

European Benchmarking of the costs, performance and revenues of GB TOCs

Final Report

Prepared for the Office of Rail Regulation

Hamburg, November 20th, 2012

Content

- **Summary**
- Background and objectives
- Scope of the study
- Methodology
- Peer group
- Cost
- Revenues
- Quality

International Benchmarking of the Efficiency of GB Train Operations

Summary (1/4)

- The Office of Rail Regulation contracted with civity Management Consultants to undertake an international benchmarking study on the efficiency of passenger train operations, comparing costs, revenues and performance of train operators operating in Great Britain (GB).
- The **key objectives** of this analysis (a follow-up of Sir Roy McNulty's Value for Money study) were to undertake first steps to better understand the costs, revenues and performance of GB train operators in comparison with other European operators and to evaluate what levels of costs, revenues and performance could be achieved in the future. This requires a more in-depth understanding of the underlying drivers and structural conditions such as franchising practices, cultural differences etc.
- civity has established an **international peer group** with train operating companies from Belgium, Denmark, France, Germany, Ireland and The Netherlands.
- ORR and ATOC engaged with GB train operators and **11 out of 19 franchise operators** have committed to join the study. All members of the peer group have undertaken significant efforts to contribute first-hand data which has been thoroughly validated and discussed in bilateral meetings. Two workshops were held with the peer group to discuss interim results and shape the study's profile.
- All analysis has been aggregated by service categories. We compared nine commuter operators, six regional operators and five long distance operators.
- GB TOCs in the sample produce 332 m train kilometres and transport 1.030 m passengers. Both in commuter and regional services they achieve very high **load factors** (up to 0.3 passengers per seat on average). In long distance services, the pictures is rather mixed.
- Normalised total cost per train kilometre, taking into account national purchasing power parities, average travel speed, annual running performance of vehicles and the length of trains vary broadly in all three service categories.

International Benchmarking of the Efficiency of GB Train Operations

Summary (2/4)

- GB TOCs normalised **total cost per train kilometre** are at the lower end in commuter and long distance service. In commuter services, GB TOCs' average cost are £ 11.29 per train kilometre, whilst European comparators produce a train kilometre at cost of £ 11.41. In regional services, GB TOCs produce a train kilometre at cost of £ 9.95 (ranking 5% above the average of continental Europe). In long distance services, GB TOCs' average cost is £ 9.65 per train kilometre (below those of European comparators).
- Staff cost and rolling stock maintenance expenditures represent the highest share of GB railway costs. In regional services these cost elements are comparatively high and lead to a less favourable position of GB TOCs. In both areas the study has analysed cost structures and potential drivers in further detail.
- Due to large variances in track access charges across the peer group these costs have been excluded from the comparison.
- Both in commuter and long distance services GB operators benefit from high levels of demand. The **cost per passenger kilometre** is clearly at the lower end of the spectrum.
- The concepts of managing rolling stock are quite different in GB. Most countries fully own their fleet and maintain it in-house; although most fleets are partially financed through state grants, operators are free to specify and decide on what type of fleet mix is used.
- The market model for rolling stock in GB is completely different. Specifications are set by national authorities and the fleet is provided by three rolling stock companies. Different contractual arrangements are in place such as wet lease, dry lease and a mix of both.
- In all three service categories, GB **rolling stock maintenance costs** are substantially higher than abroad. In commuter services, the cost per train kilometre is 40% higher, in regional 65% higher. Underlying reasons for this could be a result of fleet complexity and structure, a higher share of diesel trains, shorter trains (in regional service), and a less favourable age structure.

International Benchmarking of the Efficiency of GB Train Operations

Summary (3/4)

- In GB the **cost of a driver per train hour** is significantly higher in all service categories. GB TOCs pay 40% more in commuter services and 12% more in regional services than their mainland Europe comparators in each category.
- Whilst the output per driver, measured in train hours produced, is very competitive in the UK, the **annual cost per employee** is the highest in the sample. The annual full cost of British drivers ranges from £ 49 to 66 k. European comparators spend approximately £ 45k.
- Gross working hours, net working hours and **productive times** of a driver ("driving time") vary significantly. In GB, net working hours are 7% higher than abroad. The average driving time is also 6% higher than at other operators. However, these advantages do not compensate for the high labour cost. In summary, the cost per hour of driving are up to twice as high.
- A number of parameters that impact costs are exogenous and difficult to change (network layout, the location of depots etc.). Nevertheless, a number of issues could be addressed through operations changes, which could have a positive impact on productivity. Among these are time-tabling, roster planning and a number of parameters such as preparation times, check-in and check-out times etc.
- On average, **revenues** from British passengers per passenger kilometre are the highest in all service categories. For example, farebox revenues for commuter services are £ 139 per k passenger-km, whereas passengers at other European operators pay about 45% less. However, the British system is much more user financed than abroad and GB TOCs receive no subsidies in commuter services and less than others in long distance operations. In regional transport, the opposite is true. Regional GB TOCs receive a slightly larger share of revenues as subsidies than European comparators do on average.
- Aspects of **quality** were analysed briefly. A rough assessment of the costs analysed shows that only a small fraction of the total cost, potentially 5 to 10%, is directly linked to quality. It is unclear from this analysis whether higher costs actually result in better quality or if the opposite is true.

International Benchmarking of the Efficiency of GB Train Operations

Summary (4/4)

- The comparability and the completeness of quality indicators and customer surveys is still limited and requires further research. However, it seems that GB TOCs do not provide train operations at lower levels of quality than their other European comparators. While punctuality is comparably good, some customer satisfaction values are rather low, especially in commuter services.

Content

- Summary
- **Background and objectives**
- Scope of the study
- Methodology
- Peer group
- Cost
- Revenues
- Quality

ORR has commissioned civity to undertake an international benchmarking of the efficiency of GB train operations

Background and objectives

In March 2012, the ORR commissioned civity to undertake an international benchmarking study on the cost, revenue and performance of GB train operations. The assignment emerged from Sir Roy McNulty's Rail Value for Money (VfM) study which made a range of recommendations to the rail industry to improve its efficiency and value for money. The ORR and the Association of Train Operating Companies (ATOC) wanted to better understand the relative costs, revenues and performance of GB Train Operating Companies (TOC) compared to other European operators.

This study builds on previous analysis from the VfM study which provided an overview rail cost, revenues and performance on a system level. This study compared GB train operations with train operations in France, the Netherlands, Sweden and Switzerland. Key findings include:

- GB's supply (train kilometres) and demand (passenger train kilometres) are among the highest in the sample but resulting in comparatively low train utilisation
- The total cost of train operations are the second lowest in sample; splitting total costs into train staff, operation and customer management as well as overhead showed that GB had lower costs than study comparators in all functions
- GB passenger fare box revenues are at the upper end of peer group comparisons

Given this background, this new study will be particularly useful in helping TOCs and ORR to better understand the potential levels of train operating costs and performance that could be achieved in the future. This requires more in-depth knowledge about the levers and structural conditions such as franchising practices, cultural differences etc. In order to promote efficiency improvement, TOCs shall be encouraged to learn from each other and to exchange good practices, at least to the extent possible within the limits of competition.

The study further develops the analysis undertaken in VfM

Background and objectives

In 2010, civity was commissioned to undertake analysis titled "International whole industry including train operations cost benchmarking". This analysis, providing mainly quantitative input to Sir McNulty's Value for Money study, was a comprehensive approach which attempted to reflect the full picture of cost, revenues and performance for train operations including rolling stock as well as infrastructure on a national and system level.

Due to the broad scope and limitations in time and resources, the VfM train operations benchmarking could not explore cost and performance at a more detailed level. To gain more in-depth insight into cost and performance, this study was commissioned. Several improvements to the earlier studies were to result from this study:

- Collect more data from TOCs first-hand instead of relying primarily on existing data sets, e.g. data from DfT
- Achieve more complete breakdowns of train operations cost and revenues
- Gather further information beyond punctuality on the output/performance of the system
- Move away from a highly aggregated perspective and analyse more specifically by network segments (commuter, regional, long distance)
- Zoom into a production perspective, taking into account capacity provided (e.g. cars, seats)
- Focus on the most important parts of the value-chain (operational functions) and understand underlying cost drivers
- Normalise for structural factors and assure good comparability
- Enrich the findings from quantitative benchmarking through more contextual evidence

We have intensively worked with the ORR, ATOC, GB and international train operators to achieve these goals and it is commendable and very positive that so many companies cooperated so openly.

The study further develops the analysis undertaken in VfM

Background and objectives

The results stated in the McNulty Value for Money (VfM) study are in general confirmed in this analysis. As shown in the VfM study, the utilisation of trains is low for regional services; in the VfM study the GB cost per train kilometre was the second lowest in the sample, and in this study is the lowest. This low level of utilisation increases the cost per passenger kilometre for regional services which is also consistent with the previous analysis. Rolling stock costs remain highest in the sample, as do farebox revenues per passenger kilometre. However, the overall picture set out in this analysis is more accurate than the VfM study as it has been conducted and presented segmented by different service types for all peers.

These results will be presented in the following chapters, starting out with information on the approach and the peer group and then explaining the results concerning cost, revenues and performance.

Content

- Summary
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- **Scope of the study**
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The study disaggregates all data by dividing the network into two service categories

Scope

Network characteristics

Cost

Scope

The study focused on three different types of passenger services: commuter, regional and long distance. We have considered various criteria such as travel speed and stops to define the different service categories. High speed and freight were excluded. All cost, revenue, performance and productivity data have been allocated to these services to assure a like-for-like comparison and move away from a total network perspective.

We have collected full cost for train operations covering all cost categories which are directly related to the provision of train operations. Some of these costs have been excluded from further analysis as they differ too much due to national practices (different level of track access charges, provision of transport police is only charged in few countries etc.)

Costs have been allocated to the three service categories commuter, regional and long distance and are analysed by each category.

All costs have been normalised by purchasing power parities. We also applied a normalisation of drivers' cost by travel speed. (For more details please see explanations on normalisation).

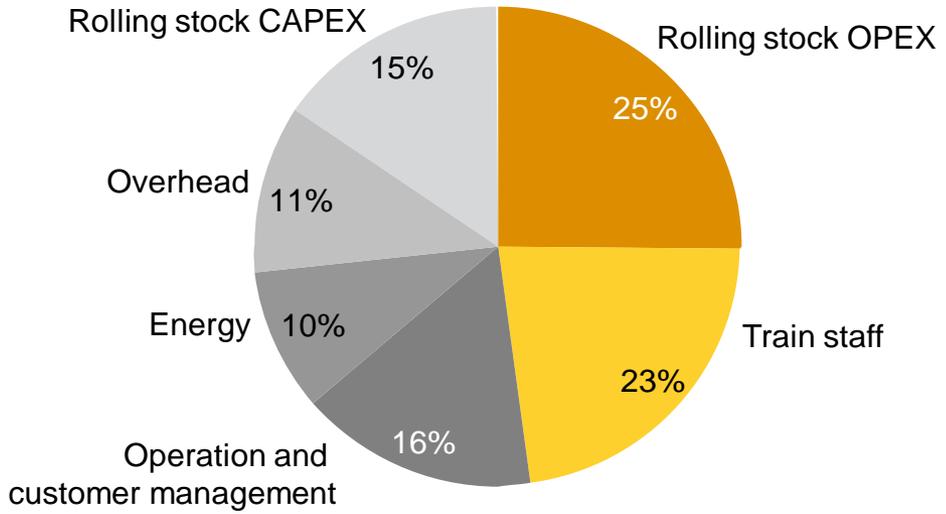
We have agreed to focus on train staff and rolling stock operational expenditures

Scope

Cost (continued)

Scope

The typical major cost categories of our analysis (average across companies) are shown in the diagram below. It has been agreed to have a more in-depth investigation into the cost of rolling stock operations and train staff (drivers and conductors). Those functions represent 48% of the total cost which are mainly managed by the train operating companies.



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For a full picture revenues and performance have been analysed as well

Scope

Revenues & subsidies

Scope

All revenues received by train operators have been included. They consist of revenues from ticket sales (fare box revenues), state subsidies and ancillary business such as car parks.

Performance

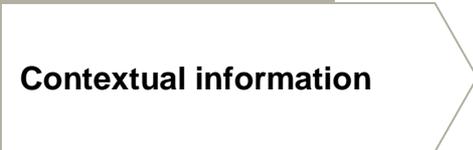
We have compiled cost and revenue data together with quality indicators. Due to the nature of different measurement concepts and the complexity of quality assessments, this part of the analysis is limited. However, it draws on quality indicators reflecting passenger satisfaction such as punctuality, cleanliness and crowding.

Output

Different metrics have been used to normalise for the level of output each operator produces. Train-kilometres are a useful indicator reflecting total production and drive most cost elements. The length of trains has been considered through a normalisation step. Passenger kilometres best represent demand. In- depth analysis of train staff uses train-hours as output.

Contextual information has been gathered to explain differences between operators

Scope



Contextual information

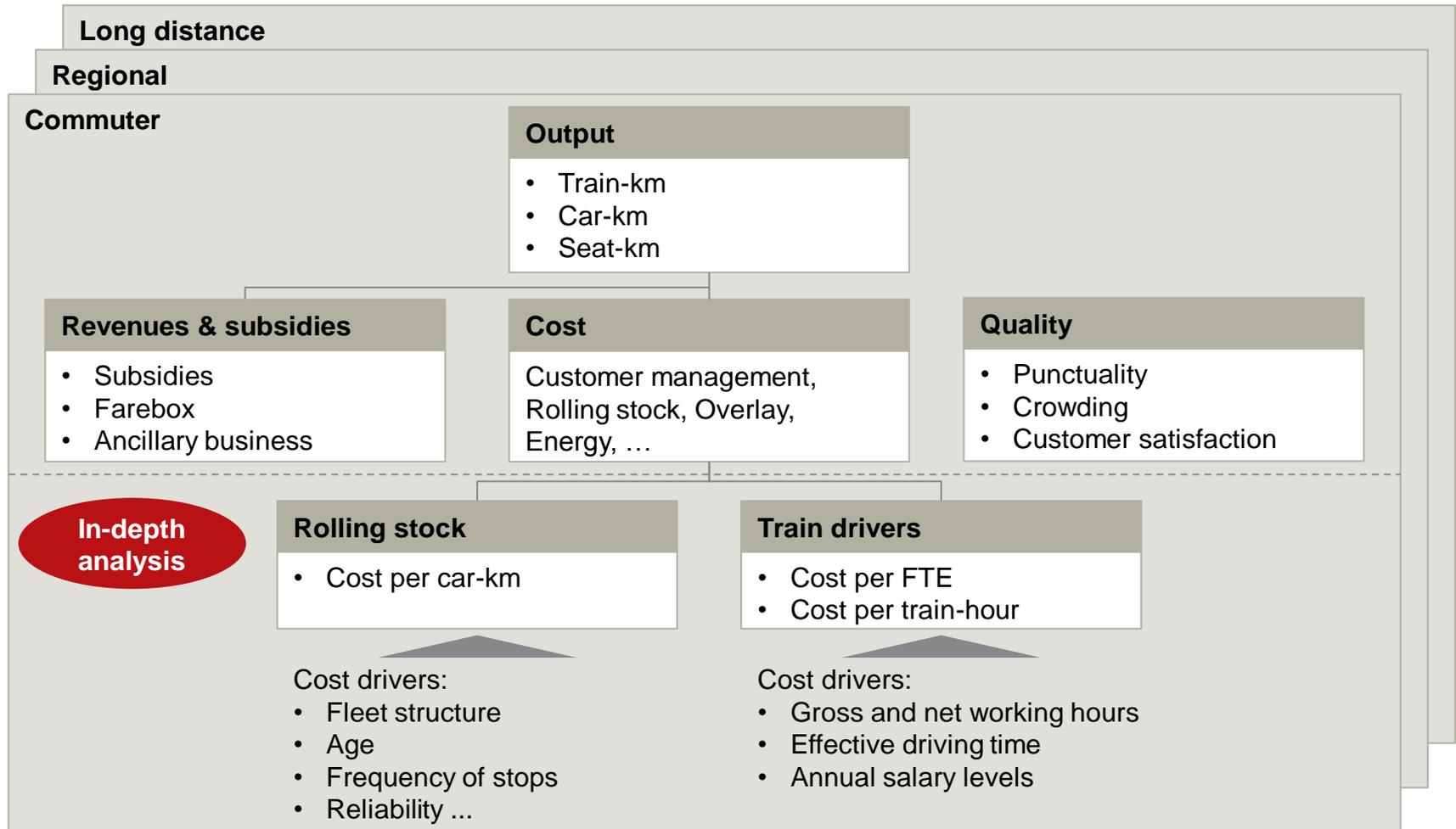
Scope

Contextual information has been gathered for a wider scope interpretation:

- Information on scale and services of the train operating companies in the sample
- Geographical and spatial conditions, e.g. dense urban agglomerations, hubs and spokes, boundaries etc.
- Market structure, including the degree of competition, number of operators and market shares
- Contractual relationships and the impact on incentives for operators, entrepreneurial freedom, standardisation of fleet etc.
- Aspects on labour markets, e.g. flexibility of working conditions, pension cost, influence by labour unions, TUPE or similar
- National railway policies, including aspects such as political support of the railway system, funding and investment

We performed in-depth analysis that focuses on Rolling Stock OPEX and train drivers' cost

Overview

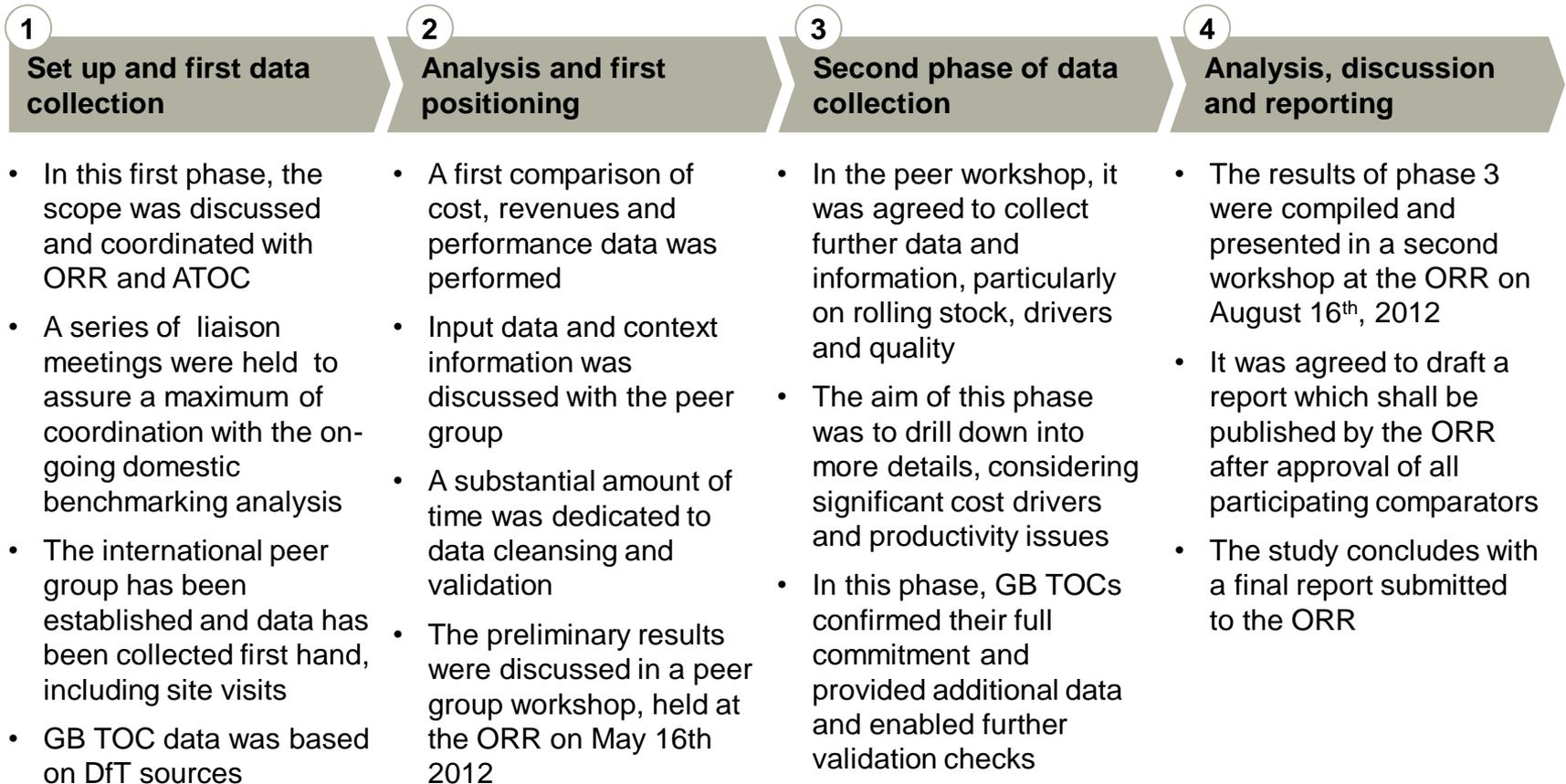


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The benchmark analysis was conducted in four steps

Approach



Definitions of data collected for the study

Output data

Output element	Definition
Train-km	Gross production volume in passenger transport by trains. Numbers include empty rides from and to the depot to the first and last station. They exclude train rides to workshops for maintenance
Car-km	Gross production volume in passenger transport by cars (coaches, railcars, trailers, individual cars of EMUs/DMUs), including empty rides
Passenger-km	Total passenger demand
Seat-km	Gross production volume in passenger transport by seats, including empty rides
Travel speed	Overall average journey speed for passengers between origin and destination of trains
Circulation speed	Overall average train speed, including all time-tabled and other operational rides
Peakiness of services	Maximum number of trains on the network in peak time

Definitions of data collected for the study

Cost data

Cost element (included)	Definition
Overhead	Finance & controlling, human resources, procurement, IT, legal services, public relations, safety and compliance, property management
Customer management	Planning of traffic supply, product development, marketing, sales, customer information and support
Operation management	Operational administration, train and staff disposition incl. crew management, time-tabling, duty rostering, exception handling
Train staff	Full staff costs including wages, bonus, paid overtime and social security cost (e.g. unemployment insurance, pension scheme, health insurance) and excluding training, clothing, travel expenses for drivers, conductors and train crew
Rolling stock maintenance	Maintenance (heavy & small maintenance, overhaul, repair), material, cleaning, provision; in the UK where maintenance costs might be included in leasing rates we have asked to extract and allocate them to OPEX
Rolling stock capital expenditures	Depreciation and interest, rent or leasing; in the UK, leasing rates were carefully checked for the share of capital expenditures and separated
Energy	Traction power, fuel including fixed energy cost included in track access charges

Definitions of data collected for the study

Cost data

Cost element (excluded)	Definition
Track access charges	Track access charges, stations and other user fees are excluded because they vary significantly and depend on national charging schemes
Station management	Costs for operating stations and maintenance activities if applicable
Franchise premium	Payments to the government to operate a franchise are excluded because they don't exist at European comparators
Rail replacement	Rail replacement cost for cancelled train service is excluded because they were only partially provided in the dataset
Transport police	Transport police (security personnel on-board, at stations etc.) is excluded because this cost position is handled very differently by individual companies and is mainly an issue in urban areas
Catering and car parks	Costs for food and beverages (on-board, at stations etc.) and car parks are excluded because they are not applicable to all train operating companies

Definitions of data collected for the study

Revenue data

Revenue element	Definition
Farebox	All revenues received from ticket sales
Government	All revenues received from grants and franchise payments
Ancillary business	Food & beverage, real estate, retail, advertisement etc.

A substantial amount of data was collected directly from peers

Data sources

- All data for the international comparators have been collected directly through questionnaires and verified through bilateral communication.
- Data for GB TOCs were provided by the ORR. These data were collected by the ORR from various sources such as National Rail Trend, Passenger Focus and Department for Transport.
- We have validated the allocation of the data to our cost definitions. Furthermore, we have collected additional data from TOCs through templates and validated these data with each TOC.
- All data relates to 2011. For one train operator, data was collected for 2010 due to extraordinary circumstances which impacted costs, revenues and performance. According to the operators, 2011 data was not distorted by any unusual event.

Since the study is based on commercially sensitive data most of the results presented are anonymised

Confidentiality

- This study builds on a fair amount of commercially sensitive data which has been provided directly by the participating companies.
- In order to protect the commercial interests of participants, all quantitative information is displayed in relative numbers and has been completely anonymised. For this reason, GB train operators are shown only with minimum, maximum and average values. Individual anonymised values by company are only shown for supply, demand and driver cost. Additionally, the letter coding applied in various sections of the report is altered to achieve maximum confidentiality.
- Tripartite agreements have been signed between the ORR, train operating companies and civity to guarantee confidentiality.

Comparability is assured by normalising for a limited number of exogenous factors

Normalisation approach

Normalisation of circumstances **not manageable** by company

PPP
Output
Travel speed
Running performance
Train length



Making the data comparable

No normalisation of parameters **manageable** by company

Fleet condition
Staff disposition
Net working times



Revealing the changeable differences

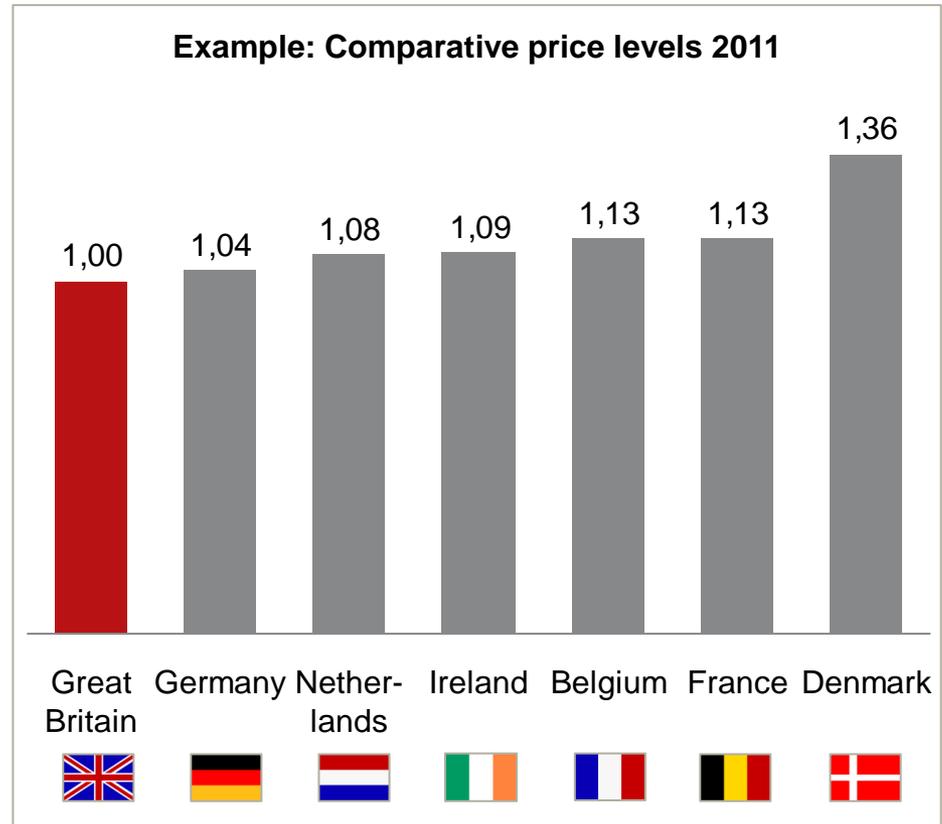
Explanatory factors

Creating an intelligent comparability and finding the differences which are *changeable* at the same time

OECD Eurostat's purchasing power parities have been applied to eliminate differences in national price levels

PPP normalisation

- Often, income or Gross Domestic Product (GDP) levels across countries are compared by applying exchange rates only
- However, exchange rates only partly reflect relative prices of goods that are domestically consumed
- Purchasing Power Parities (PPPs) are currency conversion rates that convert to a common currency and equalise the purchasing power of different currencies. In other words, they eliminate the differences in national price levels
- PPP normalise the respective national cost level that cannot be influenced by the companies compared
- For the study, each countries costs have been converted to GB Sterling and price levels

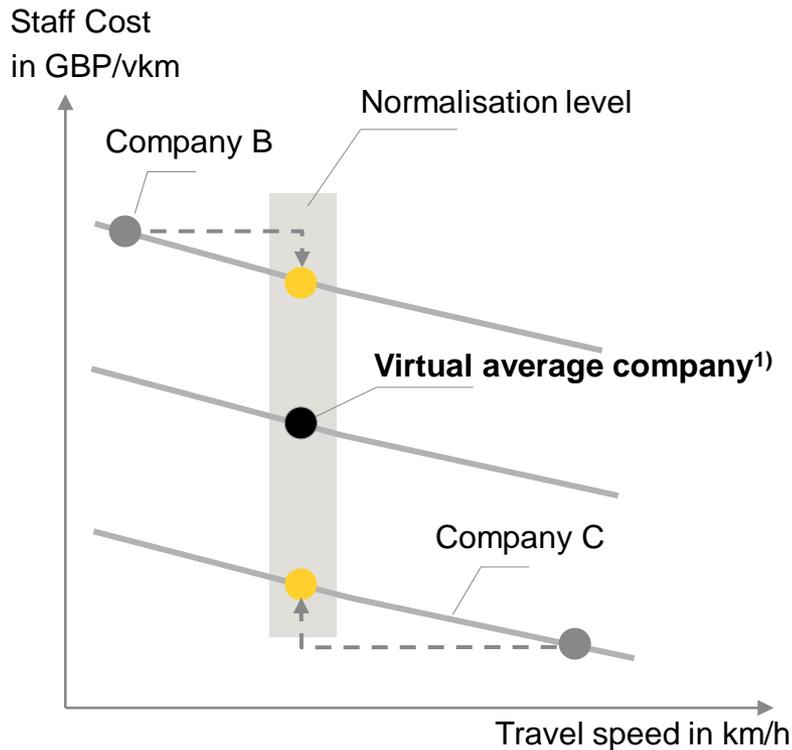


We have used the average travel speed to normalise drivers' costs when referencing to train kilometres

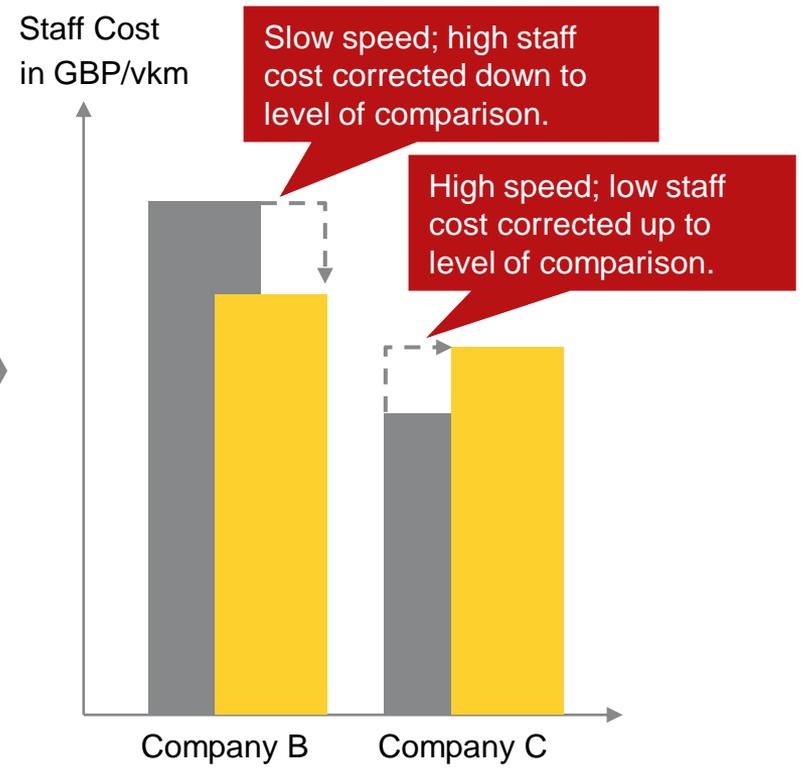
Normalisation process

ILLUSTRATION

Cost function



Normalisation



■ Original cost ■ Normalised cost

1) Normalisation separately carried out for each of the three service categories

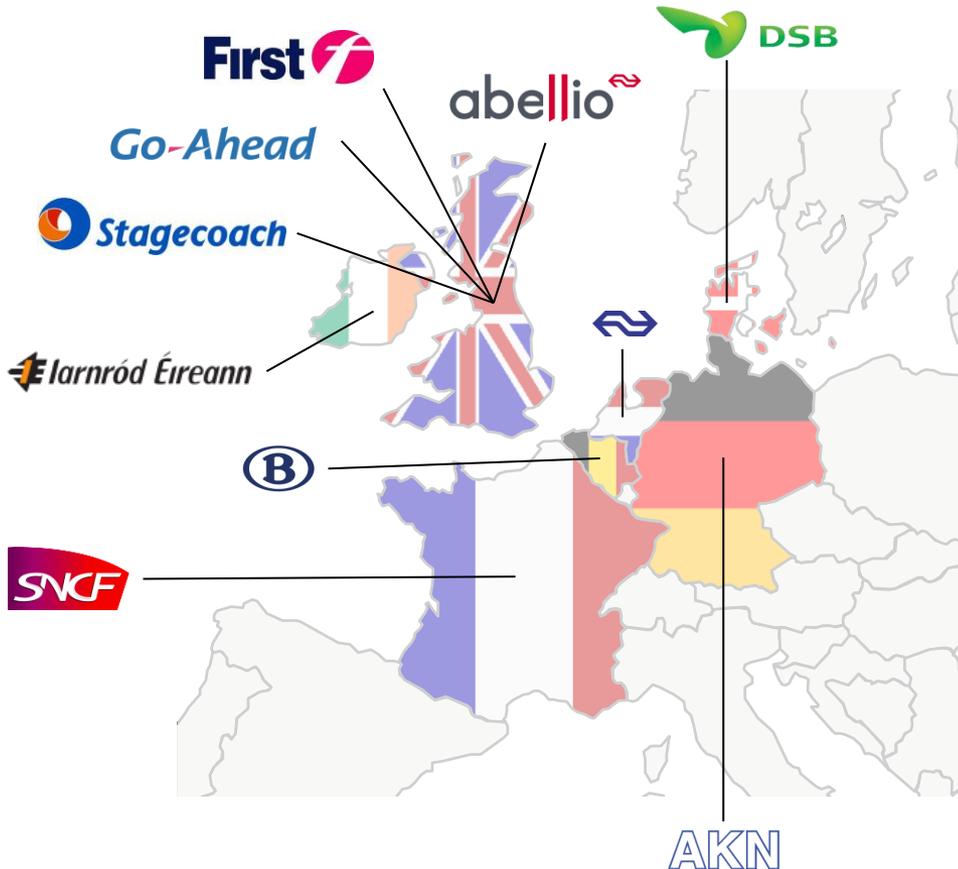
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Seventeen train operators committed to the study

Peer group



- The study includes 11 GB franchises (currently of the four companies Abellio, FirstGroup, Go-Ahead and Stagecoach) as well as six European train operators
- The selection was based on criteria such as transferability of findings as well as availability and robustness of data
- Some GB franchises did not join the study. Partial train service categories existing at operators were not included as data availability was insufficient
- The GB operations included in the study provide market coverage of 61 % in commuter, 68 % in regional and 47 % in long distance rail services (based on train kilometres)
- Countries overlap partially with comparators used in Value for Money study (UK, The Netherlands and France)

In Belgium, domestic passenger transport is provided by SNCB

SNCB, Belgium



Network

- Comparably small network with mainly regional traffic and small share of commuter service in the Brussels area
- 80 million train-km and 220 million passengers p.a.

Market and competition

- SNCB is the only Belgian operator in passenger transportation, providing primarily regional services
- The company is state-owned and part of SNCB Holding. Internally, SNCB Mobility organises domestic passenger transport

Contractual arrangements

- SNCB holds a five-year management contract with the national government. It sets out a minimum level of passenger services, such as the number of train kilometres and trains per day
- Quality related indicators have been agreed to, but there is no bonus or penalty scheme in place that is linked to these targets.
- SNCB is free to establish the annual timetable and procuring fleet.

NS Reizigers is the Dutch state operator, accounting for 85 % of domestic passenger services

NS Reizigers, The Netherlands



Network

- Network is comparably expansive with mainly regional traffic and a high share of commuter service in the Amsterdam, Den Haag, Utrecht, Rotterdam region
- 110 million train-km and 314 million passengers annually

Market and competition

- Tendering of regional lines was introduced in 1998. Concessions to regional operators is given by provinces and municipalities
- NS Reizigers remained the biggest rail transport operator with a market share of over 90 %. Other operators in the Netherlands are Arriva, Veolia, DB Region and Connexion

Contractual arrangements

- NS holds a passenger operations concession for the main network (2005-2015)
- Under the franchise, NS annually submits a transport plan to the ministry including annual objectives for growth and quality; a penalty scheme is in place
- NS is reasonably free to design its annual time-table. The government checks conformity with both the requirements of franchise agreement and to policy objectives

In France, the markets for long distance services as well as commuter services in Paris are currently not liberalised

SNCF, France



Network

- Large network with commuter, regional, long distance and high speed service; Paris is the central traffic hub, several cross-border connections are active
- 110 million train-km and 870 million passengers annually

Market and competition

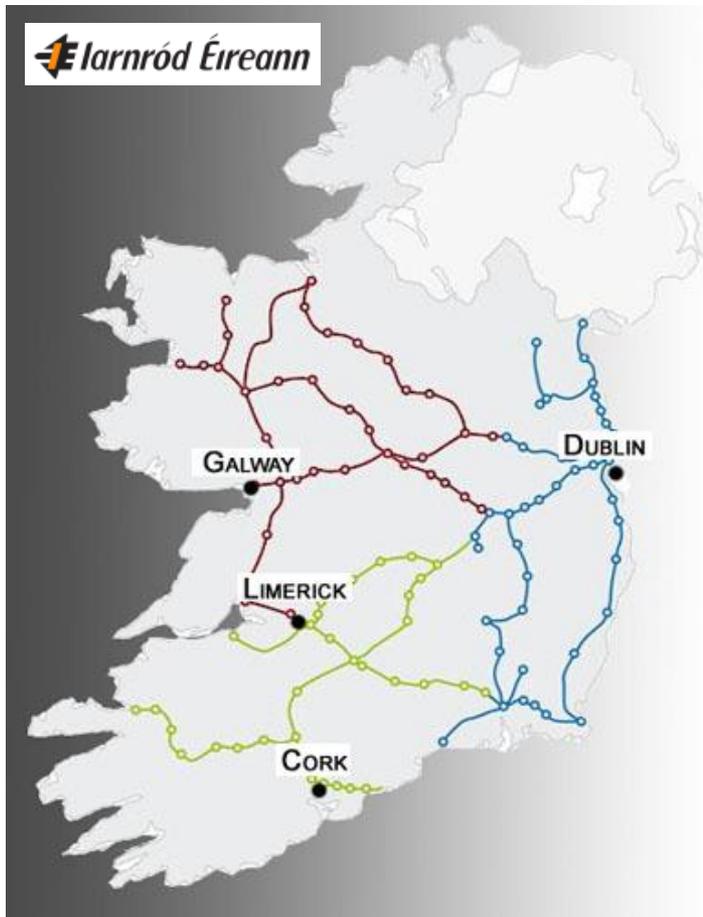
- Commuter services in Paris are provided by two state-owned operators: SNCF and RATP, without any competition between them. The only long distance operator is SNCF.
- Both markets are currently not open for competition; SNCF is the predominant supplier.

Contractual arrangements

- A 4-year contract has been signed between STIF and SNCF for commuter services; A 3-year-contract was signed between the Ministry of Transport and SNCF for long distance services
- These contracts set out the level of subsidies and define the timetable.
- Quality related indicators have been agreed to, including a bonus / malus scheme.

Irish Rail is a fully integrated operator providing all passenger rail services

Irish Rail, Ireland



Network

- Medium-sized network with commuter, regional and long distance service; overall utilisation is comparably low
- 16 million train-km and 37 million passengers annually

Market and competition

- IÉ is the only rail operator for passenger services in Ireland. The international service with Northern Ireland is run as a joint venture ("Enterprise").
- Ireland's exemption from "separating the rail" expires in March 2013 (2001/14/EC Directive)

Contractual arrangements

- A contract with the government is currently being developed
- There is no multi-annual contract – funding is agreed to on an annual basis
- There are different funding sources, e.g. for national and Dublin services, fleet, safety

The German operator provides commuter services in the Hamburg area without competition on its network

AKN, Germany



Network

- Smallest network in sample with commuter service only, suburban connections to traffic hub Hamburg, seat utilisation comparably low
- 3 million train-km and 8 million passengers annually

Market and competition

- AKN is a regional operator in the Northern part of Germany and owned by the German States Schleswig-Holstein and Hamburg. Services are directly awarded without any competition.
- AKN owns the network on which the service is provided and – in addition to Ireland – is the only company in the sample which is only separated economically, but not legally

Contractual arrangements

- A contract with the public transport authority (PTA) is in discussion, there is a compensation of budget deficit; the annual budget is approved by the advisory board
- Quality standards are set with respect to punctuality, cleanliness etc., but no bonus / penalty scheme is applied
- Establishing the timetable and changes are subject to discussion with the PTA

The Danish market for passenger services is still dominated by DSB

DSB, Denmark



Network

- Comparably small network with commuter, regional and long distance service, seat utilisation on the lower end
- 59 million train-km and 160 million passengers annually

Market and competition

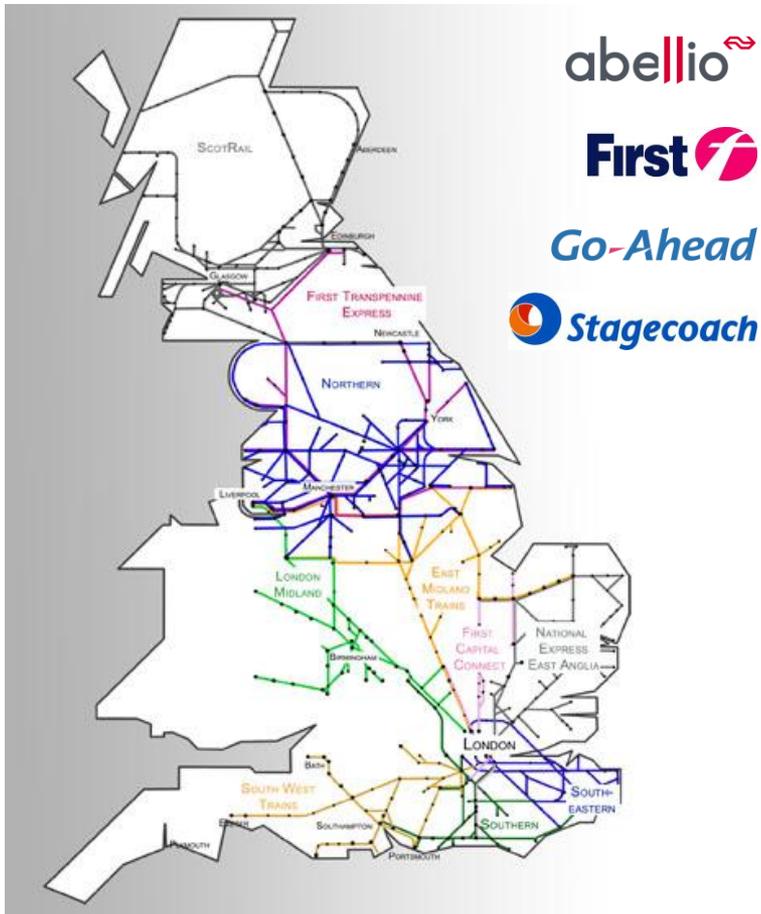
- Commuter and long distance services are provided by DSB only
- With respect to regional services, there is competition to a smaller degree, e.g. one franchise in Jutland operated by Arriva

Contractual arrangements

- DSB operates through 10-year contracts with the government with each one contract for S-tog and for all other services
- DSB receives a guaranteed amount of money each year comprising efficiency gains
- Current standards are seen to be on a rather high level (punctuality, cancellations), while future targets are reasonable and in a generally achievable range

GB is the only market in the sample that has been completely liberalised

GB TOCs, United Kingdom



Network

- Comparably large network with commuter, regional and long distance service, several urban hubs with partially very high seat utilisation
- 297 million train-km (sum of considered TOCs)
- 800 million passengers (sum of considered TOCs)

Market and competition

- The UK Market has been completely liberalised and mainly franchised by the central government; 19 operators provide passenger services
- More devolution is planned within Network Rail to better align TOCs and infrastructure management
- 70-75 % of services will be re-franchised within the next few years

Contractual arrangements

- Each franchise holds a contract with the Department for Transport. Today's franchise periods are up to 7 years, they shall be extended to 12-15 years
- Bonus / malus arrangements are generally applied
- Franchises in this sample are large with a range of 15 to 45 mio train kilometres

Comparators have specified their data for defined service categories commuter, regional and long distance

Service categories

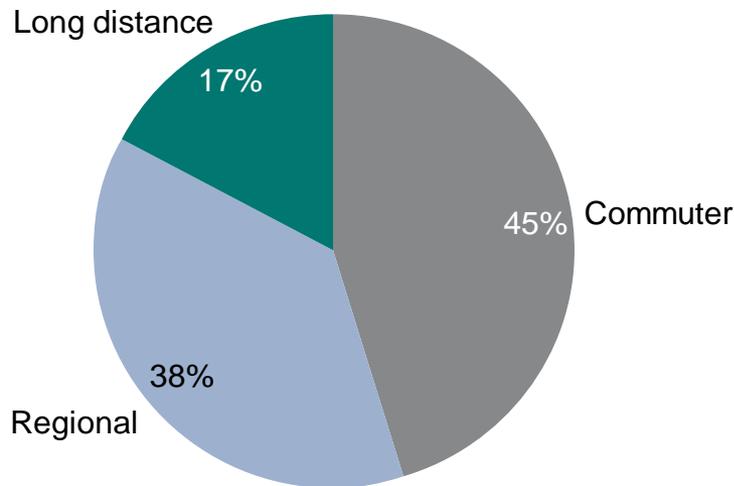
Characteristics	Commuter	Regional	Long Distance
Length of journeys	< 50 km	< 150 km	>= 150 km
Maximum travel speed	< 100 km/h	120-140 km/h	> 160 km/h
Average travel speed	40 km/h	60 km/h	80 km/h
Average journey time	1 h	2h	> 2h
Typical connections	Connects large cities with medium-sized towns	Connects medium-sized towns with small towns and villages/city center and suburban railway center	Connects metropolitan areas with large cities
GB TOCs providing data	First Capital Connect Greater Anglia South West Trains Southern London Southeastern	First ScotRail Northern London Midland	First Transpennine Express East Midlands Trains East Coast Mainline
International peers providing data	5	3	3

Commuter and regional service of all comparators dominate with regards to volume and cost

Service categories

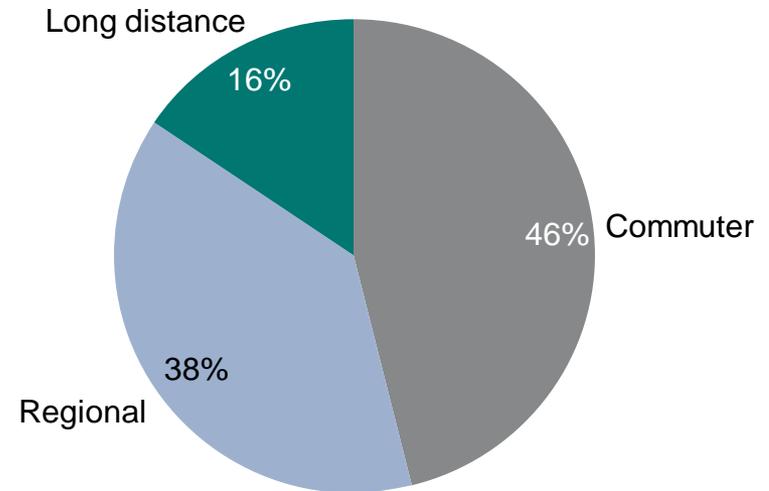
Output

Passenger-km in %



Cost¹⁾

GBP in %



1) Including overhead, customer management, operation management, rolling stock CAPEX, rolling stock maintenance, train staff and energy.

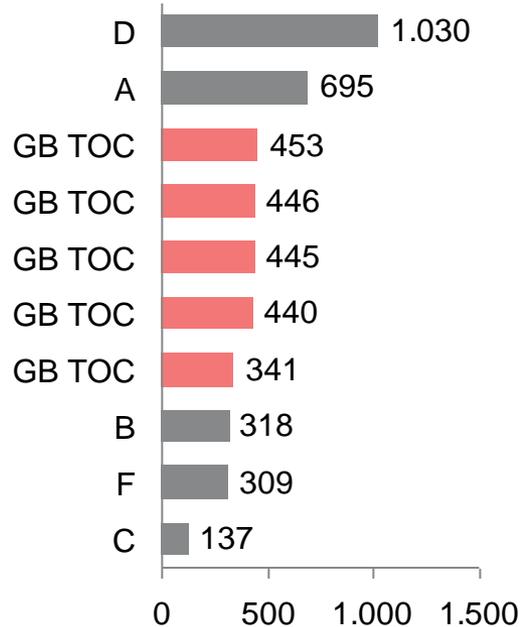
Load factors are highest in GB commuter services

Traffic supply and demand

The letter codes represent European train operating companies outside of GB.

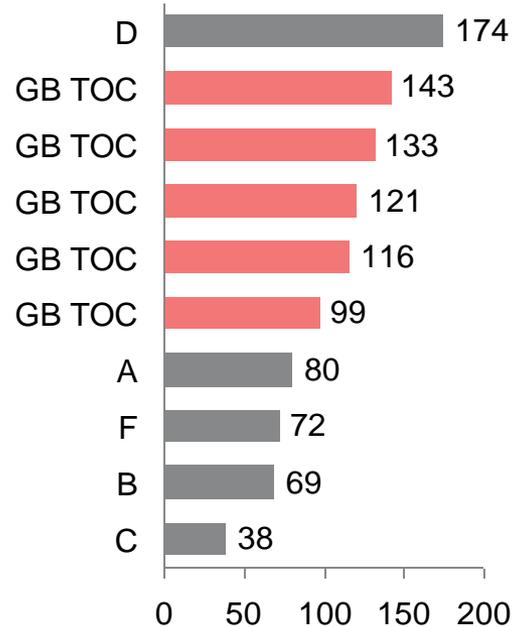
Seat capacity

Seat-km per train-km



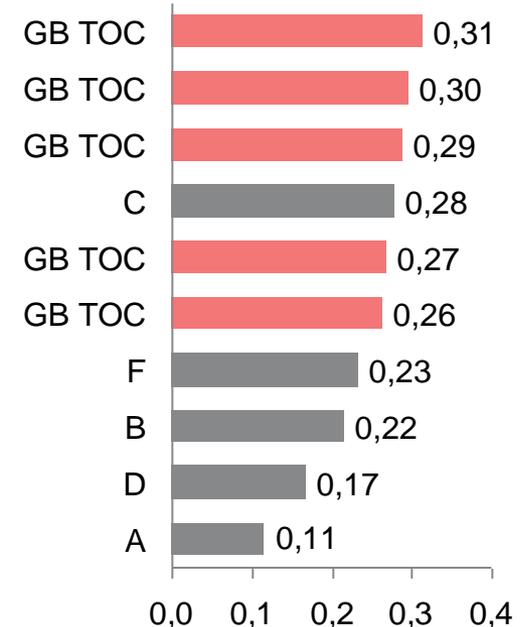
Train utilisation

Passenger-km per train-km



Load factor

Passengers per seat



Commuter

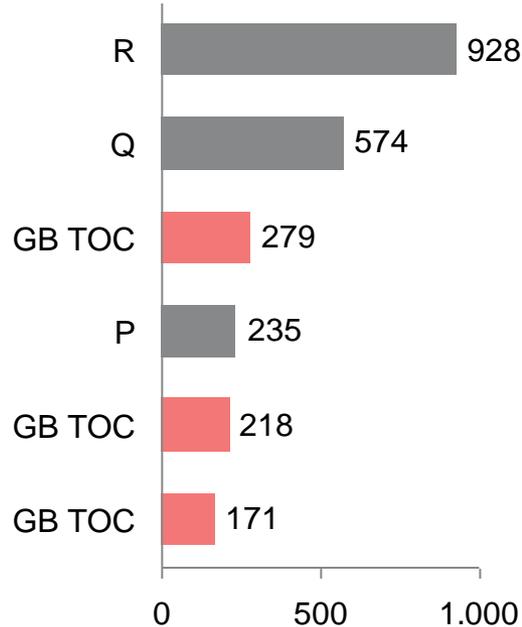
In regional service, GB TOCs' load factors are comparatively high

Traffic supply and demand

The letter codes represent European train operating companies outside of GB.

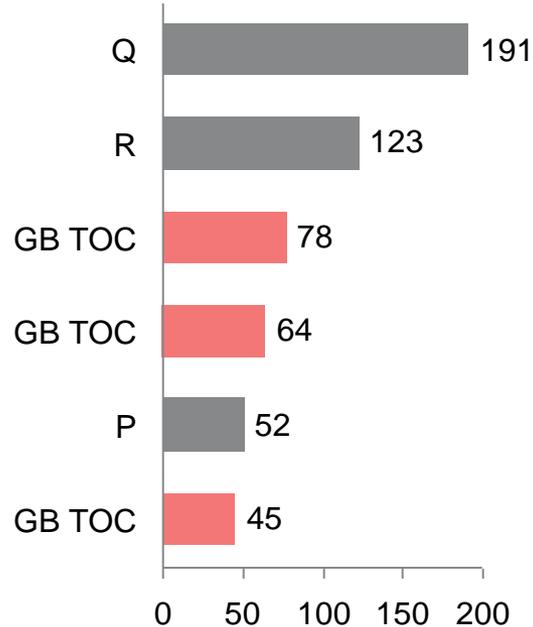
Seat capacity

Seat-km per train-km



Train utilisation

Passenger-km per train-km



Load factor

Passengers per seat



Regional

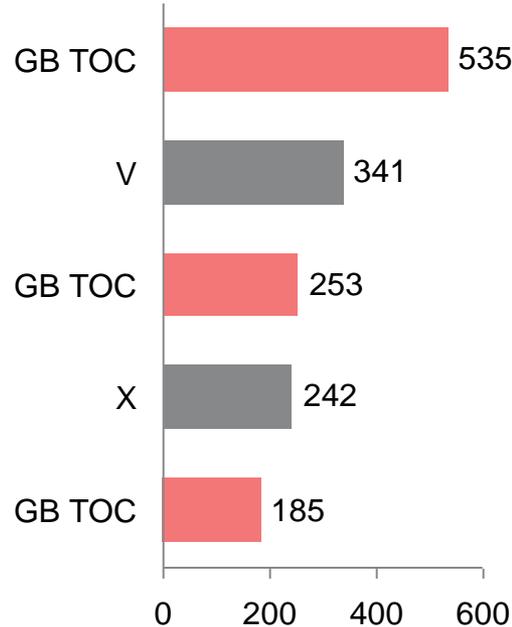
GB long distance TOCs can be found on either end end of supply and demand levels

Traffic supply and demand

The letter codes represent European train operating companies outside of GB.

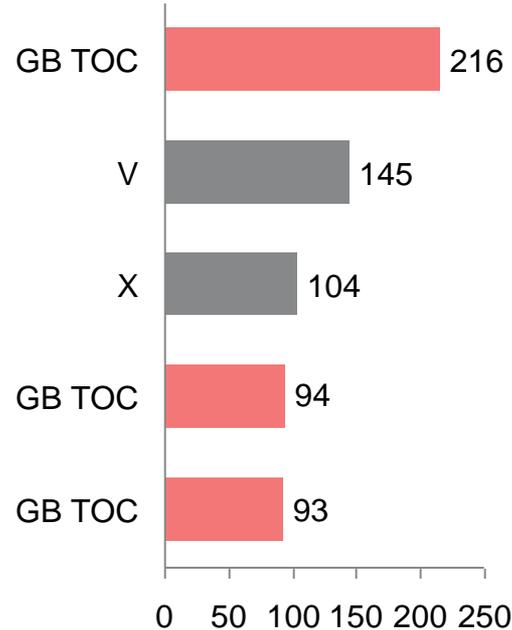
Seat capacity

Seat-km per train-km



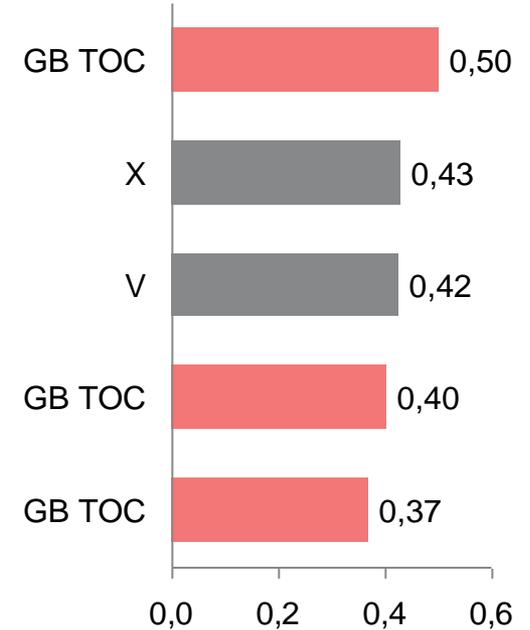
Train utilisation

Passenger-km per train-km



Load factor

Passengers per seat



Long distance

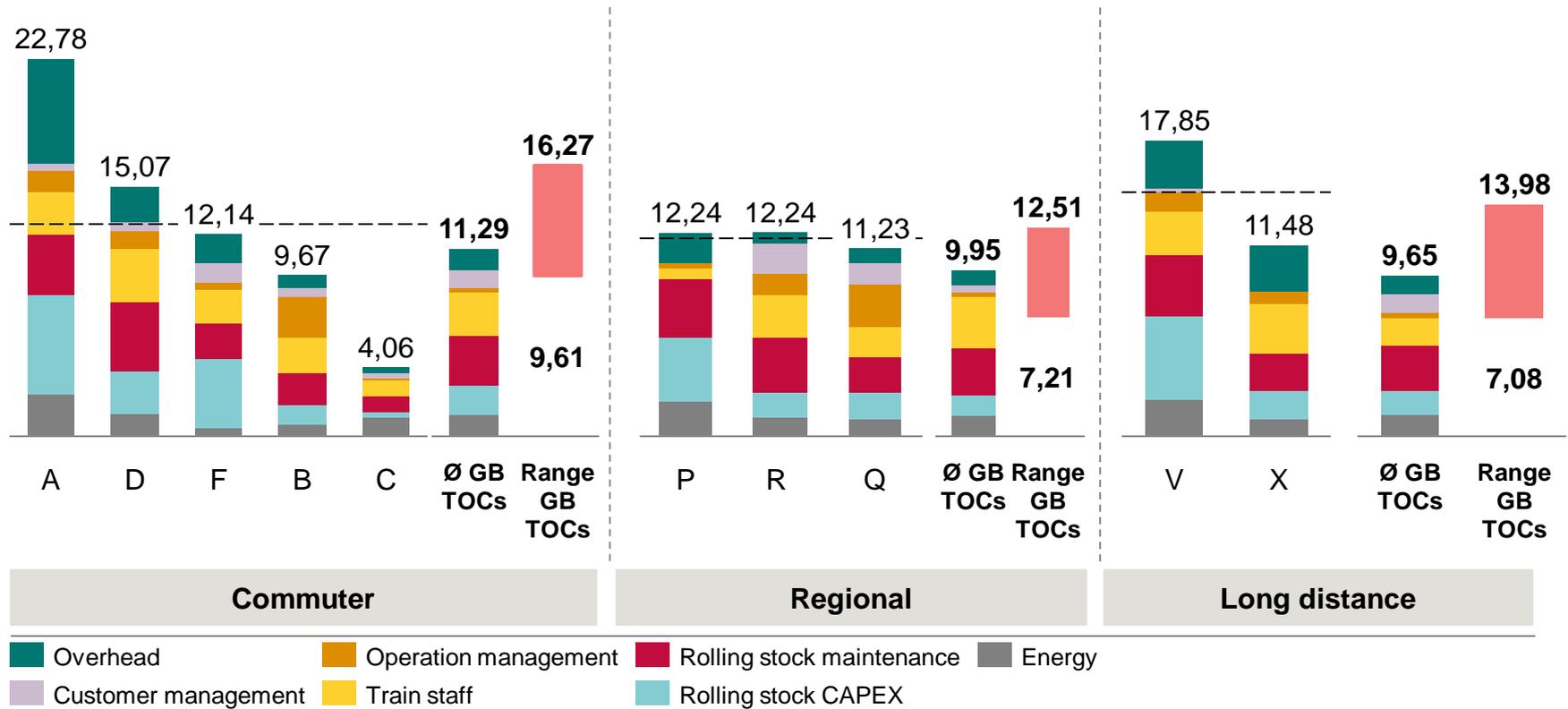
Content

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In all service categories average GB operators' cost per train-km are below average cost of peers

Total cost (PPP normalised)

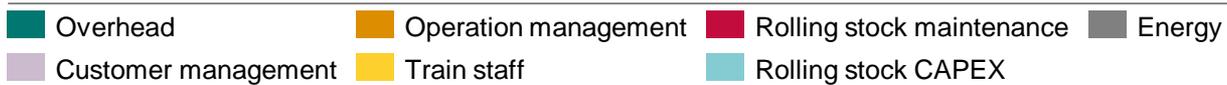
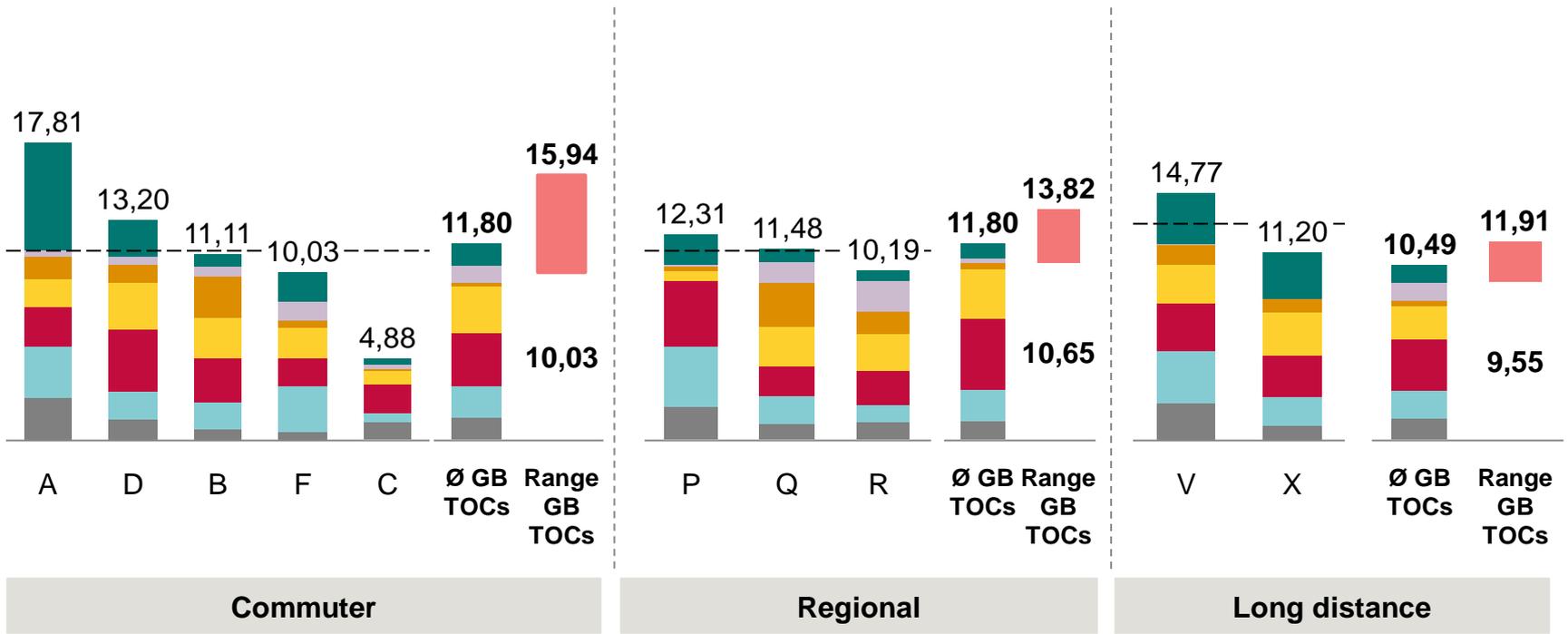
GBP per train-km



In all service categories average GB operators' cost per train-km are in line with average cost of peers, even lower in LD

Fully normalised total cost¹⁾

GBP per train-km

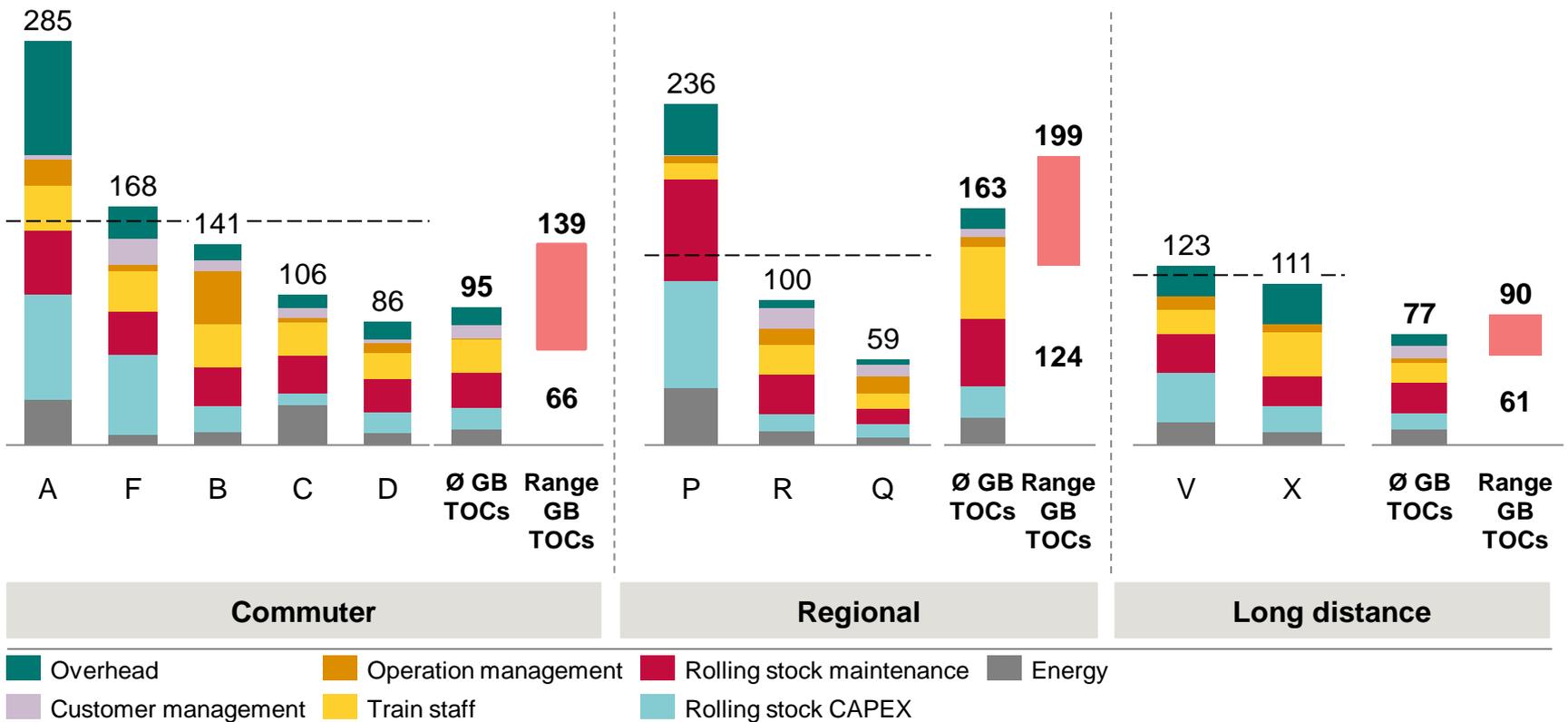


1) Train staff cost normalised over average travel speed. Maintenance and CAPEX normalised over average number of cars per train and over annual running performance per car (running performance normalisation for 50 % of maintenance cost).

Obviously good utilisation of GB commuter and long distance trains results in low cost per passenger kilometre

PPP normalised total cost

GBP per 1.000 passenger-km



Except for regional services GB operators' unit cost are in line with or below comparators' average

Cost of train operations

- **Train operations costs** include all relevant costs linked to operations. Track access charges and other functions such as the provision of a transport police and car park management have been excluded. Track access charges vary between £ 0 and almost £ 8 per train kilometre and are subject to national funding policies. Only one other European operator bears significant costs for transport police, which is why these costs were completely removed.
- The data was **adjusted** for various structural factors:
 - National macroeconomic differences were considered by applying purchasing powers to total cost
 - Drivers' costs were adjusted by average travel speed as slow operations tend to require more time and hence more drivers than lines with higher speeds. For example, for commuter service, the range of travel speeds is between 34 and 64 km/h
 - Rolling stock maintenance costs and rolling stock capex were adjusted by train length (average number of coaches per train). Train lengths in continental European commuter service are between 3 and 7 coaches. In GB, commuter trains of the franchises operate with ~ 6,2 coaches. In regional service, GB TOCs appear to operate much shorter trains than comparators. UK trains run with 2,4 to 4,1 cars while comparators operate with more than twice this capacity.
 - Fixed costs of rolling stock maintenance and capex were normalised by the annual running performance to take the (dis-)advantages of an operators' fixed cost degression into account. In other words, an operator with a high annual running performance benefits from a degression of fixed costs and achieves lower costs per train kilometre. Running performance varies significantly. In commuter service, GB operators' trains run up to 186.000 km per year while the lowest comparator drives 80.000 km per year.

From a demand perspective, GB TOCs show moderate cost in commuter service and lowest cost in long distance service

Cost of train operations

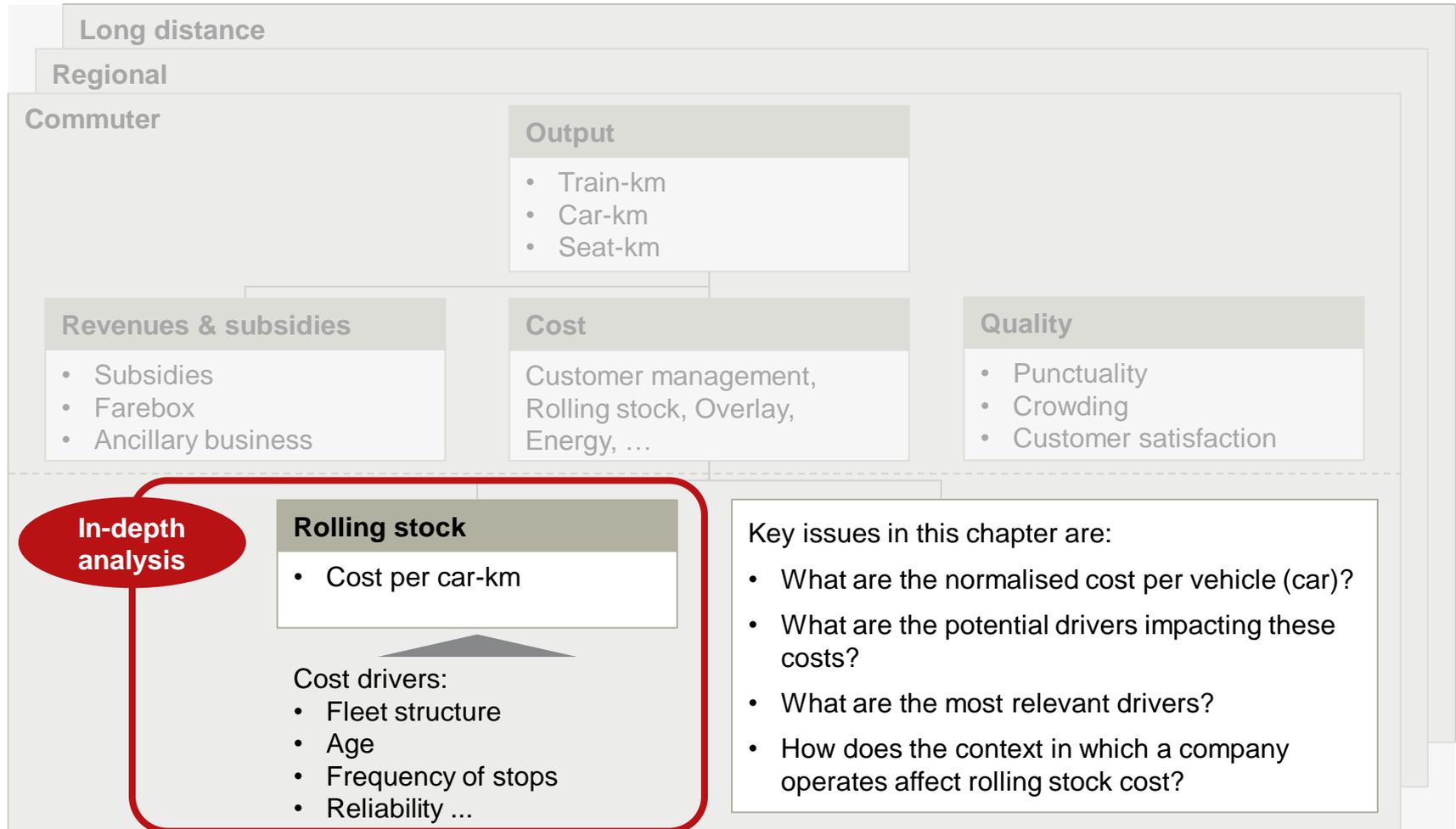
- The fully normalised operations **costs per train kilometre** differ by a factor of four in commuter services. In regional and long distance services, the variation is much smaller. GB operators produce the lowest cost per train-kilometre in long distance services while costs in commuter services are near the average European level. Cost in GB regional service is slightly above the average of others in this study.
- In **commuter services**, operations costs range from £ 10,03 to £ 15,94 per train kilometre. GB TOCs are at the lower end of the sample (excluding company C as an outlier), spending on average £ 11,80 per train kilometre. Major cost differences can be identified in all cost elements: overhead functions vary by a factor of 6 (excluding A as an outlier), energy by a factor of 5, train staff by a factor of 4 and rolling stock capex and opex by a factor of 3.
- In **regional services**, GB TOCs costs per train kilometre are 5% above the average of European comparators. The European average, excluding GB, is £ 11,33, whilst GB TOCs produce a train kilometre at £ 11,80. GB costs are higher as a result of higher train staff and rolling stock opex. In contrast, GB TOCs have the lowest cost for long distance services.
- The comparison does not take the number of **seat kilometres** offered into account. Train length was taken in to account, while the effect of double stack cars was not. Three of the countries outside GB extensively deploy double stack cars which increases capacity provided. These countries do have an advantage compared to others as the capacity offered will be produced at comparatively lower costs (doubling the seats on a car does not lead to a proportional increase in rolling stock expenditures).
- Another way to look at unit cost is from a demand perspective, taking into account the extent to which passengers are travelling by train. If operators achieve high passenger kilometres and a good utilisation of the capacity offered, **costs per passenger kilometre** are comparatively low. This is the case for GB operators in commuter and long distance services, where GB TOCs are achieving lowest cost per passenger kilometre.

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In an in-depth analysis we focus on Rolling Stock maintenance and train drivers' cost

Overview



International peers mainly own and maintain fleets themselves

Rolling stock management (1/2)

	Fleet ownership	Decision making	Outsourcing	Remarks
AKN	Fleet is owned and financed by AKN		Maintenance and cleaning is done in-house (high quality and customer satisfaction)	Fleet is rather “simple” (no toilets, air-condition etc.)
DSB	Around 85% of the fleet is purchased by DSB, rest leased due to particular problems	DSB decides on rolling stock investments/ standards (strategy change to multiple units)	Maintenance is done in-house by an affiliated company; cleaning is sub-contracted	DSB has renewed its commuter fleet and is in the process of replacing long distance fleet
Irish Rail	Completely owned by IE	Investments are proposed by IÉ (business case) and approved by the government	Technical expertise in-house while running maintenance/overhaul is contracted	Irish Rail has in recent years renewed its DMU fleet and coaches
NS Reizigers	Fleet is owned by NSR or leased through an internal leasing company	NSR is free in deciding about fleet investments but no subsidies are granted	NedTrain is a company of NS Group providing all rolling stock maintenance	
SNCB	Completely owned by SNCB	No external specifications	Maintenance is in-house	Significant investments since 2008 to modernise fleet

In the UK, fleet standards are specified by the Department for Transport

Rolling stock management (2/2)

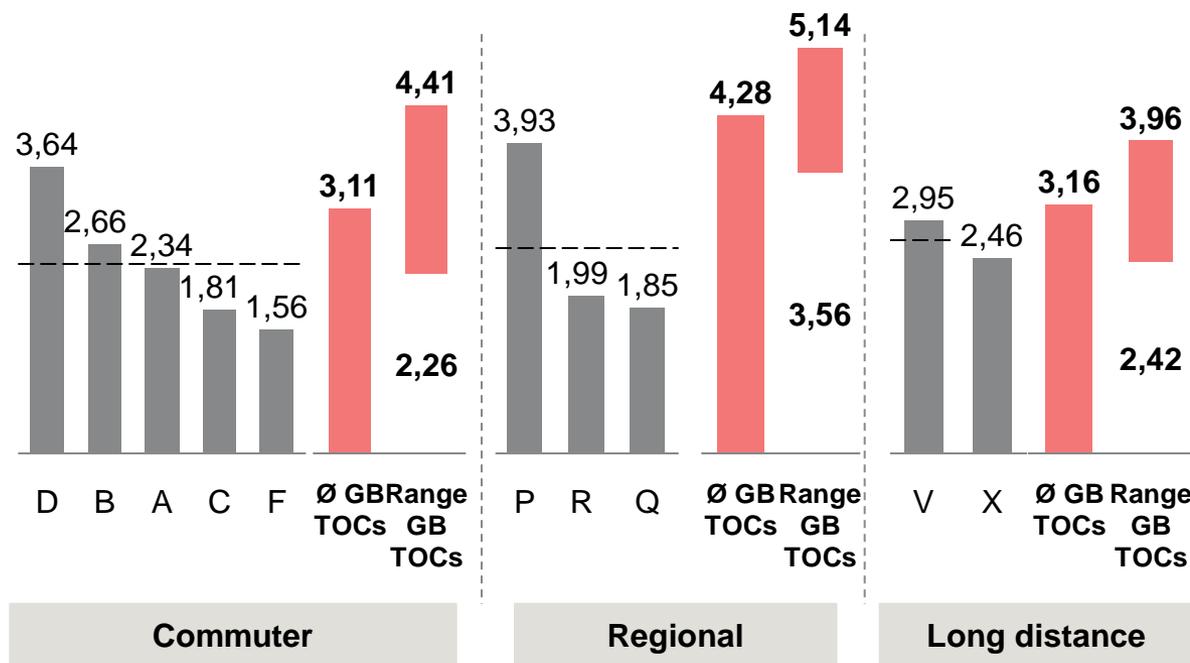
	Fleet ownership	Decision making	Outsourcing	Remarks
SNCF	Rolling stock fleet is owned by SNCF and financed through the contracts	The contract with STIF (Syndicat de Transport Île de France) defines fleet size and fleet performance indicators	Maintenance and overhaul is carried out in-house by SNCF	Fleet modernisation aims at enlarging capacity; for long distance trains an investment program is planned (aging fleet)
GB TOCs	Fleet is mostly owned by 2-3 ROSCOS (lease charge) Technically only one fleet is available in the case of bidding (low competition)	Fleet specifications are made by the Department for Transport	Older fleet is often maintained in-house, new fleet maintained by manufacturer	

GB TOCs' fully normalised rolling stock maintenance costs are above European averages

Rolling stock maintenance cost¹⁾

GBP per train-km

Cost comparison



Remarks

- Maintenance cost (heavy and small, overhaul, repair) include cleaning, provision
- Comparators outside GB mainly maintain fleet inhouse
- Various models apply in GB:
 - Dry lease with own maintenance facilities
 - Wet lease – full outsourcing
 - Combination of both (eg. own staff and material provided by suppliers)

■ Rolling stock maintenance cost

1) Maintenance cost fully normalised over average number of cars per train and partly over annual running performance per car (for 50 % of maintenance cost).

A number of possible cost drivers has been considered

Possible cost drivers (1/3)

Driver	Effect	Metrics used
Fleet structure	<ul style="list-style-type: none"> • Fleet can consist of Electric Multiple Units (EMU), Diesel Multiple Units (DMU) or coaches and locomotives. Potentially the maintenance of Diesel engines is more costly than electrical engines. • A large mix of different types of vehicles might just as well have a negative impact on cost as the complexity concerning the equipment and standards of trains (air conditioning, number of doors, lavatories etc.) Although this would be interesting to know, the study could not compare fleet on a vehicle by vehicle basis. • Double stack coaches lead to an estimated increase in maintenance costs of approximately 15-20 %. 	<ul style="list-style-type: none"> • Percentage of EMU, DMU, locomotives and coaches • Share of double stack coaches
Annual running performance	<ul style="list-style-type: none"> • The annual running performance is relevant for all maintenance activities, which do not depend on mileage • Train operators with higher running performance will benefit from a decrease of their fixed annual maintenance costs. The impact depends on the share of mileage-based maintenance costs (we assumed fixed costs to be 50 %) 	<ul style="list-style-type: none"> • Annual running performance per vehicle

A number of possible cost drivers has been considered

Possible cost drivers (2/3)

Driver	Effect	Metrics used
Age structure	<ul style="list-style-type: none">• The average age reflects the degree of modernisation of a company's fleet.• A robust, low tech fleet could be less costly to maintain than new, complex technology, especially when teething problems occur.• On the other hand, an elder fleet could cause increased reliability issues if it is not well maintained.	<ul style="list-style-type: none">• Average age of fleet
Train stops	<ul style="list-style-type: none">• The frequency of train stops might be hard on wear and tear as it requires more acceleration and deceleration.• A high frequency of stops could result in increased maintenance costs on brakes and door opening mechanisms.	<ul style="list-style-type: none">• Number of train stops per car
Fleet reliability	<ul style="list-style-type: none">• Reliability reflects the number of failures per vehicle occurring during operations.• A large number of failures leads to increasing maintenance/repair activities.• Poor performance can lead to a need of additional fleet units which adds to capital expenditures	<ul style="list-style-type: none">• Mean distance between failures (MDBF)

A number of possible cost drivers has been considered

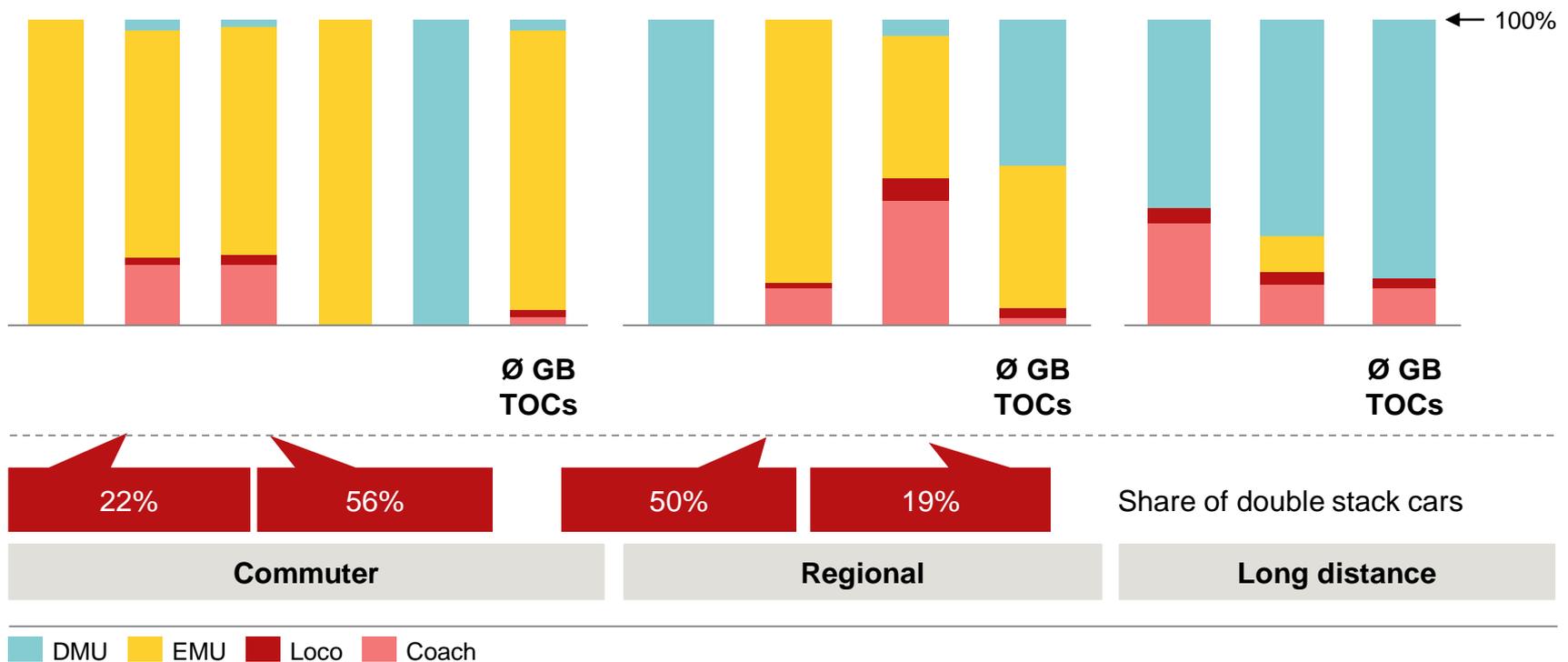
Possible cost drivers (3/3)

Driver	Effect	Metrics used
Productivity	<ul style="list-style-type: none">• In the case where the operator is in charge of maintaining the fleet with own personnel, staff productivity is a determining factor.• The number of FTEs per car would be an interesting metric to assess productivity. However, it depends too much on the organisation of workshops, the degree of automatisation, the structure of the fleet and other parameters and would not provide a meaningful comparison	<ul style="list-style-type: none">• Gross working hours• Net working hours

EMUs dominate in commuter and regional operations, some operators extensively use double stack fleets

Fleet characteristics

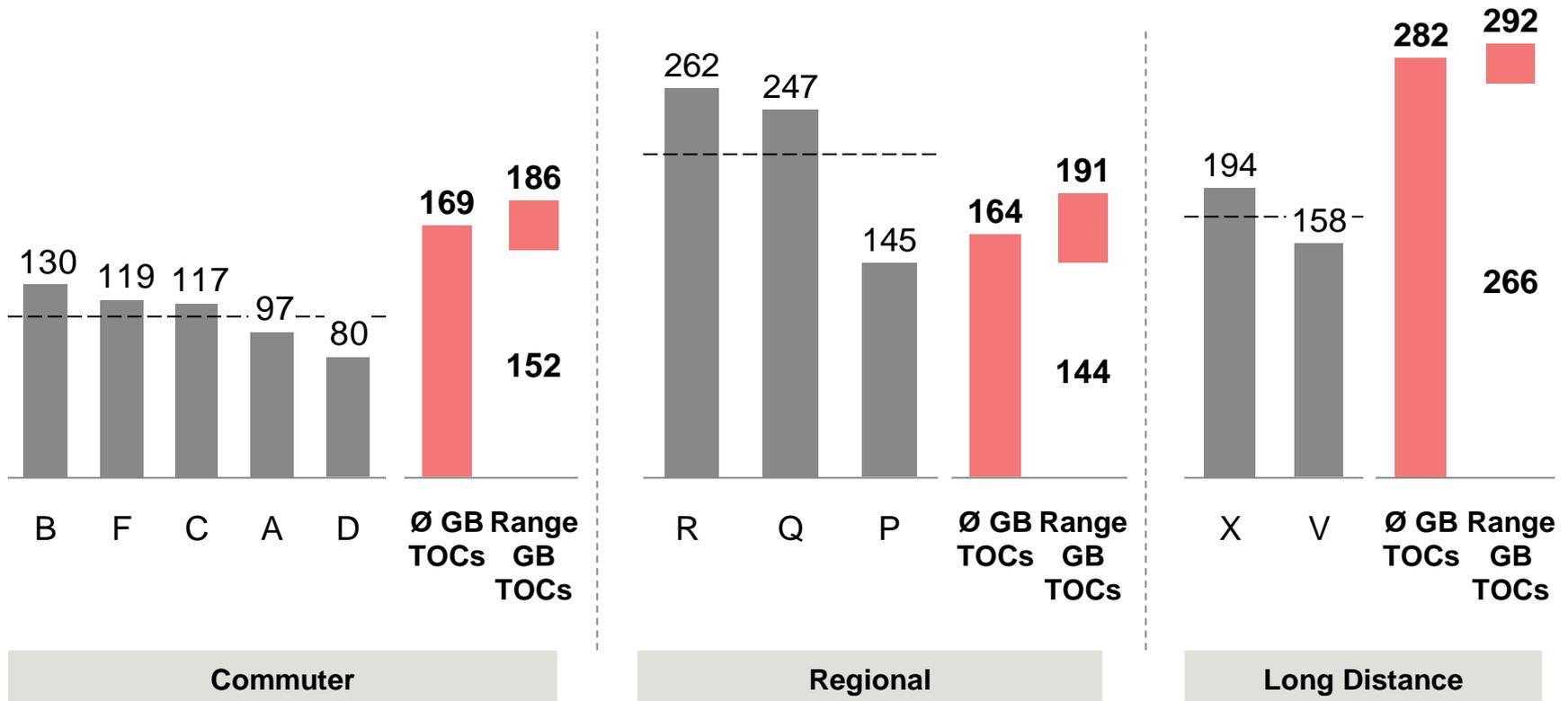
Relative structure of fleet (of 100 %)



Especially in long distance services, GB TOCs have a very high level of fleet utilisation

Annual running performance

1.000 car-km per total number of units

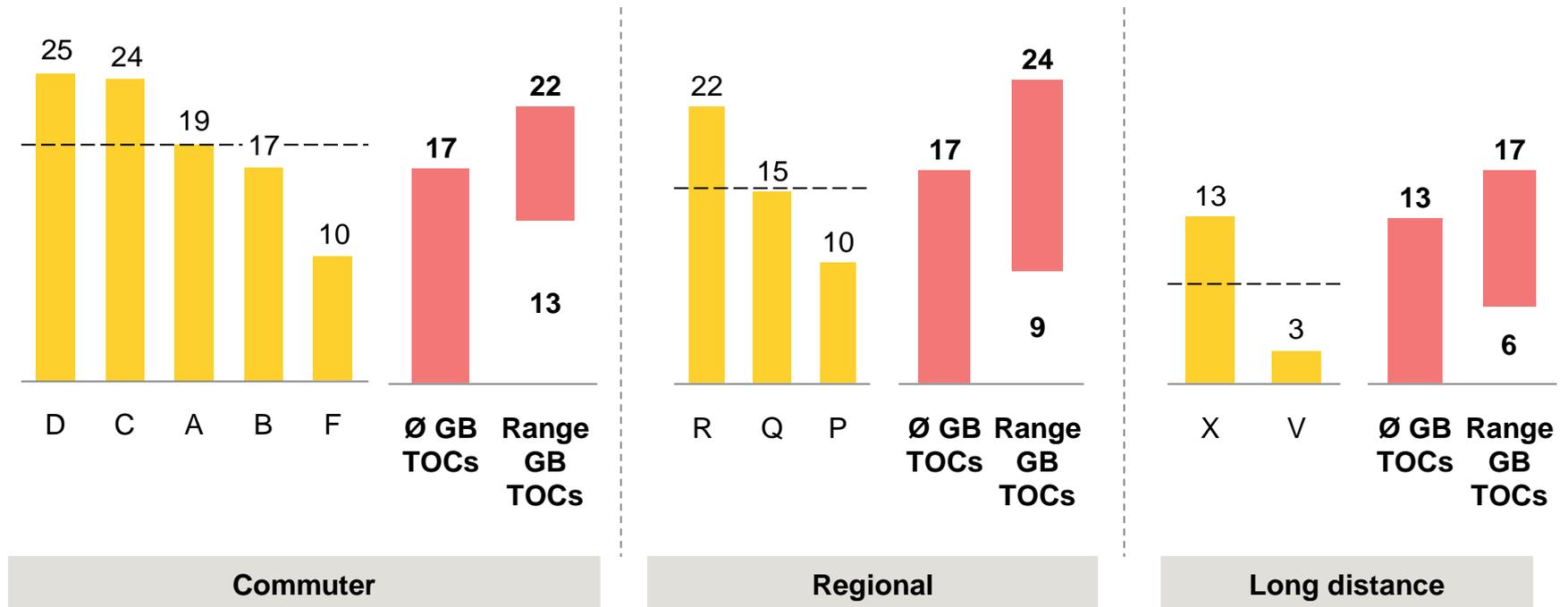


On average, the GB fleet is older than comparator fleets

Average age

Age¹⁾ of fleet in years

Comparison of international peers and average fleet of GB TOCs¹⁾

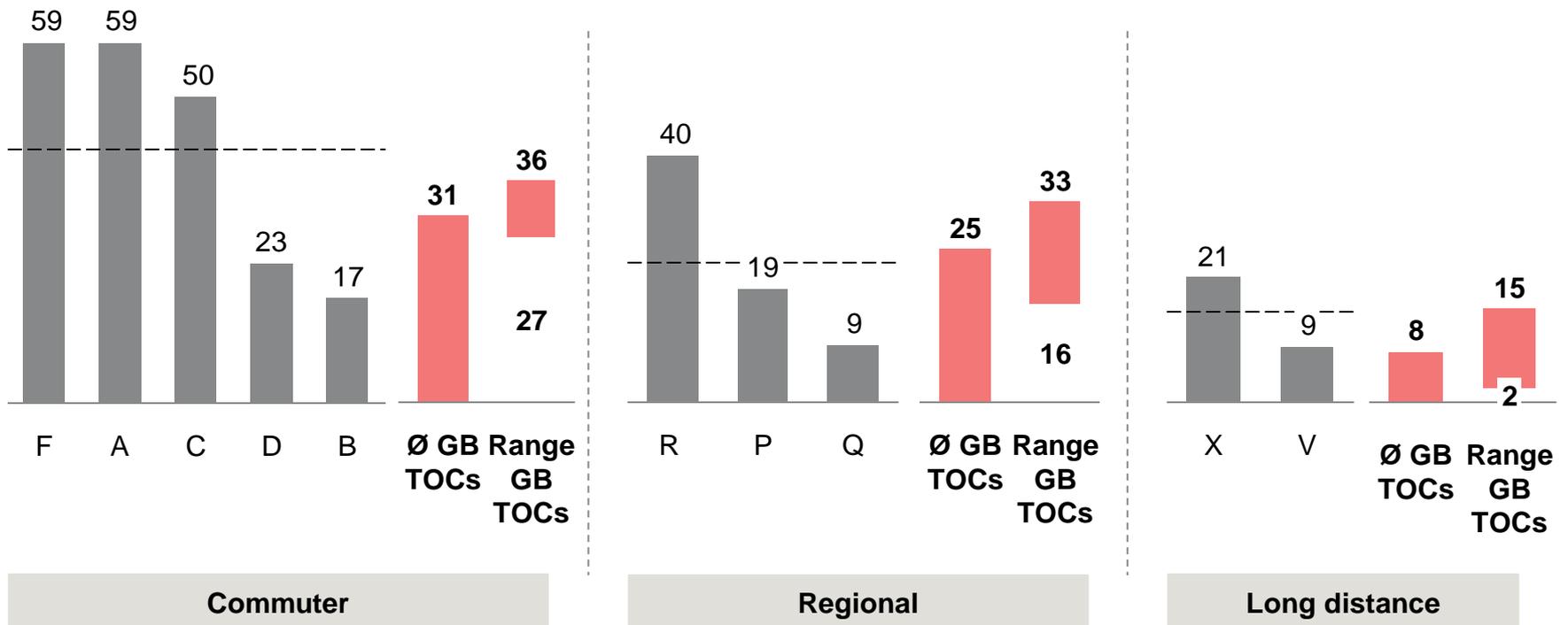


1) Average age of all vehicles weighted across number of cars per vehicle type

The frequency of train stops varies by a factor up to five, GB TOCs' frequencies are close to European averages

Train stops

Annual number of scheduled train stops in 1.000 per car



1) Annual running performance per car divided by average distance between stops

Reliability is an important indicator but definitions of failures and delay thresholds vary

Reliability of fleet

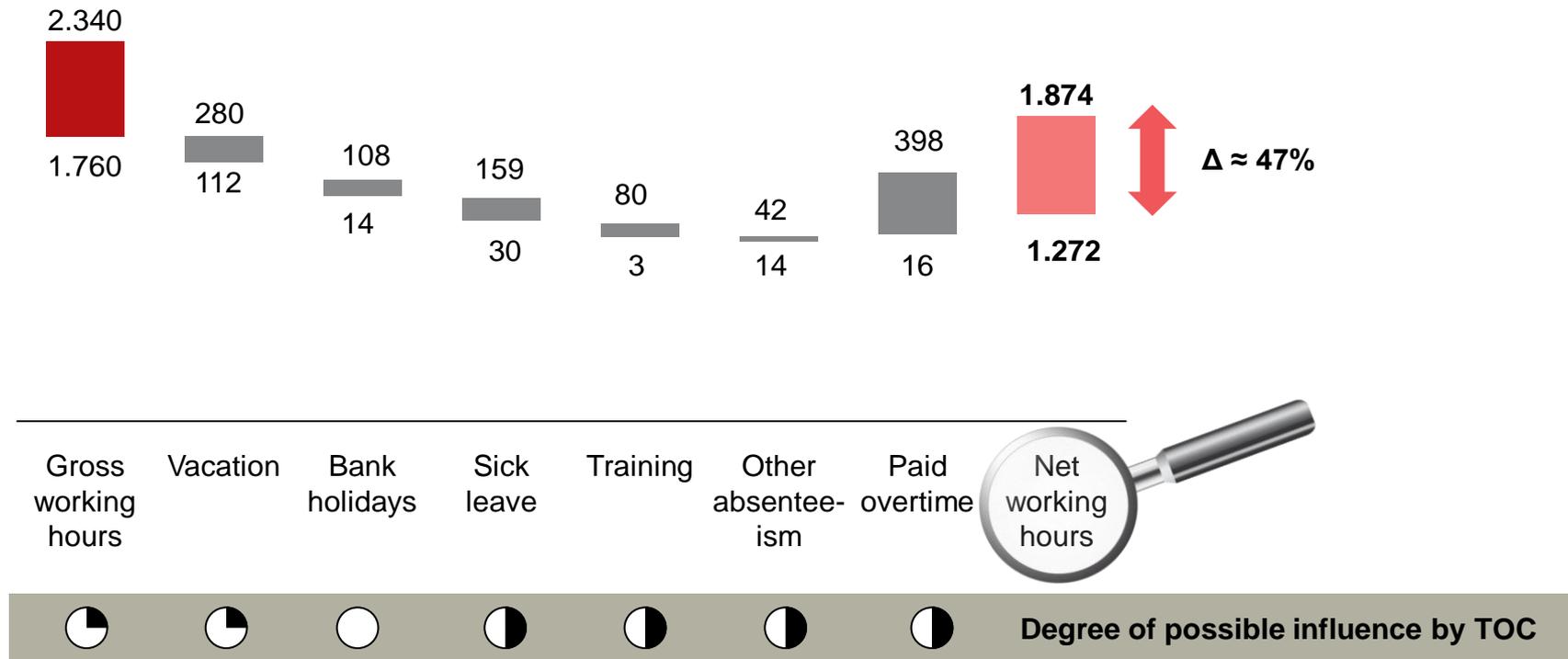
Concepts of measurement

Company	Details	Consideration of delays
GB TOCs	MTIN: Miles between trust incidents notified	All technical failures counted causing delays larger three minutes
Irish Rail	MDBF: Mean distance between failures	Failures causing delays <ul style="list-style-type: none"> • >5 min (commuter and regional) • >10 minutes (long distance)
NS Reizigers	MDBF: Mean distance between failures	Failures causing a service to be cancelled due to a breakdown of a train
AKN	Number of train-km cancelled due to failures	
SNCF	MDBF: Mean distance between failures	Failures causing delays > 5 min (TN and RER-E service)
DSB	MDBF: Mean distance between failures	Failures causing delays <ul style="list-style-type: none"> • > 2:29 min (commuter) • > 4:59 minutes (long distance)
SNCB	n/a	n/a

Annual net working hours of maintenance staff across the sample vary by 47 %

Net working hours

Gross working hours vs. net working hours¹⁾

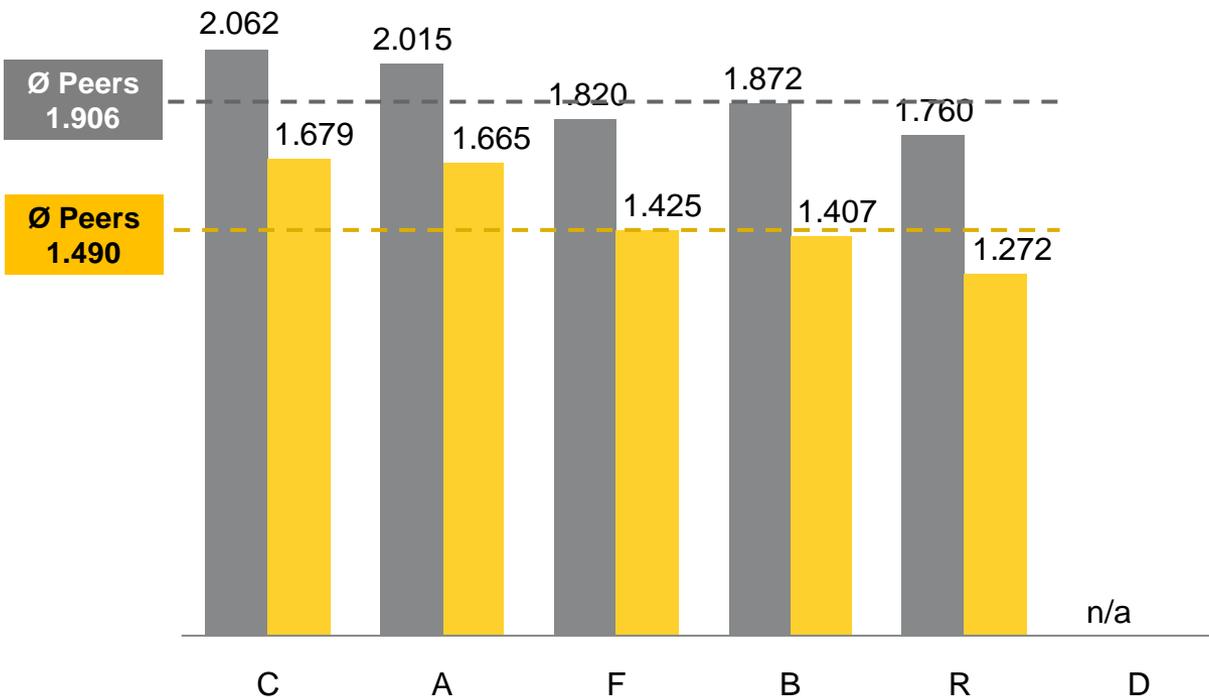


1) Values represent a range from minimum to maximum across all companies (international peers and GB TOCs combined).

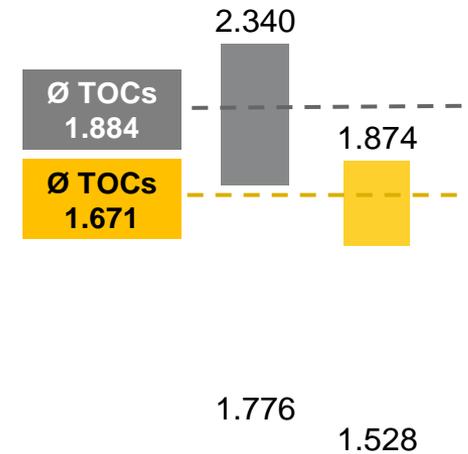
Net working time of maintenance staff varies across peers, but most GB TOCs exceed the average of peers

Maintenance productivity

Working hours per maintenance FTE



Ranges GB TOCs



■ Gross working time ■ Net working time

The operating conditions in GB are quite different from other nations in the sample

Rolling stock opex

- In contrast to GB TOCs, the fleets of European comparators are predominantly **owned** by the operators. Some countries like The Netherlands finance their fleet from cash flows while others receive dedicated subsidies. In GB, the fleet is owned by and leased from three rolling stock companies (Roscos).
- When procuring new rolling stock, most countries are free to develop fleet **specifications** and tendering. The degree of freedom in decision-making appears to be higher elsewhere than in GB, where operators report that specifications are set out in contracts with public authorities.
- European comparators stick to their traditional **in-house maintenance** concepts. Some comparators, such as those in Denmark and the Netherlands, have created in-house companies. In most companies, maintenance handled in its entirety by in-house staff. Countries like Ireland have outsourced heavy maintenance for new trains but experience high costs due to short overhaul cycles and high logistics costs. In GB, various models exist, e.g. dry lease, wet lease or a combination of both.
- Normalised **maintenance costs** in GB commuter services are between £ 2,26 and £ 4,41 per train kilometre and about 50% higher than comparators' average. In regional services, GB TOCs operate at about 1.5 times higher cost. The cost level in long distance service is also higher in GB.
- In commuter services, the **type of fleet** depends highly on the degree of electrification. Most countries, including GB, run predominantly or exclusively EMUs. Only one country deploys DMUs. In regional services, more of a mix of different configurations exists. GB TOCs have about 40% Diesel driven trains. In long distance services, more than two thirds of trains are Diesel fuelled. Three countries have a notable share of double stack fleet in commuter and regional operations.
- It has not been possible to consider **fleet standards** and complexity in more detail. However, one of the comparators outside GB has a very "lean" fleet (no air condition, no toilets) which results in clearly lower costs.

Several cost drivers have been identified

Rolling stock opex

- The **annual running performance** varies broadly between comparators. For example, in commuter services GB TOCs have the highest annual mileage per car in the sample (169.000 km per car vs. 109.000 at comparators). A high running performance is considered advantageous, as it reduces annual fixed costs such as fixed maintenance costs and capital expenditures.
- With respect to **age** structures, the average commuter fleet is about 20 years old. The age range of continental European companies is from 10 to 25 years old, indicating that some companies have heavily invested while others operate an over-aged fleet at an average age of 25 years. Fleets in regional and especially long-distance services are generally much younger. In all three service categories, the age of UK fleets tends to be at the higher end of the spectrum.
- The **frequency of stops** per train is relatively high in commuter services, lower in regional and lowest in long distance. As network density and fleet utilisation vary, we note a significant range in stopping frequencies. In commuter and regional services, the stopping frequency of GB TOCs is close to comparators' average. Based on correlation analysis from former studies, the impact of the number of stops on total maintenance costs is low.
- **Reliability** can be used as an indicator for the fleet's technical performance. A high mean distance between failures indicates that the failure rate is low. From a methodological point of view, the analysis is tricky as all operators apply slightly different measurement concepts. The definitions of failure varies and the thresholds in delay minutes to count a failure range from 2:29 to over 10 minutes. With these caveats in mind, it appears that reliability of the GB fleet is comparable to abroad, except for the GB regional fleet. Poor reliability leads to higher system costs. This is because failure repair is expensive and unavailability of fleet components requires exception handling, additional efforts in traffic management and results in replacement costs.

The impact of cost drivers on rolling stock can only be assessed in a qualitative way

Rolling stock opex

- If maintenance is carried out by the train operating company the concept of **net working hours** provides an important indicator to take into account staff availability. Our comparison demonstrates that outside GB net working hours can differ by 400 hours per year, resulting in net working hours as high (or low) as 1.874 (1.528) hours per full time employee and year. In GB net working hours are at 1.671 hours per year which is 13 % higher than abroad.
- A correlation analysis between the cost drivers discussed so far and the costs shown does not seem to be sensible. The number of data points is rather low and a further breakdown of cost would be needed (e.g. stopping actions do not impact total maintenance costs but only maintenance costs on doors and brakes.)
- We have discussed the **influence** of these drivers with the peer group and came to the following conclusions:
 - The share of double stack has an impact on some of the maintenance costs such as cleaning and regular maintenance. Wear and tear is somewhat higher due to heavier axle loads. The additional costs are estimated to be around 15 to 20 %
 - Poor reliability can lead to increased maintenance costs due to failures and higher system cost. However, according to train operators a high degree of reliability can also be bought by increased maintenance efforts. Some TOCs follow the approach to rather invest into maintenance to assure a more reliable and available fleet.
 - Where maintenance is carried out in-house networking hours are an important driver as they directly impact staff cost. Higher networking hours translate into lower demand for staff.
 - The share of diesel cars has an impact of maintenance costs as they are more expensive to maintain than an electric fleet. Former analysis has shown that the cost of DMU are about 40 % higher than EMU vehicles.
 - The age of cars does not necessary influence maintenance costs if the fleet is for example well maintained and less complex than modern vehicles.
 - The frequency of stops should only have a minor impact on costs as they only affect a part of the total costs.

Maintenance costs appear to be influenced primarily by the share of doublestack vehicles, reliability and net working time

Summary: Maintenance cost

Degree of influence on OPEX							
TOC commuter	Maintenance per train-km	Share of doublestack	Reliability	Net working time	Share of diesel cars	Age of cars	Stopping actions
1	Medium	Low	High	High	Low	Low	High
2	Medium	Medium	High	Medium	Low	High	Low
3	Low	Low	High	High	High	High	High
4	High	High	Medium	High	Low	High	Medium
5	Low	Low	Medium	Medium	Low	Low	High
6	Medium	Low	Medium	Medium	Low	Medium	Medium
7	High	Low	High	Medium	Low	Medium	Medium
8	Medium	Low	Medium	High	Low	High	Medium

Low	Low	High	High	Low	Low	Low
Medium						
High	High	Low	Low	High	High	High

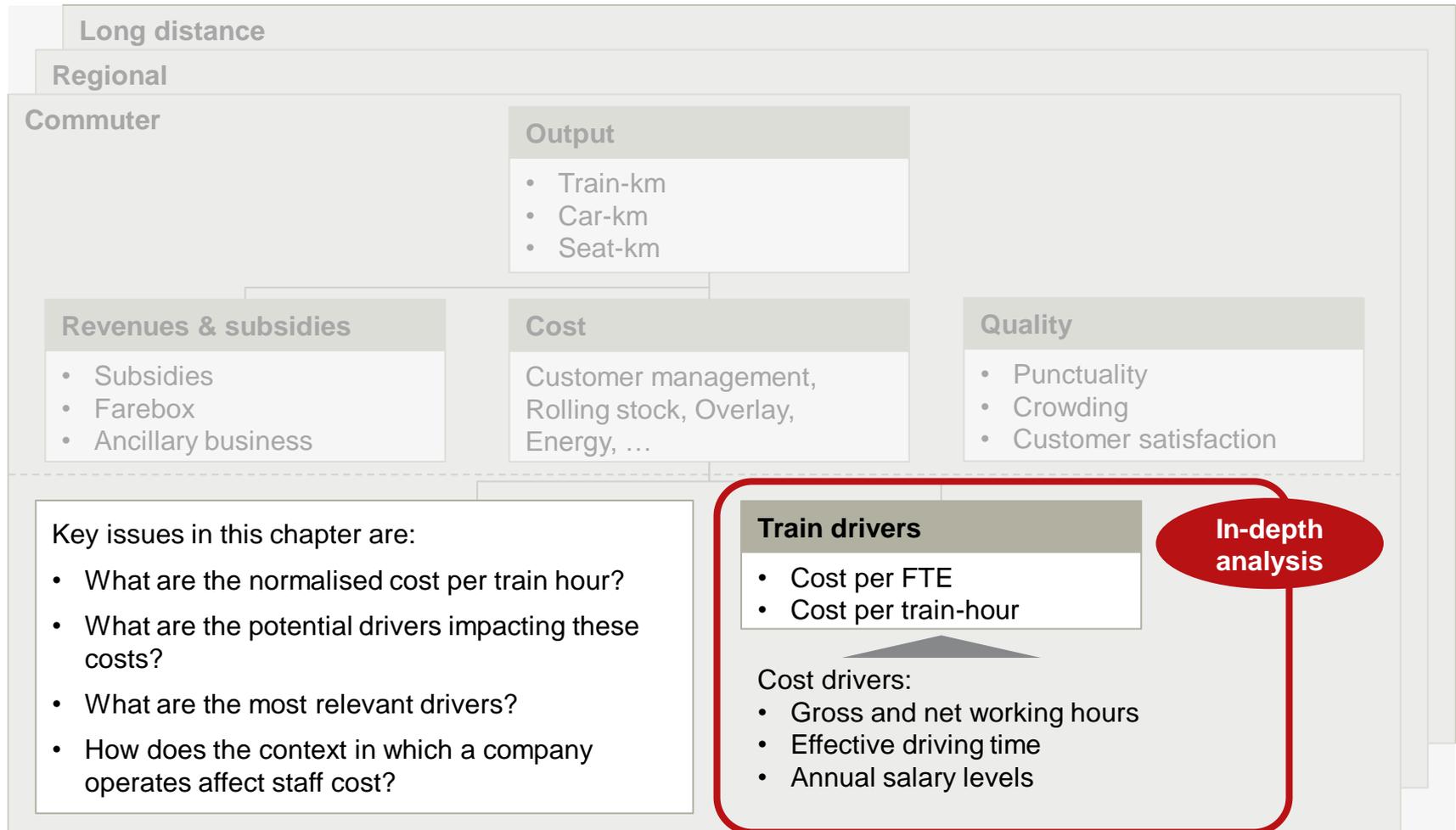
Assumed influence on cost: ■ positive ■ negative ■ neutral

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In an in-depth analysis we focus on the analysis of Rolling Stock OPEX and train drivers' cost

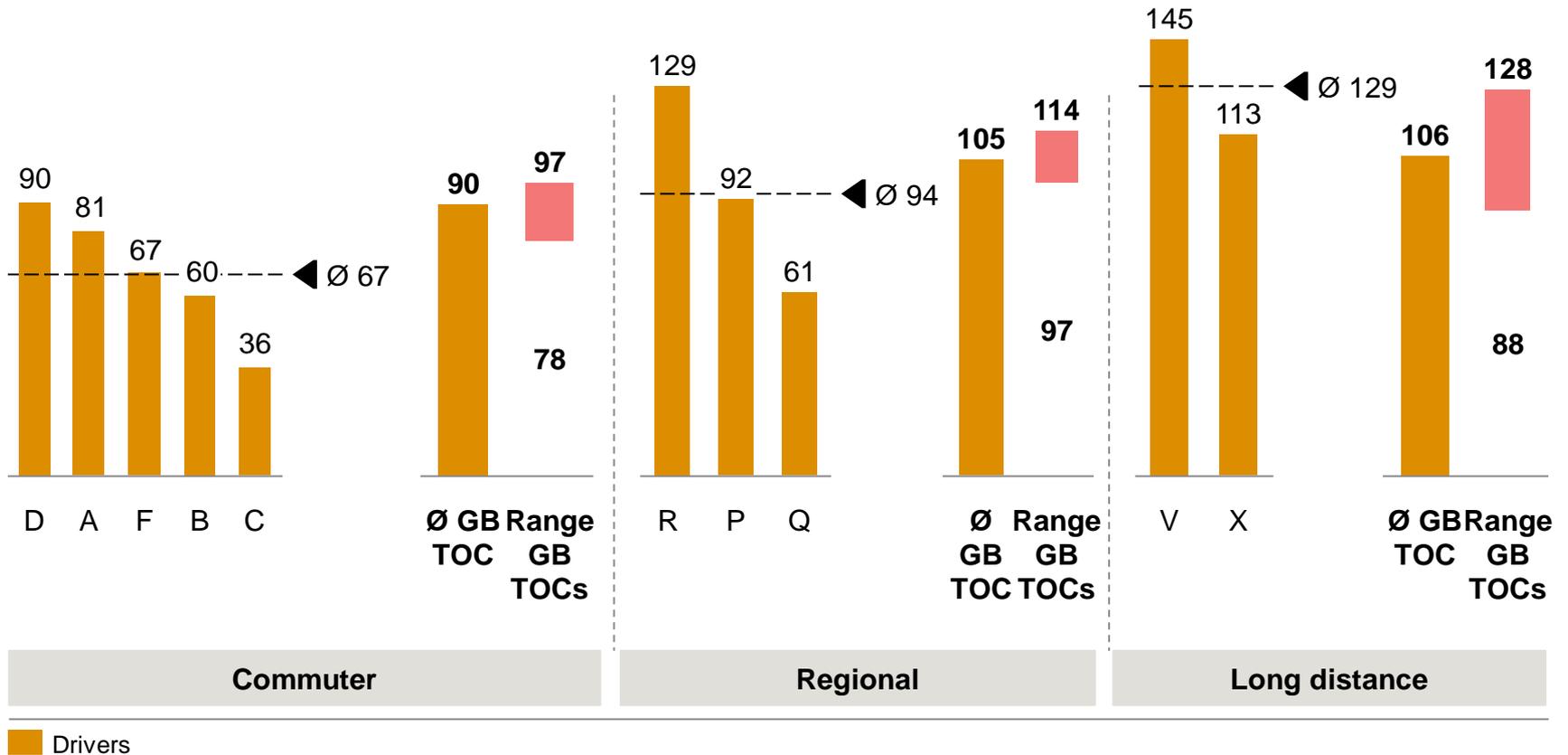
Overview



GB drivers' full staff cost per train-hour are up to 40% higher than that of peers

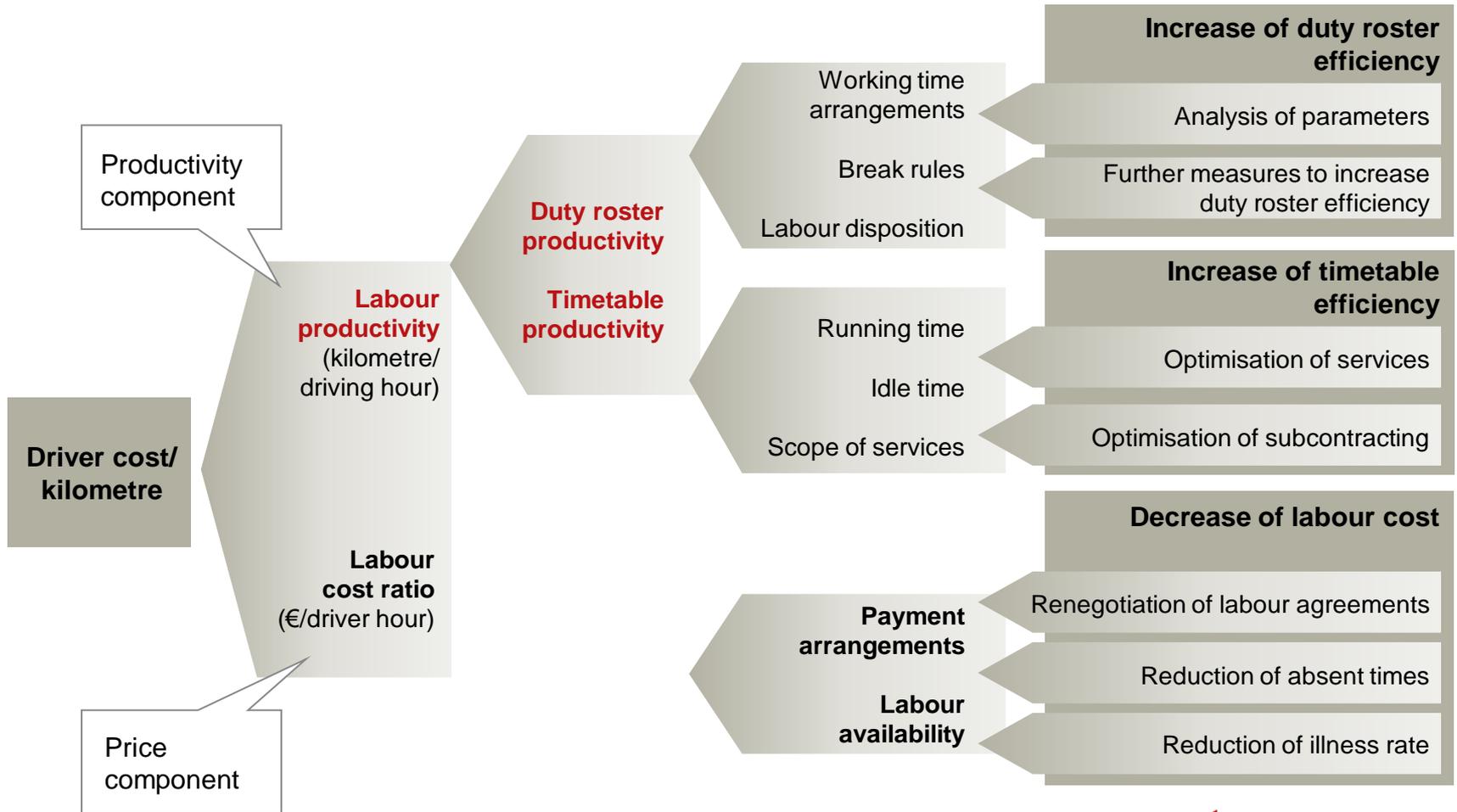
Cost of train drivers (PPP normalised)

GBP per train-hour



The driver's unit cost per kilometre is determined by various elements of productivity and labour cost

Cost driving factors



The driver's unit cost per kilometre is determined by various elements of productivity and labour cost

Cost driving factors

The cost per train-km for drivers depends on a number of unit cost and productivity factors as illustrated in the graph on page 69. The key factors which impact costs are:

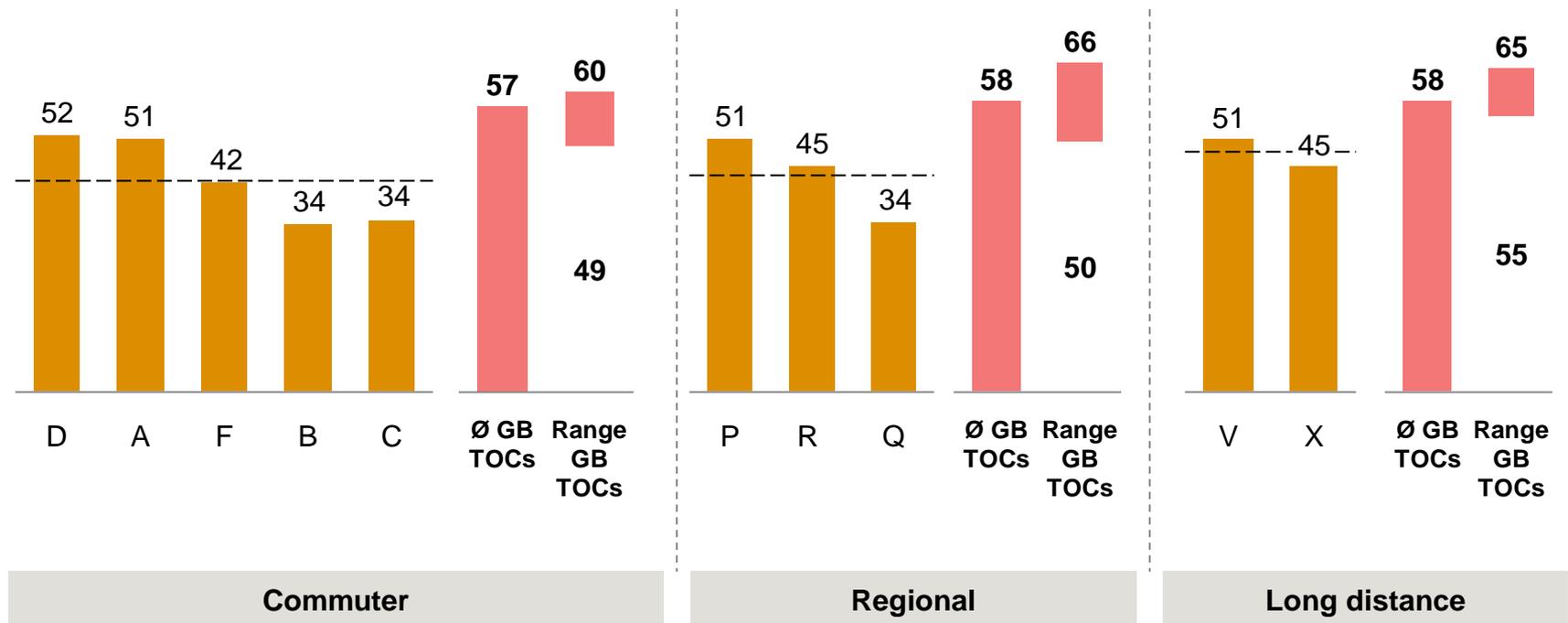
- The **unit cost** which is expressed in GBP/hour. It is influenced by local/national wage levels and the number of gross working hours which are both subject to contractual arrangements. The difference between gross and net working hours is determined by various forms of absenteeism (sick leave, training etc.), which is partly manageable by the operator.
- With respect to productivity, the key question is how many kilometres of driving are produced within one train driver hour (labour productivity). In principle, this ratio is determined by two metrics:
 - The **duty roster productivity** asking "How many hours of train driving are produced with the number of driver staff hours available?" A high percentage implies that resources planned in duty rosters are well used for driving and do not get lost in "unproductive" hours. Important levers to reduce unproductive times are paid breaks, planned technical preparation times for vehicles, check-in and check-out times etc. A flexible shift system with shift lengths matching demand are another important parameter to optimise resources. These factors are mainly in the influence of the operator but are normally subject to negotiations with labour representatives and unions.
 - The **timetable productivity** indicates how many time-tabled hours are produced with the total hours of driving. The latter includes all hours driven, such as turnaround times, waiting times, empty rides from/to depots and maintenance facilities. The ratio is high if an operator manages to reduce empty or other service rides which are not carrying passengers. Some factors are rather structural and difficult to change, e.g. the number and location of depots. The ability to modify the operational programme and time tables provides the flexibility needed to optimise this productivity.
- Within the study we managed to gain further insight into some of the drivers, notably unit cost and some high level elements of labour productivity (net working hours, driving time). Further analysis of operational parameters was not possible.

GB TOCs' annual full staff cost for drivers are almost 50% higher than abroad

Cost per full time driver (PPP normalised)

1.000 GBP per FTE

Comparison of international peers and average fleet of GB TOCs

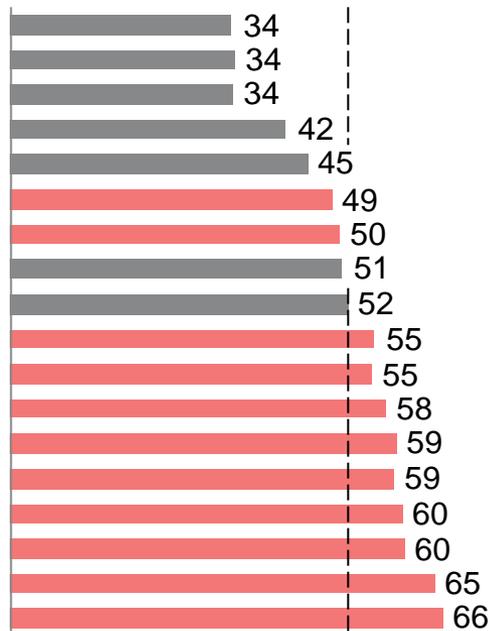


Drivers

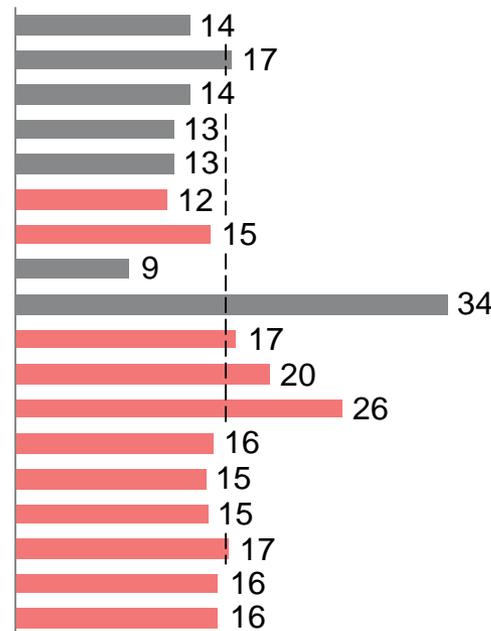
Even after deducting employers' higher share of the social security costs, GB's annual staff cost remain the highest

Drivers' cost and share of social security

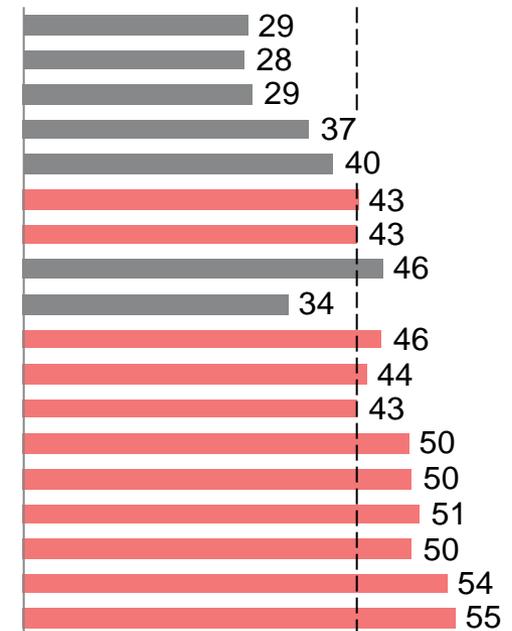
Total drivers cost in 1.000 GBP per FTE



Share of social security¹⁾ of drivers' cost in %



Drivers cost excluding social security in 1.000 GBP per FTE



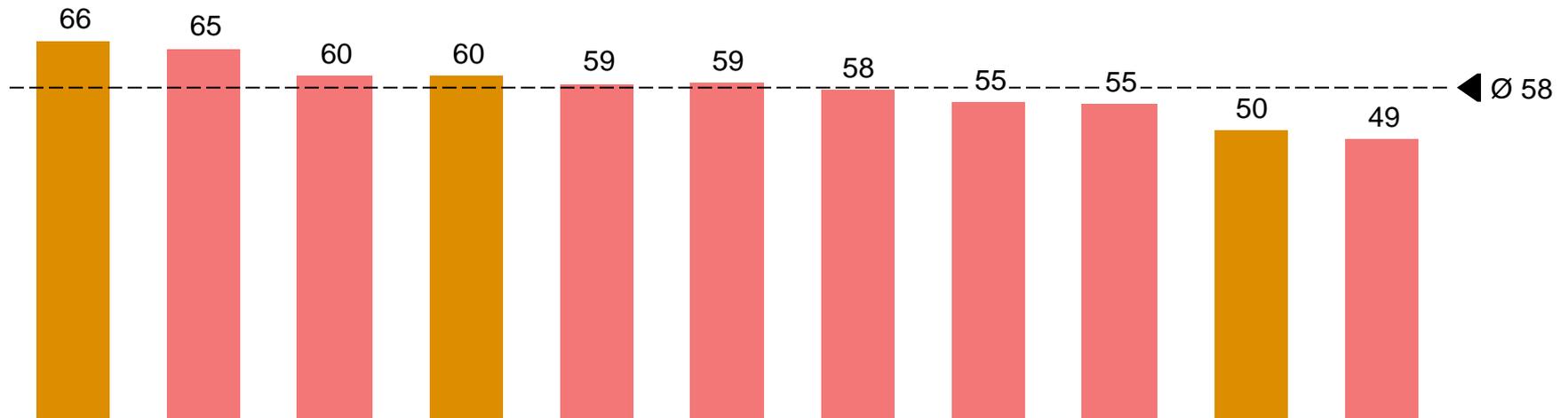
GB TOCs International peers

1) Including contributions to health insurance, unemployment insurance, pension and retirement schemes etc.

The higher cost of living in urban regions do not seem to impact the annual cost per driver systematically

Drivers cost in different areas

1.000 GBP per FTE



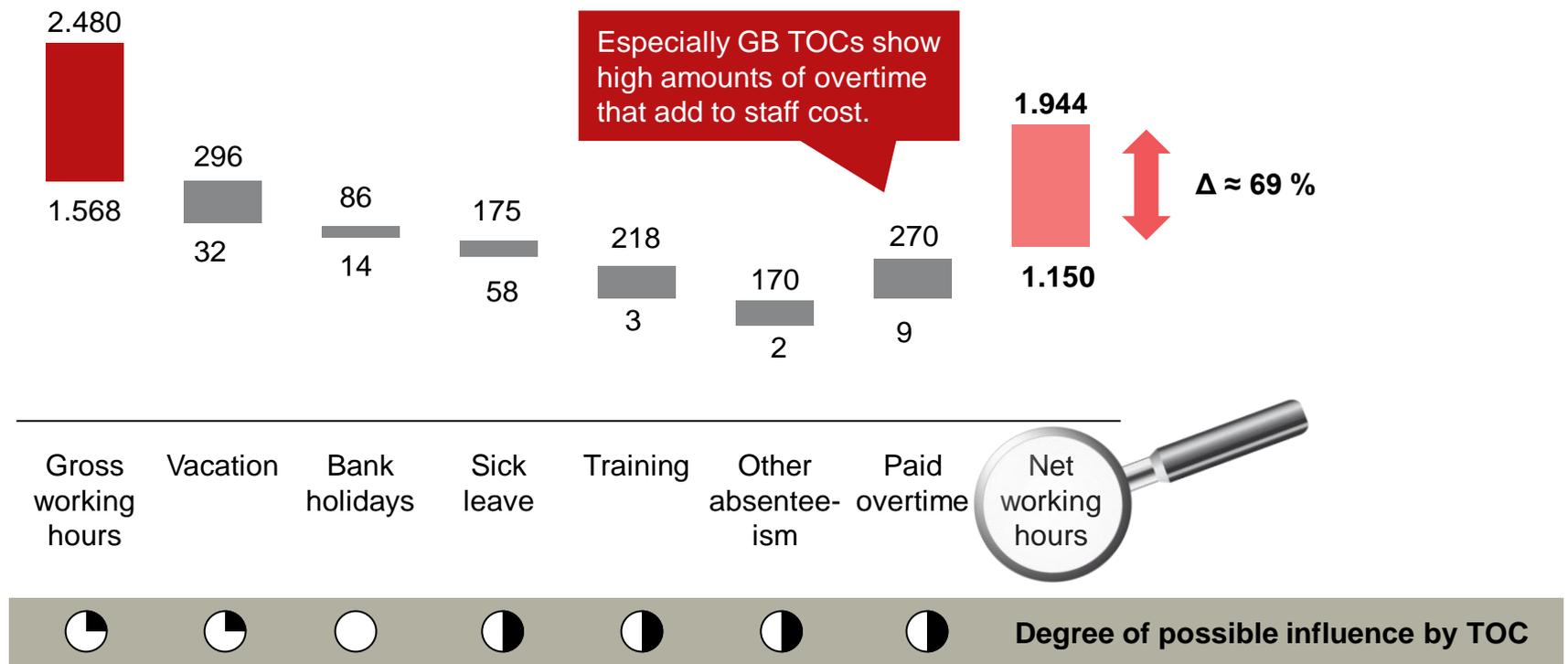
GB TOCs across all service categories

Not mainly operating in urban area Mainly operating in urban area

Annual net working hours of drivers across the sample vary by no less than 69 %

Net working hours

Gross working hours vs. net working hours¹⁾

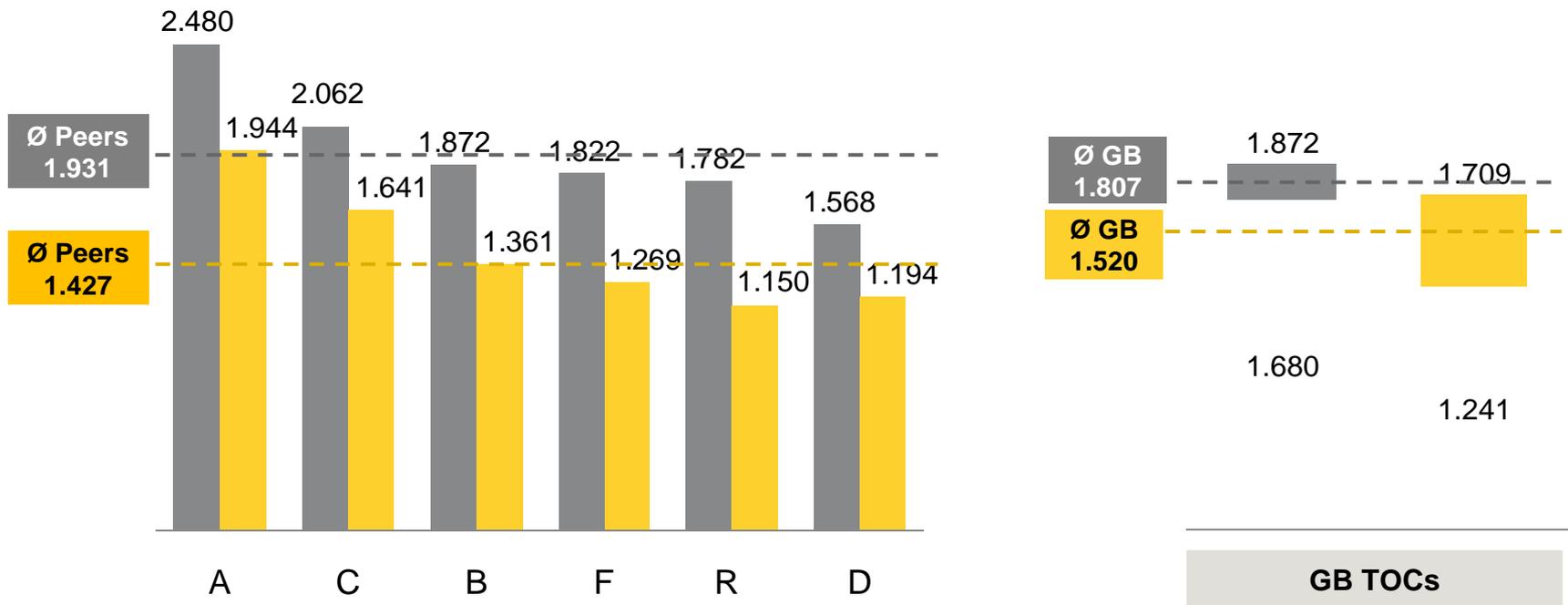


1) Values represent a range from minimum to maximum across all companies (international peers and GB TOCs combined).

Differences in net working hours for drivers are very substantial and range from 1.150 to 1.944 hours per year

Net working hours

Net working hours per driver FTE

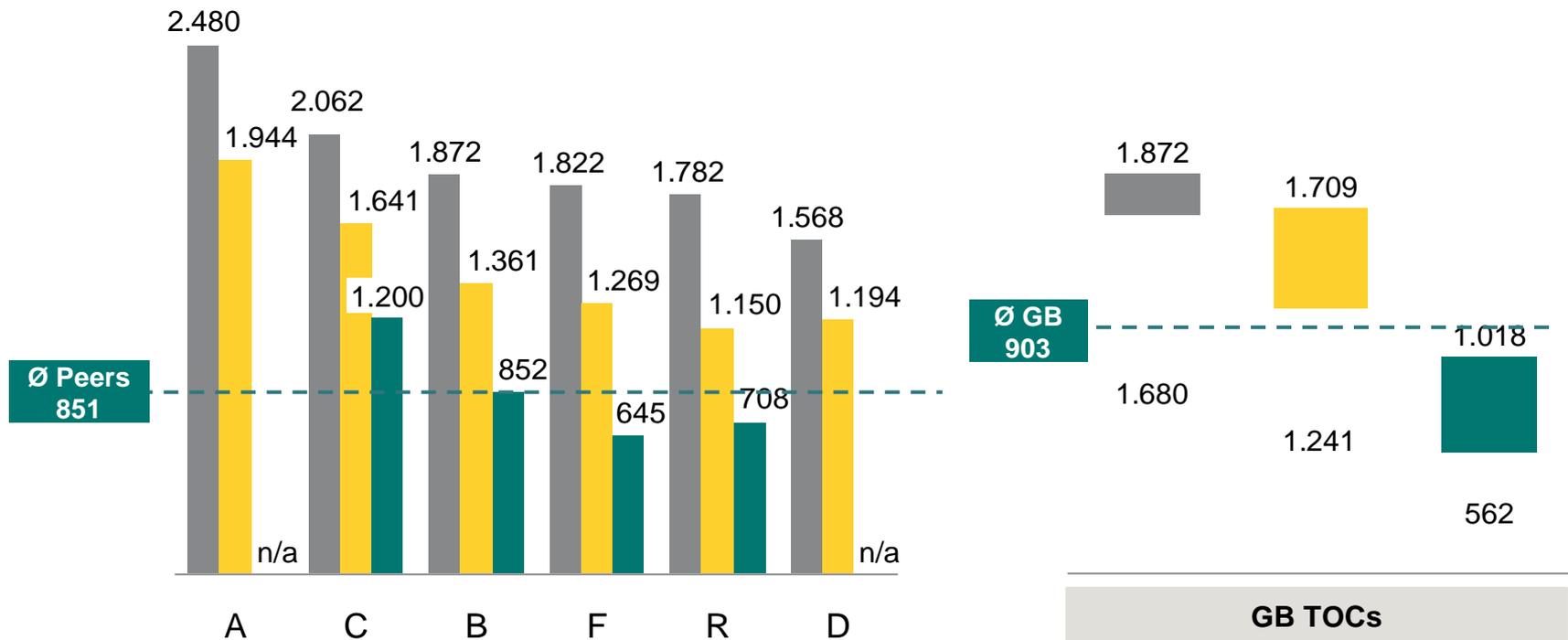


■ Gross working hours ■ Net working hours drivers

GB TOCs' driving time is about 6 % higher than at comparators

Driving hours

Net working hours and driving time per driver FTE



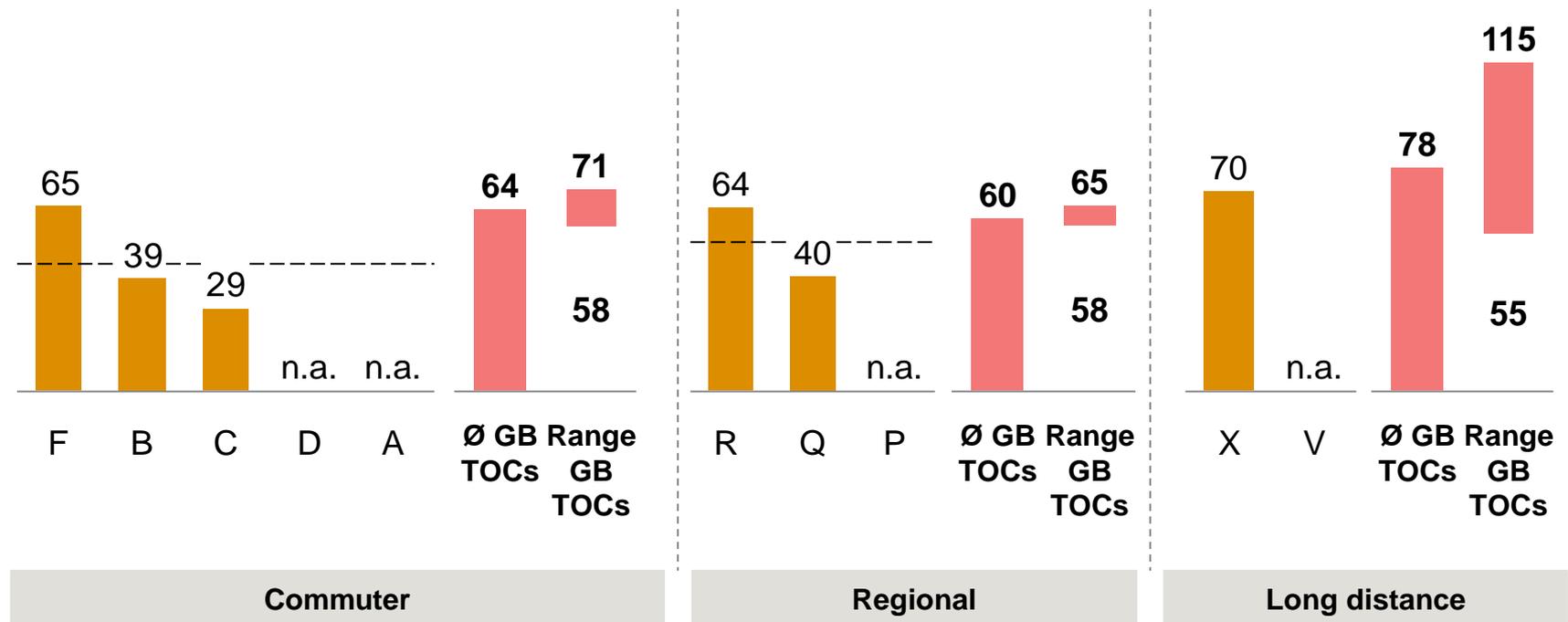
Gross working hours
 Net working hours drivers
 Driving time

Annual staff cost per driving hour vary by a factor of up to two, GB TOCs are above average peer levels in all categories

Cost per full time driver (PPP normalised)

GBP per driving hour

Comparison of international peers and average fleet of GB TOCs



Drivers

GB TOCs' cost for train drivers are high due to the level of salaries

Drivers' cost

- In GB, the **cost per driver and train-hour** are 40 % above the average cost of European peers in commuter and 12 % in regional services. While in the UK a driver in commuter services costs £ 90 per hour, peers spend between £ 36 and £ 90. We have analysed a number of drivers to explore the underlying reasons.
- The **output per driver** measured in train hours per full time employee is very competitive in the UK in almost all service categories. In commuter it is second best.
- Annual **cost per full time employee**, consisting of salaries and all social security payments such as health insurance, unemployment insurance and pensions, are higher in GB than in other countries. The cost for a British driver are between £ 49 k and £ 65 k, while the average cost of comparators are around £ 45k. Whilst staff abroad becomes slightly more expensive when moving from commuter to regional and from regional to long distance, commuter staff is almost as expensive as long distance drivers in the UK.
- We have analysed if **social security cost** drives annual cost and increases GB operators' cost. Although most GB TOCs provided a cost share for these expenses of 15 to 20 %, they do not explain the difference. Even if social security cost are deducted from staff cost, GB comparators remain on a higher level.
- Part of the discussion was concerned with whether **local differences** in wage levels potentially increase annual staff cost. We have compared costs per full time employee in the UK by TOC but could not identify any cost difference which could be derived from more expensive urban living conditions.
- We see significant differences in annual **gross working hours**, which are derived from the number of working hours per week. Whilst in some countries drivers have a 48 hour week, in others the annual working time is close to 30 hours. As a consequence, annual working hours are between 1.568 and 2.480 hours. In GB, gross working time is between 1.680 and 1.872 hours.

GB TOCs partially compensate high wage levels by generating more driving hours

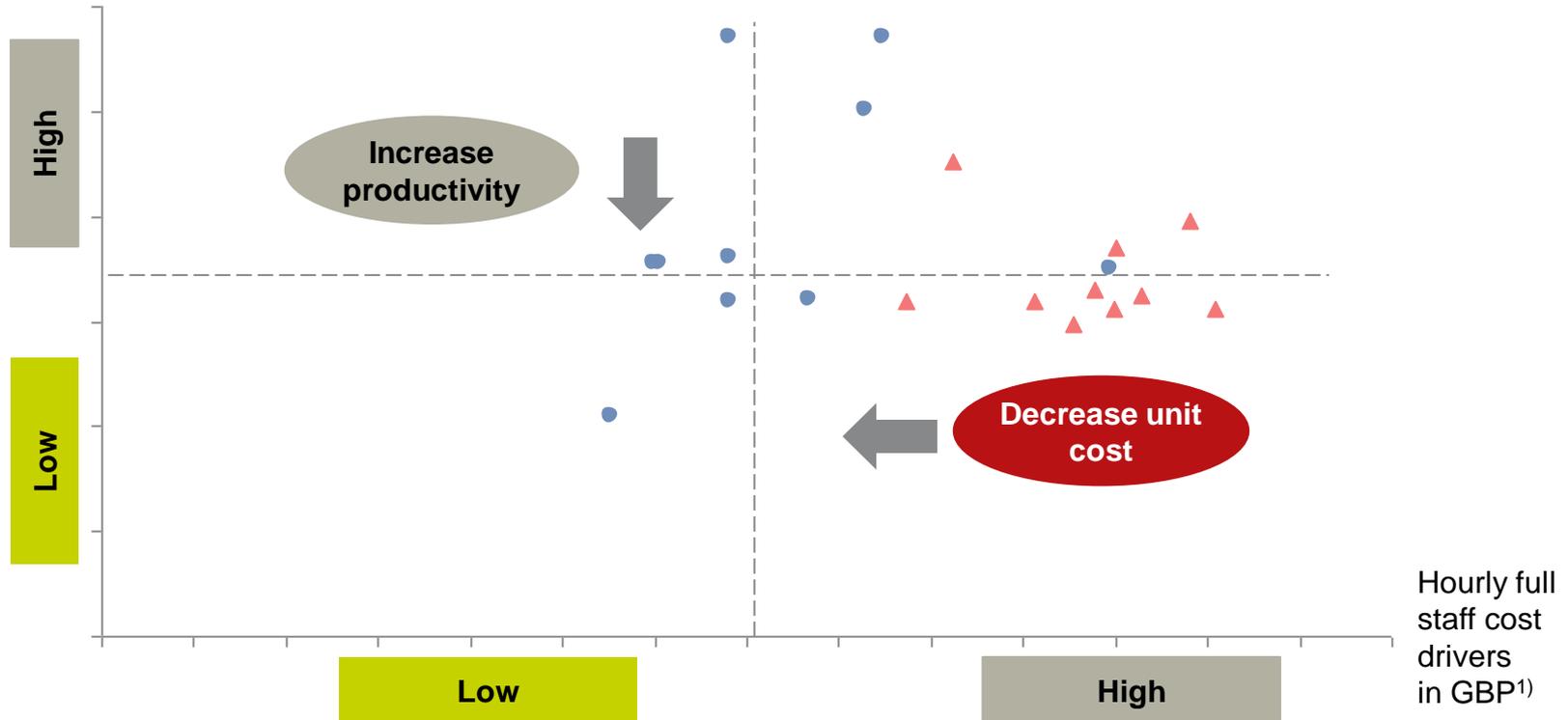
Drivers' cost

- **Net working hours** are the result of gross working hours minus all "non-productive" hours which are dedicated to bank holidays, annual leave, training, sick leave and other absenteeism. Paid overtime needs to be taken into account as well, as it increases net working hours. In some countries, annual net working hours are higher than gross working hours in other countries. Compared to European operators, GB's net working hours are 1.520 hours and thus slightly above average. There is a large range in the UK, too, with some operators benefitting from 1.709 hours per year while the lowest only have 1.241 hours.
- However, the key objective is to achieve high effective **driving time**. It is the difference between net working hours and productive stationary times such as: check-in, check-out, waiting time, paid break times, technical preparation times and other duties. Here the range is also fairly wide: driving hours per year and driver are as low as 708 and as high as 1.200. With 903 hours, GB TOCs are performing 6 % better than European average.
- GB's comparatively high drivers' cost are the result of high annual staff cost. These are partially compensated by higher outputs of train drivers which are a result of net working hours and especially driving hours which are somewhat above average.
- Several parameters in this context are exogenous and difficult to **change** (network layout, depot structure, speed). Others can be controlled or influenced by operations management, including time-tabling, roster planning, programmes to reduce sick-leave, revision of training concepts, preparation times etc. Many of the parameters impacting unit costs and productivity require intensive and lengthy negotiations with labour representatives. It is noticeable that in some countries these labour issues are very sensible and that reforms are seen as a very challenging subject. The next pages depict the potential moves that peers could make but also a brief self-assessment about the current situation in the different countries.

Ideally operators can increase drivers' productivity and decrease hourly cost

Staff cost efficiency

FTE drivers per
1.000 train-hours



● International peer ▲ GB TOC

1) Hours based on gross working time

Across Europe, labour conditions of state operated companies are rather rigid

Labour conditions (1/2)

	Labour conditions
AKN	Labour agreements with two different unions are in place, one for train drivers and another one for other staff. Labour conditions and payments are similar though. Staff costs are only slightly below DB's staff costs and according to AKN, other regional operators have lower wage levels. Additional flexibility is achieved by staff in workshops supporting driving staff in peak periods.
DSB	Currently, productivity of train staff is a major issue at DSB. However, the company is under strong influence of labour unions.
Irish Rail	A collective labour agreement is in place, but there are a lot of diverse local structures with different labour conditions. So far, no large reforms have taken place; rather small moves were made to avoid strikes. In case of franchising "TUPE" ¹⁾ would apply.
NS Reizigers	A collective labour agreement between NS and unions is in place. In contrast to NS, regional operators have a multi-modal agreement which is more flexible. TOCs have an obligation to take over staff when tendering.
SNCB	Labour conditions are similar to those of other Belgian public companies. No reforms concerning labour conditions in passenger operations are planned.
SNCF	SNCF is under strong influence of labour unions including discussions on timetables. All labour arrangements are equal (issued state framework applicable to all operators). No reforms with respect to labour conditions are expected.

1) TUPE: The Transfer of Undertakings (Protection of Employment) Regulations (TUPE) protects employees' terms and conditions of employment when a business is transferred from one owner to another. Employees of the previous owner when the business changes hands automatically become employees of the new employer on the same terms and conditions.

Across Europe labour conditions of state operated companies are rather rigid

Labour conditions (2/2)

	Labour conditions
UK	There is a strong influence of labour unions and only minor changes were made in recent years. Better labour conditions including payments were achieved at larger TOCs due to more revenues / more bargaining power. Conditions differ by region.

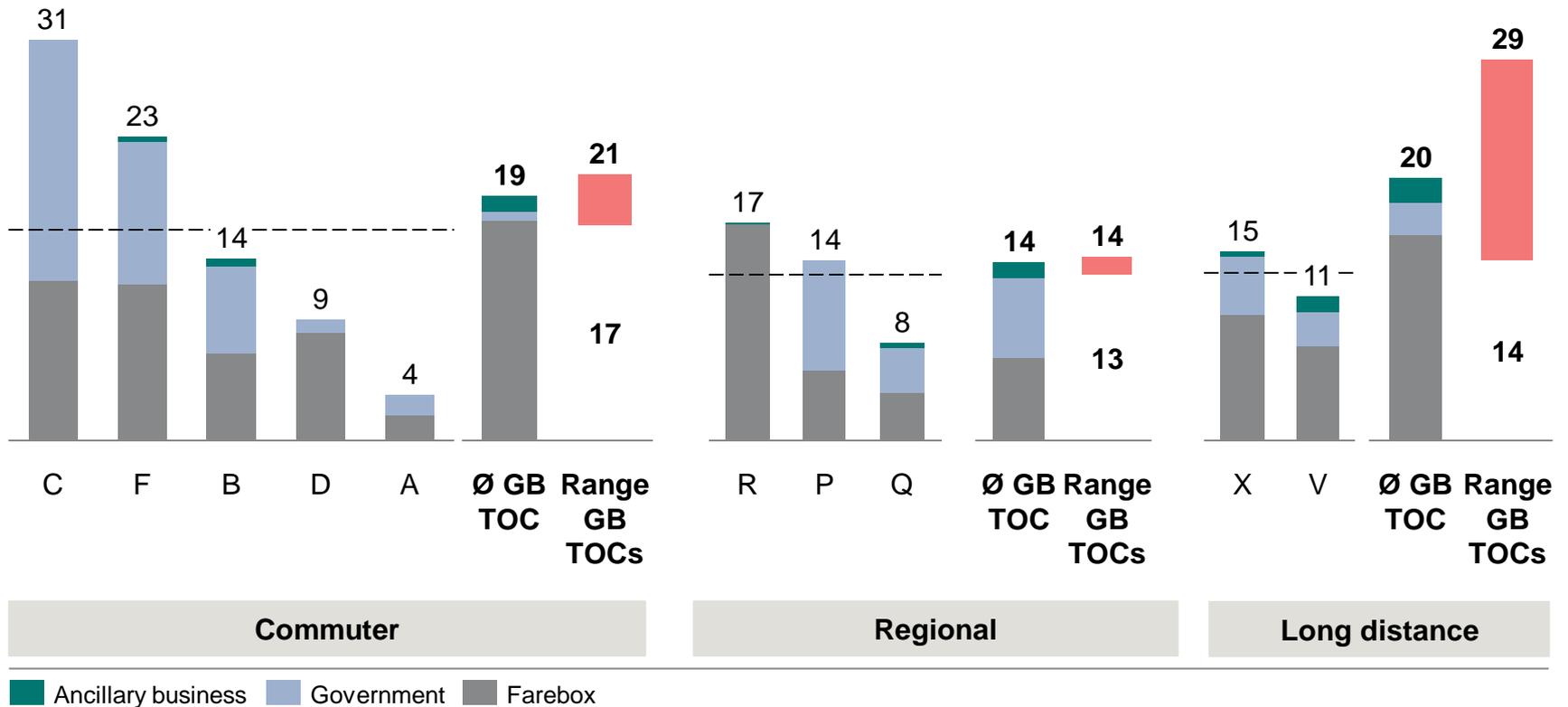
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- Background and objectives
- Scope of the study
- Methodology
- Peer group
- Cost
- **Revenues**
- Quality

In commuter and regional services, GB revenues per train-km are on average level of peers, but in LD far above them

Total revenues (PPP normalised)

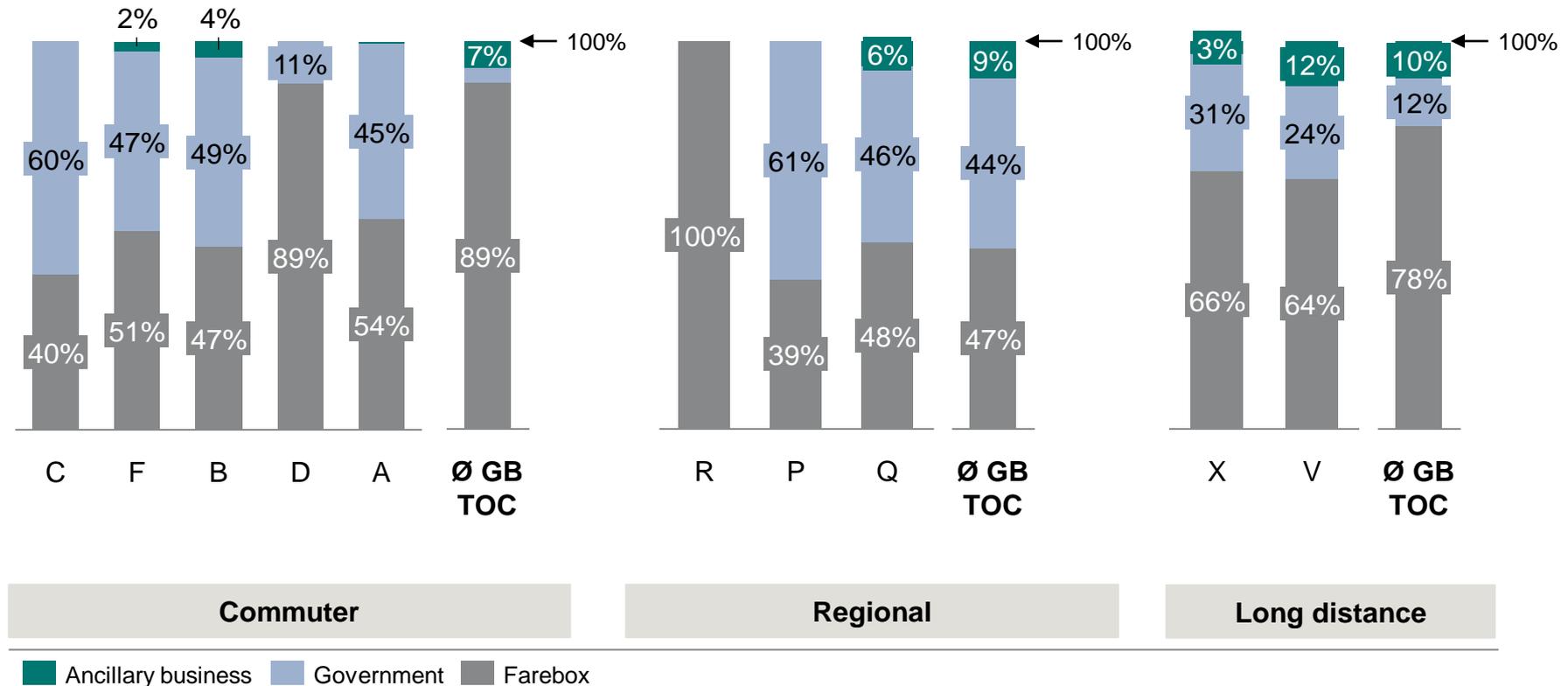
GBP per train-km



A large revenue share of European train operating companies and GB regional TOCs comes from government funds

Total revenues (PPP normalised)

GBP per train-km

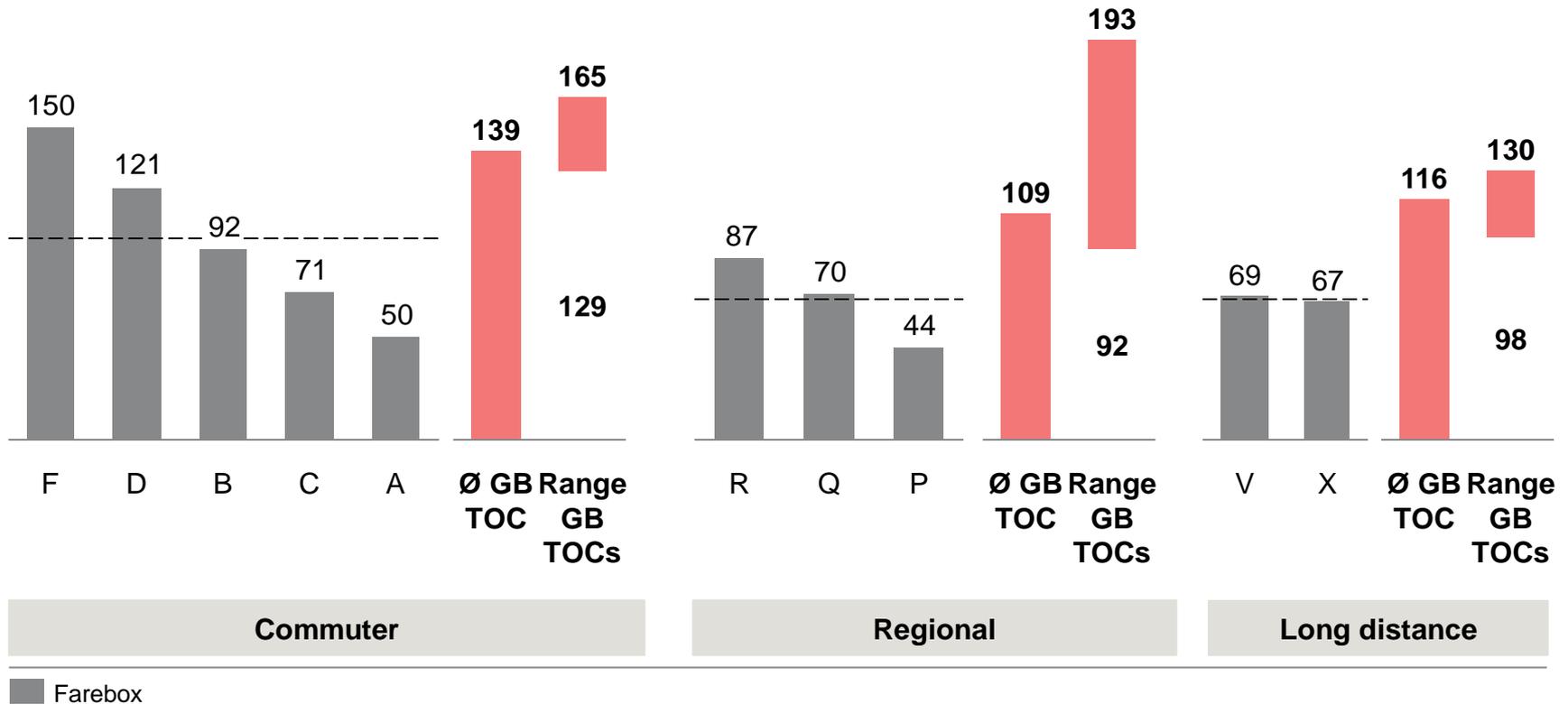


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GB farebox revenues per passenger-km are significantly above average in all three service categories

Farebox revenues (PPP normalised)

GBP per 1.000 passenger-km



British railway operations are more user financed

Revenues

- We analysed **three different streams** of income of train operating companies: farebox revenues (ticket sales), government subsidies and revenues from ancillary business such as car parks or catering.
- From a user's perspective, **revenues per passenger kilometre** are a useful metric indicating how much the passenger pays for a journey. The comparison of all income sources per train kilometre shows the total level of revenues and to what extent services are **subsidised** by the government.
- In **commuter services**, UK revenues per passenger kilometre are higher than abroad. British travellers, on average, pay £ 139 per 1.000 passenger kilometres, while other European passengers pay about 30% less. European comparators receive 54% of their income from ticket sales and compensate through subsidies. In contrast, GB operators generate 93% of their income through farebox revenues and the rest through ancillary business. There are no subsidies at all for this kind of service.
- In **regional services**, the average revenue per 1.000 passenger kilometres in the UK is £ 101 against £ 67 at other operators. With regards to total revenues and subsidies, GB TOCs on average receive the same per train kilometre as comparators. 44% of the income in the UK is provided through state funding, which is 13 % more than abroad.
- British **long distance** travellers pay around £ 116 per passenger kilometre, which is 1.7 times as much than in the other European countries. Farebox revenues also have a higher share in total revenues in the UK (78%) than abroad, where passengers contribute 65% of total revenues.
- With regards to **state subsidies**, it should be noted that the levels of funding can also differ due to different levels of track access charges. For example, for commuter services, charges per train kilometre range from £ 0 to £ 7,83.
- The **ancillary business** only plays a notable role in the UK, where it contributes approximately 7 to 8 % to the operators' revenues

Content

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- **Quality**

Quality indicators include the customer perspective as well as operational metrics produced by TOCs

Approach

- To consider the quality of services, we analysed quality metrics directly related to services provided as well as customer satisfaction surveys reflecting the passengers' perception.
- Important indicators measured by train operators are:
 - The punctuality of trains
 - The share of cancelled trains
 - The share of overcrowded trains
- Customer satisfaction measurements are based on a European survey and include passenger satisfaction with:
 - Cleanliness of stations
 - Cleanliness of vehicles
 - Passenger information
- With regards to comparability, the indicators used by train operators are based on different definitions and they are not available for every comparator. Satisfaction indicators were taken from a European passenger survey and from national operators and are thus partially comparable (except for Germany where we include one regional operator only).
- One of the key questions is if low production costs necessarily come with low quality or vice versa. We have assessed the quality of UK operations and provided some thoughts about the correlation of costs and quality.
- Certainly, this area has not been investigated in depth and requires further research, particularly to discuss the importance of different quality indicators and measuring concepts.

Given the limitations in comparing quality further research is suggested

Conclusions

- **Punctuality** of GB operations is slightly below average in commuter services and at the lower end in regional services.
- The number of **cancelled trains** is difficult to compare. However, for commuter and regional services, GB TOCs have a higher percentage of cancellations than peers.
- **Customer satisfaction** levels concerning the cleanliness of vehicles and availability of passenger information is at the lower end of the spectrum for each service category.
- As the sources vary and the methodology differs by country and organisation, **comparability** is difficult and these evaluations are only a rough assessment. In addition, with regards to satisfaction levels, passengers may have different expectations from country to country.
- It appears to be difficult to create a link between **costs and quality**. Sometimes cost increases can be justified to achieve a better level of quality, such as investments in passenger information systems and staff. However, higher costs can also be a result of poor quality if, for example, operators react to failures, pay penalties, provide bus replacement etc.
- Furthermore, the share of total cost which can be linked to aspects of quality is rather low. An estimated 5 to 10% is relevant for quality.

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