

International whole industry including train operating cost benchmarking

Final report to the Rail Value for Money Study

Department for Transport / Office of Rail Regulation

Hamburg, May 9th, 2011

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The Whole Industry Cost Benchmarking is part of DfT's and ORR's "Value for Money"-studies

Background

- The aim of the study is to examine railway systems in GB and other European countries and to compare costs, revenues and outputs
- The scope of the study mainly encompasses
 - The identification and breakdown of whole industry costs, consisting of infrastructure, train operations and rolling stock
 - The application of normalisation procedures to make costs comparable across countries
 - The identification of staff employed in different functions, including the cost for employment
 - The outputs produced in each country such as train kilometres, passenger kilometres and tonnage, including development over time
 - The funding and revenue streams of each country and the flow of financial means
 - The underlying frameworks in the different countries, for example market structures, allocation of responsibilities and different accounting treatments

A large share of the data and information has been provided directly by the railways

Approach (1 of 2)

- The study is based on data and information from a total of four "core countries" (GB, France, Sweden and The Netherlands) and supplementary information from Germany and Switzerland, covering a large number of infrastructure managers, train and freight operators as well as rolling stock providers
- However, the approach to collect and discuss the data varies from country to country:
 - GB
Data has been provided by DfT/ORR on 19 train operating companies, data from Network Rail has been collected through a questionnaire
 - Germany
The focus has been on the effects of public tendering services in regional services; the data has been based on research
 - France
Data have been provided by the infrastructure manager RFF and by SNCF through a questionnaire

A large share of the data and information has been provided directly by the railways

Approach (2 of 2)

- Sweden

The data on Sweden's infrastructure have been provided by Trafikverket through a questionnaire; data on SJ had to be gathered through research

- Switzerland

Data on Switzerland have been used partially and were collected through publicly available sources

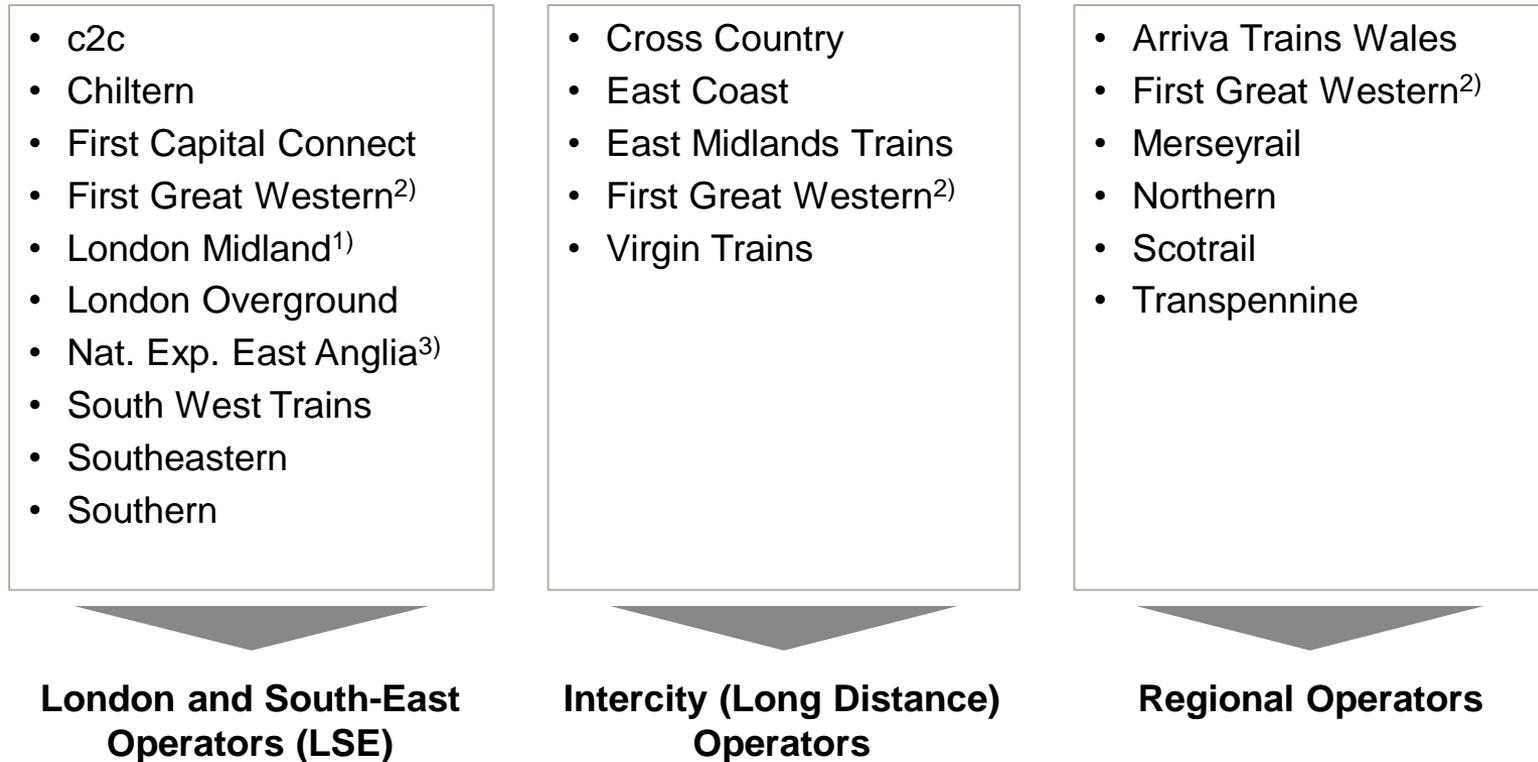
- The Netherlands

Both Nederlandse Spoorwegen as ProRail have provided their data and information through a questionnaire

- Generally, data were requested for the year 2009
- For France, Sweden and The Netherlands data completeness and consistency was assured by the means of meetings and personal contacts to discuss the input
- We are very grateful for the contribution made by all peers and DfT's/ORR's value for money-team. Without their intensive support this study would not have been feasible

For the evaluation GB's nineteen train operating companies have been grouped into three categories

Grouping of TOCs



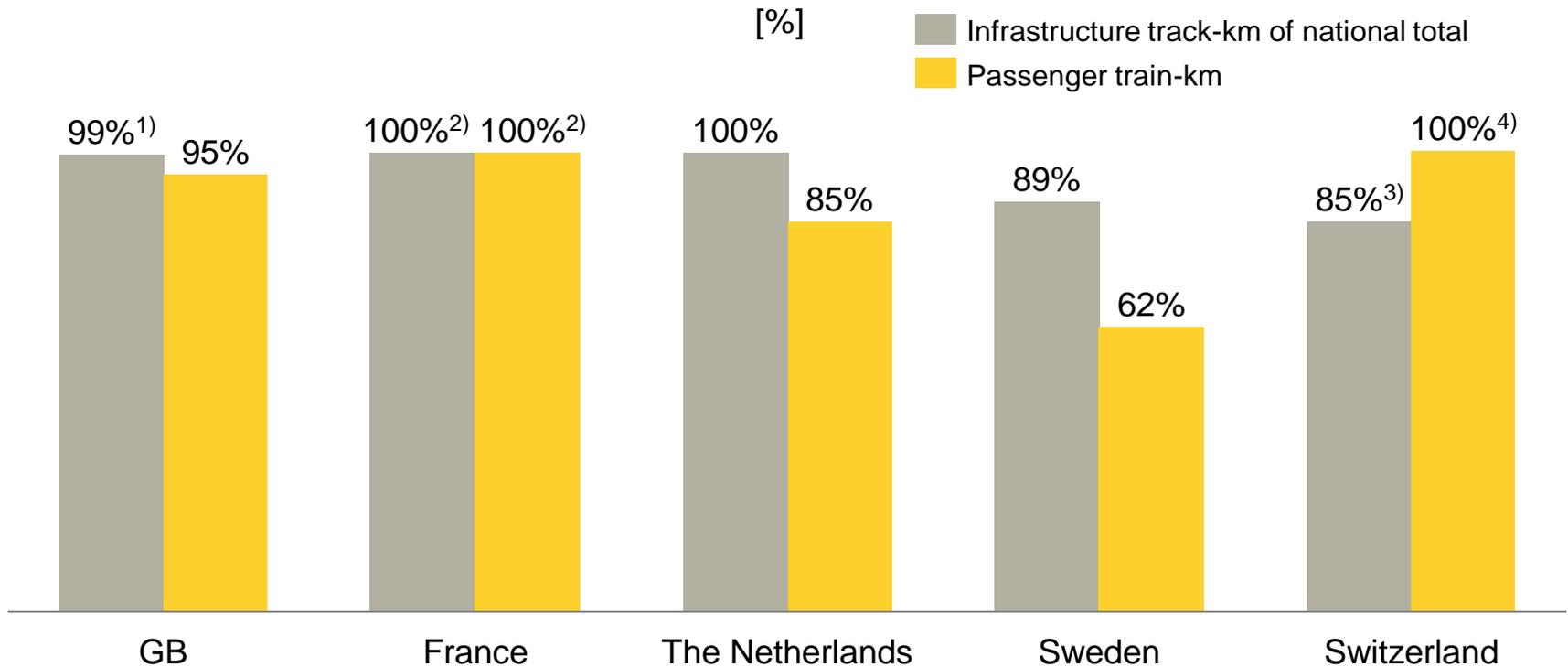
1) Classified by DfT as both LSE and regional, here grouped as LSE

2) Classified by DfT as 33% LSE, 26% regional, and 41% IC (based on train mileage)

3) Classified by DfT as both LSE and IC, here grouped as LSE

The sample of companies covers more than 80% of infrastructure and passenger train operation in each country

Market coverage (1/2)



1) Remaining 1%: LCR; value for UK (including Northern Ireland): 97%

2) Excluding narrow gauge; including narrow gauge: 98,5%

3) Value excluding narrow gauge; including narrow gauge: 61%

4) Including train-km by SBB on other Infrastructure Managers' tracks; Train-km SBB on SBB's tracks: 99%

In GB some smaller train operating franchises have not been considered

Market coverage (2/3)

- Great Britain
 - Infrastructure track-km do not include the track of London Continental Railways
 - Passenger train-km include the supply of 19 franchise operators; excluded are open access operators, Eurostar, Nexus and minor railways
- The Netherlands
 - Passenger train-km only cover NS (Nederlandse Spoorwegen), the state owned railway operator
- Sweden
 - Infrastructure track-km do not include the track of railways such as Botniabanan or Inlandsbanan
 - Passenger train-km only cover SJ, the state owned railway operator but not supplies from competitors
- France
 - Infrastructure track-km only includes standard-gauge track of SNCF

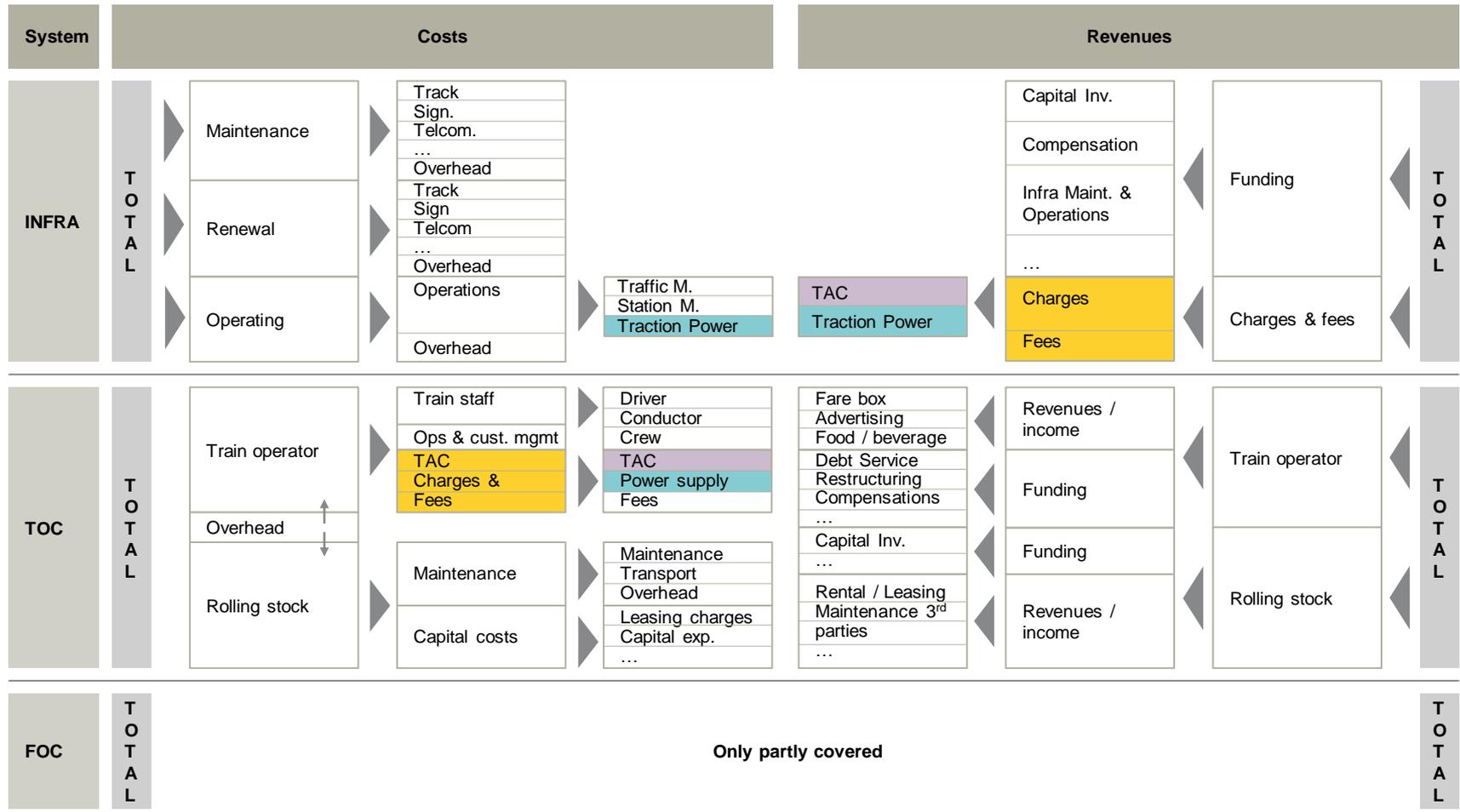
In GB some smaller train operating franchises have not been considered

Market coverage (3/3)

- Switzerland
 - Infrastructure track-km do only include SBB's network but not any track of private railway lines
 - Passenger train-km do only include passenger-km of SBB-trains. Passenger train-km of SBB trains on other infrastructure managers' track are also included

The study covers infrastructure costs, train operating costs and revenues

Synoptical overview



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2. Market development and structures

2.1. Long term development (comparison)

2.2. Long term development (by country)

2.3. Market structures

2.4. Market players

2.5. Conclusions

Dutch growth rates have been rather modest

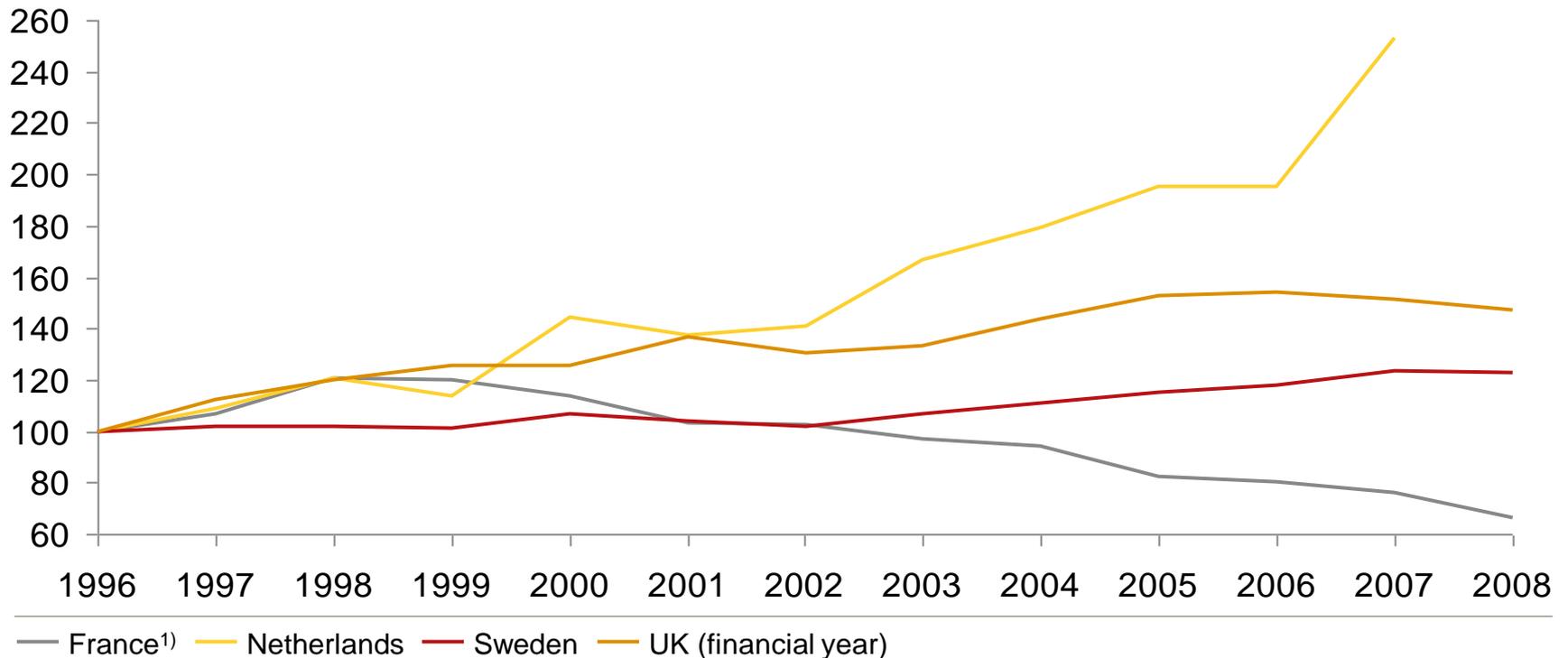
Development passenger transport (2/2)

- In contrast to the other countries in the Netherlands had rather modest growth rates in railway passenger transport over the last decade
- This development is due to the following facts
 - It is traditionally a very well developed network and one of the most densely used networks in Europe
 - It has mostly served for passenger transport and been a strong commuter network with good intercity connections
 - Over the past decades the network had only been slightly extended (track length grew by only 5% since 1982)

In The Netherlands freight transport boomed but UK had also gained more than 40%

Development freight transport

Index net-tonne-kilometres 1996-2008



1) Development of gross-tonnes kilometres

Source: UIC, SIKA; calendar years

The Netherlands opened the market and created competition among operators

Development freight transport

- In The Netherlands freight has more than doubled in the past decade for a number of reasons:
 - An increase in international transport
 - Higher transport volumes of iron ore and coal to Germany
 - A strong growth of container and swap body transport
 - The introduction of the shuttle concept in the mid 90ies for transports between The Netherlands and Germany
- This positive development has been supported by open access to the network and a continuously growing number of market entrants
- Furthermore, new companies have entered the market for leasing rolling stock providing for example flexible rental and lease agreements
- France where SNCF is the only rail freight carrier has seen a massive decline due to pressure from open access freight operators who are said to have fared much better
- Furthermore SNCF's performance is troubled by frequent strikes, restrictive working policies and low efficiency and quality levels

2. Market development and structures

2.1. Long term development (comparison)

2.2. Long term development (by country)

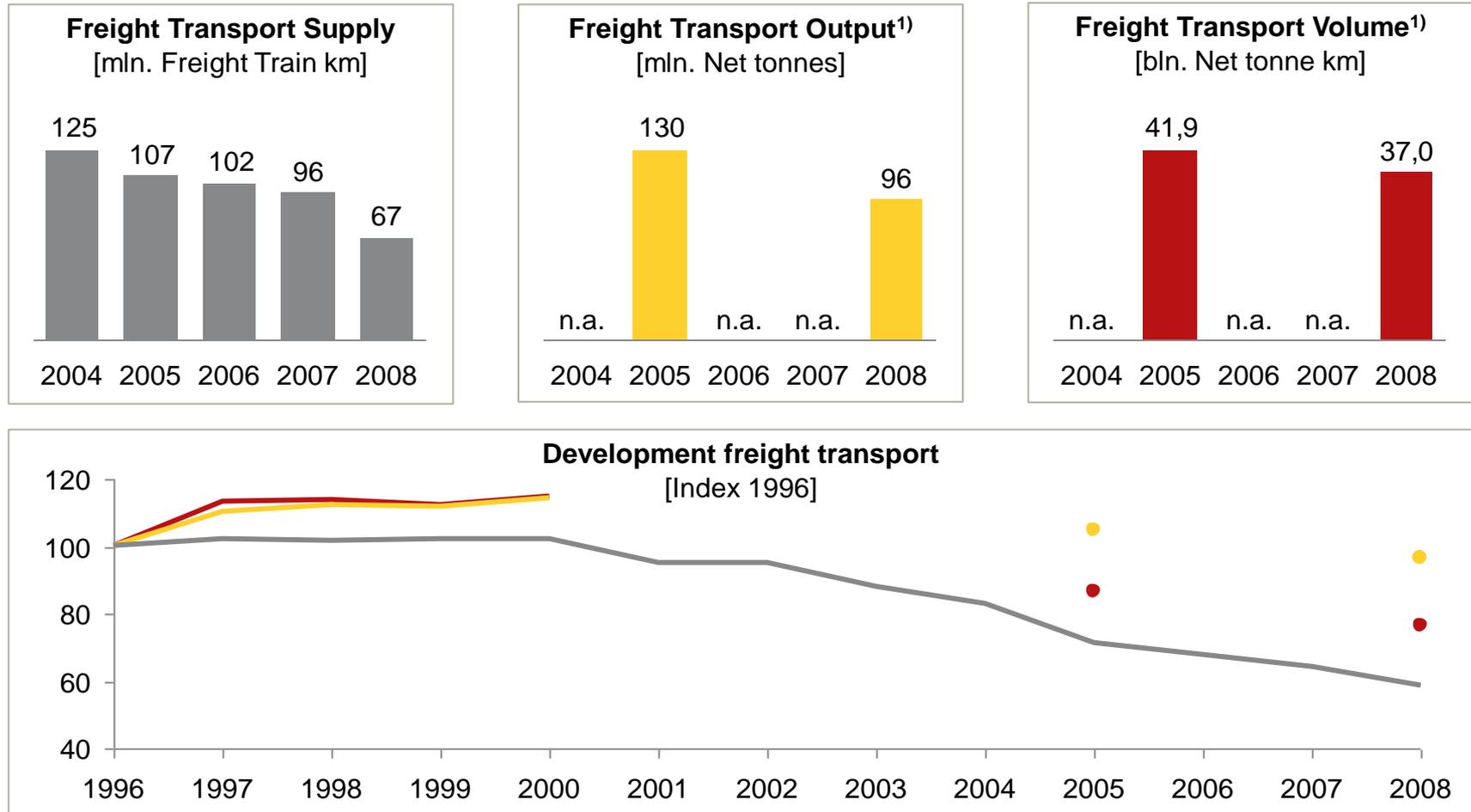
2.3. Market structures

2.4. Market players

2.5. Conclusions

In France freight transport has declined significantly since the 90ies

Freight transport in France

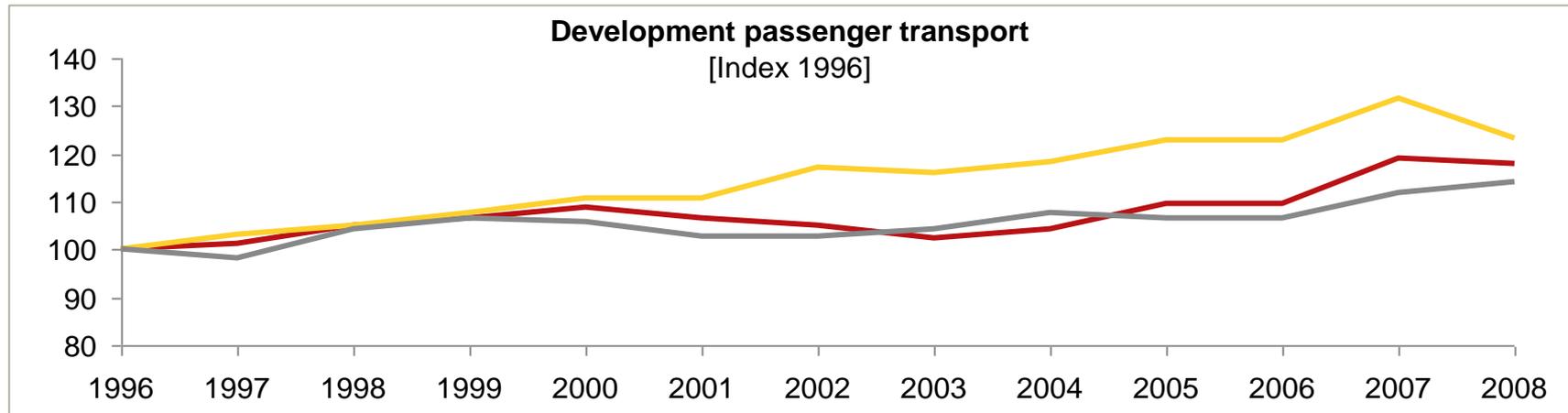
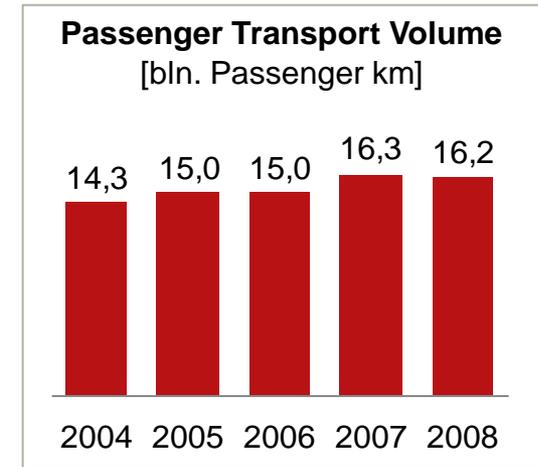
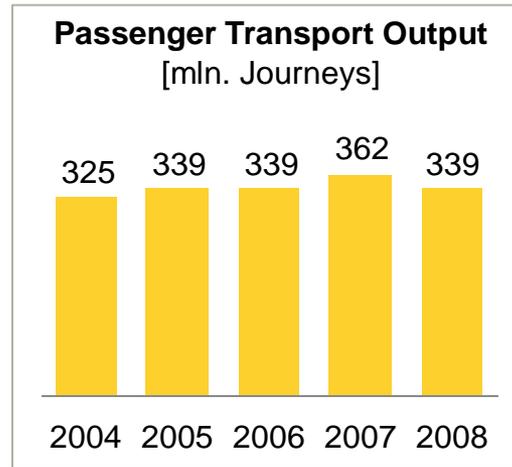


Source: UIC

22 1) Data only partly available from 1996 to 2001 and for 2005 and 2008

In The Netherlands passenger transport has increased, with more and shorter journeys

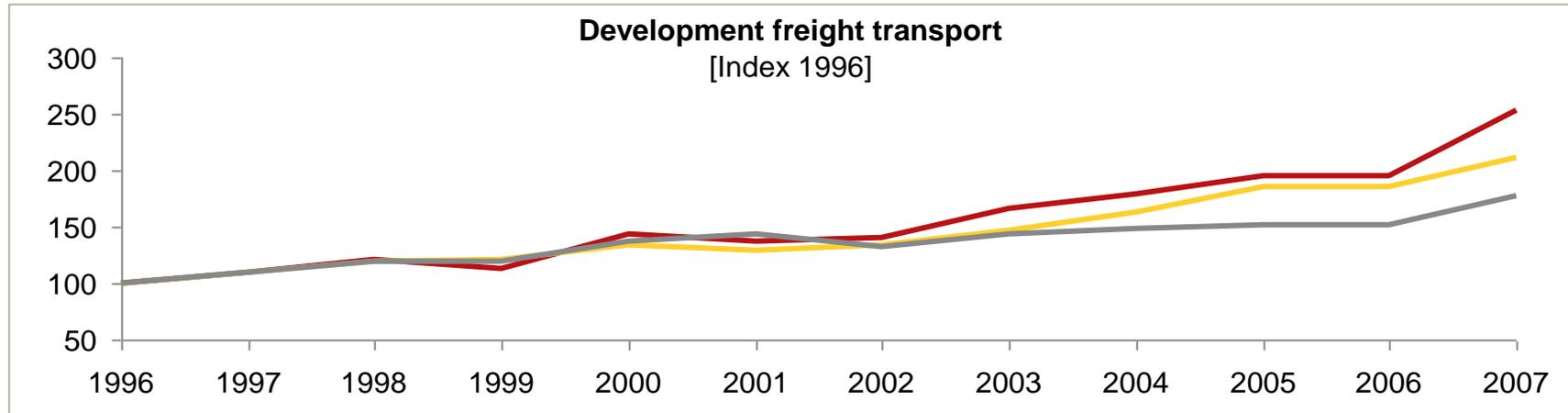
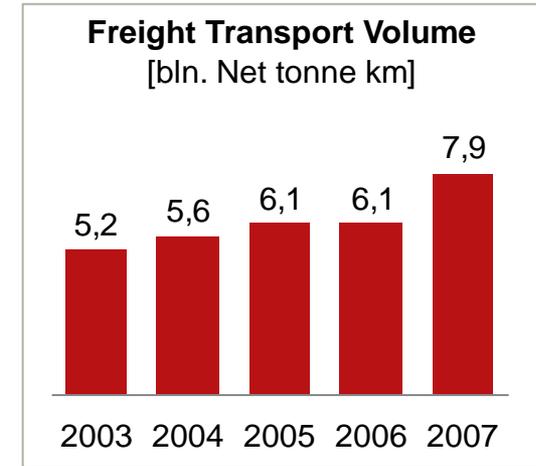
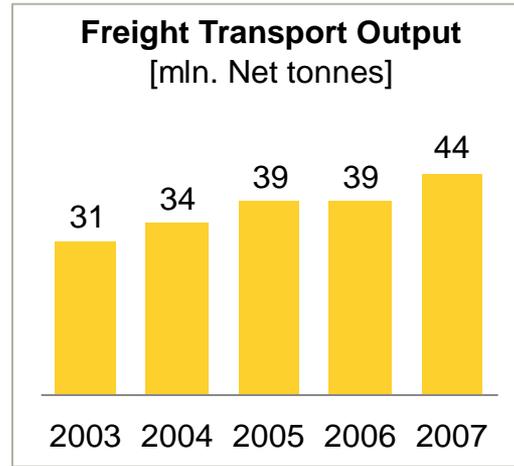
Passenger transport in the Netherlands



Source: UIC

In The Netherlands freight transport has doubled in the past decade – with a strong increase in efficiency

Freight transport in the Netherlands

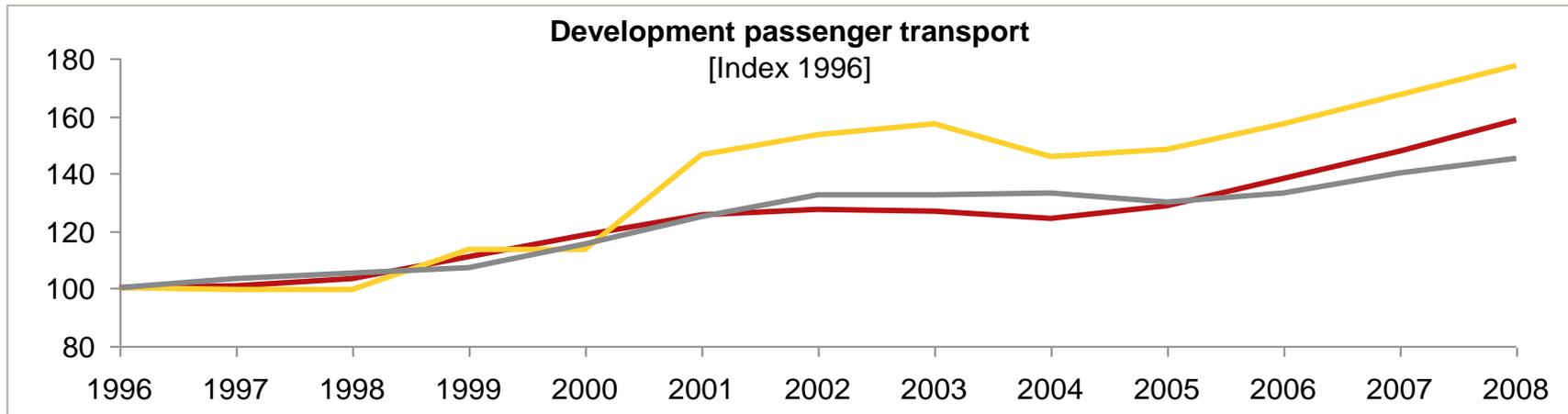
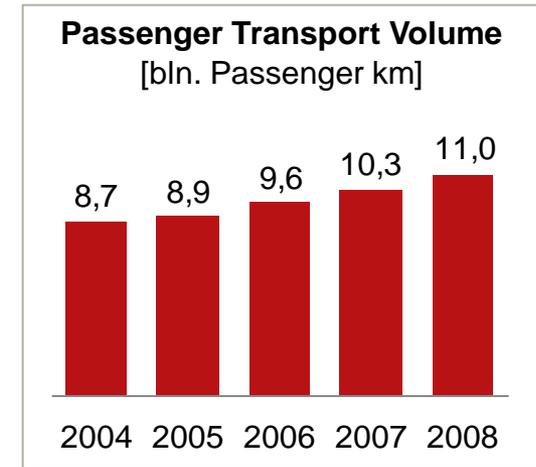
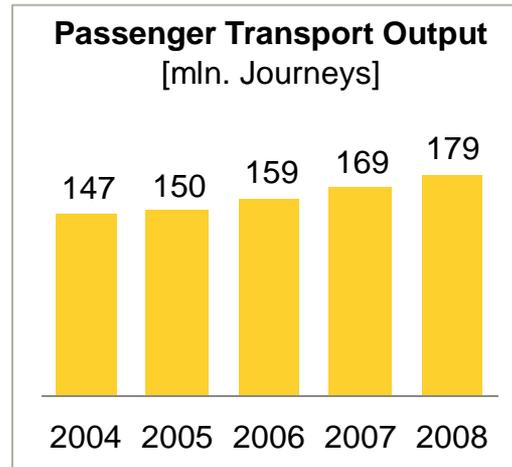


Source: UIC

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Sweden has seen output and input broadly increasing at the same pace

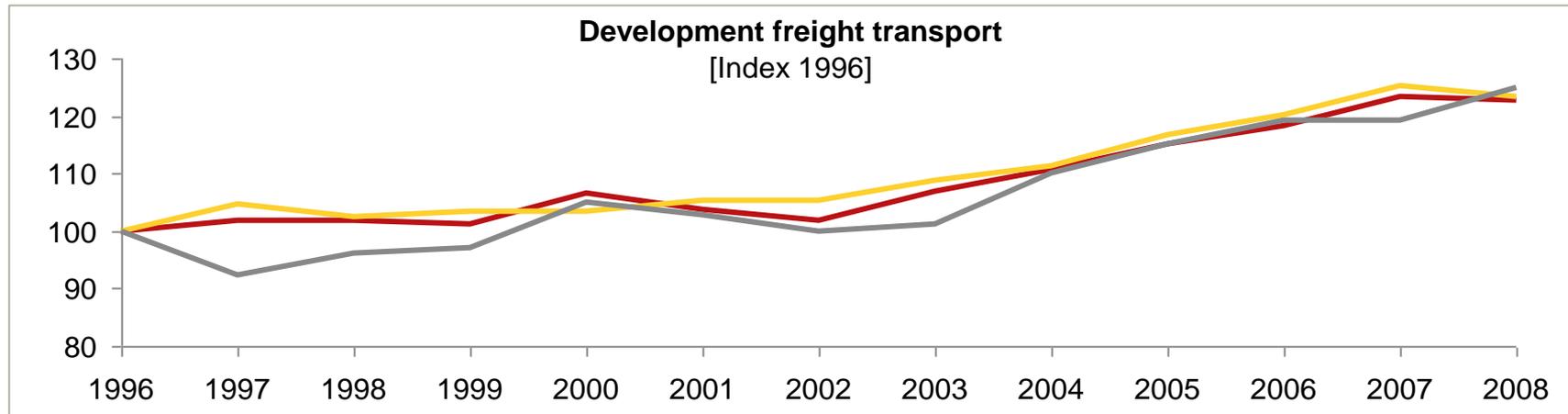
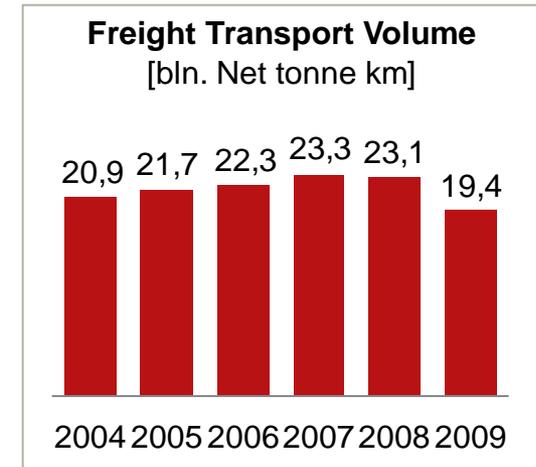
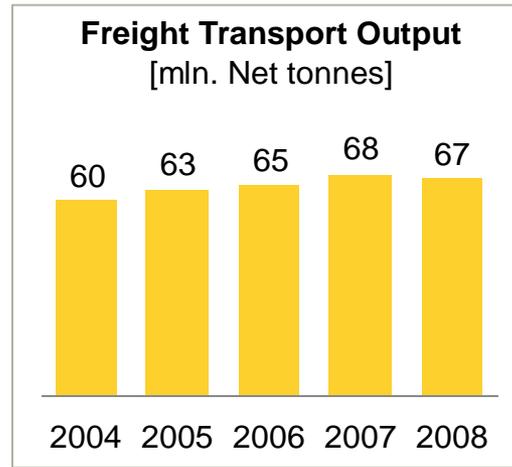
Passenger transport in Sweden



Source: UIC, SIKa

In Sweden freight transport has continuously increased

Freight transport in Sweden

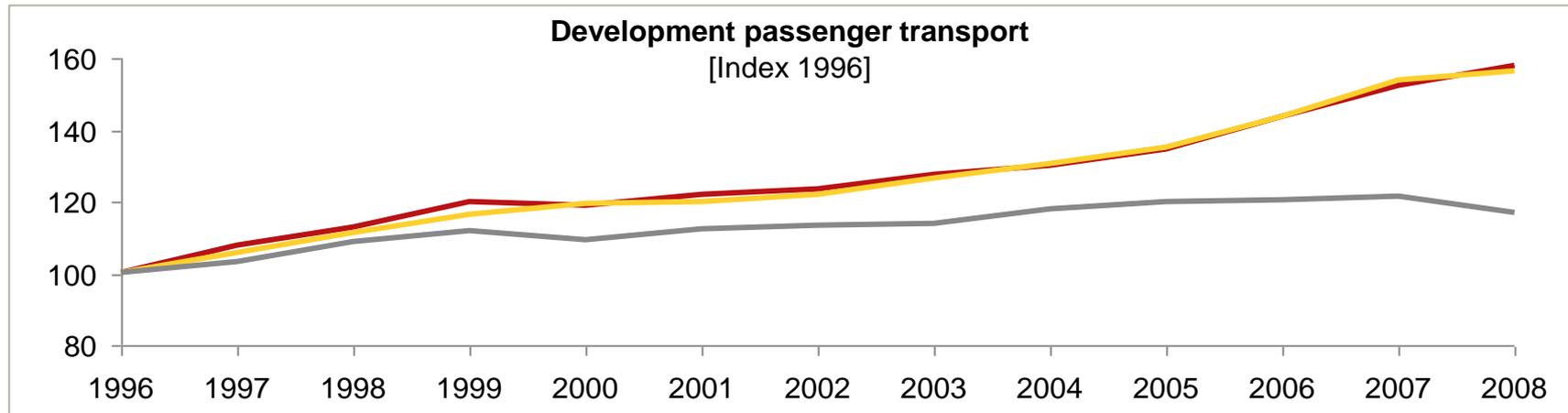
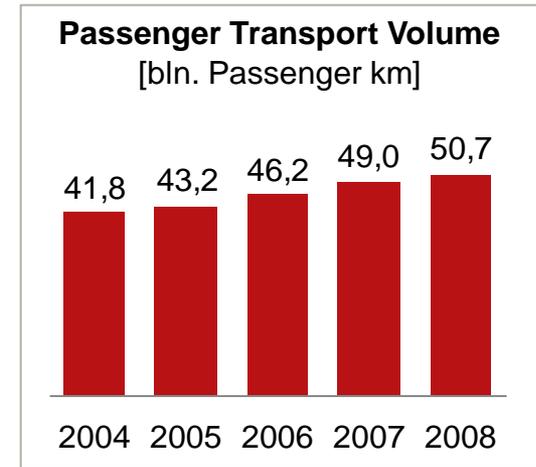
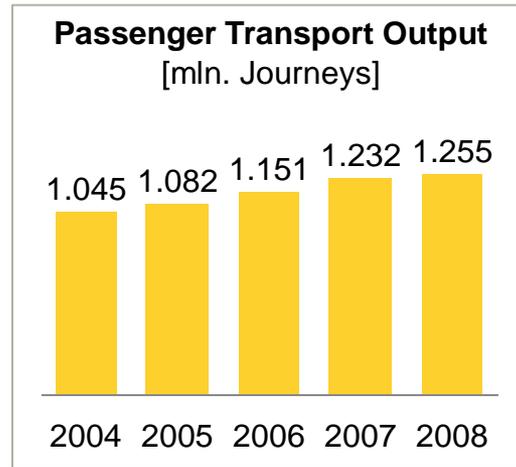
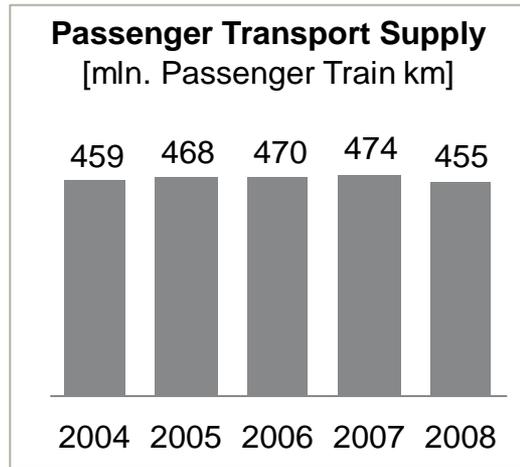


Source: UIC, SIKa

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In GB substantial gains in train utilisation were realised

Passenger transport in GB



Source: UIC

2. Market development and structures

2.1. Long term development (comparison)

2.2. Long term development (by country)

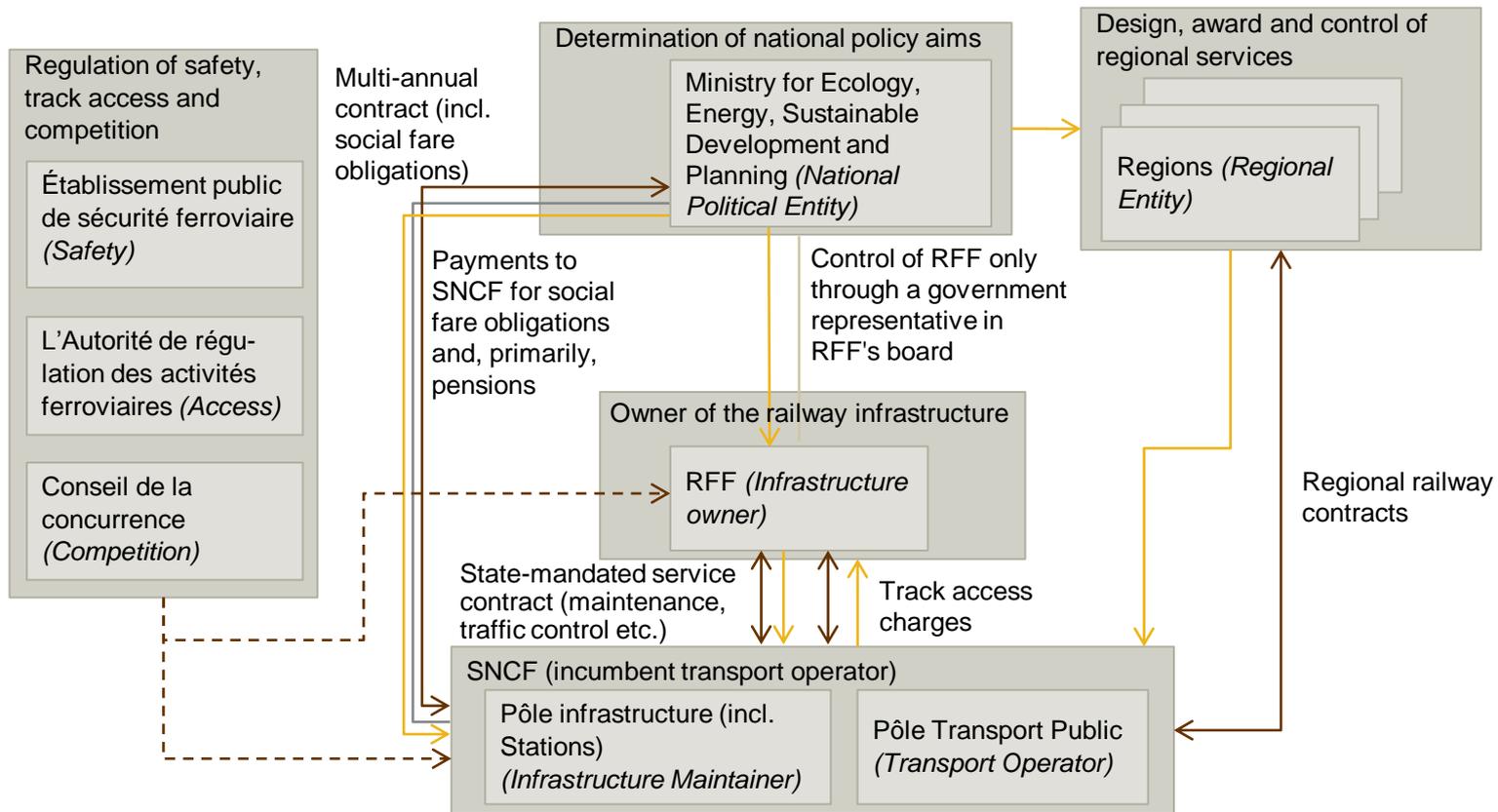
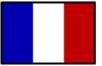
2.3. Market structures

2.4. Market players

2.5. Conclusions

In France infrastructure manager and train operator have a complex relationship

Market organisation in France



— Ownership → Funding/Cash Flows → Contract (incl. Concessions) - - - → Regulation

Source: Internationalisation of Infrastructure

The French government enforces its aims in the rail transport primarily via ownership control

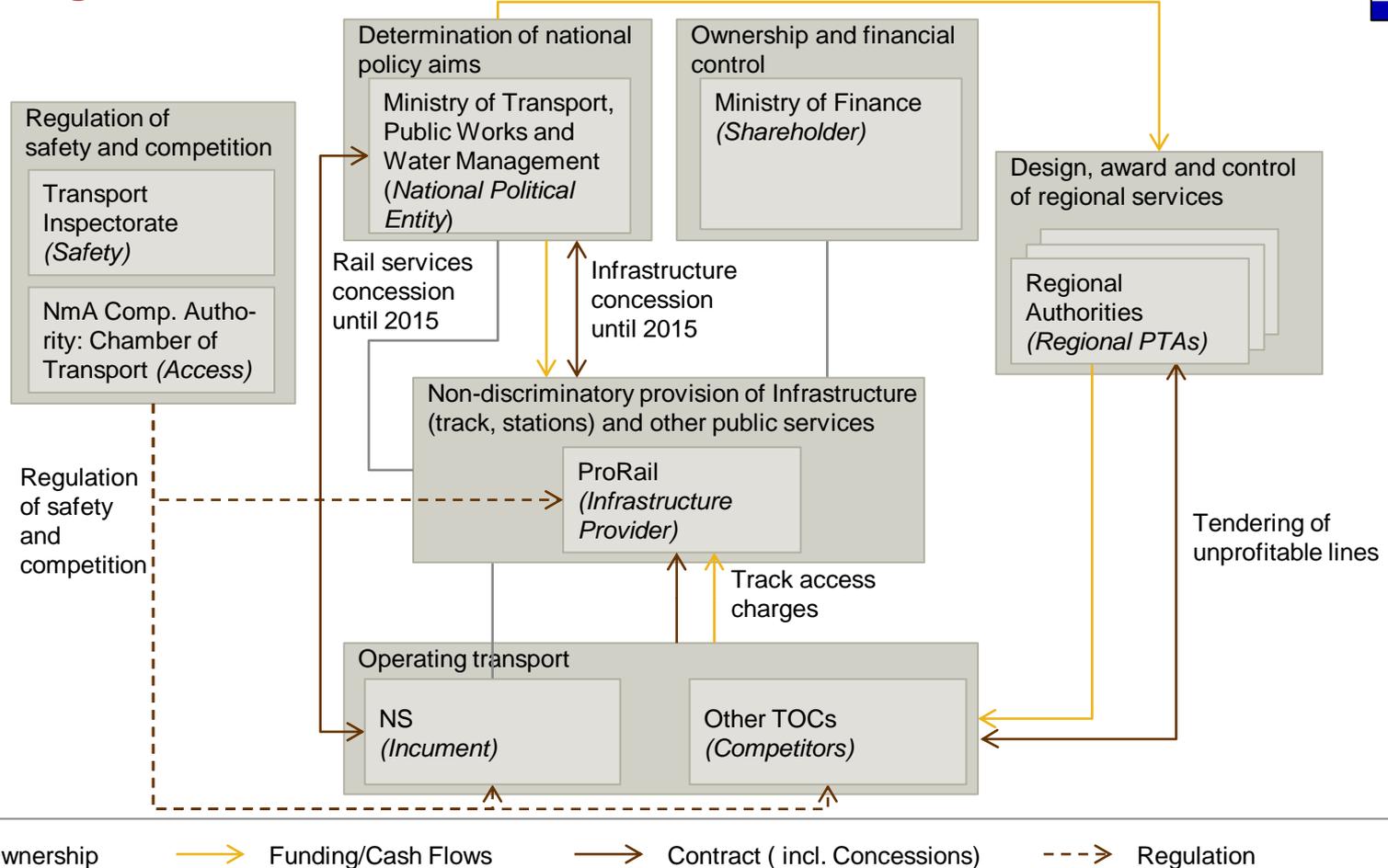
Determination and enforcement of policy aims in France (overview)

- Réseau Ferré de France (RFF) is charged with formulating policy pertaining to the maintenance and development of rail infrastructure, but control of RFF takes place only through a Government representative in RFF's board
- A Contract (contrat de plan) between the State and Société nationale des chemins de fer français (SNCF) establishes multi-annual budgetary agreements, but this contract does not seem to be enforced as in other European member states according to experts
- In General the aim for SNCF is that high-speed and long-distance services must be profitable (with free market access and without any contract)
- A list of further requirements for SNCF contains a number of social fare obligations
- Few financial incentives and penalties are included in the contract between RFF and SNCF to enforce the obligations of the contracting parties (e.g. maintenance of network by SNCF and providing track access by RFF)
- Steering of RFF and SNCF by the national government primarily takes place via ownership control within the boards, not via contracts
- The regions determine their transport policy aims in terms of quality (e.g. punctuality) on their own and they are fixed in service contracts with SNCF

Source: Internationalisation of Infrastructure 2009

The Netherlands have a system of federal agencies for regulation and funding

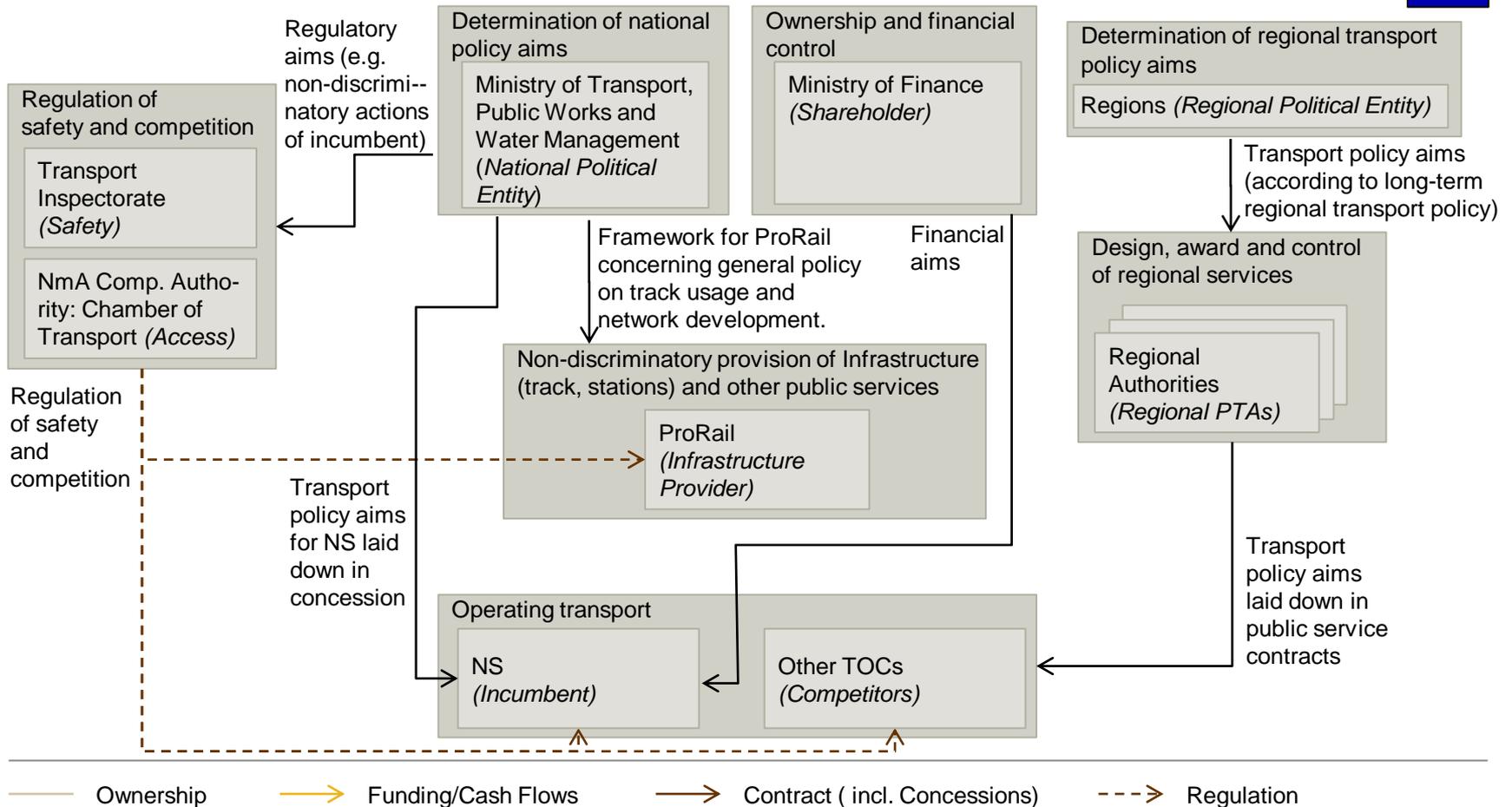
Market organisation in the Netherlands



Source: Internationalisation of Infrastructure, van de Velde, Jacobs and Stefanski 2009

The Netherlands have a system of federal agencies for regulation and funding

Determination of policy aims in the Netherlands



Source: Internationalisation of Infrastructure, van de Velde, Jacobs and Stefanski 2009

The national government in the Netherlands has some ambitious aims for the rail sector

Policy aims in the Netherlands as determined by national government (overview)

- The national government has identified four aims for improving the quality and capacity of both passenger and freight transport. They are:
 - frequent services on the busiest lines in and around the Randstad region in the west of the country;
 - cohesive regional public transport systems revolving around rail transport;
 - a sufficient quality of travel times to the various parts of the country;
 - a future-proof strategy for freight transport routes.
- In its 2007 coalition agreement, the government aimed for 5% annual growth in passenger transport during its term in office.
- The public incumbent operator NS and ProRail, the provider of the infrastructure, received 10 years concession contracts in 2005 that include financial incentives based on performance indicators (e.g. NS has performance indicators on passenger growth and punctuality). NS and ProRail have to propose yearly improved values for these performance indicators in so called transport and infrastructure plans which have then to be judged and agreed upon by the Ministry.

Source: van de Velde, Jacobs and Stefanski 2009

In Sweden a number of public actors organise a fairly liberalised market (but state owned companies dominate)

Market organisation in Sweden

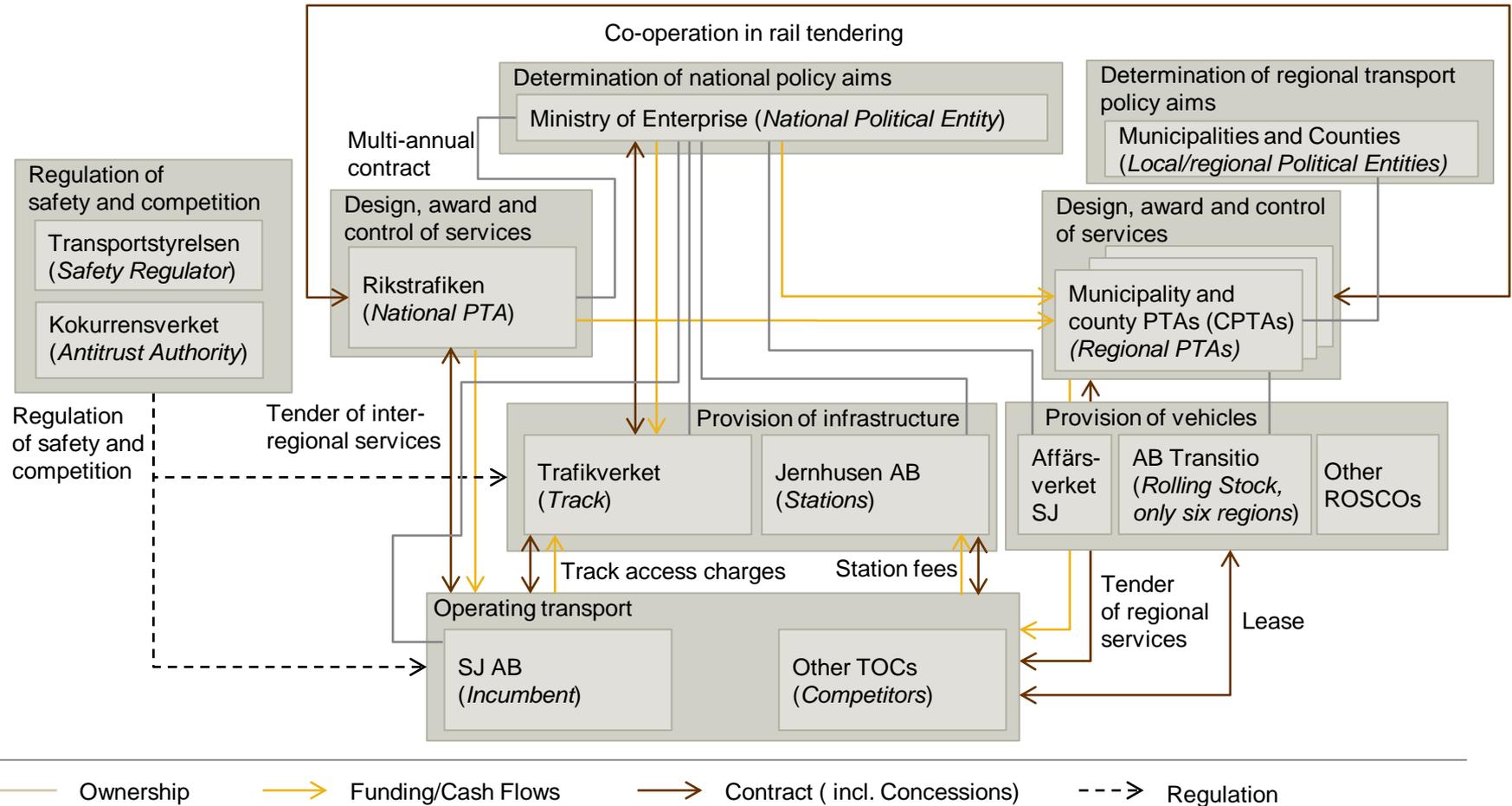
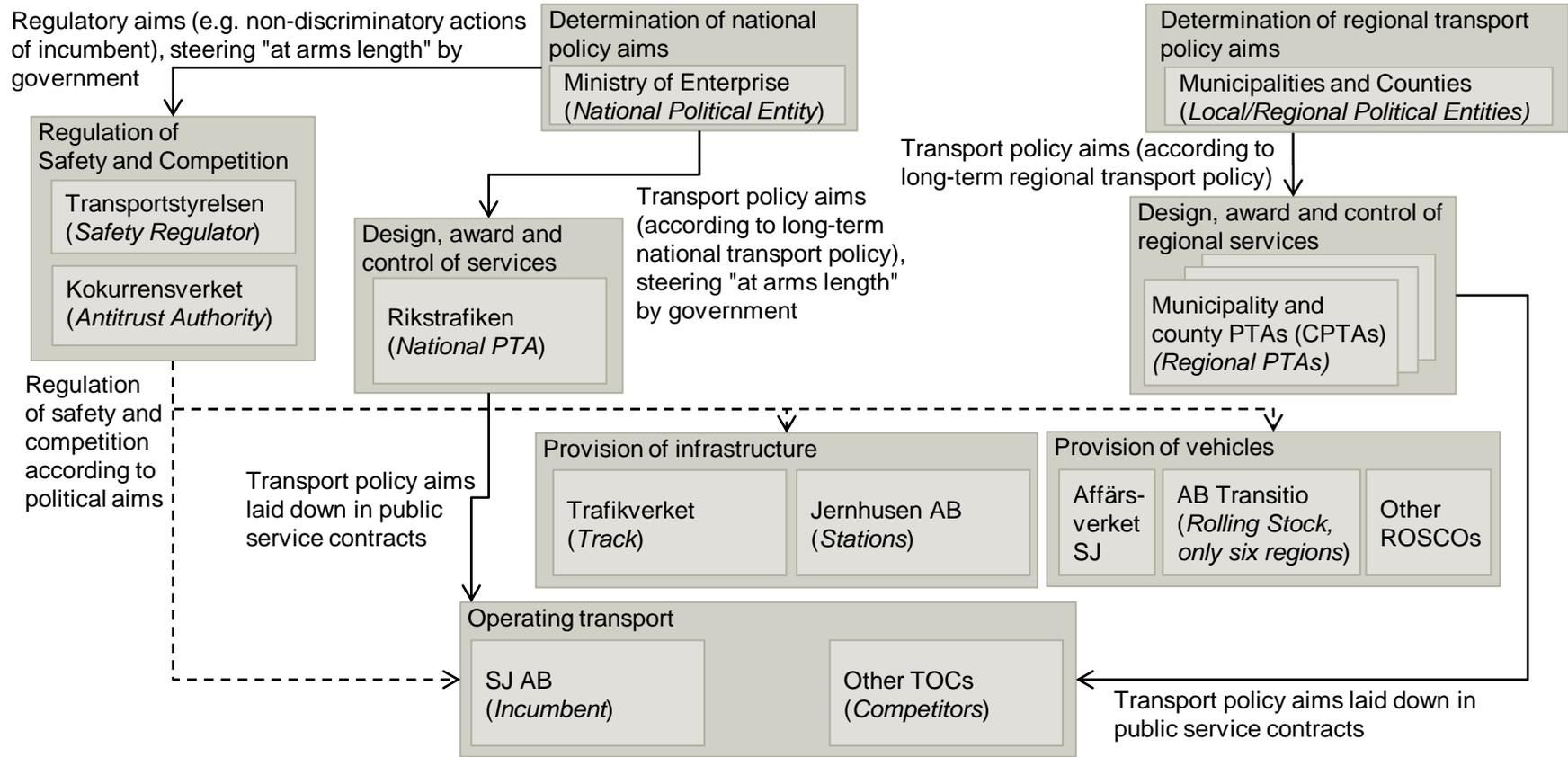


Figure based on non-commercial services (note: Sweden has recently liberalised commercial services (introduction of free market access for commercial services), figure shows only main actors (e.g. excluding other individual infrastructure managers with ~10% of nationwide track length). Source: Banverket Sector Report 2008/9, Trafikverket Homepage, Alexandersson

In Sweden the policy objectives are set by the national and the regional and local levels

Determination of policy aims in Sweden



→ Policy aims - - - → Regulation

Source: Banverket Sector Report 2008/9, Trafikverket Homepage, Alexandersson and Hultén 2009

The overall objective in Sweden is to provide a socio-economically viable, efficient and sustainable transportation

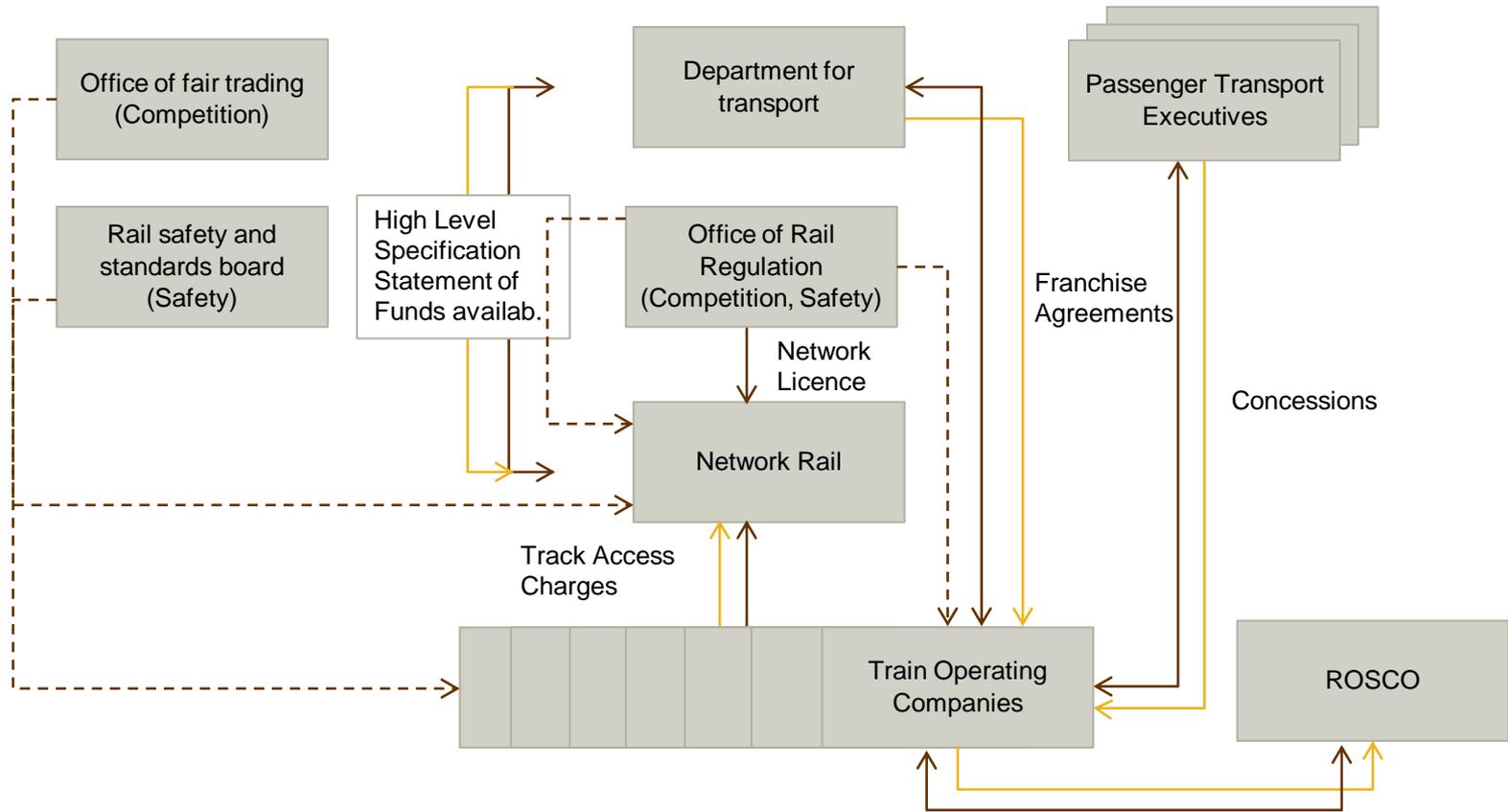
Policy aims in Sweden as determined by Trafikverket (overview)

- **Overall vision: Everybody arrives smoothly, the green and safe way**
- **The aim is to meet transport policy targets**
 - The overall objective of the transport policy in Sweden is to ensure socio-economically viable, efficient and sustainable transportation for citizens as well as for trade and industry
 - The functional objective of transport policy: Availability
 - The considerate objectives of transport policy: Health, safety and the environment

Source: Trafikverket November 2010

In GB the ORR plays a central role in regulating the railway industry

Market organisation GB



— Ownership → Funding/Cash Flows → Contract (incl. Concessions) - - -> Regulation

Source: Internationalisation of Infrastructure, Network Rail

2. Market development and structures

2.1. Long term development (comparison)

2.2. Long term development (by country)

2.3. Market structures

2.4. Market players

2.5. Conclusions

By number of companies GB and Sweden have the most developed market for passenger traffic

Overview market participants (1 of 2)

Category	Countries			
	France 	Netherlands 	Sweden 	GB 
Government Agencies	<ul style="list-style-type: none"> Ministry for Ecology, Energy, Sustainable Dev. and Planning L'Autorité de régulation des activités ferroviaires Établissement public de sécurité ferroviaire Conseil de la concurrence 	<ul style="list-style-type: none"> Ministry of Public Works and Water Management Chamber of Transport Transport Inspectorate 	<ul style="list-style-type: none"> Ministry of Enterprise, Energy and Communications Rikstrafik Transport Styrelsen 	<ul style="list-style-type: none"> DfT ORR
Infrastructure Managers	<ul style="list-style-type: none"> RFF (network) (Public) SNCF Gares & Connexions (Stations) (Public) 	<ul style="list-style-type: none"> ProRail Ltd. (Public) NL Railinfratrust Company (Public) 	<ul style="list-style-type: none"> Trafikverket (Public) Others: Inlandsbanan AB (Public), A-Train AB (PPP), Jernhusen AB (stations) (Public) 	<ul style="list-style-type: none"> Network Rail (Private) Northern Ireland Railways (Public)
Train Operating Companies	<ul style="list-style-type: none"> SNCF Voyages (Public) SNCF Proximités (Public) 	<ul style="list-style-type: none"> Nederlandse Spoorwegen (Public) Others: Arriva (Public DB), Veolia (Private), DB Regio NRW (Public), Connexion 	<ul style="list-style-type: none"> SJ AB (Public) Stockholmståg KB (Public SJ) A-Train AB Others: Veolia Transport Sverige AB (Private), Svenska Tågkompaniet AB (Public), Arriva Tåg AB (Public DB), Roslagståg AB (Public), Inlandsbanan AB (Public), DSBFirst Sverige AB (PP), Merresor AB (PP), SJ Norrlandståg AB (Public) 	<ul style="list-style-type: none"> First (Private) Stagecoach (Private) Govia (Public Private Keolis)/Go-ahead) Arriva (Public DB) Abellio (Public NS) National Express (Private) Others incl. DB

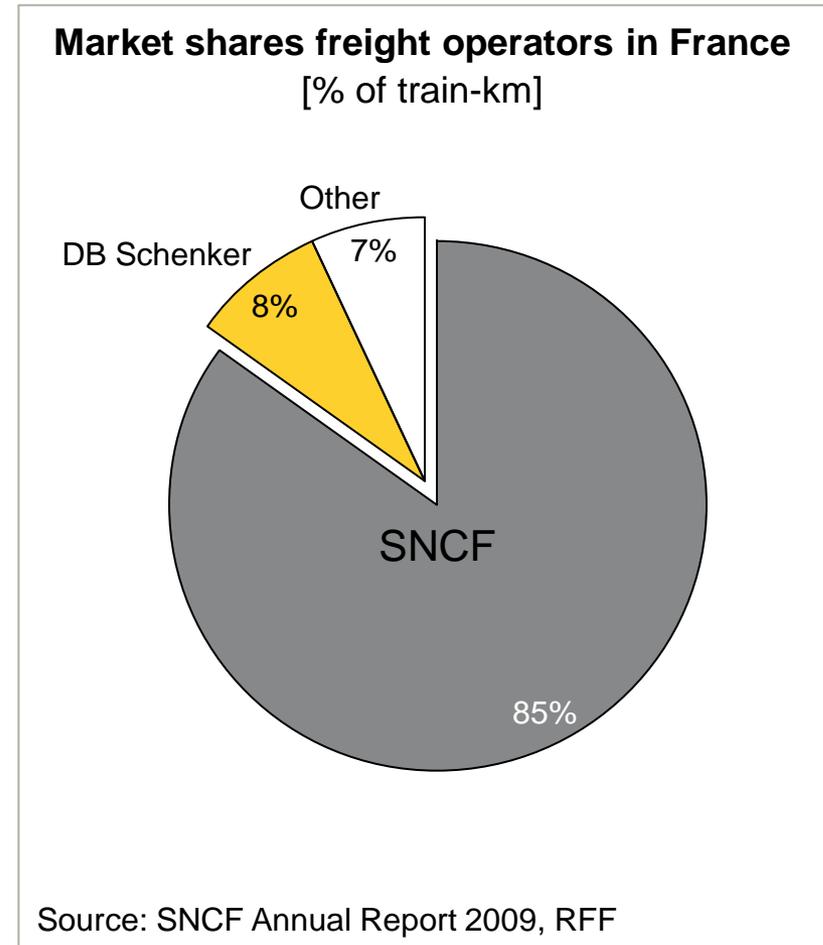
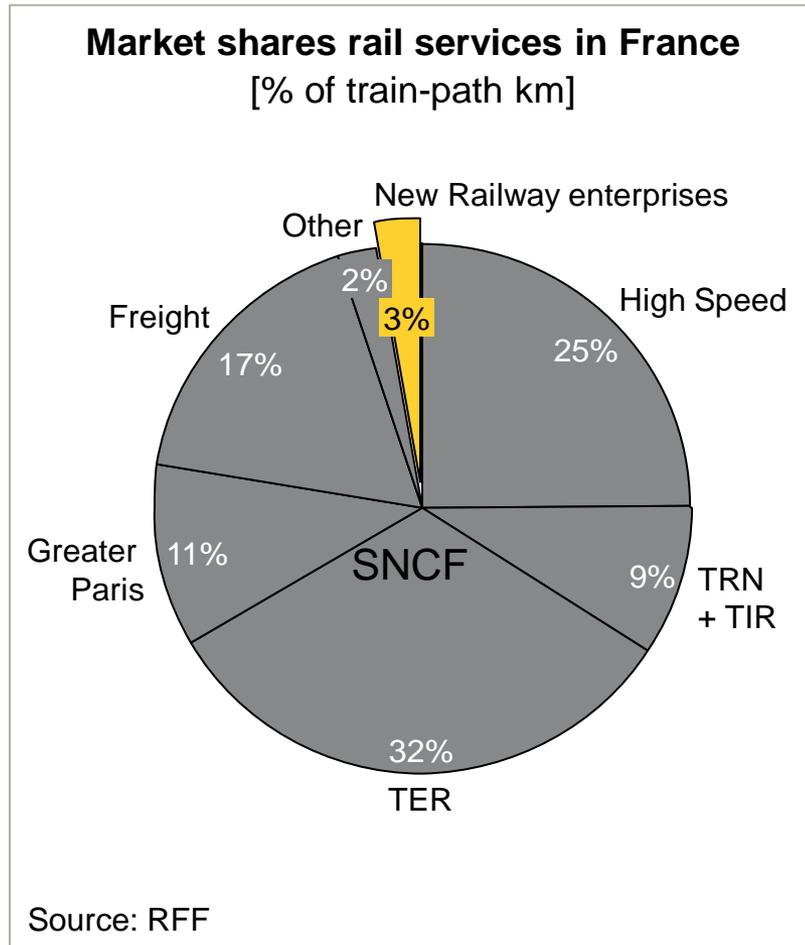
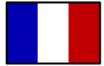
Also in freight and rolling stock the level of diversity of players in the markets differs significantly

Overview market participants (2 of 2)

Category	Countries			
	France 	Netherlands 	Sweden 	GB 
Freight Operating Companies	<ul style="list-style-type: none"> • SNCF Geodis (Public) • Euro Cargo Rail (Public DB) 	<ul style="list-style-type: none"> • DB Schenker Rail Nederland (Public) • Cross-border: Rail4chem (Public SNCF), SNCF Fret (incl. ITL, Public), Dillen & Lejeune Cargo (Private), HGK AG (Public), B-Cargo (Public SNCB), TX Logistics AG (PP Trenitalia) • Domestic: ACTS (Private), ERS Railways BV (Private), Rotterdam Railfeeding (Private), Veolia Cargo Nederland BV (Public SNCF) 	<ul style="list-style-type: none"> • Green Cargo AB (Public) • Cargo Net AB (Public) • Malmtrafik i Kiruna AB (Private) • Hector Rail AB (Private) • Others: TGOJ Trafik AB (Public), Tågakeriet i Bergslagen AB, TX Logistik AB (Public Private Trenitalia), RailCare Tåg AB (Private), Peterson Rail AB (Private), Tågfrakt Produktion i Sverige AB, DB Schenker Rail Scandinavia A/S (Public), MidCargo AB (Private), Stena Recycling AB (Private) 	<ul style="list-style-type: none"> • DB Schenker (Public) • Freightliner Intermodal (Private) • Freightliner Heavy Haul (Private) • DRS (Public) • G.B. Railfreight (Private) • Fastline (Private) • Advenza (Private)
Rolling Stock Leasing Company	-	<ul style="list-style-type: none"> • Railpool (Public banks) • Ox-Traction (Private) • CB-Rail (Private) • Alpha-Trains (Private) • Mitsui Rail Capital Europe (Private) • Siemens Dispolok (Private) 	<ul style="list-style-type: none"> • AB Transitio (Public) • Transwaggon AB (Private) • Tågakeriet i Bergslagen AB (Private) 	<ul style="list-style-type: none"> • Angel Trains (Private) • HSBC Rail (Private) • Porterbrook (Private) • Sovereign trains (Private) • QW Rail Leasing (Private) • Diesel Trains Ltd. (Public) • Lyods TSB General Leasing (Private) • Other Spot-hire companies

SNCF absolutely dominates the rail market in France

Market shares rail services



Source: Annual Reports, UIC

SNCF provides transport and infrastructure related services

Profile SNCF



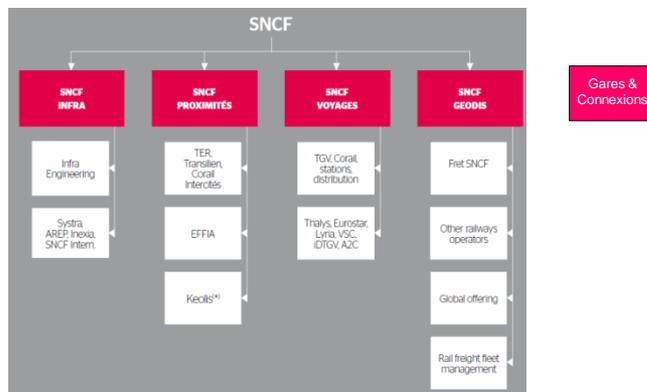
Portfolio

- Markets: Long-distance, regional, commuter and night rail
- Services:
 - Urban, sub-urban and regional transport
 - High-speed rail
 - Freight and logistics
 - Maintenance and engineering services
 - Maintenance and operation of stations

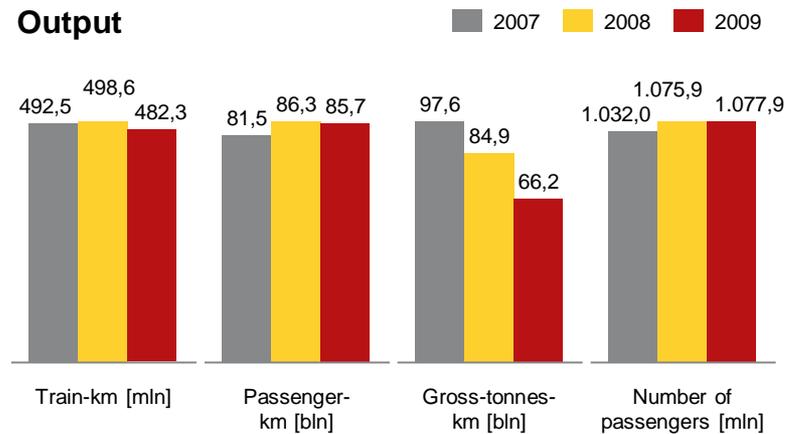
Key Financials¹⁾

	2009	2008	2007
Net Sales [GBP mln]	22,151	20,006	16,116
• Proximités	• 5,857	• 5,037	
• Voyages	• 6,565	• 5,930	
• Geodis	• 6,567	• 6,377	
Operating result [GBP mln]	129	775	683
Staff (Group)	161,771	163,485	166,213

Organisation



Output



Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

RFF is the French infrastructure manager

Profile RFF



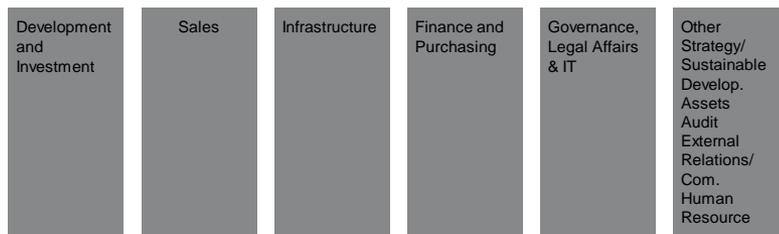
Portfolio

- Responsibilities: RFF ensures funding, development and promotion of the network, manages and pays for work performed by the main contractor, and decides on the procedures relating to traffic management and the running of the network
- Infrastructure management and maintenance work is outsourced to SNCF as well as traffic control (state-mandated)

Key Financials¹⁾

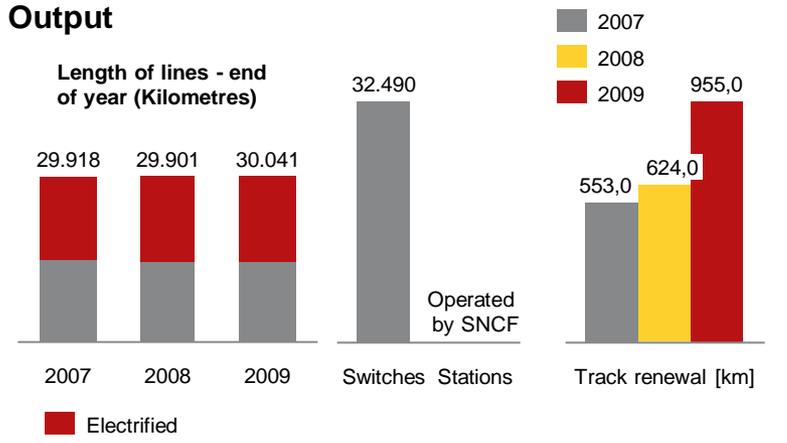
	2009	2008	2007
Net Sales [GBP mln]	2,921	2,462	1948
Operating result [GBP mln]	1,412	-315	-5
Investment new projects [GBP mln]	1,399	1,195	0
Staff (end of year)	1,166	939	843

Organisation



The organisational structure is completed by 12 regional divisions

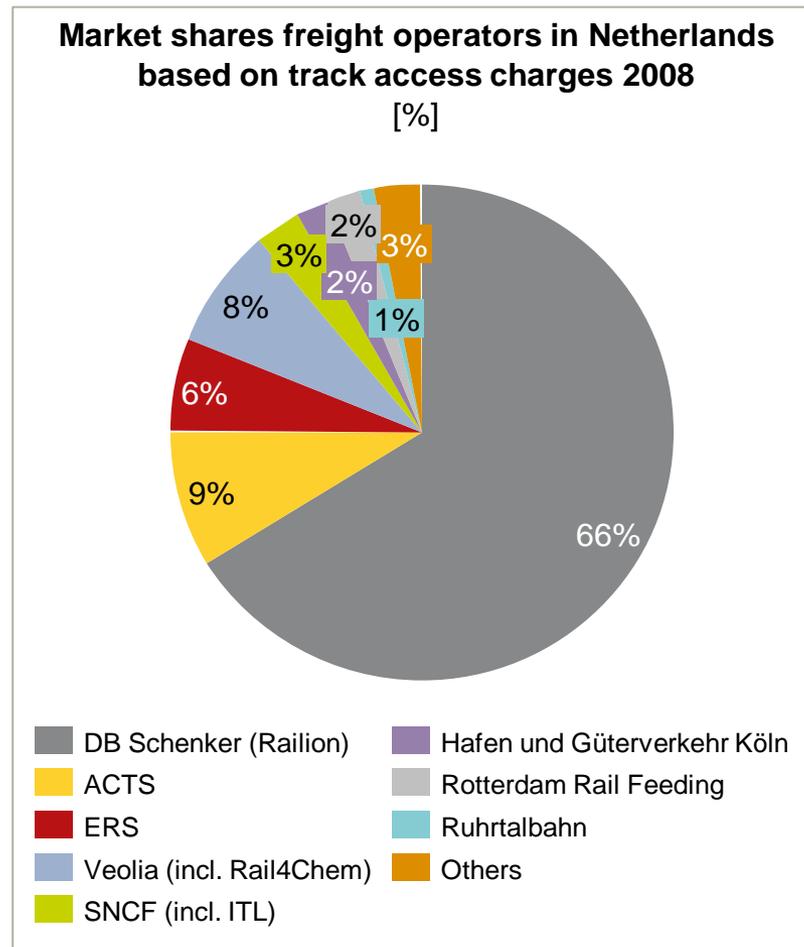
Output



Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

There is significant competition on the Dutch freight rail market – DB Schenker largest operator

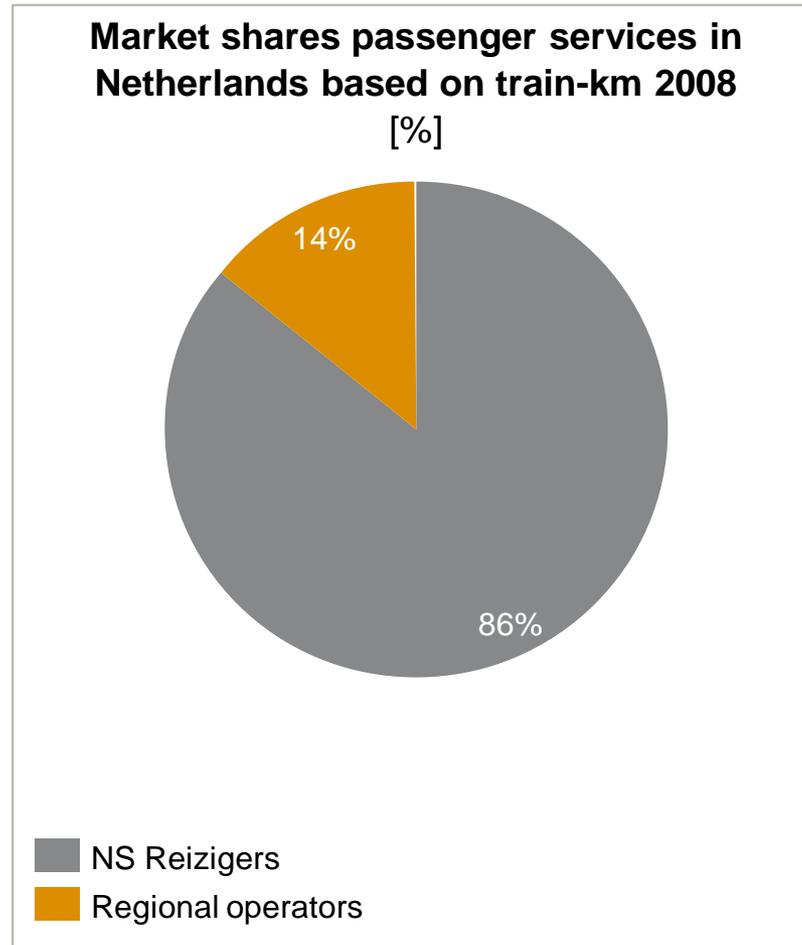
Market shares freight Netherlands



Source: Pro Rail

Passenger services are dominated by NS Reizigers

Market shares passenger services Netherlands



Source: Pro Rail

NS Group provides passenger transport in the Netherlands and abroad

Profile NS



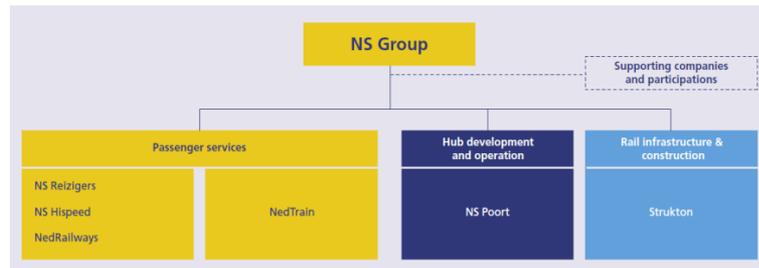
Portfolio

- Services: Rail operations (high speed, national, regional), bus services, associated sales and service activities, Station management, hub development and operation, fleet management and maintenance, rail infrastructure & construction
- Markets: Netherlands, Great Britain, Germany, Czech Republic, France and Belgium

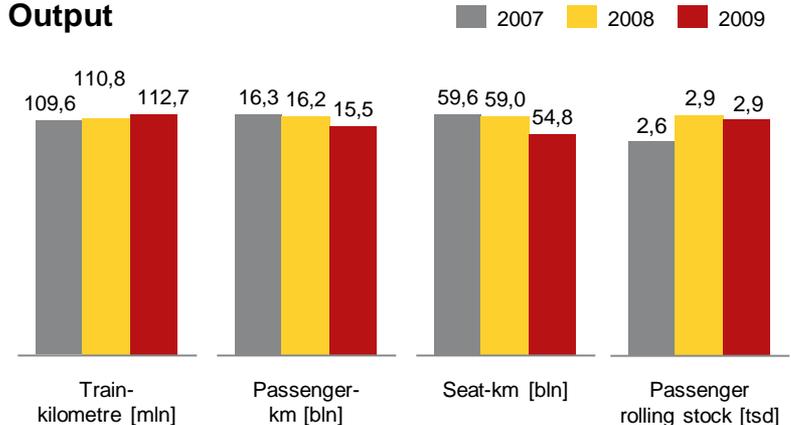
Key Financials¹⁾

	2009	2008	2007
Revenue [GBP mln]	4,092	3,379	2,764
Ticket revenue [GBP mln]	1,637	1,422	1,190
Operating Result [GBP mln]	143	261	243
Staff (number year-end)	33,582	29,384	28,676

Organisation



Output



Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

ProRail is the Dutch infrastructure manager – all maintenance outsourced

Profile ProRail



Portfolio

- Responsibility:
 - maintenance and extensions of the national railway network infrastructure
 - allocating rail capacity
 - traffic control

Key Financials¹⁾

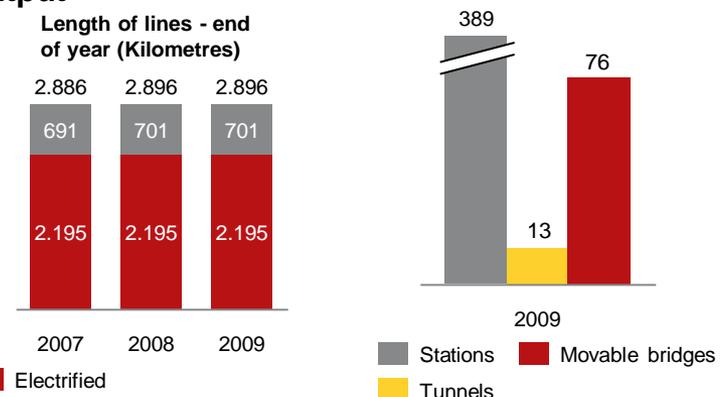
	2009	2008	2007
Revenue [GBP mln]	1,314	1,144	910
Gross investments [GBP mln]	959	813	587
Operating Result [GBP mln]	15	1	21
Staff (number year-end)	3,679	3,220	2,903

Organisation



Output

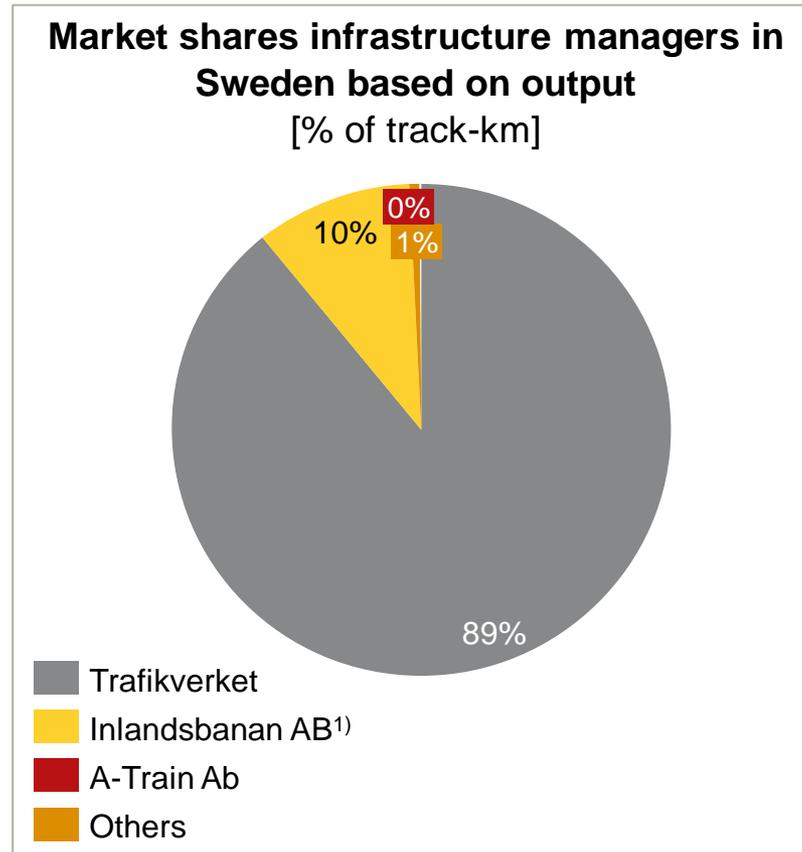
Length of lines - end of year (Kilometres)



Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

Trafikverket owns 89% of the track infrastructure in Sweden

Market shares infrastructure



1) North-South Axis from Gällivare via Öresund to Mora owned by 15 local authorities

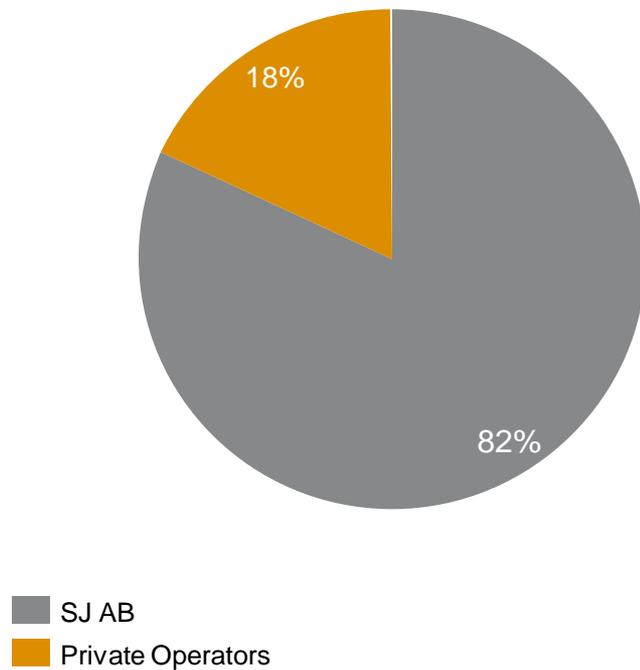
Source: Trafikverket Railsector Report 2009

SJ AB dominates the passenger market in Sweden

Market shares passenger transport

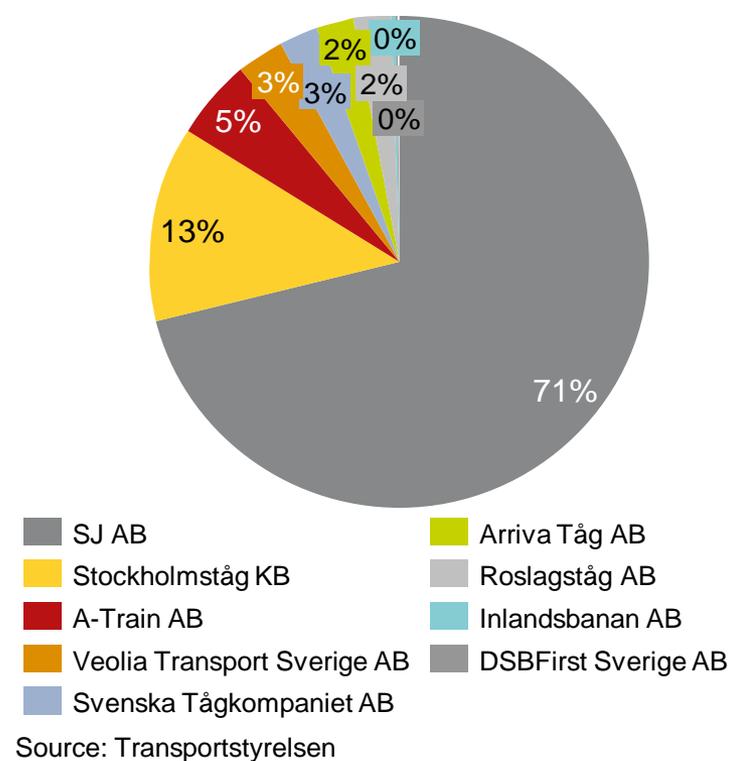


Market shares passenger transport operators in Sweden based on output ¹⁾
[% of passenger-kilometre]



Source: Transportstyrelsen

Market shares passenger transport operators in Sweden based on revenue
[% of net revenues]



Source: Transportstyrelsen

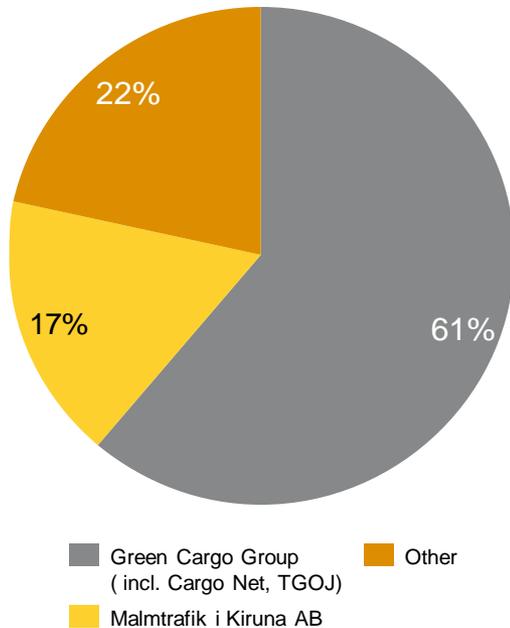
1) Contracted interregional rail services make up for 6% of SJ transport volume

Green Cargo dominates the freight market both by share of rail transport output and net revenues

Market shares freight

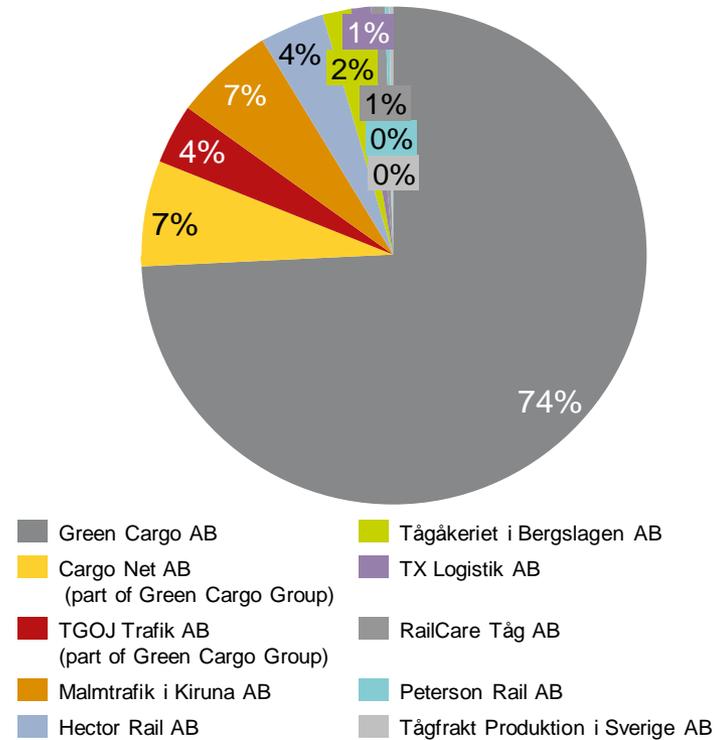


Market shares freight operators in Sweden based on output
[% of net-tonnes kilometre]



Source: Transportstyrelsen

Market shares freight operators in Sweden based on revenue
[% of net revenues]



Source: Transportstyrelsen

SJ provides passenger services including rolling stock maintenance

Profile SJ AB



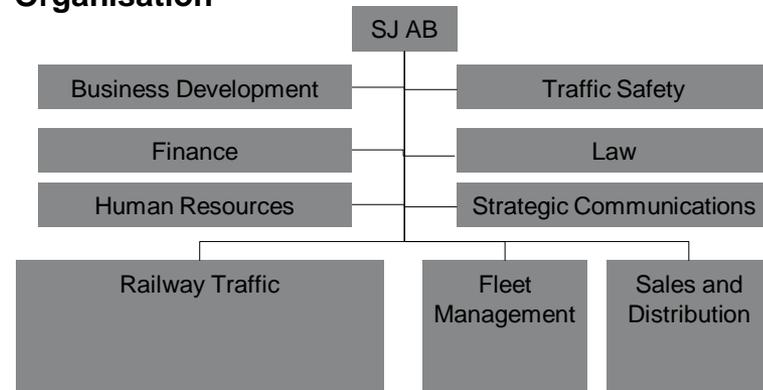
Portfolio

- Markets: Long-distance, regional, commuter and night rail
- Services:
 - Rail Services
 - Fleet ownership and maintenance
 - Customer services in train stations, call centers and with travel agencies
- Subsidiaries: Norrlandståg, Stockholmståg, SJ Event, SJ Service Academy and Linkon

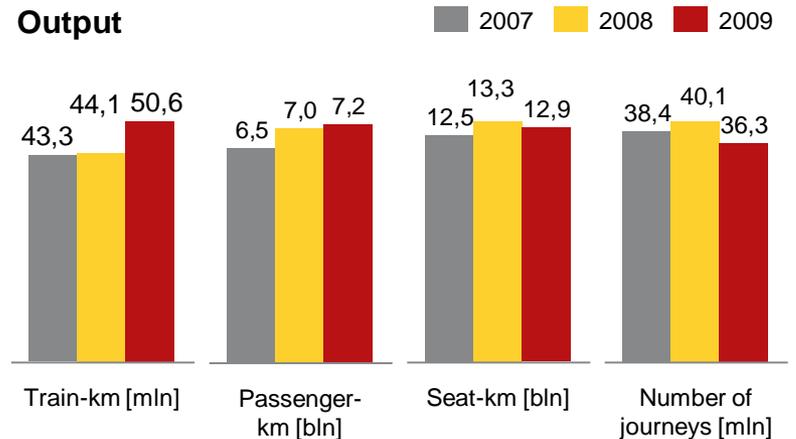
Key Financials¹⁾

	2009	2008	2007
Net Sales [GBP mln]	737	744	609
Operating profit [GBP mln]	53	66	60
EBIT Margin	7,1 %	8,1 %	8,4 %
Staff (Group)	4.439	4.539	4,053

Organisation



Output



Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

Trafikverket is the Swedish infrastructure manager – responsible for rail and road

Overview Trafikverket



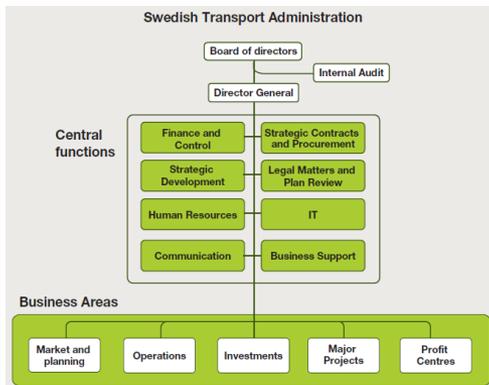
Portfolio

- Responsibilities:
 - Long-term planning of the transport system for all types of traffic (incl. rail, road, maritime, air)
 - Building, operating and maintaining public roads and railways
 - Administering the theoretical and driving tests licence and certificate of professional competence.
- Subsidiaries: Norrlandståg, Stockholmståg, SJ Event, SJ Service Academy and Linkon

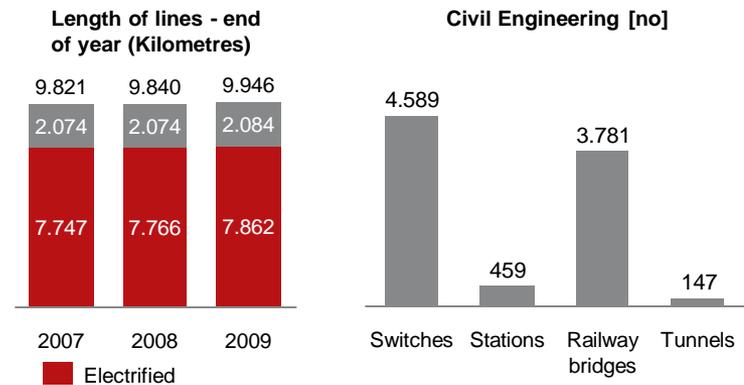
Key Financials¹⁾

	2009	2008	2007
Income from appropriations and grants [GBP mln]	576	1573	410
Income fees [GBP mln]	436	368	286
Investments [GBP mln]	1,061	872	685
Staff (average number)	6.588	6.534	6.518

Organisation



Output



Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

Green Cargo is Sweden's largest cargo and logistics company owned by the government

Profile Green Cargo



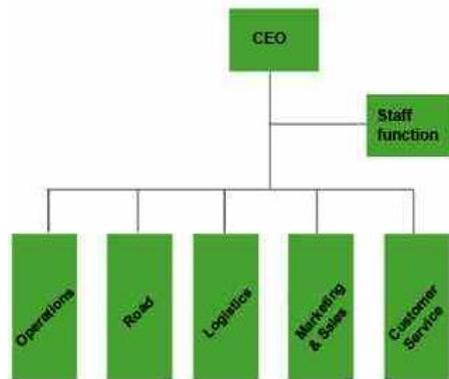
Portfolio

- Markets: Rail and secondary road transport in Sweden mainly steel, chemicals, automotives, engineering, forestry and retail
- Services: Freight transport services and logistics incl. Warehousing, handling, distribution
- Subsidiaries: TGOJ Trafik AB, NTR AB, Hallsbergs Terminal AB, Cargonet AS (partly), DB Schenker Scandinavia (partly)

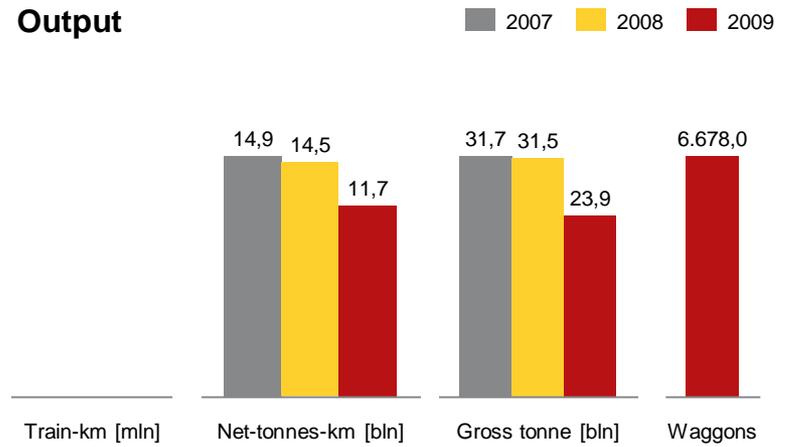
Key Financials (Group) ¹⁾

	2009	2008	2007
Net Sales [GBP mln]	494	529	609
Profit GBP mln]	-19	2	18
Net investment [GBP mln]	77	49	15
Staff (Group)	2.719	2.859	2.770

Organisation



Output



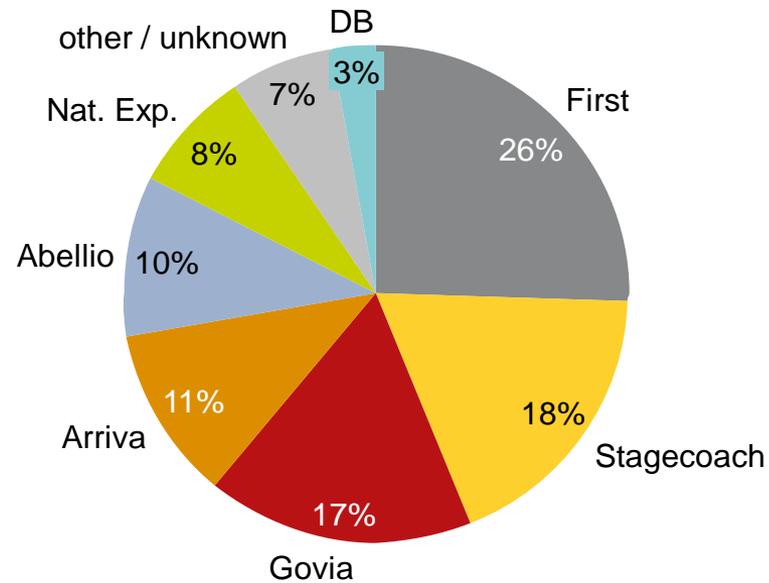
Source: Annual Reports, UIC 1) Conversion via average OECD spot rates per year

In GB there is a number of competitors both in passenger services and freight rail services

Market Shares rail services GB

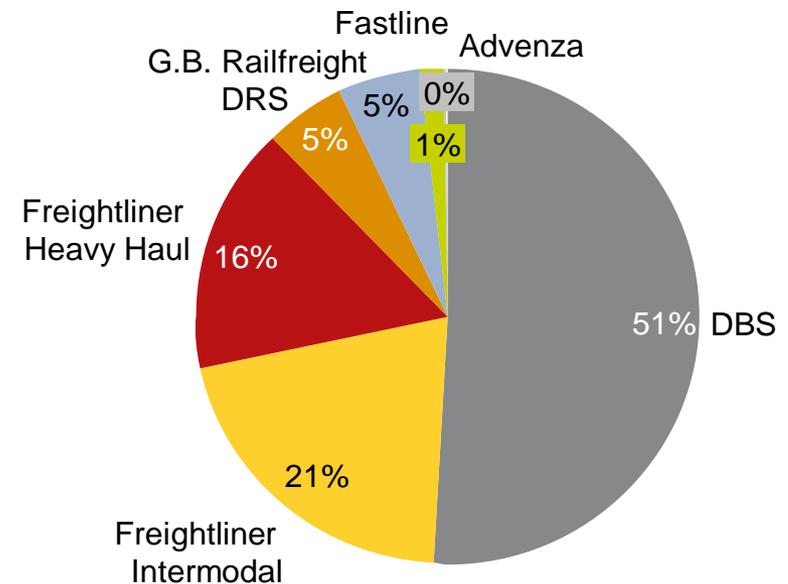


Market shares passenger service operators in GB
[% of train-km]



Source: ORR

Market shares freight operators in GB
[% of train-km]



Source: ORR

2. Market development and structures

2.1. Long term development (comparison)

2.2. Long term development (by country)

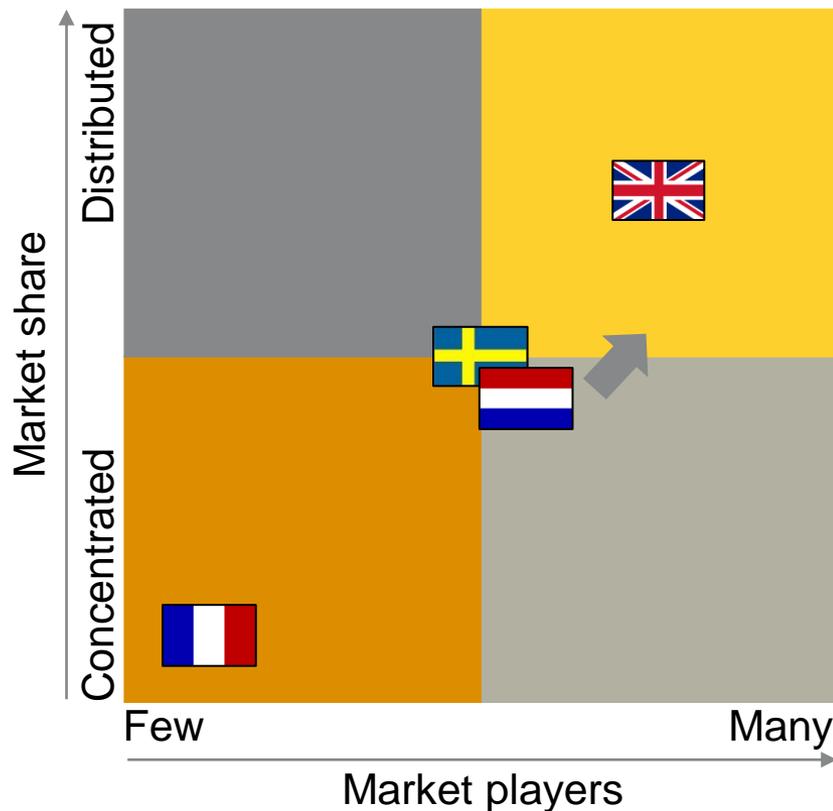
2.3. Market structures

2.4. Market players

2.5. Conclusions

The number of railway undertakings and their market shares are quite different

Summary of market structures



- France has hardly any competition
- GB has the most developed competitive market structure with market shares well distributed among players
- Sweden and The Netherlands take a position in the middle with state owned companies still dominating – both in freight and passenger services
- In The Netherlands the degree of competition in freight seems to be higher than in Sweden

In all countries demand for passenger services has grown since 1996

Conclusions

- Between 2000 and 2008 Sweden had the highest growth rates in traffic supply per capita which was driven by both passenger services and freight
- On the demand side Sweden, UK and France have seen a growth in passenger-kilometres of up to 50% (1996 until 2008)
- Demand in The Netherlands grew less as the Dutch network has been quite utilised before and now faces saturation problems
- The development in rail freight is quite different:
 - The Netherlands have more than doubled net-tonne-kilometres between 1996 and 2008
 - Growth was modest in the UK and Sweden
 - In France rail freight transport has declined steadily since the end of the 90ies
- In The Netherlands net tonne kilometres grew stronger than freight train kilometres supplied indicating an increase in efficiency
- British freight companies have also managed to realise some substantial gains in train utilisation

The way markets are organised varies between the four countries

Conclusions

- In France RFF is directly subordinated to the Ministry and responsible for managing the railway infrastructure; maintenance is contracted out to SNCF
- SNCF plays a dominating role in the French market providing services to passengers as well as to the freight sector; there are only a few small private enterprises
- In The Netherlands ProRail acts as infrastructure manager having fully outsourced all maintenance and renewals which is comparable to Sweden
- Passenger services are mainly provided by NS with a small percentage of regional operators; freight is mainly provided by state-owned DB-Schenker and a growing number of private operators
- The former Swedish railway administration Banverket became Trafikverket in April 2010, combining the responsibilities of managing infrastructure for road and rail now
- In contrast to other countries, there is a separate entity in Sweden managing the railway stations (Jernhusen)

The way markets are organised varies between the four countries

Conclusions

- In Sweden passenger and freight services are still dominated by state-owned SJ with some smaller public and private operators in both segments
- Apart from GB Sweden is the only country in the sample where rolling stock is provided by a rolling stock company to operators (but limited to regional traffic)
- GB is the only country in the sample with a nearly complete franchise system, a fully separated provision of rolling stock and a regulator performing extensive economic regulation

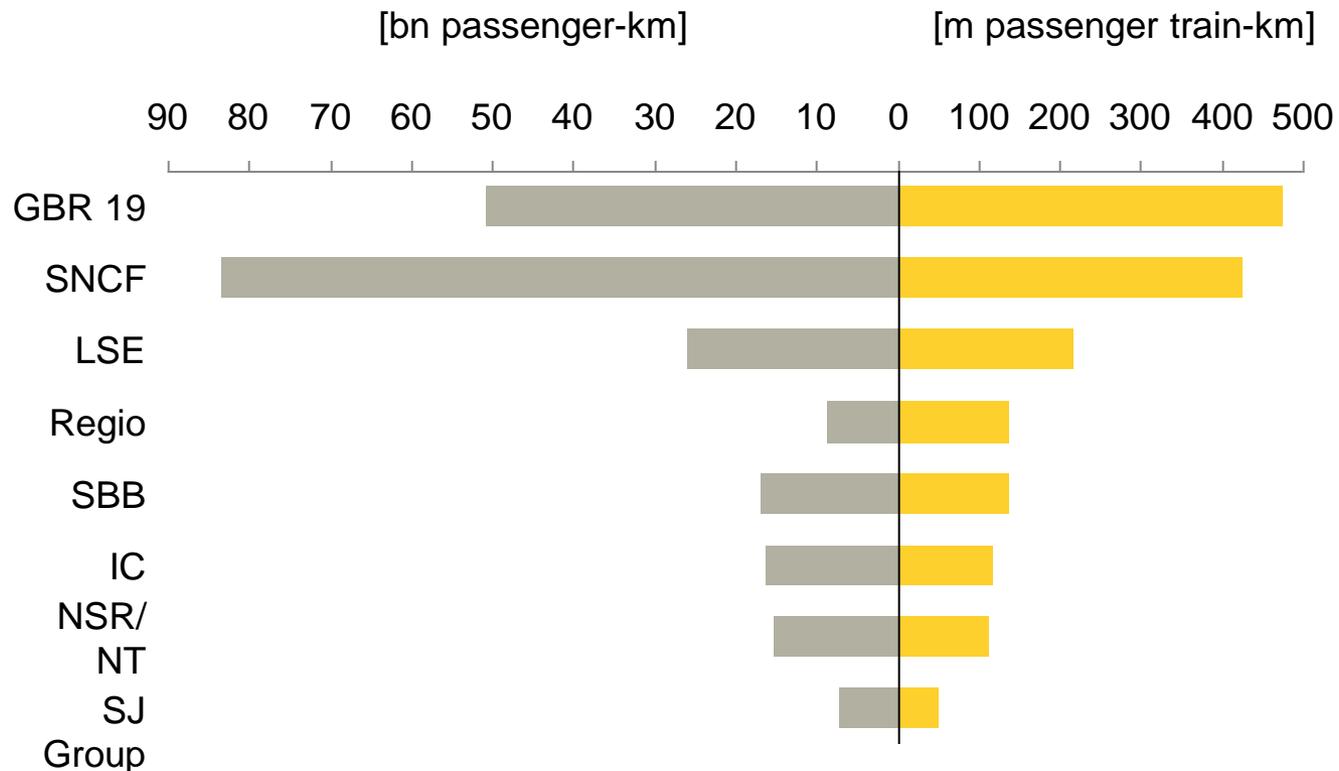
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GB's supply and demand are second highest in sample

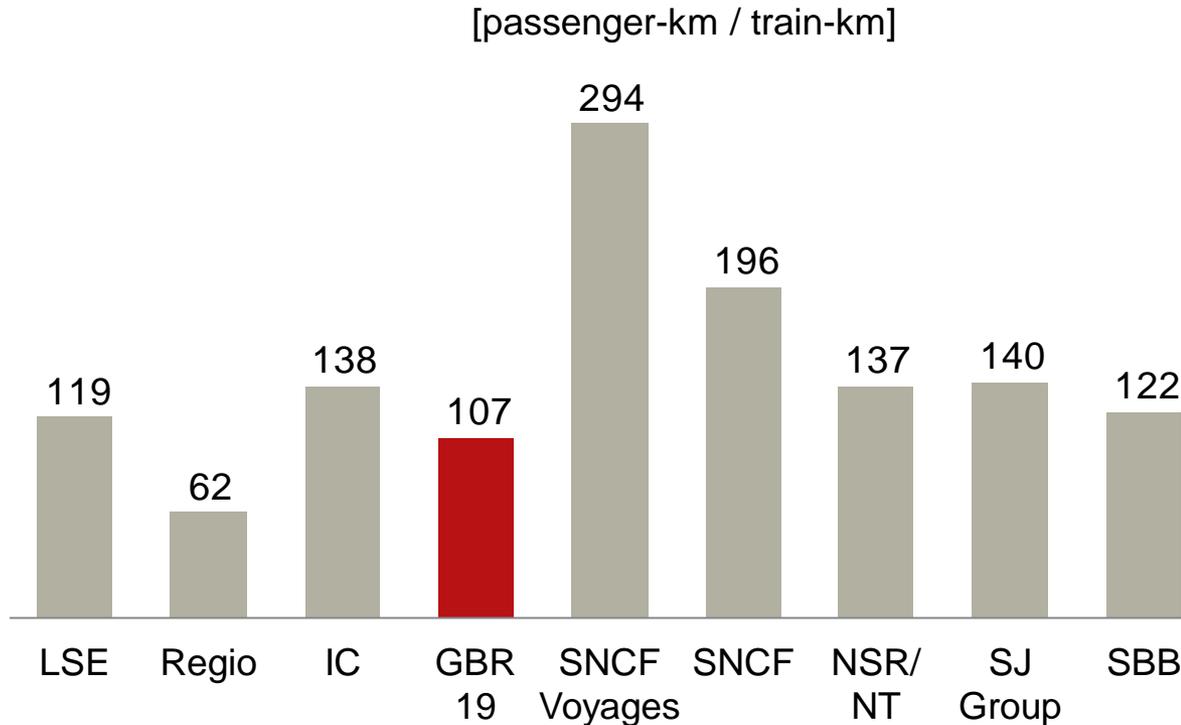
Traffic demand and supply (2009)



1) Corresponding to the 19 franchised TOCs; GBR 19 is an accumulation of GBR LSE, Regio and IC

The GB's train utilisation is at the lower end of the sample

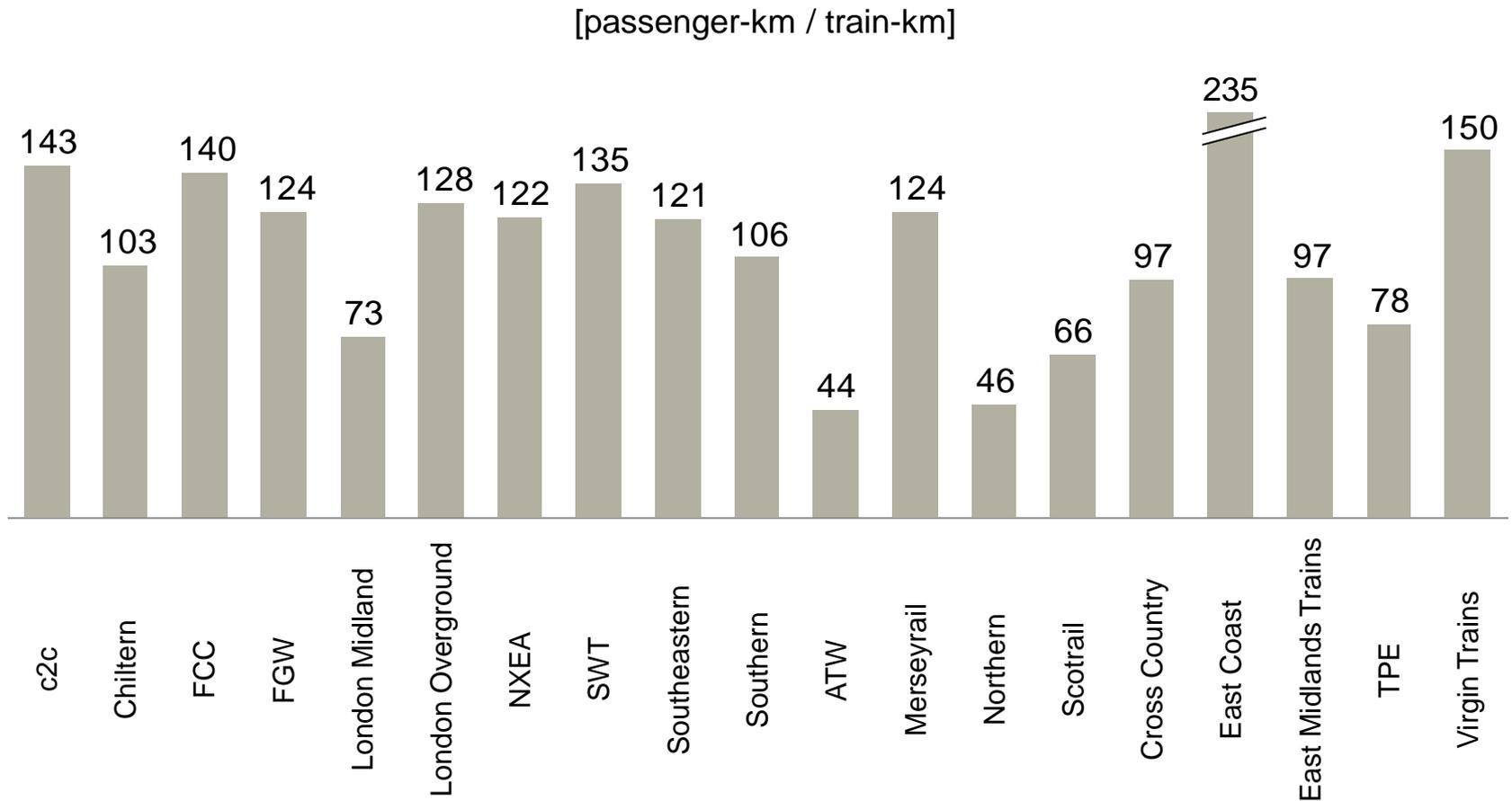
Average train utilisation (2009)



- Average utilisation of trains is particularly high in France
- This is very much driven by SNCF's high speed system which is accounting for a large share of the passenger transport supply
- These trains have a large seat capacity (~ 500 seats), fairly long train sets (~ 240m), partly use double stack coaches (TGV Duplex) paired with a high demand
- Utilisation of TGVs was 78% in 2007

East Coast shows the highest average train utilisation

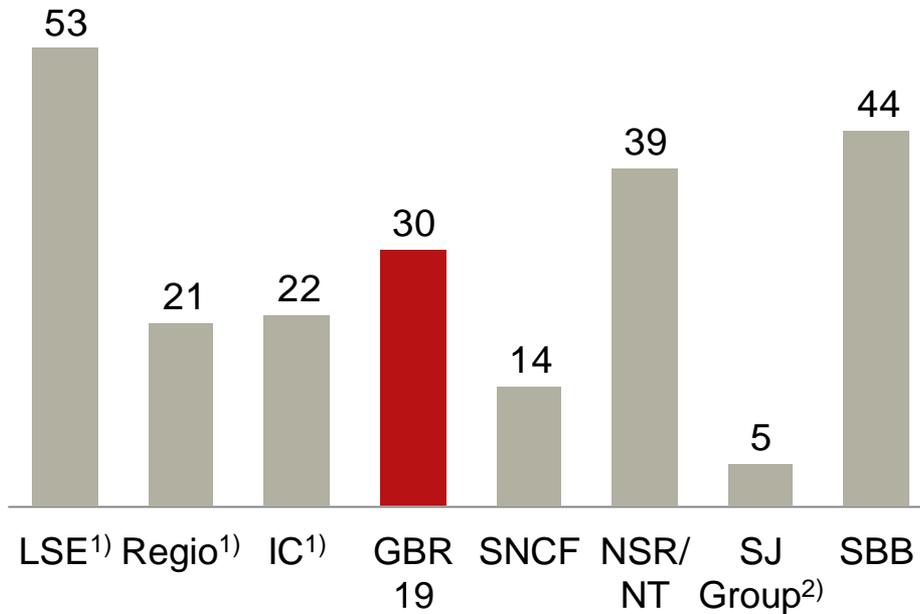
Average train utilisation (2009)



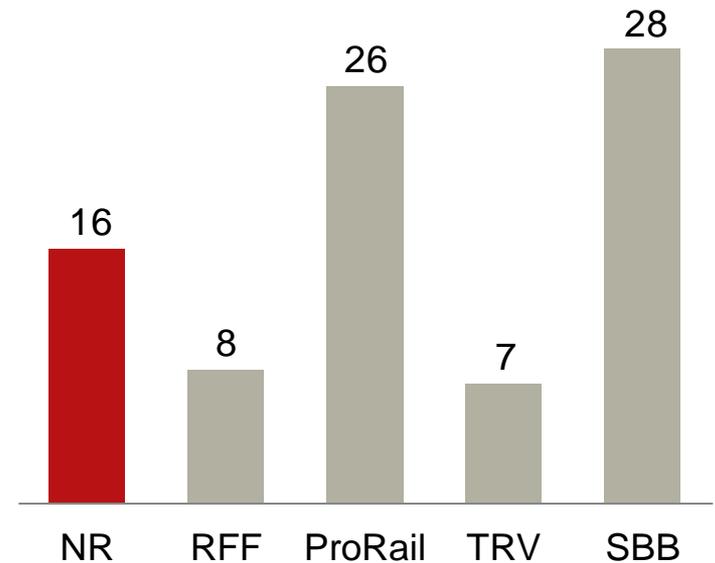
Switzerland and the Netherlands use their infrastructure more intensively than UK

System performance (2009) (1/2)

Train frequency
[k train-km / route-km]



Utilisation Infrastructure
[k passenger train-km / main track-km]



1) Route-km calculated as sum of route lengths of the individual TOCs, normalised to the real total route-km. Approximate values only, therefore

2) Train km of all operators would lead to a value of 9 k train-km/route-km

The Swiss railways have consequently promoted their railways network

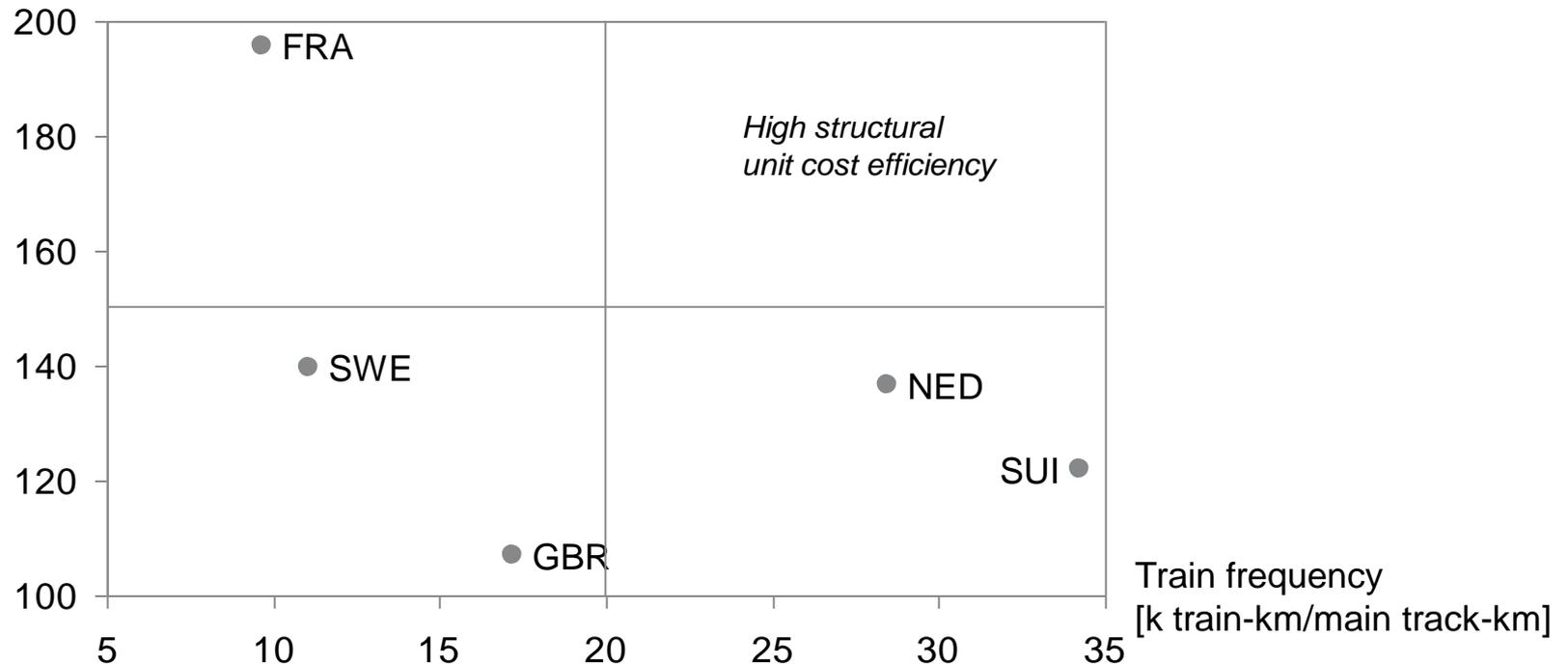
System performance (2/2)

- The Swiss have the most densely used network in Europe; on the one hand this is due to international traffic being a centrally located transit network
- On the other hand the Swiss railways have undertaken strong efforts to increase the attractiveness and utilisation within the country
- Some reasons for this development are:
 - A high degree of quality (punctuality, cleanliness etc.) and a focus on customers
 - Large investments in rolling stock and infrastructure
 - The integrated synchronised timetable for optimised connections and reduced travel-times
 - A regionally dense and well balanced transport service offer
 - An attractive pricing model (Switzerland has the highest share of full-fare travelcards; it's also valid for many buses, trams and boats)
 - A high degree of intermodal integration
- The Swiss government backs the railway system by its favourable environmental legislation

GB has the lowest train utilisation while infrastructure utilisation is less than medium

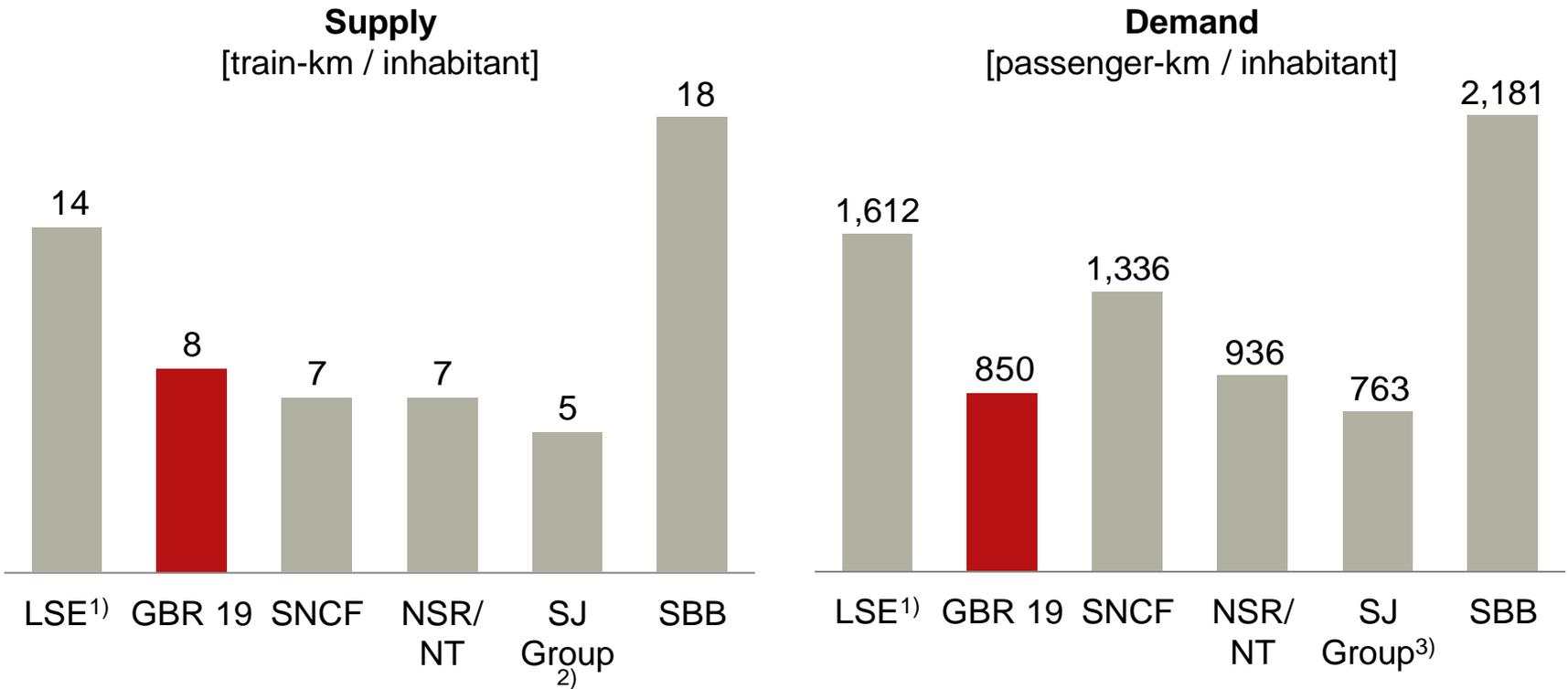
Train utilisation vs. infrastructure utilisation

Average train utilisation
[passenger-km/train-km]



Related to inhabitants GB's supply is comparable to most others, demand is fairly low

System performance (2009)



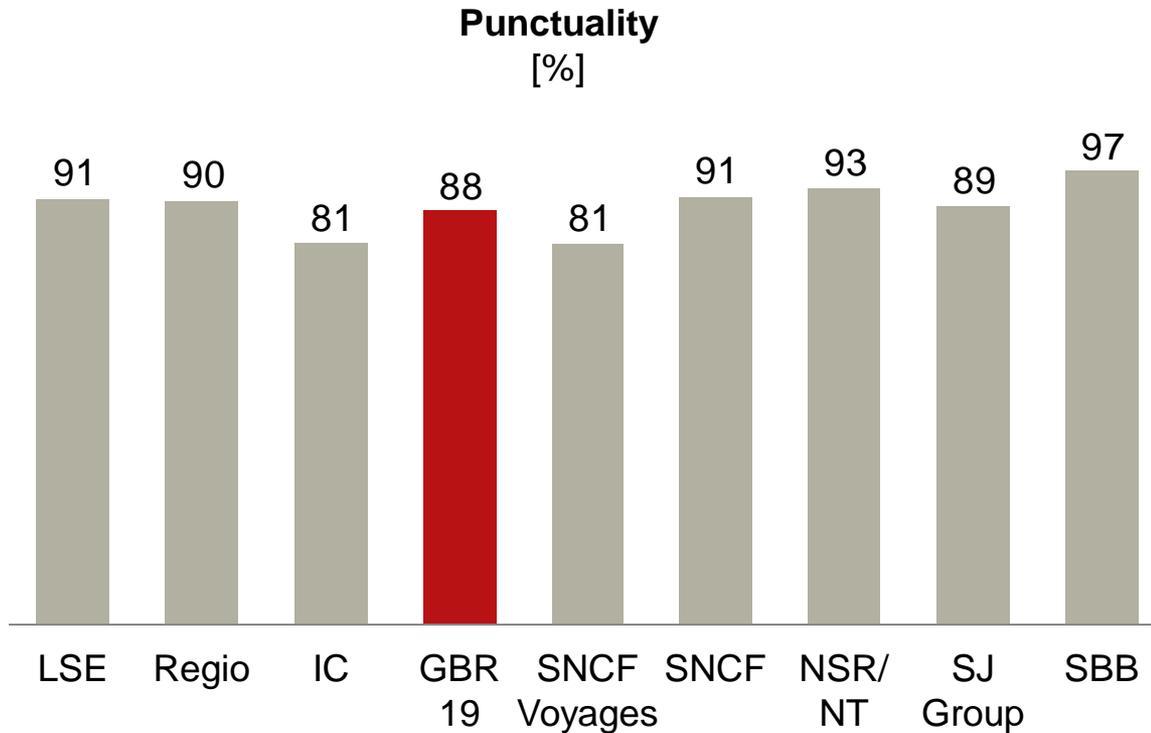
1) Inhabitants LSE-Region (London and Southeast): 16,04 m

2) Train km of all operators would lead to a value of 9 k train-km/inhabitant

3) Train km of all operators would lead to a value of 954 passenger-km/inhabitant

Punctuality is lower in GB than in other countries of the sample

System performance (2009)

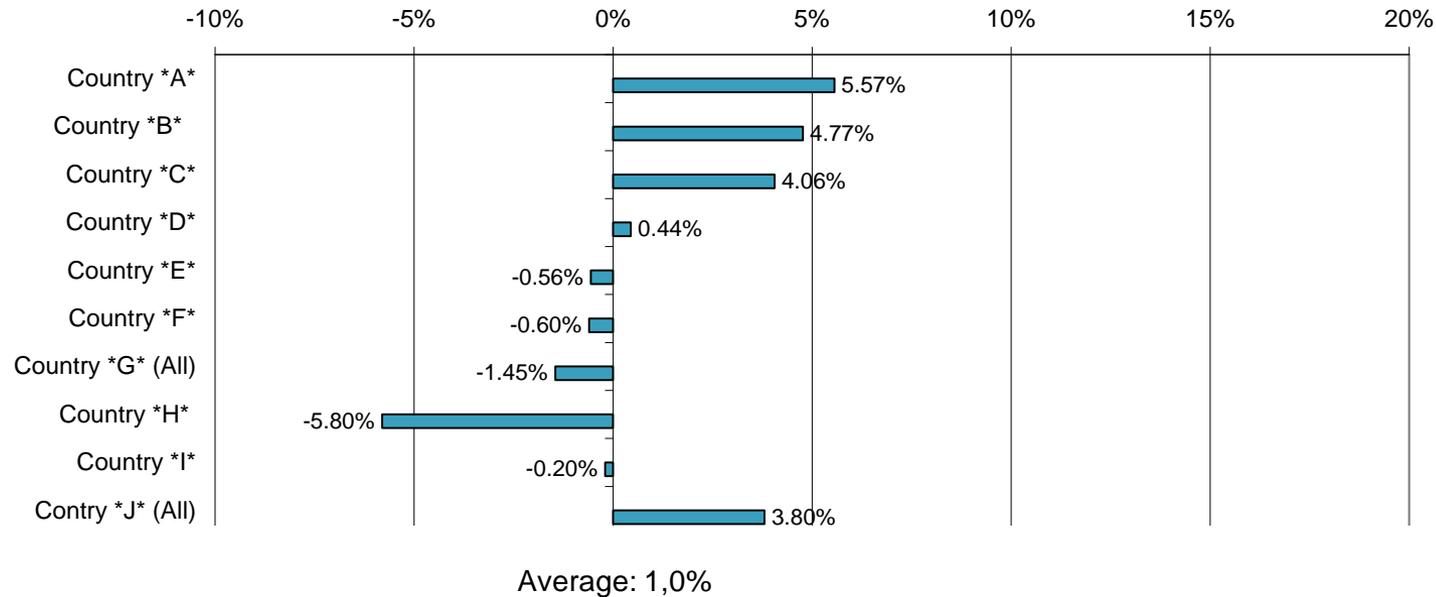


- Punctuality is difficult to compare due to different measuring concepts, definitions, thresholds, timetable reserves etc.
- In this sample all countries use time-to-5 as threshold

Source: Annual reports, peer group

Based on a recently conducted international study GB's punctuality is slightly above average

System performance (2009)



- The sample includes Western European countries and UK performance (punctuality) has been rebased to each comparator's metric
- Performance refers to all trains
- The figures shown are 2009/2010 UK performance less 2009 reported comparator performance, for example: GB's punctuality is 5.57% higher than country A's

Source: NR/ATOC/ORR Performance Benchmarking 2010

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4. Infrastructure

4.1. Introduction

4.2. Total cost and network characteristics

4.3. Maintenance and renewal costs

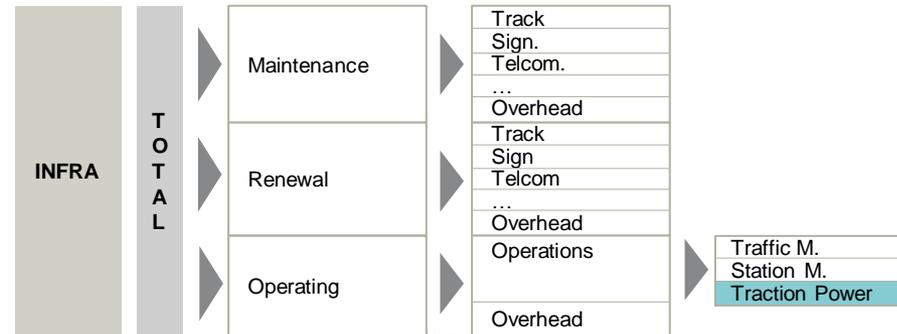
4.4. Network operations costs

4.5. Infrastructure operating costs (overhead)

4.6. Conclusions

Infrastructure costs are analysed by activities and asset

Infrastructure Costs



Maintenance costs will be split into the most important asset categories

Renewal costs for the existing network will be split into the most important asset categories and cover a five and ten year horizon

Operating costs result from running the network and consist of two main cost elements:

- **Operations:** The costs to manage traffic, stations and customers; traction power is looked at separately
- **Overhead:** Administrative activities which cannot be attributed to any specific business activity but are necessary for the business to function

4. Infrastructure

4.1. Introduction

4.2. Total cost and network characteristics

4.3. Maintenance and renewal costs

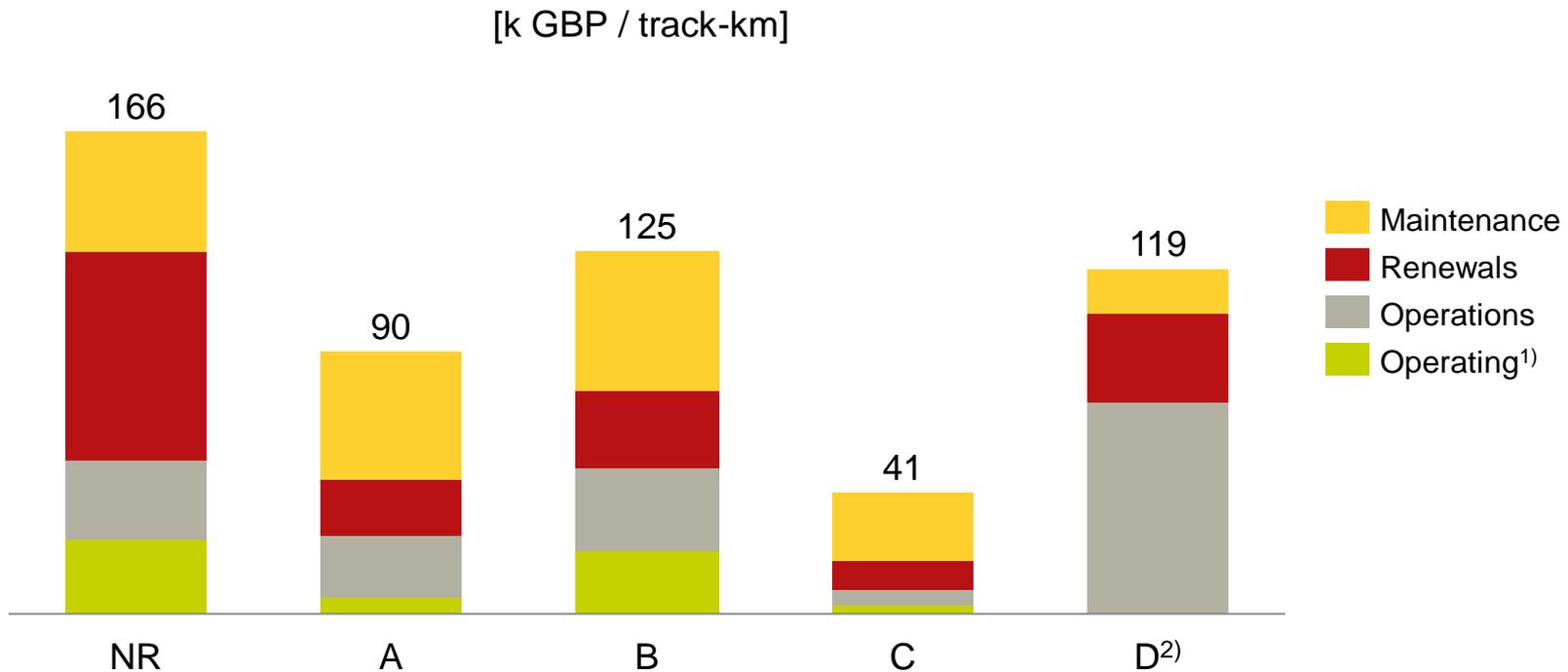
4.4. Network operations costs

4.5. Infrastructure operating costs (overhead)

4.6. Conclusions

Accumulated infrastructure cost are highest in UK

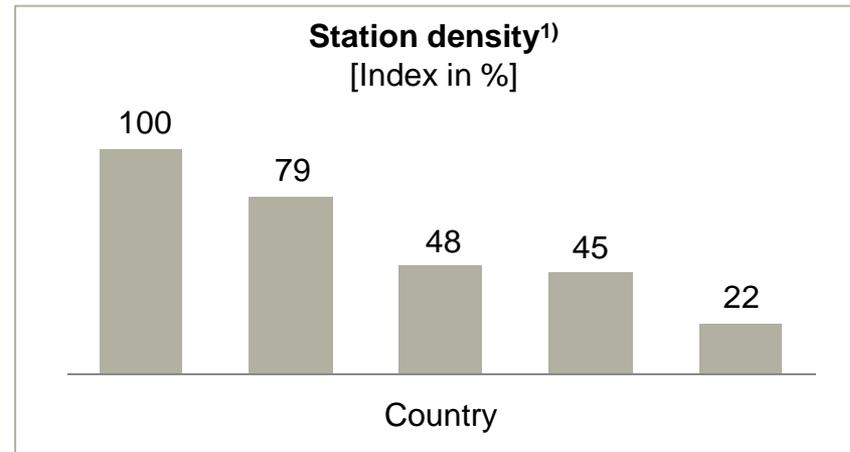
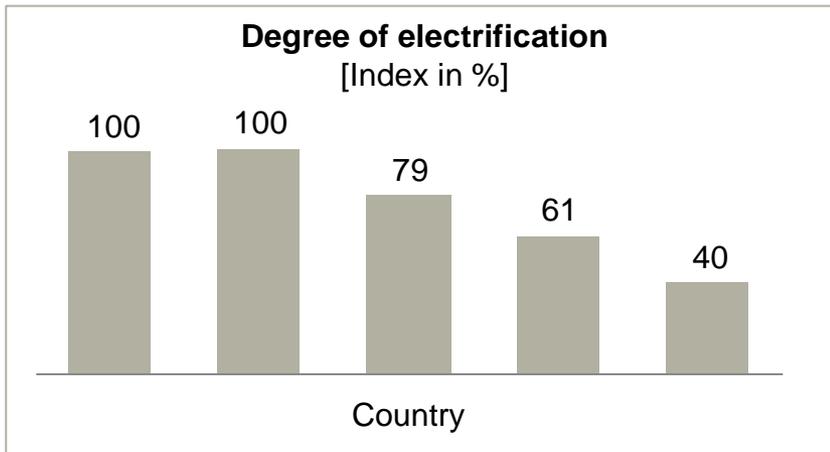
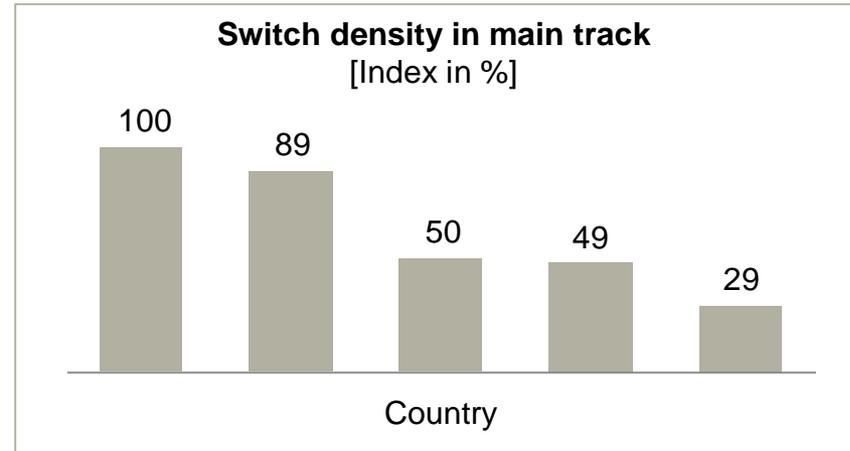
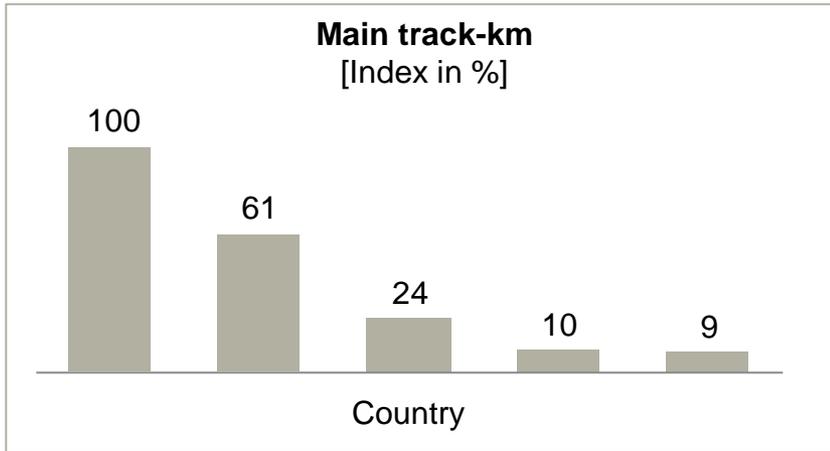
Total infrastructure costs (2009, fully normalised)



- 1) Cost elements included in operating vary strongly between countries
- 2) Cost for operating are included in operations

Network characteristics strongly vary among peers, especially main track-km and station density

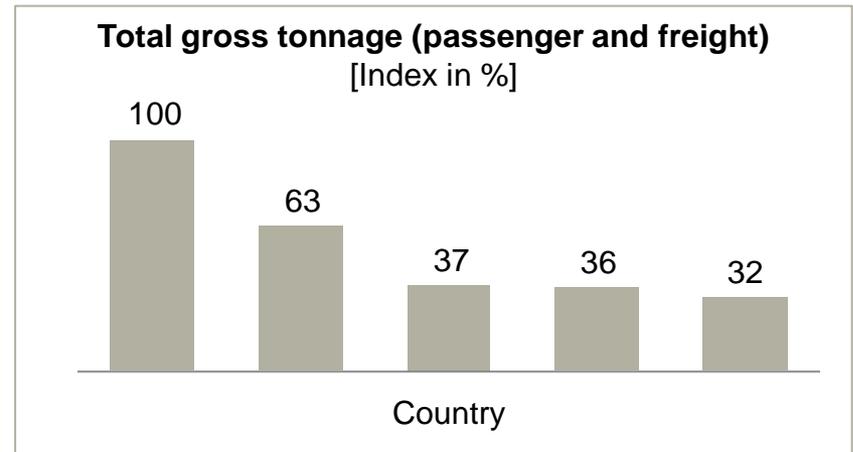
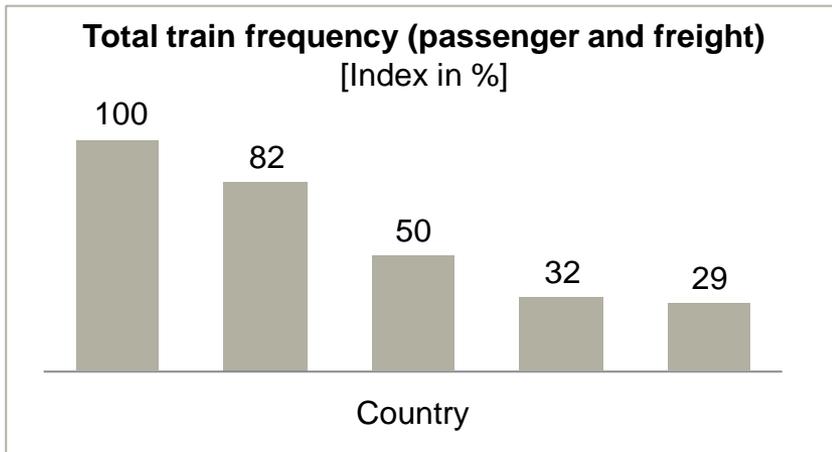
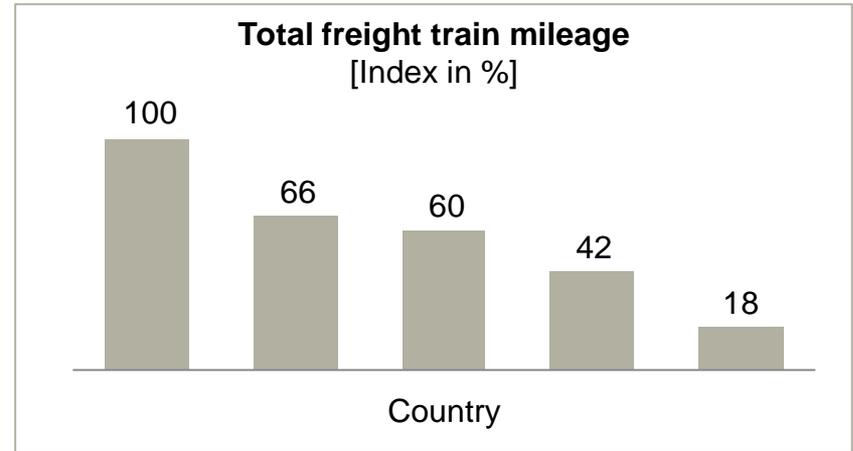
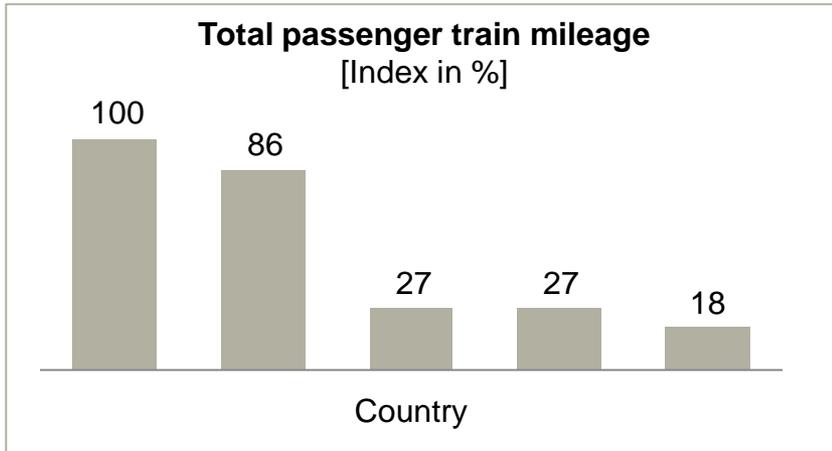
Network characteristics (2009)



1) Stations and flag stops

Network utilisation also strongly varies among peers, especially passenger and freight train mileages

Network performance (2009)



4. Infrastructure

4.1. Introduction

4.2. Total cost and network characteristics

4.3. Maintenance and renewal costs

4.4. Network operations costs

4.5. Infrastructure operating costs (overhead)

4.6. Conclusions

This chapter looks into Network Rail's normalised expenditures on maintenance and renewals

Introduction

- According to the comparison of total infrastructure costs Network Rail has the highest expenditures per track-km in the sample
- As shown before Network Rail has a lower switch density than other networks, the lowest degree of electrification and a utilisation (train-kilometres and gross tons) which is close to average
- These parameters cannot be influenced by an infrastructure manager in short or medium term, if at all. To avoid a comparison based on fundamentally different network characteristics and performance levels civity applies a normalisation method based on the UIC LICB benchmark
- Furthermore face values are normalised by applying currency conversion rates to equalise different purchasing powers between countries compared
- The next page shows the application of normalisation factors by asset group. Please refer to chapter 9 for more details on the normalisation process
- This chapter provides a more detailed insight in Network Rail's expenditures on maintenance and renewals

Normalisation of infrastructure costs is based on the methodology as applied within the UIC LICB benchmark

Infrastructure cost normalisation

Cost function	Switch density		Degree of electrification		Train frequency		Gross tonnage	
	M	R	M	R	M	R	M	R
Civil engineering	X	X			X			X
Track	X	X			X			X
Power supply			X	X	X			X
Signalling	X	X			X			X
Telecommunications	X	X			X			X
Stations								
Buildings								
Other	X	X			X			X
Operational overhead					X			X

For further information on the methodology and normalisation process please refer to chapter 9; the "x" indicates the application of a normalisation factor to a cost function

The definitions of maintenance and renewal are based on the ones used in UIC's LICB¹⁾

Definitions

Maintenance

Activities performed in order to optimise asset lifetimes and to sustain the condition and capability of existing infrastructure, e.g.

- Inspections
- Measuring
- Failure prevention
- Repairs (but not replacement)
- Routine over-hauls
- Small scale replacement work excluded from the definitions of renewals

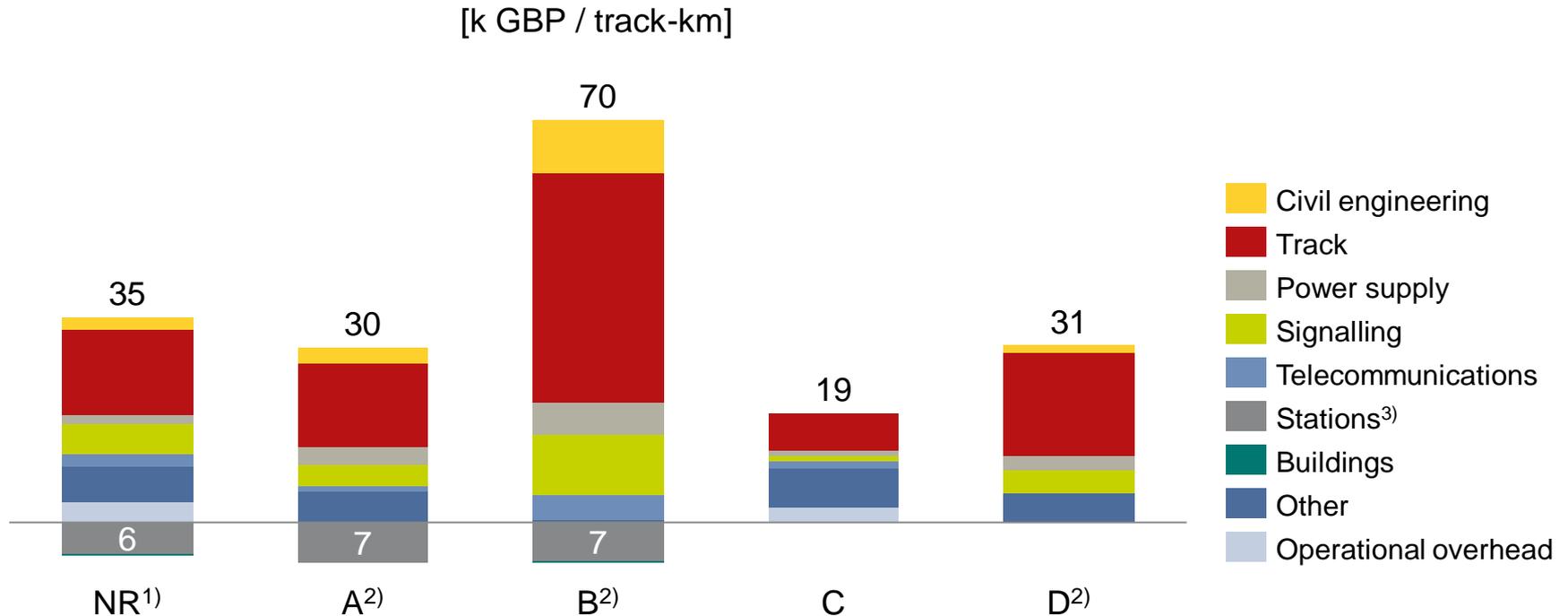
Renewals

- Mainly capital expenditures projects where existing infrastructure is replaced with new assets
- Replacement of complete systems or systematic replacement of components at the end of their lifetime
- Borderline to maintenance differs among the railways, usually it depends on minimum cost levels and/or minimum scope

1) LICB = Lasting Infrastructure Cost Benchmarking

Non normalised maintenance costs are the second highest in GB

Maintenance costs (2009, PPP-normalised)



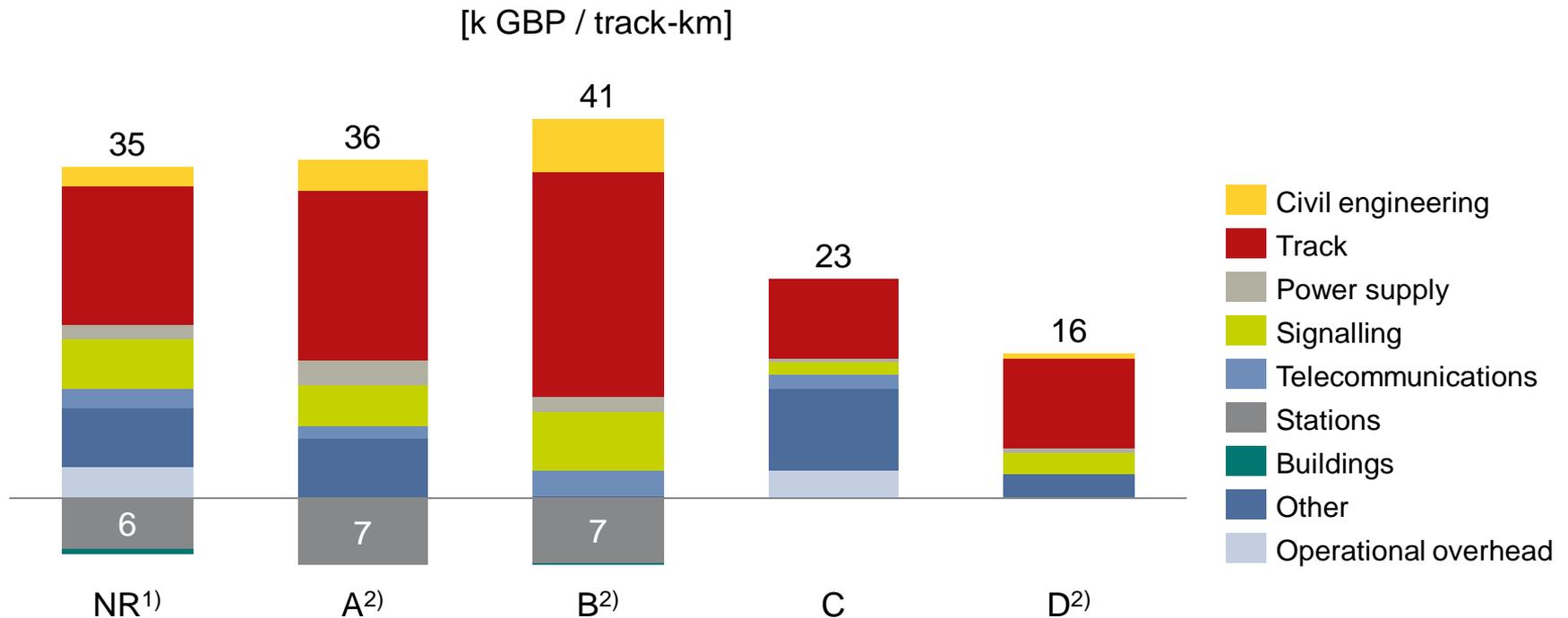
1) Station maintenance costs including TOCs (NR: 24 m GBP; TOCs: 141 m GBP)

2) Operational overhead included in asset cost positions (no separate position)

3) Stations are indicated below the line as not all infrastructure managers are responsible for station management

After normalisation GB's maintenance costs are still at the higher end

Maintenance costs (2009, fully normalised)

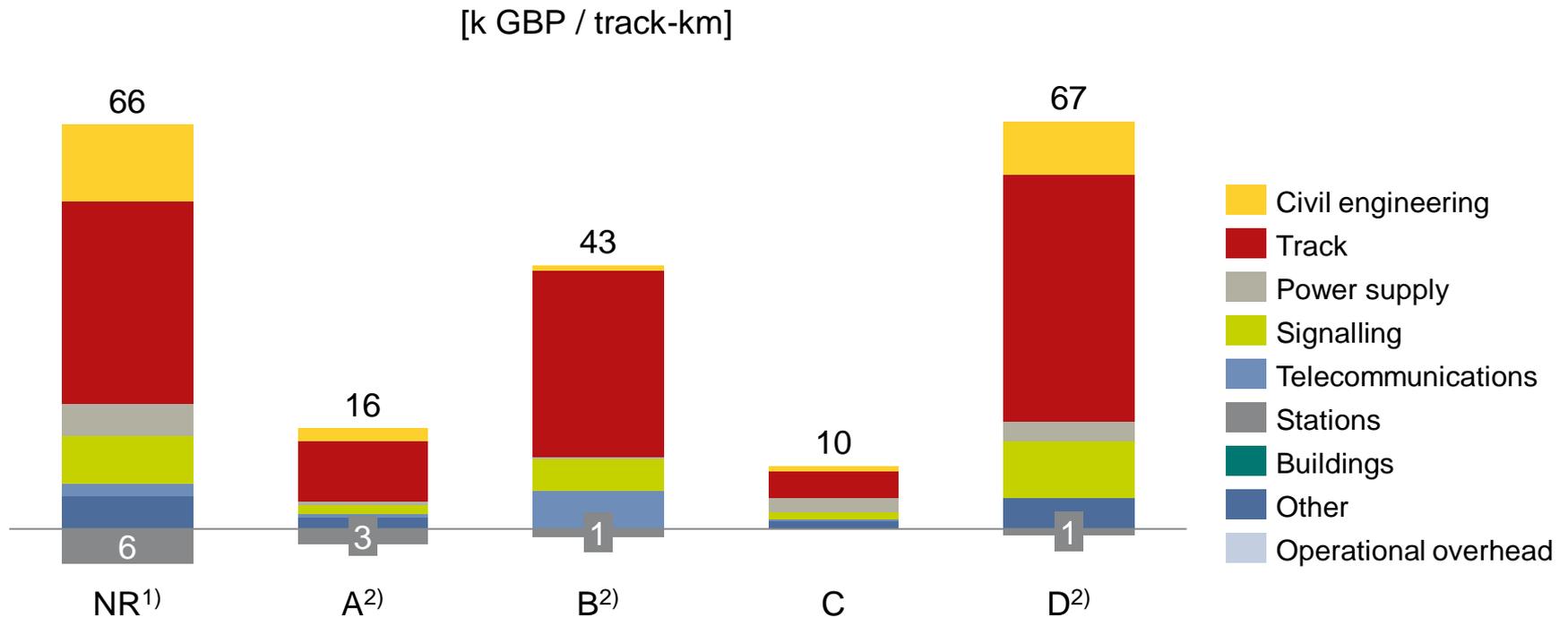


1) Station maintenance costs including TOCs (NR: 24 m GBP; TOCs: 141 m GBP)

2) Operational overhead included in asset cost positions (no separate position)

Renewal levels in GB are highest in the sample

Renewal costs (5-year-average 2005-2009, PPP-normalised)

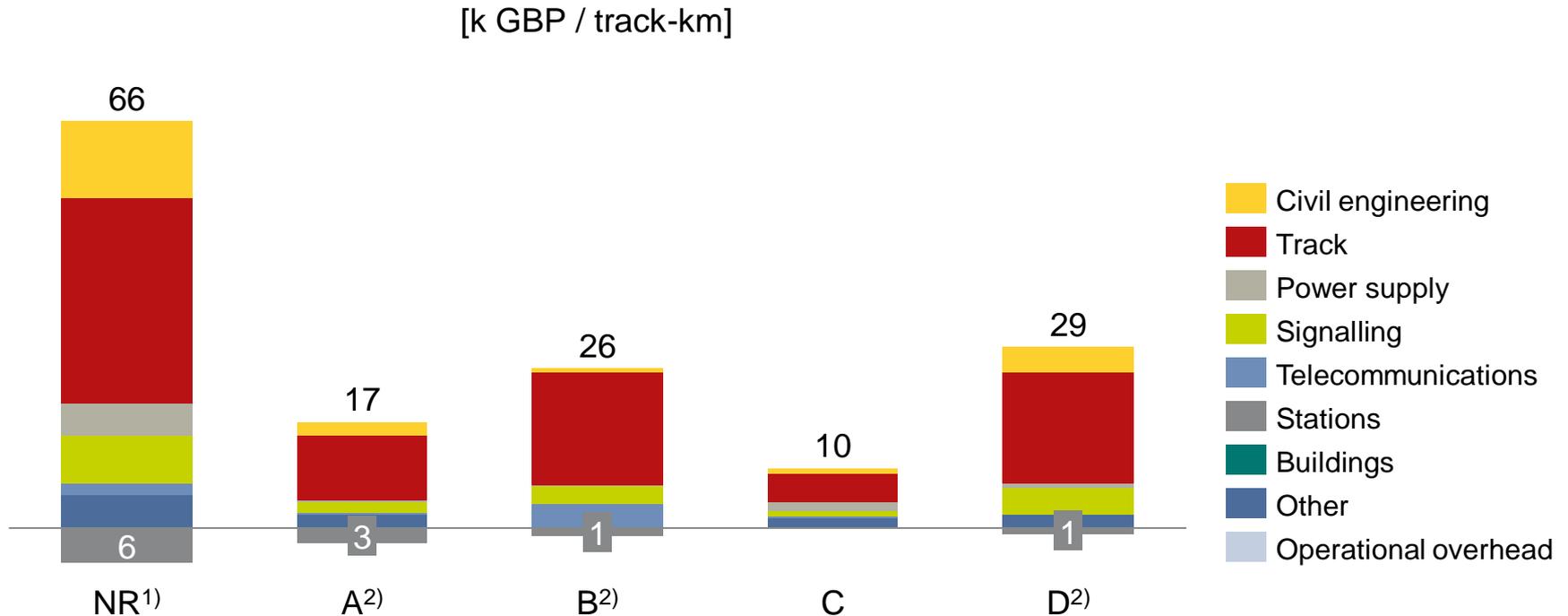


1) No station renewals at TOCs

2) Operational overhead included in asset cost positions (no separate position)

After normalisation GB's renewal cost levels are still highest in sample

Renewal costs (5-year-average 2005-2009, fully normalised)



1) No station renewals at TOCs

2) Operational overhead included in asset cost positions (no separate position)

The condition of the British Network leads to higher activity levels

Maintenance and renewal costs

- Former analyses¹⁾ has shown that based on the age structure Network Rail had built up an investment backlog
- As a consequence Network Rails has increased renewals levels in order to catch-up on the investment backlog which is partly explaining the high expenses in the sample
- Furthermore, current track quality and system reliability require enhanced maintenance activity levels
- In addition to activity levels determining the volume of activities efficiency plays an important role, both in maintenance and renewals
- For maintenance a number of cost driving factors had been identified:
 - Annual labour cost levels are higher than European average
 - Different unit cost levels across Network Rail's maintenance delivery units
 - The under-utilisation of plant and machinery in combination with mark-ups for plant in the UK

1) Gap Analyses by BSL in 2008

There is are various underlying factors with a negative impact on efficiency in maintenance and renewals

Maintenance and renewal costs

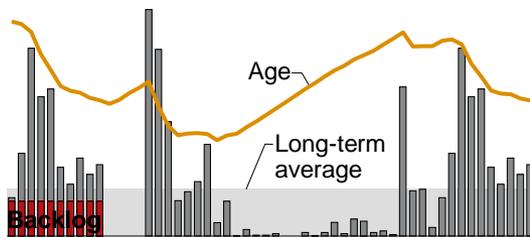
- Similarly, a number of underlying reasons had been identified for renewal activities:
 - Comparatively high labour cost levels per full time employee
 - Higher procurement costs for plant and machinery
 - UK uses mainly conventional plant whereas other European countries more commonly use high output equipment
 - Productive times in possessions are shorter than in other countries
 - Non realised economies of scale due to longer work-sites
 - High transaction costs in projects and insufficient stability in planning
- The issue of higher staff costs had been addressed in a recent study on "People in the GB Rai Industry; a PPP-adjusted comparison of NR's annual salary with DB, ProRail and Banverket (Trafikverket) shows significant disadvantages of Network Rail compared to Germany and Sweden (25% less cost in Sweden than in GB)

For a more realistic picture of renewals comparisons would need to be based on a steady state

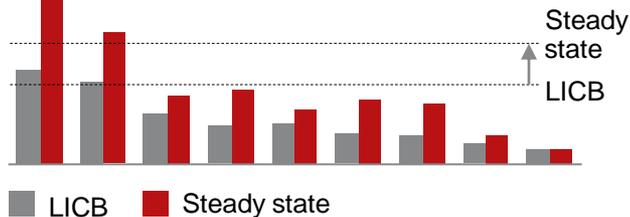
Steady state

Steady state reinvestment needs

Typical renewal forecast



Annual renewal expenditures per km

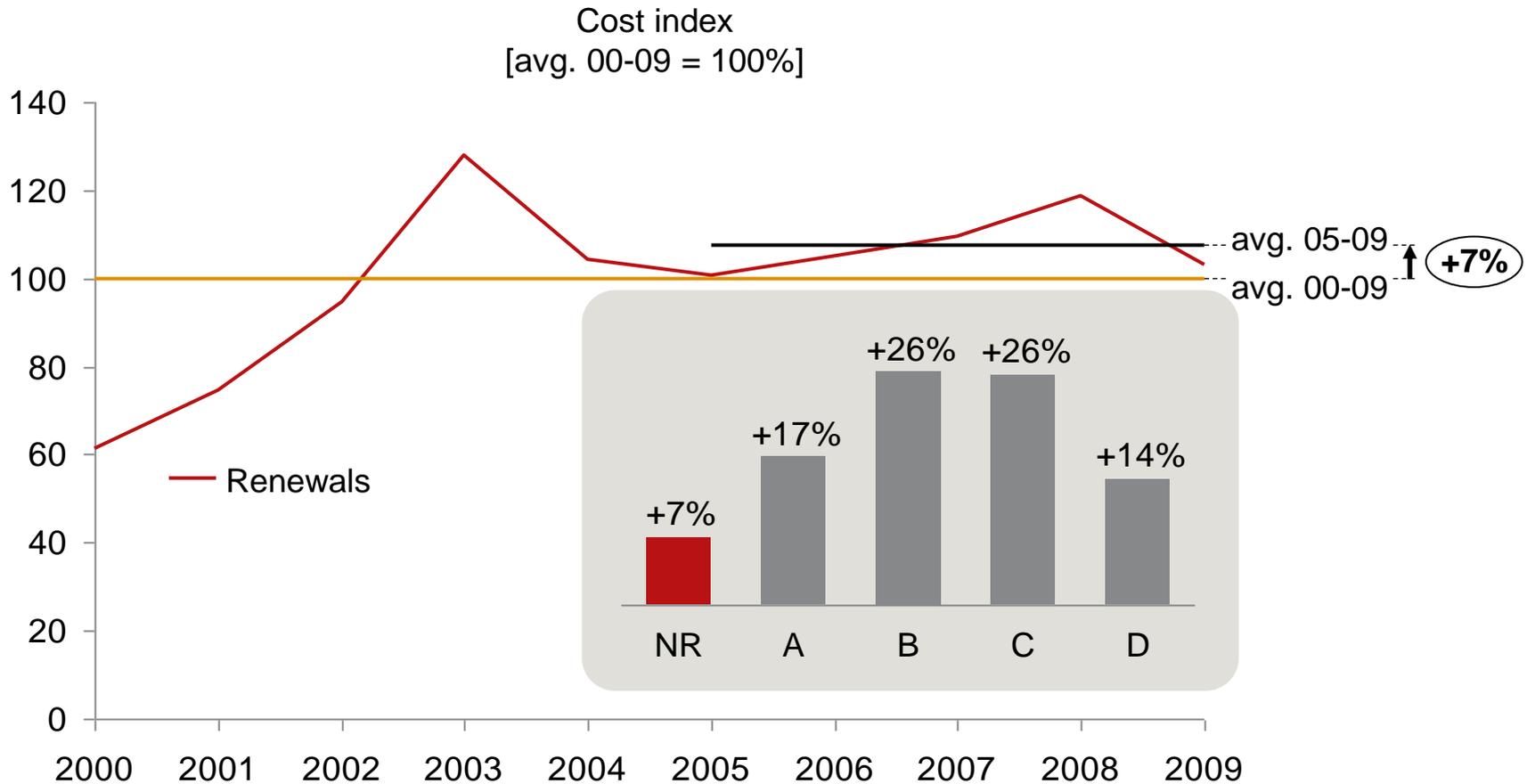


Remarks

- Currently cost comparisons show annual maintenance and (mid-term) renewal expenditures
- Expenditures are determined by work activity volumes and corresponding unit cost
- Therefore, a period of increased renewal expenditures (e.g. to catch up an investment backlog) does not necessarily reflect inefficiency in unit costs
- Vice versa an infrastructure manager with low expenditure levels in the comparison might just invest less in its network and consequently build up an investment backlog
- To get a realistic picture of the individual position, comparisons need to be based on steady-state activity levels
- An age- and condition-based renewal forecast covering at least one life cycle shows typical ups and downs (see upper illustration)
- The derivation of long-term annual averages would mean an important step from comparing expenditure levels to comparing different cost levels needed for balanced infrastructure maintenance and renewals
- The lower graph – based on real data – shows the order of magnitude by which current expenditures deviate from steady-state regeneration levels

On average, all infrastructure managers renewed more during the last five years compared to the last decade

10 year average of renewals (1)



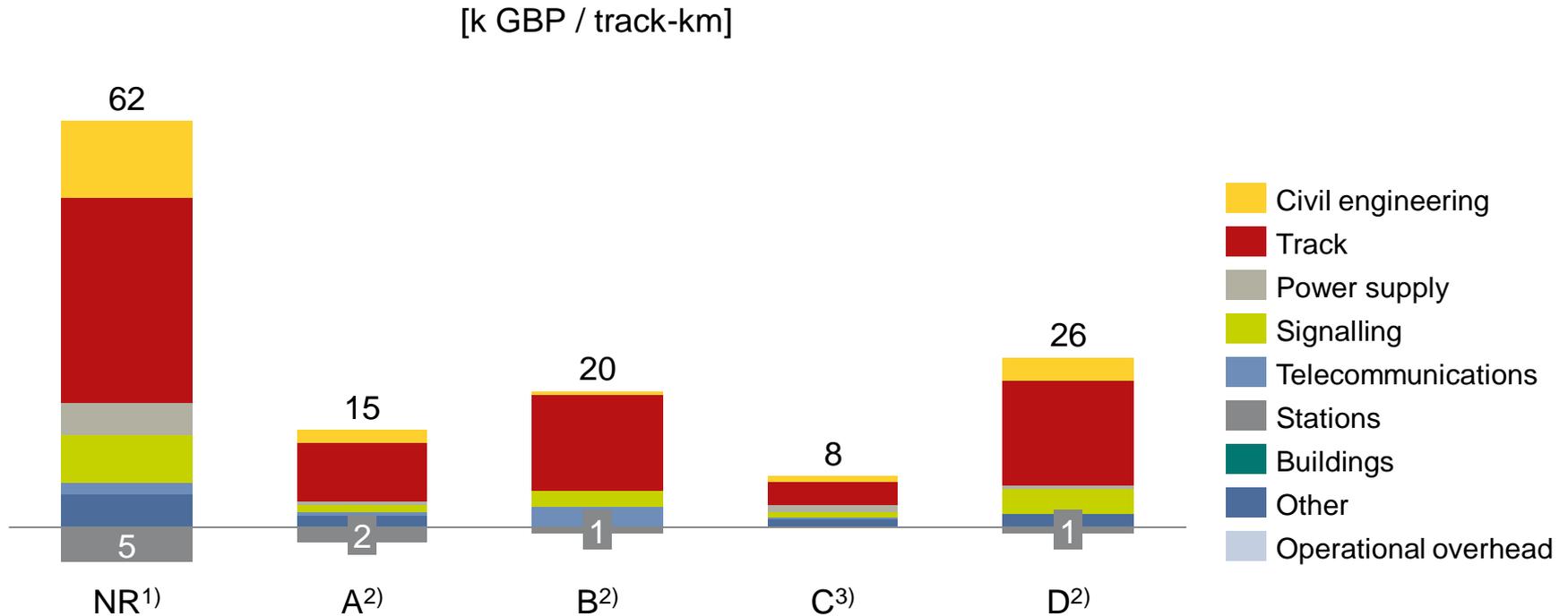
The comparators' renewal volumes were on average more than 15% higher in the last five year period

10 year average of renewals (2)

- The graph depicts Network Rail's renewal expenditures indexed over a period of ten years (red line)
- In a ten year perspective (brown line) these expenditures have been 7% lower than in a five year perspective (black line) or: between 2005 and 2009 Network Rail has uplifted the level of renewals
- This difference has been analysed for other countries in the peer group, too; the result is that all countries show the same trend: average renewal volumes in a five year period are 12% to 21% higher than in a ten year period

Considering a 10-year average does not change GB's relative position

Renewal costs (10-year-average 2000-2009, fully normalised)



1) No station renewals at TOCs

2) Operational overhead included in asset cost positions (no separate position)

Due to different sourcing strategies Network Rail's staff numbers can hardly be compared to other infrastructure managers

Staff infrastructure maintenance and renewals

- Network Rail employs 564 staff for maintenance per main track km and 220 for renewal activities per main track km; concerning maintenance Network Rail's strategy is to fully insource these activities
- The degree of outsourcing maintenance and renewals varies broadly throughout Europe, two countries in the sample have chosen to fully outsource maintenance and renewals
- Over more than a decade they have developed the market for infrastructure maintenance and construction companies, nowadays employing staff to manage the network and contractors only
- One country with a similar sourcing philosophy as GB has a total headcount for maintenance and renewal staff which is about 12% less than in GB

4. Infrastructure

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Network operations cost consist of four cost categories

Definitions

Traffic management

Staff responsible for strategic / operational planning, signalling, traffic control, supervisory tasks, train paths

Station management

Staff responsible for the management of passenger stations, dispatching of trains etc.

Customer service and security

Staff responsible for passenger information in call and customer centers, assistance on platforms and in stations, ticket sales, security personnel in stations

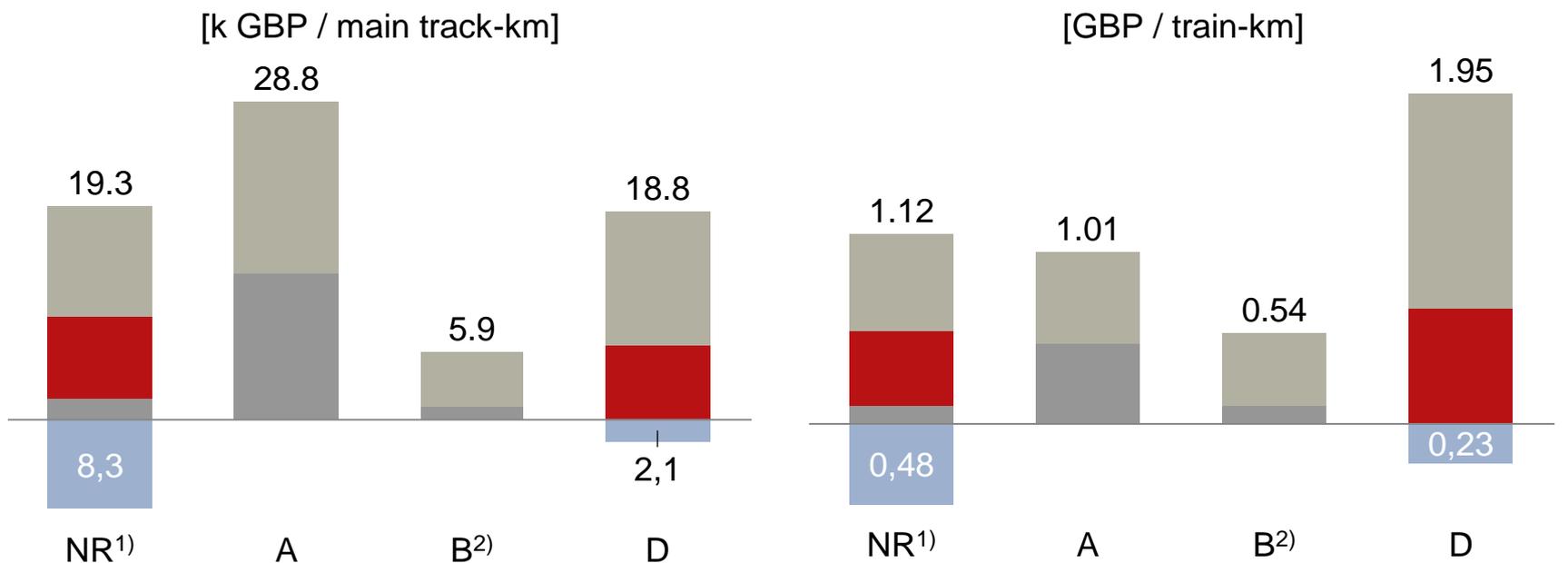
These costs could not be separated and are included in the other positions

Traction power supply

Acquisition and provision of the traction power or production and provision (if infrastructure operator produces the energy himself)

GB's costs for network operations are the second highest

Network operations (2009)



- 1) Including TOCs (NR: 17 m GBP; TOCs: 183 m GBP)
- 2) Excluding station management
- 3) Traction Power not in every country provided by infra manager or data not available

- Traffic management/control staff
- Other train operations
- Station management staff
- Customer service and security staff
- Traction power supply³⁾

The cost of traffic management is usually driven by traffic control, Network Rail is on a similar level as others

Network operations

The cost for network operations are difficult to grasp as peers had difficulties to separate the cost by different cost categories

Traffic management

- All peers were able to provide figures on traffic management cost in total
- These cost comprise different functions such as strategic / operational planning, signalling, traffic control, supervisory tasks, production of train paths
- From our experience we expect most staff to be allocated to signalling, traffic control and production of train paths
- GB's spending per train-km, as the significant cost driving factor, is rather similar for Network Rail and the two peers A and B, possibly revealing some potential for Network Rail compared to peer B
- Peer C's cost are comparably high due to a high number of interlockings that have not been centralised so far

Network Rail's cost of station management per train kilometre are lower than in country C

Network operations

Station management

- Station management cost as another significant position was provided separately only Network Rail/TOCs and by one other peer
- As British TOC's are partly responsible for station management their cost position "Staff cost commercial" had to be split into "Stations" as part of infrastructure and TOCs' operations cost
- Network Rail displays a slight cost disadvantage against peer C based on main track-km, but a cost advantage based on train-km which is the most driving factor for expenses in this area (more trains reveal an impact on passenger information, assistance on platforms/in stations, ticket sales etc.)
- Peer B is not in charge of station management, thus no cost is emerging
- For peer A it was not possible to separate station management cost from "other train operations" cost, thus not being comparable without further analysis
- The study "People in the GB Rail Industry" points out that there may be too many stations employing one staff only which could be questioned

In particular "other train operations cost" include a number of different cost elements

Network operations

Other train operations

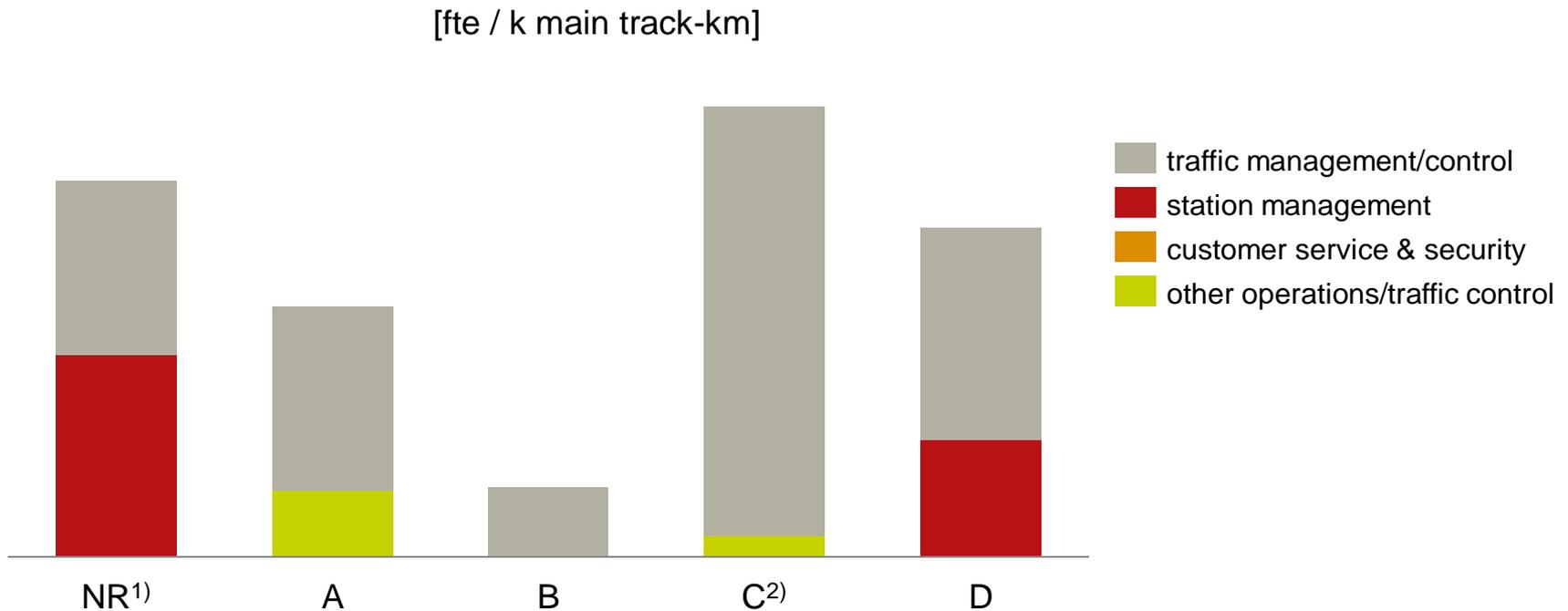
- These costs include utilities, plant/machinery, IT and telephone, but also "Miscellaneous" which cannot be allocated to the cost positions in the questionnaires (e.g. general surveillance of the network, calamity management)
- Thus no one-to-one comparison of "other train operations cost" is fruitful without further analysing the activities

Traction power supply

- The cost for traction power supply were provided by one external peer only and are than at Network Rail (per train-km)
- To better understand better the cost differences the purchasing philosophies as well as the market prices of electric power require more in depth analysis (for reasons of anonymity no further explanations are provided here)

Network Rail's operations staff per track-km is comparatively high

Staff infrastructure operations (2009)

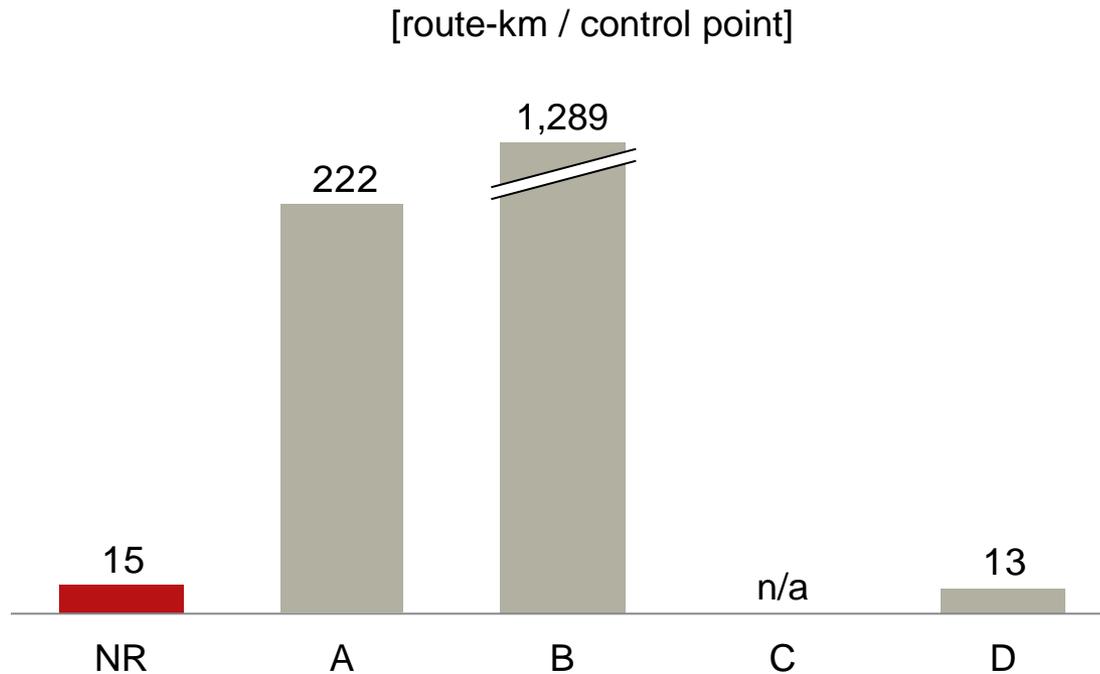


1) NR 7,235 fte traffic management plus 8,184 fte station management (TOCs)

2) Traffic management staff includes staff for station management

Countries A and B have completely eliminated manned signal boxes and established centralised control centres

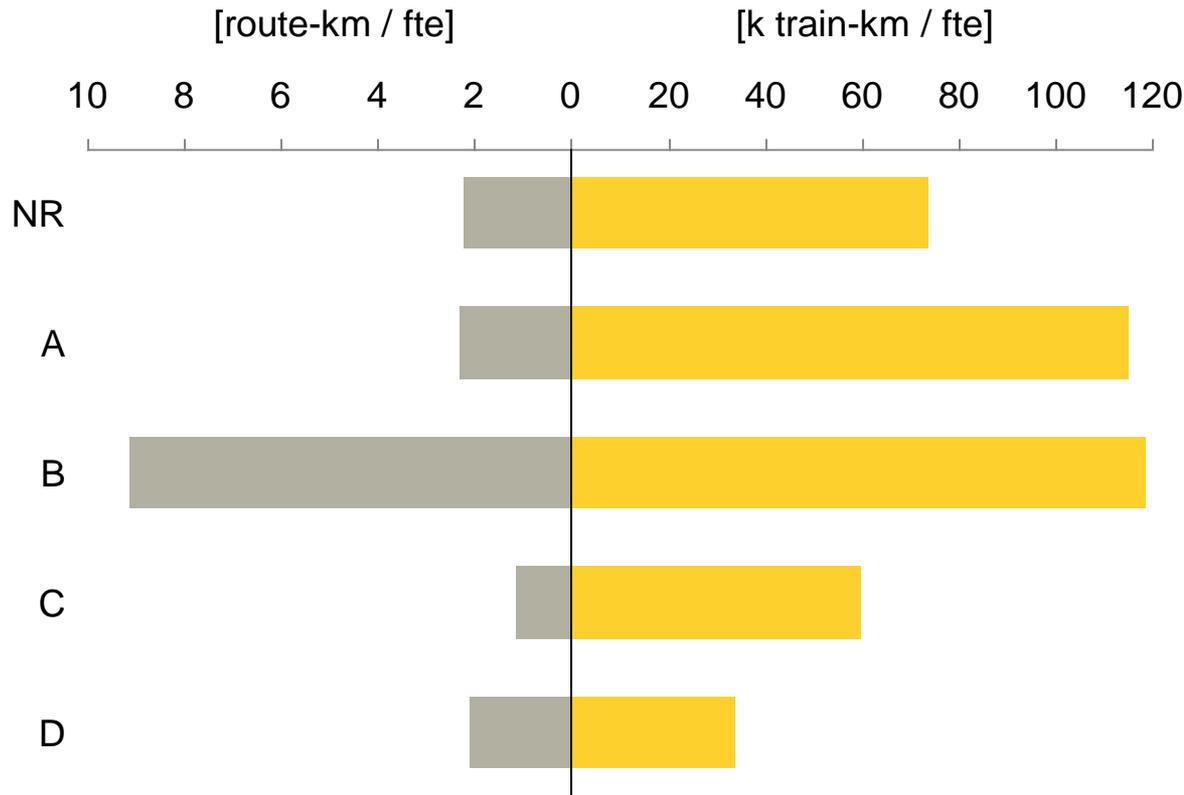
Average route length covered by manned control points (2009)



- Some countries have been establishing centralised control centers by reducing the number of manned interlockings
- This leads to less staff and a higher productivity in terms of route kilometers managed per control center and full time employee
- If staff is effectively reduced operating costs can be decreased
- Countries A and B have managed to increase the number of route km managed per control point

Country B has benefitted rigorously from centralisation and automation

Average route length and traffic volume per fte traffic management (2009)



- Countries A and B manage a larger number of train-km per full time equivalent than other countries
- Whereas country B has significantly reduced the number of operating staff, country A has not gone that far yet

The combination of centralisation and efficiency improvements can unlock substantial cost reductions

Traffic management/control

- Several European infrastructure managers have started programmes to centralise control centers and reduce the number of interlockings
- This is an opportunity to reduce the number of staff and increase the productivity of manned control centers (90% of the total cost of network operations is driven by staff)
- The full potential can only be unlocked by a number of additional measures aiming at an improvement of efficiency such as
 - IT-based traffic planning and decision support to dispatchers
 - A reduction of traffic perturbations which create additional workload
 - The application of sophisticated staffing rules by calculation methods, parameters and time values
 - An increase of productive working time by shift flexibility, multitasking, part-time work, management of take-over times and the optimisation of working hours
 - A reduction of hourly cost of labour by increasing net working hours

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Overhead costs can be allocated to three different categories

Definition

Conventional/Commercial Overhead

- Finance & Controlling
- Procurement/Purchasing
- Information Technology
- Human Resources

This Overhead was to be considered and compared in the study

Operational M&R Overhead

- Overhead in Maintenance and Renewal departments
- Linked for example to Asset Managers in track, signalling etc.

This Overhead is included in the Maintenance and Renewal costs

Additional Overhead Functions

- Real Estate Management
- Safety & Compliance
- Transport Police Costs
- Marketing

Some companies provided additional overhead costs which needs to be compared function by function

The degree of detail of overhead cost and staff data varies

Overhead

Network Rail

Network Rail provided a cost breakdown for conventional/commercial overhead and additional functions; staff is one total number

A

Country A provided total cost and a limited cost separation only

B

Country C provided a cost breakdown for conventional/commercial overhead and additional functions; staff is broken down, too

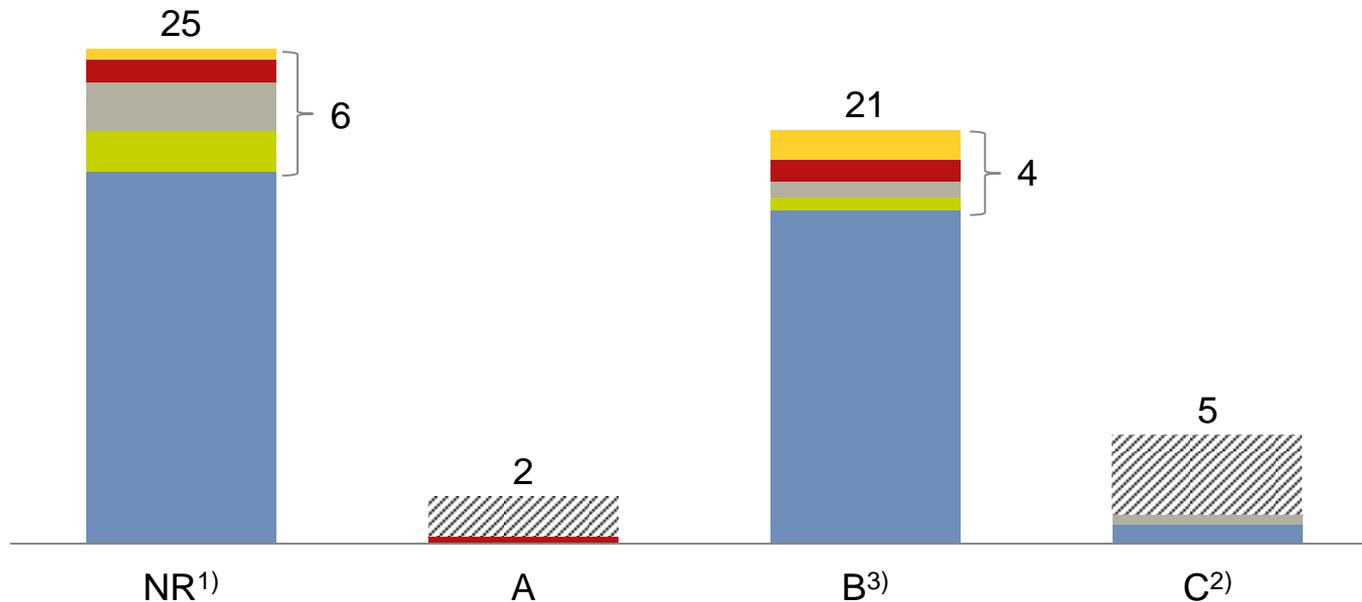
C

For country C overhead numbers are not completely available

Network Rail's overhead consists of "conventional overhead" as well as of "other overhead"

Infrastructure operating costs (2009, PPP-normalised)

[k GBP / track-km]



1) Others include: commercial property; infrastructure development and asset management; overhead group / central, other overhead; non-controllable overhead (external to NR)

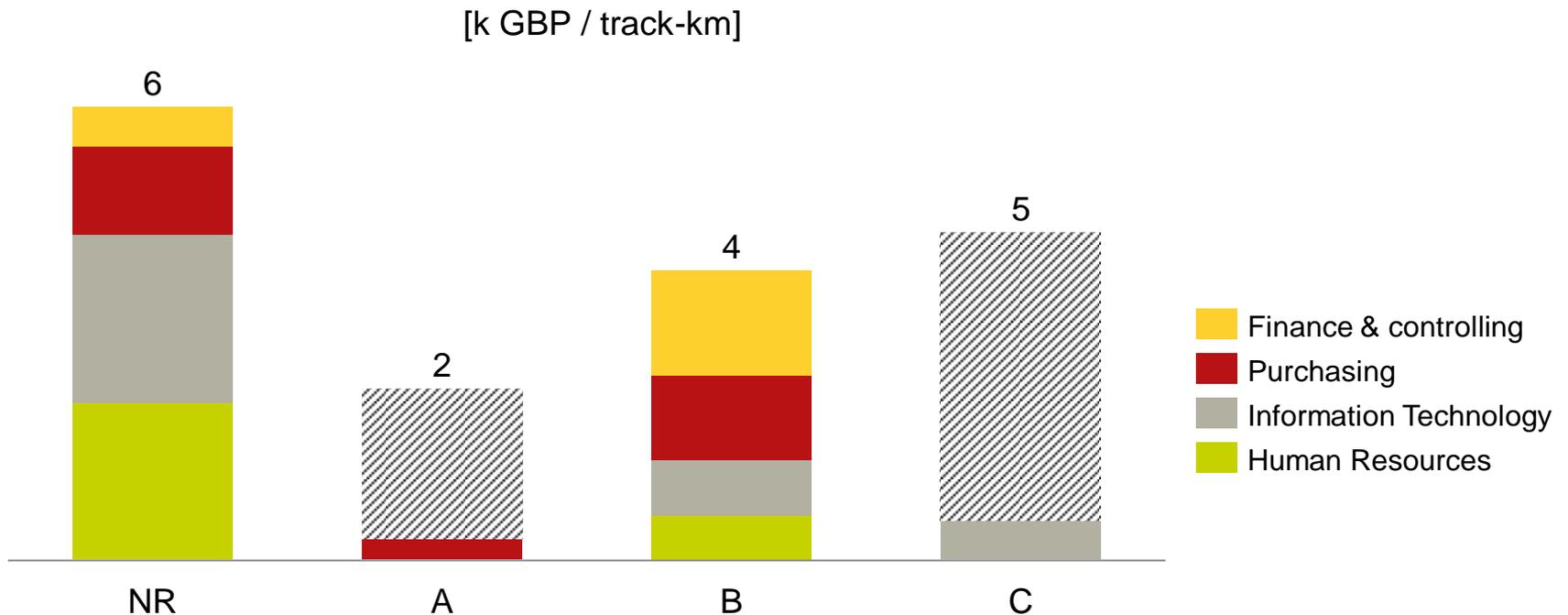
2) Others include only studies

3) Strategy, asset management, projects

- Finance & controlling
- Purchasing
- Information Technology
- Human Resources
- Others

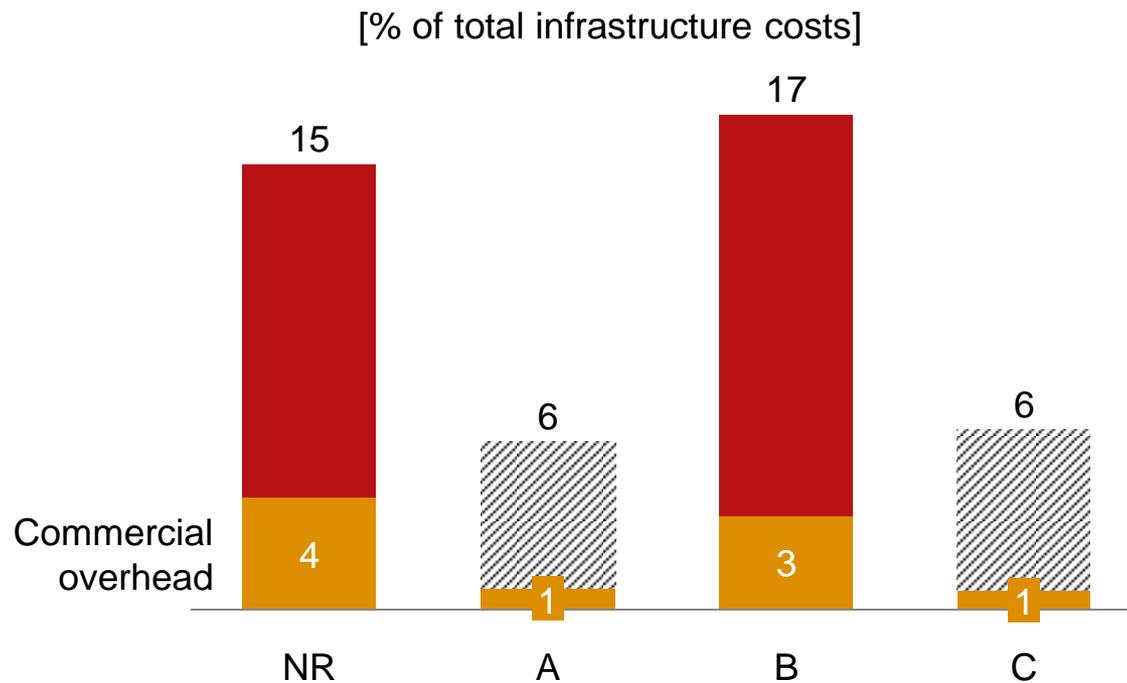
Focusing on conventional overhead functions shows higher resources for IT and HR at Network Rail

Infrastructure operating costs (2009, PPP-normalised)



The share of comparable commercial overhead is between 3% in country B and 4 % in GB

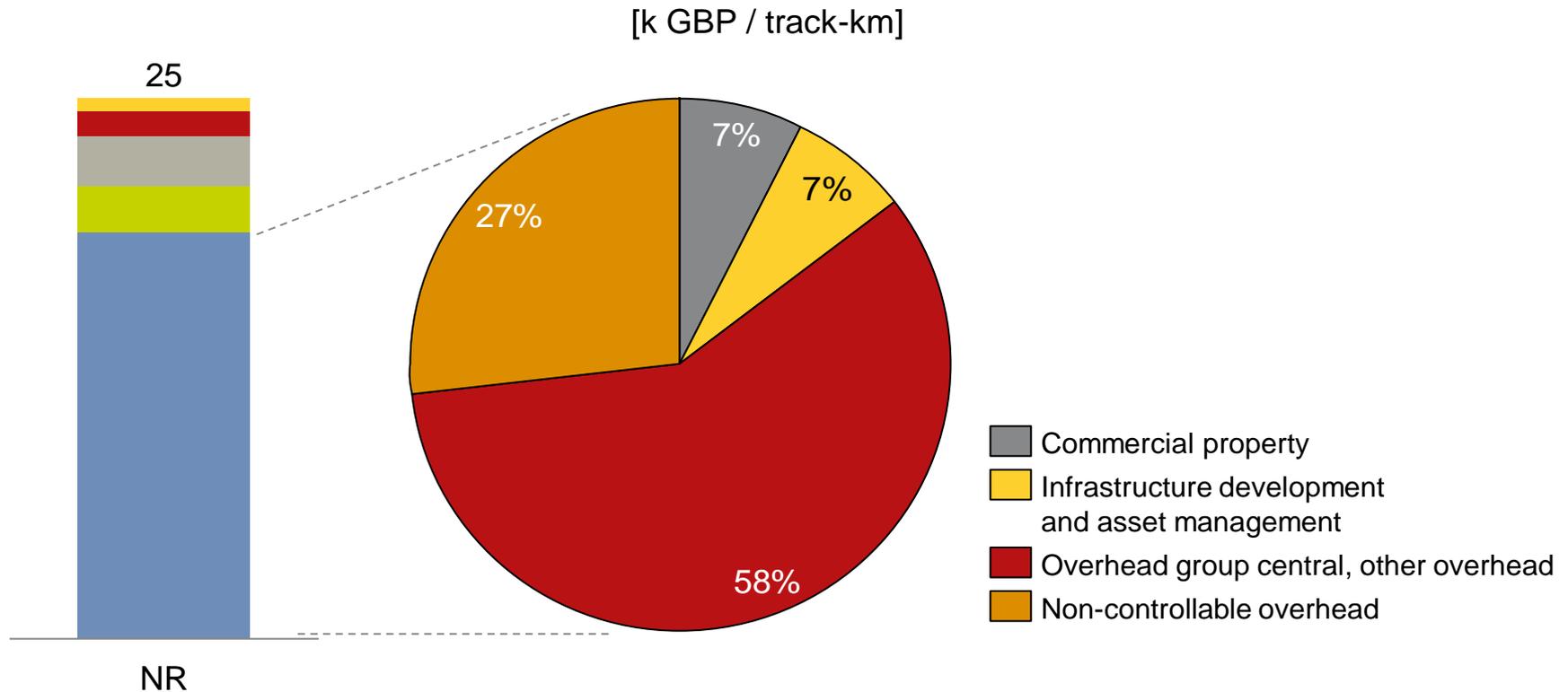
Infrastructure operating costs (2009, PPP-normalised)



- Only country B is comparable to Network Rail
- Country A only separated the cost for procurement
- Country C did not provide a complete separation either
- According to country A's annual report administration costs are at 3,3% in relation to total operational costs
- In other publicly owned railway organisations commercial overhead – including properties – makes for 4-5% of total cost

"Other overhead" at Network Rail can be broken down into four categories

Network Rail: Other overhead



Pensions, group insurance, bonus payments, BT Transport Police, RSSB accumulate 73% of other overhead

Network Rail: Other overhead

Commercial Property (44 mio. GBP)

- Commercial lettings
- Developments
- Retail space at Network Rail's stations

Overhead Group/Central, other overhead (344 mio. GBP)

- Other corporate services (335 mio. GBP for pensions, staff annual performance bonus, group insurance etc.)
- Safety and compliance (2 mio. GBP)
- National Delivery Service (7 mio. GBP)

Infrastructure Development and Asset Management (43 mio. GBP)

- Planning and development (8 mio. GBP)
- Infrastructure investments/projects (-2 mio. GBP)
- Asset management and engineering/Asset heads (37 mio. GBP)

Non-controllable overhead (external to NR) (158 mio. GBP)

- Cumolo rates
- BT Transport Police costs (74 mio. GBP)
- Rail Safety & Standards Board (RSSB, 76 mio. GBP)

A comparison of overhead requires a more in-depth investigation of possible explanatory factors

Infrastructure operating costs (1/2)

- Both in cost per track-km as well as by percentage of total costs Network Rail's commercial overhead seems to be higher than other company's overhead; furthermore Network Rail spends more on other overhead functions
- Network Rail's other overhead mainly consists of costs for pensions, group insurance, bonus payments, BT Transport Police and the RSSB
- The difference to others could be explained by various factors:
 - By insourcing maintenance from various contractors Network Rail might have inherited various practices which need to be standardised and require resources
 - Network Rail is undertaking quite some effort to be a better asset manager and seems to accordingly dedicate resources to asset management related activities
 - The high amount for IT cost could result from a large number of applications and interfaces as well as a lot of support needed for modelling
 - The cost for Human Resource management could be driven by standards (safety, training, administration) which might be higher than elsewhere

A more in-depth analysis is needed to explore the underlying reasons for the gap

Infrastructure operating costs (2/2)

- Explanatory factors (continued):
 - Planning & Regulation as well as Government & Corporate Affairs seem to bind a substantial number of staff
 - Other overhead seems to be driven by cost elements which do not occur at other infrastructure managers: transport police, Rail Safety & Standards Board
 - Network Rail is spending 44 mio. GBP which covers the development and management of real estate such as complex stations. One of the countries considered is not in charge of this function
 - There is a degree of uncertainty to what extent overhead is actually included in these figures and what part is "hidden" in functions on a decentral level (for example HR or controlling support in the maintenance department)
- To remove uncertainty about the underlying reasons a more in-depth analyses including precise cost allocation and headcounts based on a detailed breakdown of overhead functions would be needed

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Driven by renewal expenditures GB's infrastructure costs are highest in sample

Key findings

- GB's network is the second largest in sample, utilisation being about average. Other comparators like The Netherlands and Switzerland have denser traffic with higher train frequencies and tonnage
- Cost differences due to utilisation and network complexity need to be adjusted as they can only be influenced in the long run. The necessary adjustments are made in the normalisation process
- Fully normalised GB's maintenance expenditures are 10 to 20% below cost levels of countries A and B but more than twice as high as in country D
- GB's total normalised renewal expenditures are significantly higher than the comparators' expenditures; an analyses of five and ten year average renewal expenditures shows that all peers including Network Rail have lifted up their renewals in the more recent five year period
- As former gap analyses has shown NetworkRail's high expenditure level is not only due to catching-up on backlogs but also caused by high unit costs

Infrastructure costs and performance (2)

Key findings

- Operation costs are strongly influenced by the number of manned interlockings and staff-related costs
- Concentration has led to a small number of centralised control centres in two countries – all manned signal boxes were abandoned; one country has unlocked significant savings potentials by effectively reducing staff numbers
- Related to traffic output GB's operations cost are at about average; centralisation and automation of network operations in GB seem to bear a potential for efficiency increases
- Network Rail's "classical" overhead seems higher than in other countries but comparability is very limited
- Network Rail has also provided cost data on other overhead functions which cannot be directly compared but drive Network Rail's infrastructure cost
- Due to different sourcing strategies staff sizes for maintenance and renewals varies broadly

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5. Train operations (incl. Rolling stock)

5.1. Introduction

5.2. Total cost and structural characteristics

5.3. Train staff

5.4. Customer and operation management

5.5. Overhead

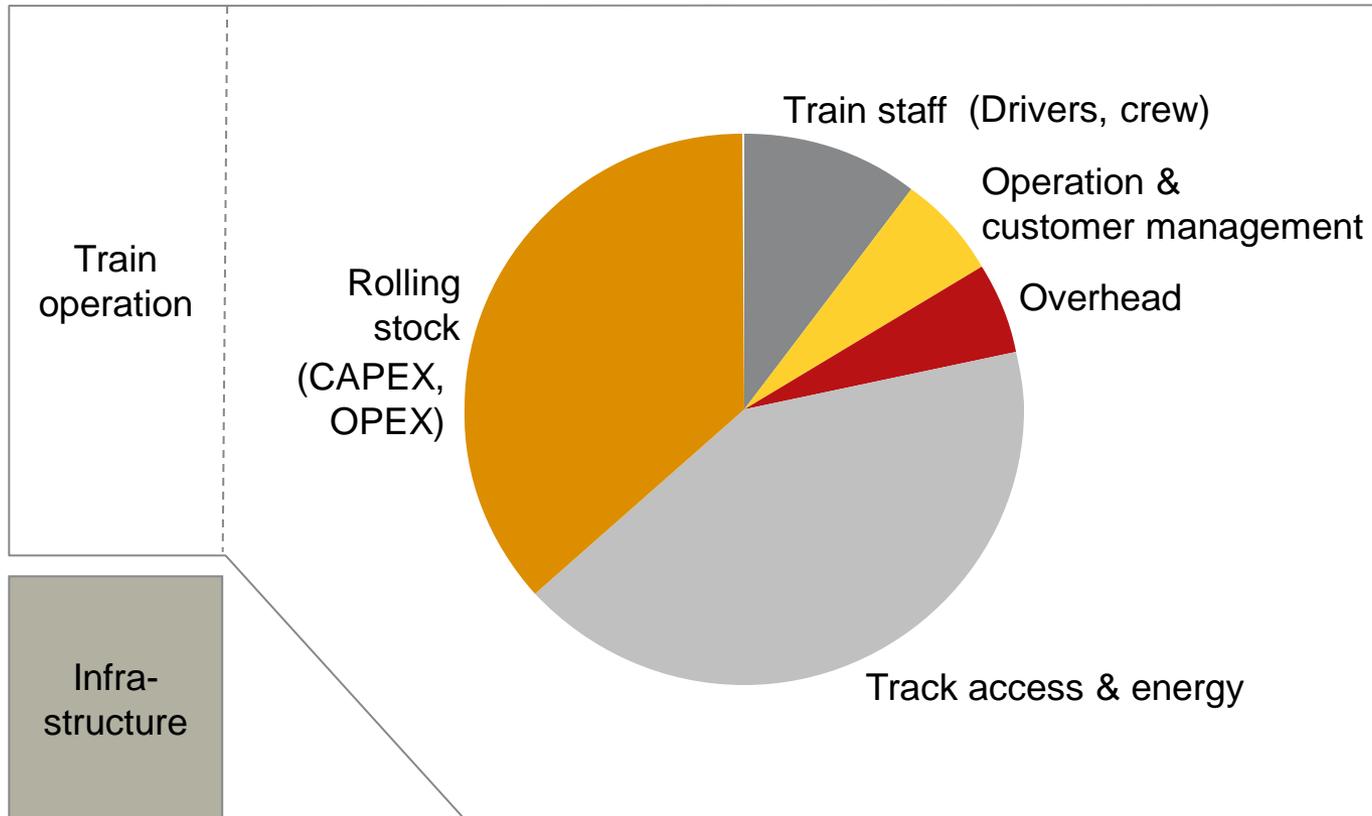
5.6. Track access charges and energy

5.7. Rolling stock

5.8. Conclusions

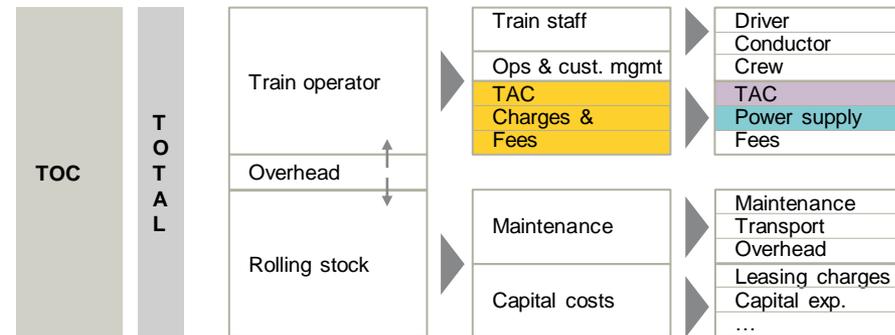
Data for passenger train operations have been evaluated using a proven functional cost structure

Cost structure



Train operations costs mainly consist of train operators and rolling stock

Train operation costs



- **Train operation costs** will be split into three categories
- **Train operations** includes
 - Staff necessary to operate trains such as drivers, conductors and other crew
 - Staff to manage staff
 - Staff for customer management
 - Non staff related cost to access track and run trains such as track access charges and power supply and other costs
- The **overhead** necessary to operate staff and trains is separated and mainly staff driven
- **Rolling stock** costs are split into maintenance and capital costs

5. Train operations (incl. Rolling stock)

5.1. Introduction

5.2. Total cost and structural characteristics

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5.5. Overhead

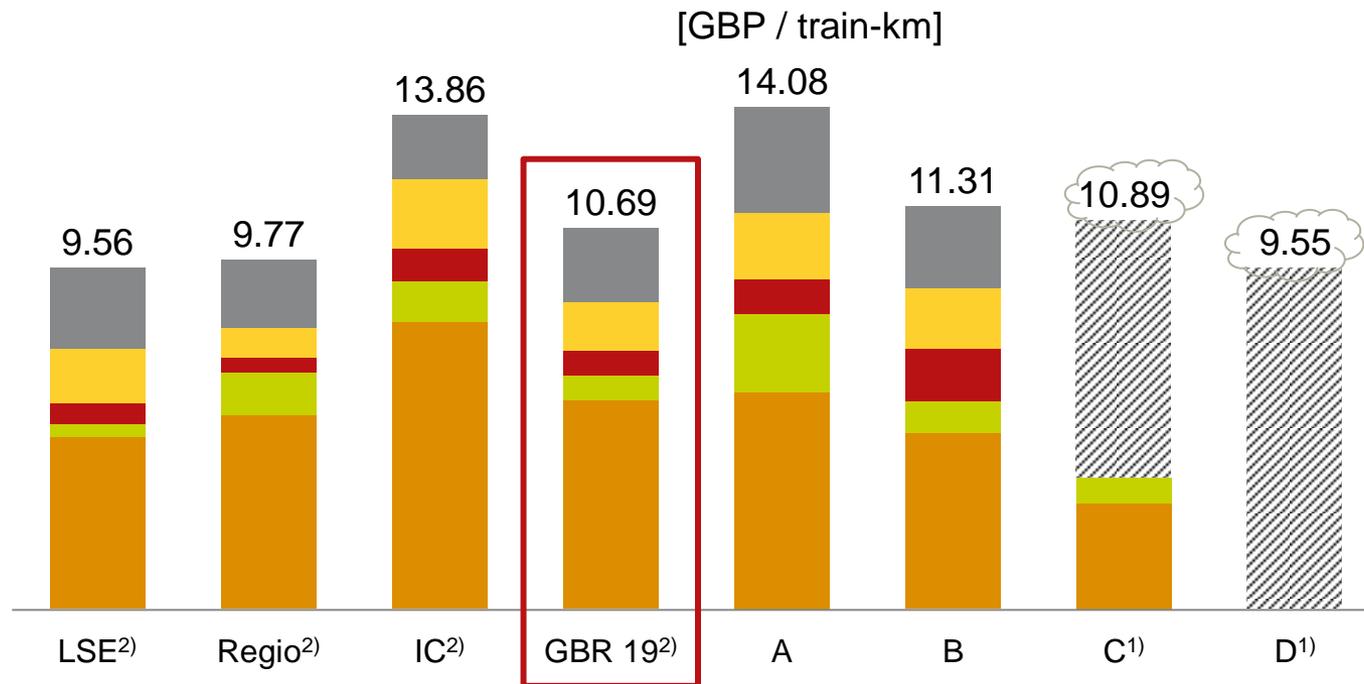
5.6. Track access charges and energy

5.7. Rolling stock

5.8. Conclusions

Compared to state owned operators GB's non-normalised total train operation costs are the second lowest in sample

Total train operation costs (2009, excluding track access, non normalised)

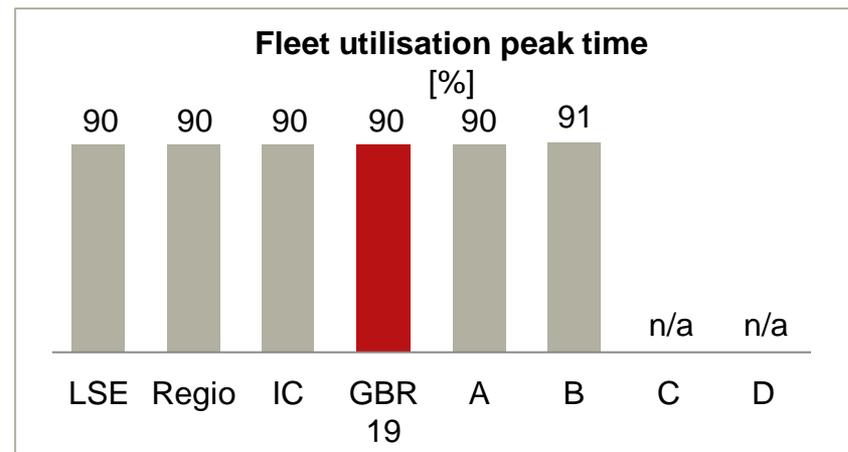
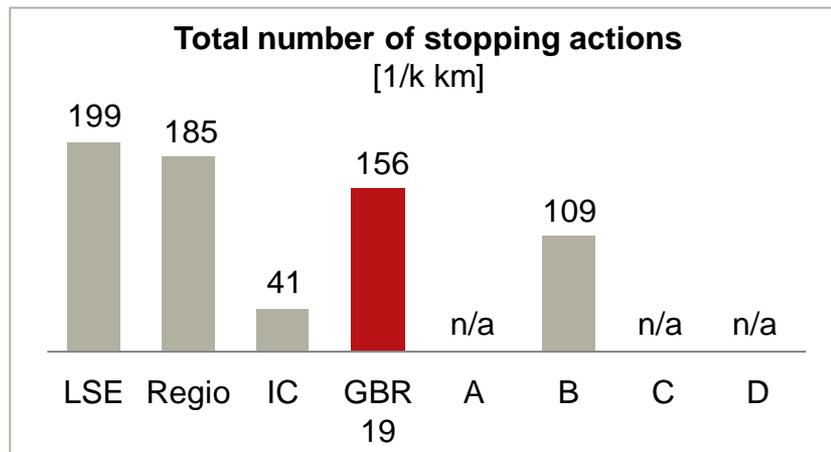
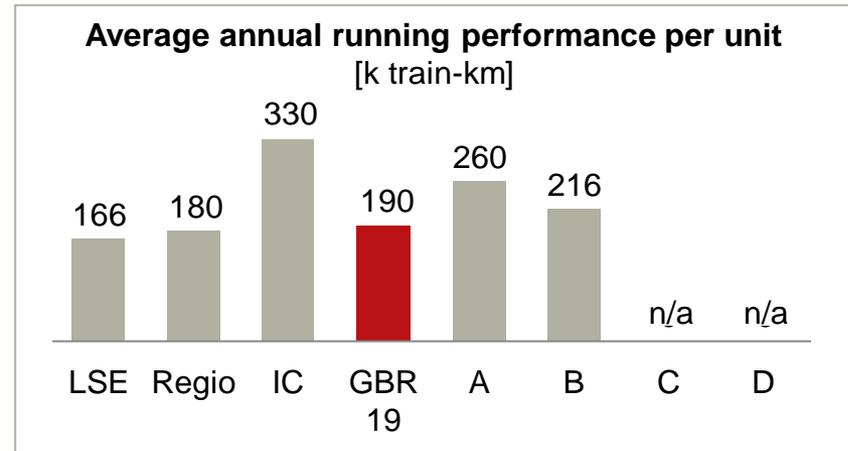
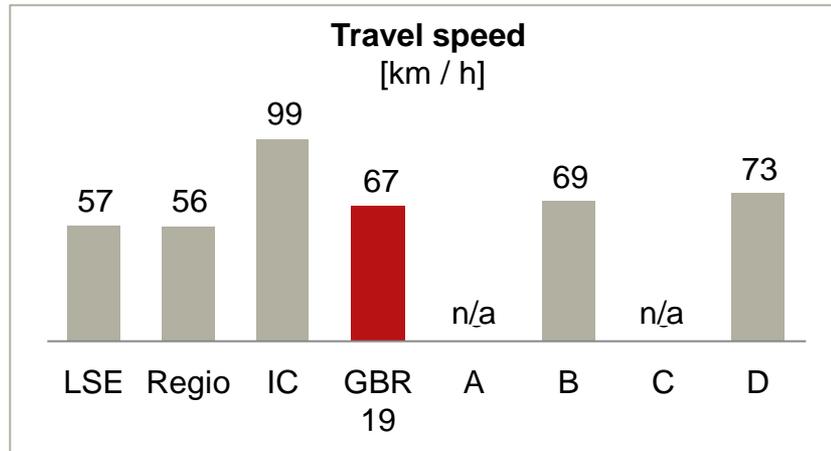


- 1) Cost distribution of shaded block not known
- 2) Operation management costs here contains a portion of rolling stock maintenance staff costs



Structural parameters differ and require normalisation

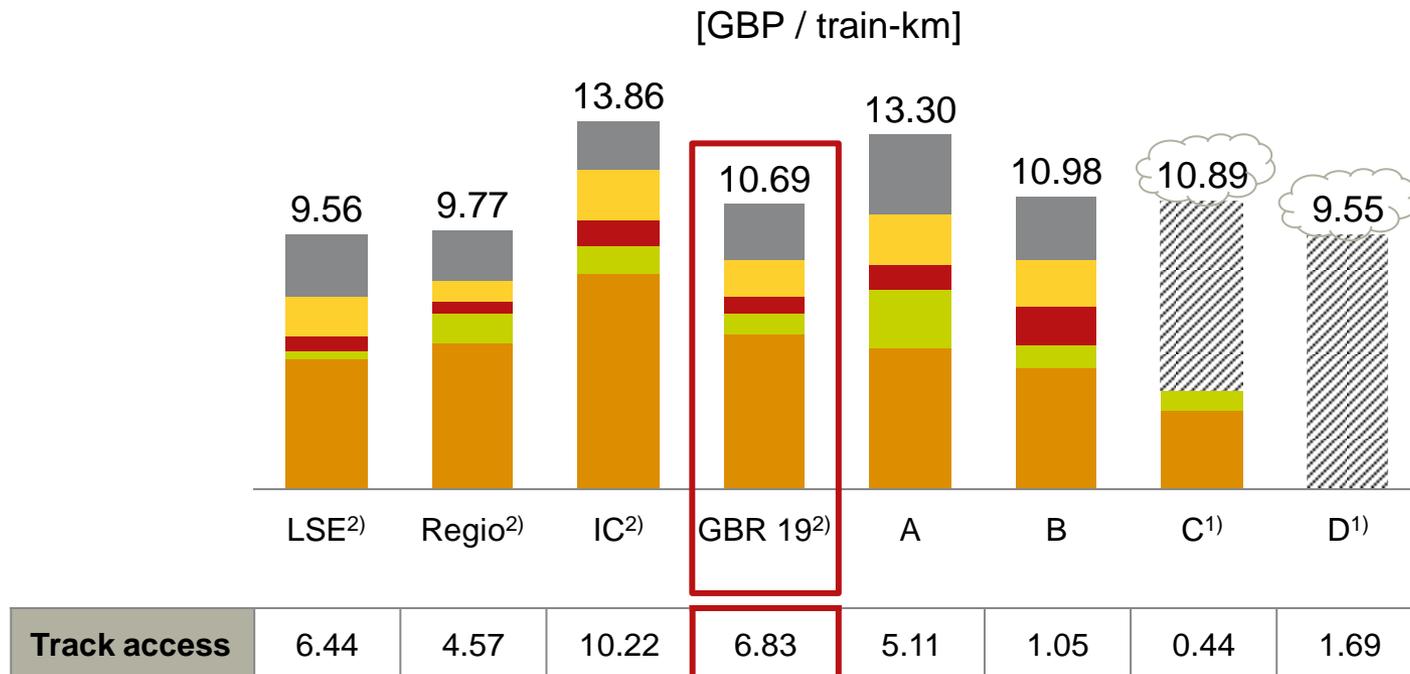
Structural characteristics (2009)



For further information on the methodology and normalisation process please refer to chapter 9

Compared to other state-owned train operators normalised costs per train-km are second lowest in GB

Total train operation costs (2009, excluding track access, partly normalised¹⁾)

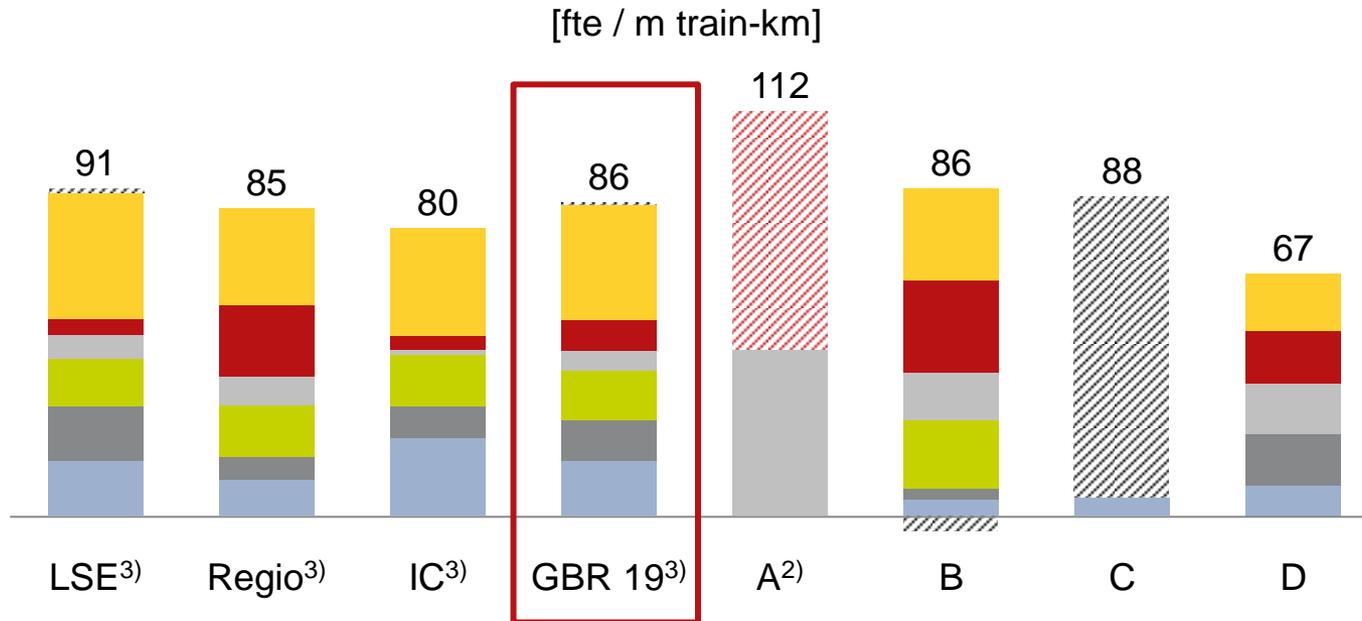


- 1) Train operation and rolling stock has been normalised for the countries where normalisation factors were known
- 2) Cost allocation of shaded block not known
- 3) Operation management costs here contains a portion of rolling stock maintenance staff costs

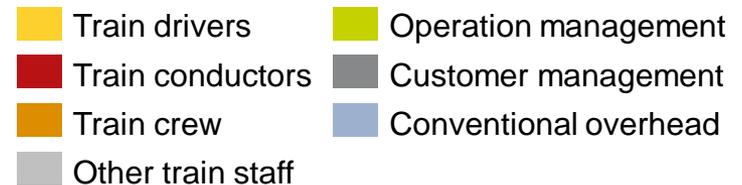
- Train staff
- Operation and customer management
- Overhead
- Energy and user fees
- Rolling stock

Total staff size for train operation in GB is close to average

Staff size passenger train operation¹⁾ (2009)



- 1) Drivers, conductors, train crew, operation management, customer management, conventional overhead
- 2) Other train staff including operation management, customer management and conventional overhead
- 3) Operation management staff here contains a portion of rolling stock maintenance staff



Comparison of train operation costs is against state-owned operators

Total train operation costs

- Normalised data show that GBR19's train operating costs are at the lower level of the sample
- Track access charges have been excluded as they are externally set by the infrastructure manager and not (fully) controllable by the train operating company
- In contrast to GB the other countries have not franchised all rail passenger services and state-owned operators such as SNCF, NS Reizigers and SJ still dominate the national markets
- Whereas British Rail ceased to exist these companies are still operating
- This is clearly reflected in market structures shown in chapter 2.4; the state-operators still have significant market shares and contribute to most of the national system cost related to train operations
- In order to maximise coverage of total system cost the comparison of British TOCs is against these large and dominating state-operators and not against smaller private operators
- Nevertheless it needs to be mentioned that former studies have identified cost savings in a range of 20 to 40% from franchising (see EMCT 2007)

Comparison of train operation costs is against state-owned operators

Total train operation costs

- The analysis on the German market for regional passenger rail services underpins these trends: German public transport authorities have realised savings between 15 and 47%, depending on the type of service
- Hence there could be a potential for the other countries to further reduce their costs by tendering more rail services what would challenge GBR19's actual cost position

5. Train operations (incl. Rolling stock)

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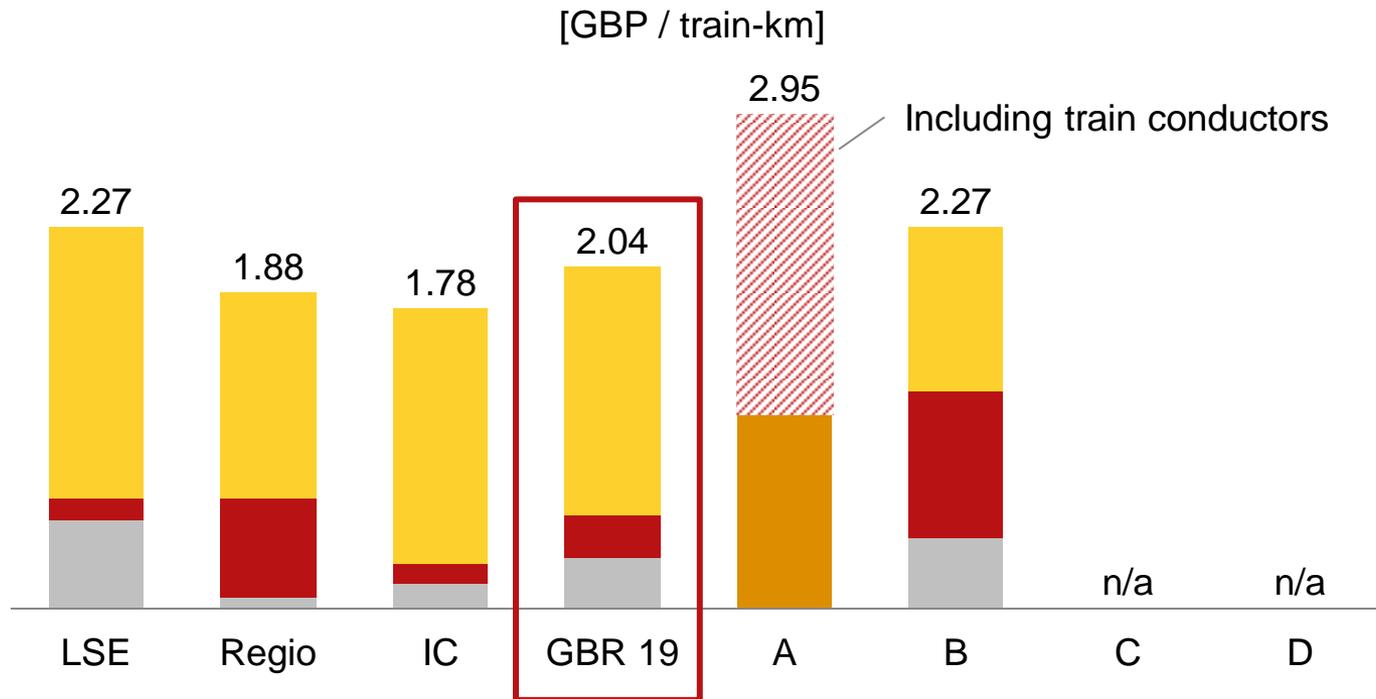
5.6. Track access charges and energy

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5.8. Conclusions

British train operating companies have lowest train staff costs in this sample

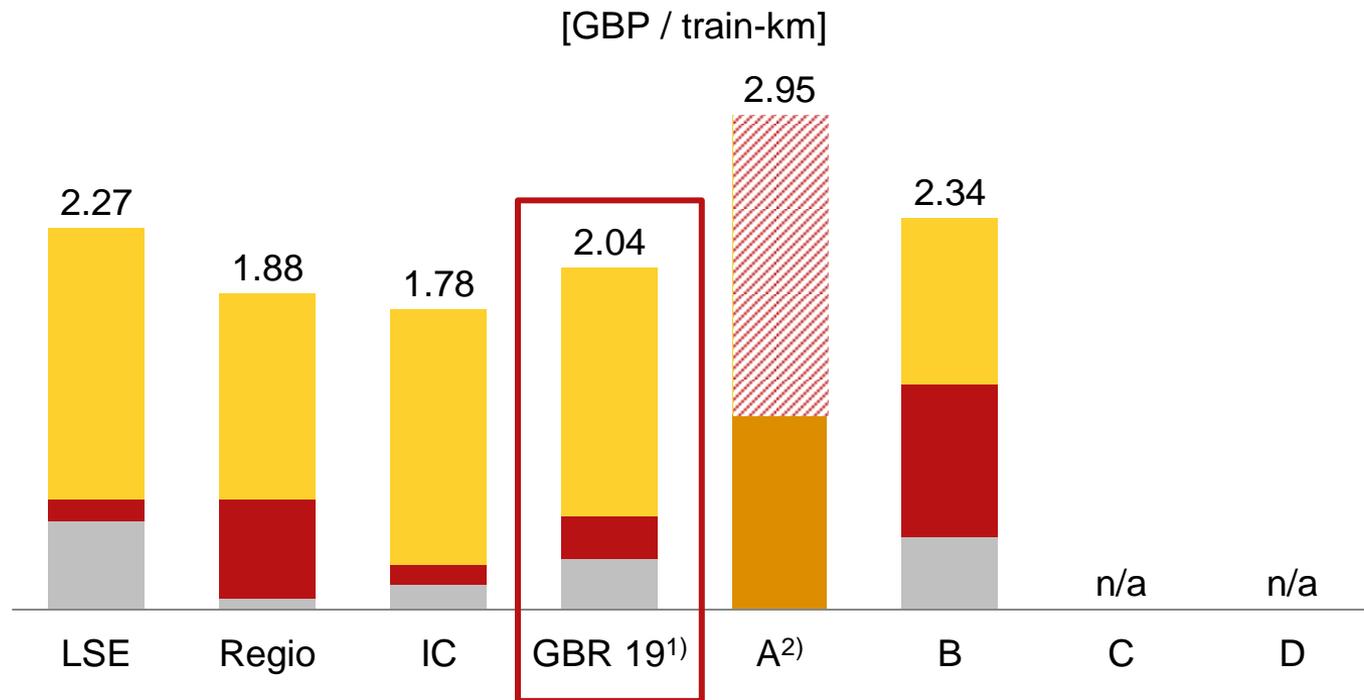
Train staff costs (2009, non normalised)



Train drivers
Train crew
Train conductors
Other train staff

Train staff costs normalised by travel speed lead to higher costs in country B

Train staff costs, normalised by travel speed (2009)

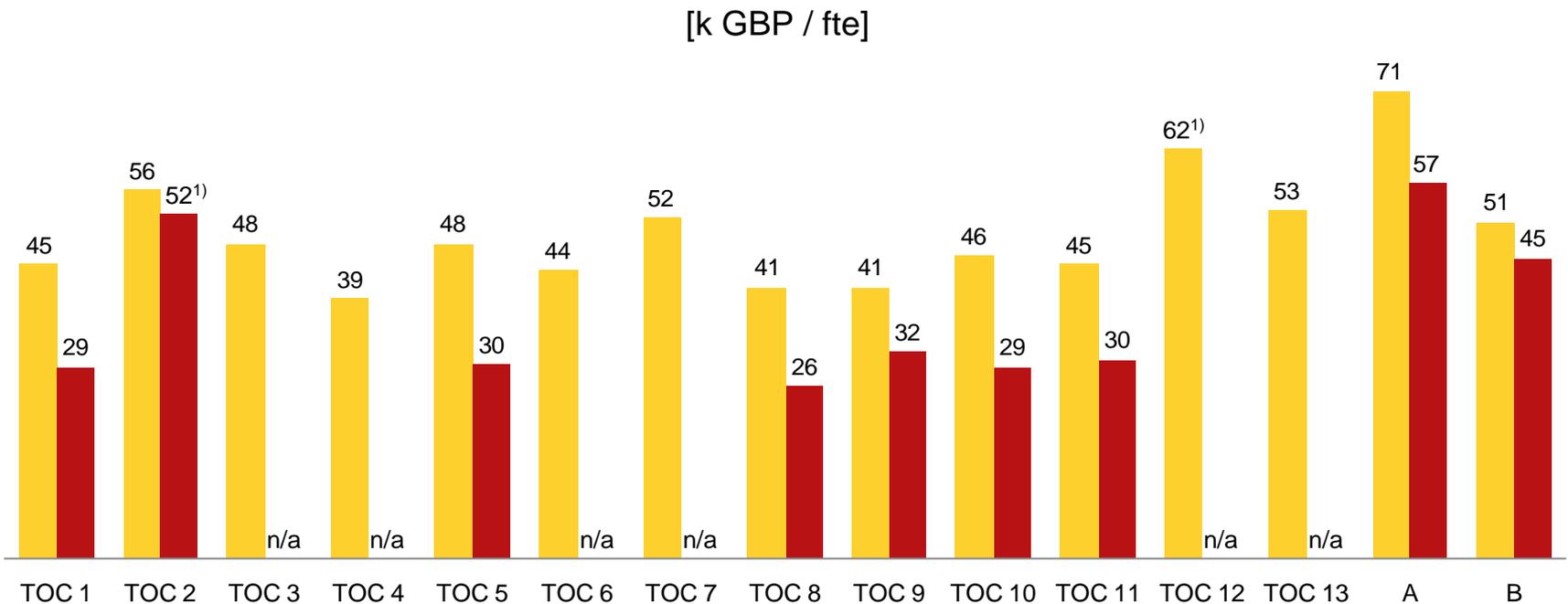


- 1) Normalisation only related to GBR19
- 2) Non normalised as travel speed not available



Compared to countries A and B British train staff costs are much lower

Train staff costs (2009)



1) Unlikely high values, possibly staff group allocation mistake in source data

■ Train drivers
■ Train conductors and other Train crew

Train staff costs can be lower at private competitors

Train staff costs

- The comparison of train staff costs per full time employee is based on privately operated British companies and two state-operated companies in countries A and B
- Experience from other countries proves that privately operated companies (for example Connex, TransRegio and metronom versus DB AG in Germany) employ their train drivers at substantially lower cost
- The difference in hourly wage rates between these companies and DB AG can be as much as 50% of what private companies pay
- One of the reasons is that private companies often do not pay tariff salaries while DB pays salaries based on official framework tariffs; furthermore they do not necessarily take over staff from the previous franchise
- As DIW econ reports (Wochenbericht des DIW Berlin Nr. 43/2007) a DB train driver's monthly gross salary is up to 2.750 Euros whereas his British colleague has a monthly income of 2.960 Euros
- If GBR19 salaries were compared to private international operators annual staff costs would probably look higher and less favourable than what the analysis has shown

According to another study British TOC staff cost are at about the same level as TOCs abroad

Train staff costs

- A recent study on "People in the GB Rail Industry" analyses average salaries per employee by type and company in Britain, Sweden, Germany and The Netherlands
- British TOCs' "All FTEs' costs" are at about the same level as companies in Germany and Sweden; only Dutch staff is significantly more expensive
- This is true for management/administration staff as well as for non-management/administration staff

5. Train operations (incl. Rolling stock)

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5.8. Conclusions

Customer management and operations management are two important support functions

Definitions

Customer management

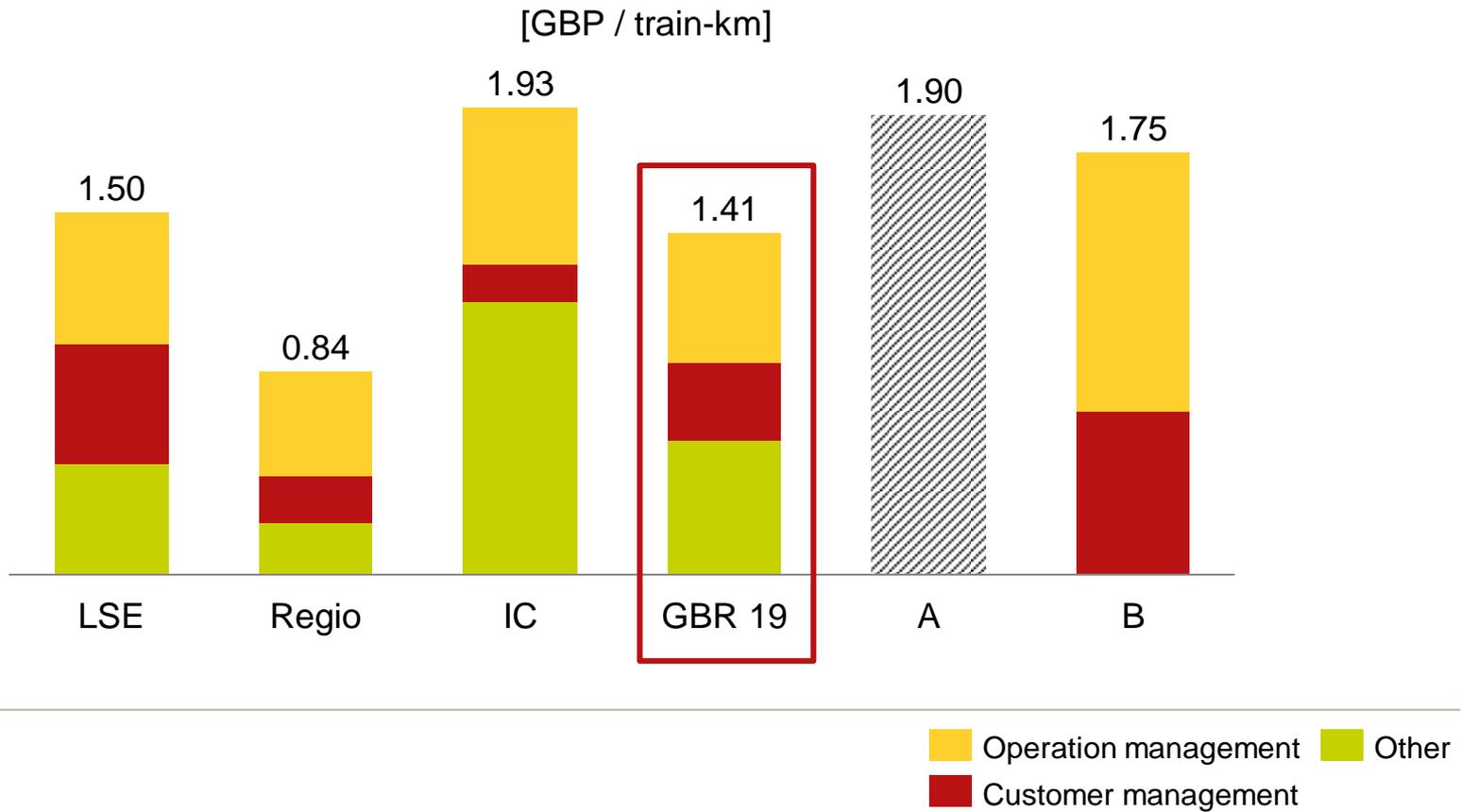
- Planning of traffic supply and product development
- Marketing, sales (B2B, B2C)
- Customer information and support services
- Key account management

Operations management

- Duty Rostering
- Train disposition/rolling stock planning
- Timetabling and staff disposition
- Exception handling

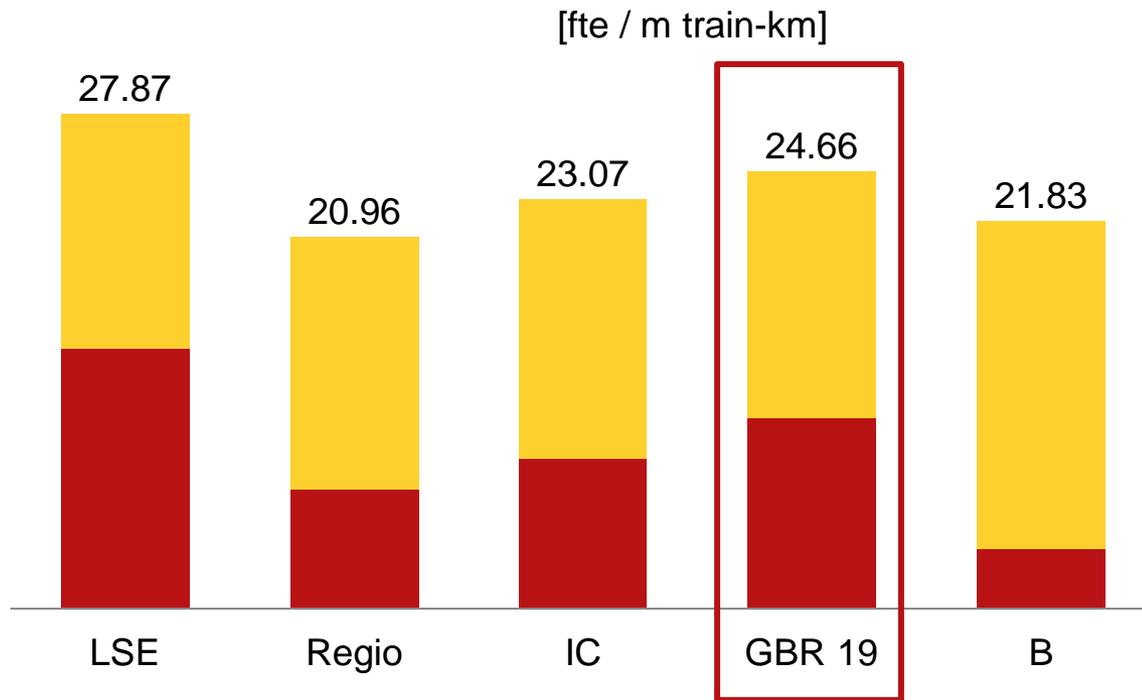
Operation and customer management costs are lowest in GB

Operation management and customer management costs (2009)



Compared to country B staff numbers per train-km are higher in GB

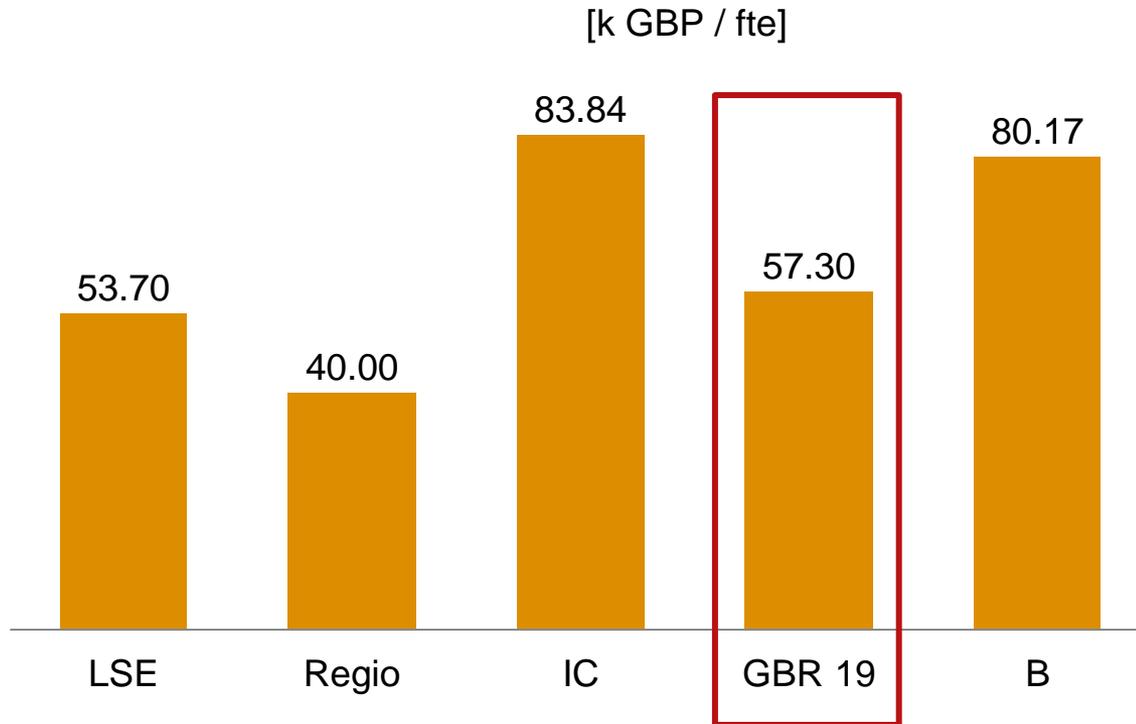
Operation management and customer management staff (2009)



Operation management
Customer management

Compared to country B costs per full time equivalent are lower in GB

Operation management and customer management costs (2009)



■ Total operation and customer management

5. Train operations (incl. Rolling stock)

5.1. Introduction

5.2. Total cost and structural characteristics

5.3. Train staff

5.4. Customer and operation management

5.5. Overhead

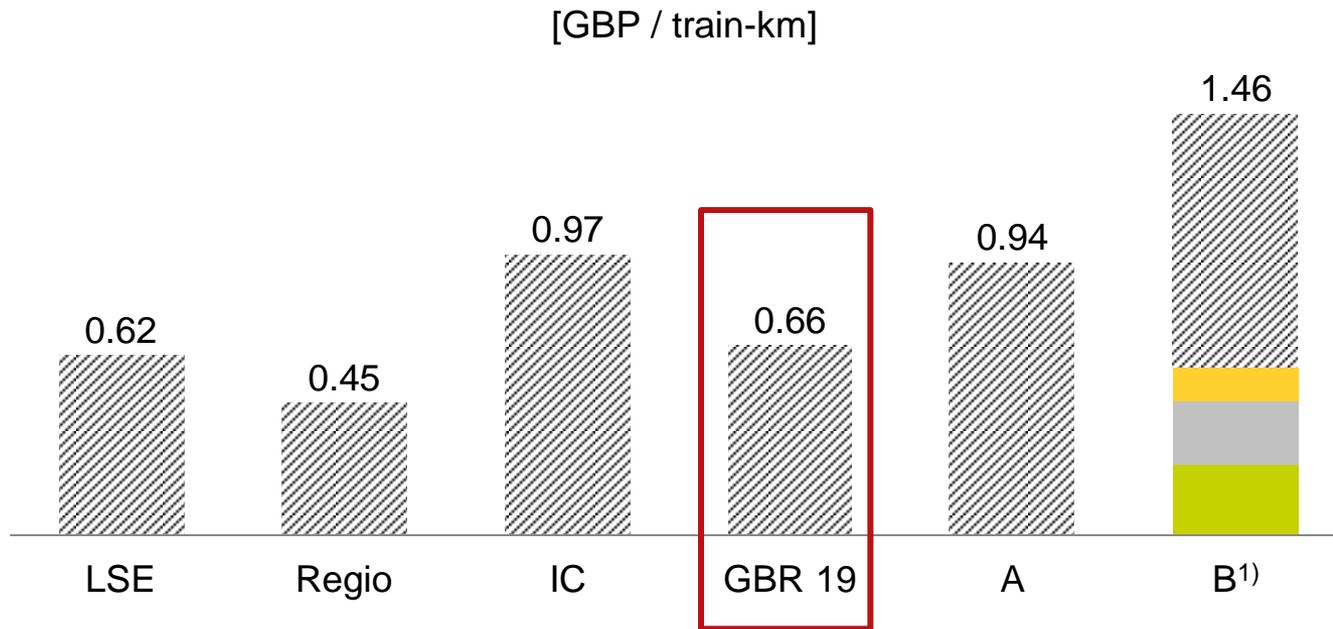
5.6. Track access charges and energy

5.7. Rolling stock

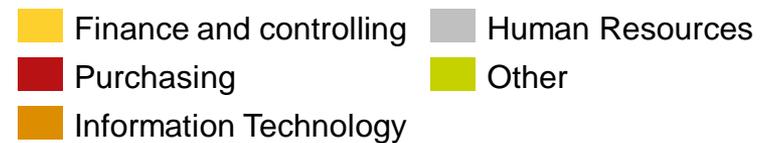
5.8. Conclusions

Overhead costs per train-kilometre seem to be very low in GB

Overhead costs (2009)



1) Other: travel information, safety



Other studies partially support this picture

Overhead costs

- The study on "People in the GB Rail Industry" comes to similar results for one of the countries in our sample
- For Sweden productivity in train-km per management/administration employee is slightly higher than in GB and Germany produces more than four times as many train-km per employee than British TOCs
- The German figure includes six TOCs and will probably be lower if resources from the holding are factored in and definitions of management staff are revised; despite these uncertainties the study comes to the conclusion that these factors are unlikely to fully explain this large difference
- This is also supported by the analysis on Germany included in this report which shows comparatively lean overhead structures for tendered services

5. Train operations (incl. Rolling stock)

5.1. Introduction

5.2. Total cost and structural characteristics

5.3. Train staff

5.4. Customer and operation management

5.5. Overhead

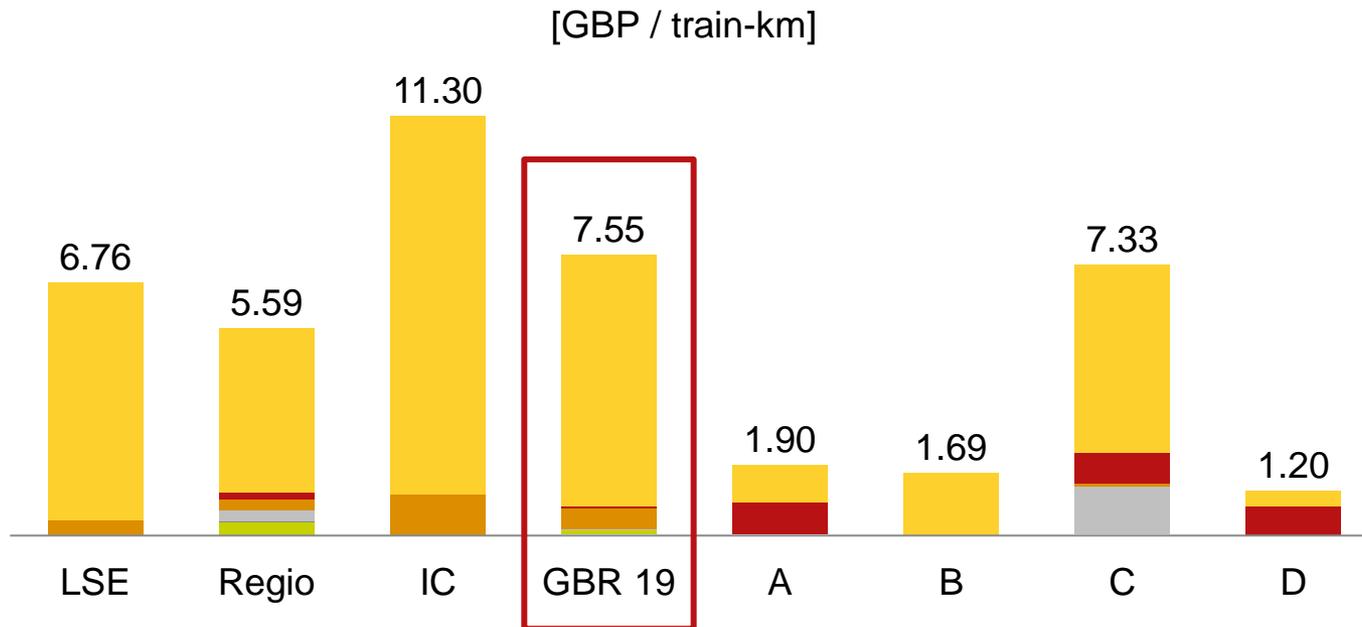
5.6. Track access charges and energy

5.7. Rolling stock

5.8. Conclusions

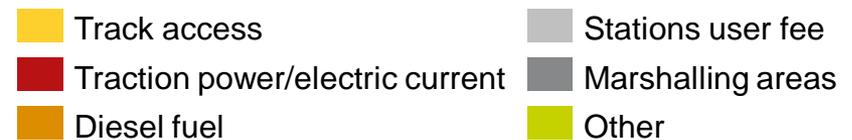
Track access charges are lower outside GB

Track access and energy costs (2009)



Cost for electric traction supply are only available for three TOCs: London Overground, Northern, Mersey and Scotrail

In country B cost for electric traction supply are included in track access charges



The charges for track access do not reflect the actual cost levels of infrastructure

Track access and energy costs

- The cost for track access per train-km is varying broadly between the five countries with Network Rail charging the highest amount per train-kilometre
- Countries A, B and D have chosen to rather charge low track access charges which does not imply that infrastructure costs are at a lower level
- As shown later in chapter 7 "Funding and Revenues" the countries charging low track access charges opt for a higher share of direct funding to the train operating company and vice versa

5. Train operations (incl. Rolling stock)

5.1. Introduction

5.2. Total cost and structural characteristics

5.3. Train staff

5.4. Customer and operation management

5.5. Overhead

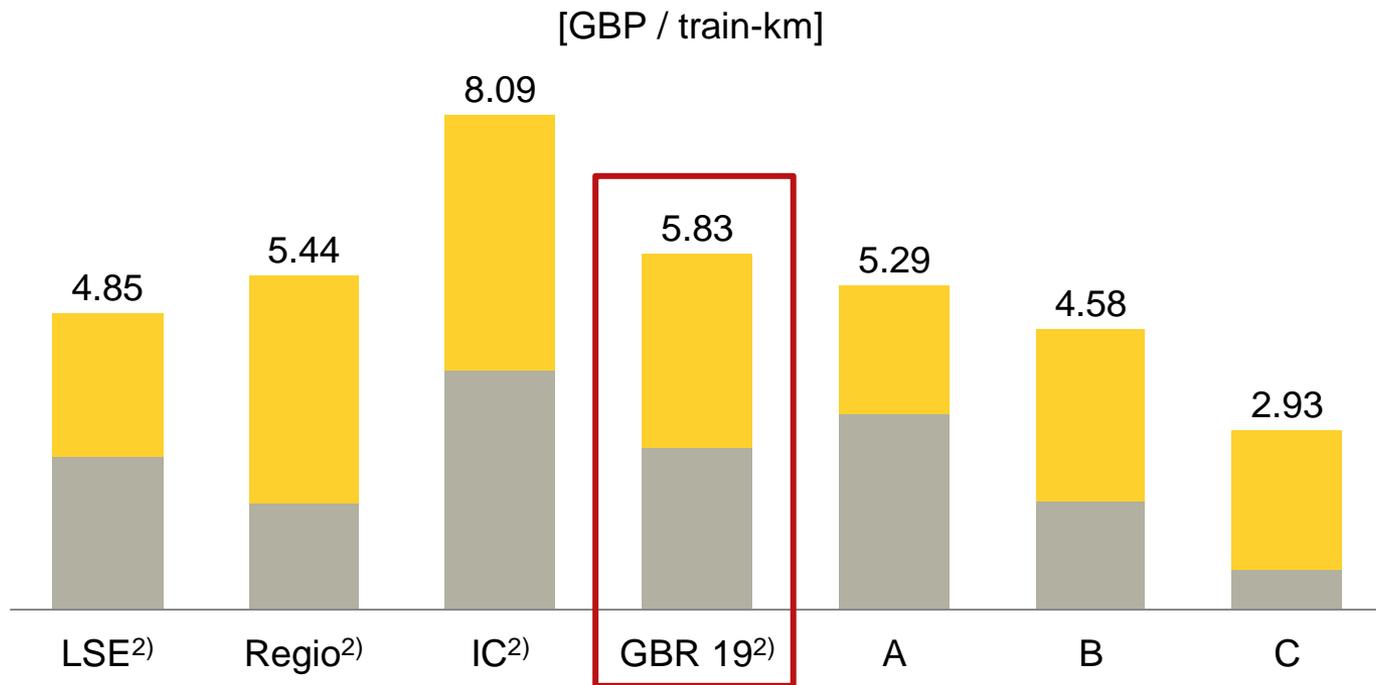
5.6. Track access charges and energy

5.7. Rolling stock

5.8. Conclusions

Operational and capital costs for rolling stock are highest in GB

Rolling stock costs normalised by running performance and fleet utilisation (2009)¹⁾

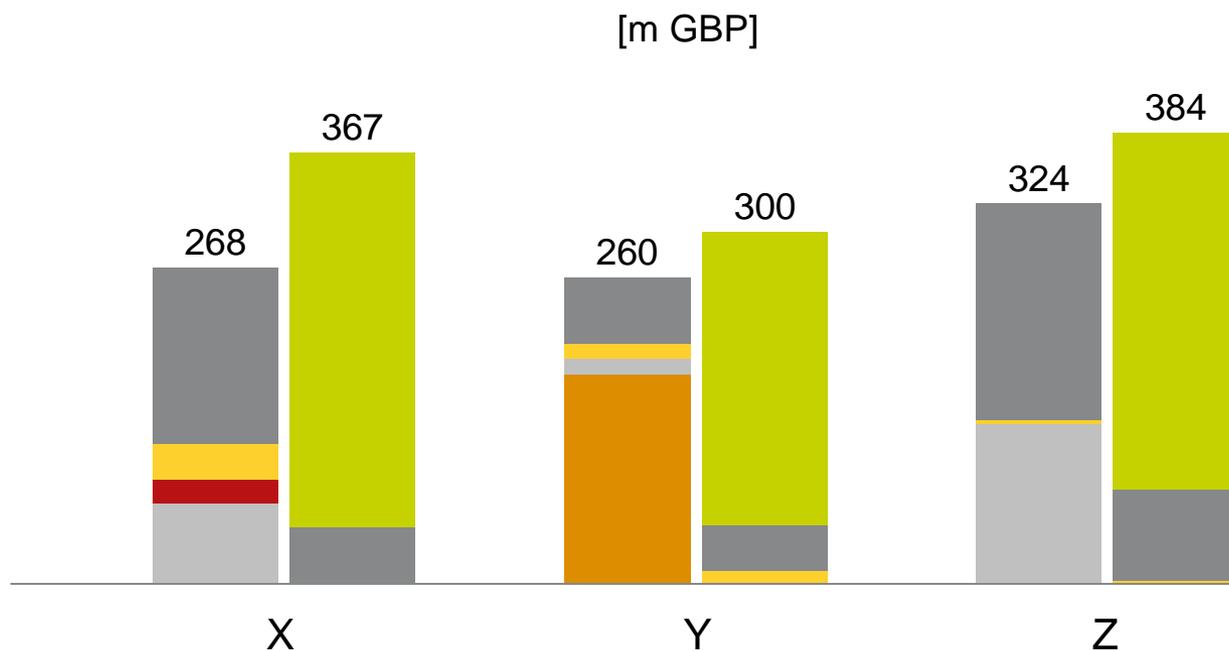


- 1) For details on normalisation see chapter 9
- 2) A portion of rolling stock maintenance staff costs included in train operation – operation management
- 3) Costs for rolling stock purchase and refurbishment

■ OPEX
■ Capital costs³⁾

A part of GB's high rolling stock costs could be explained by substantial profit margins generated by the ROSCOs

ROSCOs (2008)



1) Year 2007

Source: Income Statements

Expenditures

- Cost of sales
- Administrative expenses
- Other gains/losses
- Finance costs
- Operating lease rentals

Revenues

- Revenues
- Investment income
- Other gains/losses

The competition commission stated a variety of reasons for a not well functioning rolling stock market

ROSCOs

- The Competition Commission has investigated the market for leasing of rolling stock for franchised passenger services and the supply of maintenance services
- Whilst the latter market segment seems to be functioning and the Commission did not find any evidence for shortages of competition, the leasing market is not fully competitive
- Some of the major reasons identified were
 - Substitutability between different fleets is limited, particularly due to technical and operational restrictions
 - The overall lack of spare capacity which weakens the ROSCOs' incentives to compete on lease rentals
 - TOCs have limited ability to refuse to do business with the ROSCOs which reduces their countervailing buying power
 - As there is no market for used rolling stock new entry into the rolling stock market is difficult
 - The mismatch of length of the franchises and asset lifetimes does not encourage TOCs to invest into own rolling stock

5. Train operations (incl. Rolling stock)

5.1. Introduction

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5.3. Train staff

5.4. Customer and operation management

5.5. Overhead

5.6. Track access charges and energy

5.7. Rolling stock

5.8. Conclusions

Total cost for British train operating companies are relatively low, rolling stock cost are higher

Key findings

- Excluding track access charges GB's total train operation cost per train-kilometre are almost the lowest in sample; however it needs to be considered that cost are compared to state railway companies
- Different structural characteristics such as travel speed and annual running performance require normalisation which has been applied where possible
- Train staff cost of GB's train operating companies are the lowest when normalised; whilst staff size for train operation in total is similar to other countries cost per full time employee are lower both for drivers and conductors
- Cost for operation and customer management are also lower in the GB, this is also true for overhead
- Track access charges per train-kilometre are highest in GB; only one comparator is on a similar level, the others charge significantly less
- GB's largest problem in competitiveness results from rolling stock costs being 20-50% higher than abroad; a brief analysis of three ROSCOs' annual economic performance shows significant margins

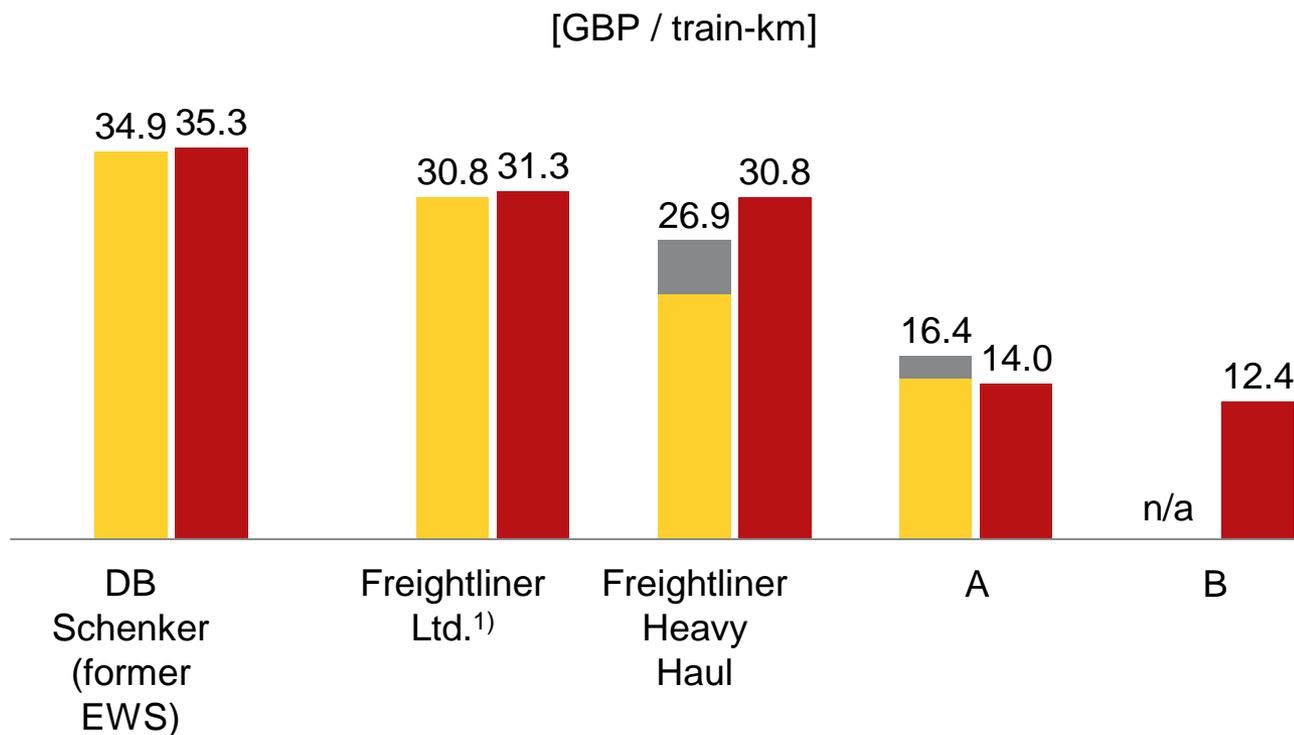
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Freight train operations in GB appear to be high but data from other operators is hardly available

FOCs (2008)



1) Year 2009

Track access charges
 Turnover
 Costs

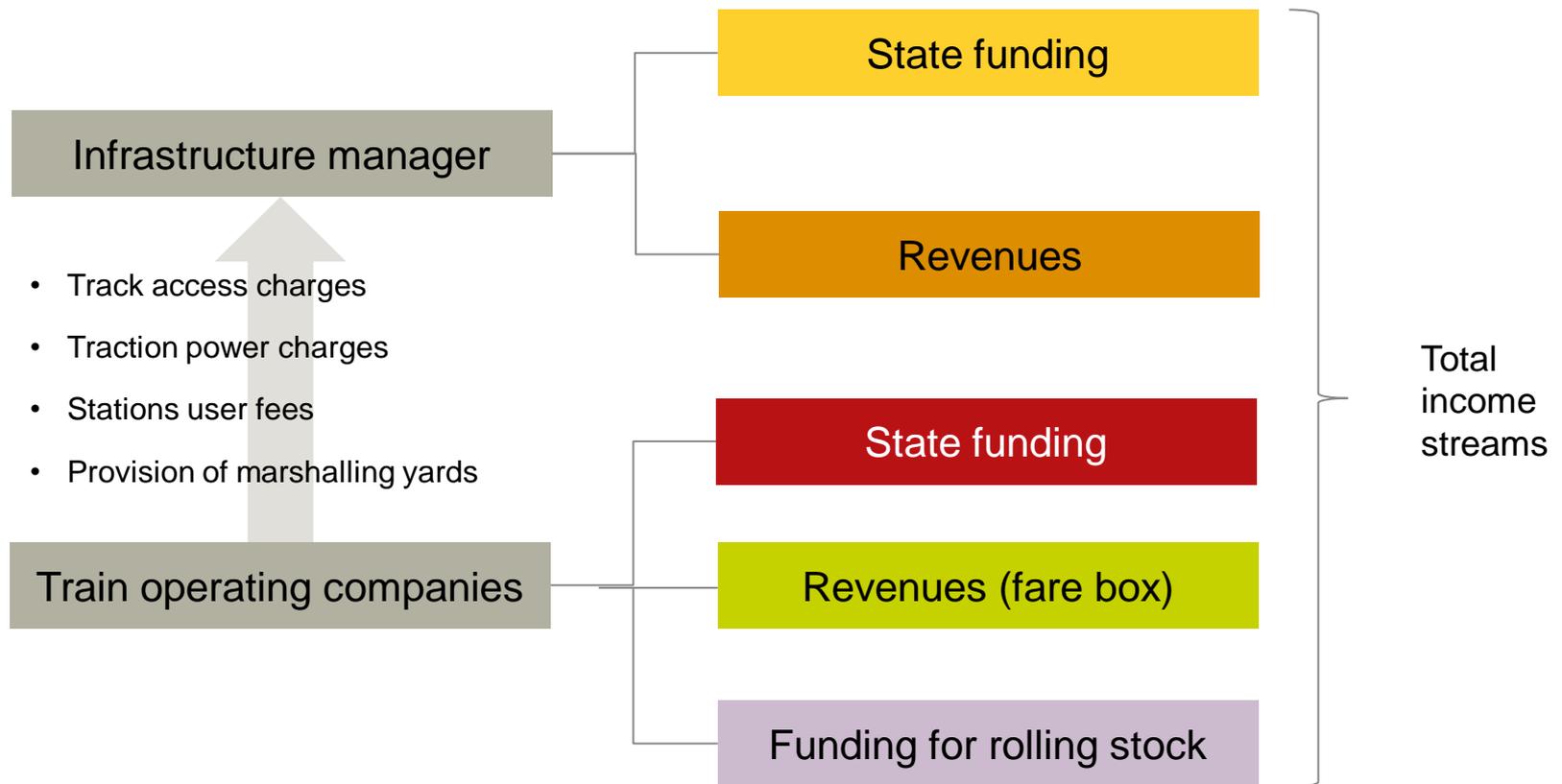
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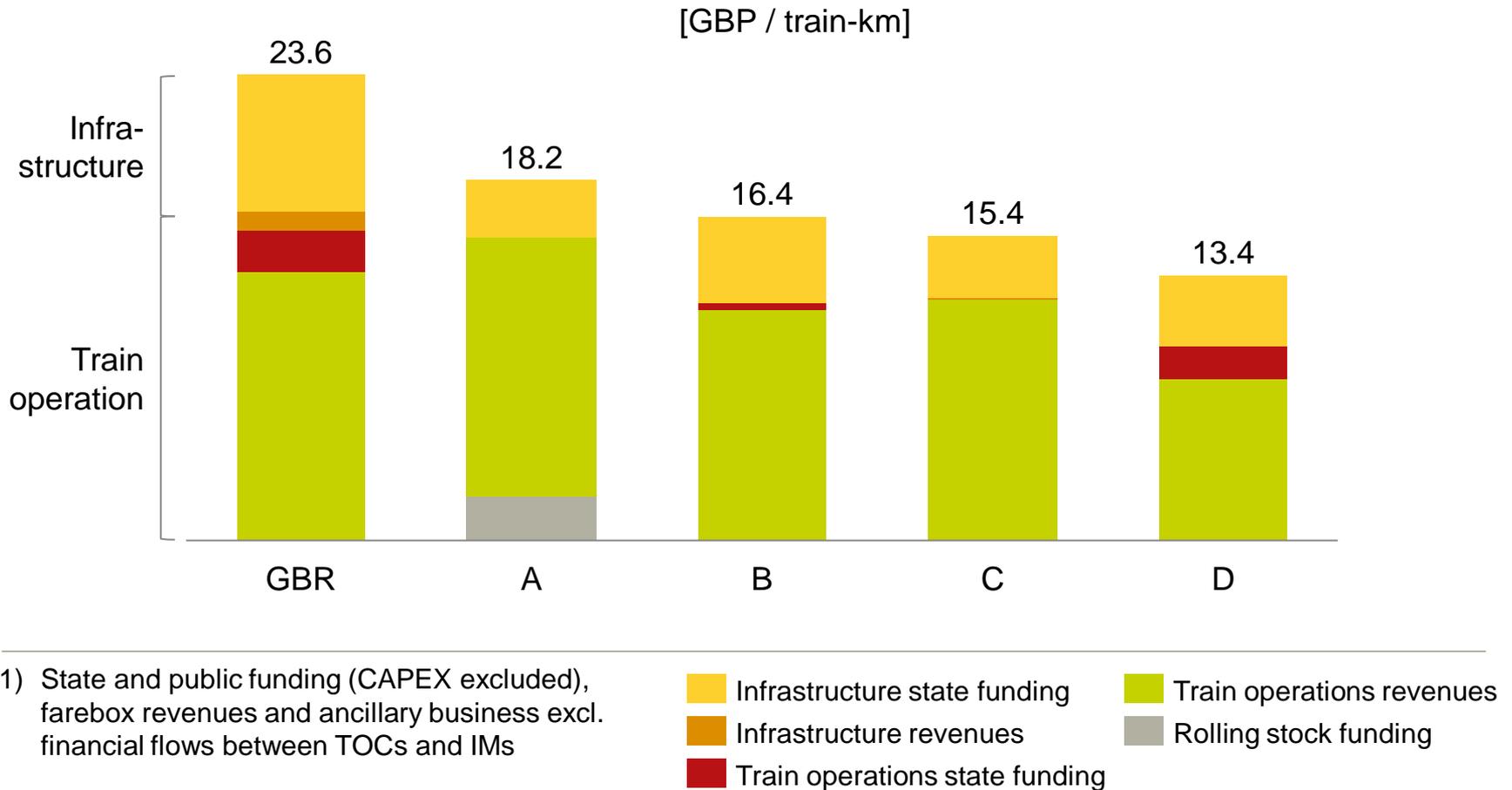
Total income streams for the railway system originate from generic revenues and state provisions

Overview



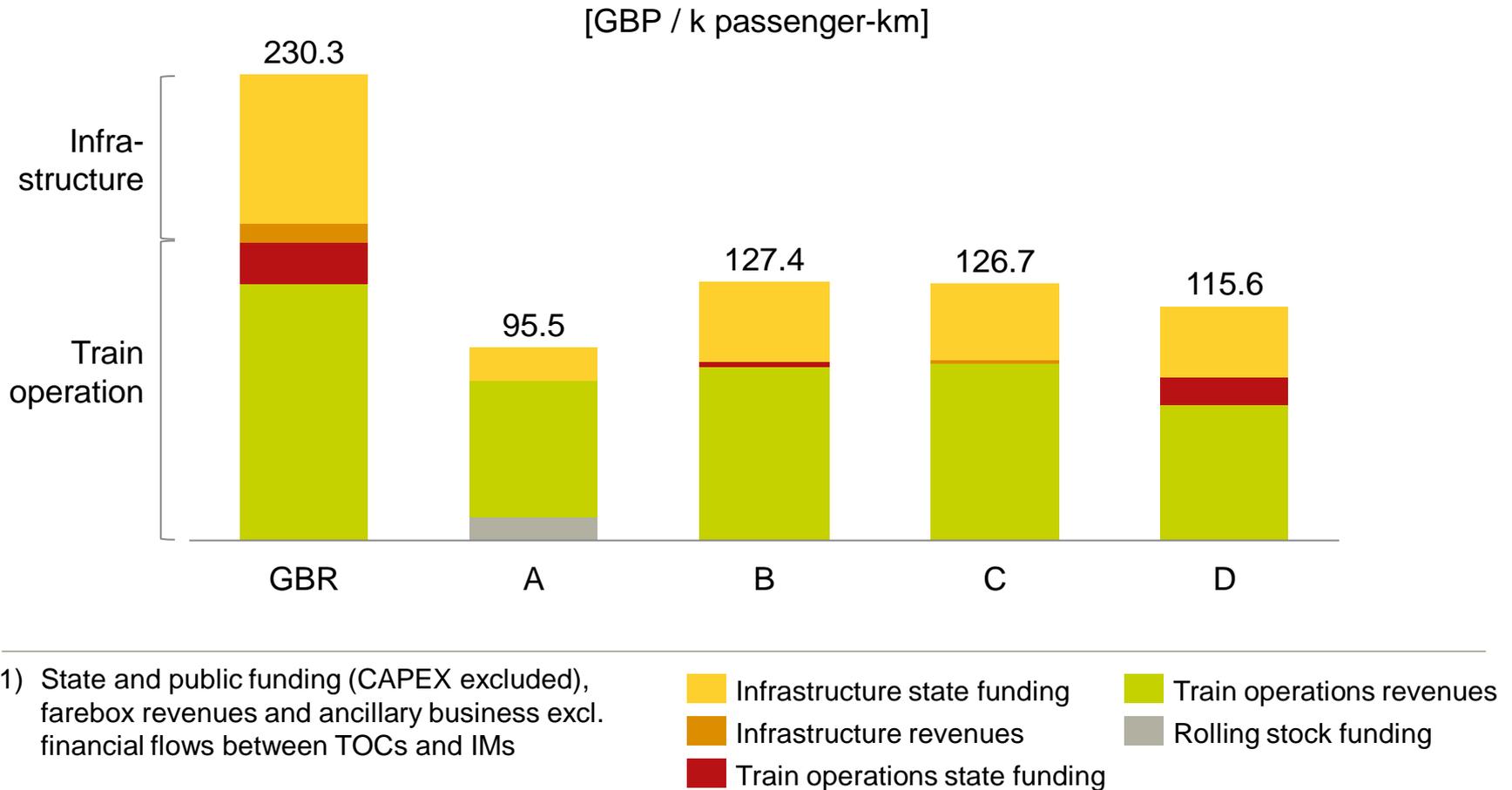
Total income for infrastructure and train operations is highest per train kilometre in GB

Total income¹⁾ streams (2009)



Total system funding per passenger kilometre is highest in GB

Total income¹⁾ streams (2009)

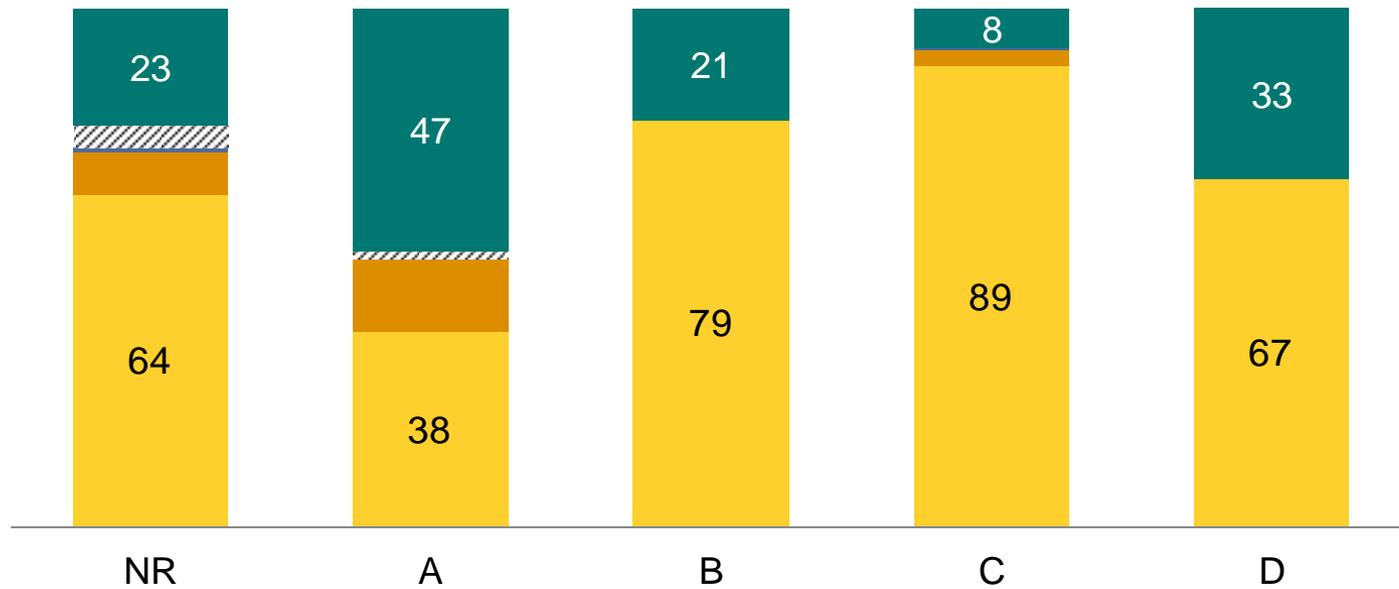


In most countries infrastructure is dominantly financed through state funding

Share of total revenues incl. state and public funding (2009)

INFRASTRUCTURE

[%]



Track access charges

Other revenues

Traction power

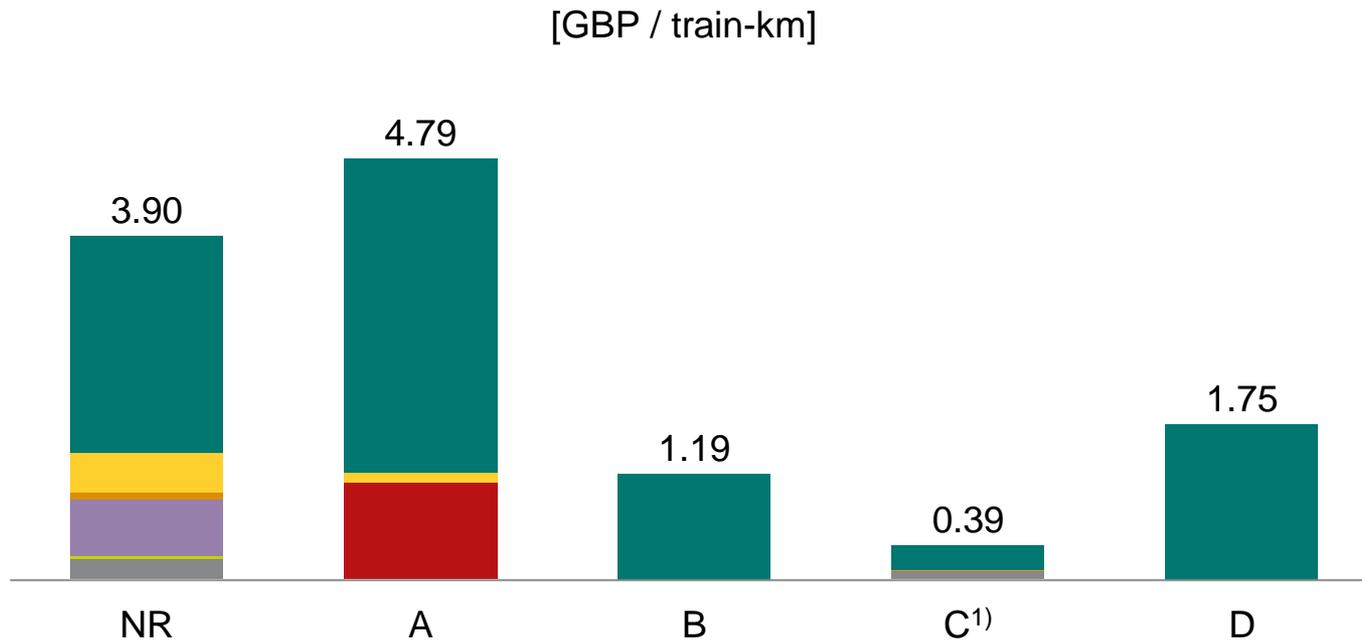
State funding

Fees for providing marshalling areas

In GB both track access charges per train-km and revenues from other sources are comparatively high

Total infrastructure revenues (2009)

INFRASTRUCTURE



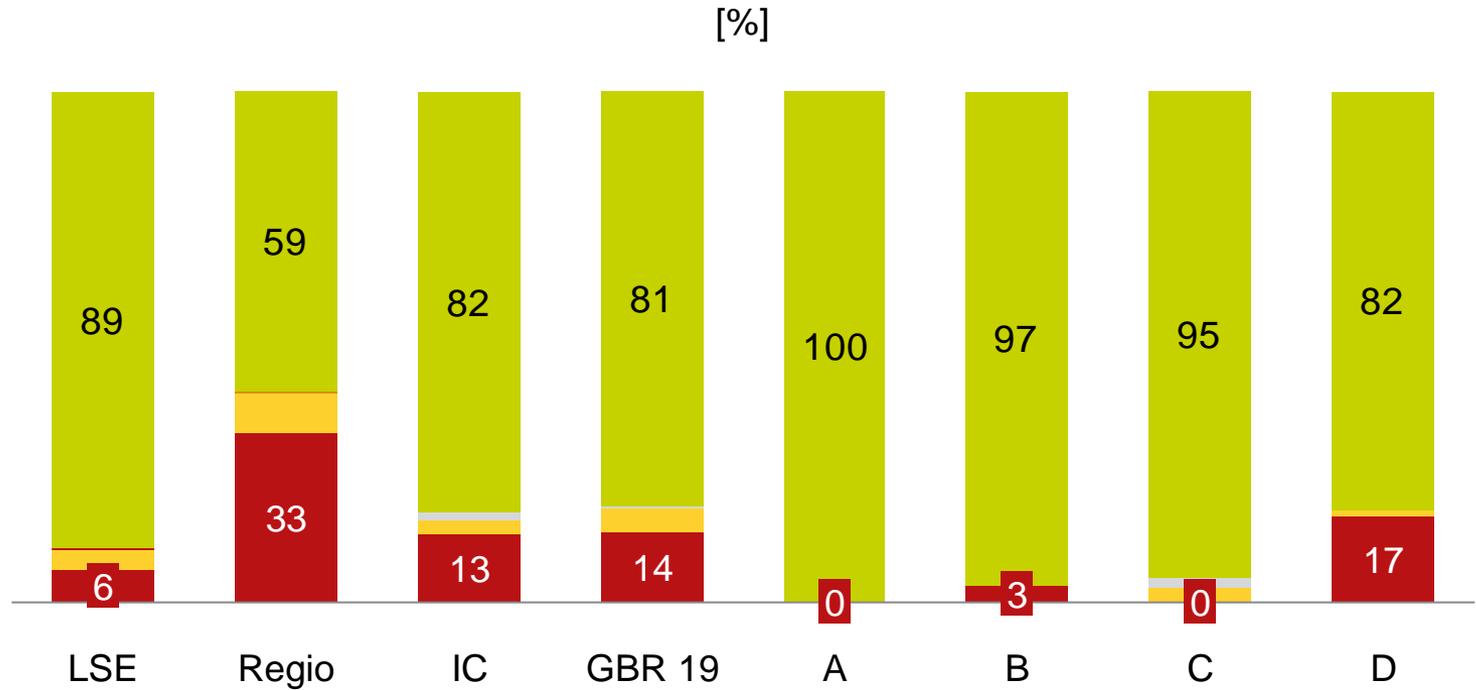
1) Excluding traction power supply

- Track access
- Charges for traction power
- Stations user fee
- Fees for providing marhalling areas
- Rental of stations and buildings
- Advertising in stations and buildings
- Other revenues

GB is the only country in the sample where train operating companies' income includes a large share of state funding

Share of total revenues incl. state and public funding (2009)

TRAIN OPERATIONS

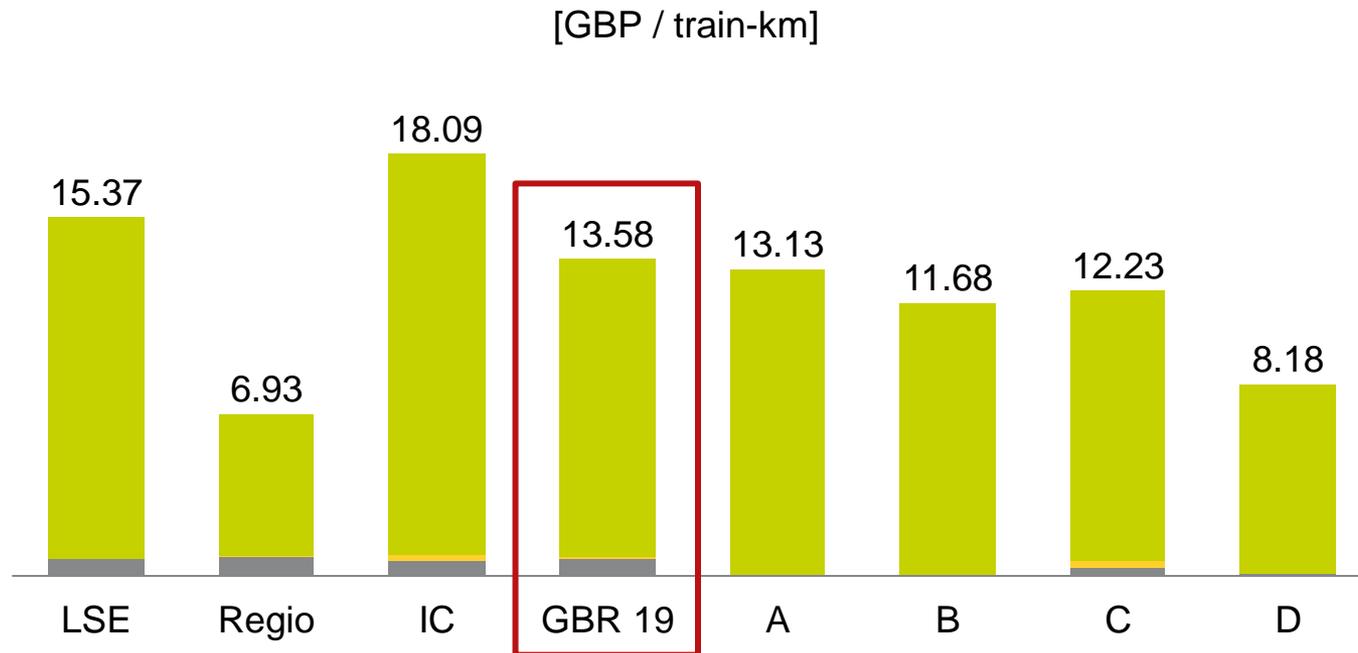


- Farebox revenues
- Other revenues
- Advertising and merchandising
- State and public funding
- Food & beverages

Regular passenger revenues per train kilometre are highest in the UK

Regular passenger revenues (2009)

TRAIN OPERATIONS



1) Other revenues in GB include revenue commissions which are paid by other TOCs for selling their tickets

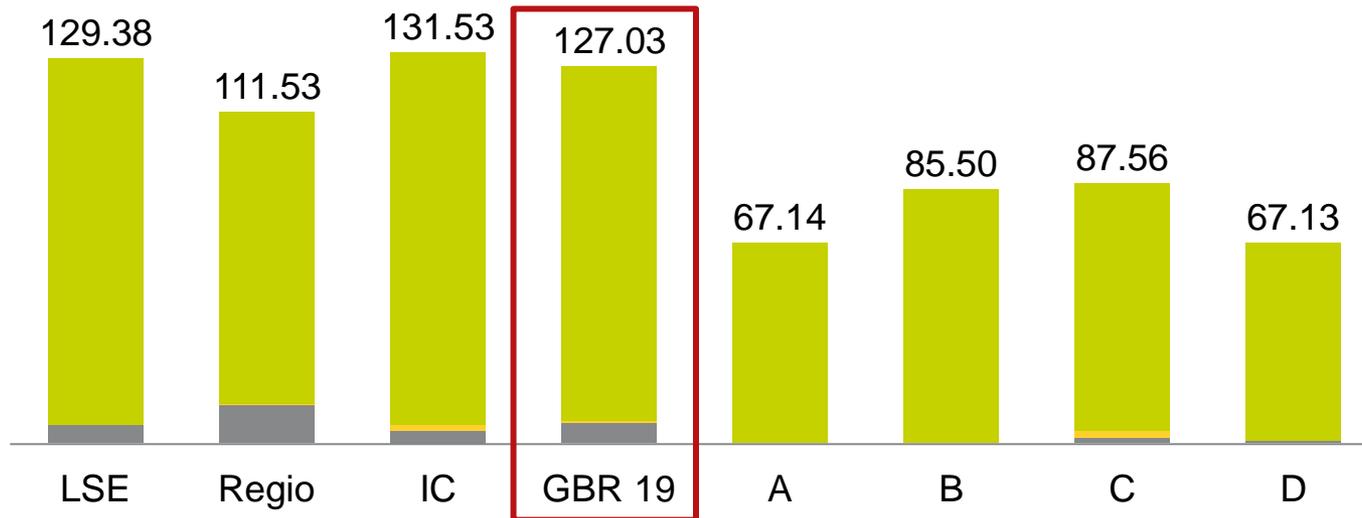
■ Farebox revenues ■ Other revenues¹⁾
■ Food & beverages

The fare levels per passenger-kilometre stand out in GB

Regular passenger revenues (2009)

TRAIN OPERATIONS

[GBP / k passenger-km]



1) Other revenues in GB include revenue commissions which are paid by other TOCs for selling their tickets

■ Farebox revenues ■ Other revenues¹⁾
■ Food & beverages

GB's railway system receives higher income streams per passenger and train kilometre than other comparators

Conclusions

- In GB funding and revenue per train-kilometre including infrastructure, train operations and rolling stock is highest in sample
- Due to GB's comparatively lower utilisation of trains the funding level per passenger-kilometre is even much higher compared to other countries
- Regarding infrastructure most countries including GB finance the majority of their expenditures through state and public funding; one country generates an exceptionally high share of track access charges
- GB also generates higher infrastructure revenues per train-kilometre than other countries; they are mainly driven by rental of stations and buildings
- In contrast to other countries GB finances train operators more extensively through state and public funding
- This practice corresponds to the fact that operators pay higher track access charges per train-kilometre than elsewhere
- Regular passenger revenues per train-kilometre (fare box) are higher than in other countries; lower train utilisation leads to more significant disadvantages when relating these revenues to passenger-kilometres

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8. Market analysis Germany

8.1. Market structure, supply and demand

8.2. Development of costs

8.3. Development of quality

8.4. Case studies

8.5. Conclusions

Exchange rate applied in this chapter: ECB 3rd of December 1 EUR= 0.848 GBP

<http://www.ecb.int/stats/exchange/eurofxref/html/eurofxref-graph-gbp.en.html>

The German regional rail services market is still characterised by a co-existence of direct awarding and tendering

Market characteristics regional services Germany¹⁾

- **From the view of the operators** the passenger rail services market in Germany is characterised by a **parallelism of**
 - non-subsidized **long-distance services**, with, despite free market access, still a 99% market share at national rail operator Deutsche Bahn AG - DB) **and**
 - regional and short-distance subsidized services (so called **regional services**), with co-existence of direct awarding and competitive tendering
 - Until the end of 2009, approximately 32% of the annual volume of 630 million train kilometres p.a. (m tkm) was put out to public tender
- **Subsidies** were thereby **reduced by an average of 26% per train kilometre (tkm)**, enabling authorities a.o. to increase train kilometres offered to passengers by 31% since the market-reform in the mid-1990s
- DBs' market share decreased to 80%, but their volume in train kilometres increased

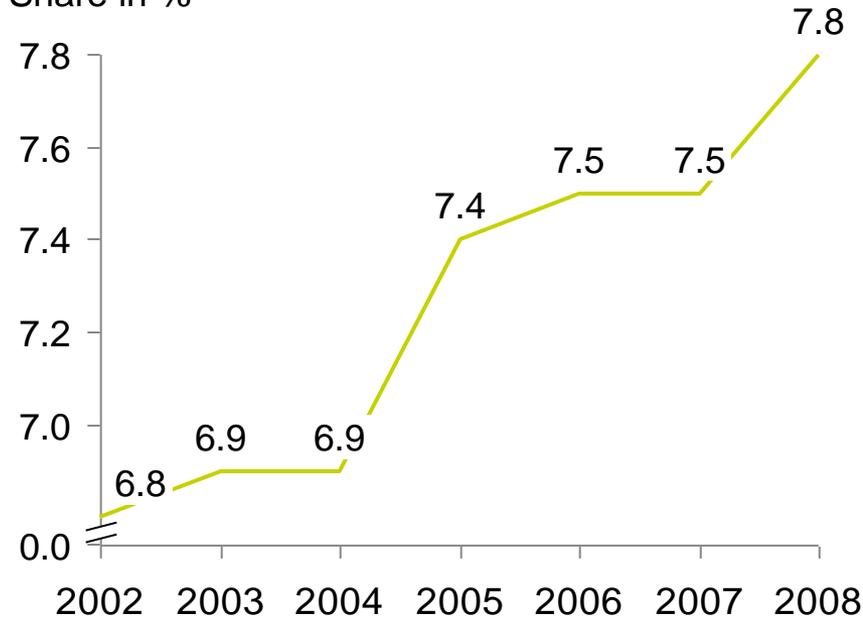
1) Source: Beck, A. (2010), DB (2010), KCW (2009, p. 34) and own research.

Until the financial crisis in 2009 rail services increased their market share, a.o. due to a higher quality of regional services

Market share of rail in passenger transport sector

Rail market share based on passenger km p.a.¹⁾

Share in %



Explanation

- Rail services (long-distance and regional services) increased their market share
- Reasons discussed²⁾
 - Increased level of regional services, e.g. frequency, quality ... (main reason)
 - New high-speed lines
 - Gasoline price increases
- Allianz pro Schiene (2010) confirms in a study of 15 cases increases in passenger figures of 48% to 3790% due to increased service levels
- Note: a significant share of enhancement of supply was re-funded by reduced subsidies due to tendering

1 Source: Allianz pro Schiene (2009, p. 13). In 2009 a slight decrease occurred due to financial crisis (see DB (2010, p. 19)

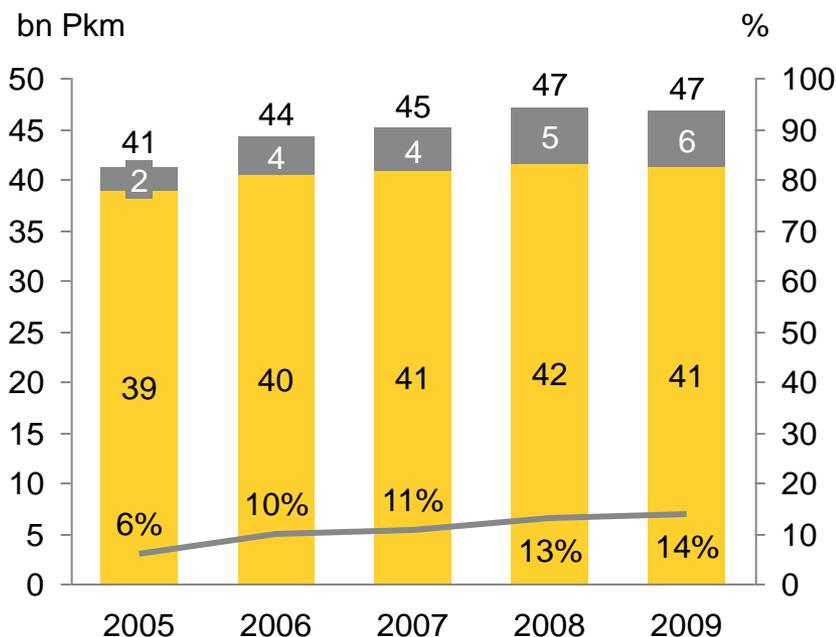
2 Discussed e.g. by BAG SPNV (2010, p. 27) and Lalive and Schmutzler (2008)

3 More details on the development of quality will be described in the next subchapter)

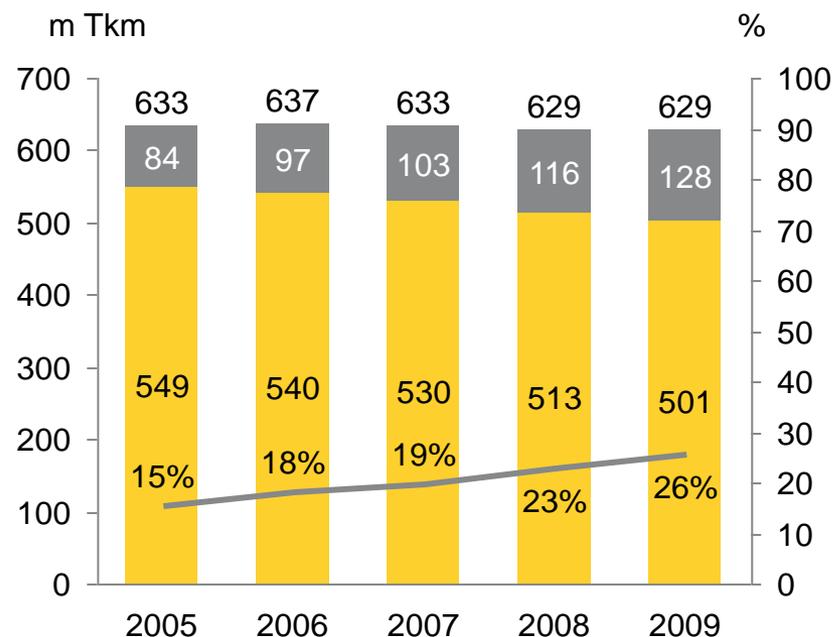
Based on DB figures competitors are primarily operating services with a limited volume of passengers

Market development of regional services¹⁾

Development of passenger km p.a. (Pkm)²⁾

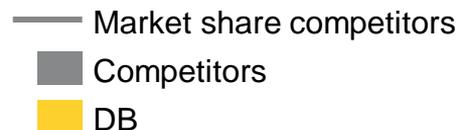


Development of train km p.a. (Tkm)



1 Source: DB (2010, pp. 19/20)

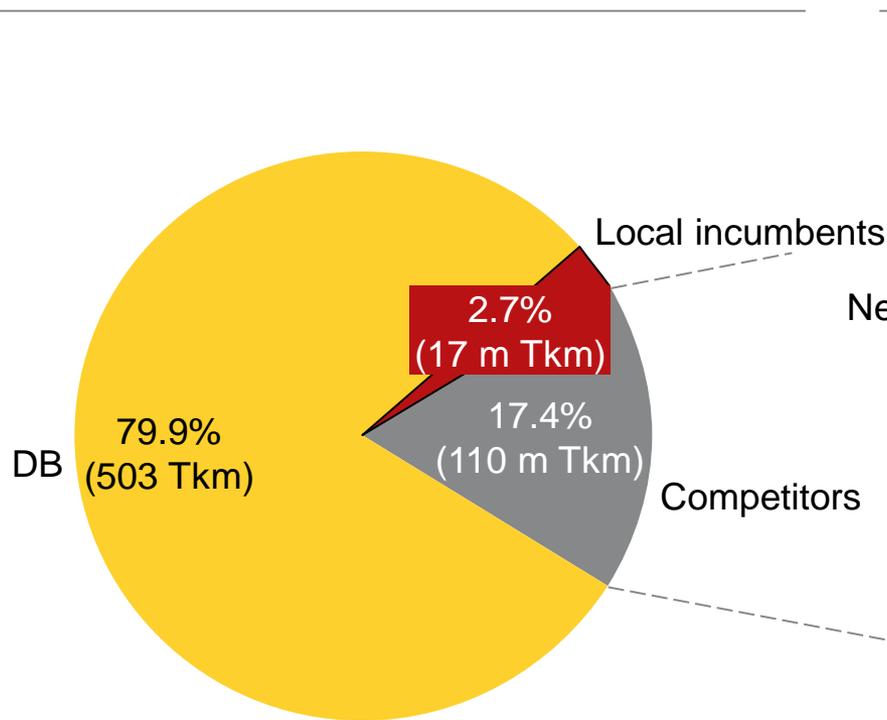
2 Note: According to BMVBS (2010, pp. 220-221) passenger-km p.a. were 36.1 bn in 1996. The 30% increase until 2009 is thus seen as a clear success story of regionalisation of subsidised passenger rail services



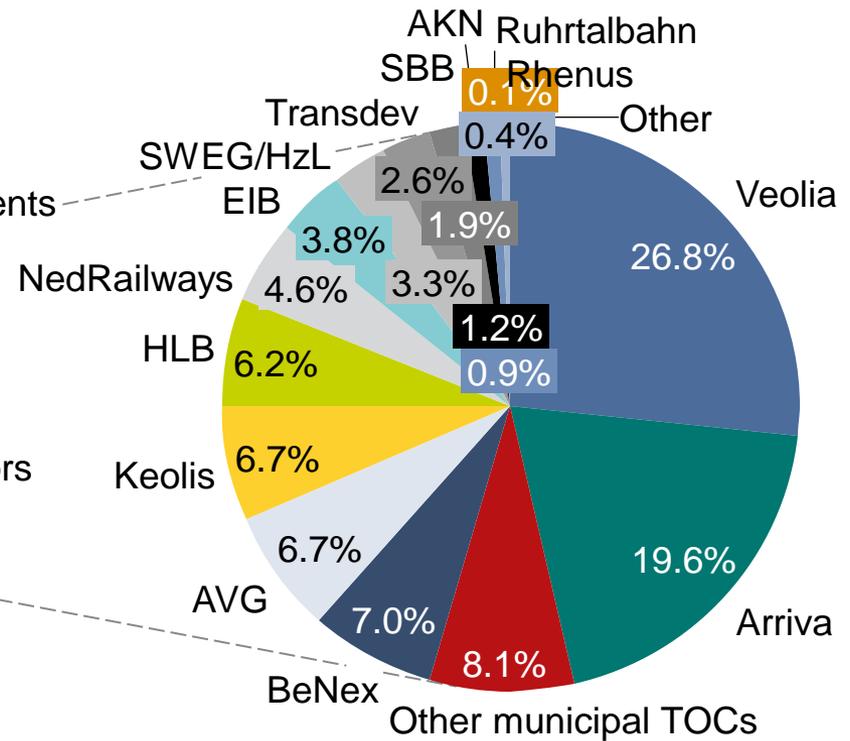
Despite a 14 year history of tendering a strong impact of national, state owned and municipal operators still remains

Distribution of market shares in 2009¹⁾

Market share of DB and competitors



Distribution of competitors



1) Source: KCW (2009, pp. 28/29), based on ~630 m tkm. Expected market share of competitors in 2011: 22.3%
 Note: Market share of DB includes contracts directly awarded and contracts won in tender. Local incumbents are operators where awarding is due to historical relationship (no tendering to be expected)

8. Market analysis Germany

8.1. Market structure, supply and demand

8.2. Development of costs

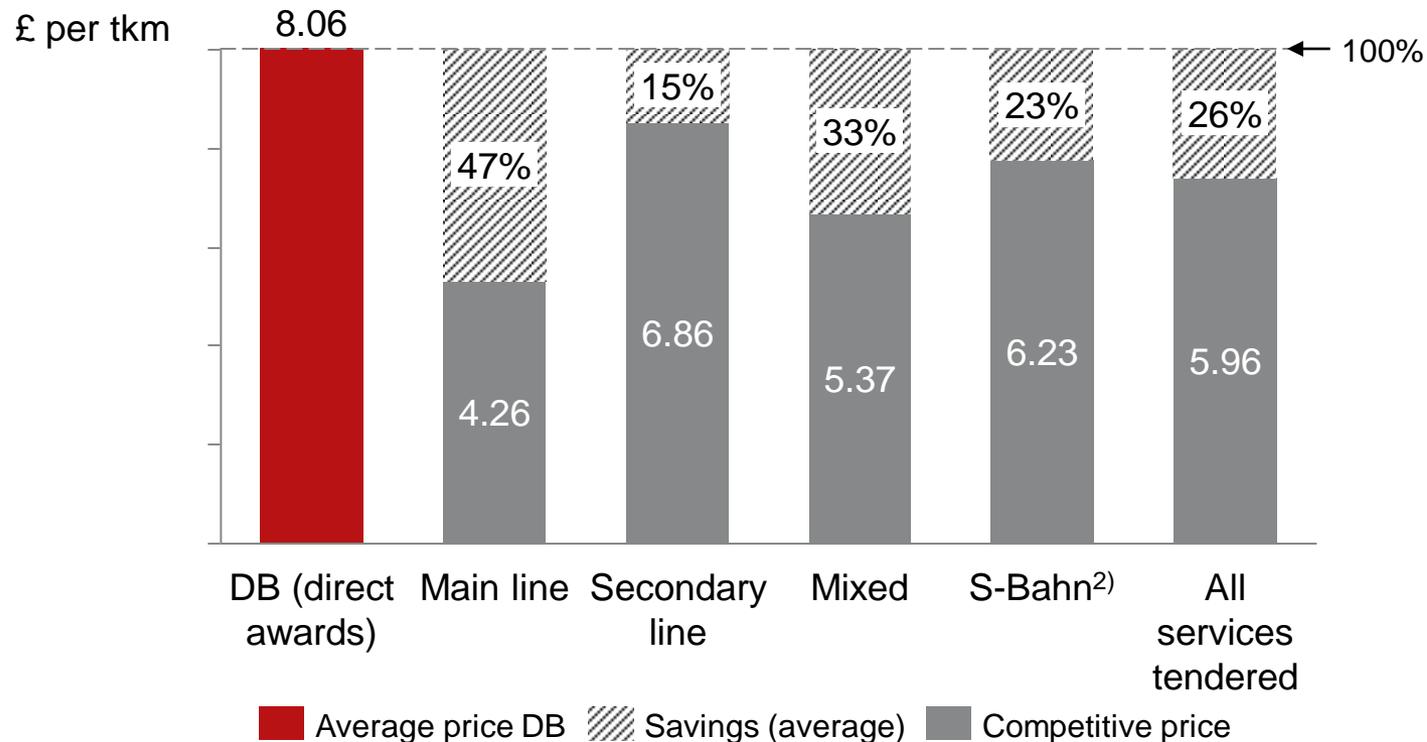
8.3. Development of quality

8.4. Case studies

8.5. Conclusions

On average PTAs realised savings between 15% and 47%, depending on the type of service

Savings realised by PTAs according to type of service¹⁾



1) Source: KCW (2009, p. 28/29). Note: The authors calculated savings for the period 2002 to 2024 based on inflation of 1.5%, so competitive prices are only an indication

2) S-Bahn: suburban networks serving metropolitan areas in high frequency

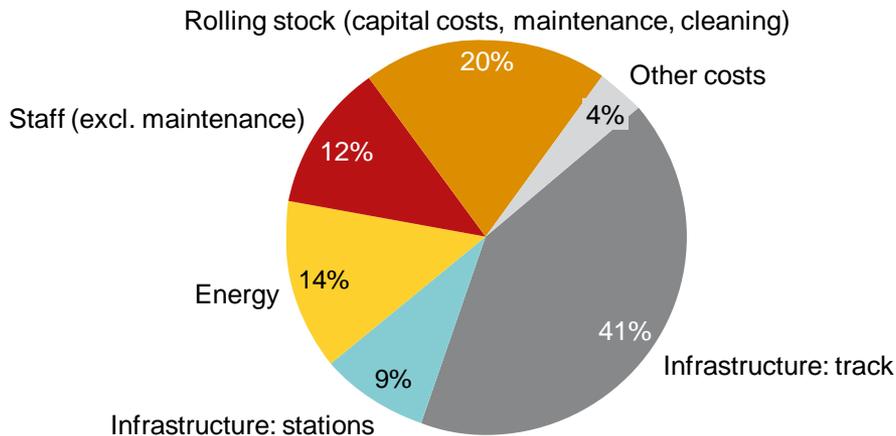
Note: So far no major gross-cost/net subsidy increase (after adjustment of inflation) has been announced for regional services in Germany

In Germany half of the procurement budgets for train services cover access charges

Average distribution of costs of production (1 of 4)¹⁾

General assessment according to BAG SPNV (2010)¹⁾

Additional explanations



- The figures presented here may only enable a general impression on the distribution of costs of regional services in Germany as they show average shares of operating costs per train kilometre
- Like in other countries the height of costs for operating a specific network in reality depends on the service characteristics
- Note that price increases of energy, staff and infrastructure are usually taken over by PTAs in Germany, why related risk margins are limited

¹⁾ All values presented in this subchapter are mean values based on experiences of PTAs (source: BAG SPNV (2010, pp. 11/12)), verified by expert interviews with TOCs
Note: BAG SPNV is the national association of rail tendering authorities. Note also: Main provider of infrastructure in Germany: DB

There is a strong variation in costs per function

Average distribution of costs of production (2 of 4)¹⁾

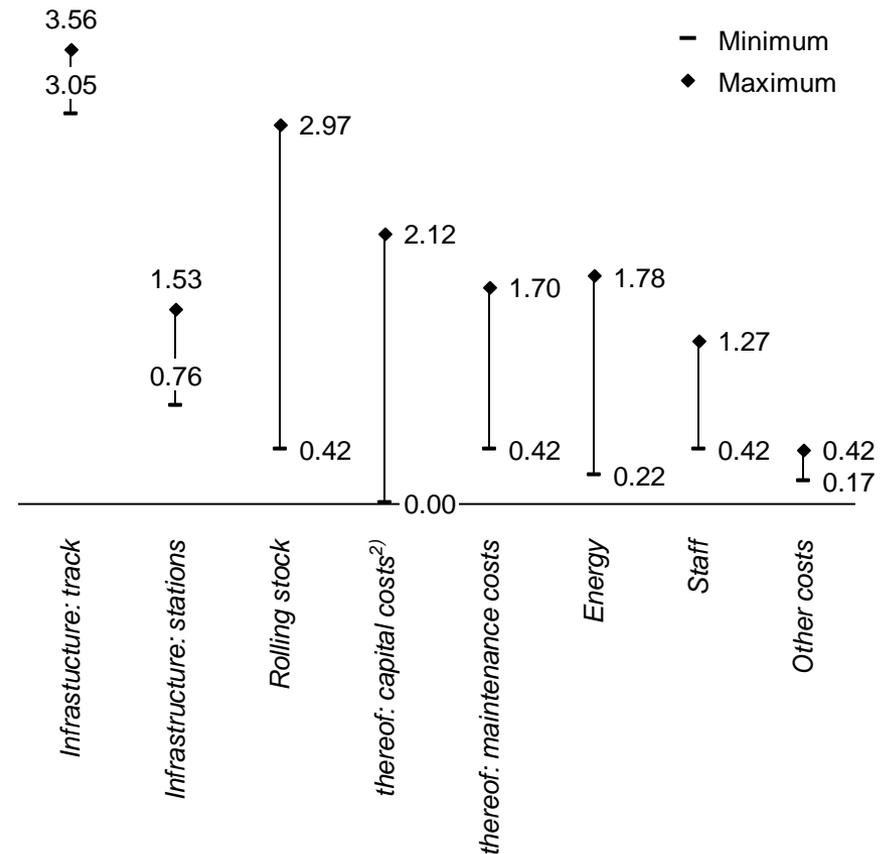
Note on infrastructure costs

- Track access charges and user fees for stations show high variation depending on the classification of track (e.g. electrified main line vs. non-electrified secondary line) and stations (e.g. central station vs. flag stop)
- Note: DBs price system for stations will have to be changed due to a notification of the German network authority as of December 10, 2009 who claimed this system to be discriminatory
- Price increase expected by BAG SPNV for upcoming years: 2% to 3% p.a.

1 Source: BAG SPNV (2010, pp. 11-19) and assessments by experts (operators) interviewed. Note: Costs for Infrastructure and Energy are solely based on assessments by experts

2 On some lines operators are allowed to use depreciated vehicles

Spread of operating costs in £ per tkm



BAG SPNV, the association of rail tendering authorities, stresses that there is a significant variation in costs

Average distribution of costs of production (3 of 4)¹⁾

Variation and expected increase of main cost drivers

- **Rolling stock:**

- Share varies between 15% to 25% (0.42 £ to 2.97 £ per train kilometre – tkm), depending on
 - Type and age of vehicles required (capital costs for depreciated vehicles: ~0 £ /tkm, capital costs for new cars: ~2.12 £/tkm)
 - Recovery periods used (which vary between 15 to 30 years, depending on kind of vehicle, risk aversion of the owner and kind of operations)
 - Volume operated by vehicle (costs for vehicle used only during peak hours: > 2,54 £ per tkm)
 - Height of maintenance costs, which varies between 0.42 £ to 1,70 £ per tkm, depending on kind and age of vehicle as well as capital costs, size and efficiency of the workshop
- Price increase expected by BAG SPNV for upcoming years : 3% p.a.

- **Energy:**

- Share varies between 8% and 15% of total costs (0.22 £ /tkm to 1,78 £ /tkm for electricity and 0.42 £/tkm to 1.27 £/tkm for diesel), depending on the mode of traction (electrified or diesel), the kind of services (and thus the kind of vehicles) and the topography
- Price increase expected by BAG SPNV for upcoming years : 4% p.a.

1 Source: BAG SPNV (2010, pp. 11-19)

Variation of costs is not only depending on the type of service, but also on the market power of the incumbent

Average distribution of costs of production (4 of 4)

Variation of further costs & revenues¹⁾

- **Staff costs** presented by BAG SPNV are only costs for ticket collectors and for engine-drivers
 - Costs vary between 0.42 £ and 1.27 £ per tkm, primarily depending on the proportion of train guards required (minimum proportion with respect to fare dodgers discussed in Germany: 10%)
 - Price increase expected by BAG SPNV for upcoming years : 2.5% p.a.,
- **Other costs**
 - Are primarily costs for sales and distribution
 - Share is usually below 5% and varies between 0.17 £ 0.42 £ per tkm, depending on the kind of service, number of vending machines permitted and the fare system applied
 - Price increase expected by BAG SPNV for upcoming years : 2% p.a.
 - Furthermore other costs also entail administration costs (overhead), insurances, profit, ...
- **Fare revenue varies** (usually 1.27 £/tkm to 2.54 £/tkm)

Cost advantages of incumbent operator²⁾

Its market power provides DB with several advantages for its own business, what also influences cost variations

- Sales provision for ticket distribution differs
 - Provision paid by DB to competitors: 5-8% of fare sales
 - Provision to be paid by competitors to DB: 10-18% of fare sales (rationale: DB operates the clearing-house)
 - Purchasing power of DB, e.g. double stack wagon
 - DB price at Bombardier: ~1.02 m £ per vehicle
 - Price for competitors: ~1.19 m £ per vehicle
 - Funding conditions: Public operators like DB (and other public TOCs) benefit from low capital costs
- Note: even return on sales in 2008 shows a difference
- DB Regio AG: 11.2% (plus overhead costs of a ~8.1% share of turnover)
 - Competitors: < 5.0%

1) Source: BAG-SPNV (2010, pp. 19-21)

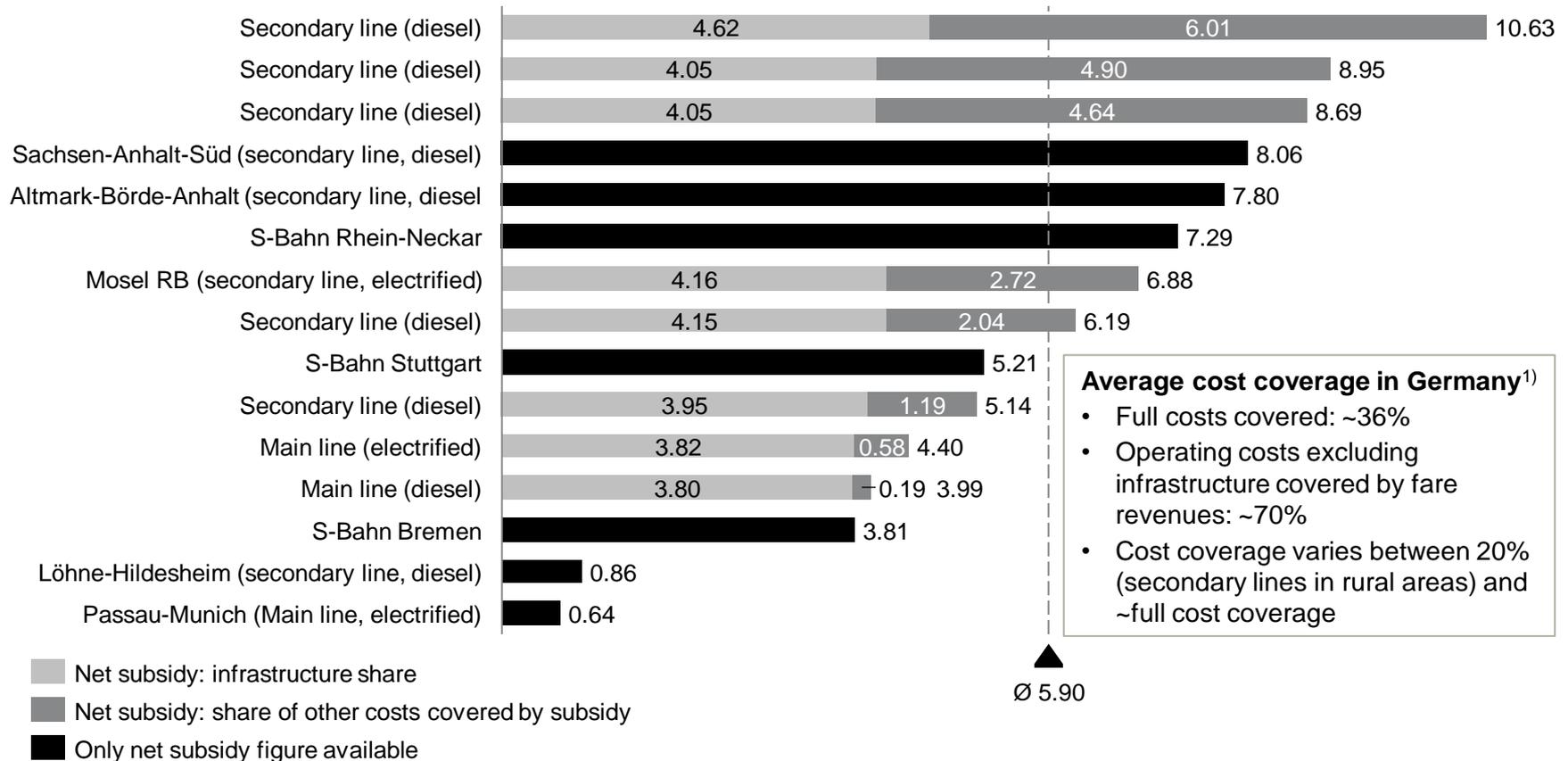
2) Source: KCW (2009, pp. 44/45, 59 and 62)

Note: A recent agreement between BAG SPNV and DB is that for using DBs generic product categories (e.g. „S-Bahn“) PTAs will pay 0.004 € per tkm (Source: RoterRenner 2010-107)

The results of tendering procedures also show a high variation, why general statements on prices are difficult

Variation of net subsidies per tender

Net subsidy payment in £ per train kilometre (in 2010 prices)¹⁾



¹⁾ Including indicative figures. Price adjustment applied: 1.5% p.a.

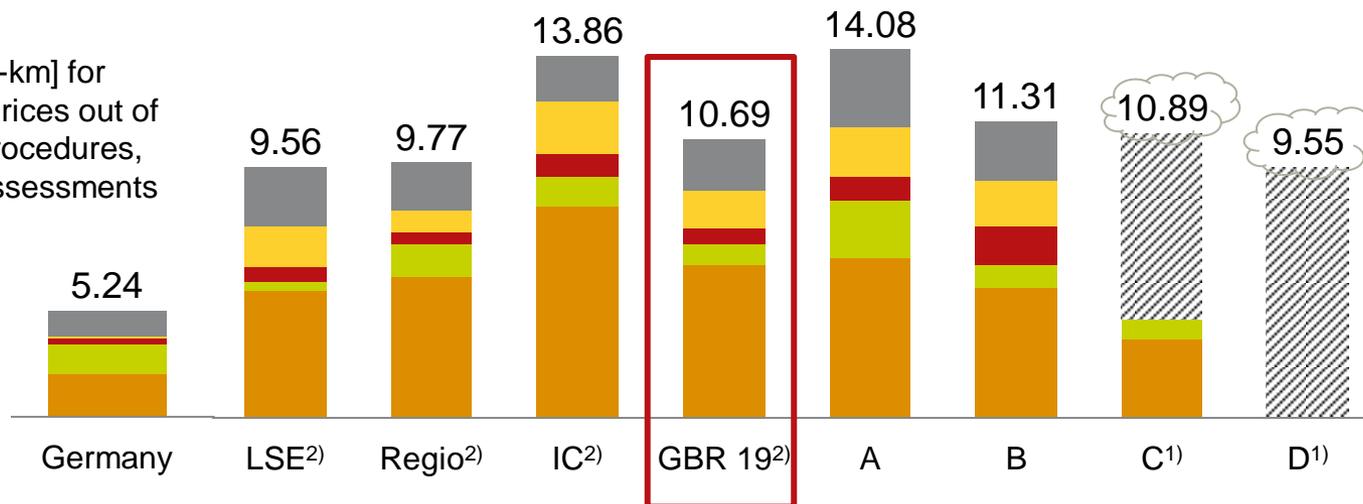
Source of data: Geyer (2008), own research, KCW (2009, p.46) and Beck and Kühl (2007, p. 782)

Germany's tendering partially led to significantly lower prices

Total train operation costs (2009, excluding track access, non normalised)

[GBP / train-km]

[GBP / train-km] for Germany: Prices out of tendering procedures, based on assessments by experts



- 1) Cost distribution of shaded block not known
- 2) Operation management costs here contains a portion of rolling stock maintenance staff costs

- Train staff
- Rolling stock
- Operation and customer management
- Overhead
- Energy and user fees

The specific framework conditions need to be considered when comparing German train operation costs

Remarks on Germany's cost position

- In Germany mainly secondary lines have been tendered so far; they require comparatively lower standards in terms of rolling stock and cause lower infrastructure costs
- Lower rolling stock cost are also due to fleet that has already been written off
- The 5.24 GBP per train-kilometre is an assessment of average cost; the bandwidth for regional trains and secondary lines ranges between 17 and 6 GBP (including track access charges)
- Costs are not normalised considering travel speeds, stops and annual running performance

8. Market analysis Germany

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8.5. Conclusions

Tendering hasn't improved infrastructure quality directly, but it raised quality levels of vehicles and services

Effects of tendering on quality

Tracks & stations: No direct influence

- No direct influence since **infrastructure** is primarily **operated by incumbent DB** (usually **no tender** on operating infrastructure) and service operators are only able to contract DB
- Several reports claim that (re-) investment and **maintenance activities of DB diminished** in recent years due to increased goals on profit¹⁾
- Although providing infrastructure is a main task of DB (and the federal level), several regional **PTAs have co-funded investments to improve quality of infrastructure** in recent years²⁾
- Some states have even **reopened stations and lines** already closed before market reform (for example Schleswig-Holstein: 23 stations new or reopened and two lines reopened)

Vehicles and services: direct influence

- **Tendering conditions** usually foresee **new vehicles** and, compared to the incumbent DB, **improved levels of service quality** (punctuality, quote of train guards, air conditioning, cars accessible for disabled ...)
- Since market reform **supply**, measured in train kilometres p.a., has **increased by ~31%**. A major part has been refunded by efficiency gains from introducing competitive tendering
- Furthermore, several operators introduced further quality improvements on their own, especially in case of net-cost contracts
- Such quality improvements will be described in more detail in a case study analysis in the next subchapter

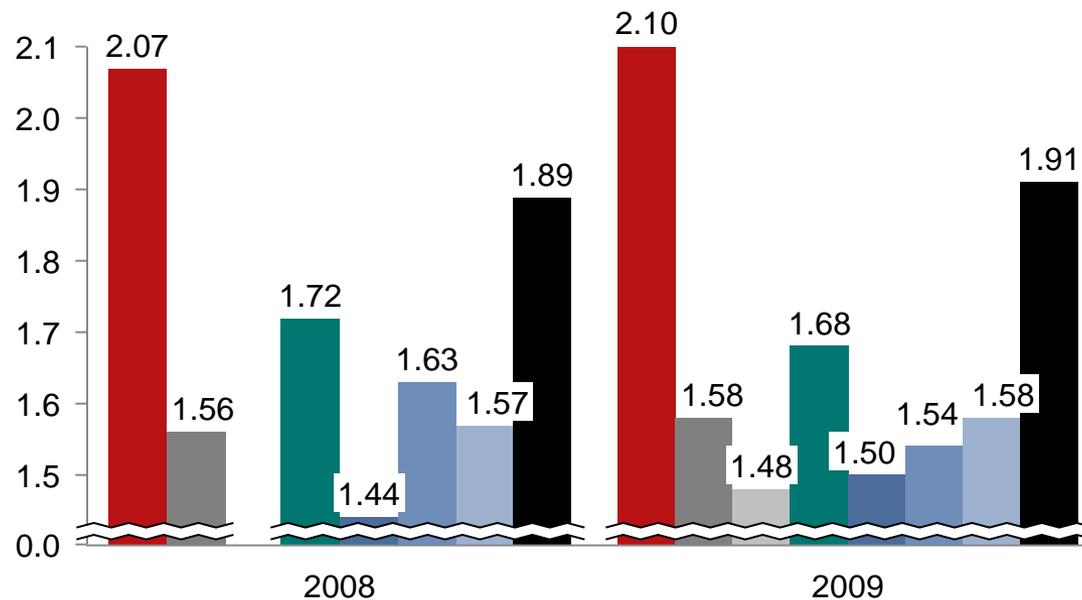
1 Source: BAG-SPNV (2009 and 2006) and Netzwerk Privatbahnen (2006)

2 Source: SCI Verkehr (2006)

In Berlin-Brandenburg customer satisfaction is higher on networks tendered out to private operators than on those of DB

An example for customer marks: survey-results from Berlin-Brandenburg

Customer satisfaction measured by marks



Explanations

- Note: DB, the incumbent operator, still operates 80% of all 36 m Tkm (main and secondary-lines) in Berlin-Brandenburg region (including a small line section that has been tendered out)
- School grades used in survey:
 - Very good = 1 to
 - Defective = 6

1 Source: VBB (2009, p. 24)

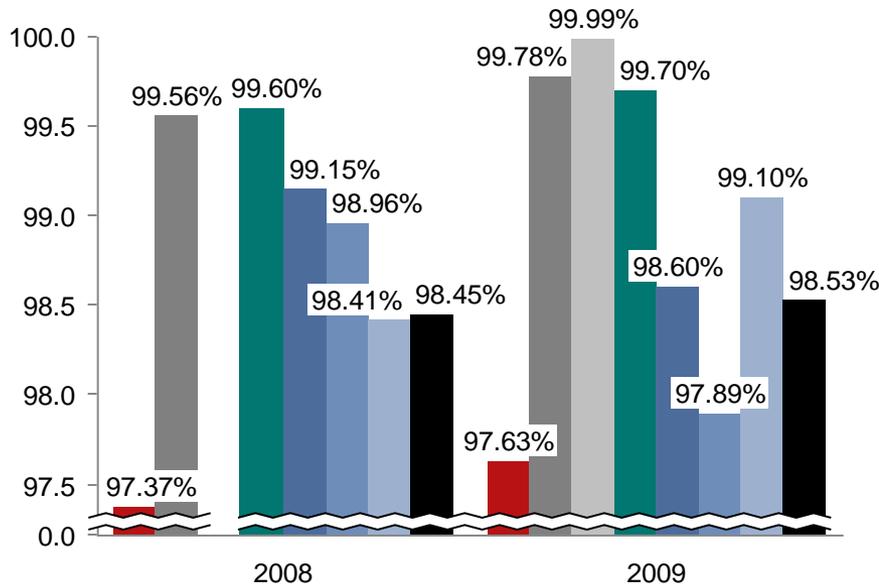
Legend: Network (and affiliated operators)



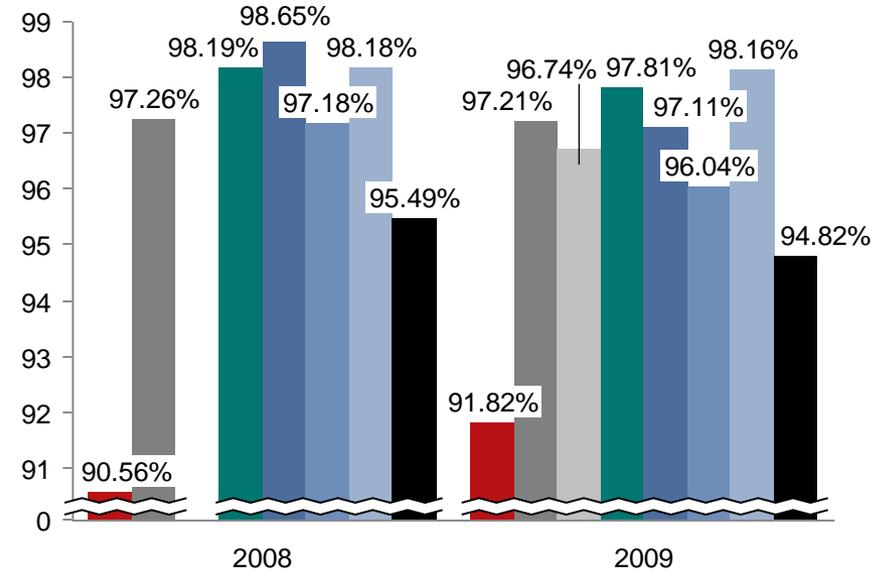
Services tendered out to private operators in Berlin-Brandenburg show higher quality levels than those of DB

An example for quality of vehicles: evaluation results from Berlin-Brandenburg

Share of damage-free vehicles



Share of clean vehicles



1 Source: VBB (2009, p. 23)

Legend: Network (and affiliated companies)

- DB Regio (DB)
- PEG (Arriva)
- OLA-MR (Veolia)
- ODEG I+II (Arriva & BeNex)
- NE 27 (Veolia)
- Average
- NE 26 (Veolia)

8. Market analysis Germany

8.1. Market structure, supply and demand

8.2. Development of costs

8.3. Development of quality

8.4. Case studies

8.5. Conclusions

The case studies will present a detailed description of the Marschbahn and the Odenwaldbahn tender

Case studies – outline of main results¹⁾

Schleswig-Holstein: Marschbahn

„Marschbahn“ tender (Hamburg – Westerland-Sylt)

- Main line operations (route length: 273 km, volume: 4.2 m tkm, start of operation: December 2005)
- Guarantee for reuse of rolling stock & **net cost contract**
- **Strong quality increases** e.g.
 - New rolling stock equipment (among others low floor access and suitable for the disabled)
 - Air-conditioning and audio system
- But: initial difficulties with teething troubles
- **Net Savings** realised by tendering authority through tender (despite strong quality increases)
 - **Approx. 11.9 m GBP per year**
 - Approx. 119 m GBP over the 10-year contract
- Net subsidies **down by 42%** to 3.71 £ per tkm, but Veolia experienced a winner's curse due to over-estimated passenger figures (**-73,4 m £ in 2006**)

Hesse: Odenwaldbahn

“Odenwaldbahn” tender (Frankfurt/Darmstadt – Odenwald-area)

- Secondary line operations (route length: 210 km, 1.84 m tkm, start of operation: December 2005)
- Rolling stock pool owned by tendering authority and **gross cost contract**
- **Strong quality increases, esp. new rolling stock**
 - Allows for **reduction of trip length up to 20 min.**
 - Low floor and suitable for the disabled
 - Air-conditioning and noise-reduction
- **Increase of demand** by approx. **20%** despite initial difficulties with infrastructure and teething troubles
- Effects of tender: **Stabilization of price**
- The operator Vias has reported a profit : 922 k £ in 2006, 53 k £ in 2007 and 350 k £ in 2008

1 Source of case studies: Beck and Kühl (2007), Beck, Kühl and Ladewig (2007), KCW (2007), Veolia Environment (2007), VGF (2008), (2007) and (2006) and own research. Note: Figures are based on 2005

8. Market analysis Germany

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Despite a significant decrease in net subsidies introducing tendering in Germany has improved quality

Main results of competitive tendering in Germany

- German regional passenger rail services experienced numerous cases where competitive tendering was introduced by PTAs since market reform in the mid-1990s
- **Subsidies** were thereby **reduced by an average of 26% per train kilometre**, enabling authorities a.o. to increase train kilometres p.a. offered to passengers by 31% since market-reform in the mid-1990s
- Despite a strong increase in efficiency tendering conditions usually require a **significant quality improvement** (e.g. new vehicles, increased requirements on punctuality, higher service levels), what has supported an **increase in passenger kilometres p.a. by around 14%** since the mid-1990s
- **DBs' market share** in train kilometres p.a. decreased to **80%**, but their volume in real terms increased
- Main competitors of DB are Veolia and Arriva
- Usually **half of the share of costs is determined by access charges for tracks and stations**, while rolling stock shows a ~20% share, energy a ~14% share and staff a ~12% share
- Case studies analysed show a strong variation of net payments by state authorities to operators, with an **average net subsidy level of 5.90 £ per train kilometre**, and a spread of 0.64 £ to 10.63 £ per train kilometre

1) Source: Beck, A. (2010), DB (2010), KCW (2009, p. 34) and own research

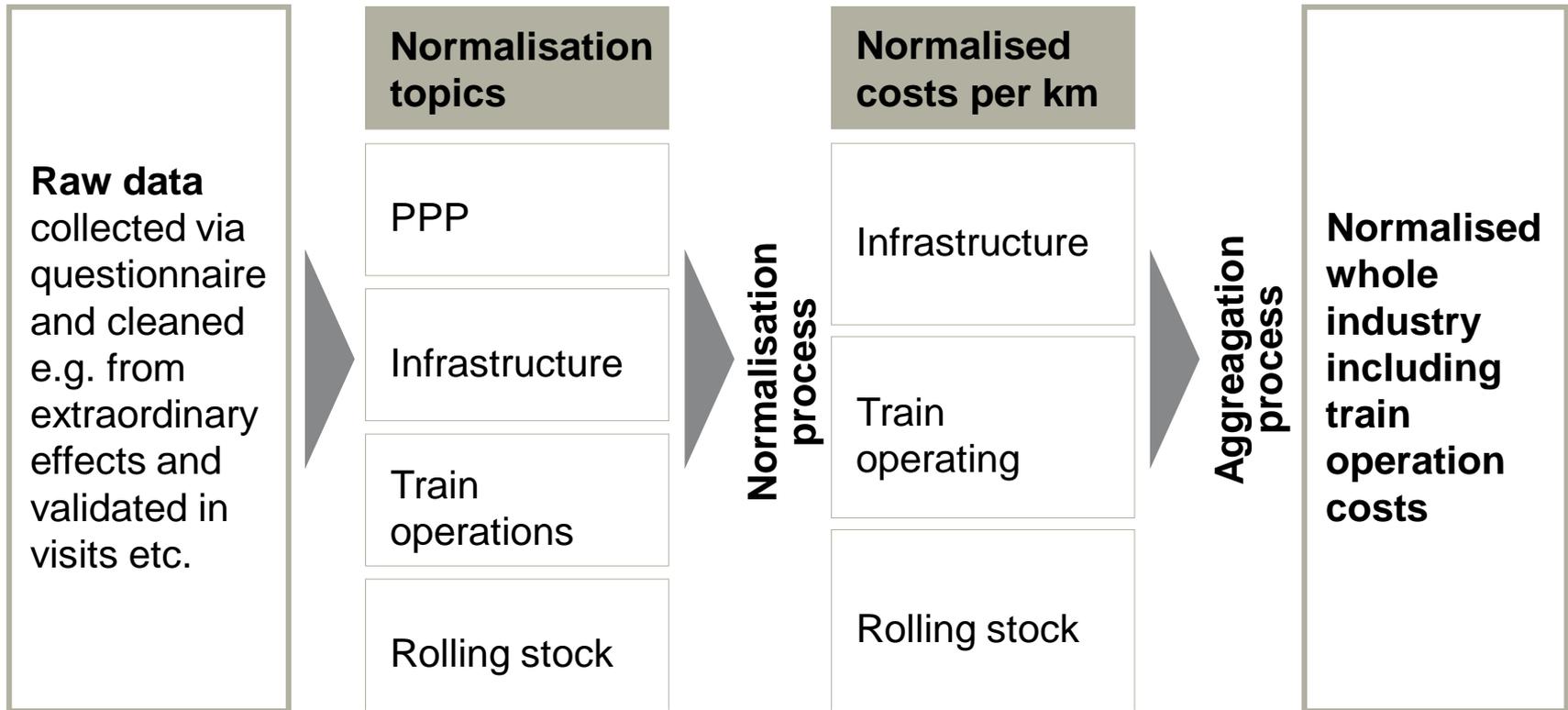
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To compare costs a well proven normalisation process including an aggregation to cover whole industry costs will be applied

Overview on normalisation process



Some of the possible key normalisation factors are indicated in the graph

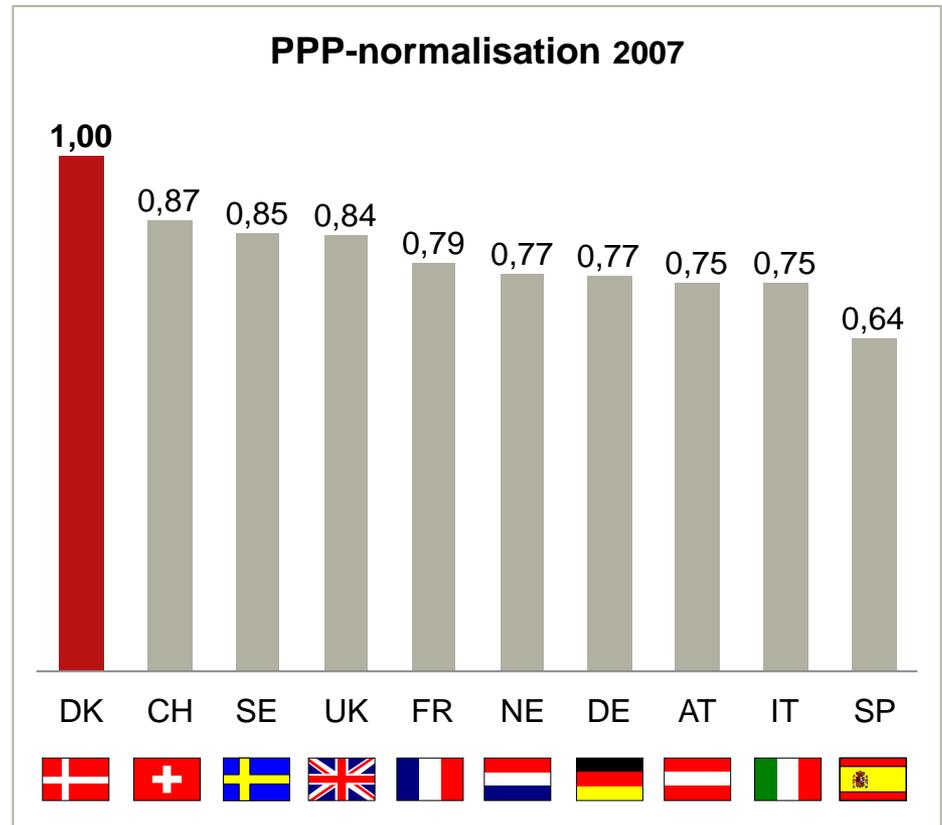
Railway system		Currency conversion with PPPs	Individual normalisation
Annual revenues		Funding	
		Transport business	
		Ancillary business	
Annual costs	Infrastructure	Renewal	Utilisation (train-/track-km)
		Maintenance	Switch density
		Traffic Control	Degree of electrification
	Freight train operation	Total costs	
	Passenger train operation	Overhead & management functions	
		Train staff	Travel Speed
	Rolling stock	Capital Cost	Running performance
		Maintenance & cleaning	Distance between stops
		Energy	Fleet reserve
	Extraordinary costs		Investment & enhancement

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International cost benchmarks need to be based on meaningful currency conversions

Comparative price levels based on OECD-Eurostat PPPs

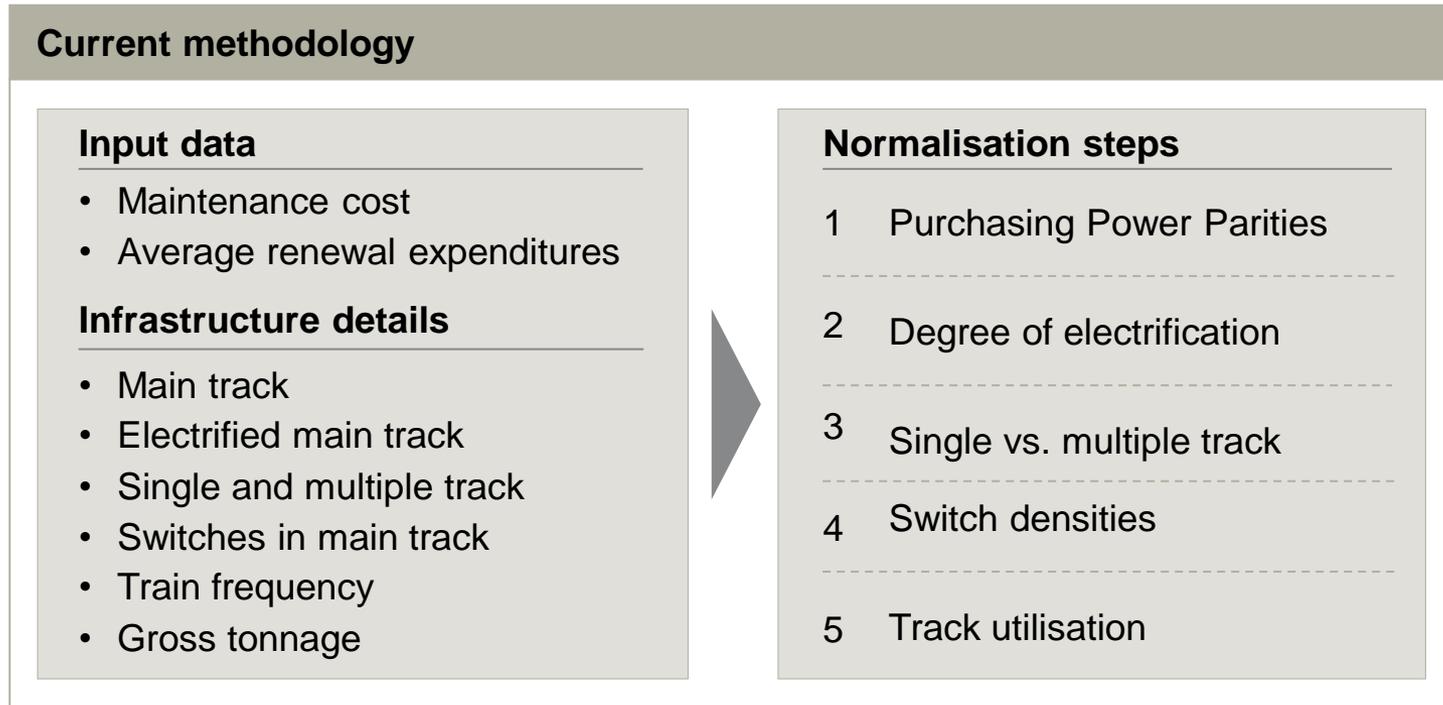
- Often, income or Gross Domestic Product (GDP) levels across countries are compared by applying exchange rates only
- However, exchange rates only partly reflect relative prices of goods that are domestically consumed
- Purchasing Power Parities (PPPs) are currency conversion rates that convert to a 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



Normalisation of infrastructure costs is based on existing UIC practices

LICB methodology

MAINTENANCE AND RENEWAL

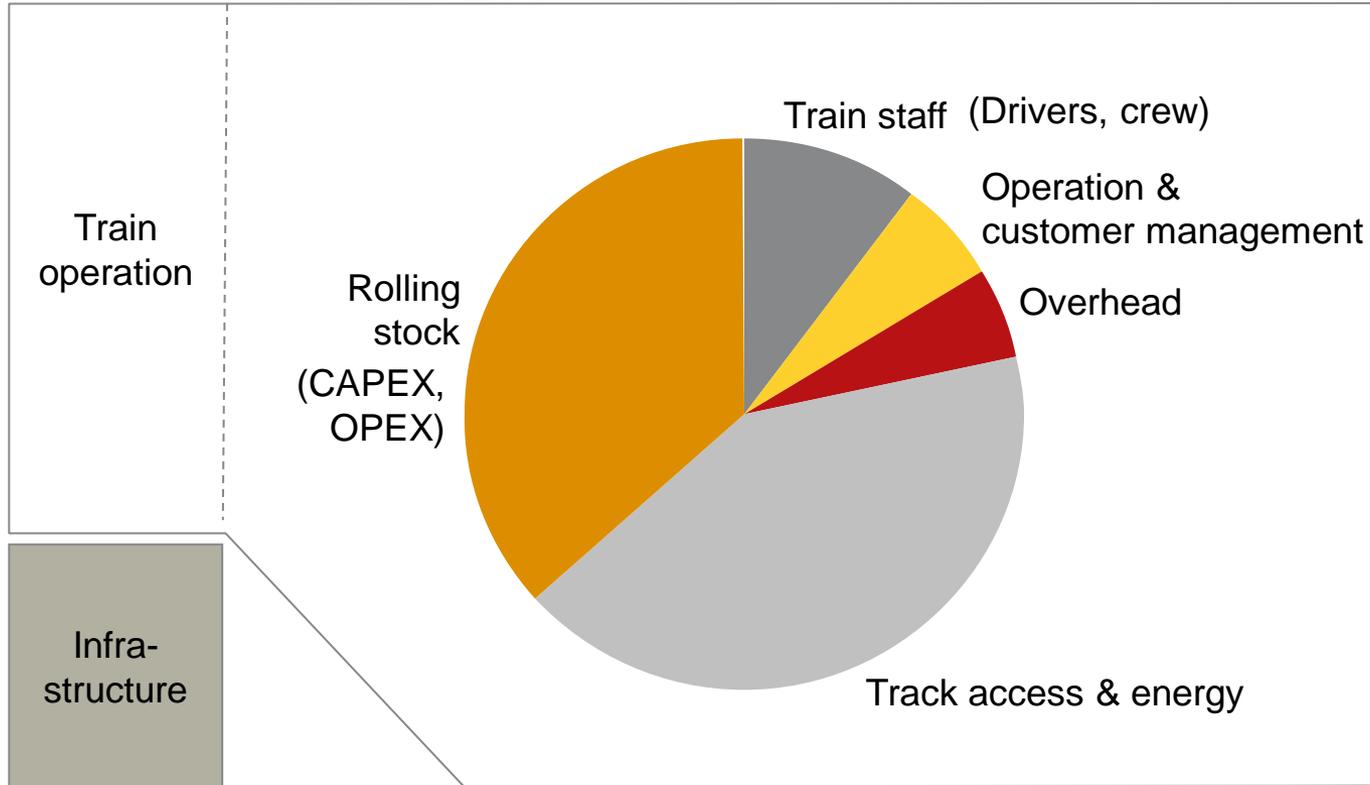


The following LICB or commonly utilised structural parameters will not be normalised:

- Single versus multiple track (LICB-methodology)
 - Built-up areas of stations incl. platforms
 - SEU density
 - Slab or ballasted track
- No data available
- Level too detailed

To generate a solid comparison, the costs of each analysed company will be allocated to the cost structure

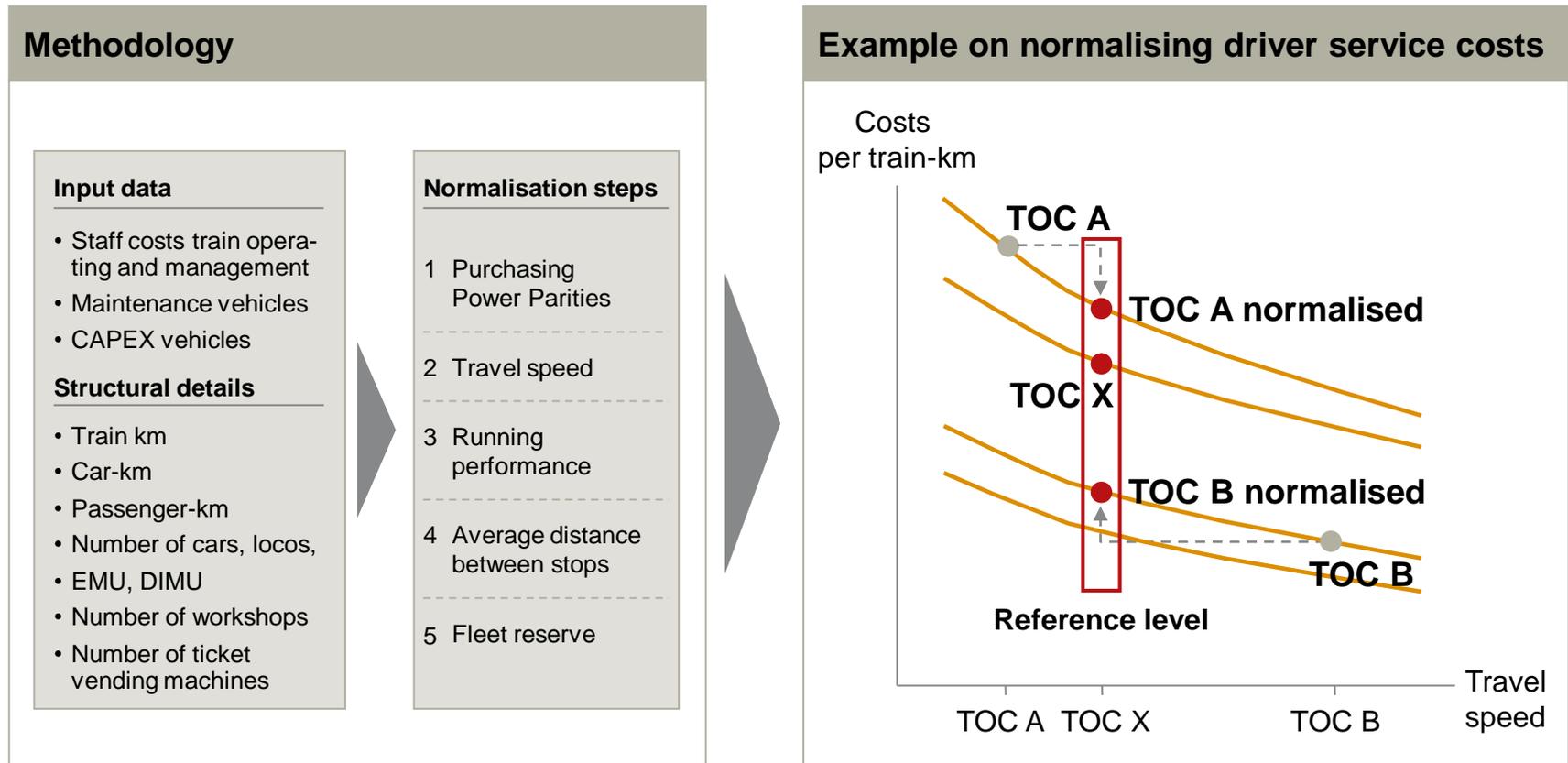
Scheme of the cost structure



- The basis for qualified benchmarking is the classification of costs into a proven cost structure
- This guarantees a comparability of data from different transportation companies regardless of their organisational structure and their cost accounting system

For the train operating cost benchmarking a proven normalisation approach will be applied

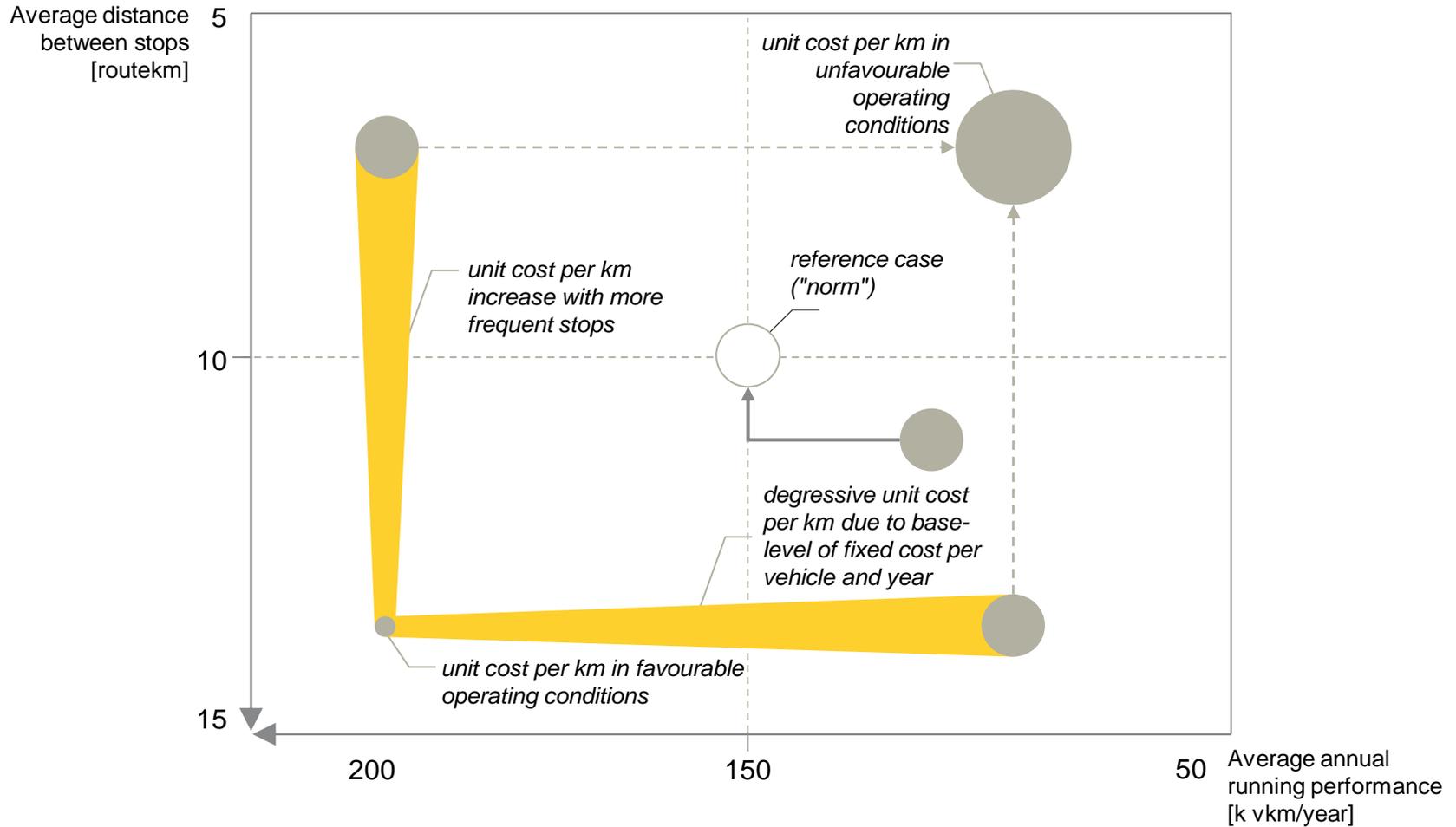
Overview methodology



Stopping actions and annual running performance are dominant cost-drivers that need to be normalised

Example

SCHEME



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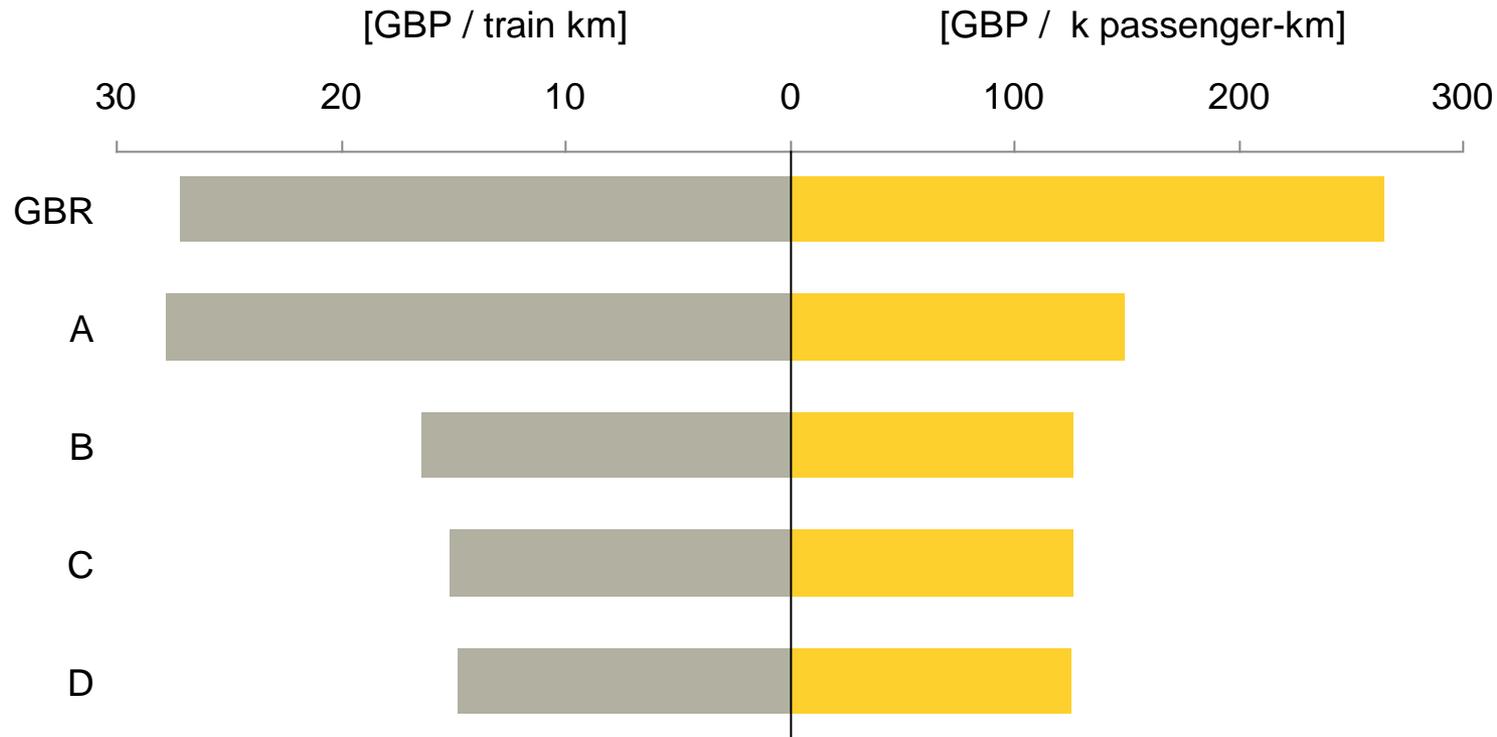
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In GB total system costs are higher than in other countries

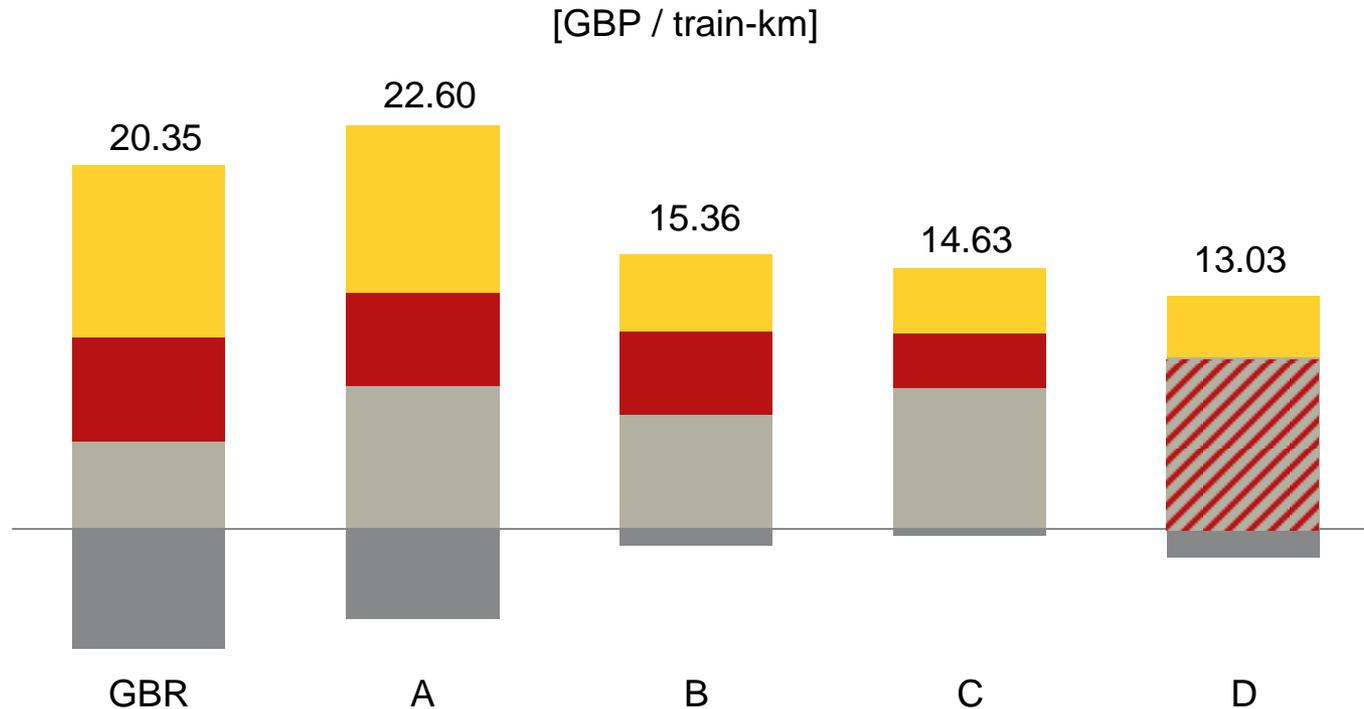
Total System Costs (partly normalised¹⁾)



1) Infrastructure has been fully normalised, train operation and rolling stock has been normalised for the countries where normalisation factors were known

Especially in infrastructure and rolling stock cost per train-km are higher

Total System Costs (partly normalised¹⁾)



1) Infrastructure has been fully normalised, train operation and rolling stock has been normalised for the countries where normalisation factors were known

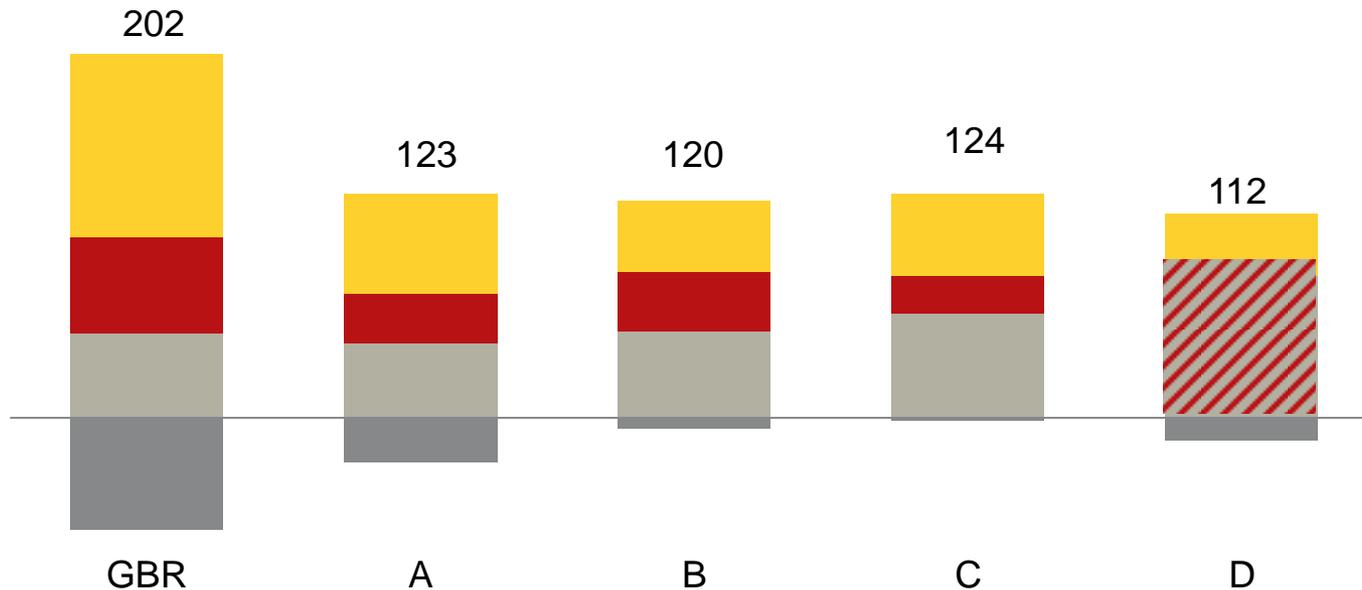
Numbers do not include track access charges

- Infrastructure
- Rolling Stock
- Passenger train operation
- Track access charges

Strong differences in ridership increase the gap between GB and comparators

Total System Costs (partly normalised¹⁾)

[GBP / k passenger-km]



1) Infrastructure has been fully normalised, train operation and rolling stock has been normalised for the countries where normalisation factors were known

Numbers do not include track access charges

- Infrastructure
- Rolling Stock
- Passenger train operation
- Track access charges

System cost

Key findings (1/3)

- Among a sample (!) of European peer markets with modest (or none) progress in market opening, the UK has arguably achieved the highest degree of on-rail competition
- The overall cost-efficiency of passenger train operations in the UK shows a good competitive position in comparison with the European peers, however with the exception of rolling-stock lease expenditures
- Passenger train farebox revenues are "at the upper end" of peer group comparisons, this however is the somewhat "unhealthy" reason for low train utilisations on one hand, over-compensated by exceedingly above average tariff levels in the UK passenger market on the other ("high-end" positioning in a niche-market segment) – a repositioning of the UK passenger rail system, as successfully demonstrated by countries like Switzerland, looks appealing in a thrust to add more value to the system in the future
- The rail network utilisation in the UK ranges close to peer group average, which is equivalent to low infrastructure asset turnover, yet this may be partly attributable to the different travel and freight traffic geographies of the respective countries

System cost

Key findings (2/3)

- The industry set-up at the interface between infrastructure and train operations in the UK is geared towards very high levels of track access charging, which however does not appear to have any immediate, beneficial steering effects
- Network infrastructure costs in the UK are substantially above peer levels, which is a result of both, below standard cost-efficiency, but also a due recovery from historically accumulated investment backlogs
- As a grand total the overall "cash-intake" (or "resource consumption") of the UK railway system is clearly above European comparators in relative terms (compared by system size), an added benefit to the system from this extraordinary level of resources deployed cannot be detected
- In particular the total amount of tax-payer generated funding into the system, which is deployed for both, infrastructure and train operations, is by far the highest (again in relative terms) among the peers

System cost

Key findings (3/3)

- All in all, and given the relative proportions of costs for infrastructure ("high share") and train operations ("low share"), it can be concluded that the benefits of "on-rail" competition may well be playing out, they are however far less significant in absolute terms than the disadvantages that the UK system is burdened with regarding sub-standard value-for-money of network infrastructure provision

Abbreviations

FOC:	Freight Operating Company
FTE:	Full Time Equivalent
IC:	Intercity
LCR:	London and Continental Railways
LSE:	London South East
PPP:	Purchasing Power Parities
ROSCO:	Rolling Stock Company
TAC:	Track Access Charges
TIR:	Inter-Regional Express Trains (France)
TOC:	Train Operating Company
TRE:	Regional Express Trains (France)
TRN:	National Express Trains (France)

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