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OPTIONS FOR CHANGES TO THE RAIL ACCESS CHARGING REGIME

ORR/CT/23-53: ACCESS PRICE SETTING

03 JUNE 2024

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1 Executive summary

Charges for access to the main rail network in Great Britain provide Network Rail with a source of revenue and provide incentives for particular behaviours on the part of passenger and freight operators. As part of the Office of Rail and Road's (ORR) Periodic Review process, the ORR reviews the access charges proposed by Network Rail. These access charges must be set in accordance with a number of pieces of legislation, particularly Schedule 3 of the Access Management Regulations (AMRs)[1] and the Commission Implementing Regulation (EU 2015/909).[2] The ORR must undertake its review of those access charges in a way which is consistent with its Duties as set out in Section 4 of the Railways Act 1993 (RA), and the requirements set out in Schedule 4A of the Railways Act.

The ORR has commissioned Frontier Economics Ltd (Frontier) to undertake a strategic review of options for how access charges could be set for Control Period 8 (CP8). The scope of this review is to assume that the legislative underpinnings of the access charging regime are not changed. Frontier has partnered with Burges Salmon LLP (Burges Salmon) to undertake this review. However, please note that the material in this document does not constitute legal advice.

We have conducted this strategic review by examining the most relevant legislation,[3] economic principles, and precedent. We have also held an industry workshop with passenger and freight operators and their representatives and held discussions with Network Rail. As this project is a strategic review, it necessarily cannot address all the areas of the access charging regime in detail, or provide definitive conclusions: what it aims to do is to provide a comprehensive framework for thinking about access charging and identify the questions which need to be addressed as the ORR considers the approach to access charging in CP8.

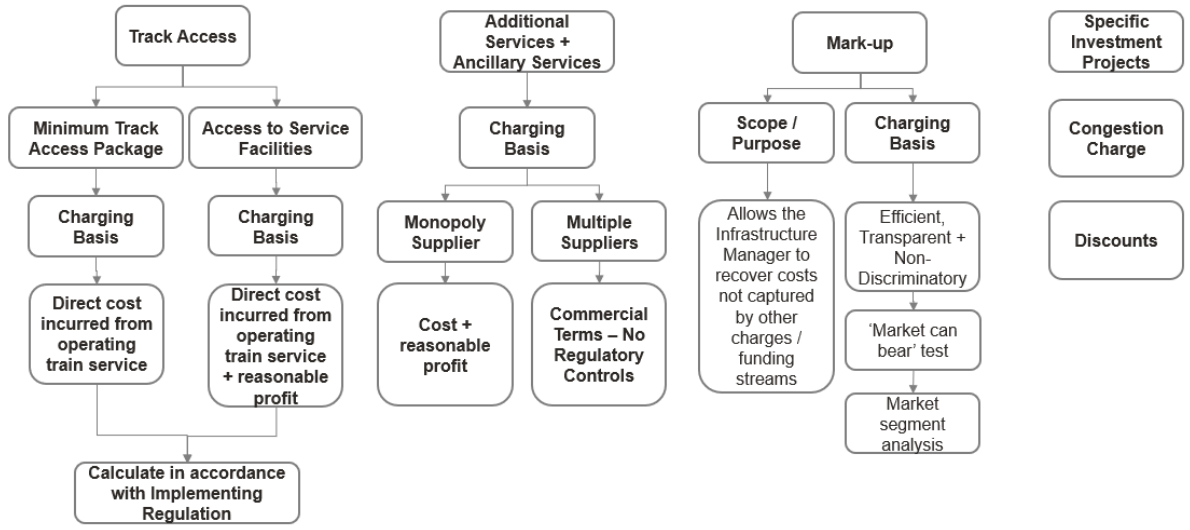
The legal underpinnings of the access charging framework, drawn from Schedule 3 of the AMRs and the Implementing Regulation are illustrated in the figure below.

1 The Railways (Access, Management and Licencing of Railway Undertakings) Regulations 2016: https://www.legislation.gov.uk/uksi/2016/645/made

2 Implementing Regulation (EU 2015/909) https://www.legislation.gov.uk/eur/2015/909/contents

3 Specifically, Schedule 3 of the AMRs, the Implementing Regulation, and Section 4 of the Railways Act 1993.

Figure 1 Summary of charging regime



Source: Frontier Economics/Burges Salmon.

As reflected in the figure above, different aspects of access charging are subject to different legal requirements. The legal terminology used to label these aspects of access charging – for instance, "Additional Services and Ancillary Services" or "Mark-up" – often is not the same as the terminology used for the specific charges which are in place on the network run by Network Rail.

In practice, there are a wide range of charges for access to the rail network which are derived from the underlying legal bases. These charges include variable charges which recover the costs directly incurred by Network Rail when train services operate over its network (these charges reflect the cost of accessing the "Minimum Track Access Package", illustrated in the diagram above[4]) as well as charges for energy usage and station access. They also include mark-ups levied to recover some of the fixed costs of the network (known in practice as "Infrastructure Cost Charges", including the "Fixed Track Access Charge"). Different charges make substantially different contributions to Network Rail's revenue, and the expected contribution of these charges to Network Rail's revenue in CP7 is summarised in the table below.

4 The Minimum Track Access Package is set out in Schedule 2 of the AMRs and includes the handling of requests for infrastructure capacity and the right to use the capacity granted including the railway infrastructure, electrical supply equipment where available/necessary, train control systems and assets, and any other necessary information to operate the service for which capacity is granted.

Table 1 Network Rail CP7 revenue from charges

	CP7 total (£m, 23/24 prices)	Proportion of Network Rail's gross revenue for CP7
Fixed Track Access Charges (FTAC)	6,657	14%
Variable Usage Charges (VUC)	2,069	4%
Electrification Asset Usage Charge (EAUC)	140	0%
Electricity for Traction (EC4T)	4,964	10%
Managed Station Qualifying Expenditure	568	1%
Station Long Term Charge	1,726	4%
Other	3,347	7%
Total	**19,472**	**41%**

Source: Adapted from Table 1.1. of the Office of Rail and Road (2023), "PR23 final determination: policy position – access charges", p. 7.

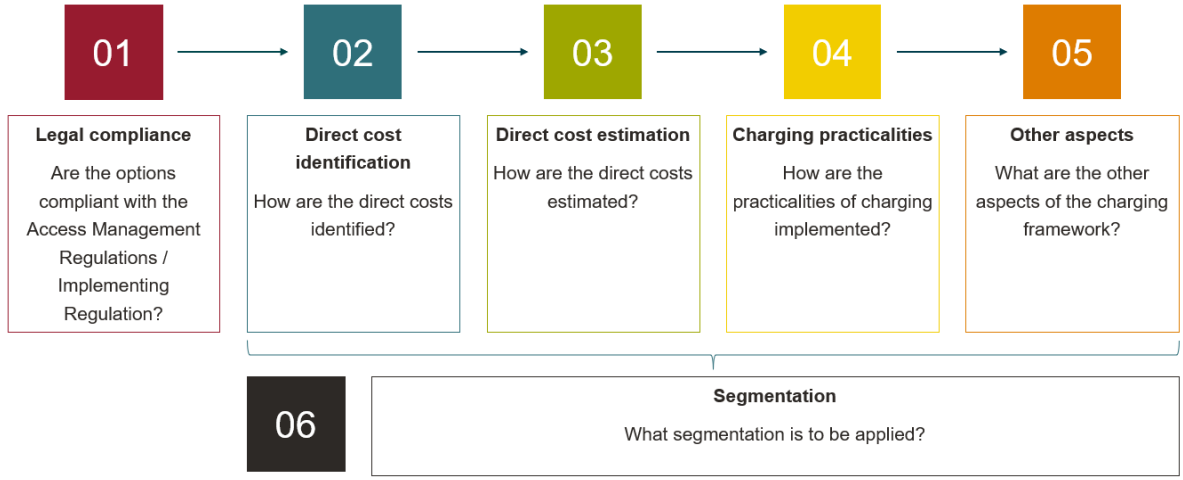
Note: Table does not include the network grant, which accounts for £28,559m or 59% of total gross revenue. Other charges include Schedule 4 and 8 income, Schedule 4 access charge supplementary income, other freight income, stations lease income and station facility charges, depot lease income and facility charges, other facility charges, other open access income, other non-regulated income, property rental, property sales and other income.

In discussions with the ORR and passenger/freight operators, the major area of focus of the access charges regime in the periodic review process has been Variable Usage Charges. This is one of the areas that the ORR identified as a key area for work early in CP7. Therefore, this is the area that we have focussed on for this strategic review. While we have also examined other aspects of the charging framework, it has been in less detail. In this context, it is important to note that the underlying legislation is particularly clear on the basis for charging in this area: the requirement being to price Variable Use Charges "at the cost that is directly incurred as a result of operating the train service."[5]

To provide structure to thinking about options for change in the different aspects of the access charging regime, we have developed the framework outlined below. This structure sets out six steps which need to be considered in developing an access charging framework.

5 AMRs, Schedule 3, para 1(4).

Figure 2 Charging framework



Source: Frontier Economics.

Step 1: There are many options for charging for access to the rail network which could be considered. However, many of those options are not consistent with the existing legal framework. In this review, we have aimed to capture as broad a range of options as possible, but the scope of this study is to assume that the underpinning legal framework remains unchanged. This rules out a number of potential options including setting access charges to reflect externalities (for example, rail being a safer and more environmentally friendly mode of transport than road); taking into account the competitive positioning of rail compared with other modes to price in a way that would induce modal shift; or to introduce targeted incentives to incentivise desired behaviour (for example in introducing modifications to rolling stock to be safer or more environmentally friendly).

Step 2: As outlined above, the AMRs require the price for the minimum access package (for Network Rail's network, this is reflected in the Variable Usage Charge) to be set on the basis of the costs which are directly incurred by Network Rail as a result of that service. There is some ambiguity about what this may mean in practice, with both average direct costs (where the direct costs of operating all services on the network are derived in accordance with the Implementing Regulation, and those costs averaged over the services on the network – potentially adjusted to reflect differences in the costs incurred by different services) and marginal costs (which are the costs associated with running one – or a very small number – extra trains on the network), being permitted.[6] From our discussion, there is a lack of clarity within the industry about whether the current charging regime is based on average direct costs, or marginal costs. We recommend that Network Rail and the ORR clarify this with the industry.

As with many aspects of the rail network, the ORR will need to balance different duties in

6 Implementing Regulation, para 12, Article 3, para 1, and Article 5, para 1.

arriving at its decisions, and this is the case in reviewing access charging. Which of the options outlined above would be preferred is likely to depend on the balance of objectives of the access charging regime, with a regime which puts more focus on increasing the level of cost recovery (i.e. the extent to which users of the network pay for the costs) likely to prefer to focus on the average direct cost; while a regime which puts more focus on maximising the efficient use of the network is more likely to focus on the use of marginal costs.[7] There is a clear trade-off between these two potential aims of a charging regime. These decisions on access charges will also have an impact on the subsidy required from taxpayers to fund the rail network. We recommend that the ORR clarifies the objectives, and the balance of those objectives, of the access charging regime ahead of the next periodic review.

In addition to deciding on the definition of the direct cost to be charged for (i.e. marginal cost or average direct cost), it is also necessary to decide on whether to set these costs on the basis of short-run or long-run costs. From economic principles, charging on a long-run basis is likely to lead to a more efficient use of infrastructure, however it is unclear whether the data is available to support a robust assessment of long-term costs.

It is also necessary to decide how to segment the base that is incurring the direct costs, for example, whether to work on a base of all types of operators, or split the market into different aspects for the cost calculation – for example, between passengers and freight. In our industry engagement, several operators expressed a view that they do not have visibility over the costs being put into the calculation for their market segment, or the ability to meaningfully challenge those costs. We recommend that Network Rail and the ORR should be clearer on what the costs are which are going into the calculation and provide increased mechanisms for operators to challenge those costs in a proportionate way, and it seems likely that basing these costs separately for passengers and freight would help operators to engage in this discussion.

Step 3: having identified the direct cost to be charged for, it is then necessary to decide how to estimate those costs. Three methods are available – engineering, econometric and subtraction – which can be used in isolation, or in conjunction with one another:

- The engineering method calculates direct costs based on engineering knowledge of how characteristics of trains affect network wear and tear (and associated costs).
- The econometric method calculates direct costs using a statistical/econometric model to estimates the impact of traffic levels on cost, holding equal other factors that might affect cost.
- The subtraction method calculates direct cost as the difference between the total cost for provision of a minimum level of access and any non-eligible costs.

All methods are commonly used and consistent with the legal framework and there do not appear to be strong reasons to prefer one over the other, except that the subtraction method seems unlikely to accurately identify marginal costs (such a method inherently estimates

[7] This assumes that there is already a network in place and hence marginal cost pricing may maximise the (allocatively) efficient use of the network.

average, not marginal, costs). Each of these model types will make different assumptions and have different strengths, weaknesses, and data requirements, and therefore a triangulation approach of using two or more methods is likely to provide more confidence in the robustness of the results.

Step 4: after estimating the relevant cost, there are then a number of practicalities which must be addressed to turn that direct cost into a charge. These practicalities include how long any charge is fixed for, whether the charge increases with inflation or not, whether real price effects are allowed for or not,[8] whether there is any provision for adjusting the charge based on differences between forecast and actual traffic/efficiency. There are many trade-offs required in this area, however a charge which is fixed for a reasonable length of time (say, 5 years) and which makes allowances for both expected efficiency savings and real price effects over that period would seem a reasonable balance between different objectives, although different parties may reach different conclusions on precisely how to achieve this balance.[9]

Step 5: steps 1-4 have primarily considered charging for the Minimum Track Access Package (which is the underpinning framework for the Variable Usage Charge, as well as the Electrification Asset Usage Charge). The EC4T charge is a pass-through of costs for electricity and so has not been considered in detail for this study. The largest charge is the Infrastructure Cost Charge. There are many ways in which economists allocate fixed and common costs between different activities. The approach in the existing access charging regime is outlined in Section 3.2 of this report. We recommend that Network Rail and the ORR consider further the potential for allocating fixed costs to particular paths and then charging on that path basis, although we note that there is legal risk around this approach if it results in a particular market segment being unable to pay for that path. Otherwise, a form of Ramsey pricing, where mark-ups are applied to different market segments on the basis of their willingness to pay is a commonly used approach to setting mark-ups in different countries. This form of pricing is used in various European countries;, more details regarding its different applications can be found in Annex B.

Step 6: market segmentation in the access pricing regime may be used in two different contexts:

1. **optional** use of market segmentation to produce a Variable Usage Charge that is calculated on a segmented basis (i.e. using market segmentation to tailor charges applying to the minimum access package between train services operating in different market segments); and

8 Real price effects arise when an organisation's costs increase above the general rate of inflation, for example, because it has substantial exposure to a raw material for which prices move differently to the average price change across the economy.

9 For instance, to ensure direct cost charges include provisions for inflation, a regime might choose to link the charges to an index for inflation or rather choose to include an estimate for inflation over the course of the period in a charge that is then flat.

2. **mandatory** market segmentation to be conducted by Network Rail when it seeks to levy a mark-up to recover some of the fixed costs of the network. Market segmentation must be conducted in this context to ensure that a market segment is not 'priced out' by the imposition of the relevant mark-up (i.e. the Infrastructure Cost Charges). In this context, the AMRs mandate that market segmentation be conducted and that certain market segments must be considered.[10]

We consider that it is helpful to be clear about which of these aspects any market segmentation is addressing and to base any market segmentation on the principles of reflecting the degree of uncertainty in the underlying evidence base and after considering the administrative costs and impacts of uncertainty that arise from more complex market segmentation. We further recommend that Network Rail and the ORR conduct a careful review of the current market segmentation (based on charging by train-type), to assess whether radical simplification could be provided. This would reduce administrative complexity and also the uncertainty of market participants.

We also recommend that Network Rail and the ORR investigate whether better use can be made of those elements of the AMRs which provide for:

- a premium charge in certain circumstances where portions of the network are congested; and
- the provision of discounts where the network is under-utilised.

The use of these mechanisms may provide price signals to operators to move services to less utilised parts of the network where this is operationally possible. It is important to note that the AMRs do not allow for the establishment of different charging regimes for different geographic areas[11]. Network Rail 'must ensure that the charging system in use is based on the same principles over the whole of the network,'[12] with 'the network' in this case being the entire network managed by Network Rail. It may be that applying the same charging principles on a network-wide basis results in practice that different charges are levied in different areas of the network, for example because the direct costs of the network are different in different areas. However, this outcome should be achieved by the implementation of network-wide principles, rather than area specific charging systems.

Through this work, we have engaged with the industry on access charging, on what works well and what works less well currently, from different perspectives. Through this engagement, we have heard that:

- Operators value the AMRs because of the stability and clarity that they bring, but the AMRs and the Implementing Regulation are restrictive on the extent to which the access

10 AMRs, Schedule 3, para (10).

11 However, in certain circumstances (as discussed later in this report) the AMRs *do* facilitate the levying of charges to recover investment in relation to a specified portion of network in particular circumstances – AMRs, Schedule 3, Para 3

12 AMR, Schedule 3, Para 1(3)

charging regime can be used to support wider policy objectives. We recommend that the ORR and DfT consider whether the AMR and IR should be evolved to allow access pricing to reflect wider policy objectives such as reducing carbon emissions, improvements in safety, etc; without losing the stability that the AMR provide to the industry;

- Operators value having early clarity on the pricing methodology to be adopted for the next price control review as early as possible in the price control review phase to enable them to understand the potential impacts on their business. We recommend that Network Rail and the ORR consult on the proposed pricing methodology as early as practicable during the price control process.

2 Introduction

2.1 Scope of work

Determining access charges to a network is a fundamental task for all network infrastructure managers and regulators. An important consideration for Network Rail, the Infrastructure Manager (IM) for much of Great Britain's (GB) railway infrastructure, is to set access charges such that the revenue will cover, along with the network grant, the costs of operating and maintaining its network. The access charges are also a critical part of the tools that can be used by Network Rail to incentivise desired behaviours from passenger and freight operators.

As part of the Periodic Review (PR) process of Network Rail, the Office of Rail and Road (ORR) reviews and approves the access charges that are proposed by Network Rail.[13] In reviewing these charges, the ORR must balance a number of requirements and duties set out in law, particularly those derived from the Railways Act 1993 and the 2016 Railways Regulations, whose requirements are derived from the European Commission's Recast of the First Railway Package (Directive 2012/34/EU). There are further relevant restrictions in the Implementing Regulation (2015/909) which sets out detailed instructions on how to calculate applicable costs in determining rail access for the Minimum Track Access Package and access to infrastructure connecting service facilities.

The ORR recently determined the access charges for Network Rail infrastructure as part of the Control Period 7 (CP7) Final Determination, and a number of stakeholders questioned elements of this determination. The ORR has hence commissioned Frontier Economics Ltd (Frontier) to conduct a strategic review of how to best determine access charges for the rail network in GB for Control Period 8 (CP8). Frontier has partnered with Burges Salmon to conduct this strategic review.

This output of this strategic review is a practical set of options for a potential reform of the Network Rail access pricing regime for CP8 and beyond. None of these options are committed policy by the ORR and all would need further assessment and detailed legal, economic, and operational assessments prior to being implemented.

2.2 Legislation review

Burges Salmon have identified the legal requirements for setting access charges and hence bringing to light the areas of opportunity for reforming the current approach.

To this end, Burges Salmon reviewed the following legislation:

[13] The ORR regulate access pricing – as part of the overall price control processes – for Network Rail and also for High Speed 1 and the Elizabeth Line.

- **Schedule 3, Railways (Access, Management & Licensing of Railway Undertakings) Regulations 2016** (the "AMRs"), which sets out the rules and principles by which the ORR must determine the access charges it sets pursuant to the 2016 Regulations.
- **Section 4, The Railways Act 1993** (the "RA 1993"), which sets of the general duties of the ORR in performing its functions as the regulator of access charges.
- **The Implementing Regulation (EU 2015/909)** ("the Implementing Regulation"), which sets of the modalities for the calculation of cost that is directly incurred as a result of operating rail services, for the purposes of calculating charges for the Minimum Track Access Package and access to infrastructure connecting service facilities under the 2016 Regulations.

The legal requirements and opportunities identified as a result of the Burges Salmon review of this legislation were then used:

- To inform **an initial legal filter** to highlight those options on the list for reforming access pricing that may require legislative change to implement. These options are captured in this study, but not taken forward into a detailed evaluation; and,
- To inform **an indicative legal flag review** to capture – for an option that is not deemed to require legislative change, and hence is subject to a full evaluation – the extent of consistency with the current legislative requirements.

An important note: The full output of the Burges Salmon review is included in Annex A of this report. Nothing in this document should be considered as legal advice regarding any of the options listed in the report.

2.3 Approach to this study

Our approach to this study is outlined in the figure below.

Figure 3 Study approach

Source: Frontier Economics.

In more detail, our approach was:

- **Legal review:** As described above, Burges Salmon reviewed the relevant legislation that has direct bearing on the options available for an access pricing regime for the UK rail network. The results of this work is outlined in Section 3.1 of this report.
- **Review of current access pricing regime**: We review the current regime, to understand the current approach to setting access pricing. We present a summary of this review in Section 3.2.
- **Criteria to assess change:** We develop a set of five criteria, designed to illustrate the relative strengths and weaknesses of different choices, given a set of objectives. These criteria are described in Section 4.
- **Approach to market segmentation:** We identify the purposes of market segmentation in the context of track access charges, and key principles for choosing segmentation. We also suggest a process for applying these principles to choose an approach to market segmentation. This is presented in Section 5.
- **Options for change:**
  - To obtain a broad list of options for change, we held a workshop with industry stakeholders to gather ideas. The notes from this workshop are presented in Annex C. We complement this with desk research and draw on prior experience to reach a long list of options for changes to the access charging regime.
  - We fit these options into a framework for access pricing options; this framework is structured to make clear the choices for the set of building blocks of the overall access pricing regime. This framework is presented in Section 6.1.
    - As an initial step of this framework, we filter out options needing legislative change. These are listed, together with a description of why we consider the option would not be implementable without legislative change. The options are then not taken forward for full evaluation (Section 6.2.1).
  - We then conduct an evaluation of the remaining options according to the 5 criteria. This is presented in Section 6.2.2-6 of the report.[14]
- **Practical recommendations:** We outline a set of recommendations for the ORR to consider. These are intended to assist the ORR as it scopes its review of the access charging regime for CP8 and are made on the basis of the workshop and other stakeholder discussions, and on the basis of the options evaluation. These recommendations are presented in Section 7.

[14] We also include some additional details of the options in Annex B. This Annex makes reference to material describing the different options used in other European Countries.

3 Context

3.1 Legal requirements and opportunities[15]

3.1.1 Baseline scope and charging basis outlined in the AMRs

In this section, we briefly outline the key content of the legal documents reviewed, in terms of the scope of activities that each charge may cover ("scope") and the rules for setting the charges ("charging basis").

There are six categories of track access charges outlined in the AMRs. Each of these has a defined scope and charging basis. The six categories together with their respective scope and charging basis are illustrated in the figure below. We note that the terminology used by the AMRs is different from that used in the current access pricing regime for Network Rail, but it is possible to map the charging categories in the AMRs across to the access charges for Network Rail as laid out for CP7.

The **Track Access Charge** is made up of two parts: first, the Minimum Track Access Package i.e. accessing the railway tracks; and second, Access to Service Facilities, for instance accessing facilities such as train maintenance or cleaning. In economic terms, these are the variable costs incurred by the use of the network. The AMRs require that the charge for each of these must be based on the direct cost incurred from operating a train service, although the Service Facilities allows also the provider to generate a "reasonable profit". Rules for calculating the two parts of the track access charge are described in the Implementing Regulation.[16] This category sets the framework for the Variable Usage Charges in CP7.

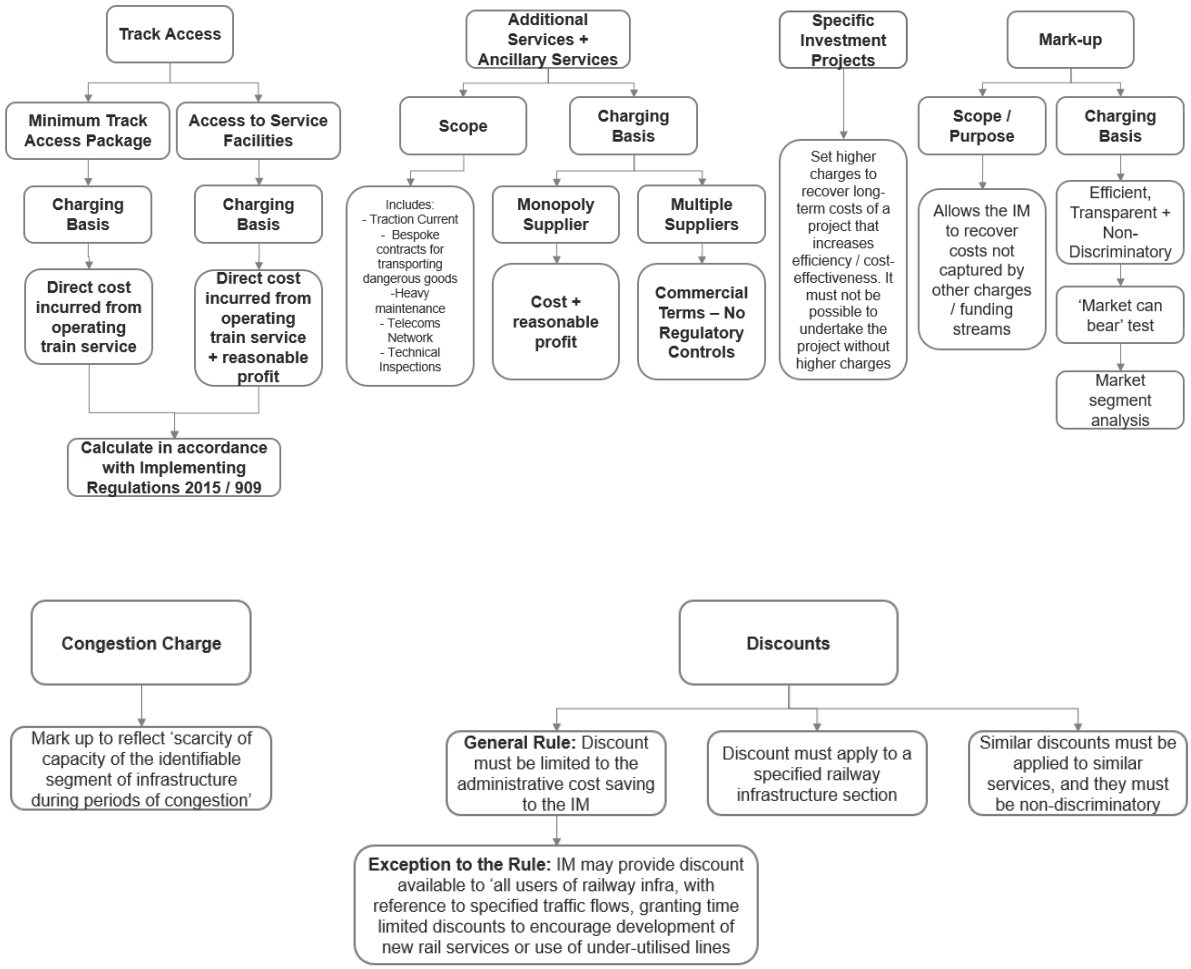
The second category covers **Additional Services and Ancillary Services**; these are further variable costs that stem from an operator's direct use of particular services such as charges for traction current or contracts to carry dangerous goods on the network. The charging approach for these varies according to whether the service is run by a monopoly supplier, necessitating a cost plus reasonable profit approach, or by multiple suppliers, in which case the prices may be set by market forces.

The third category allows for introducing a access charge to cover the cost for a **specific investment project** that could not be implemented without the revenue generated from this charge.

15 The full legal review from Burges Salmon can be found in Annex A of this report.

16 The Implementing Regulation sets out the modalities for the calculation of cost that is directly incurred as a result of operating rail services, for the purpose of calculating charges for the minimum access package and access to service facilities. The full details are available in Annex A.

Figure 4 AMRs – Categories of Charge



Source: Frontier Economics/Burges Salmon.

The fourth category of charges is **mark-ups**. These can be thought of as a "sweeper" charge, to cover some of the fixed costs of the network . The charging basis to cover these costs is a mark-up imposed above direct costs, which must be set in such a way as they pass a 'market-can-bear' test, stemming from a market segmentation to divide the market into groups who may be able to bear greater or lesser mark-ups.[17] In the current access pricing regime, this charge is equivalent to the Infrastructure Cost Charges, of which the largest is the Fixed Track Access Charge.

[17] We discuss segmentation in greater detail in Chapter 5 (on approaches to segmentation) and Chapter 7 (as we evaluate options for change, including alternative approaches to segmentation).

The fifth category of access charging is the **congestion charge**, which is a specific form of mark-up charge to reflect the periods of congestion of particular network segments.

The sixth category of access charge is the **discount**, whose charging basis is that it can be applied to particular segments of the network / specified traffic flows but must be available to all groups of users (non-discriminatory). The discount scope is fairly limited: it may only cover administrative cost savings for Network Rail, or be offered on a time-limited basis to facilitate market entry or to encourage use of considerably under-utilised lines on the railway network.

3.1.2 The legal requirements and opportunities stemming from the AMRs

On the basis of the detailed scope and charging basis for these categories of costs, we have identified six key legal requirements that stem from the AMRs**.** We describe these here, and give some examples of what might be prevented or permitted by these requirements.

1. The overall charging regime must be based on **network-wide principles**: that is, except for charges for Specific Investment Projects, the charging system in use must be based on the same principles over the whole of the network. This prohibits, for instance, a charging system differentiating access charges purely on the basis of geographical region within the same network.[18] However, if a congestion charge were introduced across the network to levy a higher charge for sections operating at a higher capacity, and this led to charges varying according to regions (due to regional variation in congestion), this would be not be prohibited.
2. The charging must be **non-discriminatory**: the charging regime must result in equivalent and non-discriminatory charges for different railway operators performing services of an equivalent nature in a similar part of the market. This would prohibit, for instance, charging different operators who are fulfilling the same function, using the same trains, different prices.
3. There is a clear requirement that **access charges cover direct costs**: the charges for the Minimum Track Access Package must be set at the cost that is directly incurred as a result of operating the train service. This limits the possibility to introduce a discount to reduce the direct cost coverage i.e. the variable costs (save that in the specific circumstances set out in sched. 3, par. 6). The manner by which those direct costs may be identified and how they are estimated is not, however prescribed by the AMRs or the Implementing Regulation and therefore there remains significant flexibility in this regard for setting access charges.[19] This flexibility is explored in detail later in this report.
4. The scope of access charging need **not only be direct cost**: to recover some of the fixed costs incurred, the Infrastructure Manager (IM) may levy mark-ups. These must be on the

[18] The AMRs define network as “except in those cases where the context otherwise requires, the entire railway infrastructure managed by an infrastructure manager.”

[19] See Annex A for more details from the Burges Salmon review of the Implementing Regulation, which outlines clear rules regarding the eligible and non-eligible costs to be included in the direct cost charge.

basis of efficient, transparent and non-discriminatory principles, whilst guaranteeing optimum competitiveness, in particular in respect of rail market segments.

- Any proposed mark-up must pass a test: the mark-up must not exclude market segments which can pay at least the cost that is directly incurred as a result of operating the railway service from using the rail infrastructure. We note that ORR approval is required for any mark-ups.
- We note also that the impact of a proposed levy on a defined set of market segments must be considered.[20]

5. The **use of discounts is fairly restrictive**:[21] discounts may be used to cover any savings to administration costs for the IM, or on a time-limited basis to encourage use of considerably under-utilised lines on the network or to facilitate the development of new rail services This does not directly allow for the application of blanket discounts, for instance, on the Minimum Track Access Package charges which cannot be charged below direct cost. However, the other variable charges – additional services and ancillary services – may have scope for charging based "up to" (and therefore less than) the direct cost of these.
6. Access charging may take into account **scarcity of capacity**: a specific mark-up may be imposed to reflect periods of congestion, but any such mark-up must be non-discriminatory and applied according to the same principle across the network.

3.2 Current charges and how they are calculated

Network Rail is expected to receive approximately £16 billion from access charges during Control Period 7 (CP7), which accounts for around 34% of total income. There are three broad types of charges paid by operators:

- **Variable charges:** Recover costs that are directly incurred by Network Rail when train services are operated over its network.
- **Infrastructure cost charges (ICCs):** Recover a portion of the fixed costs of rail infrastructure, that is, costs which do not vary with network use in the short term.
- **Station charges:** Recover the costs of operating, maintaining and renewing the stations that are operated by Network Rail.

Table 2 details Network Rail's expected revenue from charges in 2023/24 prices.[22]

We note that the charges outlined in this table draw on the underlying legislation presented in the previous section: variable charges calculated as direct costs, and ICCs as a form of mark-up to cover fixed costs of the network. There is nevertheless flexibility in the manner in which

20 Further details available in Section 5.

21 We note that any mark-up is expected to be zero (no mark-up) or positive (i.e. a mark-up cannot be negative, so as to be used as a discount mechanism to avoid the restrictions on setting discounts).

22 PR23 Final Determination Policy Position on Access Charges, p7.

the legislation is applied; for instance, mark-ups are not mandated to be charged in the specific way that the ICCs are implemented and likewise there is scope for flexibility in the estimation of the variable charges.

Table 2 Network Rail revenue from charges

2023/24 prices	CP7 total (£m)	Proportion of gross revenue
Fixed Track Access Charge	6,657	14%
Variable Usage Charge	2,069	4%
EAUC	140	0%
Electricity for Traction	4,964	10%
Managed Station Qualifying Expenditure	568	1%
Station Long Term Charge	1,726	4%
Network grant	28,559	59%
Other	3,347	7%
Total	**48,031**	**100%**

Source: ORR PR23 Final Determination Policy Position – Access Charges.
Note: Prices in 2023/24 (£m) values.

3.2.1 Variable charges

Network Rail is forecasted to receive around £7.2 billion (2023/24 prices) in variable charges income during CP7. This is comprised of income through three charges: variable usage charge (£2.1 billion), traction electricity charge (£5 billion) and electrification asset usage charge (£0.1 billion).[23]

Variable usage charge (VUC)

The VUC recovers the operating, maintenance and renewal costs incurred as a result of small (or marginal) changes in traffic levels, assuming network capacity remains fixed. It recovers costs related to track (84%), civil engineering (13%) and signalling costs (3%) as these are costs which are directly impacted through use of the network.

[23] PR23 Final Determination Policy Position on Access Charges, p32.

To calculate the charge, forecasted operating, maintenance and renewal costs are calculated using an engineering model to estimate traffic tonnage.[24] This is then used to give short-run marginal cost increases which maintain constant track performance over the next 35 years. Specifically, the Vehicle Track Interaction Strategic Model (VTISM) estimates expected costs to the network due to wear and tear. These outputs are then used in Network Rail's VUC model alongside forecasted traffic to produce a single average rate for GB in pounds per thousand gross tonne miles (£/KGTM) value (= estimated total costs / forecast traffic). The single average rate over the 5 years of the control period is then apportioned between vehicle types based on damage formulae which estimate impact according to weight, speed and un-sprung mass. Outputs are then tested by increasing the traffic forecast in order to give an idea how much of the cost base varies with traffic.[25]

The phasing in policy is then applied to market segments to balance cost recovery with usage, such that new services are not disincentivised from operating due to high costs in their first years, but rather the extent of cost coverage by these new entrants is gradually increased. Rates paid by freight and charter operators are set to increase by specified rates over CP7, with a view of achieving cost-reflective rates as estimated in CP6 by the end of CP7.[26] There is no cap, or phasing in policy for passenger operators.[27]

Traction electricity

The Traction Electricity (EC4T) charge recovers the cost of electricity supplied by Network Rail to power electric trains. The level of charges depends on electricity prices rather than being a charge set for a whole control period. The calculation of the charge is based on one of three approaches.[28]

1. **Metered consumption** is based on meter readings taken from meters on trains. This is considered the most cost-reflective and accurate charging approach. Operators pay the actual cost of their energy consumption, which incentivises them to optimise their consumption on the network.
2. **Modelled consumption** is estimated and subject to an end of year volume reconciliation exercise. Consumption can be estimated using one of the following rates: bespoke, generic and default. During CP7, the ability to obtain bespoke modelled consumption rates has been removed, as well as the generic rates being removed from the price list at the start of CP7. This is done to incentivise operators to take up the metering option.
3. **Partial fleet metering** which extrapolates metered consumption from metered trains to estimate consumption for non-metered trains in the same fleet. This has been removed

24 PR23 Final Determination Policy Position on Access Charges, plus details from our discussions with Network Rail.

25 A combination of details stated in the PR23 Final determination policy position on access charges and Frontier Economics notes from meetings with Network Rail

26 PR23 Final determination policy position on access charges, page 32.

27 PR23 Final determination policy position on access charges, page 33.

28 PR23 Final determination policy position on access charges, page 51.

for CP7 as it was deemed to be too complex and no operator had used it since it was introduced it in PR13.

Electrification Asset Usage Charge

The Electrification Asset Usage Charge (EAUC) recovers variable costs (that vary with the changes in level of electrified traffic) of maintaining and renewing electrification assets.

The charge is calculated by forecasting average annual maintenance and renewals costs of electrification assets over 35 years, then calculating which proportion of these costs are variable. Variable costs are then allocated to passenger and freight operators based on their forecasted share of electrified vehicle miles for passenger services and gross tonne miles for freight.[29]

3.2.2 Infrastructure cost charges (ICCs)

Fixed network costs are recovered through several sources, including a significant proportion which is funded through network grant payments from funders. A small proportion of fixed costs are recovered from ICCs levied on open access and freight services. The remaining costs are then recovered through Fixed Track Access Charges (FTAC) paid by passenger operators which operate under contract to public funders based on each operator's share of Network Rail's avoidable fixed costs. Network Rail is expected to receive around £6.7 billion (2023/24 prices) in income from ICCs, more than 99% of which is from the FTAC.

Fixed Track Access Charges

The FTAC is set at the level which is required to recover Network Rail's remaining fixed costs after accounting for those recovered through grants and ICCs levied on open access and freight operators. The charge is set as a lump-sum annual charge. When calculating the charge, it is assumed that in England and Wales, DfT will make available network grants as set out in its statement of funds available (SoFA).[30] For Scotland this is based on Transport Scotland approved figures.

ICCs levied through mark-ups

ICCs for interurban open access services, airport based open access services and freight services are levied through mark-ups. These mark-ups are applied to services satisfying specific operation criteria which define each market segment. For open access and airport based services this criteria relates to the stations served, and for freight services this relates to the type of cargo being transported.[31]

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29 PR23 Final Determination Policy Position on Access Charges, page 55.

30 https://www.gov.uk/government/publications/railways-statement-of-funds-available-2022

31 Further detail on the criteria is provided in the PR23 Final Determination Policy Position on Access Charges

The level of the ICCs is based on an assessment of what contribution to the fixed network costs can each market segment bear to contribute via a mark-up. There are requirements in the legislation for setting mark-ups, including how the assessment is conducted. This 'market-can-bear analysis' must be applied within each market segment individually on a non-discriminatory basis. For example, in the interurban segment for open access services, evidence on forecasted net revenues generated by interurban services in the first year of CP7 is used to provide an indication of the mark-up which can be borne, while continuing to operate profitably.[32]

3.2.3 Station charges

Network Rail is expected to receive around £2.3 billion (2023/24 prices) in station charges during CP7. This is made of the Station Long Term charge (£1.7 billion) and Qualifying Expenditure charge (£0.6 billion).

The station Long Term Charge (LTC) covers the maintenance, renewal and repair costs for stations which are owned by Network Rail. For large/complex stations, the charge is calculated using station-specific expenditure forecasts. For other stations it is calculated using region-level expenditure forecast.

The qualifying expenditure charge recovers the day to day running and expenditure at Network Rail managed stations, it is made up of a fixed element and a management element. This is made up of:

- A fixed element which recovers costs such as the station staff, cleaning and refuse and collection costs. This is determined by negotiations between Network Rail and the operators.
- A management fee which recovers overhead costs and allows for a reasonable profit. This is regulated by the ORR comprising of a fixed fee and profit element percentage of that fixed fee.

3.2.4 Conclusion

While the largest source of revenue for Network Rail is the FTAC, this is a transfer from passenger operators under contract to funders, the level of which is dependent on both the grants made available from governing bodies and the underlying spend on the network. This transfer does not change with use of the network. However, the variable usage charges apply to all operators and is highly sensitive to the structure in which it is calculated in terms of methodology and inputs. This calculation of this charge and the resulting price list is of great interest to industry stakeholders as it plays a large part in their business planning.

32 More details available on the 'market can bear' analysis in the PR23 Final Determination Policy Position on Access Charges.

At a workshop hosted by Frontier Economics, industry stakeholders expressed several concerns with the current approach to calculating variable cost charges and the granularity of the resulting price list. In particular, these concerns focused on the VTISM model, highlighting its complexity and lack of transparency. To stakeholders it is not clear that VUCs are genuinely attributable to the service using the network. On the basis of these concerns, the following sections of this report will focus on the calculation of variable costs and particularly the charges for the Minimum Track Access Package (analogous to the VUC).

4 Criteria for assessing change

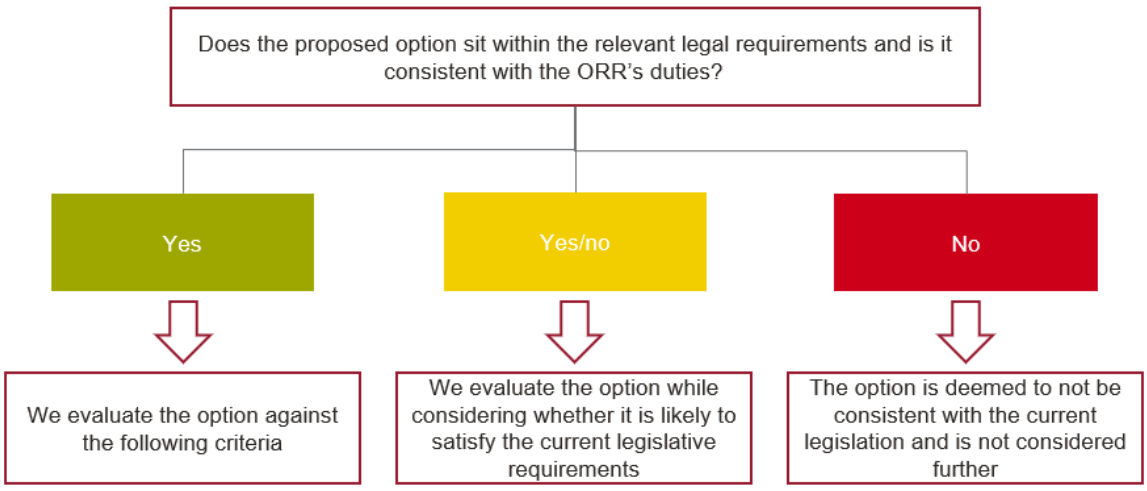
4.1 An initial legal filter

To assess each option for changing the approach to access pricing, we first determine whether that option is likely to satisfy the legislative requirements identified in the legal review. This is not a legal opinion and should not be relied on as such. The option is scored according to a Red, Amber, Green scale (RAG):

- **Red** indicates that the option would be unlikely to be consistent with the current legislative requirements;
- **Amber** indicates that the option sits within a legal "grey area" i.e. implementing this option bears a risk that it may not be consistent with the current legislative requirements;
- **Green** indicates this option is likely to be consistent with the current legislative requirements.

If the proposed option is given a green or amber score, we next assess the option against the five evaluation criteria outlined in the next subsection. If the option is unlikely to be within the bounds of the current legislation (a red score), it is not assessed further. While the current industry reform may provide the opportunity for changes to the current legislation, but the scope of this study is to assume that the legislative framework does not change.

Figure 5 Legal filter for pricing options



Source: Frontier Economics.

4.2 Purpose and scale of the evaluation criteria

We developed five criteria to assess the options for change that pass the initial legal filter. These are designed to evaluate each option according to the strengths and weakness of

implementing the revised methodology. The criteria also have regard to the impact of the proposed change on stakeholders.

Each option is assessed against each criteria, again using a RAG scale:

- **Red** indicates that the option is likely to satisfy the requirements for this criteria to little/no extent;
- **Amber** indicates that the option is likely to satisfy the requirements for this criteria to some extent;
- **Green** indicates that the option is likely to satisfy the requirements for this criteria.

As each of these options could be implemented in many ways, there remains a substantial degree of variation within each option which would need to be worked through should options for change be taken forward by the ORR for further consideration. The set of five criteria is designed to be both concise, to facilitate the ease of assessment of each option, and also comprehensive, to ensure the evaluation considers the critical determinants of a successful implementation of the proposed option. The rest of this subsection outlines the evaluation criteria in more detail.

4.2.1 Deliverable and durable

Factors to be considered:

- To what extent is there an **administrative or a legal risk** to this method being delivered?
- To what extent is the **data** required for calculating the charge available, accessible and reliable?
- To what extent does the method enable different **funders to pursue their own objectives**?
- To what extent is the method **sustainable and adjustable to any changes to future funding structures**?

Assessing whether an option is deliverable is partly dependent on the interpretation of the legal requirements. The legal review conducted by Burges Salmon looked to identify areas of the current legislation which are not fully prescriptive and left room for interpretation. These legal “grey areas” present opportunities for changes to the current charging system.

Methods for setting rail access charges must also be deliverable in terms of the data required. If the data required is scarce, or not easily made available, this may hinder or prevent its use. To produce reliable and credible access charges the data underlying the calculations must also be accurate and of high quality (including being available in a timely manner).

Deliverability also stems from the acceptability of the option by the funders, which will be driven by the extent to which the option facilitates these funders achieving their objectives. This connects to the durability arm of this criteria: funders' objectives may alter over time, with evolving politics on the role of rail in the UK (both freight and passenger). For this criteria, we therefore also consider the extent to which the option is likely to be flexible to future changes in what stakeholders desire the rail industry to deliver (without taking a view on what those policy objectives might be).

4.2.2 Proportionate

Factors to be considered:

- To what extent is the **benefit generated from implementing the option** proportionate to the **regulatory burden** imposed on the ORR, Network Rail and other stakeholders? *This regulatory burden can include both administrative costs and the impact of uncertainty caused by the option under consideration.*

This criteria considers the costs imposed on the ORR, Network Rail, network users and other stakeholders in terms of initial implementation and ongoing operation. These costs depend on the level of administrative burden incurred through any complex methodology or any uncertainty introduced in terms of determining the charges.

These burdens must be weighed against the benefits of the proposed change, such as cost recovery – if an objective of the access charging regime is to increase the costs of the network recovered from users of the network – or network efficiency, through more granular price lists. While this may generate benefits, there is likely to be an interaction between the complexity (cost) of the method used to determine rail access charges and the granularity of the resulting price schedule. This may also impact governing bodies as decisions regarding subsidies and financial support to the sector depend partly on the track access charges. Larger complexity in the implementation may provoke or necessitate a larger degree of scrutiny.

If the option relies on an option that is already employed in other European countries, this may facilitate an easier transition for international stakeholders as they may have some understanding of the option from other operations: in contrast, a complex, unfamiliar access pricing regime may generate uncertainty and administrative costs in particular for international network users who need to operate across multiple access pricing regimes.

4.2.3 Predictable

Factors to be considered:

- To what extent can the method for access charging be **easily understood** by all key stakeholders?
- To what extent would the option produce **predictable charges**?

This criteria evaluates both the understandability of inputs/methods and the predictability of the outputs (prices). This includes a possible tension: options which rely on more complex and technical modelling may produce more predictable outputs, however, these may be more difficult to justify to stakeholders. Conversely, more complex methodology – which requires a greater technical understanding of the network, assumptions and calculations – may be less predictable to stakeholders, as only those within the ORR or Network Rail may be able to replicate the analysis. Stakeholders are more likely to understand and accept a methodology which is straightforward in nature, and/or is more aligned with current approaches used in other European countries. If, on the contrary, proposed access pricing methods are deemed hard to understand, there may be resistance from both operators and funding bodies to their implementation.

Opting for a simpler option may produce a more straightforward price list, but such a method may be constructed on a set of simplifying assumptions which in turn render the prices less cost-reflective at a granular level (hence also perhaps less immediately transparent to users).

4.2.4 Cost recovery

Factors to be considered:

- To what extent would the method of setting access charges enable **the desired level of cost recovery**?

One of the objectives of access charges is to recover some of the costs of the rail network. There is scope for wide ranging interpretations of what such a desired level may be: which costs specifically should be recovered, what is the desired level of user contribution and what level of governmental funding can be assumed? The desired level of cost recovery from users of the rail network is not straightforward.

Legislation currently requires access charges for the Minimum Track Access Package to be based on the calculation of direct costs: however, the definition of direct costs is open to

interpretation. That is, one could interpret direct cost to be the marginal cost, the average cost, or the incremental cost.

The level of cost recovery is a policy decision, and the access charging regime should be sensitive to this. We explore this in more detail subsequently.

The level of access charges will also depend on the time horizon for which the costs are recovered. Access charges reflecting long-run costs will likely differ to those reflecting only costs incurred in the short-run. For example, short-run costs may only consider the use of the network over the current 5 year price control period, whereas long-run costs will account for the operation, maintenance and renewal of the network which may occur within a longer time period, as well as other longer term network costs, for instance innovation and other investment costs.

4.2.5 Incentivises efficient railway use

Factors to be considered:

- To what extent would the method **incentivise the efficient use of the rail network** by providing appropriate price signals to its users?

Economic theory suggests that access charges should be set at the price level which produces the efficient use of the rail network. By efficient level, we mean allocatively efficient: the use of the network such that it meets the needs and wants of society. In theoretical terms, this equates the marginal benefit of the network to the marginal costs. In practical terms, we can see this as finding the access charges that maximise the net benefit of the network to society. However, the private costs and benefits to operators and Network Rail are different to those of society, due to externalities such as carbon emissions and noise pollution.

The methodology for setting access charges should therefore encourage both passenger and freight users to use the network efficiently. If a charge is too high, this could lead to operators changing their levels of use as it will no longer be cost effective, for example, freight operators choosing to transport material via road rather than rail. If a charge is too low, the rail network may become congested with too many operators rendering it inefficient.

Note that we consider efficiency in terms of optimal use of the network (not too empty, not too congested).

4.3 Use to evaluate options

We provide a qualitative assessment of each option's performance against the individual criteria to provide a basis for evaluating the options for setting access charges.

As well as this qualitative assessment, we assign a numerical value to represent the options' respective performances against the criteria. This quantitative assessment allows us to produce a high level visual representation of the option's strengths and weaknesses relative to the criteria.[33] We use the following numerical scale alongside our RAG scale:

1. Red
2. Between Amber and Red
3. Amber
4. Between Amber and Green
5. Green

[33] The numerical ratings will be present in our final evaluation tables to help those who are red/green colourblind.

5 Market segmentation

In this section we provide some guiding principles for how one could implement market segmentation in practice. We do not undertake a detailed analysis of the options to test the existing market segmentation, or to develop a new one, as this lies outside the scope of this study.

5.1 Principles

We have identified the following purposes of implementing market segmentation in the context of track access charges:

- Group services with **similar levels of direct costs** for the purpose of establishing variable usage charges;
- Group services with **similar levels of willingness to pay** for the purpose of establishing mark-ups. That is, group services which have similar abilities to either absorb, or pass-on, any mark-up costs; and similar likely customer responses to those mark-ups, such that they are willing to pay similar levels to operate the service on the network;
- Identify which market segments could **benefit from a discount,** to stimulate the use of the network by that market segment.

There may be a tension between the appropriate groupings for achieving these purposes. While some services may have similar levels of willingness to pay, there could be large differences in the levels of direct cost associated with the operation of the service (and vice versa). Segmentation should therefore look to balance this tension appropriately. Indeed, it might be that different segmentation approaches are appropriate for different facets of the access pricing regime.

We have developed the following principles for choosing a segmentation approach:

- Segmentation **must be in line with the legal requirements** (outlined in Section 5.2);
- The degree of granularity in the market segmentation should **reflect the uncertainty in parameter estimation**;
- Segmentation should **reflect the purpose of its application**;
- Segmentation should **consider the cost of granularity** against the benefits of targeted incentivising.

5.2 Legal requirements

Segmentation in practice should be in line with the requirements set out in the legislation. The legislation requires that before approving the levy of a mark-up, the ORR must ensure the list

of market segments to be considered by Network Rail contains a set of pairs, listed in AMR, Schedule 3, Section 2, paragraph 10.[34]

The market segmentation must also contain at least the following three segments: **freight services, passenger services within the framework of a public service contract and other passenger services.**[35] In addition to this, Network Rail may consider further market segments according to commodity or passengers transported.

It is also stipulated that Network Rail must define market segments in which railway undertakings are not currently operating, but in which services may later be provided during the period. Network Rail should not include a mark-up for services in such market segments. Final list of market segments must be published by Network Rail in its network statement and reviewed at least every five years.

5.3 Principles of market segmentation in practice

Following the legal filter, one could apply further segmentation where appropriate. The figure below shows various possible characteristics upon which market segmentation could be applied (note, this list should not be considered extensive, but shows a subset of possible factors). When considering segmentation, these options should not be seen as mutually exclusive, however, segmentation by these factors could be applied sequentially where appropriate.

Segmenting by inputs alone such as physical train characteristics could be implemented in specific cases, but this is not recommended as one would need to establish a credible link between these inputs alone and the factors you would like to segment by, e.g. damage to the infrastructure or willingness to pay.

Further segmentation could be applied based on factors stemming from the external environment in which the service operates in, on the basis that this affects the willingness and / or ability to pay of the network user. For example, in the context of freight services, segmentation could be applied based on how easy it would be to switch to an alternative mode of transport. Services which could easily be transported by alternative means would require

34 The following pairs of segments are listed in 2(10):

- passenger versus freight services;
- trains carrying dangerous goods versus other freight trains;
- domestic versus international services;
- combined transport versus direct trains;
- urban or regional versus interurban passenger services;
- block trains versus single wagon load trains; and
- regular versus occasional train services.

35 The Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2016, 2(6)

larger incentives to continue using the rail network, relative to services where it is extremely difficult to move away from rail.

Further segmentation could also be applied based on factors which impact the direct cost of operating the service. This could, for example, relate to the speed of the service. Faster services operating at a much higher speed are likely to inflict different damages to the infrastructure compared to slower services.

Figure 6 Factors for market segmentation

	By output (direct cost of service)	By external environment	By inputs
Physical characteristics			
Characteristics of trains – physical descriptions of the train e.g. weight	X		X
Characteristics of users/cargo – passengers vs freight (different types), empty vs full	X	X	X
Journey characteristics			
Timing – frequency / days per week / time of day	X		
Journey – distance / stops / speed / flexibility	X	X	
Location – urban / regional / interurban / international		X	
Infrastructure characteristics			
Physical state / sophistication	X		X
Capacity utilisation	X		

Source: Frontier Economics.

More granular market segments create the ability to target specific areas and facilitate more efficient use alongside greater cost recovery. This however creates a greater administrative cost and burden to justify the segmentation. The benefits to further granularity should therefore be evaluated against the costs and the possible uncertainty in parameter estimation.

Segmentation based on certain characteristics may also lead to unwanted trade-offs. As outlined in Section 5.1, segmentation should group services which have similar levels of direct costs, and group those which have similar levels of willingness to pay. Journey characteristics such as speed / distance / flexibility can be used to segment based on factors impacting the direct cost and/or the willingness to pay. Segmentation should only be applied where it reflects both these purposes, while mitigating any overarching conflict between them.

In the options for change outlined in the following sections of this report, market segmentation has been considered to an extent, but further work would need to be done to apply these principles prior to any option being implemented.

6 Options for change

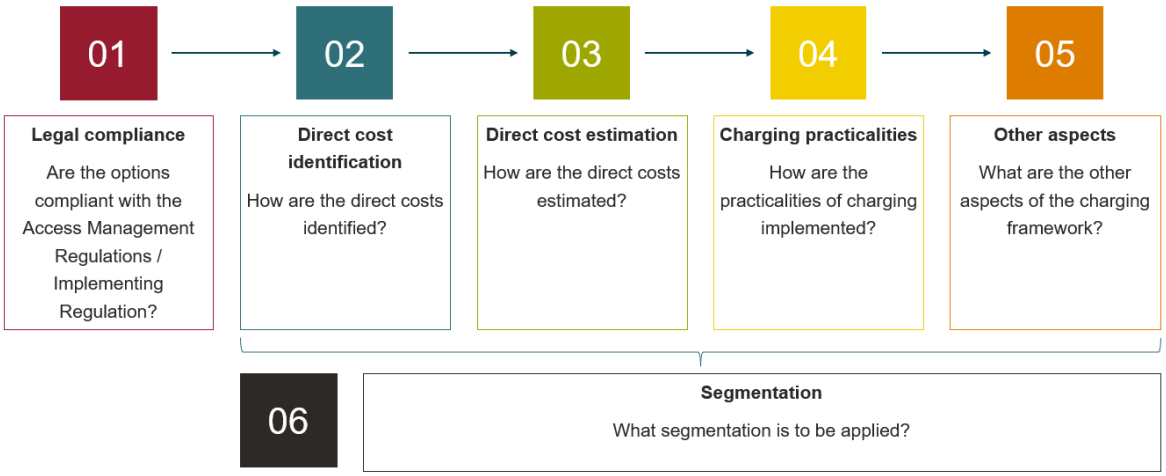
6.1 A framework for access pricing options

Through desk research, a workshop held with operators and through our prior experience, we developed a long list of options for potential changes to the access pricing regime. We developed a framework to structure this set of options. The framework is designed to:

- Give structure to the large set of options that are available, by grouping them into the aspects of access pricing that they cover; and
- Enabling our evaluation of each option to be conducted relative to other options for the same access pricing aspect.

The overall structure of the framework is illustrated at a high level in the figure below (the full framework diagram is in Annex B).

Figure 7 Options framework at a high level



Source: Frontier Economics.

We include in the framework a first step to group together all the options that are not compatible with the current legislative framework. These options are not carried forward for evaluation according to our criteria as they are outside the scope of this study, which assumes that the legal basis is not changed.

Some further detail on the subsequent steps in the framework is as follows:

- **Identifying direct costs:** This step includes defining the direct cost that is to be charged, in order to be able to determine the appropriate measure of the variable costs of a user of the network. This might be average direct costs (total variable costs divided by the usage of the network), marginal costs (the cost of adding the last user to the network), or

the incremental cost (the costs of adding a group of users to a baseline). Identifying direct costs also includes deciding whether to set these costs on the basis of short-run or long-run costs. It is also necessary to decide how to segment the costs, for example, whether to work on a base of all types of operations, or split the market into different aspects for the cost calculation – for example, between passengers and freight.

- **Estimating direct costs:** This step involves choosing a method to estimate the direct cost measure chosen in the previous step. A method will have a particular set of data inputs, assumptions and calculations. The options for estimation include engineering methods, econometric methods, subtraction methods, or a combination of two or all three of these methods.
- **Charging practicalities:** After estimating the relevant cost, there are then a number of practicalities which must be addressed to turn that direct cost into a charge. This includes the length of time for which a price is set, the profile of the price within the fixed period, the choice of index used when adjusting charges for inflation, the inclusion of a provision for differences in traffic forecast versus outturn, and the allowance (or not) for any difference between forecast cost efficiency and the efficiency actually achieved .
- **Other aspects:** Steps 1-4 primarily consider charging for the Minimum Track Access Package (which is the underpinning framework for the Variable Usage Charge). There are then a set of further options including how to allocate fixed costs, and whether to introduce a congestion charge and / or discounts. This final step includes options for these additional elements for the full access pricing regime.
- **Segmentation:** A charge can be applied to all users of a network, or rather set differently for different users. This segmentation has two purposes: grouping users who ought to pay a similar level of variable costs, given patterns of usage of the network and grouping users who should contribute similar levels of fixed cost coverage. Segmentation could be achieved by train type, by bulk / non-bulk (for freight), by speed banding, by axle-weight bandings, by individual train type, by commodity (freight), by time of day or by geography.

6.2 Evaluation of options

We have qualitatively evaluated each option within the five steps against the criteria set out in Section 4. In deciding which option is preferable, there are many trade-offs which need to be made and we highlight the key trade-offs for different options to assist the ORR in scoping its further review of access charging for CP8.

6.2.1 The initial legal filter

Here we present the options from the long list that are filtered out in the first stage of the framework, and briefly outline why the option is considered likely to not be consistent with current legislative requirements. Generally this is due to one or more of the requirements highlighted in Section 3.1.

Table 3 Options that are deemed incompatible with current legal constraints

Options	Brief description	Reason for incompatibility	Legal flag
Environmental externalities	Charges reflect environmental externalities, such as (relative) reduction in carbon emissions. Generally, this can be considered a charge based on direct private and social costs.	The AMR requires pricing access for the Minimum Track Access Package on the basis of the direct costs incurred by the Infrastructure Manager. The Implementing Regulation is clear that only private costs directly incurred by the operation of the train service should be included in the calculation of direct costs.	Red
Competitive positioning	Charges take into consideration the competitive environment within which the service operates (for example, the position with respect to a road/air alternative) and make adjustments to charges to account for this.	The Implementing Regulation is clear that access pricing must be on the basis of the direct costs incurred by the operation of the train service.	Red
Targeted incentives	Use discounts to influence usage behaviour, for example by introducing price variation along certain dimensions such as safety improvements such as for trains operated using anti-slip wheels.	The AMR requires discounts to be limited to the actual saving of administrative costs or to be offered on a limited time basis to facilitate new entrants, or to encourage use of considerably under-utilised lines on the network.	Red
Negative mark-ups	Introduce negative mark-ups which can be applied to segments without the legal limitations on using discounts.	The AMR requires mark-ups must be zero or positive to recover the fixed costs of the network from users of the rail network.	Red
Fixed access fee + variable costs as incentives	Set a fixed fee for access to the network, then set variable costs as incentives for use.	The AMR stipulates that variable costs for the Minimum Track Access Package should be based on direct costs rather than be used for incentives.	Red
Commercial value	Rather than the costs of network usage, base the charge on the commercial value generated by the operator's use of the network.	The AMR requires pricing access for the Minimum Track Access Package on the basis of the direct costs incurred by the Infrastructure Manager. The AMRs also require that access pricing is on a non-	Red

	discriminatory basis between similar services.

Source: *Frontier Economics.*

Note: *This does not constitute legal advice. "Legal flag" represents an assessment of the extent of consistency with current legislative requirements.*

These options are not considered further in this report. However, this does not mean that they would not have merits: only that they would require legislative change to implement them (or incur a significant risk of a successful legal challenge if the legislation were left unchanged).

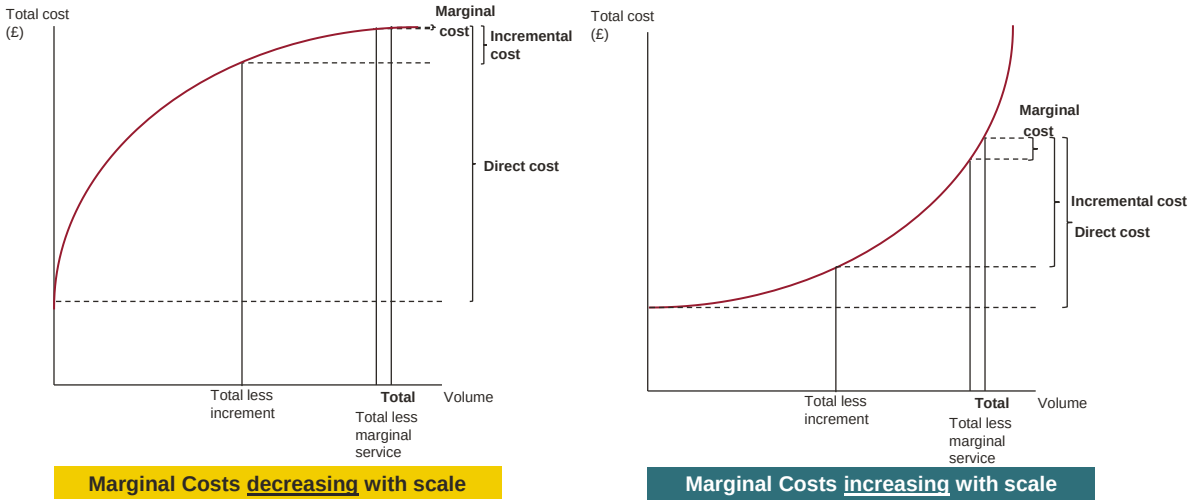
6.2.2 Identifying Direct Costs

We outline here the options for identifying direct costs, grouped into three key choices: cost increment, identification time frame and increment base.

There are three broad choices of cost increment to identify the direct costs of using the railway infrastructure. These are illustrated in the diagrams below. The marginal cost is the cost for the marginal user to use the network. The average direct cost of using the network is the direct cost for the full network, divided by the total number of train services using the network. The incremental cost of using the network is the extra cost for an incremental group of users.

The diagrams illustrate that the difference between these costs: whether, for instance, the marginal or incremental costs might result in a smaller, or larger, cost than the average direct costs approach, will depend on the shape of the marginal cost curve of the network, and where on that curve the total volume of users is places (i.e. how close, or not, the network is to full capacity).

Figure 8 Cost increments



Source: *Frontier Economics.*

There is also a choice between identifying direct costs over the short-run (for example, over a time frame shorter than the Control Period) and long-run.

Likewise, identifying direct costs also requires a choice of base: all traffic, versus using segments as the base for cost increments.

We next present the results of our evaluation of the options within each group and we highlight the key drivers of these evaluation results.

Figure 9 Evaluation – identifying direct costs and the choice of increment

How are the direct costs identified?	Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal flag
Choice of cost increment: Marginal cost (MC)	3	4	2	1	5	5
Average direct cost (ADC)	4	4	3	5	3	5
Incremental cost (IC)	3	4	2	2	4	3

Source: Frontier Economics' analysis.

Note: Note that the legal flag does not constitute legal advice.

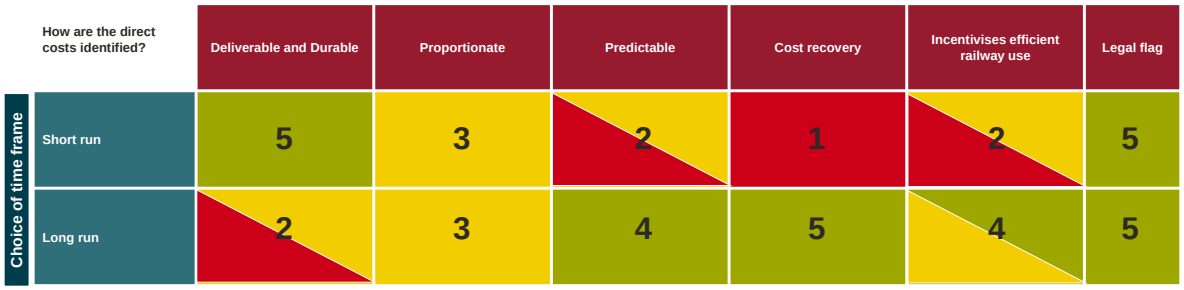
We note that the AMR and Implementing Regulation make reference to charging both on the basis of direct cost and marginal cost, but do not use the term "incremental cost", for which reason we give this option an amber legal flag.[36]

There is a tension here between efficient use of the network and cost recovery. Marginal cost pricing will, in theory, price network use at the optimal level to maximise efficient use, whereas average direct cost pricing will enable better cost recovery for the IM.[37] Marginal cost pricing and incremental cost pricing may both be harder to deliver, more difficult to predict (given uncertainties around the IM's underlying cost curves) and for stakeholders to understand, relative to an average of direct costs.

36 Nevertheless, case law (Commission vs Poland CURIA - Documents (europa.eu)) suggests that there is a level of discretion that Member States have to transposing and applying the term "direct costs".

37 This assumes diminishing marginal costs, as per the left hand diagram. We consider this to be a reasonable assumption on average: it assumes that the GB network has not yet reached a level of congestion that adding an additional user would result in increased marginal costs, relative to the one before. However, there are likely to be places/times on the network where this assumption does not hold: the extent of these is an empirical question. We note that if we had constant marginal costs, marginal cost, average direct cost and incremental costs would result in the same price.

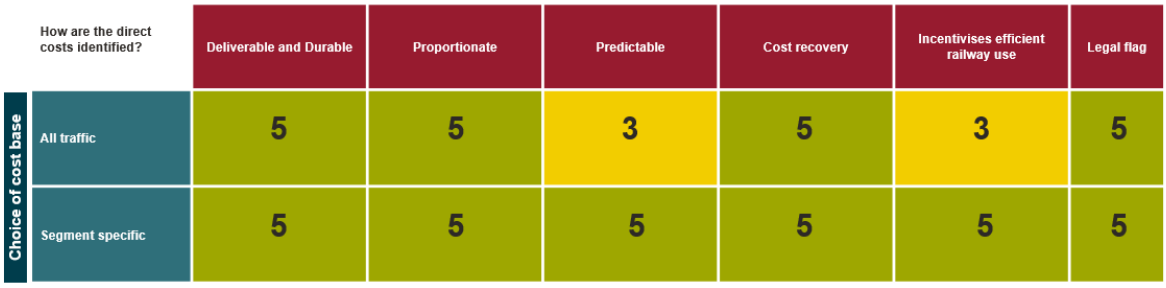
Figure 10 Evaluation – identifying direct costs and the choice of time frame



Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

Overall, identifying direct costs in the long-run may be more appropriate from a conceptual perspective, but there may be practical or data-related issues that prevent the approach from being realised, or introduce too much uncertainty into the estimations. Taking a long-run approach would in theory better facilitate both cost recovery and efficient railway use, as taking into account longer term cost can ensure that not only "immediate costs", those which are fully incurred at the time of network use, are priced in and can offer smoother signals for user business planning. Volatility in short-run costs may also result in changes that are less predictable to users of the network, to the IM.

Figure 11 Evaluation – Identifying direct costs and the choice of base



Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

The expected effect of the choice of base – all traffic, versus using segments as the base for cost increments – on cost recovery will depend on the underlying shape of the marginal cost curve for the network. Should this be linear, the choice of base will be neutral in terms of cost recovery: in this case identifying the direct costs for the full set of users, versus for one group relative to a baseline other group, should not have an effect on the final ability for the prices to cover the costs of the network. With marginal costs decreasing in scale, using segments as the base for cost increments will be closer to the marginal cost pricing result.

A tension also lies between the ease of accurately identifying the costs for groups – simpler to do at an aggregate level – and interactions of the approaches with users. A segmented approach here may send clearer price signals to groups, hence getting closer to an efficient level of railway use. It also may be more understandable and transparent for users.

6.2.3 Estimating Direct Costs

We outline here the choices available for estimating direct costs. There are three broad methodological approaches that are used across Europe for estimating the direct cost for usage of rail infrastructure:

- The **subtraction method** computes direct cost as the difference between the total cost for provision of a minimum level of access and any given non-eligible costs (set by regulation and / or assumptions); the method uses costs from financial statements together with estimates of costs from IMs, using technical studies or assumptions.
- The **engineering method** estimates direct costs using detailed technical parameters, construction or production techniques, and these parameters' effects on network wear and tear; the method uses as data inputs train and track parameters and costs related to the observed relationship and dependencies.
- **Econometrics** estimates direct costs using a model that estimates the impact of traffic levels on cost, holding equal other factors that might affect costs; the data inputs include cost data, traffic data, infrastructure characteristics and regional data.

These options could be used separately, or in combination with one and another. Below, we evaluate the three options separately.

Figure 12 Evaluation – Estimating direct costs

Methods of estimating direct costs	Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal flag
Engineering	3	3	3			5
Econometrics	3	3	3			5
Subtraction	4	2	2			5

Source: *Frontier Economics' analysis.*
Note: *Legal flag does not constitute legal advice.*

We note first of all that all three options are permissible under the legal constraints, and are used individually or in combination across the IMs of railway networks in Europe (see Annex B for a table summarising estimation techniques for IMs across Europe).

There is a trade-off here between the ease of deliverability and durability of an option, and the level of predictability of the estimates. Both engineering and econometrics models require complex assumptions and a wide range of data inputs, whilst the subtraction method can use information already available in the financial accounting system. However, the high-level financial data approach may be less understandable to users of the network as a clear estimate of the direct costs of running their particular train on a piece of track. Additionally, the information readily available in the accounting system may also not be appropriate for the calculation of direct costs. Likewise, the results of the estimate may be less traceable back to small changes.

We do not assess these options according to the cost recovery or efficient railway use criteria because we are not aware of any evidence which suggests that the estimation methods have a ranking in these criteria: these criteria are sensitive to the choices for identifying direct costs (see the previous section) but once identified, the estimation is concerned with the data inputs, outputs and assumptions.

6.2.4 Practical considerations

We outline here the practical considerations to turn a direct cost approach into a charge. We consider the options for the length of time for which a charge can be fixed: we take three options of prices fixed for 1 year, 5 years or 10 years. We also consider three options for the profile of that price over the fixed length: this might be flat in real terms over the period, tilted to gradually increase or decrease over the period in real terms, or be simply flat in nominal terms. To express the prices in real terms, we consider two options: adjusting charges for inflation based on the Consumer Prices Index (CPI) only, or adjusting to reflect changes in the CPI and the forecasted wedge between input price growth and CPI (this wedge is known as Real Price Effects, RPE).

Provisions can be added for differences between the forecasts and outturn. These provisions could be a wash-up mechanism adjusting for differences between the forecasted and outturn of traffic volumes, or a wash-up adjusting for differences in traffic mix. We also include the option for adjusting charges according to differences between the IM's forecasted efficiency and outturn.[38]

[38] We note that the possibilities for including "wash-up" mechanisms are wide ranging. We have evaluated below two common suggestions for such mechanisms, but one could also envisage a "wash-up" for differences between forecast and actual inflation (CPI) and RPEs.

Figure 13 Evaluation – Length of charge fixed

What are the practicalities of charging?		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal Flag
Length of charge fixed	1 year	5	3	3	5	1	5
	5 year	5	5	5	3	4	5
	10 year	3	3	3	1	4	5

Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

For the length of time a charge is fixed, there is a tension between data-availability, precision and flexibility of the charge, versus offering stability and predictability over the course of the period chosen. Alongside industry specific factors, the appropriate length of the fix will also be affected by the volatility of broader macroeconomic factors, such as inflation and interest rates, which should be considered during high periods of uncertainty. A 1 year charge will be easily calculated with available data (although the turn-around for gathering the data and running the calculation would be quite short, given the need to update prices yearly), and facilitate good cost recovery for the IM. However, there are administrative costs associated with setting and re-issuing charges annually, and an instability for network users in terms of being able to conduct business planning. The 10 year charge, as the "other extreme", may struggle with cost recovery – charges cannot flex to meet unexpected costs during the period – which could also have implications for the required level of funding from governments which are revised over shorter (5 year) time horizons and this may also have an impact on efficient use of the network (price signals becoming out of date).[39] However, a charge which is fixed for a longer period would aid users of the network in the production of business plans by providing clarity on charges for a longer period of time.

[39] For this option, there are a wide range of variants on the three we have evaluated. For instance, one could envisage a 10 year fixed charge, with a re-opener clause mid-way, which could be automatically re-opened, or "triggered" if the market environment changes to a certain degree. Such a practice will introduce more work and more uncertainty, but on the positive side, it would allow for more flexibility and adaptability that the longer full fix.

Figure 14 Practicalities of charging – charging profile and inflation

What are the practicalities of charging?		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal Flag
Profile within the fix	Flat real	5	5	3	5	5	5
	Tilted real	4	4	2	5	5	5
	Flat Nominal	3	2	3	1	1	5
Inflation adjustments	CPI only	5	5	4	3	3	5
	RPE	3	5	5	5	5	5

Source: *Frontier Economics' analysis.*

Note: *Legal flag does not constitute legal advice. We have not evaluated a tilted nominal profile, as we take the "fixed nominal" as the most simple baseline, but then look at real adjustments (flat and tilted) as the options to take the profile closer to real costs.*

Overall, it is likely to be beneficial to have a charge that is fixed or tilted in real terms: a flat nominal charge is unlikely to recover costs or incentivise users appropriately as inflation changes over the course of the period and, relatedly, the price is unable to move as users would expect given the macroeconomic context. The choice to fix a real flat trajectory, or a tilted trajectory, is less clear. Generally, it is unlikely that the choice of tilt will match the forecasted changes to drivers of cost over the period, and therefore the resulting prices are unlikely to remain close to the efficient prices for the network. There is also additional work involved with setting the appropriate tilt and additional complexity for stakeholders in understanding it. Nevertheless, the tilt may offer a helpful tool to gradually reach a desired level of cost recovery over the course of a period, particularly if previous charges had been fixed for a long period of time and hence needed a large adjustment to meet new cost challenges in the period ahead.

The choice of inflation adjustment has a trade-off between deliverability and the other criteria: whilst adjusting using CPI is the simplest option to implement, and may be aligned with inflation adjustments used by funders and other stakeholders, an RPE adjustment, given its inclusion forecasts of input prices as well as inflation, would enable a more precise charge in line with changing input prices, driving better cost recovery and efficiency of network use. We note however, that introducing a further set of assumptions regarding input prices introduces an additional aspect to calculations that could be subject to challenges and would increase the regulatory burden and degree of uncertainty for users of the network.

Figure 15 Evaluation – Charging practicalities – Wash-up mechanisms

What are the practicalities of charging?		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal Flag
Provisions for differences in traffic forecast and outturn	By volume	5	5	4	5	4	5
	By mix	5	5	5	5	4	5
Adjustments made for differences in forecasted efficiency and outturn		3	3	3	5	4	5

Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

We consider that the wash-up mechanisms – by traffic volume or mix – are similar to each other in the benefits and costs they offer. Both introduce additional work, and also increase uncertainty ex ante (in terms of an additional moving element to pricing in subsequent periods), to the access pricing regime, but should forecasts turn out to be fairly different from outturn, they offer a large benefit in terms of cost recovery. The adjustment to prices in the next period, however, may introduce an inefficiency in terms of use of the network: moving prices away from marginal costs.

The price adjustments based on the IM's forecasted efficiency are more problematic: there are issues associated with offering the IM the chance to adjust access charges ex post, according to their performance. If the IM is less cost efficient than planned, this triggers a higher access charge in the following period. This may result in inefficient use of the network in the following period, less predictability of the charges ex ante and ex post for users of the network, and be unsustainable as an approach.

6.2.5 Other aspects of the charging framework

Fixed / common cost allocation

In this section, we consider the options available to allocate fixed costs between services: setting an appropriate (and legal) mark-up for different users. These range from a fixed mark-up over variable cost charges (EPMU), a mark-up set by the external environment faced by a service / group of services (Ramsey pricing, competitive considerations, political or public judgements, the value of the activity), a mark-up set by physical differences (inputs, outputs) or a mark-up applied by segment of the railway (by path).

Figure 16 Evaluation – Fixed cost allocation

Other aspects of the charging policy		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal flag
Fixed cost allocation	Per-path basis	3	5	3	5	4	3
	Equi-proportional markup (EPMU)	1	1	5	2	3	3
	Ramsey pricing	3	3	3	3	4	5
	Value-based	1	1	1	3	3	3
	Inputs-based	3	2	3	1	1	5
	Outputs-based	3	2	3	1	1	5
	Competitive considerations	2	2	2	3	3	5
	Political / public judgement	1	1	1	1	3	3

Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

We note first that any mark-ups must pass a 'market-can-bear' test, as referenced in the AMRs. Indeed, any mark-up applied must be used to achieve: optimum competitiveness, efficiency, transparency, non-discrimination and pass a 'market-can-bear' test. These legal constraints render a number of these options amber for the legal flag:

- Value-based or political / public judgement based mark-ups may not be considered "non-discriminatory", and hence be open to legal challenge, nor may they also pass a 'market-can-bear' test (these principles may not be correlated with market features allowing costs to be absorbed / passed on);
- Per-path mark-ups may also be open to legal challenge, if the fixed costs of a particular segment result in a high mark-up that some segments are unable to bear and therefore be excluded from using this path;
- An Equi-proportionate mark-up (EPMU) may also be open to challenge as a fixed mark-up over the variable cost charges may not be bearable by all segments of the market.

In addition to these potential legal issues with specific options, it is important to note that any option in the list would be evaluated according to the AMR principles above. Hence, whilst they have a green flag, the manner in which they were applied in practice and the mark-ups that they would result in, would need to be examined with regards to these legal duties.

From economic principles, any access pricing moving away from the efficient price of marginal cost, will result in less efficient use of the network.[40] Hence, any mark-up to cover fixed costs in principle will move the network away from the efficient use. However, the responsiveness

[40] If the network is not at capacity.

of users to a price above marginal cost will determine the extent to which the equilibrium use of the network moves away from the optimal use. This is where mark-ups based on competitive considerations, or Ramsey pricing (mark-ups based on the price elasticity of users) are likely to be most helpful for achieving efficient use.

In terms of cost recovery, EPMU mark-ups are likely to be the most straightforward option to facilitate cost recovery, as the constant mark-up can be set in order to meet the desired level of cost recovery. Likewise, when mark-ups are set in accordance with external environment conditions and hence are in line with assumed price elasticities / ability to absorb or pass-on additional costs, this is likely to facilitate greater cost recovery than mark-ups based on physical differences (inputs, outputs), as relative mark-ups can be scaled to an appropriate level to cover as much of the fixed costs as possible.

The key challenge in setting the mark-ups in accordance with external environment is the data and assumptions required to estimate the levels. In contrast, a constant mark-up, or a mark-up set by physical (observable) differences between services, or indeed by a political agenda, would be comparatively simpler to estimate.

Other charges

We note that in addition to charges to cover direct costs, and mark-ups to help recover some fixed costs, the AMRs envisage other bases for charging, most notably scarcity charging and discounts. Scarcity charges would involve charging a premium for services operating in highly congested parts of the railway. Discounts could be applied to services that operate in under-utilised parts of the railway to encourage efficient use (or be used in a time-limited way to facilitate new entrants).

Figure 17 Evaluation – Scarcity charging and discounts

Other aspects of the charging policy		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal flag
Discount policy	Encourage use to stimulate use of less popular routes	4	5	5	4	5	5
Scarcity charge	Premium to use congested parts of the railway	4	5	5	5	5	5

Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

Generally, we do not consider that either of these charges present any obstacles to achieving cost recovery and efficient railway use, in a manner that is quite simple to deliver and understand. Discounts may slightly reduce cost recovery – by definition, discounts involve setting prices lower in some circumstances for some users – but in stimulating use it may be helpful in the longer term if it leads to sustained higher use. Scarcity pricing will rely on good

data on congestion, but this is likely to be easily available and hence does not provide a large administrative hurdle.

6.2.6 Segmentation approach

We consider a set of options for applying segmentation: by high level train type (for instance, freight vs passenger trains), which could be further broken down into bulk or non-bulk for freight. Passenger and / or freight trains could be segmented into groups by speed-bandings, axle-weight bandings or at the granular level of individual train types.

The freight segment could also be broken down to varying degrees of granularity according to the commodity being transported: a coarse level of differentiation, or very granular (e.g. by type).

There are additional options for segmentation that move away from the physical features of trains or goods carried, and rather group services by the time of day they run (e.g. peak or off-peak), or by geography: pricing services according to the country, by region or by type of line.

We highlight two key observations related to the evaluation of the options for segmentation:

- As discussed in Section 5, the groups of options presented are not mutually exclusive, and could be applied in sequence to each other. For instance, one could envisage an initial segmentation by train type, and then further segmentation by time of day. We apply the evaluation criteria to each segmentation approach as if taken in isolation.
- As discussed in Section 5, segmentation need not be applied to all aspects of the access pricing regime in the same manner. Indeed, this may be a sensible approach as the legal requirements for segmentation considerations differ according to the aspect of charging (see Section 3.1). We conduct the evaluation of the segmentation approaches with this in mind: what are the strengths and weakness of the approach in the round, and, where applicable, are there any particular observations to be made for a particular aspect of the charging regime.

Figure 18 Evaluation – Approaches to segmentation (1/2)

How will segmentation be applied? NB more than one option could be applied		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal flag
By train type	No differentiation	1	1	1	1	1	2
	Simple freight / Passenger differentiation	3	3	3	3	3	3
Within Freight	Bulk / non - bulk	3	5	5	5	5	5
Within Passenger and / or freight	Speed bandings	4	3	5	5	5	5
	Axle weight bandings	4	4	5	5	5	5
	Individual train types	3	1	1	5	5	5

Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

Figure 19 Evaluation – Approaches to segmentation (2/2)

How will segmentation be applied? NB more than one option may be applied		Deliverable and Durable	Proportionate	Predictable	Cost recovery	Incentivises efficient railway use	Legal flag
By commodity (freight)	No differentiation	5	5	5	5	3	5
	Coarse differentiation	5	5	5	5	5	5
	Granular (by type)	3	4	4	5	5	5
Time of day	No differentiation	5	5	5	5	3	5
	Peak / off-peak	3	5	4	5	5	5
Geography	Country	3	3	5	5	5	3
	Regional	2	3	5	5	5	3
	Line type	2	5	5	5	5	3

Source: Frontier Economics' analysis.
Note: Legal flag does not constitute legal advice.

We first observe that there are a number of options for segmentation that have an amber or red/amber flag. The option not to differentiate segments at all is given a red/amber legal flag, due to the requirements on segmentation considerations for mark-ups, as outlined in Section 5 of this report. Likewise, the final group of options – segmenting by geography – have an amber legal flag. This is because the charging regime must be non-discriminatory and charges must be set according to the same principles across the whole network. There may nevertheless be arguments to be made as to how applying the same principles for determining direct costs across the network may result in variations of these charges for different regions, or in particular for different line types.

We note that in general, greater levels of granularity in segmentation – irrespective of the particularities of the approach – is likely to be neutral in terms of cost recovery: the estimation of direct costs is the starting point, and this can then be divided into greater or fewer market segments, without altering the total direct costs covered. However, no-segmentation or very high-level segmentation approaches, may result in a blunt access charge.

Likewise, we can expect that a more tailored charge brings the price closer to the true direct cost of the network, and hence facilitates more efficient use of the network. It might be that in practice, the dimension of segmentation, for instance by speed banding, will be not able to greatly influence behaviours on the network – train operators choosing to purchase faster / slower train models in response to price signals, or operating existing trains at a slower speed than operationally viable to avoid higher charges – however, we do not consider that this renders usage inefficient in itself (direct costs are still more accurate for a particular user).

There is clearly, however, a trade-off between granularity and the number of assumptions and additional data points needed to calculate very specific charges for small groups of users. The extreme end of this option – pricing by individual train type – is likely to be onerous in terms of issuing access charges, but also for existing or potential users of the network. Nevertheless, the data for segmenting on the basis of observable differences between train types such as speed banding or axle-weight banding, with predictable associated patterns in terms of damage to the network, is likely to be fairly easily available.

For the time of day differentiation (e.g. peak or non-peak), we consider that this may be better addressed through the congestion charging approach. There is a concrete legal provision for scarcity / congestion charges in the legislation, which would facilitate the implementation. Also, we note that applying a fixed segmentation structure to increase charges for particular times of day may be a less flexible tool that allowing for varying charges in response to changing congestion dynamics.

7 Conclusions and recommendations

To conclude this report, we make a number of recommendations for parties including the ORR, Network Rail and the DfT to consider regarding the access pricing regime in general, and also more specific recommendations related to options for changing particular elements of that regime.

Broad recommendations for the access pricing regime

We first note that passenger and freight operators value the AMRs because of the stability and clarity that they bring, but the AMRs and the Implementing Regulation are restrictive on the extent to which the access charging regime can be used to support wider policy objectives. We recommend that the ORR, DfT and Transport Scotland (TS) consider whether the AMR and Implementing Regulation should be evolved to allow access pricing to reflect wider policy objectives such as reducing carbon emissions, improving safety,[41] etc, without losing the stability that the AMR provide to the industry.

Operators have also told us that they value having clarity on the pricing methodology to be adopted for the next price control review as early as possible in the price control review phase. This enables them to understand the impacts of potential changes to access charges on their businesses. We therefore recommend that Network Rail and the ORR consult operators on the proposed pricing methodology as early as practicable during the price control process. Relatedly, we suggest that Network Rail publish indicative price lists for the coming price control as early as possible.

Operators have also expressed that they do not have visibility over Network Rail's costs being put into the calculation of direct costs, or the ability to meaningfully challenge those costs. We consider that Network Rail / ORR should consider how operators could gain greater clarity on what the costs are going into the calculation of direct costs and consider providing increased mechanisms for challenging those costs in a proportionate way.

The access charging regime has a number of effects, which may be in tension with each other – particularly in providing a source of revenue to Network Rail and in incentivising efficient use of the rail network. Depending on the objective, the charging regime may look different. However, the balance of objectives is unclear. We therefore suggest that ORR / DfT be more explicit about the objectives of the access pricing regime so that the regime can be designed to achieve those objectives, for example between supporting efficient use of the network and increasing cost recovery.

41 For instance, encouraging via differentiated track access charges, the use of particular non-mandated safety features that are currently not widely used because they are costly to implement without offering any financial benefit.

Recommendations on specific elements of the regime

In **setting charges to cover direct costs**, our report highlights that there is a need to consider how best to identify these direct costs and how to estimate them. We note that if Network Rail/ ORR were to choose to stay with the current method for arriving at VUC prices, it is likely to be helpful to offer clarification to stakeholders regarding the basis of charging within the industry: for instance is it marginal cost based, or average direct cost based? From our industry engagement, we understand that there is a lack of clarity on this point.

For any option of identifying direct costs, we suggest that the ORR weighs up the balance of cost recovery, which points towards the use of average direct costs, against incentivising efficient use of the network, which points towards the use of marginal cost pricing. In terms of the choice of time frame, economic theory would suggest that pricing on the basis of long-term costs would be preferable, but the data needed to take this approach in a robust fashion may not be available; therefore this would benefit from further investigation.

A further consideration for identifying direct costs is the choice of base. The stakeholders consulted in this study voiced concern around the transparency of the current methods for identifying and estimating the VUCs; we therefore consider that identifying charges on costs per market segment (e.g. for passenger and freight separately) may be worth consideration by the ORR, as this would likely add transparency to the variable charges and increase trust in the charging regime.

On the approach to use for the **estimation of direct costs**, our view is that there is no unambiguously better method. All three methods are used across Europe and would need to be considered based on the data available. However, we note that an econometric approach is widely used in Europe but not in the UK. We also note that across Europe it is common practice to use two options, for instance using engineering as a bottom up method, with a cross check with the subtraction method.

In terms of the **charging practicalities**, fixing charges over a 5-year versus a longer time frame was a discussion topic at the stakeholder workshop, with some attendees supporting the idea of a longer time frame. In our view, there are likely benefits to fixing charges over a 5-year time frame as this aligns with the HLoS/SoFA periods which determine the funds available to Network Rail from public funders and balances the volatility of short-term changes with the ability to adjust profiles more smoothly than if there was a 10-year fix. However, we recognise the potential benefits to freight and open access operators from gaining clarity over a longer period.

Turning to **segmentation**, we recommend that the ORR conduct a review of train-level market segmentation, exploring the potential for a radical simplification of the train type charging basis, potentially moving to a higher-level breakdown based on speed and axle-weight, and a bulk-non-bulk split within freight. This is a recommendation that naturally falls out of our evaluation of segmentation approaches (in particular in considering the administrative costs

and uncertainty created by the current level of complexity), but was also raised by a number of participants at the stakeholder workshop.

In our view, there would be a benefit to considering a move to greater geographic disaggregation of access charges, through the introduction of both scarcity based charges in more congested areas and discounts to encourage the use of under-utilised parts of the network. We note that any case for moving to different charges in England, Scotland and Wales would need to be carefully justified on the basis of actual cost differentials between these areas given that the rail network managed by Network Rail in Great Britain is managed by one legal entity and is therefore part of one network and thus the charges must be based on the same set of principles in all parts of that network. Similarly, a per-path mark-up (where the charge is fixed per path, regardless of operator using that path) is also worth investigating further, but it should be carefully considered whether this option is consistent with current legislative requirements as it may result in some market segments being excluded from particular paths.

Finally on segmentation, we consider that we have not seen a compelling rationale for Network Rail moving to a time-of-day based charging regime, given the administrative complexities of implementing this and the lack of ability of most operators to be able to act on this sort of incentive.

Annex A Burges Salmon legal review

Reference	Summary of Applicable Requirements	Issue	Legal Analysis [Note: Analysis setting out whether a requirement is prescriptive or output-based]	Prescriptive requirement? (Y/N)
Schedule 3, Railways (Access, Management & Licensing of Railway Undertakings) Regulations 2016 (the "2016 Regulations") **Sets out the rules and principles by which the ORR must determine the access charges it sets pursuant to the 2016 Regulations.**				
Principles of access charging (Schedule 3, paragraph 1)				
Para 1(1)(a)	The application of a charging scheme must comply with the rules set out in the network statement. **Appendix 1**	Compliance with rules in network statement	As the network statement is produced by the infrastructure manager ("**IM**"), the IM has a degree of control over the rules it sets in relation to its application of the 2016 Regulations. Note that whilst the rules themselves are determined by the IM, as their purpose is to apply wider requirements (namely regulations 14, 16 and 17 and Schedule 3 of the 2016 Regulations) the IM will be constrained to an extent by the nature of the requirement each rule is intended to implement.	N

Para 1(1)(b)	The application of a charging scheme must result in 'equivalent', 'non-discriminatory' charges for railway undertakings performing 'services of an equivalent nature in a similar part of the market'.	Equivalent and non-discriminatory charges	This requirement is phrased in such a way that it is open to interpretation. That charges must be 'non-discriminatory' would be a prescriptive requirement if it were accompanied by objective requirements. As inexact terms such as 'equivalent' and 'similar' are used, the whole requirement becomes dependent on one's interpretation of such terms. This requirement may benefit from an analysis as to the different ways the market can be viewed in 'similar parts' and services categorised into those of a 'similar nature'. This may be an area in which alternative interpretations may be explored.	N
Para 1(2)	Calculation of charges may take into account the mileage, composition of the train and 'any specific requirements in terms of such factors as speed axle load and the degree or period of utilisation'.	Composition of charges	This is a guiding principle rather than a fixed obligation. It provides examples of metrics which might be taken into account, but remains open to the IM to use such factors as it sees fit to ensure charges are calculated appropriately.	N
Para 1(3)	The charging system must be based on the same principles over the whole network, save where exceptions in paragraph 3 apply.	Consistent network-wide approach	Where exceptions do not apply (please see analysis of paragraph 3 below), this is a clear, prescriptive obligation with no room for alternative interpretation.	Y
Paras 1(4), 1(5), 1(5A) and 1(5B)	Charges for the minimum access package and track access to service facilities must be set at the costs incurred directly as a result of operating the train service. (1(4)) These costs must be calculated in accordance with the Implementing Regulation. (1(5)) In calculating costs in accordance with the Implementing Regulation the IM may: - apply the costs of efficient service provision (1(5A)) - modulate the average direct unit costs to take into account differing wear and tear (in accordance with parameters set out in the Implementing Regulation)(1(5B))	Charging and calculation of directly incurred costs	Whilst this is a clear, prescriptive requirement, paragraphs 1(5A) and 1(5B) do import a degree of flexibility in the calculation methodology. In particular: - it is open to IMs to determine what their 'costs of efficient service provision' comprise; and - 'to take into account' does not prescribe a particular methodology. We have set out further analysis below as to the requirements of the Implementing Regulation itself.	Y/N

Para 1(6)	Charges for track access within service facilities must not exceed the cost of providing the service, plus a reasonable profit.	Reasonable profit on service facility charges	The term 'cost' is not defined in the regulations: this leaves scope for interpretation. The term 'reasonable profit' is defined as being a '*rate of return on own capital that takes account of the risk, including that to revenue, or the absence of such risk, incurred by the operator of the service facility and is in line with the average rate for the sector concerned in recent years*'' This definition of reasonable profit also leaves room for interpretation, including as to an assessment of the relevant level of risk, and average profit rate for the sector. We consider this a key area in which interpretations may be explored. This provision also allows IMs to set location-specific charges for users of particular infrastructure.	N
Para 1(7)	If additional or ancillary services referred to in paragraphs 3 and 4 of Schedule 2 (which include traction current charges and access to the telecommunication network) are offered by only one supplier, the charges must not exceed the cost of providing the service plus a reasonable profit.	Reasonable profit on additional or ancillary charges	As above, the 'reasonable profit' element of this requirement is open to interpretation. Crucially, where additional or ancillary charges are offered by multiple suppliers the restriction that charges must not exceed cost plus reasonable profit does not apply. Where multiple suppliers offer additional or ancillary charges, there is significant scope to provide for different bases of charging.	N
Para 1(8)	The infrastructure charge may include a charge to 'reflect the scarcity of capacity' of an identifiable segment of infrastructure during periods of congestion.	Additional charges where capacity is scarce on an 'identifiable segment' of infrastructure	This is a non-prescriptive principle which is open to interpretation. In determining additional charges IMs may decide what it means 'to reflect the scarcity of capacity'. We consider this a key area in which alternative interpretations may be explored, particularly in the context of easing capacity issues across the network.	N

Para 1(9)	Charges for the minimum access package, track access to service facilities and any additional capacity uplifts (per 1(8)) may be 'averaged over a reasonable spread of train services and times' provided that they remain relative to the costs attributable to the services.	Averaging of charges	This paragraph permits IMs to smooth out charges and is not a strict obligation. Where an IM does choose to do so, the accompanying obligation to ensure charges remain proportionate is a prescriptive one. As an IM will have calculated the costs attributable to particular services in accordance with paragraphs 1(4)-(5), it will be possible to determine whether the averaged charges remain relative to these costs.	Y/N
Exceptions to the charging principles (Schedule 3, paragraphs 2, 3, 4 and 5)				
Paras 2(1) and 2(2)	In order to ensure full recovery of their costs, IMs may levy mark-ups on charges on the basis of 'efficient, transparent and non-discriminatory principles, whilst guaranteeing optimum competitiveness' and in particular in respect of rail market segments. (2(1)) Such mark-ups are subject to approval of the ORR (save in respect of channel tunnel rail link facilities). (2(2))	Mark-ups on charges	There is no prescriptive calculation methodology for IMs proposing mark-ups. In particular, the parameters that mark-ups should be calculated on the basis of 'efficient' principles which guarantee 'optimum competitiveness' are open to interpretation. The flexibility of this exception is limited by the need to seek ORR/SoS approval for mark-ups and the requirement that they must represent actual costs incurred by the IM, as well as paragraph 2(3) as explained below. Despite these limitations, we do consider that this exception presents a key opportunity for interpretation as there are a number of different ways it could be applied to act as a 'sweeper' for the recovery of an IM's costs.	N
Para 2(3)	Mark-ups referred to in 2(1) must not have the effect of excluding a particular market segment from using the relevant infrastructure, where such market segment can pay at least the directly incurred costs plus 'a rate of return which the market can bear'.	Effect of mark-ups on market segments / Mark-up must pass the 'market-can-bear' test	This is an output-based requirement which obliges the IM to ensure increases to its charges do not have a prejudicial effect on individual market segments which could otherwise afford a reasonable charge. The regulation does not require this to be achieved or measured in a certain way. This obligation also applies to the ORR in its capacity as approver pursuant to paragraph 2(2).	N

Para 2(4)	The charging system must respect the productivity increases achieved by applicants.	Respect of productivity increases	This exception is open to interpretation by IMs. In particular: - IMs may determine what to 'respect' means in these circumstances; and - the exception does not prescribe what constitutes a 'productivity increase'.	N
Paras 2(5) – 2(7)	Before approving a mark-up under 2(1), the ORR must ensure that the IM evaluates the relevance of a mark-up for specific market segments. (2(5)) The list of market segments considered by the IM must: - consider at least the pairs listed in 2(10) (2(5)); and - include freight services and passenger services (both under public service contracts and otherwise) (2(6)). **Appendix 2** The IM may also consider further market segments as relevant. (2(6))	Evaluation of impact on market segments	This is a clear obligation on the ORR to ensure the IM undertakes an evaluation in accordance with paragraphs 2(5) – 2(10). The requirement is prescriptive in that it sets out the minimum parameters for the IM's evaluation but leaves room for further consideration where appropriate.	Y/N
Para 2(8)	The IM must define market segments in which railway undertakings are not currently operating, but in which services may later be provided during the relevant period. The IM must not include a mark-up for services in such market segments.	Treatment of prospective / inactive market segments	This requirement is open to a degree of interpretation, as it will be up to the IM to determine which inactive market segments it predicts may later provide services in the relevant period.	N
Paras 2(9)	The list of market segments referred to in 2(5) must be published by the IM in its network statement and reviewed at least every 5 years. The ORR must control that list in accordance with paragraph 2 of regulation 31.	Publication of list of market segments	These are prescriptive requirements on both the IM and the ORR which are not open to interpretation. Note that the ORR's obligation at regulation 31(2) is to ensure the IM's access charges comply with this Schedule 3.	Y

Paras 3(1) – 3(3)	The IM may set higher charges on the basis of long-term costs of specific investment projects. (3(1)) This is subject to such project: - increasing efficiency or cost-effectiveness (3(2)(a)); and - being unviable without the prospect of increased charges. (3(2)(b)) This increase may be accompanied by agreements on the sharing of risk with new investments. (3(3))	Increases for specific investment projects	This is a permissive provision which allows IMs to further increase charges in certain circumstances. If an IM does take this option, the accompanying requirements are open to interpretation. In particular: - IMs must determine what it means for a project to increase efficiency and cost-effectiveness (noting that there is no object of this requirement); and - there are a number of different ways an IM might choose to justify whether a project could not be undertaken without the higher charges. Though open to interpretation, there is court precedent as to the limitations of this exception. The High Court ruled in Heathrow Airport Limited v ORR that Heathrow Airport Limited (HAL) had failed to demonstrate that its project to build the Heathrow express rail link could not have gone ahead without the prospect of higher charges for beneficiaries. The court determined that the ORR was justified in its decision not to permit the higher charges and conclude that the exception did not apply.	N
Para 4(1)	The IM's average and marginal charges must be comparable between equivalent uses of railway infrastructure. The IM must charge the same charges for comparable services in the same market segment.	Parity of charges	This provision is not prescriptive as the terms 'comparable' and 'equivalent' are open to interpretation by the IM.	N
Para 4(2)	The IM's network statement must demonstrate that the charging system meets the requirements of (4(1)) (so far as possible without disclosing commercially sensitive confidential information).	Evidencing parity of charges in network statement	This is an output-based requirement which is open to interpretation by the IM as to how its compliance is demonstrated.	N
Para 5	Any changes an IM intends to make to the charging system in accordance with paragraph 2 must be 'made public' at least three months prior to the deadline for publication of its network statement.	Publication of proposed amendments	This is largely a prescriptive requirement as IMs must make the information public by the specified deadline. Note that the IM may decide the means by which the information is 'made public', however in practice it is likely that normal procedures (i.e. website publication) will always be followed.	Y
Discount (Schedule 3, paragraph 6)				

Para 6(1)	Discounts on charges must: - comply with the principles of this paragraph 6 (6(1)); and - be in accordance with the access charges review or the development agreement (as applicable) (6(4)).	Parameters for discounts	This is a prescriptive requirement, notwithstanding that the parameters themselves may be open to interpretation.	Y
Para 6(2)	Discounts must be limited to the actual saving of the administrative cost to the IM. In determining the level of discount, an IM may not take account of cost savings which the charges already incorporate. This is subject to the exception in paragraph 6(3) below.	Discounts to reflect actual savings	This is a largely prescriptive requirement which caps discounts at the actual savings of the IM. There is an element of flexibility in that: - IMs may choose to set a lower discount; - there may be scope for flexibility in the interpretation of what constitutes; o an 'administrative' cost; and o an 'actual saving'.	Y/N
Para 6(3)	The IM may introduce discount schemes which: - are available to all users of the railway; - are calculated with reference to specified traffic flows; and - grant time-limited discounts to encourage: o the development of new railway services; or o the use of 'considerably under-utilised' lines.	Requirements of discount schemes	These parameters for discount schemes are open to interpretation by IMs. In particular: - it will be up to the IM to determine what it means to calculate a discount 'with reference to' a particular traffic flow; - whether a discount will encourage the development of new railway services is open to interpretation; and - the term 'considerably under-utilised' is not an objective measurement.	N
Para 6(5)	The discounts must only relate to charges levied for a specified railway infrastructure section.	Charges to relate to specified infrastructure section	This is a prescriptive requirement with no room for alternative interpretation.	Y
Para 6(6)	Similar discount schemes must be applied to similar services.	Parity of discount schemes	It is open to the IM to determine what is meant by 'similar' in this context.	N
Para 6(7)	Discount schemes must be applied in a non-discriminatory manner to any railway undertaking.	Discount schemes to be non-discriminatory	This is a prescriptive requirement, though it will be up to the IM to determine how it demonstrates that schemes are applied in a non-discriminatory manner.	Y
Performance Schemes (Schedule 3, paragraph 7)				
Para 7(1)	Paragraph 7 sets out the principles which the IM's charging performance scheme must follow (as required by regulation 16).	Performance scheme principles	This provision is not in itself a requirement or obligation.	n/a

Para 7(2)	The IM must agree the 'main parameters' of the performance scheme with applicants. In particular: - the value of delays; and - the thresholds for payments due under the scheme, relative to both individual train runs and all train runs in a given period.	Parameters of performance scheme	This requirement is prescriptive to an extent, in that the IM *must* agree the 'main parameters' with applicants and certain of these parameters are dictated. As 'main parameters' is not defined, the IM will need to determine the extent to which it should agree any further parameters with applicants. Note that this process incorporates significant flexibility when it comes to IM / applicant agreeing the substance of the relevant parameters.	Y/N
Para 7(3)	The IM must inform railway undertakings of the working timetable which will be used as the basis to calculate delays. This must be communicated at least five days before the train run, save in the case of force majeure or later alterations to the working timetable.	Notification of working timetable	This is a largely prescriptive requirement with a clear deadline for notification. Note, however, that the definition of force majeure is left open to interpretation.	Y/N
Para 7(4)	All delays must be attributable to one of the delay classes and sub-classes listed in this paragraph.	Classes of delays	This is prescriptive in that the IM must attribute a delay to one of the classes, however it is up to the IM how it determines its categorisation.	Y/N
Para 7(5)	Delays must be attributed to a single organisation wherever possible, considering both the responsibility for causing the disruption and the ability to re-establish normal traffic conditions.	Delays attributable to a single organisation	This is a prescriptive requirement in that, if it is possible to do so, an IM must attribute a delay to a single organisation. Whilst parameters are provided, it is left open to the IM to consider additional factors when attributing a delay.	Y/N
Para 7(6)	The calculation of payments must take into account the average delay of train services of similar punctuality requirements.	Calculation of payments	This provision is open to interpretation. As with similar requirements above, it is open to IMs to decide: - what it means to 'take into account' the average delay; and - how 'similar' is interpreted in this context.	N
Section 4, Railways Act 1993 (the "RA 1993") **Sets out the general duties of the ORR in performing its functions as the regulator of access charges.**				

Section 4(1), 4(6) and 4(7)	The ORR has a duty to exercise its functions under Part I of the RA 1993 that are not safety functions (i.e. its function as regulator of access charges) in the manner which it considers best calculated to: - promote improvements in railway service performance (4(1)(zb)); - otherwise to protect the interests of users of railway services (4(1)(a)) and in particular the interests of disabled persons (4(6)); - promote the use and development of the railway network in GB for the carriage of passengers and goods to the greatest extent it considers economically practicable (4(1)(b)); - contribute to the development of an integrated system of transport of passengers and goods (4(1)(ba)); - contribute to the achievement of sustainable development (4(1)(bb)); - promote efficiency and economy on the part of persons providing railway services (4(1)(c)); - promote competition in the provision of railway services for the benefit of users of railway services (4(1)(d)); - promote measures designed to facilitate journeys involving the use of more than one passenger service operator (4(1)(e)), including arrangements for through tickets (4(7)); - impose minimum restrictions on operators of railway services which are consistent with its functions under Part I of the RA 1993 (save for safety functions) (4(1)(f)); and - enable persons providing railways services to plan the future of their business with a reasonable degree of assurance (4(1)(g)).	Principles for exercise of ORR Duties	These requirements call for the ORR to determine 'the manner in which *it considers* best calculated' to achieve the various aims. Whilst the ORR has a duty to exercise its duties in accordance with these principles, the provision is clear that the way it does so is to be determined by the ORR. The limbs are drafted using broad, general terms which allow room for interpretation.	N

Section 4(2)	In addition to the above, the ORR has a duty to exercise such functions in the manner which it considers best calculated to protect: - the interests of users and potential users of services for the carriage of passengers by railway in respect of the prices of fares and quality of service (save in respect of operators operating under franchise agreements) (4(2)(a)); and - the interests of users of railway facilities vested in a private sector operator (i.e. track, stations or light maintenance depots) in respect of the prices charged and quality of service (4(2)(b)).	Duty to protect interests of passengers and service providers	As above, this requirement again calls for ORR to determine 'the manner in which *it considers* best calculated' to protect such interests. This is similarly drafted in general language such that it is open to interpretation, and clearly indicates that the ORR is to determine its approach.	N
Section 4(3)(b)	The ORR is under a duty in exercising such functions to 'have regard to the effect on the environment of activities connected with the provision of railway services'.	Duty to have regard to environmental impact	This is another broad duty which gives the ORR agency as to how it is applied. Importantly, this provision gives the ORR explicit jurisdiction to make decisions about charging based on environmental factors.	N
Section 4(5)	The ORR further has a duty to exercise such functions: - having regard to any general guidance given to it by SoS or Scottish Ministers (where applicable) about railway services or other matters relating to railways (4(5)(a)-(ab)); - in a manner which it considers will not render it unduly difficult for network licence holders in financing their activities in relation to which the ORR has functions under Part I of the RA 1993 (4(5)(b)); - having regard to the funds available to the SoS for the purposes of his functions in relation to railways and railway services (4(5)(c)); - having regard to any notified strategies and policies of Welsh Ministers (where applicable) (4(5)(ca)); - having regard to the ability of Welsh Ministers, the Mayor of London and Transport for London (where applicable) to carry out the functions conferred on them (4(5)(cb)-(d)).	Duties to have regard to functions and policies of governing bodies	This requirement sets out a list of non-prescriptive requirements which are open to interpretation. It is up to the ORR to determine what it means: - to 'have regard' to certain policies and strategies; and - to act in a manner 'it considers' will not create financing challenges for licence holders.	N

Section 4(5C) and 4(5D)	In performing the duties listed above (and in particular when securing value for money for users and providers of railway services) the ORR must have regard of: - the persons who make the relevant resources and funds available; and - the general public. This duty applies only in respect of matters: - affecting the interests of users or potential users of railway services; - affecting the interests of providers of railway services; and - to which public financial resources are applied.	Duty to have regard to source of funds and the general public	This requirement is again very general and open to interpretation. Whilst it provides parameters for ORR consideration, it does not prescribe what it means for the ORR to 'have regard' of such matters. It is further open to the ORR to decide how it determines whether a matter affects the interests of users or providers of railway services.	N
Implementing Regulation (EU 2015/909) (the "Implementing Regulation") **Sets out the modalities for the calculation of cost that is directly incurred as a result of operating rail services, for the purposes of calculating charges for the minimum access package and access to infrastructure connecting service facilities under the 2016 Regulations.**				

Art I 3(1)	The IM shall calculate direct costs on a network-wide basis as the difference between: - the costs of providing the services of the minimum access package and for the access to the infrastructure connecting service facilities; and - the non-eligible costs referred to in Article 4. Asset values for the purposes of the above shall be based on historic values or, where such values are not available or where current values are lower, on current values. The IM may apply estimated, current or replacement values only where they can be 'transparently, robustly and objectively measured and duly justified' to the ORR. (3(3)) In calculating its directly incurred costs, the IM may take into account: - staffing costs for keeping open specifically requested lines outside regular hours; (3(4)(a)) - the costs of points infrastructure exposed to wear and tear by the train service; (3(4)(b)) - the costs of renewing and maintaining overhead wire or third rail directly incurred as a result of operating the train service; (3(4)(c)) and - staffing costs for preparing timetables and allocation of train paths to the extent they are directly incurred as a result of operating the train services. (3(4)(d)) All such costs may only be included in a calculation to the extent the IM can 'transparently, robustly and objectively measure and demonstrate' to the ORR, on the basis of 'best international practice' that costs are directly incurred by the operation of the train service. (3(4)) The costs used for this calculation shall be based on payments effected or forecasted by the IM, consistently on the basis of data from the same time period. (3(5))	Calculation of direct costs on a network-wide basis	This article provides very prescriptive requirements for the calculation of direct costs, and a high standard of proof for IMs to demonstrate that such costs are directly incurred. However, we note that there may be scope for ambiguity in what should be considered a 'cost of providing the service'. Whilst the IM may choose not to include certain costs in its calculations (i.e. those listed at Article 3(4)(a)-(d)), it is not in its interests to omit these where they do apply. The Implementing Regulation does not prescribe how the ORR should assess whether this requirement has been met. Though the IM may determine its methodology for collecting data for the calculation, it is ultimately held to the clear requirement that it must 'transparently, robustly and objectively' measure and justify its direct costs to the ORR. We have not classified this as 'open to interpretation' as, whilst the methodology is not prescribed, the parameters are clear and the ultimate outcome is an objective measure. It is our interpretation that any flexibility afforded by the Implementing Regulations is underpinned by the aim of allowing IMs to determine its 'direct' costs as accurately, fairly and objectively as possible. The Independent Regulator's Group – Rail (a group of independent EU regulators) has produced an overview of the implementation of direct costs in Europe, which provides a helpful insight as to how different IMs across the EU have approached their calculations.	Y

Arts 4(1), 4(3)	An IM is not permitted to include the following costs in its calculation of direct, network-wide costs: - fixed costs relating to the provision of a stretch of line which the IM must bear whether or not there are train movements (4(1)(a)) - costs that do not relate to payments made by the IM, provision of the minimum access package or to access to infrastructure connecting service facilities; (4(1)(b)) - costs of acquisition, selling, dismantling, decontamination, recultivation or renting of land or other fixed assets; (4(1)(c)) - network-wide overhead costs, including salaries and pensions; (4(1)(d)) - financing costs; (4(1)(e)) - costs relating to technology updates; (4(1)(f)) - costs of intangible assets; (4(1)(g)) - costs of track-side equipment, unless directly incurred by the operation of the train service; (4(1)(h)) - costs of information, telecommunication and communication equipment; (4(1)(i)) - costs relating to individual force majeure events, accidents and service disruptions; (4(1)(j)) - costs of electric supply equipment for traction current unless directly incurred by operation of the train service. Charges for non-electric train services must not include costs of electric supply equipment; (4(1)(k)) - the costs of providing beneficiaries with information necessary to operate their services, unless directly incurred by operation of that train service; (4(1)(l)) - depreciation which is not determined on the basis of real wear and tear of infrastructure caused by the operation of train services; (4(1)(n)); - the part of the costs of maintenance and renewal of civil infrastructure that is not directly incurred by operation of the train service. (4(1)(o)) These costs shall be based on payments effected or forecasted by the IM, consistently on the basis of data from the same time period referred to in Article 3(5). (4(3))	Non-eligible costs	This article provides further detail as to the costs which may not be included in the calculation of direct network-wide costs set out in Article 3 above. Many of these limbs simply underpin the principle that the calculation must be based only on costs which are directly incurred as a result of the operation of train services, providing specific examples by way of clarification. In some cases the IM may be able to interpret these limbs in order to argue that a cost it wishes to include does not fall into the list, for example, the meaning of 'overheads' will need to be defined and calculated. However, the IM will remain restricted by the defined principle of direct costs set out in Article 3.	Y

Art 4(2)	If the IM received funding to finance specific infrastructure investments: - which it is not obliged to pay back; and - such investments are taken into account in the calculation of direct costs, then the cost of such investments must not increase the level of charges (without prejudice to the exceptions set out in paras 2-5, Sch 3, 2016 Regulations).	Exclusion of the cost of infrastructure investments	The drafting of Article 4(2) is unclear and not very helpful. However, it appears that the intention is to prevent an IM increasing access charges where it has received funds for specific infrastructure investments that are not repayable. E.g. If an IM receives government grant (that it is not obliged to repay) to conduct storm damage repairs, then: - the cost of conducting these repairs would be a direct cost of maintaining the infrastructure; but - due to the nature of the funding, the IM cannot increase access charges as a result of this direct cost.	Y
Arts 5(1) and 5(5)	IMs must calculate average direct unit costs for the entire network by dividing the direct costs on a network-wide basis by the total number of vehicle kilometres, train kilometres or gross tonne kilometres forecasted for or actually operated. Alternatively, an IM may levy different charges for different parts of the network where it can demonstrate that the values or parameters set out in Article 5(2) below are 'significantly different' for different parts of its network. The IM must calculate average direct unit costs for parts of its network by dividing the direct costs for these parts by the total number of vehicle kilometres, train kilometres or gross tonne kilometres forecast for or actually operated. In calculating the average direct unit costs, the IM may: - use a combination of vehicle kilometres, train kilometres or gross tonne kilometres (provided this does not alter the direct causation link with the operation of the train service); and - apply outturn or forecast costs (without prejudice to the requirements of Article 3(3)). These calculations must be based on data from the same time period referred to in Article 3(5). (5(5))	Calculation and modulation of direct unit costs	This article provides IMs with a flexible, discretionary right to allocate different charges to different parts of the network where it can demonstrate that its direct costs differ 'significantly' between such parts. Whilst the calculation itself is prescribed, there is no guidance as to what constitutes 'significantly different'. This is open to interpretation by IMs, though will need to be clearly justified to the ORR. IMs are also granted a degree of flexibility as to the data they use to calculate such costs, as well as the parameters they may choose per Article 5(2) below.	N

Art 5(2)	The parameters referred to in Article 5(1) are: - train length and/or number of vehicles in the train; (5(2)(a)) - train mass; (5(2)(b)) - type of vehicle, in particular its unsprung mass; (5(2)(c)) - train speed; (5(2)(d)) - traction power of the motorised unit; (5(2)(e)) - axle-weight and/or axle numbers; (5(2)(f)) - recorded number of wheel flats or effective use of preventative equipment; (5(2)(g)) - longitudinal stiffness of vehicles and horizontal forces impacting the track; (5(2)(h)) - consumed and measured electric power or the dynamics of pantographs or contact shoes as a parameter to charge for wear and tear of overhead wire or electric rail; (5(2)(i)) - track parameters, particularly radii; (5(2)(j)) - any other cost related parameters where the IM can demonstrate to the ORR that values for each such parameter are objectively measured and recorded. (5(2)(k))	Parameters for modulation of costs	Whilst the purpose of these parameters is to provide IMs with flexibility to assess differing costs in different parts of the network, the article itself sets out clearly defined categories which are not open to interpretation.	Y
Art 5(3)	Modulation of direct unit costs must not result in an increase of the direct costs on a network-wide basis.	Effect of modulation on network-wide costs	This is a clear, objective requirement which is not open to interpretation. The overall network-wide direct costs calculated in accordance with Article 3(1) shall not increase due to the approach used to modulate those network-wide direct costs across different market segments.	Y
Art 5(4)	Direct unit costs must not include additional costs incurred as a result of diversions instigated by the IM (scheduled or otherwise). This will not apply if a beneficiary is re-imbursed by the IM for such additional costs, or if the diversion arose from the coordination procedure under regulation 23 of the 2016 Regulations.	Costs incurred as a result of diversions	Where the model operated is based upon 'forecast' mileage, rather than actual mileage, it is not clear how this article would be applied, other than to say that the relevant forecast model must not provide for additional costs due to IM instigated diversions.	Y

Art 6	In exception to the calculation principles in Article 3(1) and the first sentence of Article 5(1), an IM may calculate direct unit costs using 'robustly evidenced econometric or engineering cost modelling' as long as it can demonstrate to the ORR that the direct unit costs include only direct costs incurred by the operation of the train services (and in particular do not include any costs listed in Article 4(1)). The ORR may request that the IM calculate such costs in accordance with Article 3(1) and the first sentence of Article 5(1) for comparison purposes.	Cost modelling: Econometric v engineering approach	This is a discretionary right which provides IMs with the opportunity to use modelling to calculate direct unit costs. It is open to the IM to determine which form of modelling is used, provided it can demonstrate to the ORR that the model achieves a calculation which accounts only for directly incurred costs. Though this is an option for IMs, the ORR retains the right to require an IM to undertake the usual calculation.	N
Art 7	If the costs calculated by an IM in accordance with Article 3(1) or Article 6 are equivalent to either: - less than 15% of the full costs of maintenance and renewal; or - less than the sum of 10% of maintenance costs and 20% of renewal costs, the ORR may carry out its control over the calculation of direct costs (pursuant to reg 34 of the 2016 Regulations) 'in a simplified manner'. (7(1)) Member States may decide to increase these percentages by up to twice the original figure. (7(1)) The ORR is further permitted to use simplified control in respect of costs referred to in Articles 5(1) and 5(2), and cost modelling referred to in Article 6, where the average direct costs per train kilometre of a 1000 tonne train is less than EUR 2 (subject to indexation).	Simplified control	This is a discretionary right granted to the ORR, which is open to interpretation. In particular, the regulation specifically provides that it is up to the ORR to determine the details of the 'simplified control'. There is scope for a range of interpretation as to the calculation of costs – including for example, 'the *full* costs of maintenance and renewal'. Further discretion is granted to the UK government as to the thresholds which apply to this right. The provision does however contain some prescriptive elements, in that it sets clear parameters for when a simplified control may be used how they should be applied.	N
Art 8	The IM shall regularly update the method of calculation of its direct costs taking into account, inter alia, the best international practice.	Review of the calculation	This provision is open to interpretation. IMs are required to determine: - what it means to 'regularly' update its methodology; - what it considers 'best international practice'; and - anything else which should be taken into account in updating the methodology.	N

Source: Burgess Salmon.

Annex B Further details on options

B.1 Direct cost estimation – methods and implementation across Europe

Table 4 Options for direct cost estimation

Option	Description
Engineering	■ **Method:** Direct cost is estimated using detailed technical parameters, construction or production techniques, and these parameters' effects on network wear and tear (and associated cost). ■ **Data inputs:** Train parameters influencing wear and tear (e.g. train mass…) and track parameters (e.g. inclination…) and costs related to the observed relationships and dependencies, and (if top down), accounting costs. ■ **Key assumptions:** Engineers' cause/effect assumptions and associated costs.
Econometrics	■ **Method:** Direct costs is calculated using a model that estimates the impact of traffic levels on cost, holding equal other factors that might affect the costs. ■ **Data inputs:** Cost data (network section level), traffic data (network section level), data on infrastructure characteristics such as types of rail or the age of the tracks, and other regional data such as climate. ■ **Key assumptions:** Model functional form and assumed non-traffic cost drivers (controls).
Subtraction	■ **Method:** Direct cost is computed as the difference between the total cost for provision of a minimum level of access and any non-eligible costs. ■ **Data inputs:** Costs from financial statements, estimates for costs from infrastructure managers, using technical studies or assumptions. ■ **Key assumptions:** Eligible vs non-eligible costs (set by regulation and/or assumptions).

Source: *Frontier Economics summary. Full details of the methods can be found in the IRG 2022 paper: "An overview of the implementation of direct costs in Europe".. We also draw on the National Commission for Markets and Competition (Comisión Nacional de los Mercados y la Competencia) "Draft communication on the supervision of railway line usage fees".*

Note: *The costs referred to in all estimation methods can include all, or a subset, of operation, maintenance or renewal costs (this choice varies by country).*

Table 5 Methodology used to calculate direct costs in Europe

	Subtraction methodology	Engineering	Econometric
Austria	✓	✓	×
Belgium	×	✓	×
Bulgaria	×	×	×
Croatia	✓		
Czech Republic	✓	✓	×
Denmark	✓	×	×
Estonia	×	×	✓
Finland	✓	×	✓
France	×	✓	✓
Great Britain	×	✓	×
Germany	×	✓	✓
Greece	✓	×	×
Hungary	×	✓	✓
Latvia	✓	×	×
Lithuania	✓	×	×
Norway	×	×	✓
Poland	✓	×	×
Portugal	×	×	×
Romania	×	×	×
Slovakia	✓	×	×
Slovenia	×	×	✓
Spain	✓	✓	×
Sweden	×	×	✓
Netherlands	✓	✓	✓

Source: Adapted from IRG Rail – Overview of Charging Practices for the Minimum Access Package in Europe: Table 13.
Note: Missing entries for Croatia are not explained in the report.

B.2 Approaches to the allocation of fixed costs

The following table gives some summary details on the different theoretical options available for allocating fixed costs for an infrastructure. The CNMC notes that the most widely used approach in Europe is to use a form of Ramsey Pricing.[42] The CNMC – drawing on earlier work by the IRG – describe the varied European approaches to implementing Ramsey pricing to set mark-ups:

- **Austria:** Ramsey pricing is used, using a parameter called "relative ability to hear higher cost", to determine the revenues that the government determines should be recovered through mark-ups. This parameter is a transformation of the "inverse elasticity of the final consumer weighted by the cost structure of the operators (weight of charges over total costs)". The pass-through ratio (i.e. access charge cost passed onto the final consumers) is assumed to be 100%.
- **Belgium:** Standard Ramsey prising used to determine the mark-up for each of the 36 segments (by type of service, traffic density and time of day).
- **France:** Mark-ups are applied only on passenger services, as freight are considered unable to bear costs above direct costs. The commercial passenger services are segmented according to "the population of the cities connected by the route and the intensity of modal competition (both road and air)." For the 'market-can-bear' test, the effect of increasing or decreasing the mark-up for different periods of day is calculated via a theoretical profit and loss account for a High speed representative transport operator.
- **Germany:** There are 64 segments, identified by the type of goods transported and the type of traffic (service type, distance or speed). Ramsey pricing is then used in a similar fashion to Austria. There is a check of the impact both on operators (access charge increases, and the pass-through onto tickets) and to end users, as well as on the demand for train paths.
- **The Netherlands:** Markets are segmented directly by elasticities of different traffic, i.e. transport operators with similar levels of demand elasticities are grouped together. Ramsey pricing then determines the mark-ups for these segments.

Table 6 Approaches to fixed cost allocation and mark-ups

Approach	Description
Per-path basis	■ **Method:** charge a mark-up for all, or a subset of, physical segments of the network: this mark-up should be calculated on the basis of the fixed costs for that segment in particular.

42 National Commission for Markets and Competition (Comisión Nacional de los Mercados y la Competencia) "Draft communication on the supervision of railway line usage fees", p.43. This CNMC paper also cites the IRG-Rail 2021 annex: "Appendix to the paper on Market Segmentation and Mark-up Case Studies".

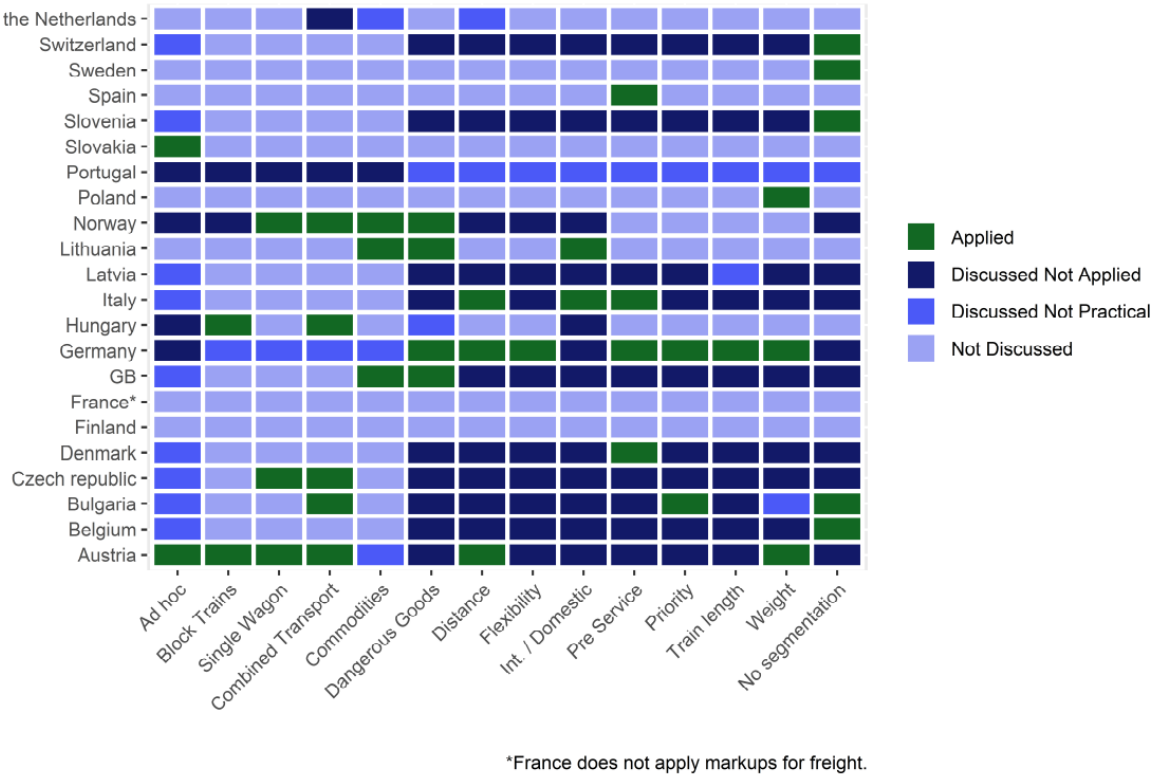
Approach	Description
	■ **Data inputs:** de-centralised fixed costs data (i.e. at the desired network segment level) ■ **Key assumptions / caveats:** related to 'market-can-bear' test – test whether all users who typically use a segment will be able to continue to do so, after the path mark-up is applied.
Equi-proportional mark-up (EPMU)	■ **Method:** allocate common costs using a constant mark-up applied to direct costs e.g.. for all users in all segments, add 5% to direct cost charges, in order to recuperate a contribution to fixed costs from all users of the network. ■ **Data:** total fixed costs for the network. ■ **Key assumptions / caveats:** related to 'market-can-bear' test - must determine a fixed % mark-up that will result in overall charges that are bearable for all users.
Ramsey pricing	■ **Method:** allocate mark-ups on the basis of customer willingness to pay for different groups of users to use the railway (segments). ■ **Data:** extensive market data for each group of users, to estimate the price elasticity for using the rail network (i.e. the responsiveness of demand of that user for rail access, as the price of rail access changes). ■ **Key assumptions / caveats:** assumptions on the dynamics within the external environment faced by each segment, demand modelling assumptions for each segment. This method is inherently designed to pass the 'market-can-bear' test.
Value-based	■ **Method:** allocate common costs based on the value generated by the activity of each group of users (segments). ■ **Data:** market data (e.g. revenues) related to the commercial activities of each group of users. ■ **Key assumptions / caveats:** the definition of value – commercial value (revenues) versus a different definition (e.g. social value); also assumptions related to 'market-can-bear' test – this would need to be applied to any mark-up estimated by value (an activity of high commercial value may not equate with a high willingness / ability to pay a mark-up over direct costs).
Input-based	■ **Method:** allocate common costs based on inputs, i.e. the services running on the network. For example, this could be allocating fixed costs according to the type of train running on the network. ■ **Data:** observable information regarding the services running on the network.

Approach	Description
	■ **Key assumptions / caveats:** assumptions related to 'market-can-bear' test – will need to be applied to any mark-up estimated by inputs.
Output-based	■ **Method:** allocate common costs based on outputs, i.e. the results of the services running on the network. For example, this could be the damage caused by the train to the infrastructure. ■ **Data:** costs of damage to the infrastructure. ■ **Key assumptions / caveats:** damages related to different train types / speeds etc; also assumptions related to 'market-can-bear' test – will need to be applied to any mark-up estimated by outputs.
Competitive considerations	■ **Method:** set mark-ups based on competitive pressures for groups of users (segments). This could be one dimension that feeds into the Ramsey pricing approach of price elasticity, for example the ability of different users to pass-on additional costs onto their own customers. ■ **Data:** depends on the competitive dimensions chosen – for the above example, external market data for each group of users. ■ **Key assumptions / caveats:** assessment to determine which critical competitive dimension that should be used; also assumptions related to 'market-can-bear' test – to be applied to any mark-up estimated by this dimension of competition (although such an approach is likely to be correlated with Ramsey pricing).
Judgement / general and public interest	■ **Method:** allocate common costs on the basis of some policy reason, for instance choosing mark-ups based on a green agenda ■ **Data:** requires an appropriate quantification of the chosen public / political agenda. ■ **Key assumptions / caveats:** assumptions related to 'market-can-bear' test – must be applied to any mark-up estimated by this method.

Source: Frontier Economics.

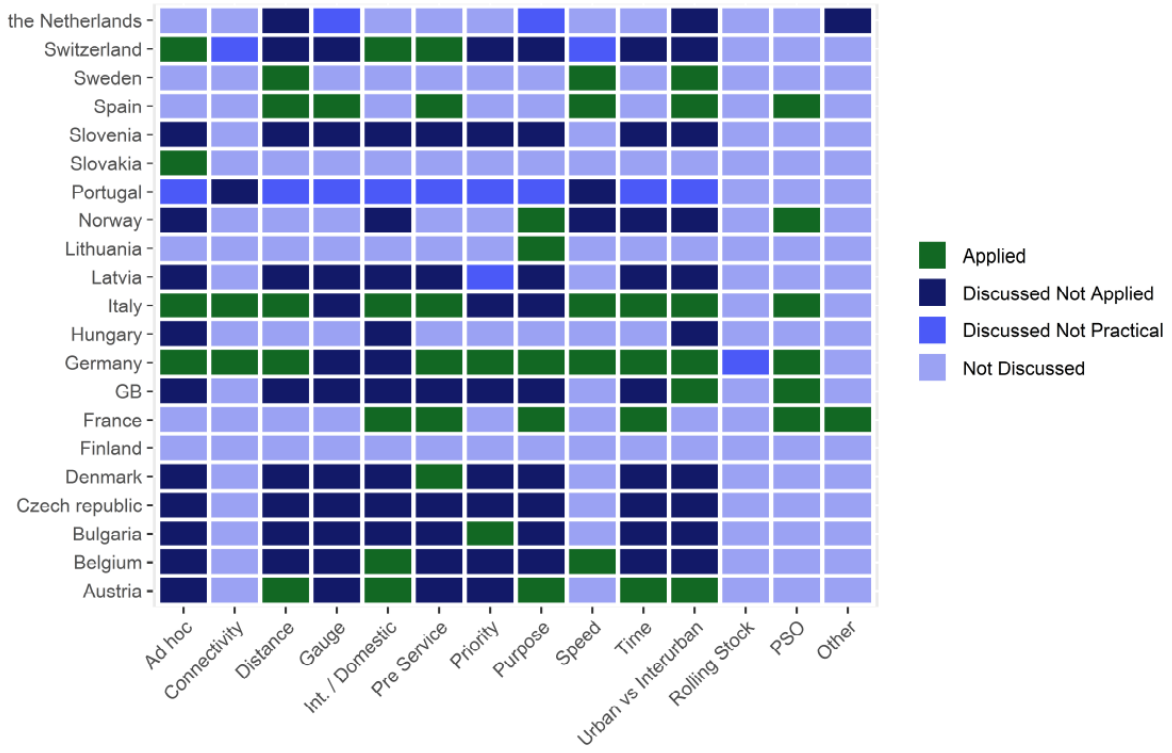
B.3 Segmentation approaches across Europe

Figure 20 Reproduction of IRG's heatmap of segmentation to freight approaches across Europe



Source: Figure 2, p16, IRG Overview of the application of market segments and mark-ups in consideration of Directive 2012/34/EU (November 2021).

Figure 21 Reproduction of IRG's heatmap of segmentation of passenger services across Europe



Source: Figure 3, p19, IRG Overview of the application of market segments and mark-ups in consideration of Directive 2012/34/EU (November 2021).

B.4 Congestion / scarcity pricing element to access pricing regimes in Europe

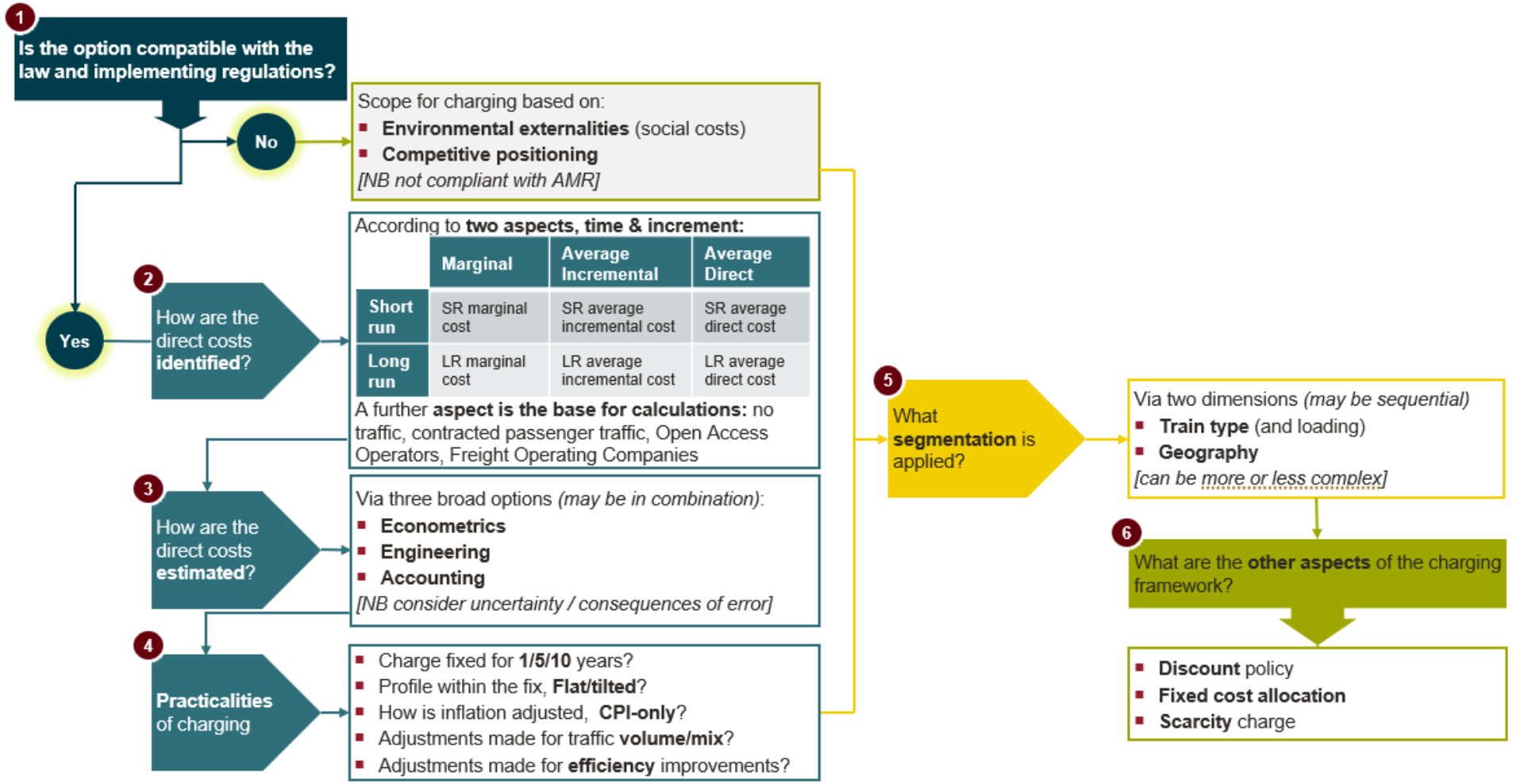
Table 7 Congestion / scarcity pricing methodology

	Congestion / scarcity pricing
Austria	✓
Belgium	×
Bulgaria	×
Croatia	×
Czech Republic	×
Denmark	×
Estonia	✓

	Congestion / scarcity pricing
Finland	✗
France	✗
Great Britain	✗
Germany	✗
Greece	✗
Hungary	✗
Latvia	✗
Lithuania	✗
Luxembourg	✓
Norway	✓
Poland	✓
Portugal	✗
Romania	✗
Slovakia	✗
Slovenia	✓
Spain	✗
Sweden	✓
Switzerland	✓
Netherlands	✓

Source: Adapted from IRG – Review of charging practices for the minimum access package in Europe (November 2020) Table 11, p.45 .

B.5 The full options framework developed for this project



Annex C Notes from the Access Pricing Workshop

C.1 Introduction

■ On 22nd February 2024, Frontier Economics hosted an Access Pricing Workshop as part of a study commissioned by the Office of Rail and Road (ORR) to investigate options for changing the current rail access pricing regime, looking towards CP8 and beyond. The goal was to give stakeholders of the UK's rail network an opportunity to create and discuss options for change. The morning session included presentations and Q&A on the legal constraints and opportunities from the legislation which underpins the current access charging regime and on market segmentation principles. The afternoon was made up of small group discussions.

■ This document records the opinions and ideas that were shared over the course of the workshop. The workshop was run under Chatham House Rules, meaning that these opinions and ideas were noted but are not attributed to individuals or organisations.

■ The options for change that were proposed and discussed have been organised into the options framework developed by Frontier Economics for the ORR.

■ We note that not all options considered for the full study are included in this annex: only those proposed, and discussed, at the workshop.

■ **This annex aims to summarise the discussions – the inclusion of a statement in this annex should not be taken to mean that Frontier Economics, or the ORR, agrees (or disagrees) with that statement.**

C.2 Issues with the status quo

In this section we note the views shared during the workshop on the critical issues with the access pricing regime currently in place.

General issues

- The access pricing regime is trying to achieve three competing goals simultaneously, which pull prices in different directions:
  - Cost recovery (for Network Rail) – *higher* prices
  - Incentivising optimal behaviours across a spectrum of users – *broad ranging* prices
  - Encouraging rail use – *lower* prices
- Current timeframes are too short – investment and other decisions need longer term certainty / visibility than 5 years e.g. for rolling stock investment
- The charges are based on forecasted costs and theoretical processes / assumptions, not actual incurred costs – and there is never a reconciliation

- There is a lack of cross-modal alignment i.e. the framework does not consider what is happening to the costs of other modes, particularly road, but also air.
- There is a lack of ORR understanding of the full implications of the current access pricing strategy
  - The mix of access pricing components often pull in different directions
  - The choices are not neutral on a commodity level
- The overall access pricing regime is too complex, and this is particularly problematic when those navigating the regime for users change roles frequently
- A frustration that the focus is simply on covering costs, not paying costs to fund an agreed output

Issues with variable costs

- The Vehicle Track Interaction Strategic Model (VTISM) is too complex, which results in:
  - A general lack of trust (a concern that the outcome it gives may not be correct)
  - A deterrent of potential / current rail network users from wanting to use rail
  - A lack of understanding by manufacturers as well as users
- The outputs of the VTISM model are not always predictable – the model seems to be unable to handle big changes in a comprehensible way / the key drivers of the outputs of the VTSIM model are not clear
- It is not clear to users that the final Variable Usage Charges (VUC) are genuinely attributable to the service using the network (e.g. are freight services truly paying the freight direct cost?)
- The VUC charges are too granular: the level of detail is not needed / has no (or only very limited) impact on actual behaviours or choices; although some users also noted that the VUC has been successful in driving some behavioural/technical change at the TOC/FOC level, but a view that it did not incentivise change for Network Rail
- The VUC charges are too high
- Electricity charges also not well understood

Issues with fixed costs

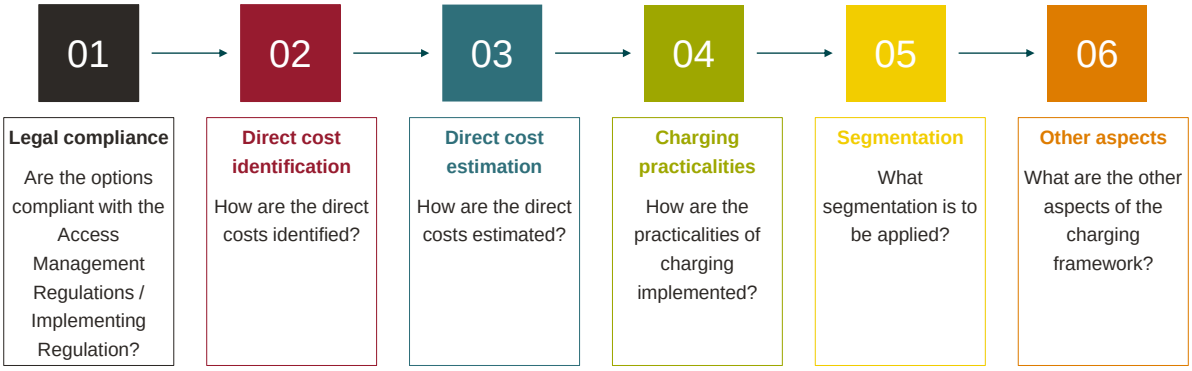
- Fixed Track Access Charges (FTAC) is a misnomer / misleading name because it is largely a policy choice of how to allocate subsidy to the rail industry between subsidy to infrastructure and subsidy to operations
- The coverage of the FTACs is not clear / transparent
- The interactions between charges and subsidies needs to be more transparent
- Incentives need to be consistent / fair for all stakeholders (government / users / Network Rail)

C.3 Access Pricing Options

An options framework

In this section we record the ideas shared during the workshop for changing the access pricing regime. We organise these ideas according to an Options framework developed for the ORR as part of the wider project. This framework is designed to give a structure to the broad range of choices for the suite of elements underpinning an overall access pricing regime. The 6 key steps within the framework are presented in the high-level figure below.

Figure C1 Access Pricing Options – High level framework



Source: Frontier Economics.

Note: This is a previous version of the options framework – we have since altered this to position Segmentation as the 6th step, which is the framework presented in the main body of this report.

Options proposed during the workshop

Step 1: Are the options compliant with the Access Management Regulations (AMR) / Implementing Regulation?[43]

- In this section, we list the options that were raised and discussed during the workshop, but that are unlikely to be deliverable given the constraints imposed by the AMR and Implementing Regulation.
- Set a **fixed fee for access, then set variable costs as incentives**
- Complement variable costs with **targeted incentives (discounts) to influence usage behaviour** via varying prices on the following dimensions:
  - Environmental based charging – e.g. incentivise replacing locomotives, low carbon traction, any fuel types that reduce carbon emissions (benchmarking would be needed)

[43] The Railways (Access, Management & Licensing of Railway Undertakings) Regulations 2016 ("AMRs") and Commission Implementing Regulation 2015 / 909

  - Anti slip braking on wagons
  - Short distance / long distance (which would also address the goal of modal shift – shorter journeys more switchable to road, so these should be cheaper)
  - Longer vs shorter trains
  - Express freight
- **Introduce negative mark-ups** (to get around the legal constraints that result in limited use cases for discounts) – the legal review suggests that mark-ups have to be zero or positive
- **Charging based on social costs or on commercial value** (rather than cost estimations)
  - *Counter-suggestion from another group:* it might rather be better to take commercial considerations / wider social cost considerations not into account via access *pricing* but rather access *contracts (*i.e. keep access pricing based on concrete cost based rationale)

Step 2: How are direct costs identified?

- Have **accounting separation for freight vs passenger**, such that the direct costs can be identified for each high level segment separately

Step 3: How are direct costs estimated?

- **Simplify the VUC charges – i.e. make them less granular** (this idea also relates to segmentation below)
  - Freight: unit cost (tonne/km) that varies by bulk and non-bulk, and locos vs wagons, and by wagon type
  - Passenger: unit cost varying by speed and axle-weight banding
- **Find a model that is both transparent and reconcilable in inputs**
  - The model needs to be transparent on the costs that go into it
  - The model also needs to be transparent on the rules on how the cost inputs are then allocated (likely to be helpful to look at other market approaches to this)
  - The model's inputs need to be reconcilable with actual maintenance / renewals, and actual wear/tear costs by vehicle type

Step 4: How are the practicalities of charging implemented?

- **A longer term view of access charging** (i.e. longer than 5 years) is needed to meet long term commercial expectations / requirements
- **A longer lead time for changes** to the pricing (and to the methods) is needed
- Note that sticking with **tariff based access charging** is preferable for all parties and for financial backers to keep costs related to uncertainty down (i.e. avoid going back to a situation where operators are individually negotiating with Network Rail)

- **Segmentation granularity should be backed up by cost evidence** from Network Rail as to why this level of granularity matters (e.g. segmentation needs to be based on clear and observable cost differences)
- **Segmentation should be simplified** (in particular with respect to the VUCs) i.e. make this less granular; for example VUCs might vary only on the following dimensions:
  - Freight: unit cost (tonne/km) that varies by bulk and non-bulk, and locos vs wagons, and wagon type
  - Passenger: unit cost varying by speed and axle-weight banding

Step 6: What are the other aspects of the charging framework?

- **Introduce discounts to incentivise use of under-used routes**[44] (passenger)
  - NB note that often under-used routes may be a "longer way round" hence would be more expensive if billed purely as train/km or tonne/km – this would need to be taken into account in determining the discounts
- **Complement variable costs with targeted incentives to influence usage behaviour** via varying prices on the following dimensions (freight):
  - New flows
  - Tapered track access charges, as used in other EU member states (aiding the introduction of new services and encouraging modal shift)
  - Time of day (possibly: also consider that this may be too complicated and not a very flexible choice dimension for users)
  - Congested vs quiet routes (as above for passenger services, recognising potential extra cost for longer routes)
- **Pricing based on regions / paths** (via mark-ups and / or discounts)
  - Considered useful by some stakeholders, but not by all
    - Eg1 path specific charges for groups of regions (rationale: there is differing ability to bear costs in different regions – but note that this should not result in cross-subsidy across regions of the network; rather, revenues from higher mark-ups should be channelled in a transparent manner to investment projects in the region itself) – this would be envisaged like an extension of the existing ICC
    - Eg2 discounts to incentivise an uptick of railway activity in areas needing more economic activity (NB this would have to be on a short term basis, to meet legal requirements on discounts)
- **Incorporate efficiency targets met by Network Rail during the Control Period** into Access Pricing

44 The AMR refer specifically to the use of discounts for "considerably under-utilised lines".

C.4 Key considerations for change

Considerations of the wider context

- Consider and make clear access pricing's **interactions with government subsidies**
- Consider how might the change **incentivise Network Rail to perform better**
- Consider how any new access pricing may **interact with how other modes are charged**
- Consider **wider ramifications of the change – not just impact on rail vs other modes of transport** e.g. a user choice might be rail in UK or going elsewhere entirely?
- Consider **consequences on complexity of billing** (i.e. if segmenting by time / route, and this is disrupted on the day)
- Note that **access pricing is one piece of the puzzle** for operator behaviour / choices: users also have access contracts and duration of access rights; changes should keep the terms "neutral" overall – suppose access pricing goes up, in turn access contracts should be extended?
- Take into account the fact that **performance charging will also incentivise actions**
  - Consider any links of the access pricing to Schedules 4 and 8
- Consider **the incentive schemes that hang off the access charging regime and the overall goal of running track friendly trains** e.g. bogie technology incentives have driven helpful behaviours

Considerations for the charges themselves

Desired pricing / method features

- **Simplicity** – avoid levels of detail in the models or the output which don't have a clear purpose in terms of influencing behaviours
- **Predictability** – look for price outputs that move in predictable ways given changing context (and inputs)
- **Transparency** – ensure a clear connection between use by a particular service and resulting cost (e.g. freight users can see they are paying for freight direct costs)
- **Tangibility** – base costs on concrete / observable factors
- **Robustness / Durability** of outputs – note that very granular segments justified on very detailed 'market-can-bear' tests may not be robust across the whole 5 year period
- Consider how the change might give Network Rail an **incentive to sell more access** – do not just use prices for Network Rail to offset maintenance, but rather incentivise more users
- Note that **pricing should be agnostic to the commercial value of the service, and to any other social values** (may change with policy), but rather be based on tangible costs

Size of the change

- Change should be an **adaptation / evolution / simplification** of the current system
- Change needs to **last** (not have to be changed at the next Control Period)

Use of incentives

- Need for **clarity on incentives and their purpose**: looking for a Yes/No for using rail (i.e. modal choice) vs modifying ways of using of rail
- Changes always bring winners and losers, so the critical question should be: **what option will result in the best use of the railway that we have?**
- Use of pricing as incentive for particular behaviours / choices from operators must be backed up by **evidence that such behaviours are useful / helpful / cost saving** etc for Network Rail
- Prices should incentivise the "right" behaviours from all stakeholders, including Network Rail and government
- Considerations of Actual Network vs Ideal Network – think about good and bad incentives in this regard

Changing access pricing – ripple effects

- How can we set prices so that **operators feel like customers who are purchasing a service** from Network Rail?
- Be careful about **unintended consequences** (e.g. incentivising slower / smaller trains to avoid costs resulting in network capacity being reached sooner but fewer volumes transported)
  - Connected to being mindful of the goal of efficient network use
- Be mindful of the fact that access pricing is one of a set of costs; may want to think about the relative importance of this cost vs others – not the same for all types of operators

C.5 Additional ideas captured

Remarks stemming from legal review

- Operators have typically defended the AMR, but can also be open-minded about potential opportunities if it were to be replaced (noting that it seems to be associated with price increases every Control Period… so perhaps could be usefully amended / replaced)
- Need to understand the spread of options used across Europe (given the common legal foundations that underpin the approaches) – possible to see both differences in the steady state approaches, but also in the way in which different systems respond to shocks (with varying levels of regard to the AMR…)
- Important to consider not just the AMRs/Implementing Regulation but also the Competition Act

- This Act has its own implications on possibilities / challenges, hence will have an important bearing on how reform could look
- NB the Act will have particular importance for segmentation choices (discrimination concerns)

- Need for clarity on the legal constraints on the mandated rate at which caps must be unwound (the repeated imposition of caps with expiry dates causes cliff edges…)