, the CMA analysed parts of the Franchise Agreement and discussed issues around quality and the franchise agreement with DfT before concluding that the franchise contract restricted the ability to adjust quality of the franchise. Because of the extensive regulation of quality and compliance monitoring by DfT, the CMA decided that a service quality-specific theory of harm was unlikely.

[84] The CMA will consider the Franchise Agreement to determine whether it can rule out service based theories of harm. Open access operators are generally not so tightly regulated, and so the CMA may look more closely at non-fare theories of harm if the Franchisee has open access operations.

[85] The CMA has focused on unregulated fares in past cases where regulation was different. However, this should be assessed if regulation changes.

[86] The theory of harm could apply to regulated fares if those are set through a fares basket.

7.28 The ability to increase unregulated fares might be limited by regulated fares, which, in practise, are likely to provide a fare ceiling. For example, if the return ticket is the regulated fare on a flow, the unregulated single fare may not be priced above the fare of the return ticket (because passengers would buy the return ticket even for a single journey).[87] Similarly, an unregulated but less restricted[88] ticket might also provide a price ceiling (although the CMA would also consider whether that fare might also be increased following the merger).

7.29 Therefore, a TOC has the ability to increase unregulated fares if there is headroom relative to other, especially regulated, fares on a flow. The scale of competition concerns arising on that flow with respect to fares can be assessed by measuring the headroom on the flow and the revenue from unregulated fares on the flow.

Incentive to increase fares

7.30 The next step in the analysis is to establish the incentive for the Franchisee to increase fares on a flow. This section provides an overview of the different building blocks of the assessment of incentives. In the final assessment those building blocks are considered on their relative merits on a flow by flow base.

Substitutability and closeness of Competition

7.31 Passengers are generally willing to substitute TOCs on their journey if the TOC offers comparable journeys. Furthermore, passengers will be more responsive to small changes in the service offering the closer substitutes the TOC are to one another. Therefore, the closer substitutes TOCs are the stronger the competitive constraint those TOCs pose on each other.

7.32 In this section we discuss indicators that can be used to assess the closeness of substitution between TOCs in a merger inquiry.

Flow characteristics

7.33 The characteristics of a TOC's service on a flow are helpful in understanding the closeness of substitution between TOCs. Some of the characteristics that can be used to assess the closeness of substitution of the different services

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[87] The CMA understands that many classes of single fares are usually priced £0.10 below the corresponding return fare.
[88] For example, a fully inter-available fare might be the upper bound for a dedicated or routed inter-available fare; and a routed inter-available fare might be the upper bound for a dedicated fare. See paragraph 6.40.

on a flow are listed below. Other things being equal, passengers are more likely to choose the service with:

(a) lower fare;

(b) lower journey time;

(c) a direct service;

(d) higher frequency; or

(e) higher quality service in other respects.

7.34 However, if services differ in more than one respect, passengers may have to trade-off journey characteristics in their service choice. For example, some passengers may be more price sensitive and therefore prefer the low fare service, accepting the longer journey time. Other passengers are more time sensitive and may choose the more expensive but faster service.

7.35 As a general principle, if services have similar journey characteristics, they should be considered as close substitutes and therefore competition concerns are more likely to arise. Furthermore, if there are more than two services operating on a flow, a ranking of services with respect to closeness of substitution may be established. If the merger is between services that are close in the ranking, competition concerns are more likely to arise.

7.36 There are two systematic ways in which the CMA has compared characteristics: MOIRA modelling and GJC analysis. These are methodologically similar, and each is briefly described below. The CMA will also take differences in characteristics into account in the overall competitive assessment of remaining flows.

MOIRA modelling for competition analysis

7.37 To test the substitutability of overlapping rail services the rail industry standard model **MOIRA** can be used. [89] The model is used in the industry, and by DfT, to estimate passenger allocation in response to changes to services, such as time table changes. The CMA has found this to be most useful for flows where passengers have a choice of more than two rail services; where there are only two services, those services are always likely to be the closest substitutes to each other. The CMA will use MOIRA data to calculate a "**revenue retention (RR) ratio**", described below, and will

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[89] In this section, we provide an overview of how MOIRA analysis can be applied in a merger assessment. The technical detail is presented in Appendix V.

generally not find a competition problem on a flow where the ratio is below 50%.

7.38   The MOIRA model relies on timetable information, passenger preferences and estimates of generalised journey time (GJT). The GJT combines journey time, frequency and interchange-penalties to allocate passengers to specific trains.

7.39   MOIRA may be used to identify flows which are close alternatives.[90] Specifically, the RR ratio can be used to assess the closeness of alternative TOCs. The RR ratio is defined as the total revenue gain to a TOC relative to the total revenue gains of all TOCs in response to a hypothetical degradation of the service of a TOC on a flow. The total revenue gain is generated from passengers that are choosing to travel on a different TOC and therefore do not exit the rail system. The RR ratio may be calculated by using various scenarios, but the CMA will generally focus on the following two:[91]

   (a) The services of the Franchisee on a flow are withdrawn. This forces passengers to either travel on other providers or to exit the railway system, ie travel by other transport modes or not travel at all.

   (b) An increase in the journey time of all services on the flow from the franchise in question. While the removal of whole trains from timetables (as above) provides an effective way to analyse diversion of passengers, it is an extreme scenario. It is possible to simulate the effects of fare rises by assuming that fare increases are similar to time penalties for passengers.[92,93]

7.40   A higher RR ratio suggests a high degree of substitution between TOCs. If passengers divert to a particular TOC in high numbers, and therefore increase the revenue substantially at that TOC, the implication is that the degree of substitution is high between TOCs. For example, consider a hypothetical flow with three services operating (directly or indirectly) on the flow: the Franchise, A; another service run by the Franchisee, B; and a third party service, C. Suppose that A's service is slowed down. A RR ratio for A to B of close to one

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[90] For a detailed explanation of MOIRA and its application in the competitive assessment of the Arriva/Northern inquiry, see Annex 1 to Appendix E of the final report.
[91] Both of these were used in Arriva/Northern and First/SW.
[92] This assumption is supported by GJC, which converts time based measure, such as journey time, in the calculation of GJT into monetary costs (or vice versa). Hence a fare increase can be converted into a time penalty.
[93] For example, in Arriva/Northern the CMA tested the sensitivity of the RR ratio with respect to service withdrawals, by calculating the RR ratio with a 10 per cent increase in journey time. The CMA found that both types of RR ratio (withdrawal of service and slowing down of service) yielded broadly the same results.

suggests that of the passengers diverting away from A to a different TOC, almost all passengers divert to B and indicates that the Franchisee's two services are close substitutes.[94]

7.41   Therefore, on flows with a high RR ratio, the incentive to increase fares or degrade quality are likely to be high. This is because absent the merger, a proportion of the revenue gain would have been lost to competing TOCs, but post-merger most of that is retained by the Franchisee, and hence the merger may create incentives to increase fare or degrade quality.

7.42   The CMA will generally consider that a RR ratio below 50% is indicative of a lack of competition concerns.[95] Beyond this threshold, the two TOCS are likely to be each other's closest competitors, and (depending on fares) the Franchisee would likely retain half or more of any passengers that switch away in response to changes to the service.[96]

7.43   A caveat to this type of analysis is that MOIRA does not include fare information and so allocates passengers based purely on non-fare characteristics, such as journey time and frequency. The model does not consider the trade-off passengers face between fares and other journey characteristics. Therefore, MOIRA may allocate passengers to, for example, a more expensive train than they would actually choose. If fares are similar between the alternative services, this is less of a concern.

GJC analysis

7.44   The CMA may also use GJC analysis, as described in the bus/rail overlaps section above and subject to the same caveats.[97] The CMA would be unlikely to find a competition problem on flows which have a GJC difference of greater than 25% for all calculated values of GJC.[98] However, flows with a greater difference may still be assessed further if other evidence suggests that the services were competing closely.

7.45   For rail-rail overlaps, the CMA will consider more than one GJC calculation, since it will wish to use each different franchise as a denominator (since the Franchisee could plausibly degrade any service it operates). For example, if one franchise has a GJC of 80 and the other 100, then the difference could be

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[94] While MOIRA approximates the number of passenger exiting the rail system, it is not possible to assess which other modes of transport those passengers choose, or whether they completely stop travelling.
[95] This was the threshold used in Arriva/Northern.
[96] This problem is stronger if the RR ratio is calculated based on the withdrawal of a service.
[97] ¶7.20ff.
[98] This approach was used in First/SW.

expressed as (100-80)/80=25% or as (100-80)/100=20%. The CMA may also wish to consider different ticket types as a sensitivity.[99] More weight will be placed on the ticket type that is more commonly used on the flow.

7.46 The intuition behind the GJC approach is related to MOIRA modelling (MOIRA effectively uses GJT in calculating the diversions of passengers when a service is degraded, and so the results are related to GJC). However, the outputs of a GJC calculation may add to the CMA's understanding of competition on a flow. In particular, where only two services run on a flow, MOIRA modelling will typically indicate a high RR ratio, but GJC may indicate that the two are not close substitutes once fares are taken into account.[100]

Adjustment costs

7.47 Where TOCs have headroom to increase fares, the TOCs would lack the incentive to adjust fares if the costs of doing so outweigh the gains from the adjusted fares. However, the CMA will need evidence that the size of the adjustment costs is greater than any gains in profitability.[101] In addition, it is important to consider the adjustment costs relative to the potential profit gain. For example, the argument that adjustment costs are high is unlikely to be determinative if the profit gain is higher.

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[99] In First/SW, the CMA looked at both Anytime and Off-Peak/Super Off-Peak fares.
[100] In Arriva/Northern, for rail-rail overlaps, the CMA used the MOIRA model to determine the GJT element of the GJC function. In First/SW, the CMA preferred to calculate GJC directly, rather than using MOIRA, for consistency with bus-rail analysis (since MOIRA cannot be used for buses). However, the CMA is open to arguments as to whether it may be more practical to use MOIRA.
[101] FirstGroup told the CMA that the administrative costs associated with introducing a dedicated fare include undertaking an approval process involving other TOCs that offer rail services on the flow (they would have 28 days to object to the introduction of the ticket, and can propose that the share of inter-available revenue is reviewed as a result); and updating ticket vending machines (which is straightforward operationally subject to limited screen space and the range of existing fares). Franchisees may need to incur additional operational costs in ensuring that customers who purchase a dedicated ticket board the right train.
The CMA has not seen evidence that it is costly to adjust the level of fares for existing tickets, given that TOCS typically use yield management systems.
The CMA welcomes evidence on the magnitude of these costs in practice.

8.   In the round assessment

8.1   The above sections, and related appendices, aim to provide detailed guidance on the systematic steps the CMA will generally take in its assessment. The thresholds used are deliberately conservative so that they can be applied broadly. Flows which are not cleared by these steps, or where there is other evidence to suggest a possible competition problem, will be assessed in the round, ie taking account of all available evidence. Although it is not possible to give an exhaustive description of what may be taken into account, the CMA's assessment will seek to be consistent with the theories of harm and evaluation principles outlined above.

8.2   This may in principle take place at any stage of the process.[102]

8.3   The factors that the CMA may take into account the in this assessment may include:[103]

(a) Share of services and revenue;

(b) Closeness of pre-merger competition, in terms of the similarity of frequency, hours of operation, journey times (including interchange penalties) and fares;

(c) Ability to increase fares;

(d) Incentive to increase fares;

(e) Other constraints, such as competition from other modes of transport; and

(f) Entry or expansion, which must be timely, likely and sufficient.[104]

8.4   On the last point, barriers to entry or expansion on rail services are typically high, but may be lower for bus services. The CMA will wish to establish which rival bus operators are active in the area, could plausibly launch or increase services on the flow(s) in the question – which in practice is likely to mean an existing depot in a suitable location[105] – and whether those operators have plans and capability to expand.

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[102] In First/SW, the CMA was able to quickly clear a number of flows after the filtering stage either from the data already provided for filtering or because of other information provided by FirstGroup. The CMA then applied the principles described in section 7, and undertook a further in the round assessment after that stage.
[103] These factors were taken into account in Arriva/Northern, ¶¶10.31-32.
[104] CC2, ¶5.8.11.
[105] A depot is a substantial cost that is usually spread across a number of routes. The CMA would not normally expect an operator to establish a new depot because of an opportunity on a small number of flows.

8.5   Additional evidence that may be useful includes: internal documents; detail on the type of services (eg school services and tendered services, even if they do not meet the requirements for filtering); passenger behaviour (eg response to a service starting or ending); passenger type (commuters or leisure passengers); or passenger location if the start or endpoints of overlapping services are not close together.[106]

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[106] For example, in First/SW, some overlapping rail flows involving London ran from Paddington and some from Waterloo.

Appendix I: Stages of analysis and data requirements

1.   This appendix sets out the process that the CMA will generally adopt in Rail Franchise mergers with a view to reducing the data requirements placed on the Franchisee.[107] The CMA's approach is likely to develop over time in light of its experience in dealing with such cases. The CMA will assess each case on its merits and is open to submissions as to why a different approach may be appropriate. In particular, this type of multi-stage approach generally requires some time in pre-notification and might need to be compressed if the time for pre-notification analysis is limited.

2.   The two tables below summarise the procedure used for bus-rail and rail-rail overlaps respectively. They are followed by a summary of the thresholds that the CMA will generally use in applying these rules. For remaining overlap flows, the CMA will make an in the round assessment taking into account the characteristics of the Franchisee's services, competitors on the flow, internal documents and third party responses.

Bus-rail overlaps

Activity	Additional information needed
Filters:	
1. Tendered route	Which routes are tendered; understanding of how tenders work – how passengers pay, what elements of service can/cannot change
2. Route revenue	Bus route revenues
3. Small flows (rail revenue)	Overlaps; rail flow revenues
4. Overlapping bus revenue	Bus flow revenues
5. Significance of overlap	
6. Small flows plus (bus revenue)	
7. Revenue increment	
8. Effective competitor	Bus frequencies and bus competitor frequencies
Flows where further data is not required, eg:	
Identify flows with major and significant differences in journey times and frequencies between rail and bus	None
Identify school services when Franchisees have no ability/incentive to degrade	Understanding of how school services work – what elements of service can/cannot change, what affects operator's revenue
Identify flows just missing all/ many filters	None

Activity	Additional information needed

Closeness of competition pre-merger:
 	
Calculate GJC: calculate generalised journey costs on the remaining flows to identify whether the bus service and the Franchise can be seen as close competitors.
	• Distance covered by bus journey
	• Franchise peak frequencies (peak frequencies on a typical workday)
	• Basic fares:
	    ○ Franchise adult single peak fare
	    ○ First bus adult single peak fare

Ability to increase fares: **Impact of Multi operator and zonal tickets on ability to increase fares:** Establish headroom for possible bus fare increase.	Multi-operator tickets: Coverage of tickets on the overlapping flows; Fares Single operator tickets: Coverage; Fares; % of revenues from zonal tickets Availability of ticket zones, and First's ability to change them
Incentive to increase fares: **Look at general factors:** flow's share of route revenue; Competition from other rail or bus operators (frequencies, journey duration); Info on tendered services; Info on concession passengers **Profitability analysis:** Find upper bound profitability of increasing fares to limit provided by headroom **Barriers to entry**	Details of voluntary partnership agreements between bus operator and local authorities. Share of concessionary tickets and description of how they are remunerated • Single/return/zonal bus fares • Single/return peak rail fares • Diversion ratios on the overlapping flows (eg away from bus and from bus to rail) Presence of competing bus operators in close proximity or on part of the flow; competitors' ability and plans to enter/expand

Rail-rail overlaps

Activity	Additional information needed
Filters:	
1. Implausible flows	Qualitative info
2. Small flows (rail revenue)	Revenues
3. Regulated and interavailable fares	Regulated revenues; fully and routed interavailable revenues
4. Effective competitor	Rail competitor revenues
Flows where further data is not required, eg: **Identify and eliminate any flows where frequency very low on one service** (eg less than daily) **Identify and eliminate flows narrowly missing all/ multiple filters**	None None
Closeness of competition pre-merger **Examine Franchisee's frequency, hours of operation, journey duration and fares** **Generalised Journey Cost (GJC)**	Hours of operation (ie timetables), basic fares: • single peak adult fare for competing rail services • proportion of tickets that are singles/returns/other

Activity	Additional information needed
• Compute GJC values based on: • Fares • Journey duration • Service frequency • DfT Values of Time • Distance	• Basic fares • Peak service frequency
MOIRA Use modelled degradation of service to assess Revenue Retention (RR) by merged party as indicator of degree of competition faced pre-merger. **Examine competitors' journey characteristics** in terms of duration and frequency.	Results of modelling. Frequencies on consistent basis (clarification of existing data).
Ability to raise fares **Assess headroom** between unregulated and regulated fares	Detailed fare info: • Fare setter TOC • Which fares are regulated • Whether Franchisees set unregulated fares • Difference between these fares and regulated fare
Incentive to raise fares **Assess upper limit revenue gain** for Franchisees from increasing unregulated farers to headroom limit by multiplying difference from current fare by number of passengers *Barriers to entry & expansion* *Other constraints* Presence of other factors such as competition from other modes of transport.	None Information on other modes of transport

Bus-rail thresholds

3.   Tendered route: the CMA will filter out flows/routes where passengers do not pay a fare to the Franchisee's bus service.

4.   Route revenue: The CMA will filter out each individual bus route with a total revenue of less than £500,000 per year. Substantially overlapping routes may be combined for this purpose.

5.   Small flows (rail revenue): The CMA will filter out rail flows with less than £20,000 revenue per annum.

6.   Overlapping bus revenue: the CMA will filter out each individual bus route where total bus revenue from flows that overlap with the Franchise is less than £500,000 per year. Substantially overlapping routes may be combined for this purpose.

7. Significance of overlap: the CMA will filter out flows that, when combined, accounted for less than 10% of the overall bus route revenue.

8. Small flows plus (bus revenue): the CMA will filter out bus flows which have both less than £20,000 revenue per annum and a cumulative share of 10% of revenue on the relevant bus route.

9. Revenue increment: the CMA will filter out flows where rail revenue is no more than 5% of combined bus and rail revenue on the flow.

10. Effective competitor: the CMA will filter out flows where a competitor bus service runs with a frequency of at least 50% of the Franchisee's bus service.

11. GJC: The CMA will generally not find a competition problem on flows with a GJC difference of greater than 25%.

12. Profitability: The CMA will generally not find a competition problem on an overlap flow where the profit incentive is less than £10,000, unless there is a higher profit incentive when taking into account a number of overlap flows on the same route or a combination of overlapping routes.

Rail-rail thresholds

13. Implausible flows: the CMA will filter out flows where it is clear-cut that the merging Franchisee's rail services are not plausible alternatives for passengers.

14. Small flows (rail revenue): the CMA will filter out rail flows with less than £20,000 revenue per annum.

15. Regulated and inter-available fares: the CMA will filter out flows where both (i) inter-available fares account for 100% of revenues and (ii) regulated fares account for more than 80% of revenues. (Please refer to the definition of these terms as used in this filter in ¶73 of section 6.)

16. Effective competitor: the CMA will filter out flows where at least one third party rail operator has a revenue share of at least 50%.

17. MOIRA: The CMA will generally not find a competition problem on a flow where the revenue retention ratio is below 50%.

18. GJC: The CMA will generally not find a competition problem on flows which have a GJC difference of greater than 25% for all calculated values of GJC.

Appendix II: Catchment areas for bus-rail overlaps

1. The CMA has used the National Travel Survey (NTS) to assess the distance passengers walk to rail stations. The NTS survey asks respondents to complete the diary on one of seven days for walks of less than one mile and walks of less than 50 yards are not recorded.[108] The CMA therefore adjusted the NTS data by adding 50 yards to journeys with unrecorded walks, assuming that unrecorded walks are all equal.[109,110] The CMA focused on passengers' willingness to walk to a rail station.

2. The CMA has reviewed walking distances for different lengths of rail journey, across the country. Although there is variation between regions for longer journeys (above 9 miles), the CMA found that walking distances are generally shorter with shorter rail journeys (see Table 1). In recent cases, the CMA has found that the large majority of bus-rail overlaps are less than 9 miles in length, which would imply that, when considering bus-rail competition, the CMA should focus on this shorter journey distance.

Table 1: NTS 80th percentile walking distances for rail services (miles)

Rail journey distance	Whole country* (excluding London†)	Northern franchise area	South West Franchise area
All journeys	1.00	0.80	0.80
<30 miles	0.90	0.80	0.80
<20 miles	0.80	0.70	0.75
<12 miles	0.75	0.50	0.60
<=9 miles	0.50	0.50	0.50

Source: NTS data/CMA calculations.
* The survey is conducted for households living in England, travelling in the whole country.
† London is likely to differ from the rest of the country in its transport, and there are generally no relevant bus/rail overlaps within the area where bus services are regulated by Transport for London.

3. Accordingly, the CMA will assess catchment areas on the basis of a walking distance of 800 meters (approx. 0.5 miles). In recent decisions, the CMA has not varied catchment areas on the basis of, for example, urban and rural areas. This is partly for principled reasons (for example, flows are bidirectional, and one end of a flow may be rural and the other urban) and partly for practical reasons (identifying overlaps is the first stage of the

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[108] Longer walks are recorded on a daily basis.
[109] There are some caveats to this approach. First, not all passengers actually walk 50 yards and therefore the averages are overstated. Second, any correction to the data might be incorrect (eg passenger forget to record the walk). In this case, no correction should be applied and therefore the presented average is understated. However, the CMA added the 50 yards' walk on a conservative basis.
[110] Walks preceding and following a bus or rail journey were considered. However, some passengers may be combining different transport options, which would effectively widen the catchment area of the services. For example, a passenger may travel by bus to a rail station in order to travel on the rail service. While passengers might, for example, drive by car to a station, the CMA focuses on walking distances because it is the most common mode of transport to get to and from a station.

analysis and so it is preferable to have a simple rule). The CMA also notes that there is variation across regions of the country. Accordingly, the CMA considers it is appropriate for a Phase 1 investigation to take a cautious approach by not using smaller catchment areas for specific flows in the absence of flow-specific evidence.[111]

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[111] If a Franchisee has good evidence on catchment areas, the CMA would expect this to be presented early in the process and systematically across all relevant flows, in order that overlaps can be identified and filtering can proceed efficiently.

Appendix III: Generalised Journey Cost

1.   This appendix describes the calculation of the Generalised Journey Cost
        (GJC) and provides a detailed discussion of the CMA's modelling choices.[112]

The modelling approach

2.   When embarking on a trip, passengers may face a choice of (i) which public
        transport mode to choose (for instance, bus or train) and (ii) which service to
        use, for a given transport mode (for instance, when different TOCs operate on
        a flow). This choice is potentially affected by a variety of factors, such as
        journey time, frequency of the service, and fares.

3.   The GJC is a measure expressing, in monetary value (ie pence/minute), the
        passenger's choice. Specifically, for service *m* on flow *f,* the GJC is calculated
        as a function of journey time, frequency and fare, using the following formula:

$$GJC_{mf} = \underbrace{\left(time_{mf} + frequency_{mf} + \cdots\right)}_{\text{Generalised Journey Time}} * VOT_{mf} + fare_{mf}$$

        where VOT denotes the Value of Time (see paragraph 22 below).[113]

4.   The dots in the formula above indicate that, in principle, additional factors,
        such as punctuality or interchange, can be modelled into the GJT. Paragraphs
        18 and 19 illustrate how to account for interchange in the GJC formula, and
        the CMA views this as appropriate when assessing indirect journeys on a
        flow.[114]

5.   The CMA considers that GJC is an appropriate prioritisation tool for both rail-
        rail and bus-rail overlaps.[115] The CMA would generally prioritise in its analysis

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[112] The CMA may use the GJC approach for both bus-rail and rail-rail overlaps.

[113] The journey time should be doubled when return fares are considered in the GJC calculation (see paragraph 23 below).

[114] However, the CMA considers that access and egress times, ie the time spent by a passenger to reach the departing point of their preferred mode, should not be included in the GJT calculation. As noted in paragraph 7.22, this is partly for technical reasons, and partly because access and egress times will vary between passengers depending on the ultimate start and end-point of each individual's journey (eg home and work).

[115] As such, the comments in the sections below apply to both types of overlap.

flows with a GJC difference of less than 25%. Therefore, services m_1 and m_2 on flow f are unlikely to be close substitutes for a typical passenger if:[116]

$$\frac{GJC_{m_1f}}{GJC_{m_2f}} - 1 > 25\%$$

6.   The following sections describe the different components of the GJC formula and how to calculate them. We also highlight some alternative approaches.

7.   In Arriva/Northern and First/SW, the CMA's GJC calculations relied on the methodology set out in the Passenger Demand Forecast Handbook (PDFH) version 5.1.[117] The CMA understands that the PDFH is subject to periodic reviews. As such, the methodology described below may be subject to changes reflecting any future updates to the PDFH.

Journey time

8.   Passengers, when travelling, generally prefer shorter journey times. Therefore, passengers account for the relative journey length when choosing the mode of travel or the service. All else equal, one would expect two modes of transport or two services to be closer substitutes, the more similar the journey times are.

9.   Where a particular service has varying journey times, the CMA will use the average journey time as a starting point for the GJC calculation.

10.   If the average journey time on a given mode is significantly skewed by the presence of a small subset of very slow or very fast services, the CMA may exclude some of these services from the calculation of average journey time. For example, if most trains between A and B are frequent express services but some trains are stopping services and are significantly slower and have the same fare, such that a passenger travelling between A and B would be unlikely to take the stopping service, it may be appropriate to use the journey time of the express service rather than an average.

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[116] For bus-rail overlaps, service m_1 is bus and service m_2 is rail, given that CMA's theory of harm is that the merger may give the Franchisee the incentive to divert passengers from bus to rail. By contrast, for rail-rail overlaps, the CMA will consider using each different franchise as a denominator (since the Franchisee could plausibly degrade any franchise). In this case, the 25 per cent threshold must be met using both denominators.
[117] The PDFH is a handbook used in the rail industry to perform demand forecasting. The PDFH includes information on the factors determining passengers' demand for rail services and the values of the elasticities of these factors. The PDHF is managed by and available to members of the Passenger Demand Forecasting Council (PDFC), which was set up by the Association of Train Operating Companies (ATOC). PDFC also manages the MOIRA (Model of Inter-Regional Activity) train service model.

Frequency penalty (or service interval penalty)

11.   Passengers may also consider the frequency of a mode or a service and generally prefer a more frequent service. For example, if a service is very frequent, passengers may have less "wasted" time as they can show up at a stop and are likely to have only a short wait for their service.

12.   The CMA will generally assign frequency penalties to mode m on flow f on the basis of mode m's frequencies in a single direction, in peak hours (eg between 7am and 7pm).[118]

13.   For the GJC calculation on bus-rail overlaps, as noted in paragraph 6.32, the CMA might consider it appropriate to combine the frequencies of all bus routes serving a given flow, provided that journey time and fares are similar.

14.   The frequency penalty is calculated under the assumption that the frequency of mode m distributes evenly across the hour. For example, if a train runs four times an hour, the frequency interval is 15min. While in practice timetables are often irregular (unless the Franchise under consideration has adopted a *clock-face* timetable), this assumption simplifies the GJC calculation, in particular when the number of overlaps is high. However, if there is evidence that transport operators repeatedly adjust the timetable to arrive just before a competitor, the CMA may consider departing from this assumption.[119]

15.   Under the current version of PDFH (at October 2017), the CMA will refer to Table B4.7 (*full fare passengers*) of the PDFH v5.1 to calculate frequency penalty.[120,121]

16.   The PDFH frequency penalty function assigns the same penalty to all services with frequency within a certain interval (for instance, the same penalty p is assigned to services with frequency between 5 and 10 minutes). In some limited cases, this approach could assign different penalties to services with similar frequency (for instance, when the frequency of mode m_1 is just below the threshold and the frequency of mode m_2 is just above the threshold) or the

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[118] This was the approach used in Arriva/Northern and First/SW. The CMA may vary this approach depending on how the Franchisee's local bus services vary in fare or frequency across the day.

[119] An alternative approach to assessing the impact of frequency on passengers' choices would be to use the concept of Waiting Time. Passengers aim to minimise their waiting time at a stop, as waiting time results in a disutility. However, uncertainty around the trip to the station results in passengers arriving early at a stop, and waiting. WebTag states that passengers are more likely to just arrive at a station if the service is high frequency. The suggested threshold for "turning up" is 10-15 minutes' headway.

[120] PDFH sets out different penalties for journeys from and to London, in the South East etc. For simplicity, and because some flows may pass between regions, the CMA has not considered these different penalties in its GJC calculations.

[121] Note that when return fares are considered in the GJC calculation, the value of the frequency penalty should be doubled.

same penalties to services with different frequency. As such, the CMA may consider using interpolated values of the PDFH penalty function as a robustness check.[122]

17. The PDFH frequency penalty function of the PDFH v.5.1 assigns a penalty to services with frequency interval of up to three hours. For bus or rail services with frequency interval above three hours, the CMA will generally adopt a cautious approach and will assign to infrequent services the same penalty assigned to services with frequency equal to three hours. This is because infrequent services could still constrain the more frequent service, at least when the two depart or arrive at similar time and a very high penalty could not reflect the actual degree of substitution between the two services. Furthermore, passengers travelling on an infrequent service are likely to plan their journey in advance and thus a very high frequency penalty might not reflect accurately the passenger's true waiting cost. This approach simplifies the analysis when the number of overlapping flows left to analyse is high. This also ensures consistency between bus-rail and rail-rail analysis.[123]

Interchange penalty

18. Some overlap flows may require an interchange, which results in additional disutility for a passenger. For the applicable flows, an interchange penalty should be modelled.

19. The CMA refers to Table B4.10 (*full/reduced tickets*) of the PDFH v5.1 to calculate the interchange penalty.

Value of Time (VoT)

20. The VoT transforms passengers' travel time (ie journey time and frequency penalty) into monetary units so that it can be weighed against fares. The interpretation of a VoT (expressed in pence per minute) is that a passenger would be indifferent between a time saving (or deterioration) of one minute and a reduction (increase) in fare of that value. In other words, it is the amount they would be prepared to pay for a one-minute reduction in journey

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[122] In First/SW, interpolating the values of the PDFH penalty function did not change the GJC calculations significantly.
[123] This reflects the approach taken in First/SW. By contrast, in Arriva/Northern, for rail-rail overlaps, the CMA used the MOIRA model to determine the GJT element of the GJC function (and thus implicitly the frequency penalty assigned to those infrequent services).

time, or the amount they would need to be compensated for a one-minute increase.

21. To calculate the VoT, the CMA currently refers to the formula in section B4.8.3 of the PDFH v5.1. According to this formula, the VoT depends on various factors including:[124]

   (a) **Passenger's income**. The PDFH v. 5.1 measures income with a GDP index *per capita* in real terms. The PDFH gives the value of this index for year 2000 quarter 4. Given that the value of the GDP index has not been recently updated, the CMA will calculate an uplift factor to the 2000 value to account for the real growth of GDP *per capita* and the increase in the retail price index (RPI) as indicated in section B4.8.3 of the PDFH v5.1.[125]

   (b) **Distance expressed in miles**. This is the distance *travelled* by mode *m* on flow *f*, and not the straight-line distance.[126,127]

   (c) **Passenger type**. The CMA will generally use a commuter as a "representative" passenger. As a sensitivity check, the CMA may use first class, business class or leisure passengers to calculate the VoT, in particular for long journeys that are unlikely to be used by commuters.

   (d) **Whether the journey is inter-urban (ie of over 30 miles) or whether the passenger is a commuter**. In absence of specific evidence at the flow level, the CMA's GJC calculations will generally assume that all journeys are commuting.[128] As a robustness check, the CMA may recalculate on the assumption that no journeys are commuting.

22. The CMA understands there are other approaches to calculate the VoT. For instance, DfT guidance in WebTAG specifies different values of time.[129] The CMA considers that the PDFH is the standard accepted in the rail industry to

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[124] The VoT formula in the PDFH also depends on other factors such as whether the travel is (i) business travel (ie paid by the passenger's employer); (ii) done on a first-class ticket and (iii) within the London and South East area. All these factors tend to significantly increase the passenger's VoT on a specific flow and, other things being equal, it makes service/modes with different GJT more likely to be deprioritised. In Arriva/Northern and First/SW, the CMA calculations assumed on a simple and cautious basis that all journeys were on standard fares and paid by the passenger and not by their employer. Furthermore, the CMA calculations did not consider whether the journey was within the London and South-East area.
[125] Where data for GDP *per capita* and RPI can be found on the ONS website. This approach was followed in Arriva/Northern and First/SW.
[126] When return fares are considered in the GJC calculations, this value should be doubled.
[127] It may be reasonable to use straight-line distance for rail services as an approximation, if this simplifies data-gathering; but not for buses, which generally take a less direct route.
[128] This was the approach adopted in Arriva/Northern and First/SW.
[129] See the guidance in
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/603254/webtag-tag-unit-a1-3-user-and-provider-impacts-march-2017.pdf and the values in https://www.gov.uk/government/publications/webtag-tag-data-book-march-2017.

understand the determinants of passengers' demand. As such, the CMA will generally use the approach to the VoT set out in the PDFH, but will revisit this should the approach to the VoT change in future versions of the PDFH.

Fares

23.   Fares are an indicator of closeness of substitution. A common feature of transport mergers is that a variety of fares exists.

24.   The CMA will generally use peak fares in the GJC calculations as those are generally the highest and most used fares. The choice between single and return peak fares should depend on the most common fare type on the flows/routes under consideration.[130]

25.   To assess the robustness of the results, or to reflect the fact that peak fares might not be the most used fares on a particular rail route, different fares, such as off-peak or weekly tickets, can be used.

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[130] To simplify the analysis, the CMA's practice has been to choose between single and return at the aggregate level (ie, taking into account all route/flows left for assessment) and not at the single flow/route level.

Appendix IV: Profitability analysis

1.   This appendix describes CMA's typical approach to assess the Franchisee's incentives to raise fares on bus-rail and rail-rail overlaps following the merger.

2.   As noted in paragraphs 7.6-7.10 and 7.27-7.29, the CMA generally assesses the Franchisee's *ability* to increase fares on a flow as follows:

    (a) For rail-rail overlaps, by calculating the differential (or *headroom*) between unregulated walk-up fares set by the Franchisee and regulated fares on individual flows. Furthermore, the CMA considers that the Franchisee has the ability to increase fares when there is a difference between the (average) advance fare and the corresponding walk-up fares.

    (b) For bus-rail overlaps, by calculating the differential between bus fares set by the Franchisee on individual flows (ie single and return tickets) and the level of multi-operator or zonal fares applicable on the flow, if available.

3.   To determine the Franchisee's *incentive* to increase fares, the CMA calculates the maximum additional profits that the Franchisee would obtain by increasing fares by the maximum headroom theoretically available. To do so, the CMA requires information on the number of paying passengers on each flow.[131]

4.   As a first step, the CMA uses a simple, conservative calculation that assumes that passengers do not switch to other modes (or stop travelling) following the fare increase. This is on the basis that if there is not sufficient incentive for the Franchisee to increase fares in this simplified scenario, there will not be a profit incentive to increase fares once switching is taken into account.[132]

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[131] When calculating additional profits for bus-rail overlaps, the CMA notes that bus passengers who do not pay for their travel would not switch mode in response to an increase in standard bus fares. The formulae below do not include these passengers. However, if the bus company's payment for carrying these passengers is related to fares for paying passengers, the number of concessionary passengers could also contribute to an incentive to raise prices, and would also need to be taken into account.

[132] In Arriva/Northern, this simple framework was generally sufficient to show that Arriva had limited incentives to raise bus fares. In that case the CMA used a profitability analysis to assess Arriva's incentive to increase fares on overlap flows that passed all filters. In particular, the CMA calculated an upper bound for the additional revenues that a bus fare increase might have generated for Arriva. The CMA considered that for low additional revenue from a fare rise, the merger did not create a significant incentive to increase fares, and therefore the merger was unlikely to result in a substantial lessening of competition on such a flow.

To reduce the reliance on estimates of diversion, the CMA first used a simple calculation which assessed whether a fare increase would be profitable if passengers were price inelastic (in other words, the CMA assumed that passengers do not divert to competitors and/or other modes), as an upper bound to the revenue gain (therefore, if the upper bound was found to be low, the CMA interpreted this as a low incentive to increase fares); and then used estimates of diversion as a sensitivity check. The CMA assumed that Arriva would increase fares by the maximum headroom available. Using the number of passengers for different fares (eg single and return fares), the CMA then calculated the additional revenue from the fare rise. The CMA also tested the sensitivity of

5.   In some cases, the differential between zonal/multi-operator tickets and single fares may indicate that a very large price increase is theoretically possible. [133] The CMA recognises that, in such circumstances, taking into account the full headroom in its incentive calculations may not be appropriate. This is because:

   (a) in view of the general evidence on closeness of competition between bus and rail, rail may not provide such a large constraint on bus fares that removing that constraint would allow such very large price increases; and

   (b) the Franchisee's desire to ensure fare consistency across bus routes and between flows on a route could mitigate the level of fare increase which the Franchisee may have the incentive to implement.

6.   As such, as a second step or as a robustness check, the CMA could consider calculating the Franchisee's incentives to raise rail or bus fares in a more realistic framework which takes into account:

   (a) A plausible fare increase: the CMA will consider, on an appropriately cautious basis, a realistic range of fare increases that could result from removing the constraint of rail.[134]

   (b) Diversion to other services: the CMA will generally assume, as a base case, that:

      (i)   for bus-rail overlaps, 20% of non-concessionary bus passengers would switch to another mode of transport or stop travelling following the hypothetical price increase. Of these, 10% (ie half of the 20%) are assumed to switch from bus to rail.[135]

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the results including using the average diversion ratio from a survey carried out by Arriva. However, it interpreted these results cautiously because the survey was not flow specific.

[133] In First/SW, the differential between zonal/multi-operator tickets and single fares represented a theoretical price increase of 60-100%. For return fares, the differential was lower (eg 10%-30%).

[134] The CMA found that (a) the headroom for some flows was significantly larger than in Arriva/Northern, and (b) price increases would be profitable on some flows if passenger demand was inelastic. Given evidence on the closeness of competition between bus and rail, the former suggested that there were constraints on pricing that would be not removed by the merger, and that this headroom would overstate likely price rises. Therefore, the CMA considered smaller price rises at various levels up to a ceiling of 30%. To address the latter point, the CMA again used diversion ratios. In the absence of flow-specific evidence, the CMA used values based on the evidence available in Arriva/Northern (and tested various sensitivities). Under reasonable scenarios, the CMA found that very significant price increases would be necessary for First to make material gains, and that it was not plausible that removing the constraint of rail would allow such significant price increases.
The CMA also considered scenarios with rail-rail price increases of less than the headroom amount.

[135] These figures are consistent with those used as a base case, based on survey results, in Arriva/Northern. The switching figures from Arriva/Northern were based on a 10% price rise. The CMA considered a range of scenarios with different price rises, demand response and diversion to bus. With a price rise of 20% and demand response of 20%, revenue gains were not significant. With a higher demand response (and proportional switching to rail) this conclusion would not change. The CMA used the same figures in First/SW.

(ii) for rail-rail overlaps, different diversion scenarios may be considered (eg, 5-15% of passengers switching to the other TOC and 5-15% of passengers stop travelling following the fare increase).[136]

7. The CMA may consider using different switching rates in its profitability analysis if reliable evidence is available. The CMA expects to consider sensitivities around both the level of the price increase and switching/diversion.

8. Therefore, the CMA calculates maximum additional profits on flow *f* as follows (a worked example follows the formulae):

9. For rail-rail overlaps,[137] the total maximum additional profits on flow *f* are the sum of the additional profits that the Franchisee could obtain by increasing at the same time all fares where there is a positive headroom.

$$\pi_f^R = \sum_{i=1}^{I} \underbrace{\left(\Delta P_{TOC_1,f}^i N_{TOC_1,f}^i (1 - div) \right)}_{\text{Extra profits on } TOC_1} + \underbrace{\left(P_{TOC_2,f}^i - P_{TOC_1,f}^i \right) N_{TOC_1,f}^i div_{TOC_1,TOC_2}}_{\text{Extra profits diversion } TOC_1 \text{ to } TOC_2} - \underbrace{N_{TOC_1,f}^i P_{TOC_1,f}^i \left(div - div_{TOC_1,TOC_2} \right)}_{\text{Lost profits from lost passengers } TOC_1},$$

where:

- *I* is the number of rail fares where there is a positive headroom;

- $\Delta P_{TOC_1,f}^i$ denotes the increase (in £) of fare *i* on TOC$_1$ on flow *f* (which by assumption has been increased post-merger);

- $P_{TOC_2,f}^i - P_{TOC_1,f}^i$ denotes the fare differential between TOC$_2$ and TOC$_1$ for fare *i* (where $P_{TOC_1,f}^i$ is the pre-merger rail fare *i*);

- $N_{TOC_1,f}^i$ denotes number of passengers on TOC$_1$ on flow *f* pre-merger of the Franchise travelling on fare *i;* and

- *div* and div_{TOC_1,TOC_2} denote, respectively, the diversion rate away from rail and the diversion rate from TOC$_1$ to TOC$_2$ following the fare increase.

10. To illustrate the formula, consider the following simplified scenario. Following the merger, TOC$_1$ to TOC$_2$ are controlled by same rail operator. On flow *f,* pre-merger, there is only one fare where there is a positive headroom between

[136] These figures were used in First/SW.
[137] Given that, in principle, the Franchisee can increase fares on either its existing Franchise or the newly awarded Franchise, extra profits from diversion should be calculated for both TOCs.

the fare set by TOC₁ and the fare set by TOC₂. Assume that $P_{TOC_1} = £5$ and $P_{TOC_2} = £7$ and that 10,000 passengers were using TOC₁ to travel on the flow. The formula above gives the maximum profits that the rail operator could obtain by increasing, post-merger, fares on TOC₁ up to, say, the maximum headroom available, ie $\Delta P_{TOC_1} = P_{TOC_2,f} - P_{TOC_1} = £2$. If, following the fare increase, 10% of TOC₁ passengers divert to TOC₂ and 10% stop travelling (ie, *div* = 20%), then maximum profits are:

$$\underbrace{(£2 * 10{,}000 * 80\%)}_{\text{Extra profits on } TOC_1} + \underbrace{(£2 * 10{,}000 * 10\%)}_{\text{Extra profits diversion } TOC_1 \text{ to } TOC_2} - \underbrace{(10{,}000 * £5 * 10\%)}_{\text{Lost profits from lost passengers}} = £13{,}000$$

11. For bus-rail overlaps, the total maximum additional profits on flow *f* are the sum of the additional profits that the Franchisee could obtain by increasing single and return bus fares is:[138]

$$\pi_f^B = \sum_{i=1}^{2} \underbrace{\left(\Delta P_{B,f}^i N_{B,f}^i (1 - CP_{B,f})(1 - div) \right)}_{\text{Extra profits on bus}} +$$

$$\underbrace{\left((P_{R,f}^i - P_{B,f}^i) N_{B,f}^i (1 - CP_{B,f}) div_{B,R} \right)}_{\text{Extra profits diversion bus to rail}} - \underbrace{P_{B,f}^i N_{B,f}^i (1 - CP_{B,f})\left(div - div_{B,R} \right)}_{\text{Lost profits from lost passengers}},$$

where:

- *i* is an indicator for single or return fares;

- $\Delta P_{B,f}^i$ denotes the increase (in £) of bus fare *i* on flow *f* (which by assumption has been increased post-merger of the Franchise);

- $P_{R,f}^i - P_{B,f}^i$ denotes the fare differential between bus and rail on flow *f* (where $P_{B,f}$ is the pre-merger bus fare);

- $N_{B,f}^i$ denotes number of passengers on bus on flow *f* pre-merger of the Franchise travelling on fare *i*;

- $CP_{B,f}$ denotes the proportion of concession passengers on bus on flow *f*;[139] and

- *div* and $div_{B,R}$ denote, respectively, diversion rate away from bus and diversion from bus to rail following the fare increase.

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[138] Provided that there is a positive headroom on both fares.
[139] Ideally, the proportion of concession passengers should be provided at flow level.

12. To illustrate the formula, consider the following simplified scenario. Following the merger, bus and rail services on flow *f* are controlled by same operator. For simplicity, assume that a positive headroom between the rail fare and the bus fare exists only on single fares: $P_R^S = £4$ and $P_B^S = £2$. Assume that 20,000 passengers were using the bus pre-merger, and 50% of them were concessionary, ie *CP* = 50% The formula above can be used to calculate the maximum profits that the operator could obtain by increasing, post-merger, bus fares on flow *f* by, say, £1. Hence, $\Delta P_B^S = 1$; $P_R^S - P_B^S = £2$. If, following this fare increase, 5% of *paying* bus passengers divert to rail and 10% stop travelling (ie, *div* = 15%), then:

$$\underbrace{(£1 * 10,000 * 85\%)}_{\text{Extra profits on bus}} + \underbrace{(£2 * 10,000 * 5\%)}_{\text{Extra profits diversion bus to rail}} - \underbrace{(10,000 * £2 * 10\%)}_{\text{Lost profits from lost passengers}} = £7,500$$

13. To conclude whether the Franchisee has an incentive to increase fares post-merger, the CMA will consider not only the absolute value of π_f^B and π_f^R but also how they relate to revenues at the route level.

Appendix V: MOIRA

## Rail modelling and the MOIRA model

1. The MOIRA model is a rail industry-accepted best practice tool for train service planning and analysis of service changes on the rail network. It is widely used by TOCs, the DfT and other members of the PDFC.

2. It is used as the core demand assignment tool in franchising models, in the DfT's network modelling framework for strategic rail interventions, and by other parties building bespoke models for analysing rail interventions.

3. The DfT version of MOIRA allows the user to inspect the train services that operate on the Great Britain rail network and the revenues and journeys information assigned to these train services, and to analyse the impacts of timetable changes on all operators' demand and revenue.

MOIRA analytical approach

4. MOIRA predicts the effect of timetable changes on passenger demand and revenues. The assumptions in the model are based on the industry standard as set out in the PDFH. The base demand and revenue data are mostly from the industry ticket sales database called LENNON. This database contains the record of all daily rail ticket transactions and their corresponding revenue and an estimate of demand for each station to station pair.

5. The MOIRA model aims to match a passenger's preferred departure time at an origin station to their best opportunity to travel (OTT) by minimising the passenger's GJT. It combines passengers' profiles, train services and PDFH parameters.

6. Once a change in GJT is modelled from a timetable change, the model will estimate the demand change and will assign it to the available train services. Some passengers will no longer travel if the journey time is increased (as they are subject to a journey time elasticity). These passengers who no longer make the rail journey will either stop travelling or travel by other modes. Some will make their journey by private car (and guidance on this aspect of mode shift can be found in the DfT's *Transport Analysis Guidance (TAG)*).

7. The GJT is computed using the Rooftop model, described below, a widely-accepted method of combining different aspects of time components in travel.

Opportunities to travel and the Rooftop model

8.   An opportunity to travel (OTT) is a train service that will make it possible for a passenger to travel from point A to B. Usually there are many opportunities to travel which are effectively train services that are in proximity to a passenger's preferred departure time. More OTTs will indicate a wider choice of train services available to a passenger (it could be an earlier train or a later train than their preferred departure time). A routed OTT is a train-specific or route-specific OTT (ie dedicated to a particular operator or a particular route) and all other OTTs are "any permitted" ie offer a choice of travel on other operators' services.

9.   The Rooftop model is a representation of available train services including direct and connecting services and the corresponding GJT at any time interval. The diagram below (sourced from the MOIRA Technical Guide made available by PDFC) shows three train services departing from a particular station at the following times:

(a) 9:30;

(b) 10:06; and

(c) 10:42.
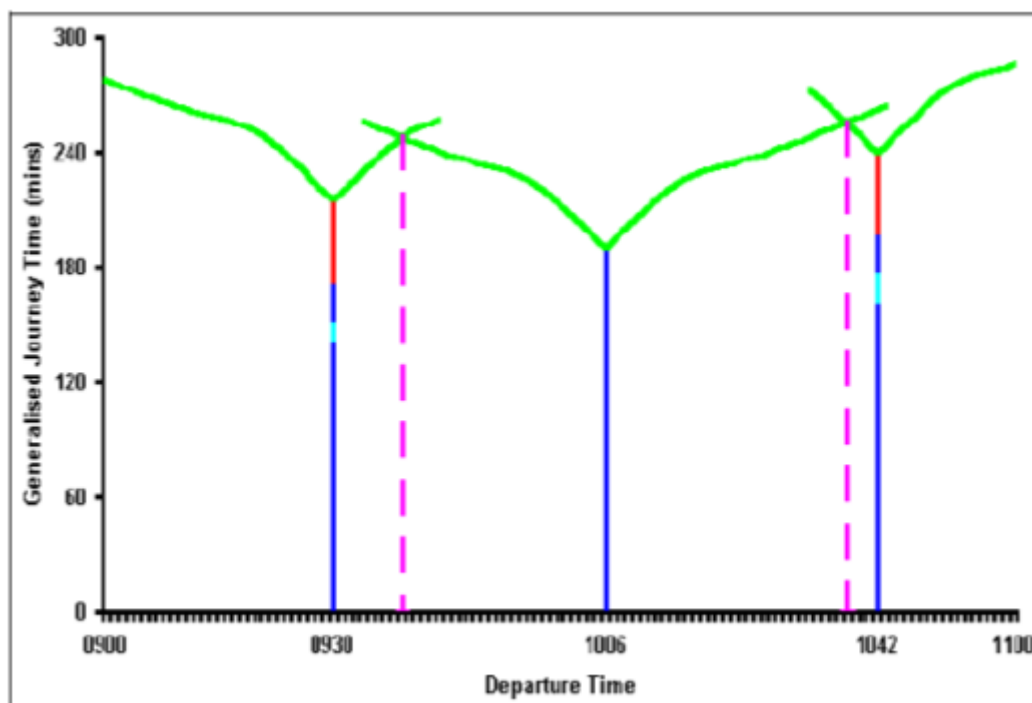
Source: Passenger Demand Forecasting Council.
Note: The vertical axis represents generalised journey time (in minutes); the horizontal axis represents departure time (note that, for clarity of explanation, only a two hour segment is shown).

10. Each service has its own components of GJT shown by three vertical lines. Each line is composed of some combination of journey times (in dark blue), wait time (light blue) and interchange penalty (red line). The "roof", in green, represents the cost of travelling on a train that is not at the most preferred time, so this cost rises the further the gap between preferred and actual time.

11. The pink dotted lines show points where passengers are indifferent between train services, so they are assigned to the train which matches their profile most closely.

12. MOIRA will calculate the GJT for each timetable or change in timetable. It will then apply the GJT (from PDFH) to estimate overall demand for rail services on the flow, which it then assigns to trains based on profiles.

13. Routed fares will be assigned to specific trains or routes and not always based on demand profiles. In particular, based on the OTTs' respective profiles, MOIRA considers not just the fare type (including full, reduced and seasons), but also time of day (based on profiles such as peak, off peak, weekend), and by geography (such as London and South East and regional traffic).

Main assumptions and caveats

Assumptions

14. MOIRA is an elasticity-based model using PDFH parameters and elasticities. It assumes a linear effect from a timetable change irrespective of the size of the change.

15. It has a fixed number of demand profiles (96) which describe people's preferences to travel at a particular time of day or day of the week. These profiles are based on historical data on passengers' travel patterns, which are assumed to be a good indication of future travel patterns.

16. The model analyses flows mostly at a station-to-station level, distinguishing travel by distance, ticket type (seasons, full, reduced, inter-available, routed), geography (London, South East, long-distance, regional), and time of week (weekdays and weekends). This level of detail is deemed sufficient as they incorporate the main categories in PDFH.

17. MOIRA uses a logit model to implement the GJT change and using PDFH GJT elasticities. The logit model is an effective method to estimate demand change from a change in GJT, and it is assumed that the spread parameter is robust to capture how demand change is calculated.

Caveats

18. Care must be taken to interpret large timetable changes as it is an elasticity-based model. For instance, a large change in a timetable, eg deleting a whole set of trains from a timetable, will only provide a broad indication of passengers' responses. Therefore, the CMA undertakes more detailed analysis of the flow and uses the evidence from MOIRA analysis in the round.

19. PDFH elasticities are essentially derived from econometric estimations of relationships based on historic data. As it is the case in all forecasting models, it may not be representative of future behaviour and care should be taken when interpreting results of analysis that forecasts demand far into the future.

20. The Rooftop model is an effective tool to bring together a heterogeneous set of train services, but is based on GJT and not on journey cost. It excludes fares and crowding. Therefore, when MOIRA assigns demand to trains, it may be that in some cases "too many" passengers are assigned to particular trains and therefore overestimating loading or demand. As such, detailed analysis (including scenario testing) of the data may be required to validate the results in some cases.

21. Explicit fares differentials or a different policy on fares cannot be modelled in MOIRA. But, the functionality in MOIRA allows detailed analysis at broad ticket categories, and is appropriate in most cases, especially when a large share of ticket revenue is from inter-available fares.

MOIRA modelling for competition analysis

22. The CMA's approach to using MOIRA in competition analysis has been as follows:

    (a) Use the list of flows that remain of concern after applying filters.

    (b) Use the data inspector function in MOIRA to understand each of the flows identified, including the services ran on the route, the particular share of each TOC on that flow.

    (c) Analyse the combined effects of a diminution of train services on all the flows in (a).

    (d) Analyse the individual effects of a diminution of services for each flow.

    (e) Use the analysis from MOIRA to calculate RR ratios, which are then used to prioritise flows for detailed analysis and as part of the competitive assessment of those flows.

23. The way that the CMA used MOIRA analysis in the Arriva/Northern and First/SW cases is summarised below.

MOIRA in Arriva/Northern

24. The combined effects of a decrement in (c) was modelled in two ways: a removal of whole train services (Northern Franchise only) on the route serving the flows; a removal of all (destination) train stops (from Northern Franchise timetables) on the relevant flows but keeping all services flowing through to all other timetabled stops.

25. The individual effects of a decrement in (d) was modelled in several ways including: removal of whole (Northern Franchise) trains that serve the individual flow under consideration; removal of destination station stop on the relevant flow from Northern Franchise timetabled services; in some cases, removal of origin station stop on the relevant flow from Northern Franchise timetabled services; and removal of some identified "peak" services on each of the relevant flows.

26. To test the findings of the RR ratio for the removal of whole trains, the CMA also calculated the RR ratio assuming an increase in journey time, which approximated a fare rise. The method that the CMA used was to impose a 10% (average) in-vehicle journey time penalty on all Northern Franchise train services on the relevant flows.

27. While the removal of whole trains from timetables provided an effective way to analyse diversion of passengers from one operator to another, the analysis must be conducted at a flow level, such as flexing the stopping patterns of trains to capture the responses of passengers on these flows. In some instances, changing some train services in the peak for the Northern Franchise was attempted in order to validate the results of the other analyses conducted, ie to check the validity of the removal of a stop within a flow on the Northern train services.

MOIRA in First/SW

28. In First/SW, the MOIRA model was used to assess closeness of competition on one flow (London-Exeter), by calculating the RR ratio in the following scenarios:

    (a) Remove the origin station from the Franchise services;

    (b) Remove the destination station from the Franchise services; and

(c) Simulate a 10% increase in journey time of all services operated by the Franchise.

29.   The CMA also calculated RR ratios assuming that the same changes were applied to the overlapping GWR service instead. This was because, in principle, either or both TOCs could be degraded following the merger.