

## **UPDATED REVIEW OF CHARGING PRACTICES FOR THE MINIMUM ACCESS PACKAGE IN EUROPE**

Version 5: November 2018

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### **Introductory remarks**

*This updated review on charging practices for the minimum access package covers the following countries, members of IRG-Rail: **Austria, Belgium, Bulgaria, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.***

*The IRG-Rail charging working group intends to review this document when appropriate as further information becomes available from other members or other regulatory bodies. In addition the working group would like to underline that this document is an **interpretation of the common charging principles as they stand rather than stating what the charging principles 'should' consist of.** In other words, the document only provides a description on the charging systems designed by national infrastructure managers.*

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## **1. General objectives of the document**

Directive 2012/34/EU, setting out the charging principles for the minimum access package, has now been implemented by all Member States. However, in some countries, charging schemes are still evolving as a consequence of the Directive's transposition.

The 2012/34/EU Directive is the legal basis for establishing the principles governing rail charging systems in Europe. The Recast requires Member States to establish charging frameworks that meet the management independence initially laid down in Directive 91/440/EC, and sets out in particular the principles of accounting, legal organisation and decision making separation between railway companies and the state, and between infrastructure managers (IMs) and railway undertakings. A regulatory body, legally distinct and independent from any other public and private entity and independent from the IM, is responsible to guarantee fairness and transparency.

This framework is crucial for a successful functioning of the European railway market. As a result, Member States are now moving towards more transparent capacity allocation and charging systems.

In particular, the charging system has several key objectives. It obviously provides a mechanism for the IM to recover costs. However it can also be used to incentivise the optimal use and provision of the infrastructure. For example, charges based on cost provide incentives to rail operators to use the infrastructure where the benefits of utilization would exceed their costs. Furthermore, it can incentivise railway undertakings to find ways to reduce the costs they place on the network by, for example, investing in less damaging trains. The purpose of this document is to present an overview of the charging approaches for the minimum access package in the Member States which are part of the IRG-Rail charging working group.

IRG-Rail intends to expand this overview report and has invited other IRG-Rail members and European rail regulatory bodies to participate and submit information on their charging systems when available. The overview published in October 2012 has been updated five times. The second version provided an addendum (section 3) that explained the regulatory bodies' general roles in charging issues. This third version included descriptions on the role of regulatory bodies in respect of investments (section 3.4) and gave an overview on the impact of public compensation on charges (section 3.4). The fourth version included new countries and added tables summarizing the main information included in section 3. The fifth version takes account of all recent changes to national legislation to keep the document up to date and adds an in depth analysis of direct cost criteria (Chapter 3.3.) and market segments (Chapter 3.6). The IRG-Rail charging working group will update the report as necessary.

The review of charging systems should allow the IRG-Rail charging working group to:

1. Obtain a common understanding of charging principles for rail in Europe;

2. Explore a common framework for the review of charging principles given by Directive 2012/34/EU, as amended;
3. Refine and/or expand activities considered in the working programme of the working group.

## **2. Charging characteristics: review of charging principles in IRG-Rail Member States**

According to Directive 2012/34/EU, Annex II-1, the charges specified in the network statements should cover the items included in the minimum access package which are:

- Handling of requests for infrastructure capacity;
- Right to utilise capacity which is granted;
- Use of running track points and junctions;
- Train control including signalling regulation, dispatching and the communication and provision of information;
- Use of electrical supply equipment for traction current, where available;
- All other information required to implement or operate the service for which capacity has been granted.

The main charging principles laid down in Directive 2012/34/EU provide that:

- Charges for the use of rail infrastructure must be paid to the IM and be used to finance its activities (article 31(1) of Directive 2012/34/EU);
- In the definition of charges, direct costs should be identified. In fact, Article 31(3) of the Directive 2012/34/EU states that “*Without prejudice to paragraph 4 or 5 of this Article or to Article 32, the charges for the minimum access package and for access to infrastructure connecting service facilities shall be set at the cost that is directly incurred as a result of operating the train service*”. This principle applies to the minimum access package (the methodology for the calculation of the cost that is directly incurred is given by the European Commission Regulation 2015/909 of June 2015. In November 2016, IRG-Rail issued a document presenting engineering and econometric methodologies which may be used to calculate direct costs<sup>1</sup>);
- There are exceptions to these charging principles :
  - In order to obtain full recovery of costs, IMs are allowed to levy a mark-up if the market can bear it and provided that market segments have been defined (article 32(1) of Directive 2012/34/EU). Under this exception, the level of charges must not exclude the use of infrastructure by market segments which can pay at least the cost that is directly incurred as a result of operating a railway service, plus a rate of return that the market can bear;

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<sup>1</sup> IRG-Rail, An introduction to the calculation of direct costs in respect of implementing regulation 2015/909, November 2016.

- Additionally, for specific future investment projects, or specific investment projects that have been completed after 1988, the IM may set or continue to set higher charges on the basis of the long-term costs of such projects if they increase efficiency or cost-effectiveness or both and could not otherwise be or have been undertaken (Article 32(3) of Directive 2012/34/EU).
- Charges can also be levied to reflect scarcity of capacity of an identifiable segment of the infrastructure during periods of congestion (Article 31(4) of Directive 2012/34/EU) or take account of environmental effects (Article 31(5) of Directive 2012/34/EU);
- Infrastructure charging schemes must also encourage railway undertakings and the IM to minimise disruption and improve the performance of the railway network through a performance scheme (Article 35 of Directive 2012/34/EU).

The table below (compiled by the working group) provides an overview of the application of charges for the minimum access package of IRG-Rail members. The table is based on the assessment of charging practices in countries detailed in the Annexes<sup>2</sup>. It does not represent the full regulatory framework of each country as a regulatory framework may allow different solutions/options that the IM does not necessarily adopt. It provides information on the following charging characteristics:

- **Charge(s) reflecting direct costs according to article 31(3) of Directive 2012/34/EU :** *“[w]ithout prejudice to paragraph 4 or 5 of this Article or to Article 32, the charges for the minimum access package and for access to infrastructure connecting service facilities shall be set at the cost that is directly incurred as a result of operating the train service”;*
- **Mark-ups and market segmentation according to article 32(1) of Directive 2012/34/EU :** *“[i]n order to obtain full recovery of the costs incurred by the infrastructure manager a Member State may, if the market can bear this, levy mark-ups on the basis of efficient, transparent and non-discriminatory principles, while guaranteeing optimal competitiveness of rail market segments. The charging system shall respect the productivity increases achieved by railway undertakings”;*
- **Annual prices:** the table indicates whether charges are set every year or not;
- **Charge(s) under article 32(3) of Directive 2012/34/EU (long term costs):** *“[f]or specific future investment projects, or specific investment projects that have been completed after 1988, the infrastructure manager may set or continue to set higher charges on the basis of the long-term costs of such projects if they increase efficiency or cost-effectiveness or both and could not otherwise be or have been undertaken. Such a charging arrangement may also incorporate agreements on the sharing of the risk associated with new investments”;*

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<sup>2</sup> **Note:** this table only refers to the mainline network of the incumbent. In some countries, this excludes high-speed lines where high speed trains (generally speed  $\geq 200$  km/h) are the only ones allowed. Other countries have a mixed usage of their whole network.

- **Discounts under article 33(3) of Directive 2012/34/EU** : “[i]nfrastructure managers may introduce schemes available to all users of the infrastructure, for specified traffic flows, granting time-limited discounts to encourage the development of new rail services, or discounts encouraging the use of considerably underutilised lines”;
- **Charges for the impact of public service operation contract under article 12 of Directive 2012/34/EU**: “[m]ember States may, under the conditions laid down in this Article, authorise the authority responsible for rail passenger transport to impose a levy on railway undertakings providing passenger services for the operation of routes which fall within the jurisdiction of that authority and which are operated between two stations in that Member State”;
- **Incentives under articles 30.1 of Directive 2012/34/EU**: “[i]nfrastructure managers shall, with due regard to safety and to maintaining and improving the quality of the infrastructure service, be given incentives to reduce the costs of providing infrastructure and the level of access charges”.

	Charge(s) reflecting direct costs (article 31.3 of directive 2012/34/EU)	Charge(s) under article 32.3 of directive 2012/34/EU (long term costs)	Annual prices?	Market segments? (article 32.1 of directive 2012/34/EU)	Mark-ups "if the market can bear this" (article 32.1 of directive 2012/34/EU)	Discounts (article 33.3 of directive 2012/34/EU)	Charges for the impact of PSO contracts (article 12 of directive 2012/34/EU)	Incentives under article 30.1 of directive 2012/34/EU
<b>Austria</b>	✓	✗	✓	✓	✗ <sup>3</sup>	✗	✗	n/a
<b>Belgium<sup>4</sup></b>	✓	✓	✓	✓	✓	✗	✗	✗
<b>Bulgaria</b>	✓	✗	✓	✗	✗	✓	✗	✓
<b>Croatia</b>	✓	✗	✗	✗	✗	✗	✗	✗
<b>Denmark</b>	✓	(✗) <sup>5</sup>	✓	✗	✗	✗	✗	✓
<b>Estonia</b>	✗ <sup>6</sup>	✗	✓	✗	✗	✓	✗	✗
<b>Finland</b>	✓	✗	✗	✗	✗	✗	✗	✗
<b>France</b>	✓	✓	✓	✓	✓	✓	✗	✓ <sup>7</sup>
<b>Germany</b>	✓	✗	✓	✓	✓	✓	✗	✓
<b>Greece</b>	✗ <sup>8</sup>	✗	✓	✗	✗	✗	✗	✗
<b>Hungary</b>	✓	✗	✓	✓	✓	✓	✓	n/a
<b>Italy</b>	✓	✗	✓	✓	✓	✓	✗	✓
<b>Latvia</b>	✓	✗	✓ <sup>9</sup>	✓	✓ <sup>10</sup>	✗	✗	✗ <sup>11</sup>
<b>Luxembourg</b>	✓	✗	✓	✗	✗	n/a	n/a	n/a

<sup>3</sup> The charging system for 2018 foresees mark-ups, but they are not approved yet.

<sup>4</sup> For Belgium, the charging system according to the implementing act 2015/909 will be implemented for the service of 2020. A proposal with this respect is discussion with the Ministry of Transport and the RB including Mark-up (this explains the 'v' in the table).

<sup>5</sup> The Danish IM charge for passing the two major bridges in Denmark. The regulatory body has not been checking the charging system for these bridge charges..

<sup>6</sup> But the new methodology will be implemented in December 2017 which does levy charges reflecting Article 31(3).

<sup>7</sup> Incentives are included in the contract between state and IM, concluded in 2017.

<sup>8</sup> The Greek IM gradually applies the implementing regulation.

<sup>9</sup> Based on a current year cost analysis and a forecast of future costs.

<sup>10</sup> Additionally, the IM applies article 32(2) of the Recast for the carriage of goods from and to third countries operated on a network whose track gauge is different from the main rail network within the Union, infrastructure managers may set higher charges in order to obtain full costs recovery of the costs incurred.

<sup>11</sup> Incentives will be part of the contract between state and IM, which is expected to be concluded soon.

	Charge(s) reflecting direct costs (article 31.3 of directive 2012/34/EU)	Charge(s) under article 32.3 of directive 2012/34/EU (long term costs)	Annual prices?	Market segments? (article 32.1 of directive 2012/34/EU)	Mark-ups "if the market can bear this" (article 32.1 of directive 2012/34/EU)	Discounts (article 33.3 of directive 2012/34/EU)	Charges for the impact of PSO contracts (article 12 of directive 2012/34/EU)	Incentives under article 30.1 of directive 2012/34/EU
<b>Netherlands</b>	✓	✗	✓	✓	✓ <sup>12</sup>	✗	✗	✗
<b>Norway</b>	✓	✗	✗	✓	✓	✓	✗	✓
<b>Poland</b>	✓	✓	✓	✓ <sup>13</sup>	✗ <sup>14</sup>	✓	✗	✓
<b>Portugal</b>	✗ <sup>15</sup>	✗	✓ <sup>16</sup>	✗	✗	✗	✗	✗
<b>Romania</b>	✓ <sup>17</sup>	✗ <sup>18</sup>	✗	✗ <sup>19</sup>	✗ <sup>19</sup>	✓ <sup>20</sup>	✗ <sup>21</sup>	✓ <sup>22</sup>
<b>Slovakia</b>	✓	✗	✗	✗	✗	✗	✗	✗
<b>Slovenia</b>	✓	✓	✗	✗	✗	✗	✓	✓
<b>Spain</b>	✓	✗	✓	✓	✓ <sup>23</sup>	n/a	n/a	n/a
<b>Sweden</b>	✓	✓	✓	✗ <sup>24</sup>	✗ <sup>24</sup>	✗ <sup>24</sup>	✗	✗
<b>Switzerland</b>	✓	✗	✓	✓	✓	✓	✗	✗
<b>UK</b>	✓	✗ <sup>25</sup>	✗ <sup>26</sup>	✓	✓	✓	✗	✓

<sup>12</sup> Only on lines designated by Transport Ministry (currently: high speed -only).

<sup>13</sup> Allowed but have not been applied yet.

<sup>14</sup> The charging system for the timetable 2018-2019 foresees mark-ups.

<sup>15</sup> The actual charging model is being updated in order to adequate with the national diploma which transposed the Recast and the Reg. 2015/909 rules.

<sup>16</sup> The charging model is being revised. It is not yet defined if the charges will be set on a yearly basis. At the moment, these are set on a yearly basis, but Portugal is in a transitional period.

<sup>17</sup> Current access charges design is transitory; the new Railway Law which transpose the Recast Directive and foresees a direct cost approach.

<sup>18</sup> But it is legally possible

<sup>19</sup> Not applicable at present, but legally possible

<sup>20</sup> Reductions for international complete freight trains in transit on the national territory

<sup>21</sup> But it is legally possible

<sup>22</sup> Implemented through the contract between the State and the IM.

<sup>23</sup> This test is based in the benefits of the incumbent RU in a monopoly.

<sup>24</sup> Not applicable at present, but legally possible

<sup>25</sup> Although High Speed 1 has this and there may be more examples in the future.

<sup>26</sup> Periodic review, 5 years.

Findings of this charging review show that:

- In most countries, the charging models are based (at least partly) on the principle of Direct Costs, which are generally calculated on basis on the marginal costs incurred by the IM for the use of the infrastructure. This reflects the fact that some of the governments support IMs through a subsidy (see par. 3.4 for more details regarding this very important issue), while others require the IM to recover some of its costs through the charging framework in the form of mark-ups. The methods by which direct or marginal costs are estimated and the charges' design vary between countries. In Italy, a new system has been implemented following the new regulatory framework issued by the Italian regulatory body (ART) in November 2015, coherent with the principles set in the Recast. Under the new system, access charges are made of different components: direct costs, mark-ups and other components (incentives for ETCS, surcharges for scarcity, environmental effects, etc.). Charges based on direct costs are estimated on the basis of three factors: train overall mass, path traffic speed and contact wire (on the basis of type of the rolling stock)<sup>27</sup>. The new system is fully applied from January 2018<sup>28</sup>;
- Most countries have a **multi-part charging structure**;
- There is a trend to take into account external effects. **Sweden**, for instance, incorporates an emission charge levied on combustion engine-driven vehicles into its charging regime. However, the IM has decided to remove this charge as of 2020. Similar approaches are considered in other countries such as **Switzerland** and **Germany**, the latter having introduced a noise differentiated charge for freight trains in June 2013. In 2015 about 16 per cent of railway undertakings of the rail freight segment used low-noise trains. However, only 5 per cent of total train-path km were travelled by those low-noise trains.

In contrast to the areas where a broad commonality of approaches exists, there are several important differences in the approach when regulating IMs in IRG-Rail Member States. These include:

- **Mark-ups and market segmentation** are not applied in all countries and, when applied, they appear to differ across countries<sup>29</sup>;

There are also key differences in the **periodicity of access charges reviews**. In the UK charges are reviewed every five years, whereas in most other countries, for example in France and Poland, this is done on an annual basis. In Italy, while the regulatory period lasts five years, at the beginning of the regulatory period access charges are calculated for each of the five years (taking into account for inflation, productivity goal and traffic forecasts). In Germany, UK and Hungary while the

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<sup>27</sup> See ART Decision 96/2015, available at the link: [http://www.autorita-trasporti.it/wp-content/uploads/2015/12/Determination-of-charges-for-access-and-use-of-railway-infrastructure\\_ARTs-Regulatory-measures1.pdf](http://www.autorita-trasporti.it/wp-content/uploads/2015/12/Determination-of-charges-for-access-and-use-of-railway-infrastructure_ARTs-Regulatory-measures1.pdf)

<sup>28</sup> A new proceeding started in May 2017 in order to review some specific components of the Italian access charges system owing to the introduction of new passenger services on HS lines, i.e. the coupled trains (decision 77/2017). The proceeding ended in December 2017 (decision 152/2017, see in the Section 4.12 for the details and other ART decisions that presents impacts on the charging system).

<sup>29</sup> This is also due to the different national policies in terms of public compensation and subsidies – see paragraph 3.4

regulatory period lasts five years, access charges are updated every year (adjusting, as an example, for inflation, productivity and traffic forecasts).

Depending on the number of IMs in each country, **charging practices may also differ within an individual IRG-Rail Member State**. Our analysis has only focused on general trends for the main line network within each Member State and does not address charging systems of local passenger or freight networks or separate high speed lines.

In addition to the access charge reflecting direct costs incurred for the use of the network targeted by Article 31(3) of Directive 2012/34/EU, most national charging systems consider other charges. In order to avoid confusion, common understandings of these additional charges are detailed below:

- **Congestion and scarcity charges<sup>30</sup>**

The issue of scarcity and congestion is addressed in Article 31(4) of Directive 2012/34/EU. It states that *"the infrastructure charge may include a charge which reflects the scarcity of capacity of the identifiable section of the infrastructure during periods of congestion."*

A table setting out whether national IMs include scarcity charges within their pricing schemes is included below.

- **Environmental charges**

Directive 2012/34/EU states, under Article 31(5), that *"[t]he infrastructure charge may be modified to take account of the cost of the environmental effects caused by the operation of the train."* It also stresses that *"[s]uch a modification shall be differentiated according to the magnitude of the effect caused."*

Some countries have decided to put more emphasis on environmental externalities and promote clean transport modes like rail. Germany uses an integrated system of bonus and malus for freight traffic: a malus for all not retrofitted wagons running on the network and a bonus for those wagons using retrofitted brake blocks. In Italy, following the Decision 96/2015, the IM is allowed to include in the access charges a component that boosts the reduction of noise effects<sup>31</sup>.

Environmental charges are used to create a level-playing field across all modes based on impacts on the environment. IRG-Rail considers that all modes should be charged in a way that prevents one mode from being at a disadvantage compared to others.

- **Performance:**

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<sup>30</sup> It is worth noting that, in November 2014, IRG-Rail has adopted a position paper providing a common initial approach to capacity charging.

<sup>31</sup> The IM may use the bonus/malus formula and the modalities provided for by Commission Implementing Regulation (EU) 2015/429.

Directive 2012/34/EU states, under Article 35(1), that “[i]nfrastructure charging schemes shall encourage railway undertakings and the infrastructure manager to minimise disruption and improve the performance of the railway network through a performance scheme. This scheme may include penalties for actions which disrupt the operation of the network, compensation for undertakings which suffer from disruption and bonuses that reward better-than-planned performance”.

Performance schemes are in place in almost all European countries. The schemes vary in their design, but their target is typically delay-minutes.

- **Reservation charge :**

Directive 2012/34/EU states, under Article 36 that “[i]nfrastructure managers may levy an appropriate charge for capacity that is allocated but not used. That non-usage charge shall provide incentives for efficient use of capacity. The levy of such a charge on applicants that were allocated a train path shall be mandatory in the event of their regular failure to use allocated paths or part of them. For the imposition of this charge, the infrastructure managers shall publish in their network statement the criteria to determine such failure to use. The regulatory body referred to in Article 55 shall control such criteria in accordance with Article 56. Payments for this charge shall be made by either the applicant or the railway undertaking appointed in accordance with Article 41(1). The infrastructure manager shall always be able to inform any interested party of the infrastructure capacity which has already been allocated to user railway undertakings”.

In some countries, this charge is introduced as a cancellation charge that applies when one or several train running days on a train path or part of a train path are withdrawn by the ordering railway undertaking.

A summary of how these various charges are applied in IRG-Rail members is given in the table below.

Country	Congestion / Scarcity	Performance	Environmental	Reservation or Cancellation charge
Austria <sup>32</sup>	✓	✓	✗	✓ <sup>33</sup>
Belgium	✗	✗ <sup>34</sup>	✗	✓
Bulgaria	✗	✗	✗	✓
Croatia	✗	✓	✗	✓ <sup>35</sup>
Denmark	✗	✓	✓	✓
Estonia	✓	✗	✗	✓
Finland	✗	✓	✗	✗
France	✓	✓	✗	✓ <sup>36</sup>
Germany	✗	✓	✓ <sup>37</sup>	✓ <sup>38</sup>
Greece	✗	✗	✗	✗
Hungary	✗	✓	✗	✓
Italy	✗ <sup>39</sup>	✓	✗ <sup>40</sup>	✓
Latvia	✗	✗	✗	✗
Luxembourg	✓	✓	✗	✓ <sup>40</sup>
Netherlands	✓	✓ <sup>41</sup>	✗ <sup>42</sup>	✓ <sup>43</sup>
Norway	✓	✓	✗	✓
Poland	✓ <sup>44</sup>	✗ <sup>45</sup>	✓ <sup>45</sup>	✓
Portugal <sup>46</sup>	✗	✓	✗	✓
Romania	✗ <sup>48</sup>	✓ <sup>48</sup>	✗	✓ <sup>47</sup>
Slovakia	✗	✗	✗	✗

<sup>32</sup> In Austria, by 2018 an incentive for noise reduced rolling stock has been introduced.

<sup>33</sup> Only for passenger services.

<sup>34</sup> In Belgium, the IM is working for designing a new performance regime. The performance regime implemented by the IM as per 2017 has been turned down by the RB following a complaint from some RU's.

<sup>35</sup> Late cancellation or non-use fees. Depends on cancellation time. In Croatia, applicants that regularly fail to use the allocated train path planned in the timetable are charged a fee for non-usage of capacity by the IM. The IM monitors the implementation of allocated train paths by calculating the degree of train path utilization for all allocated capacity. The degree of utilization is calculated by correlating realized train kilometres of the allocated train path with the planned number of train kilometres, which is expressed as a percentage. The IM charges a fee for non-usage of capacity for the allocated train paths, whose utilization degree is lower than the marginal utilization degree.

<sup>36</sup> Charge combined with mark-ups levied under article 32.1 of Directive 2012/34/EU.

<sup>37</sup> Noise differentiated track access charges for freight trains.

<sup>38</sup> Cancellation fee referring to the withdrawal or changes in a train path or part of a train path, e.g. train running days, changes of departure time, departure or arrival point or changes in train characteristics like velocity. Minimum cancellation charge is applied for cancellations until 31. day before the ride. Between the 30th day and the train ride a higher percentage is due.

<sup>39</sup> Implemented in the regulation but not used yet by the IM.

<sup>40</sup> Implemented in the regulation but not used yet by the IM

<sup>41</sup> Noise-related and path quality related (both optional).

<sup>42</sup> Noise only.

<sup>43</sup> Late cancellation or non-use fees. Depends on cancellation time.

<sup>44</sup> Implemented but not used yet.

<sup>45</sup> Currently under implementation.

<sup>46</sup> In Portugal the implementation of Regulation (EU) 2015/909 will most likely require changes in the charging system of the IM. The current charging system of the IM has been developed under Regulation IMTT 630/2011, issued by the former regulatory body pursuant to the former legal framework and is not completely in line with Directive 2012/34/EU and the cost methodologies introduced by Regulation 2015/909. The Portuguese system is in a transitional period. IM is now reviewing its charging model, so is expected some changes.

<sup>47</sup> Implemented but not used yet

Slovenia	✓	✗	✗	✓ <sup>48</sup>
Spain	✗	✓	✗	✓
Sweden	✓	✓ <sup>49</sup>	✓ <sup>50</sup>	✓
Switzerland	✓	✗	✓	✓
UK	✗	✓	✗	✗ <sup>51</sup>

The review of charging approaches highlights that Member States apply different pricing components to address additional charging possibilities. This may be a consequence of different political preferences, structural differences, different traffic patterns as well as different approaches to regulating the broader transportation sector. It is worth noting that the environmental charge is only applied in few countries (e.g. Denmark, Germany, Poland, Switzerland and Sweden).

The table below provides information on the main charging units used by Member States. It highlights that train.km is the most commonly used charging unit (few Member States currently use tonne.km).

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<sup>48</sup> Late cancellation or non-use fees. Depends on cancellation time.

<sup>49</sup> A performance scheme is in place.

<sup>50</sup> To be removed in 2020

<sup>51</sup> There is only a reservation charge on the High Speed 1.

Country	Main charging units
<b>Austria</b>	Train.km and gross-tonne.km
<b>Belgium</b>	Train.km
<b>Bulgaria</b>	Train.km and gross-tonne.km
<b>Croatia</b>	Train.km
<b>Denmark</b>	Train.km and DKK/train
<b>Estonia</b>	Train.km and gross-tonne.km
<b>Finland</b>	Gross-tonne.km
<b>France</b>	Path.km, train.km and €/year
<b>Germany</b>	Train.km
<b>Greece</b>	Train.km
<b>Hungary</b>	Train.km, gross-tonne.km and number of paths
<b>Italy</b>	Train.km
<b>Latvia</b>	Train.km
<b>Luxembourg</b>	Path.km
<b>Netherlands</b>	Train.km
<b>Norway</b>	Gross-tonne.km
<b>Poland</b>	Train.km
<b>Portugal</b>	Train.km
<b>Romania</b>	Train.km, gross-tonne.km
<b>Slovakia</b>	Train.km and gross tonne.km
<b>Slovenia</b>	Train.km
<b>Spain</b>	Seats.train.km and train.km
<b>Sweden</b>	Gross tonne.km and train.km
<b>Switzerland</b>	CHF/year, train.km, gross tonne.km, powered axle.km, % of traffic revenues
<b>UK</b>	Thousand gross tonne vehicle.mile, vehicle.mile, train.mile and billing period

### **3. Roles of regulatory bodies in charging issues**

This section approaches the role of regulatory bodies in the context of charging review in the different Member States. Most regulatory bodies are involved in the review of access charging. However, their roles and degree of involvement differ significantly from one country to another. In some countries like Italy, the regulatory body can impose specific criteria and principles that must be followed by the IM in the determination of the access charges. The “prescriptions” may include costing and pricing rules as well as specific economic values (as for example in the application of the CAPM/WACC formula).

In this context, the IRG-Rail Charging working group has produced a questionnaire to map the roles of regulatory body in respect of charging. The questionnaire aims at establishing what the general approaches to charging are in various Member States and exploring in further detail some aspects of charging issues.

The following paragraphs present a summary of the main results of the questionnaire, organized by section, *i.e.* (1) general regulatory issues, (2) charging review, (3) charging principles and cost model, (4) investment and subsidies, (5) earnings and cost of capital, (6) efficiency, (7) market segments, (8) performance regime / performance scheme, (9) traffic forecasts and (10) complaints. A table synthesizing the main information is included in subsections 1 to 5.

#### **3.1 General regulatory issues**

- *Scope of regulatory bodies' mission*

Although most railway regulatory bodies (*e.g.* the Danish, Norwegian, Finnish, Polish and Swiss regulatory bodies) are only responsible for the regulation of the railway market, some members have a wider spectrum of responsibilities in the transport sector. For example, the Belgian regulatory body also regulates Brussels Airport Operations. In Italy, the *Autorità di Regolazione dei Trasporti* (ART), beside railways, is also in charge of airports, highways, local public transport (buses, trains, metro, maritime and, under some respects, taxi) and ports. The Slovakian Transport Authority is also responsible for air and water transports. The Swedish Transport Agency is the regulatory body for rail, roads, maritime routes, and the whole aviation sector. The French regulatory body is in charge of the rail, road and coach sector regulation, while the UK, the Office of Rail and Road (ORR) regulates the rail industry's health and safety performance, ensures that the rail industry is competitive and fair and has a monitoring function for roads.. The Portuguese Regulator (AMT) is in charge of land transport and roadway infrastructure, railway regulation, regarding infrastructure managers and rail transport operators, commercial ports and maritime and waterway transport.

A few regulatory bodies are also responsible for the regulation of other network industries such as telecommunications and postal services as in Slovenia, the Netherlands or Germany. For the latter, the energy sector (electricity and gas) and energy grid expansion are also part of the

regulatory body's competencies. The Spanish and the Romanian regulatory bodies are also in charge of more general competition-related issues.

Within the railway sector, IRG-Rail members can also be responsible for issues other than economic regulation. This includes licensing in Greece, passenger complaints in Austria, Slovenia, Portugal and Italy<sup>52</sup> or safety as in Slovakia. Both in the UK and Poland, the regulatory body is responsible for economic rail market regulation, licensing, safety regulation and passenger rights. In the UK, the regulator also acts as the competition authority for rail related matters. The Swedish Transport Agency is also the National Safety Agency (NSA) in charge of licensing and safety regulation. In Hungary, the regulatory body is also in charge for licensing and passenger rights, and operates in close cooperation with the NSA that is responsible for rail safety regulation.

- *Regulation regime for charges foreseen by national law*

In most countries, the regulatory regime for charges intended by national law is based on a direct cost regime. Most IM of the IRG-Rail members have a multi-part charging structure. However, the approach to mark-ups on direct costs differs among IRG-rail countries. In fact, mark-ups are not applied in many countries and, when implemented, they appear to diverge across countries. This is also related to the choices as to public investment in the railway network that vary across countries (see Section 3.4 for a more thorough analysis on the impact of public compensation on charges).

Depending on the number of IMs in each country, charging practices may also differ within an individual IRG-Rail Member State.

- *Overview table for general regulatory issues*

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<sup>52</sup> In Italy, ART has competences on passenger rights for the following transportation modes: railways, bus and navigation.

	Additional duties regarding railways			Competition Authority	Additional duties in different sectors						
	Railway safety	Railway licensing	Railway passenger rights		Roads	Aviation	Maritime	Electricity	Gas	Telecommunications	Postal services
Austria	✓	✓	✗	✗	✓	✓	✓	✗	✗	✗	✗
Belgium	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Bulgaria	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
Croatia	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓
Denmark	✗	✗	✗ <sup>53</sup>	✗	✗	✗	✗	✗	✗	✗	✗
Estonia	✗	✗	✗	✗	✗	✓	✗	✓	✓	✗	✓
Finland	✓ <sup>54</sup>	✗	✗	✗	✗ <sup>55</sup>	✗	✗	✗	✗	✗	✗
France	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Germany	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓
Greece	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Hungary	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Italy	✗ <sup>56</sup>	✗	✓	✗	✓	✓	✓	✗	✗	✗	✗
Latvia	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Netherlands	✗	✗	✗	✓	✗	✓	✓	✓	✓	✓	✓
Norway	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Poland	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗
Portugal	✗	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗

<sup>53</sup> The Danish RB has monitored some general rules for rail passenger rights regulation (regulation 1371/2007).

<sup>54</sup> Finnish RB is an independent function within the safety authority.

<sup>55</sup> However, it is a common safety authority for railways, roads, aviation and maritime.

<sup>56</sup> In May 2018 the Italian RB concluded with ANSFISA (Rail and Road Safety National Agency) a Memorandum of Understanding to collaborate as stated in National Laws (d.l. n. 112/2015 and d.l. n. 201/2011). It must be noted that ANSFISA remains in charge of safety regulation.

	Additional duties regarding railways			Competition Authority	Additional duties in different sectors							
	Railway safety	Railway licensing	Railway passenger rights		Roads	Aviation	Maritime	Electricity	Gas	Telecommunications	Postal services	
<b>Romania</b>	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
<b>Slovakia</b>	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✗
<b>Slovenia</b>	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓
<b>Spain</b>	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓
<b>Sweden</b>	✓	✓	✓	✗	✓	✓	✓	✗	✗	✗	✗	✗
<b>United-Kingdom</b>	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗

### 3.2 Charging review

- *Review of charging principles and the level of charges*

All regulatory bodies are required to review charging principles and/or the level of charges<sup>57</sup>. In some cases such as Finland, Denmark, and Switzerland, the regulatory body has to date performed a summary review or no review at all for the main IM's access charges. In Italy, as said before, a new system was implemented in July 2016 following the new regulation issued by ART in November 2015.

Other IRG-Rail members, namely the Netherlands, and Romania review charges predominantly when dealing with complaints related to the level of charges, or when supervising negotiations. In 2018 the Netherlands has reviewed the method for calculating charges ex-ante for the first time.

Greece, Finland, Hungary, Norway<sup>58</sup>, Switzerland and Sweden do not have the power of *ex ante* control of charging principles. In Portugal, the Regulatory Body (AMT) reviews the methodology of charges calculation once, and according to the bylaws, AMT has to approve the tariffs considered concerning the use of railway infrastructure in the Network Statement. Regarding the cost assessment, AMT evaluates all the costs that are being included in the tariffs, analysing the costing model and all the costs (direct and indirect) to understand the suitability of these costs with the Regulation (EU) 2015/909.

Only the French, the UK, Croatia, the Portuguese, and the German regulators approve the charges *ex ante*. The Polish regulator approves the methodology of charge calculation, but not the charges. In France, Portugal and Poland, all rail IM charges are approved every year, prior to their entry into force. In Spain, the approval requires from the report of the Regulatory Body. In the UK the regulatory body approves the charges every five years. In Germany, a five year regulatory period applies, while access charges are approved each year on the basis of an *ex ante* regulation, adjusting, as an example, for inflation and productivity growth. In Austria<sup>59</sup>, Finland, Slovakia and Norway<sup>60</sup>, the Transport Ministry is also involved in the approval of charges. Italy verifies access charges before they are applied. Access charges must be verified by the regulatory body (ART), in order to assess if they are coherent with the Law and regulation. In Austria, the regulatory body must approve mark-ups levied on direct cost charges. The same is true for Portugal.

- *Review of charging approval process*

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<sup>57</sup> For some regulatory bodies, the legal basis for this mission could be different from the transposition of the Directive 2001/14/EC or the Directive 2012/34/EU.

<sup>58</sup> Although the regulatory body in Norway does not have *ex ante* control of charging principles and level of charges, the regulatory body is active in providing guidance about the regulation before the implementation of new charges.

<sup>59</sup> In Austria, the approval of the Ministry is only necessary for financing the IM but not necessary for validity of the charges.

<sup>60</sup> In Norway, the Ministry is only involved in the approval of mark-ups (according to article 32.1 of directive 2012/34/EU).

The Directive does not define the approval process of the charges, so member states use different approaches for setting the charges. We observed that there is usually a two stage process of proposing the charges and then approving the charges in which four parties can play a role. These four parties are the IM, the RB, both, and the ministry of transportation or another ministry in charges. The following table shows how countries have designed the approval process.

**Table on Charging Approval Process**

Process of Charges Review		Approval of Charges by			
		RB	IM	Both	Ministry
Proposal of Charges by	RB		-	-	-
	IM	UK, Austria, Germany, Belgium*, Portugal, NL	Sweden, Finland, Croatia	-	Belgium
	Both	Italy	-	Bulgaria, France, Spain, Lithuania	
	Ministry	-	-	-	

In many countries the IM proposes the charges and the RB reviews them. In some countries the IM does not really require an approval by the RB and directly approves his own charges (Sweden, Finland, and Croatia). In some other, countries both the RB and IM jointly propose and approve the charges (Bulgaria, France, Spain, and Lithuania). There is also the case that the ministry has a final say in the approval (Belgium and Norway), although in Belgium the RB is involved in the approval process.

- *Documents examined in the charges review*

When reviewing the charges, the regulatory bodies examine a variety of documents. In addition to the network statement, some regulators also look into accounts and regulatory statements. Depending on the country, other documents are examined. These range from studies or technical reports that the IMs are obliged to prepare, to business plans, cost models and charging methodologies, contracts with the State and with railway undertakings, and the opinions of stakeholders on charges. In Poland, IMs must submit applications for approval of unit rates of charges in the part of the methodology of the calculation of charges, IMs enclose calculation of costs.

These disparities are due to the existence of many different national legal frameworks, different obligations of IMs and railway undertakings and different processes of establishing charges. In Hungary, for instance, in addition to the annual charging document, the regulatory body examines the charging methodology set for a five-year period.

In other cases, the cost data is provided at an aggregated level, even though the IM may possess more detailed data. In the Netherlands and in Romania, the regulatory bodies have powers to enforce pecuniary penalties to compel companies to provide information. In Portugal, the IM has always provided the necessary information and whenever more detail was needed, it was provided. With the revision of the charging, model the IM will have to adapt its cost accounting model to the new charging framework, however that is an on-going process and the RB will analyse the impacts of this in the next period.

Only a small number of regulators have reported that they organise public consultations, prior to the issue of their decision on charges. This is the case in the Netherlands, for UK, France, Italy, Portugal, Slovakia, Poland and Germany, for example.

- *Frequency of charging reviews*

While many regulatory bodies review the charging principles on a regular basis, a few have no regular schedule for doing so. This is the case in Denmark, Finland, the Netherlands or Sweden. In general, periodic reviewing is annual - for example Poland, Slovakia, Germany, France and Portugal<sup>61</sup> - but it can be more or less frequent. In the Netherlands the ex-ante method for calculating charges will be reviewed after three years. In Hungary, in Italy and in the UK, the regulatory period extends to five years. Charges are reviewed every month in Slovenia, though the charging model is only reviewed when subject to changes. In the case of Sweden, the frequency of reviewing is approximately four years but it can vary across IMs and subject to yearly plans. In the Netherlands but also in Romania, charges are reviewed when there has been a complaint.

Modifications within the regulatory period can also be subject to reviewing as for example in Germany or Hungary.

- *Time span of the reviewing process*

There is no common trend across IRG-Rail members regarding how long it takes to review or control charges. Regulators that perform annual reviews carry them out in a time span ranging from one month to a whole year. In France, for instance, the formal review process takes two months. In Poland, the procedure for approval of unit rates of charges (methodology of charging system) should last 90 days

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<sup>61</sup> As the charging model is undergoing changes, there are several things that are being defined and might have an adjustment in the near future.

As for countries in which the regulatory period exceeds one year, more time is needed to perform the charging review. This requires approximately six months in Hungary and significantly longer in the UK.

Where the statutory time span for *ex ante* review may be short, in some cases timescales for *ex post* controls, if any, may be less limited. For instance, the German regulator has two months for *ex ante* reviews but in general no time limit for *ex post* reviews. The Slovakian regulator also does not have a legal deadline for *ex post* reviews, while *ex ante* reviews are limited by law to three months. In Slovenia, although the regulatory body examines the fees on a monthly basis, in the case of an appeal, its decision must be made within two months. In the Netherlands, the regulatory body has a maximum deadline of nine to ten months for a review upon complaint and five years for *ex officio* reviews.

In Portugal, the regulation does not specify whether the regulatory control on charges (both control of charging principles and control of the level of charges) is to be conducted *ex ante* or *ex post*. In practice, AMT's assessment on charges is triggered by the submission of the network statement and of the reasoning behind the charges by the IM. This normally occurs in November/December of each year, just before the publication of the networks statement takes place, which means that AMT's intervention occurs already after the publication of the network statement. The AMT acts as the appeal body for matters concerning the charging scheme, the level or structure of infrastructure charges and the charging for rail related services, among other (in line with article 56 of Directive 2012/34/EU) and consequently may intervene on an *ex post* basis. The Portuguese system is in a transitional period. The implementation of Regulation (EU) 2015/909 will most likely require changes in the charging system of the IM. The charging system currently in use by the IM has been developed under the regulation issued by the former regulatory body pursuant to the former legal framework and is not completely in line with Directive 2012/34/EU and the cost methodologies introduced by Regulation 2015/909. IM is now reviewing its charging system and the regulator is also defining the new way of functioning. Given this, it is not yet decided the frequency of tariff approval (if it is year on year, every five years, and so on).

- *Publication of the review*

Not all IRG-Rail members publish the result of their charging reviews. Some members systematically publish the review and some never have so far but intend to. The German regulatory body publishes the decisions of the ruling chamber. Further, it only has a legal obligation to publish an annual report and a report on its activities every two years; it also issues press releases and publishes all decisions. The Belgian regulatory body publishes also an annual report. It also publishes on its websites their main decisions. The Italian regulatory body publishes all its annual report that has to be presented in front of the Parliament decisions on its website. In Sweden, the regulatory body publishes all its decisions on its website.

In Poland, all decisions on charges for access and use of rail infrastructure are published as required under Polish law where decisions of public administrations (such as the Office of Rail

Transport) are public information. The Spanish regulatory body has a legal obligation to publish the charging review as well as an annual activities report. The Romanian regulatory body is legally required to publish an annual activities report, issue press releases, publish studies about the railway sector as well as all issued decisions, as every citizen should have access to the text of decision. Other members only publish reviews based on complaints or *ex officio* investigations; this is the case in Denmark, Finland or Slovenia. The UK regulatory body publishes its final decision, together with any relevant consultation documentation or reports produced in the course of the periodic r review. The same situation applies in Italy, where the new system of access charges was adopted, following several public consultations and a final assessment by ART on the coherence of the actual set of charges designed by the IM with the law and regulation in place<sup>62</sup>.

Most regulatory bodies pay attention to the confidentiality issue regarding any sensitive information that may be contained in their published decisions or reviews. For instance, in Poland, Germany and Romania some parts of the decisions are not published if they are considered as a business secret of the IM or other involved party. In Italy, the documents provided by the stakeholders during the consultations are published in their non-confidential versions. In Portugal, following a public consultation and a final assessment, the regulatory body publishes the final decision on the charges review.

- *Overview table for charging reviews*

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<sup>62</sup> All the documents of the consultations and the final decision are available on the ART website: [www.autorita-trasporti.it](http://www.autorita-trasporti.it). The final assessment, decision 75/2016 is available in English at the following address: <http://www.autorita-trasporti.it/wp-content/uploads/2013/11/Delibera-nr.-75-2016-english-version.pdf>.

	Review of charging principles		Review of the level of charges		Documents considered for reviews			Frequency of reviews	Consultations on reviews	Publication of decisions or opinions
	Ex ante	Ex post	Ex ante	Ex post	Network Statement	Accounts of IM	Regulatory Statements			
<b>Austria</b>	✓	✓	✓	✓	✓	✓	✗	Ex post review every year	✗	✓
<b>Belgium<sup>63</sup></b>	✓	✓	✗	✓	✓	✗	✗	Ex ante review every year	✗	✓
<b>Bulgaria</b>	✓	✓	✓	✓	✓	✓	✗	Ex post review every year	✓	✓
<b>Croatia</b>	✓	✓	✗	✓	✓	✓	✓	Ex post review every year	✗	✓
<b>Denmark</b>	✓	✓	✗	✗	✓	✗	✓	No fixed frequency	✗	✓
<b>Estonia</b>	✓	✓	✗	✗					✓	✓
<b>Finland</b>	✗ <sup>64</sup>	✓	✗ <sup>65</sup>	✓	✓	✓	✗	No fixed frequency	✗	✓
<b>France</b>	✓	✓	✓	✓	✓	✓	✓	Ex ante review every year	✗	✓
<b>Germany</b>	✓	✓	✓	✓	✓	✓	✓	Ex ante review every year and whenever changes occur, regulatory period of 5 years for which the ceiling of total costs and base level of total costs are determined	✓	✓
<b>Greece</b>	✗	✓	✗	✓	✓	✗	✗		✗	✗
<b>Hungary</b>	✗	✓	✗	✓	✓	✓	✓		✗	✓
<b>Italy</b>	✓	✓	✗	✓ <sup>66</sup>	✓	✓	✓	Ex ante review every 5 years (charging principles)	✓	✓
<b>Latvia</b>	✗	✓	✗	✓	✓	✓	✓		✗	✓

<sup>63</sup> In Belgium, the RB is reviewing the methodology of the IM (only for the direct costs part of the charge) and may launch a mission of control in order to check the level of the charges.

<sup>64</sup> Ex-ante only in case of mark-ups.

<sup>65</sup> Ex-ante only in case of mark-ups.

<sup>66</sup> The ex post assessment might take into account the level of charges in order to evaluate the conformity of regulatory criteria, such as the non discrimination principle.

	Review of charging principles		Review of the level of charges		Documents considered for reviews			Frequency of reviews	Consultations on reviews	Publication of decisions or opinions
	Ex ante	Ex post	Ex ante	Ex post	Network Statement	Accounts of IM	Regulatory Statements			
<b>Netherlands</b>	✓ <sup>67</sup>	✓	✗	✓	✓	✓	✗	Periodic ex ante review after three years (for timetable 2023)	✓	✓
<b>Norway</b>	✗	✓	✗	✓	✗	✗	✗	No fixed frequency	✓	✓
<b>Poland</b>	✓	✓	✓	✓	✓	✗	✗	Reviews every year	✓	✓
<b>Portugal</b>	✓	✓	✓	✓	✓	✓	✓		✓	✓
<b>Romania</b>	✓	✓	✓	✓	✓	✓	✗	Reviews every 2 years	✗	✗
<b>Slovakia</b>	✓	✓	✓	✓	✓	✓	✗	Ex post review every year	✓	✓
<b>Slovenia</b>	✗	✓	✗	✓	✓	✓	✓	After change of methodology	✗	✗
<b>Spain</b>	✓	✗ <sup>68</sup>	✓	✗ <sup>69</sup>	✓	✓	✗	Reviews every year	✓	✓
<b>Sweden</b>	✗	✓	✗	✓	✓	✗	✓	No fixed frequency	✗	✓
<b>United Kingdom</b>	✓	✓	✓	✓	✓	✓	✓	Periodic reviews every five years	✓	✓

<sup>67</sup> In effect for the first time for timetable 2020-2023.

<sup>68</sup> Although ex post competences are envisaged in Spanish Railway Act, their implementation is difficult as access charges are included in General Budget Law.

<sup>69</sup> Although ex post competences are envisaged in Spanish Railway Act, their implementation is difficult as access charges are included in General Budget Law.

### 3.3 Charging principles and costs model

- *Charging principles and regulatory bodies' review of cost assessment*

In most countries, the charging models are based (at least partly) on the principle of marginal cost pricing. In the case of Finland and Sweden charging systems are solely based on marginal costs. While some of the governments support IMs through a subsidy, others additionally require the IM to recover some of its fixed costs through the charging framework in the form of mark-ups, as in France, Germany, Italy, the Netherlands<sup>70</sup>, Norway, Switzerland and the UK.

In most countries, a multi-annual contract entered into between IM and the government, determines, amongst other topics, the amount of public subsidy for maintaining and renewing the infrastructure and a range of defined quality standards. In the UK, statutory arrangements play this role.

In Portugal, a 5-year Framework Contract for the National Railway Network was signed in 2016 between the Portuguese State and IP, the IM. Under this contract, the State's main obligation is to finance the management of the infrastructures while IP is obliged to meet user-oriented performance targets, in the form of indicators and quality criteria covering elements such as train performance (line speed and reliability, and customer satisfaction), network capacity, asset management, activity volumes, safety levels, and environmental protection. The contract also sets financial efficiency objectives for IP in the form of revenue and expenditure indicators.

Most regulatory bodies are involved in the review of access charging. However, their roles and degree of involvement appear to diverge significantly from one country to another. All members are required to review charging principles, even though in some few cases, the regulatory body is not involved in determining the charges in any way. Regulatory bodies in France, Germany, Italy, Poland and in the UK carry out an *ex ante* review of the methodology of charges calculation and of cost assessment. Also in Portugal, the regulatory body reviews the methodology of charges calculation once, and has to approve the tariffs considered concerning the use of railway infrastructure in the Network Statement (according to the bylaws of the RB). The ORR requires Network Rail to consult the rail industry on its methodology for calculating each charge. In addition, the ORR reviews the methodology and, for some work, appoints independent experts to subject the methodology to scrutiny and audit. A consultation on the charging scheme and network statements for the IMs is required by law in Germany and in Portugal.

- *Costs model*

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<sup>70</sup> Only for one high speed line. From timetable 2020-2025 mark-ups will be applied for the whole network in the Netherlands.

In some IRG-Rail countries, the regulatory body uses cost models to review the calculation of costs.

As stated before, the charging models are, in most countries, based on the principle of marginal cost pricing, although the methods by which the marginal cost is estimated varies between countries.

Costs estimates based on econometric approaches are used by some IMs, as in Finland, France, Netherlands<sup>71</sup>, Norway and Sweden. Bottom-up engineering methods are also used, as they are also able to provide robust estimates of direct costs. An engineering method is implemented in Austria<sup>72</sup>. French, Dutch, Swiss and UK IMs already resort to such engineering and modelling calculations. Beyond that the ORR have developed and implemented their own top-down econometric and bottom-up engineering models<sup>73</sup>. In Sweden, Trafikverket do not have their own econometric model, they rely on results from an independent government-run research institute. In Italy, a mixed approach has been recently chosen. Once the full (efficient) cost of providing the service of access to the railway network has been determined, the IM must exclude all non-admissible costs, as identified by Regulation 909/2015, in order to identify the total direct costs (following a top-down approach). The direct cost component of the charges is computed based on technical parameters such as mass, speed and contact wire that characterize the specific operator request (following a bottom-up methodology). In Portugal, the IM uses a cost model to compute direct costs. However, this cost model was developed under legal provisions that are not in force anymore. As stated before, the charging model is being revised by the IM and a new one is expected in the near future.

- *Costs drivers*

In their review of charging principles, most regulatory bodies consider cost drivers. Most regulatory bodies interpret the cost directly incurred as a short-run marginal cost that should include operating costs (*e.g.* signalling), maintenance costs (*e.g.* wear and tear costs), and renewal costs. IRG-Rail members consider that examples of costs that are not costs directly incurred may be the cost of capital.

For most Member States, marginal cost based charges are only differentiated by freight and passenger traffic<sup>74</sup>. Essentially, they are not broken down into smaller market segments. In general, direct costs charges do not vary by other market segments.

- *Overview table for charging principles and cost model*

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<sup>71</sup> Only from timetable 2020-2023.

<sup>72</sup> Austria: The engineering cost model is mainly used for determined the part of the used caused depreciation and to allocate the direct costs to the different train categories.

<sup>73</sup> ORR uses top-down benchmarking to assess Network Rail's efficiency . However, since the 2013 periodic review(PR13) ORR does not use top-down benchmarking to set the level of charges to recover cost directly incurred.

<sup>74</sup> This is not the case for Italy, as explained above.

	Methodology to calculate direct costs (art. 31.3)			Costs considered to calculate of direct costs (art. 31.3)				Efficient costs <sup>75</sup> taken into account in calculation of direct costs (art. 31.3)	Review of methodology to calculate direct costs (art. 31.3) by RB	Review of methodology to determine market segments and mark-ups (art. 32.1) by RB	
	Econometric	Engineering	Difference methodology <sup>76</sup>	Operation	Maintenance	Renewal	Cost of capital			Market segments	Mark-ups
<b>Austria</b>	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓
<b>Belgium<sup>77</sup></b>	✗	✓	✗				✗	✗	✓	✓	✓
<b>Bulgaria</b>	✗	✗	✗	✓	✓	✓	✗	✗	✓	✗	✗
<b>Croatia</b>			✓	✓	✓	✗	✓	✗	✓	✗	✗
<b>Denmark</b>	✗	✗	✓	✓	✓	✓	✗	✗	✓	✗	✗
<b>Estonia</b>	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓
<b>Finland</b>	✓	✗	✗	✗ <sup>78</sup>	✓	✓	✗	✗	✓	✓	✓
<b>France</b>	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✓
<b>Germany<sup>79</sup></b>	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✓
<b>Greece<sup>80</sup></b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Hungary<sup>81</sup></b>	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✓
<b>Italy</b>	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓
<b>Latvia</b>	✗	✓	✗	✓	✓	✓	✗	✗	✓	✓	✓
<b>Netherlands</b>	✗	✗	✓	✓	✓	✓	✗	✗	✓ <sup>81</sup>	✓ <sup>82</sup>	✓ <sup>83</sup>

<sup>75</sup> Efficient costs refer to direct costs calculated as described in Article 3(2) of Commission Implementing Regulation n°2015/909.

<sup>76</sup> The difference methodology refers to the methodology presented in Commission Implementing Regulation n°2015/909.

<sup>77</sup> In Belgium, this methodology will be implemented as of 2020.

<sup>78</sup> Based on the IM's methodology, operation costs are not included.

<sup>79</sup> The answer for Germany displays a situation after the transposition of the Directive 2012/34/EU into German law. The new rail regulation law came into force September 2016.

<sup>80</sup> The Greek answer is marked "Non-Applicable" yet as a phasing in plan and the new charging system are expected from the IM.

<sup>81</sup> Only from timetable 2020-2023

<sup>82</sup> Only from timetable 2020-2025

<sup>83</sup> Only from timetable 2020-2025

	Methodology to calculate direct costs (art. 31.3)			Costs considered to calculate of direct costs (art. 31.3)				Efficient costs <sup>75</sup> taken into account in calculation of direct costs (art. 31.3)	Review of methodology to calculate direct costs (art. 31.3) by RB	Review of methodology to determine market segments and mark-ups (art. 32.1) by RB	
	Econometric	Engineering	Difference methodology <sup>76</sup>	Operation	Maintenance	Renewal	Cost of capital			Market segments	Mark-ups
Norway	✓	✗	✗	✗	✓	✗	✗	✗	✓	✓	✓
Poland	✗	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓
Portugal	✗	✗	✗	✓	✓	✗	✗	✗	✓	✓	✓
Romania	✗	✗	✗	✓	✓	✗	✓	✗	✓	✗	✗
Slovakia <sup>84</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✗
Slovenia	✗	✓	✗	✓	✓	✓	✗	✗	✓	✗	✗
Spain	✗	✗	✓	✓	✓	✓ <sup>85</sup>	✗	✗	✓	✗	✓
Sweden	✓	✗	✗	✓	✓	✓	✗	✗	✓	✗	✗
United-Kingdom	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓

<sup>81</sup> In Hungary the national legislation uses the concept of 'justified costs' meaning the costs and expenses equaling to the lowest market prices of the materials, workforce and services inevitably necessary for the provision of the infrastructure services and for the given technological and service level, and including other modifying items

<sup>84</sup> Slovakia is currently preparing a new charging system.

<sup>85</sup> With the exception of the charge related to the use of the tracks. For this charge, the Spanish law do not allow to recover the renewal cost

- *Criteria for Direct Cost Calculation*

Article 5.2 §2 of the Implementing act 2015/909 authorizes the infrastructure managers to differentiate the direct cost based on different criteria and hence to differentiate direct cost charges across different train categories. This section analyses which criteria are used to calculate direct costs for direct train categories. We collected a list of different criteria of which we think that there are four different cases how they are dealt with by a national IM.

- **Applied**  
The criterion is directly or at least partly used for the differentiation of direct costs. For instance, train mass can be used to adjust direct costs proportionally or to increase direct costs above a certain threshold.
- **Discussed not applied**  
The criterion is discussed in the network statement but the IM argued that it is not necessary or reasonable to use it.
- **Discussed not practical**  
The criterion is discussed in the network statement but the IM argued that he cannot use it or observe it.
- **Discussed applied in the future**  
The criterion is discussed in the network statement and currently not used for practical reasons, but the RB or the IM plan to use it in the future. Also an indicator for ongoing discussions of the costs differentiation, which has not yet been finalized
- **Not discussed**  
There is no discussion about this criterion in the network statement of you IM.

It is interesting to compare the criteria used by each main IM of a country for both the passenger services and for the freight services. We created a heat map below that allows the reader to directly compare all criteria across in one country (horizontally) and a comparison of one criterion across countries (vertically) for each main service (freight / passenger services). The first graph below is related to the freight services and the second one is related to the passenger services.

In general, somewhat more criteria are applied for passenger services than for freight services. The number of criteria used varies between countries. Slovenia is not discussing any criteria (for both segments) , and criteria for passenger trains were not discussed in the Network Statement. Other countries, like Austria apply a relatively large number of criteria.



also a limited number of countries which only use one or two criteria (Spain, Denmark or Finland)

### 3.4 Investment and subsidies

- *Review of the IM's investment programmes*

Only the five regulatory bodies of France, Portugal, Estonia, Bulgaria and the UK have the task of formally reviewing the investments or investment programmes of the IMs. Some other regulatory bodies may however be consulted, as part of a more general consultation procedure, on medium to long term investments plans. In Sweden, the regulator is consulted on the national transportation plan which is prepared by the IM and constitutes a national investment plan over a period of 10-12 years. The Spanish Railway Act, transposing Directive 2012/34/EU, also foresees a general consultation procedure, which would include the rail regulator, on the strategic plan of network development. Finally, some regulators may have access to information on investments, without being formally consulted. The Italian regulatory body must be informed of the content of the contractual arrangements between the State and the IM which fix the investments and the renewals over a five-year period<sup>86</sup>. The German IM has to set up a business plan including investment- and financing programs. The regulatory body has the possibility to comment on the document.

In France, the regulatory body by law reviews maintenance, renewal or enhancement investment programmes for projects over 200 million euros. This review takes the form of a non-binding opinion and should assess the financial viability of the project for the infrastructure manager<sup>87</sup>.

In the UK, the regulatory body is involved at all stages of the investment lifecycle, on all capital expenditures of the IM, including maintenance, renewals and enhancements. Its role notably consists of determining the efficient price of the infrastructure investment at the beginning of the Control Period (five-year period), monitoring it throughout development and delivery and then determining the actual value of addition to the Regulatory Asset Base. To do so, the UK rail regulator analyses a series of documents (e.g. Project Management Plan, Asset Management Plan, Estimate Report, benchmarking and unit rate analysis, Investment Paper, etc.). The IM is incentivised to deliver the project at the target price, which is set at the regulator's efficient determination of price<sup>88</sup>. Any change to the target price throughout the lifecycle of the project is monitored and approved by the UK regulatory body.

In Portugal, the regulatory body (AMT), might be consulted on the investment plan which is part of the activity plan that is to be approved by the Ministry of Finance and the Ministry responsible for the rail sector. The Infrastructure Investment Plan is part of the National Reform Program,

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<sup>86</sup> In November 2017 ART issued an advice on the contractual arrangement on investments taking place during the period 2017-21 between the Italian IM and the State (Advice n° 11/2017).

<sup>87</sup> Article 2111-10-1 of the French Transportation Code states that the regulator's opinion should notably focus on (1) the relevance of the revenue forecasts from the project and (2) on the adequacy between these revenue forecasts and projected investment costs.

<sup>88</sup> Note that target prices may be set for individual projects or efficient cost may be calculated for a portfolio of projects. In case of a portfolio, the infrastructure manager is able to overspend on one project, provided that there is no net change on the overall portfolio cost.

which follows the Plan prepared by the IP designated by “Ferrovias 2020”, which is supported by PETI. At the time of the preparation of PETI, AMT did not exist however, IMT, the former regulatory body, participated in the road, sea and rail sector. According to AMT’s bylaws, it is the responsibility of this entity to issue recommendations on the drafting and modification of any public service provision agreements.

- *Financing of the IM’s investment programmes (replacement, expansion and maintenance investments)*

The IMs are largely financed either by governments (subsidies), railway undertakings (infrastructure charges) or the European Union (European funds). Some IMs also receive other income as in the UK for example, where Network Rail receives income from renting/leasing out its property. For all IRG-Rail members, the IMs receive subsidies to finance their investment programmes. In other countries, public grants represent a high percentage in terms of the costs that are covered. This percentage may vary depending on the type of investment (replacement, expansion and maintenance). For example, in Finland approximately 90% of the IM’s expenses (including expansion investments) are funded by the state budget. In Greece, no less than 70% of the total costs are subsidised by the state. In Italy, the government provides funds for investments in the conventional network (fully covered) and high speed network (partially); renewals and maintenance are partially financed by the state. In Portugal, the IM (IP) benefits from a package of community funds - “Connecting Europe Facility (CEF)” (general component - contribution of 30% to 50% and cohesion component - 85% contribution) and Portugal 2020 Programme (85% contribution), plus the Juncker Plan and the contribution of *Infraestruturas de Portugal*.

Investment programmes can also be co-financed by European Union funds. This is the case for example in Denmark, Hungary, Greece, Croatia, Italy, Germany, Poland and Romania. In Hungary, for example, the major renewal and upgrading works are mainly financed by EU funds. The maintenance cost, on the other hand, is financed using the IMs’ incomes.

In some countries, such as the Netherlands, Sweden, and Poland new infrastructure projects (expansion investments) are generally financed by the State, whereas renewals, enhancements and upgrades of the existent infrastructure are financed by the IM. The IM also receives government subsidies to finance these expenses. In Sweden, the government essentially finances both development and maintenance of infrastructure. The principle has been that the government deducts track charges from the Swedish Transport Administration's appropriation needs and assigns the difference. In the Netherlands, for example, about 75-80% of the operation and maintenance costs incurred by the IM are financed by subsidies. In Sweden, the share of government financing is around 80 to 85%.

In contrast with this subsidy allocation depending on the type of expense, the UK IM receives a grant from the relevant governments, which is not allocated towards a particular category of expenditure. However, the different governments have specified what enhancements should be delivered within the same five year period of time.

In France, new investments are financed both by public subsidies and private funds (private funds are predominant in the case of concessions). The national legislation states that the investments incurred by the IM should not result in “bad” debt.

In Portugal, IM financing is guaranteed through share capital, State and European subsidies and loans. The majority of the loans are secured by the government, where the IM plays the role of “agent”. The financing of the infrastructure manager is done through: i) government subsidies - compensatory allowances - established in the 5-year Framework Contract for the National Railway Network signed between the State and IP; ii) railway undertakings - the infrastructure charges; iii) loans contracted with the Portuguese State; iv) subsidies from different entities to finance IM investments programmes. The European Union funds contribute to co-finance some programmes, some of them are non-refundable subsidies; v) the profits and/or dividends of the companies in which it participates, such as IP Telecom and IP Patrimony and vi) the provision of services in service facilities, such as freight terminals.

- *The impact of public compensation on charges*

#### **High level impact of public compensation on charges**

The railway networks regulated by IRG-Rail members are natural monopolies. As such, the issue of the recovery of costs and, in particular of fixed costs, is central. Directive 2012/34/EU mandates a charging system based on direct costs (Article 31(3)) to which mark-ups that consider the competitiveness of the market segments may be added, in order to obtain full recovery of the costs incurred by the IM (Article 32(1)). In addition to this charging system, Article 8(2) allows EU Member States to provide the IM with public compensations. Given this framework, it can be argued that the level of public compensation necessarily impacts the overall level of charges paid by railway undertakings. Indeed, the Recast does not impose on Member States to levy mark-ups in accordance with Article 32(1). Thus, depending on the level of public compensation provided to the IM, charges may be set at the directly incurred costs or mark-ups may be introduced to cover a larger share of the full costs of the network.

#### **The impact of public compensations on direct costs and mark-ups**

Concerning individual charges, the level of directly incurred costs in a given country must not be impacted by public compensation as this charge should only reflect the additional costs incurred as a result of operating the train service. For countries that levy mark-ups, and in the context of full recovery of costs incurred by the IMs, two different approaches may be used to set the level of these charges. In countries such as Spain, Finland, Slovakia or Greece, the level of charges is calculated in a first step. Then, public compensation, particularly government subsidies, are set to balance the accounts of the IMs. An opposite approach is taken in *e.g.* Italy, the UK and Germany. In these countries, the level of public compensation is set first and the level of charges is then derived so as to cover the full costs incurred by the IMs. Using one methodology instead of the other to calculate mark-ups is likely to impact their level. In Italy, the length of the regulatory period is set at 5 years that is also the duration of the contract between the State and the IM for the public subsidies for investments and maintenance.

### **The impact of public compensations on amounts paid by RUs**

Public compensation may also be used to impact the amounts paid by railway undertakings (RUs), rather than the level of charges. This is for instance the case in Italy and France, where governments have chosen to support the railway freight sector. In France, the governmental support applies to all freight traffic, while in Italy it only concerns freight traffic towards or from the south of the country. In both states, the concerned freight services do not pay the full charges set by the IM. In Italy, the government subsidies, at the moment set for three years, cover the full amount of access charges to the railway undertakings operating in the freight sector that benefit from the incentive. Moreover, in most countries, indirect public contributions are also made to the IM to cover part of the track access charges of railway undertakings operating under public service contracts. In 2014, the German Federal Government provided regional transport authorities about 7.3 billion euros for the organization of regional passenger transport, of which 3.1 billion euros were used to cover part of the track access charges for these services. The overall level of contribution increased in 2015 and reached 8.2 billion euros in 2016, 8.3 billion euros in 2017 with approximately 3.3 billion euros spent for track access charges (for subsidized passenger services only). France has a similar organization in which the federal government pays for part of the track access charges of regional and national public services. In 2016, this contribution represented approximately 2 billion euros.

### **Breakdown of IM revenues between access charges and public compensations**

As underlined in the previous subsection, public compensation represent a substantial part of the revenues of the IM in most IRG-Rail Member States. In Greece, around 70% of the revenues of the IM come from public compensation. In Slovakia, public subsidies amount to around 80% of the IMs' incomes, while in Finland they represent 90%. The rest is covered by access charges. The breakdown of incomes between charges and subsidies within a country may vary for different parts of the network. For instance, in Spain, public subsidies represent 90% of the IM revenues on conventional lines, whereas they only represent 45% on high speed lines.

### **Time periods for the determination of public compensations**

Depending on the country or the source of financing, the level of public compensation may be set for different time periods. In Finland, public compensations are decided on an annual basis. In Germany, Italy, Norway and the UK, the bulk of public compensations is set for multi-annual periods. In the UK, the Department for Transport (for England and Wales) and Transport Scotland (for Scotland) pays a network grant to the IM for a five-year period. In Italy and in Germany, part of the public compensations is included in the public contract between the State and the IM, for a period of five years. In Germany, some public compensation such as infrastructure upgrading subsidies is set on an annual basis.

- *Overview table for investments and subsidies*

	The RB reviews the investments or investment plans of the IM	Financing of the IM				Part of investment programmes (replacement, expansion, maintenance) financed by :			Some railway infrastructures financed by private funds
		Track access charges	European subsidies	State subsidies	Regional subsidies	European subsidies	State subsidies	Regional subsidies	
Austria	✗	✓	✗	✓	✗	✗	✗	✗	
Belgium	✗	✓	✗	✓	✗	✗	✓	✗	
Bulgaria	✓	✓	✓	✓	✗	✓	✓	✗	
Croatia	✗	✓	✓	✓	✗	✓	✓	✗	✗
Denmark	✗	✓	✗	✓	✗	✗	✗	✗	✗
Estonia	✓	✓	✓	✓	✗	✓	✓	✗	
Finland	✗	✓	✗	✓	✗	✓	✓	✗	
France	✓	✓	✓	✓	✓	✓	✓	✓	✓
Germany	✗	✓	✓	✓	✓	✓	✓	✓	✓
Greece	✗	✓	✓	✓	✗	✓	✓	✗	
Hungary	✗	✓	✓	✓	✗	✓	✓	✗	
Italy	✗	✓	✓	✓	✓ <sup>89</sup>	✓	✓	✓ <sup>90</sup>	
Latvia	✗	✓	✗	✓	✗	✓	✓	✗	
Netherlands	✗	✓	✗	✓	✗	✗	✓	✗	
Norway	✗	✓	✗	✓	✗	✗	✓	✗	✗
Poland	✗	✓	✓	✓	✗	✓	✓	✗	
Portugal	✓	✓	✓	✓	✗	✓	✓	✗	
Romania	✗	✓	✓	✓	✗	✓	✓	✗	
Slovakia	✗	✓	✓	✓	✗	✓	✓	✗	
Slovenia	✗	✓	✗	✓	✗	✓	✓	✗	✗

<sup>89</sup> Regional subsidies to the IM are refund through a reduction of access charges to the RUs that operate in that Region.

<sup>90</sup> See footnote above.

	The RB reviews the investments or investment plans of the IM	Financing of the IM				Part of investment programmes (replacement, expansion, maintenance) financed by :			Some railway infrastructures financed by private funds
		Track access charges	European subsidies	State subsidies	Regional subsidies	European subsidies	State subsidies	Regional subsidies	
<b>Spain</b>	✗	✗	✗	✗	✗	✗	✗	✗	✗
<b>Sweden</b>	✗	✓	✗	✓	✗	✓	✓	✗	
<b>United-Kingdom</b>	✓	✓	✗	✓	✗	✗	✓	✗	✓

### 3.5 Other cost and accounting issues

- *The cost of capital*

Only a few regulators review the cost of capital included in the pricing of the infrastructure. This is the case of Austria, France, Germany, Italy, Hungary and the UK. The methodology that prevails when determining this cost of capital is a CAPM/WACC approach. In Italy, the regulatory body has identified criteria for the determination of the parameters used in the CAPM/WACC formula, and for some of them, the specific economic values to fill in the formula.

In France and Germany, the cost of capital is considered as a fixed cost.

- *Definition of total cost*

France and Italy are among the countries where the national legislation provides a definition for the total cost of the infrastructure. The French transport code states that the complete cost corresponds to all the charges borne by the IM related to construction, operation, maintenance and renewal of the infrastructure, including the amortization of investments and the remuneration of the capital invested by the IM. In Italy, the same content is provided by the national legislation that implements the Recast.

- *Charges based on article 32.3 of the Directive 2012/34/EU*

Five IRG-members reported that the IMs base part of their charges on Article 32(3) of Directive 2012/34/EU (recovery of long term cost). This is the case for the Diabolo project in Belgium, for the high speed line Amsterdam-Breda-Belgian border in the Netherlands, for the rail line between Stockholm and the Arlanda airport in Sweden and for freight trains crossing the Oresund Bridge between Sweden and Denmark<sup>91</sup>, and for the Channel Tunnel linking France to the UK.

- *The regulatory asset base*

In four IRG-Rail members a regulatory asset base is determined for charging purposes. This is the case in Germany, Italy and the United Kingdom. In Germany, Italy and the United Kingdom the calculation is based on both internal data (cost data) and external data (annual report). In Croatia the estimation is only based on internal data.

- *Valuation of assets*

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<sup>91</sup> This refers to the charge levied on the Swedish side of the bridge. The Öresund Bridge is managed by another IM (Öresundsbro Konsortiet) separate from the main IM Trafikverket. However, Trafikverket collect the charges and forwards them to Öresundsbro Konsortiet.

Only a few regulators reported having a national law or a practice for valuing assets for consideration within the calculation of charges. Austria, and Portugal use an historic value approach for the value of assets. Germany uses the historic costs based on the balance sheets at the start of the regulation period, which over time are adjusted by inflation and productivity increase. In Italy, the net book value of the assets used in operating the train service, with the exclusion of the assets financed by public subsidies, is taken into account for the computation of the cost of capital; IAS and IFRS apply.

Regarding the assets, the Portuguese law says that the IM must prepare and keep up-to-date a register of its assets and assets under its responsibility, used to assess the financing needed to repair or replace, and the record should be accompanied by detailed information on the expenses with the renovation and modernization of the infrastructure. Besides what is defined in the in the Regulation 2015/909, the national law does not say anything more. The Portuguese regulatory body shall monitor how the infrastructure manager will apply this, since all the charging system is being revised at this moment.

- *Overview table for investments and subsidies*

	The IM includes the cost of capital in its pricing scheme	The RB reviews the methodology to estimate the cost of capital	A regulatory asset base is determined to calculate the cost of capital	How are assets valued for their consideration within the calculation of charges?		
				Based on current costs	Based on historic costs	Other methodology
Austria	✗	✗	✗	✗	✓	✗
Belgium	✗	✗	✗	✗	✓	✗
Bulgaria	✗	✗	✗	✓	✓	✗
Croatia <sup>92</sup>	✓	✗	✓	✗	✓	✗
Denmark	✗	✗	✗	✗	✗	✗
Estonia	✓	✓	✓	✓	✗	✗
Finland	✗	✗	✗	✗	✗	✗
France	✓	✓	✓	✓	✓	✓
Germany	✓	✓	✓	✗	✓	✗
Greece	✗	✗	✗	✗	✗	✗
Hungary	✓	✗	✗	✗	✓	✗
Italy	✓	✓	✓	✗	✓	✗
Latvia	✓	✓	✓	✓	✗	✗
Netherlands	✗	✗	✗	✗	✓	✗
Norway	✗	✗	✗	✗	✗	✗
Poland	✗	✗	✗	✗	✗	✗
Portugal	✗	✗	✗	✗	✓	✗
Romania	✓	✗	✓	✓	✓	✗
Slovakia	✗	✗	✗	✗	✗	✗
Slovenia	✗	✗	✗	✗	✓	✗
Spain	✗ <sup>93</sup>	✗	✗	✗	✓	✗
Sweden	✗	✗	✗	✗	✗	✗
United-Kingdom	✓	✓	✓	✗	✗	✓

### 3.6 Efficiency

Some regulatory bodies review the efficiency of the IM. The ORR reviews the regulatory accounts and produces an annual efficiency and finance assessment of Network Rail. The ORR's *final determination* sets the complete costs of Network Rail with respect to some efficiency assumptions on costs that allow reaching the outputs set by railway funders. Then, the assumptions ORR has made on the level of Network Rail's maintenance and renewals expenditure will be reflected in the level of charges that operators pay, given that charges are set to be cost reflective. Those assumptions are made *ex ante* for the five-year control period.

<sup>92</sup> Not for all.

<sup>93</sup> Only for the charges of the service facilities.

The French and the Dutch IMs also include efficiency targets within the annual evolution of (some) charges. In Italy, after a process of consultation a target of an annual rate of 2% of reduction in operating costs was adopted by the Regulatory body for the first regulatory period (2016-2021).

In Germany, the level of total costs is defined every five years for the regulatory period. During the regulatory period, an annual ceiling of costs is determined, which considers inflation and productivity change rate as the ceiling for charges proposed by the IM.

The mechanism of the German incentive system is twofold: if the actual costs of the IM decrease during a regulatory period, the charges do not, but the profit increases. Therefore an incentive to cost reductions is set. Only with the next regulatory period, cost changes are considered for the determination of the level of total costs. The second incentive is given by the determination of a demand and amounts of train kilometers for the whole regulatory period. Any extension of demand does not change the calculation, but increases the profit of the IM. Therefore, the system sets an incentive to extend the amount of traffic on the rail network.

### **3.7 Market segments**

Regulatory bodies are responsible for controlling the list of market segments that is identified in the network statement of the IM (Article 32(1) of Directive 2012/34/EU).

There are several important differences in the approach used with regard to mark-ups and market segmentation. The latter are not applied in all countries and, when applied, they appear to differ across countries.

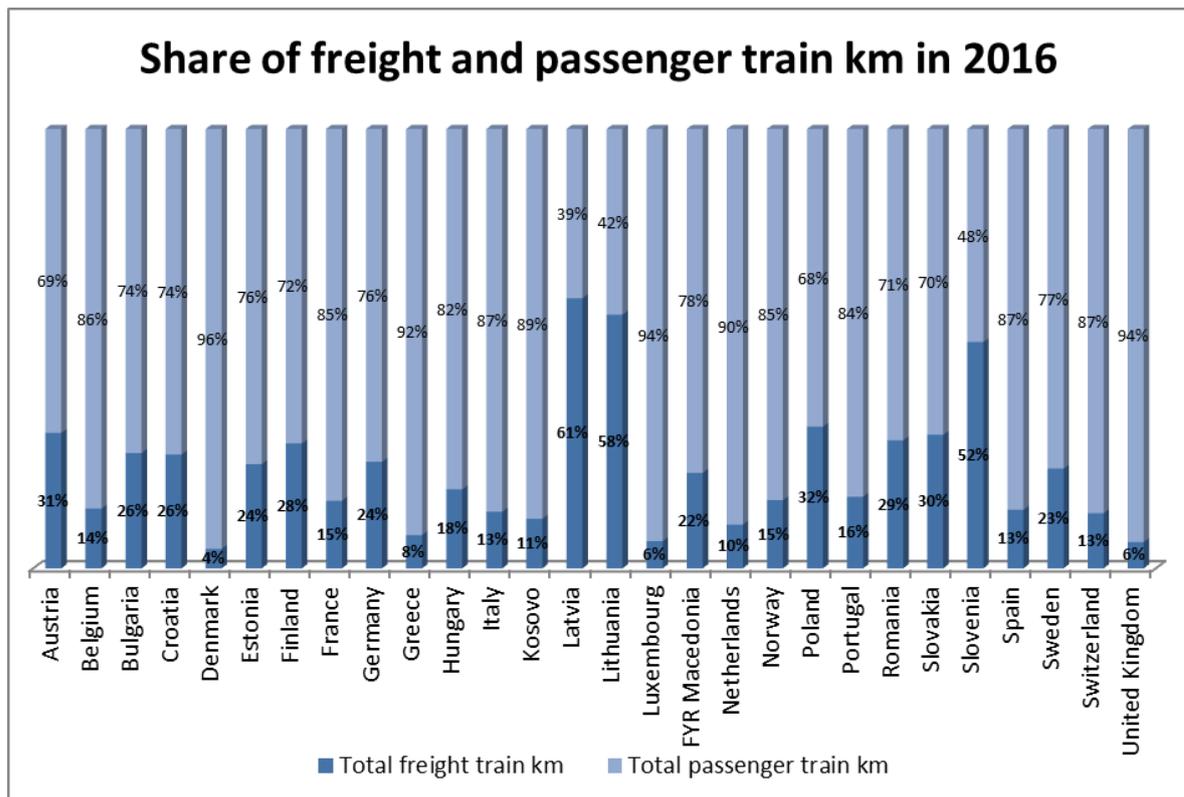
French, Italian, German, and UK IMs for example consider market segments when calculating charges. In general, market segmentation differentiates passenger services from freight traffic. Some sub-segments may complete the freight segmentation, as it does in the UK, Italy and Germany. On the subject, a specific analysis is provided in the "Initial approach to market segment definition and criteria for an assessment of mark-ups in consideration of Directive 2012/34/EU" (IRG-Rail, 2016).

In Portugal, the charging system does not rely on any definition of market segments. The IM did not define market segments. It has the costs aggregated in service categories. In the former regulation, there was a formula that converted services into segments. Nowadays the market segments IP is considering are: i) passenger trains; ii) freight trains; iii) Urban and sub-urban trains; iv) Regional and interregional; v) empty trains and vi) Intercity and International service. These market segments were determined a few years ago by the former regulatory body under the previous legal framework. IP is reviewing its charging model to bring it in line with Regulation 2015/909. From this process, new segments and mark-ups will emerge.

- Market split according to main types of services

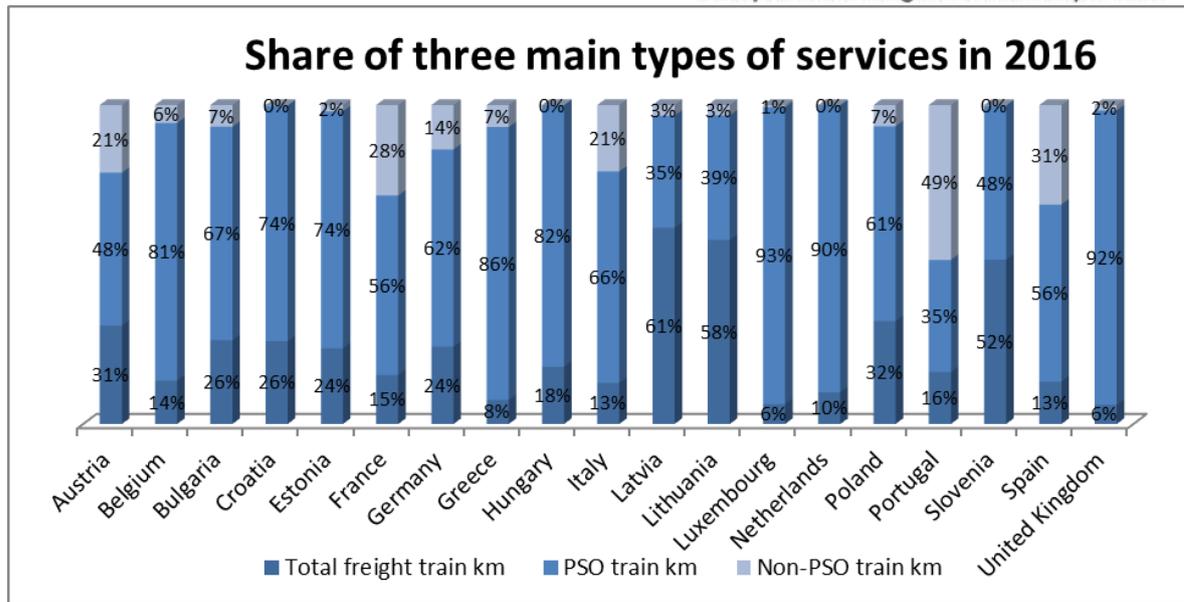
Splitting the market across main types of services is not yet market segmentation in the sense of Article 32 (2). Yet it provides an understanding of the market and the shares of the respective

services. The following figures provides a general feeling of the market split by showing the market share in train km of freight and passenger series for most member states. One can see that the share of freight traffic in most countries is below a third but for Latvia, Lithuania, and Slovenia. There are a few countries (Denmark, Greece, Luxembourg, Netherlands and the UK) where freight traffic plays a minor role and remains below 10% of total train km.



Source: Fifth IRG Market Monitoring Report 2016

The further differentiation of passenger services into PSO and non-PSO passenger services reveals that there is usually a high share of PSO services. There are some exceptions with a rather high share of non-PSO services: Austria, France, Italy, Portugal, and Spain. In Italy, there is a competitive market in high-speed traffic and a rather low share of freight services. For Portugal, the PSO train-km just considers the sub-urban traffic of the two railway undertakings that provide the passenger transport service. Considering both the sub-urban and regional traffic, would yield a share for the PSO services in 2016 of 60%, in line with the previous years, and non-PSO share of 23%. In Spain PSO was designed to be restricted to mainly urban, suburban and interurban services, together with some regional connections in high-speed lines. Furthermore, the development of the high-speed network has mainly been tied to non-PSO services, which explains the size of these services.



Source: Fifth IRG Market Monitoring Report 2016

Freight and passenger (PSO and non-PSO) services are offered to very different groups of end users. In order to do so, we will discuss several factors of segmentation that are used among IRG member states and look at the segmentation of some countries in more detail.

- Principles of segmentation

In some countries, general principles or abstract criteria were developed to evaluate the proposed segmentation. Based on these abstract criteria, more specific criteria can be derived to operationalize the segmentation. Two examples are the UK and Germany.

For the UK, the RB provided guidance on how market segments should be differentiated and the German IM described its approach in Annex 6.1. of its network statement. One could summarize both approaches as follows:

- definition of market segments should be practical, comprehensive and objective;
- market segments should, as far as possible, have common characteristics (materially, spatially, or temporally) of some kind that place them, as a class, in a different commercial position against another identifiable class; and
- choice of market segments should not distort incentives.

These criteria are not exactly codified by law, but follow the spirit of Article 32 of Directive 2012/34/EU, but cannot be directly used for segmentation. Nonetheless, they offer guidelines to develop more specific criteria to define practical segments.

- Segmentation approval process

Similarly to the charges review, there are different approval processes of the market segmentation across IRG Rail member states. Again, four possible parties either propose or approve a market segmentation as shown in the following graph

Process of Segmentation		Approval of segments by			
		RB	IM	RB & IM	Ministry
Proposal of Segments by	RB	UK	-	-	-
	IM	Austria, Finland, GER, Portugal, NL, Poland	Bulgaria, Sweden	-	Belgium, Switzerland
	RB & IM	Italy	-	France, Spain	Lithuania
	Ministry	-	-	-	Norway, Lithuania*

In six countries (Austria, Finland, Germany, Portugal, the Netherlands, and Poland), the IM first proposes a segmentation which is then reviewed and approved by the RB. In the UK, the RB proposes and approves the market segmentation. In contrast, in Bulgaria and Sweden the IM proposes and approves the market segmentation without a role of the RB. In Italy the RB and the IM jointly propose the segmentation, but the RB needs to approve it. In France and Spain, both parties propose and approve the market segmentation. In some countries (Belgium, Switzerland, Lithuania, and Norway) the responsible ministry also plays a role in proposing or approving the market segmentation.

- Segmentation Criteria

In this section, we will discuss the different criteria that are used for segmentation among IRG-Rail member states. The analysis is split by main type of service, even though some criteria are used in both main services. When they are used in both main services, the characteristics of this very same criterion are usually different for each main service. Sometimes a criterion is used to define an entire segment (e.g. weight for heavy trains), but sometimes several criteria are lumped into one segment (e.g. long distance and international into one long distance segment). The purpose of the subsequent discussion is not to look at different segments, but to show which criteria an IM could use to define segments, regardless of the final segmentation. From our point of view, there are five different cases of how a criterion can be considered by IMs:

- Applied

The criterion is directly or at least partly used for the definition of one or more segments. For instance, Int. / Domestic is sometimes used as an additional criterion for high speed traffic.

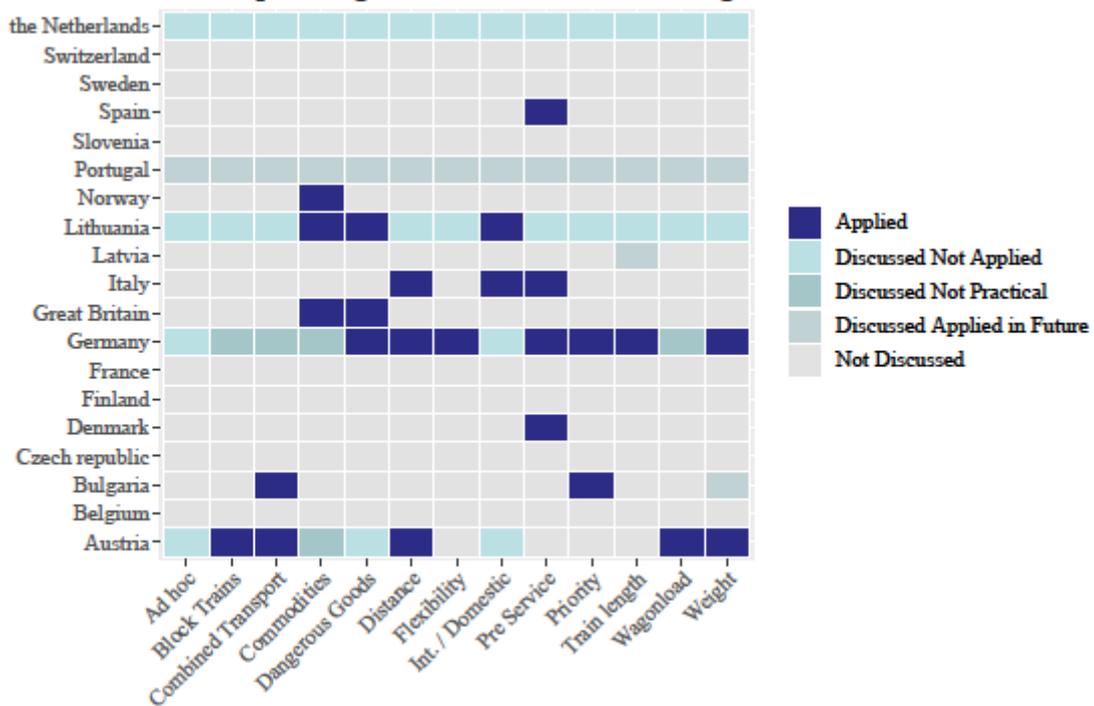
- Discussed not applied  
The criterion is discussed in the network statement but the IM argued that it is not necessary or reasonable to use it.  
For instance, Int. / Domestic traffic is mentioned but it is assumed that there is no difference in final demand.
- Discussed not practical  
The criterion is discussed in the network statement but the IM argued that he cannot use it or observe it. For instance, commodities are discussed but not used for segmentation because the IM does not observe the content of wagons.
- Discussed applied in the future  
The criterion is discussed in the network statement and currently not used for practical reasons, but your RB or the IM plan to use it in the future. Also an indicator for ongoing discussions of segmentation, which has not yet been finalized
- Not discussed  
There is no discussion about this criterion in the network statement of you IM. This can also be an indicator that there is no segmentation at all, if this is the case for all criteria.

Using the previously discussed approach to classify the segmentation among IRG member states, we created a heatmap to summarize the responses of 17 countries. This allows a quick understanding of the used criteria in one country (horizontally) and a comparison of one criterion across countries (vertically). The specific criteria are discussed in the following (first for freight and then for passenger services) and some further examples and cases are presented if available.

- **Overviews of freight segmentation criteria**

The following graph presents the used criteria for the segmentation of freight across IRG Rail member states.

Heatmap of Segmentation Criteria in Freight



### No further segmentation

The heatmap shows that a number of countries do not use any criteria for the segmentation of freight services. This might be due to the fact that it is more difficult to observe difference in demands in freight trains as they tend to be mixed and sometimes the differences are unknown to the IM. Also freight services only have a small share of the market (see figures before), so IMs maybe spend less of an effort to create further segments for freight services. The rationale for the Netherlands is that the EU Directive allows to only distinguish these minimal market segments, so the RB has no power to demand further segmentation.

### Ad hoc

Demand may differ for scheduled compared to un-scheduled or occasional train services and different charges could be applied because of the respective ability to bear mark ups. In Germany this was considered, but not applied in practice because the IM argued that the markets of scheduled and unscheduled are mostly homogenous with respect to cost, price, and market demand. A differentiation would set incentives to needlessly order scheduled services if prices for ad hoc services were higher or vice versa to order ad hoc services for actually scheduled services if prices for ad hoc service were lower. In Italy ad hoc means special (reduced) charges in case a new service is launched.

### Block Trains

Block trains, also called unit trains, are trains in which all wagons load the same commodity and have the same origin and destination, without being rearranged *en route*. This differentiates same from wagonload trains. In Germany, this is implicitly recognized in the “Standardtrain” segment for which block trains make up roughly 25%. Different studies have shown that block trains have a higher ability to bear mark ups.

### **Combined Transport**

Combined transport can be seen as sub category of wagonload traffic including a switch of transport modes, usually at the “last mile”, e.g. a container landing at a port then put on a train and finally shipped to its destination by a lorry. Usually combined transports have to compete more with other transport modes, because containers can be easily transported by whatever transport mode. Therefore, the ability to bear mark ups is expected to be lower.

The German IM claims that he cannot observe the transport mode changes and that it is not sufficient to observe if a train includes containers, because containers can also be part of a non-combined transport service . Hence, it is a discussed criterion which is not finally used for segmentation. However, roughly 50% of trains among the “Standard” train are assumed to be combined transports. Austria specifically has a segment that considers service that are “manipulated” more than once between start and finish.

### **Commodities**

Different goods have different demand elasticities or can be more or less easily transported with different transport modes. Hence, commodities could be used to differentiate segments. For instance, Great Britain uses 13 different freight commodities for which different abilities to bear mark ups are estimated based on an economic model. The model indicated that only ESI coal, spent nuclear and iron ore have the ability to bear mark ups, whereas the other commodities (such as construction materials and intermodal) were found to not be able to bear mark ups. The German IM discusses commodities, but claims that it is not able to check what good the RUs transport on their trains. That is why, it discards this criterion as not practical.

### **Dangerous goods**

Dangerous goods can be seen as just another type of commodity, but are explicitly mentioned in Annex VI (1) b). Generally, services transporting dangerous goods are under pressure (legal and public) to use trains as safer mode of transport and hence might have a different ability to bear mark ups. The German IM explicitly introduce a segment for dangerous goods in line with the national dangerous goods regulation (GGVSEB, Annex 1 § 35) and estimates that dangerous goods trains have a higher ability to bear mark ups.

In the UK, commodities are already considered as the main factor of segmentation. Nuclear transport could be seen as a dangerous good, so one could say that dangerous goods are subsumed into the “commodity” criterion in the UK.

### **Distance**

Train freight services become more viable the longer the distance, because average costs per km become much lower. Hence the ability to bear mark ups for short distance services might be lower, due to stronger competition with other transport modes. The German IM introduces a general short distance segment and one for dangerous goods, for which the ability to bear mark ups is estimated to be comparatively lower.

The Italian IM distinguishes between a distance of less than 100 km and of over 800 km (for which the ability to bear mark- up could be lower due to stronger competition with other transport

modes as maritime or air transport) and a distance between 100 and 800 km more suited to railway transport (much more competitive with other transport mode)

### **Flexibility**

Some services are more flexible with regards to their departure or arrival time for which the IM may grant a reduction of the charges. The German IM offers a deduction for services if they accept a deviation to their requested time of +/- 120 minutes.

### **International vs. Domestic**

Some countries differentiate between domestic and international services. International services would tend to be longer and have to bear higher costs as crossing borders can increase costs due to different regulations. The German IM claims that there is no difference in cost and demand between domestic and international services, hence it is not considered.

### **Pre Service**

Locomotive runs and empty rides can be seen as intermediate input or a pre service for the real services of transporting goods. That is why, some system allow for lower mark ups these services. Germany only accounts for locomotive rides but not empty wagons. Spain has a specific segment for empty rides and also test rides. In accordance with the former Regulation, which despite not being in force is being used in this transitional period, Portugal has a specific segment for freight empty rides and locomotive run. In Italy technical services are defined as the runs that are necessary to the provision of a commercial service.

### **Priority**

This would indicate different disposition rules for services within a priority segment. The German IM has extra mark up for all freight segments if they want to have priority in case of deviations from the planned schedule.

### **Train length**

Trains would be segmented differently according to their length. This could be an attempt to differentiate between wagonload and block trains. German IM only classifies train with a length of less than 370m as a short distance trains and charges a penalty if the RU violates this rule.

### **Wagonload**

In contrast to block trains, wagonload trains are rearranged en route and can carry different types of goods in different types of wagons. In Germany, this is implicitly recognized in the "Standardtrain" segment for which wagonload trains make up roughly 25%. Different studies have shown that wagonload trains have a lower ability to bear mark ups.

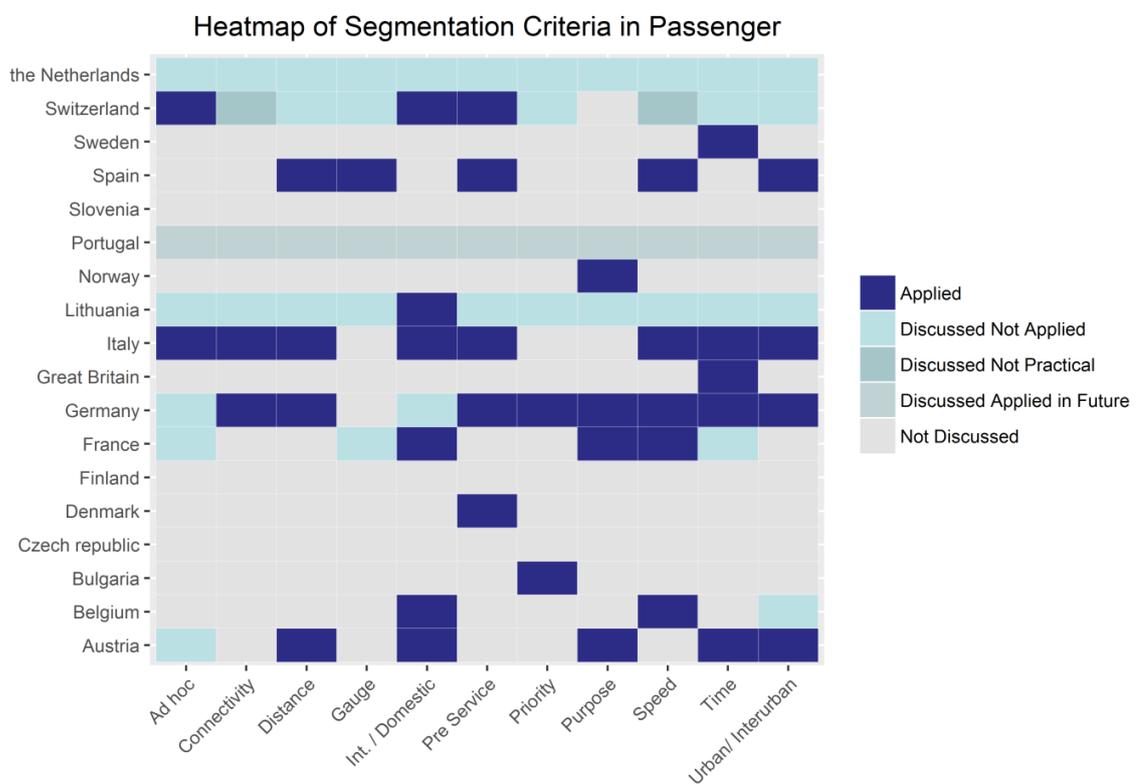
### **Weight**

IMs might have two reasons to use weight as a criterion. One the one side weight can be used to identify different demand for very heavy goods that are prone to be transported by train and therefore the ability to bear mark ups might be higher. On the other side, there might be higher

marginal costs of wear down for the track infrastructure. The German IM introduces a segment for heavy freight train (> 3000t) where the mark up is set relatively higher.

- **Overviews of passenger segmentation criteria**

As for freight, the following heatmap offers a quick overview of the application of segmentation criteria in passenger services. Compared to freight, we can see that more countries use two or more criteria for their segmentation. In addition, the number of countries that have no segmentation at all (indicated by grey row) is smaller (Slovenia and Finland). The specific criteria are discussed in the following.



**Ad hoc**

As for freight services, demand may differ for scheduled compared to un-scheduled or occasional train services and different charges could be applied because of the respective ability to bear mark ups. As for freight the Germany IM refrains from using this criterion for its segmentation. On the other hand Switzerland and Italy do use this criterion for its segmentation. In Italy ad hoc means special (reduced) charges in case a new service is launched.

**Connectivity / Network**

Large train networks derive value from their size and that allow customers to choose connections every hour or change trains easily at their convenience. This network effects provides an advantage over services that only offer few connections or just point to point services, which might lead to a different ability to bear mark ups. The German IM introduces a specific point to point segment with lower mark ups. This segment only allows up to 4 connections per day, no

direct links of connections, and RUs have to be more flexible when requesting tracks. Additionally, the average speed between metropolitan areas may not exceed 130 km/h. The Italian IM, within the PSO regional services, considers the train service which serves a node having a higher load factor than service which does not serve a node. Moreover, the IM differentiates between hub and no hub node depending on connection with centre and presence of subway.

### **Distance**

The distance of a service might warrant different mark ups because long distance passenger services might attract different group of customers that are able to bear higher mark ups. Competition might be higher for short distance services where customers would shift to cars or bus services if mark ups were higher. The German IM implicitly uses distance to differentiate between PSO and Non-PSO services. It is assumed that customers of a PSO service do not on average travel more than 50km. In Spain there is one segment "VL3" for service that run more than 700km (without Madrid) and one for less than 300km excluding PSO, international or other long distance trains. This helps to identify services with different commercial features, which should be treated differently. The Italian IM uses distance to differentiate HS services between those that serve Rome and Milan, that are considered to supply a segment with higher ability to pay with respect to services that do not include Rome-Milan and that serve in general shorter distances.

### **Gauge**

Traditionally, some countries used different gauges to avoid interoperability in times of war. New infrastructure usually uses international gauge of 1435 mm, but there are still some cases of different gauge and some IM designed specific segments for services running on these tracks. Spain historically used the Iberian gauge (1668 mm), but the new high speed infrastructure was built using the international gauge (1435 mm). There is also a third gauge in Spain, the metric gauge (1000 mm). Generally, the gauge is not an indicator for special purpose, because you can find passenger and freight train in all different kind of gauges. Portugal uses the Iberian gauge (1668 mm) for the entire railway infrastructure, with the exception of Vouga and Tua lines, for which the gauge is 1000 mm.

### **International vs. Domestic services**

Some countries differentiate between domestic and international services. International services would tend to be longer and have to bear higher costs as crossing borders can increase costs due to different regulations. Usually, there is not a specific segment for international service, but they are subsumed into another segment, for instance high speed traffic. The Italian IM defines international service as a segment with a higher ability to pay. On the other hand, the German IM claims that there is no difference in cost and demand between domestic and international services, hence it is not considered and international high speed traffics are assumed to be able to bear the same mark up as other domestic high speed traffics included in the "Metro" segments.

### **Pre Service**

Locomotive runs and empty rides can be seen as intermediate input for the real services of transporting goods. That is why, some system allow for lower mark ups these services. Germany

only accounts for locomotive rides but not empty wagons and also implicitly considers a higher share of empty rides for charter services. Portugal has a specific segment for empty trains in accordance with the former Regulation, which despite not being in force, is being used in this transitional period. Spain has a specific segment for empty rides and also test rides.

### **Priority**

End user might appreciate a guarantee that their train will be prioritized in case of any deviation within the system. So the IM might decide he will charge a premium for this. The German IM used to have an express segment for PSO traffic, which has been abolished within the new system introduced in 2018. The IM claimed that there is no difference in demand for these services. Some non-PSO services can pay extra to be prioritized in case of traffic conflicts. In Bulgaria, some train categories are prioritized without affecting the charging.

### **Purpose**

Some services are tied to a specific purpose or event. These services are usually more ad hoc and uncertain. Hence, their ability to bear mark ups might be lower. The German IM defined specific segment for charter services (soccer trains) and old-timer / nostalgic services (museum runs / steam engines), who have to pay relatively lower mark ups. The Norwegian IM defined a stretch between Oslo and the main airport as a market segment because of the specific purpose to transfer passengers to the airport

### **Speed**

Trains become more competitive with increasing average speed. Hence their ability to bear mark ups might increase. Generally, many countries have specific segments for high speed trains. The German IM uses speed to classify train service into a metropolitan segment for which the mark ups increases with average speed. Speed is also an secondary criterion for point to point services that are not allowed to run faster than 130 km/h on average between metropolitan areas, because they would compete with other long distance services. The Italian IM uses speed to differentiate segments, for regional transport services those with a speed of over than 75/km pay a higher charge. Spain: The network comprises different types of lines that, depending on their technical features, allow for higher speed. Besides lines devoted to mainly “pure” HS services (AVE), other lines allow for trains circulating at up to 200 km/h, and as such, they constitute another type of service.

### **Time**

Demand depends on time. There are peak and off peak periods of demand and studies can show demand curves differ over time. Based on a study on mobility in Germany, the Germany IM identified a peak / day (06:00 – 20:00) and of an off peak / night period (20:00 – 06:00) with more and respective less demand for traffic. There is a specific segment for night traffic for which the ability to bear mark ups is assumed to be lower. Austria allocates short distance services during peak time to a high demand segment. The Italian IM uses time to identify a segment for night traffic. This segment has charges lower than day trains. The main Swedish IM charges a “passage fee” based on time of day. The charge is applied for train paths on certain tracks in the three largest cities in Sweden during weekday mornings and afternoons (6-9 and 15-18).

### **Urban vs. Interurban**

Demand is usually focused on population or industry centers. Hence, these services might be able to bear higher mark ups than services in less populated areas. The Austrian IM differentiates for demand centers and for short distance PSO traffic, because of different demand. In Spain there is a specific segment for trains that pass through Madrid, which is as the capital is the main demand center in Spain. The German IM identified a set of metropolitan stations, which more than 50k passengers per day. Train services in between these stations are classified as metropolitan and have to pay relatively higher mark ups.

From the previous heatmaps and the discussion of the criteria used across the IRG Rail member states, it is obvious that the application of our proposed criteria is very different. Overall, there seems to be no best practice and each IM is free to use the criteria to define a final market segmentation depending on the ability to observe them, their practicality, or other member specific reasons. It seems that IMs usually use more criteria for the segmentation of passenger than freight services. There are only a few countries that use a more elaborate segmentation based on more than two criteria (Austria, Bulgaria, Germany, Italy, and Lithuania). It should be noted again, that using one of the criterion is not equal to defining a market segment based on this criterion. Instead, IMs can combine and merge criteria to define a market segmentation that best fits their market demand.

### **3.8 Performance regime**

Almost all members of the IRG-Rail have a performance regime included in their national legal framework. In Denmark, there is a performance regime on the payment for the use of the State owned rail network and on the environmental subsidy to freight transport. In the Netherlands and Romania, there is a performance regime included in the Network Statement and it is agreed with railway undertakings in their access agreements. A performance regime can also be tailored to fit for a particular railway undertaking. The Portuguese legal framework also considers a performance regime. However, the performance regime currently in use in Portugal has been implemented before the entry into force of the new legislation. A new performance regime is currently being developed by the IM to meet the requirements established in the new legislation. The new performance scheme is expected to be approved in 2017 and to be implemented in the following year. In Belgium, the IM had implemented a performance regime in 2017 and 2018. However, after a complaint from some RU's contesting the fairness of the regime, the Belgian RB has discontinued this system. The Belgian IM is working on another system to be implemented as per 2020.

### **3.9 Traffic forecasts**

Only five regulators challenge the traffic forecasts made by the IM as part of the examination of charges. In the Netherlands, the charges are corrected by the IM *ex ante* on the basis of capacity applied for and extrapolations of volumes in previous years. In Germany, traffic forecasts are also challenged during the *ex ante* examination of charges. The forecast of passenger train km is based

on an extrapolation of current train km considering additional or reduced service requirements or changes in train km due to construction works. Freight train-km are projected with the help of an internal analysis on the basis of general economic figures. In Poland, the regulatory body examines the forecast for operational work of the IM for each category of lines and weight. In case of a significant difference with the charge of the last timetable, the regulatory body asks the IM to provide a justification. In Italy, traffic forecasts over the regulatory period (5 years) are estimated by the IM on the basis of a consultation of the railway undertakings and their consistency is evaluated by the Regulatory body. In the UK, the majority of charges are not that sensitive to demand forecasts, because they are calculated per unit of traffic. However, when traffic forecasts do affect the level of charges, they are challenged *ex ante*.

### **3.10 Complaints**

The Swedish regulator has received one complaint from an RU on the differentiation of the access charges. The main Swedish IM modulated the average direct unit cost by basing the modulation on the vehicle with the highest axle weight load in the train. The RU claimed that the modulation was not in line with Regulation 2015/909 since it does not reflect the actual wear and tear caused to the infrastructure and that it was discriminatory for RUs with wagon load traffic. The RU also claimed that the method of modulation in network statements 2017 and 2018 should be based on an average of the axle weight in the train. The Swedish RB found that the IM could not prove that the modulation reflected the cost directly incurred by the train service operation and it was therefore not in line with the Regulation and not in line with the Swedish Railway Act.

The Belgian RB has received a complaint from seven RU's about the performance regime implemented by the Belgian IM contesting the fairness of this regime. The Belgian IM had foreseen two segments (National and International) with different regime for each segment. Moreover, some RU complained that this regime was more advantageous for the "big" RUs than for the "small" RUs. After examining this complaint, the Belgian RB turned down the performance regime implemented by the Belgian IM.

The Romanian regulatory body has received complaints on price discrimination, level of price and calculation methodology for services provided by the IM.

The Federal Network Agency (the German RB) has received a complaint from a railway undertaking operating night trains. The complaint was directed against the market segmentation of the night traffic segment of the IM, which was based solely on time aspects. The complainant argued for an expansion of the night traffic segment. As a result, the Federal Network Agency adjusted the market segmentation so that the time limits were extended. The Federal Network Agency has also received a complaint from several railway undertakings against previous charges in response to a ruling of the ECJ in Case C-489/15. The companies seek reimbursement of payments to the network operator and argue that the previous charges are partially unlawful. The proceedings are still ongoing.

The Italian regulatory body has decided to modify the access charge scheme issued in 2015, following a complaint of a competitor of the railway incumbent. In fact, the decision n° 152/2017 regulated the new service of couple train running on HS lines (more details in the Section 4.12).

#### 4. Annex: Summary of charging systems by IRG-Rail members

##### 4.1. Austria

The charging system for 2018<sup>94</sup> will also contain a Basic Charge 1 and Basic Charge 2. Both cover direct cost in total and Basic Charge 1 also includes the mark-ups:

Charge	Unit	Differentiation	Cost covered
<b>Basic Charge 1</b>	€/train-km	Route category (5) Market segmentation (traffic) (3)	Marginal cost and part of fixed costs
<b>Basic Charge 2</b>	€/gross-ton km	No market segmentation	Cost for repair and renewal
<b>Incentives and Mark-ups</b>	€/train-km	Incentive for capacity optimisation (1) Corridor-specific Freight Traffic Incentive (2) Engine classification (3) Congestion charge (1)	
<b>Performance regime</b>	€/min delay	To reduce disturbance in the rail network, a charge will be levied for each additional minute of delay on selected trains if the delays are attributable to causes which can be influenced. Unit is by delay in minute (capped) attributable to IM or RU.	

The charging system for 2018 will also contain a Basic Charge 1 and Basic Charge 2. Both cover direct cost in total and Basic Charge 1 also includes the mark-ups:

Charge	Unit	Differentiation	Cost covered
<b>Basic Charge 1</b>	€/train-km	Market segmentation (traffic) (6)	Direct costs plus mark-up
<b>Basic Charge 2</b>	€/gross-ton km	Market segmentation (traffic) (6)	
<b>Incentives and Mark-ups</b>	€/train-km	Engine classification (3) Congestion charge (1)	
<b>Performance regime</b>	€/min delay	Same as 2017	

<sup>94</sup> The approval of the mark-ups was revoked by the Administrative Court and the investigation was referred back to the regulatory body for a new trial.

#### 4.2. Belgium

In Belgium, the implementing act 2015/909 has not yet been implemented. The target of the IM is to implement a new charging system as per 2019. The IM has drafted a new charging system compliant with the implementing act 2015/909. This draft is under review by the office of the Ministry of Mobility and Transport and will be submitted to the RB.

The charges related to the minimum access package are split in the following categories:

- Charge path line "Your move" in order to get a specific path on a line.
- Shunting charge "Your shunt".
- Charge for use of service facilities
- Administrative costs

The IM propose other services beyond the scope of the minimum access package which are the following:

- Traction provision
- Pre-heating service
- Service for exceptional transport and transport of dangerous goods.
- Services beyond opening hours.
- Access to the telecom network
- Provision of additional information

For the provision of those services specific charges are levied.

Charge	Unit	Differentiation	Cost covered
<b>Basic Charge 1</b> Your Move	€/train.km	There are two kinds of charges: The charges related to the path-line and the charge related to the shunting-line. For this latter, there is differentiation between passengers trains and freight trains	Marginal cost and part of fixed costs
<b>Basic Charge 2</b> Your Shunt	€/train.km		Marginal cost and part of fixed costs
<b>Incentives and Mark-ups</b>	n/a	n/a	n/a
<b>Performance regime</b>	Regime came into force as per 01/01/2017 but turned down in 2018.		

#### 4.3. Bulgaria

Quick summary of the charging system (it can for instance describe each individual charge, their charging units, the services they are applied to and/or their legal basis).

Answer: The infrastructure charge is a variable charge which depends on the actual kilometers travelled on the railway infrastructure and depends on the gross weight of the train and with which the railway infrastructure manager shall be reimbursed for the costs incurred directly as a result of operation of the train service.

The charge for operating on the railway infrastructure does not depend on the type of the trains and is the same for all categories of railway lines of the railway infrastructure. Preferential charges for combined transport with block trains and for carriage of freight cars by railway transport are provided for.

The rates are: 0.7902 BGN = 0.404 EUR per train-kilometer and 0.0025 BGN = 0.0013 EUR per gross tonne-kilometer; Charge for realized gross tonne-kilometers of combined transport with block-trains – 0.0023 BGN = 0.0012 EUR per gross tonne-kilometer, irrespective of the category and of the type of the railway line. Charge for the realized gross tonne-kilometers from the carriage of freight cars with block-trains – 0.0018 BGN = 0.0009 EUR per gross tonne-kilometer, irrespective of the category and of the type of the railway line. Charge for the realized train-kilometers from combined transport with block-trains – 0.7112 BGN = 0.2828 EUR per train-kilometer, irrespective of the category and of the type of the railway line. Charge for the realized train-kilometers from the carriage of freight cars with block-trains – 0,5531 BGN = 0.2828 EUR per train-kilometer irrespective of the category and of the type of the railway line.

<i>Charge</i>	<i>Charging Unit</i>	<i>Differentiation</i>	<i>Cost covered</i>
Charge for the realized train-kilometers	BGN/train-km	None Market segmentation; there are discounts for combined transport and for the carriage of freight cars with block-trains	the directly incurred costs

Charge for realized gross tonne-kilometers	BGN/gross tonne-km	None Market segmentation; there are discounts for combined transport and for the carriage of freight cars with block-trains	the directly incurred costs
Charge for the requested and unused capacity	BGN/train-km	None Market segmentation; there are discounts for combined transport and for the carriage of freight cars with block-trains	
Price for electricity distribution in the amount of 146.73 BGN/MWh/	BGN/MWh/	None Market segmentation	Full costs of the electricity distribution activity
Performance scheme	BGN/minute	1.40 BGN per minute delay for a freight train and 2.50 BGN per minute delay for a passenger train	

#### 4.4. Croatia

In Croatia charges for minimum package of access services are based on the costs directly incurred as a result of operating the train service and they are applied on non-discriminatory terms to all rail companies. Fee for minimum package of access services is calculated through a formula published in the network statement by the IM. Based on the formula every railway undertakings can calculate the cost of using rail infrastructure.

Track access charges for the minimum access package are calculated considering:

- the number of train kilometres performed on certain line categories;
- type of power car;
- type of towing vehicle;
- weighting of the line category;
- coefficient of the power car category.

The calculation of charges for the minimum access package takes into account the part of the cost which is directly incurred as a result of operating train service, in particular the part of the cost of maintenance and renewal and rail traffic management.

The calculation of charges for the minimum access package does not include cost which are not directly incurred as a result of operating train service, in particular administration cost, financial cost and indirect cost.

Charges depend on train km and they are different on the basis of six different line categories and weight of trains.

Charge	Unit	Differentiation	Cost covered
<b>Minimum Access</b>			
<b>Access</b>	€/train.km	Differentiation between freight and passenger trains.  Freight: train km change with weight category. Passengers: train km change with weight category.  Line category (7) Main line (3) Regional line (4)	The costs directly incurred for running the railway service (for instance maintenance and renewal, rail traffic management).

#### 4.5. Denmark

Charges for 2016 are levied as laid down in the Danish Railway Act n° 686 of 27 May 2015 § 21 point 1, a national statutory order from the Transport Ministry n° 1379 of 1 December 2015 on payment of use of the state owned rail network and on environmental subsidy to freight transport on railway and a national statutory order from Rail Net Denmark n° 1357 of 27 November 2015 on infrastructure charges for the state owned rail network. The charging scheme is based on direct costs.

In 2016, the IM (Banedanmark) introduced a charge based on direct costs and train.km. The charging system includes a uniform charge (in DKK/train.km) for both passenger and freight trains and a bridge charge.

The charge is calculated on the basis of the direct costs related to maintenance of the tracks for the period 2009-2020. For the period 2009-2013 the calculation is based on real costs and train-km. For the period 2014-2020 the costs and train-km are estimated.

At the moment the IM is not able to separate other expenses concerning the directly use of the tracks.

The IM has calculated the charge DKK 4,80 (0,64 Euro) each Train-km. (2015 price level). This charge is regulated yearly by an index based on the general level for prices and wages.

Charge	Unit	Differentiation	Cost covered
<b>Charge</b>	DKK/train.km	No market segmentation, but some kinds of transportation are free of charge	Direct costs
<b>Incentives and Mark-ups</b>	DKK/train.km	Incentives for capacity optimization No mark-up is levied	
<b>Performance regime</b>	DKK/min delay	To reduce disturbances on the rail network, a capacity charge is levied for delayed trains. The IM has to pay a charge to the railway company for delays attributable to him and under different circumstances.	

#### 4.6. Estonia

Charge	Unit	Differentiation	Cost covered
<b>Charge 1</b>	Train-km	It depends on the passenger/cargo usage ratio. If the passenger train capacity is more than 75%, then it is charged both fixed and variable costs and the cargo trains only variable costs. If the passenger train volume is <75%, then cargo trains are charged fixed and variable costs and passenger trains only variable costs.	Fixed costs
<b>Charge 2</b>	Gross.tonne-km		Variable costs

#### 4.7. Finland

Track access charges include three components: basic charge, infrastructure tax and, for a single rail line, investment tax.

Charge	Unit	Differentiation	Cost covered
<b>Basic Charge</b>	€/gross tonne.km	Passenger and freight traffic	Marginal cost
<b>Infrastructure tax</b>	€/gross tonne.km	Passenger traffic, freight traffic (electricity) and freight traffic (diesel) Currently not charged for freight traffic. For passenger traffic this component is small (< 10 % of the basic charge)	Origin in environmental and accident costs
<b>Investment tax</b>	€/gross tonne.km	No	Based on article 32.3 of directive 2012/34/EU Charged for a single rail line: Kerava – Lahti
<b>Performance regime</b>		A rail operator compensates the Finnish Transport Agency (IM) if the operation of the rail operator essentially differs from the rail capacity allocated to it for a reason due to the operator, and such a deviation impedes the functioning of the railway system. The IM compensates a rail operator if, for reasons due to the IM, the availability of the rail network essentially differs from the rail capacity allocated to the operator, and such a deviation impedes the functioning of the railway system.	

#### 4.8. France

In France, the charging system implemented by SNCF Réseau<sup>95</sup> is based on a three-part tariff regime for activities under a public contract (e.g. regional trains) and a two-part tariff for the other activities (e.g. high speed trains). An additional charge is applied in both cases but only to trains using electric traction facilities.

As defined in the French Decree No. 97-446 of 5 May 1997(amended), the current charging system includes running charges, reservation charges and access charges (only for activities under a public contract). As of 2016, a charge for the use of electric traction facilities, corresponding to the variable costs of using electrical traction facilities, was added to the charges reflecting the minimum access package.

The following table details the current charges for timetable 2019:

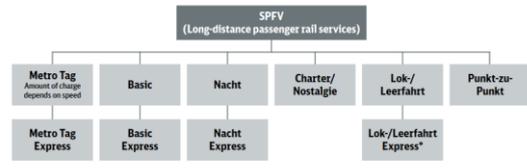
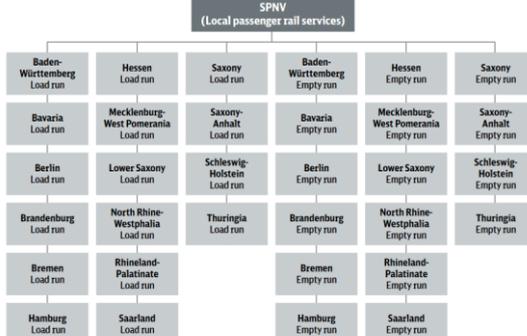
Charge	Unit	Differentiation (as implemented by SNCF Réseau in the Network Statement for 2019)	Cost covered (as laid down in Decree No. 97-446 of 5 May 1997)
<b>Running charge</b>	€/train.km €/tons.km	Type of service/train Compensated Gross Tonnage Route category The charge is issued only if the reserved path is run	Variable costs for operating, maintenance and renewal
<b>Access charge</b>	€/year	Only for activities under a public contract (TER, Transilien and TET)	Fixed costs for operating, maintenance and renewal
<b>Reservation Charge</b>	€/ path.km	For PSO activities : Scope of competence of the organising transport authority For Non-PSO activities : Origin-destination Domestic vs International routes Conventional vs High Speed Lines	0-100% of the cost of capital Mark-ups "if the market can bear this" Costs related to capacity constraints
<b>Charge for the use of electric traction facilities (RCE)</b>	€/train.km	This charge is only applied to trains using the electric traction facilities	Charge corresponding to the variable portion of costs for using electrical traction facilities
<b>Performance regime</b>	€/minute		Penalties for disrupting the operation of the network and compensation for actors which suffer from disruptions

<sup>95</sup> The other infrastructure managers regulated by ARAFER are not considered here.

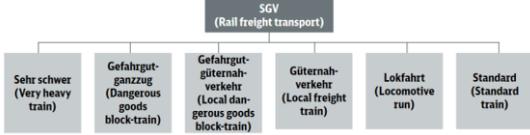
#### 4.9. Germany

The following description is valid for the track access pricing scheme 2018. For 2018 many elements changed due to the transposition of the recast into German law in 2016.

The charging system for the minimum access package comprises a charging element covering the direct costs of a train run and further components. As the direct costs only cover a smaller part of the total costs, mark-ups are levied. When defining direct cost based charges and the mark-ups users are divided into market segments and charged considering their competitiveness. Further elements of the pricing scheme are the new traffic discount, a charge for issuing an offer, a charge for movements outside line operations and incentives, penalty payments (such as compensations for additional train path costs for work-related rail freight transport diversions in the working timetable, reduced charges for non-contractual conditions/reductions upon request, charging arrangements for diversions due to construction work after conclusion of the individual usage agreement, charging arrangements for rail replacement services or emergency bus services) and charges for amendments of allocated train paths and cancellations. The charging unit is the train path kilometre.

Charge <sup>96</sup>	Unit	Differentiation	Cost covered
<b>Charge</b>	€/ train-path.km	Direct costs of train operation + Mark-ups + / - Additional elements	Sum of revenues should cover the costs of the IM (full costs - meaning total cost – minus public payments and plus return on investment)
<b>Direct costs of train operation</b>			
<b>Minimum access package</b>	€/ train-path.km	Train path charge = charge for the minimum access package x train path kilometres	
<b>Market segmentation</b>			
<b>Market segments in long-distance passenger rail services</b>	€/ train-path.km	 <p><small>* Only as part of a train path of the market segments "Metro Tag Express", "Basic Express" or "Nacht Express".</small></p>	
<b>Market segments in local passenger rail services</b>	€/ train-path.km		

<sup>96</sup> Figures are copied from DB Netz AG (2017), The Track Access Charges 2018 of DB Netz AG; [http://fahrweg.dbnetze.com/file/fahrweg-en/14069476/wEJOWHhzkE7IehpKIKZVcG5QccE/15062906/data/track\\_access\\_charges\\_2018.pdf](http://fahrweg.dbnetze.com/file/fahrweg-en/14069476/wEJOWHhzkE7IehpKIKZVcG5QccE/15062906/data/track_access_charges_2018.pdf).

Market segments in rail freight transport	€/ train-path.km		
		<p><b>“Standard” segment:</b> All train path usages in rail freight transport system that are not assigned to the “Sehr schwer”, “Gefahrgutganzzug”, “Gefahrgutgüter-nah-verkehr”, “Güter-nah-verkehr” or “Lokfahrt” market segments are assigned to the “Standard” market segment.</p> <p>Additional market segments in the rail freight transport sector arise from combining the aforementioned segments with further planning or operational characteristics.</p>	Sum of revenues should cover the costs of the IM (full costs - meaning total cost – minus public payments and plus return on investment)
		<p><b>Planning characteristics:</b> Planning characteristics include the “Z-Flex” time flexibility and “R-Flex” spatial/geographical flexibility options (except for the segment “Lokfahrt”): <b>“Z-Flex”</b> allows a temporal design-tolerance flexibility of +/- 120 minutes for rail freight train paths in relation to the departure and arrival time and the time of every stop ordered by the customer ie. total timetable construction of 240 minutes.</p> <p><b>“R-Flex”</b> allows temporal design-tolerance flexibility of +/- 120 minutes for rail freight train paths in relation to the departure and arrival time ie. total design tolerance of 240 minutes, as well as flexibility with regards all possible itineraries when the starting and end point are retained. The only binding geographical factors for constructing the train path are the starting and end points. If the train-path application contains scheduled stops for path construction, there is no geographical flexibility.</p>	
		<p><b>Operational characteristics:</b> If the applicant requires special operational handling in the event of a fault or malfunction, he can choose either “Express” or “Schnell” in the freight rail transport system. Those operational characteristics can be combined with each of the aforementioned segments except for “Lokfahrt” and „Sehr schwer“ and are available on both the working timetable and ad-hoc services.</p>	
<b>Other charging components</b>			
Noise differentiated track access charge (NDTAC)	Malus in percent of the basic price; bonus in cents per axle-km	<p>NDTAC will consist of an additional 4.0 % surcharge to the train path charge for noisy freight trains and a mileage-specific bonus totalling EUR 0.5 per axle kilometre (maximum of EUR 211 per axle) for the active use of freight wagons that have been converted with low-noise technology. Low-noise freight trains do not pay a surcharge if, depending on the day of service and train number, corresponding formal verification in line with the format template requirements of DB Netz AG is affixed/attached by way of self-</p>	Sum of revenues should cover the costs of the IM (full costs -

		declaration by the first business day of the month. A train is regarded as being a low-noise train when at least 90 % of its freight wagons operate at low noise levels by design.	meaning total cost – minus public payments and plus return on investment)
<b>New sector discount</b>	Percentage decrease to the standard usage charge	In order to promote the development of new railway services, DB Netz AG grants all applicants time-limited discount. The applicant must set out that it is a service that has been newly acquired for rail in intermodal competition, or is completely new, and runs on at least 10 train paths in a 12-month period upon the commencement of operations.	
<b>Charge for issuing an offer</b>	Timetable costs multiplied by train-path kilometres of the constructed train paths multiplied by the number of days of service	As the costs for processing requests for the allocation of train paths are contained in the train-path charge, a failure to take up a train path once an application already submitted will result in a processing charge levied for issuing the offer. Timetable costs are a part of the direct costs.	
<b>Charge for movements outside line operating hours</b>	30 euros/30 minutes or part thereof	Additional charge levied if signal-box occupancy for ad-hoc services exceeds the line operating hours.	
<b>Compensation for additional train path costs for work-related rail freight transport diversions in the working timetable</b>	€/ train-path.km	Under the certain conditions (detailed in the network statement), rail freight transport train paths registered in the working timetable are treated like train paths attributed to the “R-Flex” market segment with regard to the calculation of the charges levied for the days of service concerned:	
<b>Reduced charges for non-contractual condition/reduction upon request</b>	€/ train-path.km	DB Netz AG itself reduces the payable usage charge in the case of the faults listed in the network statement if these, due to a disruption, have resulted in additional delay minutes.	
<b>Charging arrangement for diversions due to construction work after conclusion of the individual usage</b>	€/ train-path.km	If the route of a contractually agreed train path deviates from the ENV (diversion) due to construction work not taken into consideration for such train path in the ENV, only the train path charge for the route to which the ENV relates is invoiced.	

<b>agreement (ENV)</b>			on investment)
<b>Charging arrangements for rail replacement services or emergency bus services</b>		In cases where the railway infrastructure cannot be used for a specific period of time as a result of planned measures such as construction, unforeseen faults or reasons that the RU must account for from a vehicle equipment and/or personnel perspective, the rules and regulations defined for rail replacement services (see network statement DB Netz AG) or emergency bus services are applied.	
<b>Amendments</b>	Amendment charge per day of service = timetable costs × affected train path km	The amendment fee corresponds to the share of costs that are incurred as a direct result of train operation for the processing of requests for the allocation of train paths. It is charged for: <ul style="list-style-type: none"> <li>• Amended speed without amendment to the day of service</li> <li>• Amended time of day without amendment to the day of service</li> </ul>	
<b>Cancellations</b>	Minimum cancellation fee per day of service = timetable costs × affected train path km	<b>Minimum cancellation fee:</b> For cancellations up to the 31st day prior to the departure of the train, a minimum cancellation fee will be charged for the day of service cancelled depending on the expense associated therewith. The minimum cancellation fee corresponds to the share of costs that are incurred as a direct result of train operation for the processing of requests for the allocation of train paths.	
	Increased cancellation fee per day of service = train path km × applicable cancellation fee	<b>Increased cancellation fee:</b> For cancellations within 30 days prior to departure of the train, an increased cancellation fee will be charged for every day of service cancelled in connection with the train path charge of the cancelled train and the time of the cancellation.	

#### 4.10. Greece

The infrastructure management charging system is constituted of a basic cost which includes the cost of track maintenance and operational services. Where appropriate, it also includes additional charges such as electrification and special costs.

There are two basic charges, each per train.km, one concerning operation services (0.65 euros per train.km) and the other concerning track maintenance (0.40 euros per train.km). Each one of these charges is to be multiplied by two factors. The first factor for the operation services (for the first quantity) has to do with the relation of the day time period of the route with the peak one and ranges between 0.7 and 1.2 and the second factor for the operation services (for the first quantity) has to do with the relation of the whole time of the route in the timetable in relation with the ideal minimum time that a typical fast train can operate this route without intermediate stops and ranges roughly between 1 and 1.5. The first factor for the track maintenance (for the second quantity) is related to the quality of the track and ranges between 0.53 and 0.90, while the second factor for the track maintenance (for the second quantity) is related to the axial load, the total load and the speed of the train and ranges between 1.0 and 9.61 . The sum of the two quantities gives the charge per train.km.

Charge		Unit	Differentiation	Cost covered
Basic cost	Operation	€ / train.km	Categorization of routes based on peak periods Burdening line capacity	≤ 30% of the actual cost (accrued expenditure) of maintenance and operating
	Maintenance		Maximum speed The train's composition (number of axes) The mean axial load Quality of infrastructure provided	
Additional costs	Electrification	€ / train.km	Whenever using a route which operates under electrification	
	Additional charges depending on the case	No charge per unit : charging on a case-by-case basis	Special- dangerous consignments	

#### 4.11. Hungary

The Hungarian State Railway (MAV Co.) was established in 1992. In 2000, an internal separation of accounts occurred. Different entities were created in order to manage the main activities. In 2003 the first Hungarian Network Statement was released and opened the way to foreign RUs on the network in 2004 (4 freight companies at the end of the year). The same year, the independent Rail Capacity Allocation Body was created. In 2006, the Hungarian Railway Authority was set up. The Hungarian network has a total length of 7700km. It is owned by the State and managed by the Infrastructure Manager that is a separate company, however still part of MAV Group.

The Győr-Sopron-Ebenfurti Vasúti Co. (GYSEV Co.) was founded in 1872 and is owned mainly (94%) by the Hungarian and the Austrian State. The company operates in the North-Western region of Hungary and in Austria. In Hungary GYSEV provides IM (in its geographical area) passenger and traction services and is considered as one of the two national PSO companies and also has a freight company (GYSEV Cargo) legally separated since 2010. The GYSEV network has a total length of more than 400km.

The main principles of the access charge are the following:

- no discrimination between RUs should take place;
- prices set by the IMs must reflect the total justified costs;
- differentiation of the pricing system;
- bottom-up (engineering) approach;
- long term orders are preferred.

Minimum access package	€/train.km €/gross ton.km €/electric train.km	- ensuring of train path - running of trains i) train km performance (passenger, locomotive, standard freight/special freight trains), track section category ii) gross ton km performance (passenger, standard freight, locomotive / special freight trains) - use of catenary performance	MAV Co. is seeking a full cost recovery without profit
Access to service facilities	€/use of stations €/vehicle/day €/vehicle €/litre	- use of stations by passenger trains for stopping performance/ use of origin/destination stations by passenger trains performance/ use of stations by freight trains performance, station category - storage of vehicle performance - use of wagon weigh bridges (scales) performance/ staff ensured for weighing/ exchange of axles - use of refuelling facilities/ensuring of fuel for traction performance	cost of operating the service facility + reasonable profit

	<p>€/person/hour</p> <p>€/cubic meter</p> <p>€/bogie/hour</p>	<ul style="list-style-type: none"> <li>- ensuring of shunting staff for passenger trains performance/ ensuring of shunting staff for freight and locomotive trains performance/ availability of shunting staff for passenger trains performance/ availability of shunting staff for freight and locomotive trains performance/ train preparation performance</li> <li>- ensuring of water for water supply performance</li> <li>- use of bogies</li> </ul>	
Additional services	<p>€/kWh</p> <p>€/litre</p>	<ul style="list-style-type: none"> <li>- ensuring of traction current performance/ ensuring of electric energy used for other train traction purposes (preheating, precooling) performance</li> <li>- ensuring of fuel used for other traction purposes (preheating, precooling) performance</li> </ul>	
Ancillary services	<p>€/train</p> <p>€/ticket</p>	<ul style="list-style-type: none"> <li>- technical inspection of railway vehicles performance</li> <li>- ticketing and reckoning activity performance</li> </ul>	

#### 4.12. Italy

In Italy, the charging system in place applied to all the lines is based on the economic regulation issued by ART in November 2015 (Decision 96/2015), that follows the relevant EU and Italian regulation (in particular, on the EU side, the Recast, Regulation 2015/909 and Regulation 2015/429, while on the national side, the Legislative Decree 112/2015)<sup>97</sup>. The new regulatory framework includes both costing and charging rules and introduces regulatory accountability obligations on the IM and different verification procedures along the regulatory period that lasts 5 years.

The identification of the perimeter of admissible costs to be recovered by the IM with access charges follows these principles and criteria: (i) only the relevant costs for operating the train service are considered, distinguishing direct costs from other costs; (ii) a full (efficient) cost approach, where a 2% annual efficiency target on operative costs is set for the IM; (iii) the CAPM/WACC methodology for the computation of the cost of capital is adopted.

The charging system established by the RB is modulated in components: (i) A component: direct costs (depending on mass, speed and contact wire related to the rolling stock used by the railway undertaking); (ii) B component: mark-ups; (iii) C component: other elements (for scarcity, environmental incentives, ETCS, etc.); (iv) D component: other elements deriving from specific regulations.

The table below sets out the principal elements of the access charges system according to the regulation issued by ART in November 2015:

Charge	Unit	Charging criteria	Cost covered
<b>Access charges: A component</b>	€/train.km	Depending on the mass, the speed and the use of contact wire by the rolling stock used by the railway undertaking	Direct costs (following Regulation 2015/909)
<b>Access charges: B component</b>	€/train.km	-Market segments -Track category -Slot time	Other costs than direct ones, such as residual operating costs, the cost of capital and depreciation
<b>Access charges: C component</b>	€/train.km	-Scarcity -Environmental effects -ETCS -Regional compensation regimes	External Cost based

In July 2016, the Italian IM adopted the access charges for the regulatory period 2016-2021. The new set of charges successfully passed the verification procedure set by the regulatory body. It

<sup>97</sup> Italy implemented the Recast with the Legislative Decree 112/2015 in July 2015.

foresees 24 different market segments that belong to 8 main categories: technical services, maritime services, PSO regional passenger services, PSO national passenger services, open access international passenger services, open access basic national passenger services, OA national premium passenger services, freight services. The IM has established to use only A component and B component of RB charging scheme.

From November 2015, ART has issued a number of decisions concerning the access charge system:

- (i) In May 2017, ART opened a proceedings (decision 77/2017 in order to review some specific components of the Italian access charges system owing to the introduction of a new service by the incumbent: couple trains running on HS lines. This proceedings ended in December 2017 with Decision No 152/2017 introducing (i) a new market segment pairs (single train/couple train) in order to differentiate the two types of services; (ii) a new differentiation of the component of direct costs (catenary), depending of the number of the pantographs.
- (ii) In September 2017 with decision no. 114/2017, ART has ordered that, for the new railway line AV / AC Bivio Casirate - Bivio / PC Roncadelle, the access charges have to be the same as those already determined by the IM for the routes Turin-Milan, Milan-Bologna, Bologna-Florence, Rome-Naples, already previously included in the same AV / AC network. This was to guarantee fair access and to prevent discriminatory effects on the high-speed service markets.
- (iii) In February 2018, ART issued with decision n. 17/2018, a favourable opinion on the application by IM of a differentiated charge regime for rail freight services running on the HS line Bologna-Florence during the night hours. The reduced access charges was allowed for two years.

Eventually, it is still on going a proceeding on IM regulatory accounting, which end is foreseen by December 2018.

#### 4.13. Latvia

The main principles of the access charges are developed hereafter<sup>98</sup>:

- the full cost of infrastructure should be covered by accumulated charges and state budget funding if it is available;
- all expenses are traced to particular train category;
- Train-kilometres and gross tonne-kilometres are used as cost drivers.

Charge	Unit	Market segmentation	Cost covered
<b>Operating</b>	Train.km	Differentiation among: <ul style="list-style-type: none"> <li>- Freight trains;</li> <li>- Passenger trains (electric);</li> <li>- Passenger trains (diesel);</li> <li>- Passenger trains with locomotive;</li> <li>- Narrow-gauge trains.</li> </ul>	1/ Costs of maintenance of railway infrastructure objects made by IM; 2/ Costs of railway infrastructure objects development (renewals, reconstruction, building) consists of capital depreciations costs (excluding capital depreciations costs of government, EU funds) and premium costs; 3/ Duties and taxes paid by IM

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<sup>98</sup> In order to transpose Directive 2012/34/EU, currently responsible institutions and stakeholders in Latvia have started to develop new charging scheme. Significant changes are therefore planned.

#### 4.14. Luxembourg

Charge	Unit	Differentiation	Cost covered
<b>Minimum service</b>			Equals the cost that can be allocated directly to running the railway service and include a fee for scarcity of access to infrastructure capabilities
Access and request of path	Train path.	Regular train path Pre-arranged extraordinary train path Tailor made extraordinary train path	
Operation of path (track wear)	Train .km	Freight train Combined transport freight train Motor-driven passenger train Passenger train Running locomotive	
Capacity / congestion charge	€/km		

Note: A performance regime is applied with penalties and compensations

#### 4.15. Netherlands

Charge	Unit	Differentiation	Cost covered
<b>Access Variable Usage Charge</b>	train.km / tonne.km	Differentiation between freight and passengers Freight: train km by graduated weight category Passengers: train km by graduated weight category	Covers the incremental cost of operating a train on the network. Measured by a percentage of wear and tear cost in total maintenance costs.
<b>Electrification: use of electrical wire</b>	€ per KwH	No segmentation, defined by km per train type/weight, train type and speed (actual usage in case gauges have been fitted)	Covers cost of transport of electricity only, wear and tear of wire not included
<b>Access via rail to railway stations</b>	€ per stop per train category	Six categories of stations (by size/number of passengers). Three train categories defined by percentage of stops on their total route. Category A: stops at max. 15% of stations on route Category B: stops at max. 50% of stations on route Category C: stops at 51-100% of stations on route	Recovery of ProRail's part of station maintenance; ProRail does not own the stations, but has a right of use of the tracks and passenger corridors to and from platforms. Charge covers only the costs involved with corridors (cleaning and maintenance)
<b>Shunting and parking</b>	€ per meter of track / day / month year	Two categories: service areas controlled centrally/ decentrally (switch points controlled locally or centrally)	Covers incremental cost of track wear and tear measured by a percentage of maintenance cost

#### 4.16. Norway

Directive 2012/34/EU has not yet been implemented in Norway. However, the content has mainly been implemented in national regulation.

Charges corresponding with Chapter IV Section 2 (art. 29 -37) in Directive 2012/34/EU in 2019:

Charge	Unit	Differentiation	Cost covered
<b>Charges reflecting direct costs</b>	NOK/ gross tonne.km	Passenger traffic Freight traffic Differentiated for three parts of the network	Estimated average marginal maintenance costs incurred as a result of operating a train service
<b>Capacity / congestion charge</b>	NOK/ passage	Passage through the Oslo tunnel during rush hour	
<b>Discounts</b>	NOK/ gross tonne.km	Freight traffic on "considerably underutilised lines"	
<b>Performance regime</b>	NOK/ minutes delayed  NOK/ cancellation	Passenger traffic > 3:59 min, freight traffic and long distance trains > 5:59 min.	Penalties for disrupting the operation of the network and compensation for actors which suffer from disruptions
<b>Reservation charge</b>	NOK/ gross tonne.km (percentage of charges reflecting direct costs)	Cancellation 59 days - 15 days before scheduled departure Cancellation 14 days – 72 hours before scheduled departure Cancellation less than 72 hours before scheduled departure	

The IM has defined three market segments ("main airport", "iron ore and minerals" and "PSO"), but the corresponding mark-ups have not yet been approved by the Ministry for 2019.

#### 4.17. Poland

In Poland charges for the minimum access package are based on the costs directly incurred as a result of operating the train service and they are applied on non-discriminatory terms to all rail companies.

Polish regulatory authority approves the way of fixing of unit rates of charges ex-ante annually for anyone train timetable in scope of the verification of the charges for the minimum access package.

The unit rates of these charges must be submitted, together with the calculations of their values, to the President of the Office of Rail Transport. The President of the Office of Rail Transport approves the way of fixing of unit rates of charges within 90 days of the receipt or refuses to approve them if there is any infringement of calculation rules. The calculation of charges for the

minimum access package takes into account the part of the costs which is directly incurred as a result of operating the train service, in particular the part of the costs of:

- maintenance and renewal;
- rail traffic management;
- depreciation, if it is determined on the basis of the actual wear of the infrastructure attributable to traffic.

The calculation of charges for the minimum access package does not include costs which are not directly incurred as a result of operating the train service, in particular:

- the administration costs;
- infrastructure safety and public order in railway area;
- the financial costs;
- the indirect costs.

The implementing act 2015/909 has been implemented since timetable 2018/2019

In the scope of charges to access service facilities, service facilities operator shall be set the level of charges. Charges can not exceed the cost of sharing the object incurred by the operator with a reasonable profit defined as a rate of return on equity is determined by the operator taking into account the possible risks, in particular related to income, and the average rate of return for the sector concerned in recent years, not more than 10% .

President of of the Office of Rail Transport controls the charge ex post. It is possible to order the modification of level of charges including the rules for the calculation of the charges and the amount of charges charged by other operators for sharing and provision of services in the same objects.

Charges depend on train-km and they are differentiated on the basis of different line categories and weight categories of trains. The line categories are determined on the basis of axle load limits and speed limits.

The basic charge may be increased during periods of congestion on a particular rail line or its section with insufficient capacity.

The IM may grant discount on the basic charge. Discounts may be granted for a limited time and on a particular section of the infrastructure:

- to develop new rail services;
- in order to use the railways with a significant unused capacity

Charge	Unit	Differentiation	Cost covered
<b>Operating charge</b>	PLN/ train. km	<ul style="list-style-type: none"> <li>- Freight/passengers services</li> <li>- Weight categories of trains</li> <li>- Line categories</li> </ul>	<p>The costs directly incurred, <i>i.e.</i> the part of the costs of:</p> <ul style="list-style-type: none"> <li>- maintenance and renewal;</li> <li>- rail traffic management;</li> <li>- depreciation, if it is determined on the basis of the actual wear of the infrastructure attributable to traffic</li> </ul>
<b>Reservation/ Cancellation Charge</b>	% charge		Depends on the term of cancellation

The IM can levy higher charges (excluding transport for which the minimum unit rate basic charge is used and transport dependent on public funding), if the market can bear it *i.e.* in the case it has been established that the increased charge does not result in a shift to road transport. The IM undertakes 'market can bear tests' no less than once every three years, taking into account the division of the market into at least the following pairs of types of services:

- 1) passenger services/freight services;
- 2) regional passenger service/ sub-regional passenger services ;
- 3) trains carrying dangerous goods /other freight trains;
- 4) domestic services /international services;
- 5) combined transport / direct trains;
- 6) block trains / single wagon load trains;
- 7) regular train services / occasional train services.

#### 4.18. Portugal

In Portugal, the IM (IP<sup>99</sup>) in addition to the daily management, maintenance and further development of the infrastructure, is also responsible for the control and the safety of all train traffic.

According to Decree-Law No. 91/2015 of 29 May, IP aims at the design, construction, financing, maintenance, operation, rehabilitation, enlargement and modernization of road and rail national networks.

The charging system implemented by IP should be in accordance with Directive 2012/34/EU transposed by Decree-law no. 217/2015. Charges for using the minimum access package correspond to the costs directly attributable to the operation of the rail service, as set in section 3 of article 31 of Decree-law 217/2015.

The implementation of Regulation (EU) 2015/909 will most likely require changes in the charging system of the Portuguese IM. The charging system currently in use by the IM has been developed under Regulation IMTT 630/2011, issued by the former regulatory body pursuant to the former legal framework and is not completely in line with Directive 2012/34/EU and the cost methodologies introduced by Regulation 2015/909.

The Portuguese IM is now in the process of analysing and redefining the charging model, so, the information stated bellow will change in a near future.

Charge	Unit	Differentiation	Cost covered
<b>Access charge</b>	€/train.km	Differentiation between freight and passenger trains	Costs directly incurred by train operations, for instance: maintenance and renewal, rail traffic management
<b>Cancellation Charge</b>	€/train.km	In case of partial cancellation, only the unused path will be subjected to penalty	If, for a given Working Timetable, a railway undertaking will not use more than 5% of the requested capacity, when it reaches this percentage, it will pay extra 5% over and above the defined tariff for every additional train-path it had requested and not-used, up to a maximum of 500% of the applicable tariff. VAT will be added to these values

<sup>99</sup> Infraestruturas de Portugal, S.A. is a state-owned company resulting from the merger of Rede Ferroviária Nacional – REFER, E.P.E. (REFER) and EP - Estradas de Portugal, S.A. (EP, S.A.) through which REFER was merged into EP, becoming a public limited company named Infraestruturas de Portugal, S.A. (IP). The merger became legally effective on 1 June 2015 upon publication of Decree-Law no. 91/2015, of 29 May.

<b>Access to service facilities</b>	Charges for access to service facilities may not exceed the cost of their provision, plus profit established on the basis of Portuguese market values, as set in section 11 of article 31 of Decree law 217/2015.		
<b>Additional services charges</b>	€/unit	These services may comprise: traction current, charges for which shall be shown on the invoices separately from charges for using the electrical supply equipment; tailor-made contracts.	Cost of providing the services, calculated on the basis of the actual level of use
<b>Ancillary services charges</b>	€/unit	These services may comprise: access to telecommunication networks; provision of supplementary information; ticketing services in passenger stations; etc.	Cost of providing the services, calculated on the basis of the actual level of use
<b>Performance Regime</b>	<p>The performance scheme aims at reducing disturbances to a minimum and to promote efficiency in the services, allowing for a better operating performance, in line with the standards foreseen in the allocation of capacity.</p> <p>The performance regime implemented since 2010 in accordance with the IMT Regulation 473/2010 (issued under the former legislation) does not allow a full compliance with the requisites from Annex IV of Decree-Law 217/2015 which transposed the Directive 2012/34/UE. For this reason, at the publishing date of the 2018 Network Statement, IP and the RUs are jointly developing a new process during 2017.</p>		
<b>Noise charge</b>	Decree-Law nº. 179/2014, of December 18, amending Decree-Law nº. 27/2011, transposing Directive nº 2014/38/EU, on the interoperability of the railway system within the Community regarding noise pollution, allows IM to consider a noise charge. IM does not consider it yet. However, since the charging model is being revised it is possible that this component might be considered.		

#### 4.19. Romania<sup>100</sup>

Charge	Unit	Differentiation	Cost covered
<b>IAC (infrastructure access charge)</b>	train.km	The calculation of the charging elements depends on : - category of traffic section - electrified sections - tonnage factor -type of traffic: passenger or freight - category of traffic section -technical systems for electrified sections	directly incurred cost
<b>Charges for other operating services performed by CFR S.A (the IM)</b>			
<b>Basic charges for train path preparation</b>	% from IAC	The charge for train path preparation is applied for trains especially ordered and for trains with occasional running. This charge is not applied if the train path is modified for reasons attributable to CFR	
<b>Charge for the issuing of transport documents (tickets, season tickets)</b>	0.78 Lei / for the transport document	It applies in the case when no agreements are concluded with the RU for this service. It must be monthly registered in a separate note, per each type of service, and the specialized regional office prepares the relevant invoice.	
<b>Charge for filling in commercial files</b>	11.98 Lei /file	No	
<b>Charge for storage on CFR's lands</b>	1.17 Lei /hour and tonne	No	

<sup>100</sup> In Romania has not yet implemented a new charging scheme, based on the Regulation 2015/909. At the moment, CFR SA, the Romanian IM, is in procedure to hire a consultant for a new charging model.

<b>Additional charge for falsely declaring the weight of goods for wagon shipments exceeding the axle load, the load per linear meter or the loading capacity of the waggon</b>	89.61 Lei /tone	It is levied from the railway undertaking	
<b>Additional charges for the non-compliance with or change in the scheduling of the use of train paths</b>	1.17 lei /km of train path for freight traffic 0.39 lei/km of train path for passenger traffic	No additional charges are levied for the trains which are included in the temporary traffic timetable, which have a Special Order or which are Season Trains.	
<b>Charge for train path reservation</b>	0.1 x no. of days for which the RU requires the reservation x IAC	The charge is payable by the RU that does not use the allocated train paths	
<b>Charge for long ordinary load transports with two or several wagons</b>	5.03lei /100 kg of charging mass of the bearing wagon + number of safety wagons 26,77 Lei /100 kg of charging mass of a safety		
<b>Special charge for explosive materials</b>	5.81 Lei/100 kg of charging mass		
<b>Charge for shunting on the infrastructure lines the wagons that are introduced in (taken out of) the train formation</b>	LEI 7.72/conventional wagon		
<b>Charge for the access of the shunting convoys to the railway infrastructure</b>	LEI 7.72 convoy/km		

<b>Charge for the participation of the operating personnel of the economic entities in the personnel training organized by CFR SA</b>	23.17 Lei/person and hour	No	
<b>Charge for stopping rolling stock not belonging to CFR SA on the lines of CFR SA</b>	0.47/ Lei conventional wagon 1.29 Lei/other rolling stock than wagon	conventional wagon other rolling stock than wagon	
<b>Charge for shunting on the railway infrastructure lines in the railway stations or centres with a high activity volume on extended areas</b>	18.05 Lei/physical wagon	No	
<b>Charge for the commercial stops of the passenger trains in the stations</b>	0.99 Lei /stop	No	
<b>Charge for train traffic control for non-interoperable rented sections</b>	2.99 Lei / train station (for passenger trains) Lei 4.79 / train station (for freight trains)	The charge for train traffic control for non-interoperable sections rented applies for sectioning points fitted with dispatchers and / or revise switches personnel	

#### 4.20. Slovakia

The Slovak Republic have had a valid regulatory framework since March 2017 and new charging system will be valid since January 2019.

	Charge	Unit	Differentiation	Cost covered
Minimal access package	<b>ordering and allocation of capacity</b>	€ per train.km		Variable costs and fixed costs are extracted
Minimal access package	<b>management and organization of traffic</b>	€ per train.km		Variable costs and fixed costs are extracted
Minimal access package	<b>operability of infrastructure</b>	€ per 1000.gross tonne.km		Variable costs and fixed costs are extracted
Minimal access package	<b>use of electrical supply equipment for traction current</b>	€ per 1000.gross tonne.km		Variable costs and fixed costs are extracted
Track access to service facilities	<b>access to passenger stations, buildings and facilities</b>	€ per stop		Variable costs and fixed costs are extracted
Track access to service facilities	<b>access to suitable location for ticketing services</b>	€ per m <sup>2</sup> per month		Variable costs and fixed costs are extracted
Track access to service facilities	<b>access to marshalling yards and freight terminals</b>	€ per stop		Variable costs and fixed costs are extracted
Track access to service facilities	<b>access to storage sidings</b>	€ per wagon per day		Variable costs and fixed costs are extracted

#### **4.21. Slovenia**

In February 2013 the Public Agency for Railway Transport (the allocation and safety authority), who is competent for determining and collecting track access charges, implemented a new charging methodology, based on direct costs. Track access charges for the minimum access package are calculated considering:

- the number of train kilometres performed on certain line categories
- type of power car;
- weighting of the line category;
- the coefficient of the power car category;
- cost of supplement / deduction for the type of transport.

User charges for the minimum access package are based on costs, which are directly incurred by train operations. The difference with full costs is subsidized by state funding. To date Slovenia has not taken the decision to introduce mark-ups.

In accordance with Railway Transport Act the allocation authority may establish higher access charges for congested infrastructure under following conditions:

- Allocation authority defines track section as congested;
- IM envisaged this situation and published in the network statement;
- IM prepares enhancement plan;
- regulatory body approves higher access charge.

By amending Railway Transport Act on 6<sup>th</sup> November 2015, which implemented Recast Directive, all essential functions (included determination of track access charges) were transposed from Public Agency for Railway Transport to Infrastructure manager. It is still not clear when IM will determine new charging scheme.

Charge	Unit	Differentiation	Cost covered
<b>Access</b>	€/train.km	<b>Line category ( 7):</b> - 3 main lines (G1-G3) - 4 regional lines (R1-R4)	Costs directly incurred by train operations
<b>Operating</b>	€/train.km	<b>Factor of power car's (3):</b> (A,B,C) <b>Factor of transport type (18):</b> - Cargo trains up to 1000 t gross weight - Cargo trains from 1001 to 1500 t gross weight - Cargo trains from 1501 to 1750 t gross weight - Cargo trains from 1751 to 2000 t gross weight - Cargo trains more than 2000 t gross weight - Cargo trains – empty (less than 100 t net weight) - Cargo trains (circular, collecting) - Locomotive trains (empty multiple units, solely running power cars) - Tilting passenger trains - Classic passenger trains - Multiple units - Motorail through the Bohinj tunnel - Other motorails - Empty classic passenger trains - Heritage trains - Service trains (scheduled maintenance) - Service trains (unscheduled maintenance) - Other trains	
<b>Congestion / Scarcity</b>	€/train.km	(In 2017 no congested lines were declared)	
<b>Late cancellation fees</b>	% of user charge for allocated train path  (+25 € for ad-hoc train paths)	<b>Cancellation:</b> - up to 6 hours before scheduled time of departure – FREE - less than 6 hours before scheduled time of departure – 50% of user charge - not cancelled / train does not run – 100%	

#### 4.22. Spain

In Spain, since the beginning of July 2017, the new charging system has been implemented following the Directive 34/2012

For the rail network, the minimum access package is based on train-kilometres and includes operating charges and reservation charges. According to the new railway law, the reservation charge will provide incentives for efficient use of capacity, foreseeing a penalization for the capacity reserved and not used.

The IM's cost accounting model is based on a *top down* fully distributed cost, because the main goal of the charging system is full "cost recovery". However, nowadays, this objective is only feasible for high speed lines due to the operational deficit of the conventional network.

Charge	Unit	Differentiation	Cost covered
<b>Capacity allocation charge</b>	€/train.km allocated	Type of line and type of service	Cost of capacity allocation, traffic management, traffic safety and renewal of safety and traffic control facilities.
<b>Rail track use charge</b>	€/ train.km circulated	Type of line and type of service	Maintenance and conservation cost of the railway infrastructure.
<b>Use of electric energy transformation and distribution facilities charge</b>	€/train.km circulated	Type of line, service and traction	Cost of maintenance, conservation and renewal of the electrification facilities.

#### 4.23. Sweden

The charges for the minimum package of access services are based on the short-term marginal cost of operation, maintenance and reinvestments and charged according to use per kilometre, gross tonne-kilometre and passages.

The track charge is based on gross tonne-kilometres, and is imposed at varying amounts for both freight traffic and service trains, and for passenger traffic. From Between 2016 and 2018 track charges were levied in different amounts depending on the maximum admissible axle load (STAX) of the train. Starting with the 2019 network plan, the differentiation will be based on the average axle load of the train. Trains with a higher average axle load thus pay a higher track charge. Axle load is an important parameter that reflects the wear and tear that is caused by a train. Differentiated track charges reflect variations in wear and tear between different trains.

The train path charges are levied at three levels. Passage charges are levied in three major cities during rush hours on weekdays. The emissions charge is based on the socioeconomic costs in terms of environmental and health effects. The size of the charge depends partly on the engine's environmental classification and partly on the amount of fuel consumed.

In the case of allocated capacity for train paths cancelled by railway undertakings or traffic organisers, a reservation charge is imposed.

Charge	Unit	Differentiation	Cost covered
<b>Access &amp; Operating Charges (marginal cost)</b>	€/gross tonne.km	Passenger, service or freight traffic	
<b>Track charge</b>	For 2018: Factor 0.9-1.1 depending on average axle load	Freight traffic and service trains ≤20 tonne / > 20 tonne ≤ 22,5 ton / >22,5-≤25 tonne > 25 tonne Passenger traffic <20 tonne/>20 tonne	Maintenance, operation and reinvestment cost and socio- economical costs of environmental and health effects
<b>Emission charge</b>	€/litre of diesel fuel	Train type (diesel engine)	
<b>Train path (also marginal cost)</b>	€/train –km	Passenger, freight, service traffic Route categories (high, medium and base)	
<b>Passage charge</b>	per crossing	Freight traffic Öresund link	Special project
<b>Passage charge</b>	per passage	Stockholm, Gothenburg and Malmö during peak hours	Part of fixed cost of infra
<b>Quality charges</b>	€/minute of additional delay	IM and railway undertakings	

#### 4.24. Switzerland

This is the Swiss charging system valid from 1<sup>st</sup> January 2017. The existing scheme of 2016 will be extended by a wear and tear factor by this date.

The charging for the minimum access package covers the standard marginal costs considering the different costs of infrastructure in the network, the demand and the environmental impact of the vehicles. Contribution margins are levied in the passenger transport segments, considering if it is a franchised or non-franchised service.

Note: Switzerland as non-member of the EU has not fully adopted the different European Railway reform steps. The legal structure of the Swiss charging system as well as the prices for the minimum access package are defined by State (and not the IM). However the prices for additional services are fixed by the IM.

	<i>Charge</i>	<i>Charging Unit</i>	<i>Differentiation</i>	<i>Cost covered</i>
Variable minimum train-path price	<b>Minimum train-path price</b>	CHF/path km	3 categories of routes on the network	The revenue for each traffic segment should cover the standard marginal costs considering the different costs of infrastructure in the network, the demand and the environmental impact of the vehicles
	<b>Peak-hour demand coefficient</b>	Factor 1 or 2	Factor is applied, when the train-path is used during peak-hours on Mo to Fri between 6.00 to 8.59am and/or 16.00 to 18.59.	
	<b>Train-path quality</b>	4 different factors	The applied factors consider the priority rules for the different traffic segments based in the railway act	
	<b>Stop surcharge</b>	CHF/stop	Surcharge for sections with mixed traffic	
	<b>Basic price by wear</b>	CHF per unit	Differentiation of the various trains on infrastructure in relation to speed, path layout, vehicle type and vehicle design.	
	<b>Basis price by weight</b>	CHF/gross ton kilometre	For historic vehicles. For regional transport segment in 2017 only.	

	<b>Surcharge for trains hauled by combustion-based move</b>	CHF/gross ton kilometre	Trains with thermic traction on electrified lines	
	<b>Dangerous goods surcharge for freight traffic</b>	CHF/axle kilometre	Specific costs arise in connection with the transport of dangerous goods (security or restrictions on operation)	
	<b>Low-noise bonus for freight traffic</b>	CHF/axle kilometre	For freight vehicles with disk, drum or composite brakes	
	<b>Discount for the ETCS train control system</b>	CHF per year	Granted for vehicles not travelling on specific new lines and brought into service before 1 <sup>st</sup> January 2013.	
	<b>Discount for traction assisted transalpine freight trains</b>	CHF/powerd axle and train-path kilometre	The discount is applied for the entire route travelled with more than four powered axles on the Lötschberg-Simplon and Gotthard-line section	
	<b>Cancellation fee</b>	Factor	Depending on the deadline of cancellation	
	<b>Contribution margin for passenger trains</b>	% of traffic revenues or CHF/kilometre offered	Differentiation between franchise-holders' and non-franchise holders' passenger trains	
	<b>Ex-catenary energy</b>	CHF/kwh x Factor	The „network load factor“ takes account of varying demand and the resulting production costs throughout the day	Price is fixed in the manner, that no uncovered costs arise

#### **4.25. United Kingdom**

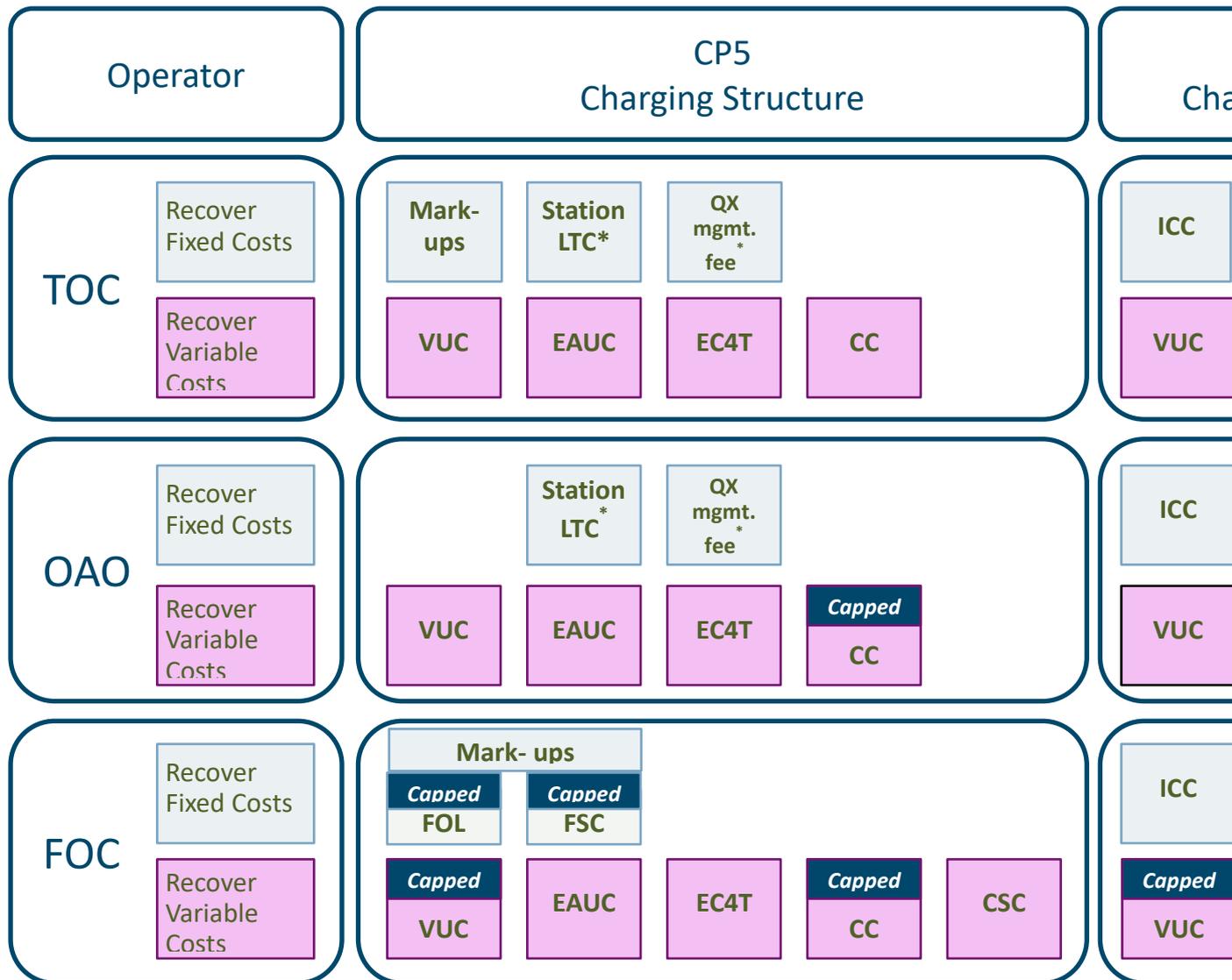
In the UK, the charging regime for the IM of the national network<sup>101</sup> has been developed to cover the short-run marginal costs of running services on the network. In addition, for the purposes of full cost recovery, train operators pay various fixed charges to cover a proportion of the IM fixed costs. These charges are recovered as mark-ups. Currently, open access operators do not make contributions towards the IM fixed costs.

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<sup>101</sup> All other infrastructure managers are not considered here.

Charge	Unit	Differentiation	Cost covered
<b>Variable Usage Charge (VUC)</b>	£ per thousand gross tonne mile for freight and £ per vehicle mile for passenger	All services pay this charge but it varies based on the vehicles used and for freight, also the commodity carried.	Covers the maintenance and renewal costs that vary with traffic in terms of the incremental damage the service does to the track, civils and signalling infrastructure
<b>Traction electricity charge (EC4T)</b>	kWh. For services that are not metered, this is modelled per train mile for multiple units, otherwise per kgtm	Operators have option of using modelled consumption rates or metering their use of electricity	Network Rail recovers their costs of providing electricity for traction purposes.
<b>Electrification asset usage charge (EAUC)</b>	£ per vehicle mile (passenger) £ per thousand gross tonne mile (freight)	Applied to all electrically powered services	Recovers maintenance and renewal costs of electrification assets that vary with traffic.
<b>Coal spillage charge (CSC)</b>	£ per thousand gross tonne miles	Only applicable to freight trains carrying coal	Recovers cost of coal spillage
<b>Capacity charge (CC)</b>	£ per train mile	Applied to all types of train operators	Intended to allow Network Rail to recover the performance regime costs that it incurs by allowing additional traffic onto the network
<b>Fixed Track Access Charge (FTAC)</b>	Lump sum charge determined for the control period (5 years)	Applies to passenger services under public service contracts (franchises) only	Determined on basis of Network Rail's revenue requirement after accounting for the income received from variable track access charges, regulated station charges, other single till income and network grant.
<b>Freight only line charge (FOL)</b>	£ per thousand gross tonne mile	Applies to freight services carrying coal for electricity generators, nuclear fuel or iron ore.	Recovers some of the fixed costs associated with freight only lines.
<b>Freight specific charge (FSC)</b>	£ per thousand gross tonne mile	Applies to freight services carrying coal for electricity generators, nuclear fuel or iron ore.	Recovers 'freight avoidable costs' - the costs that would be foregone if freight services were to no longer use the network.

This charging structure will change from 1<sup>st</sup> April 2019 when we start the implementation of the next control period i.e. CP6. Some charges will be removed (such as capacity charge and coal spillage charge) while others will be grouped together in what will be called Infrastructure Cost Charge (ICC). The figure below compares the current CP5 charging structure and the forthcoming CP6 charging structure.



\*refers to station charges and are not part of the MAP

Note:

For CP6, all charges recovering fixed network costs will be known as infrastructure cost charges (ICCs). These are the charges currently referred to as mark-ups. The following freight commodities will be subject to ICCs: ESI coal, iron ore, spent nuclear fuel, ESI biomass. For freight services, we have confirmed that FOL and FSC will be merged in CP6, and only one ICC will be levied, which for billing purposes will be called the FSC. The ICC for



franchised passenger operators will continue to be called FTAC. We will levy ICCs on open access services in the interurban market segment in CP6, as a rate per train mile