On track for tomorrow.
Public Works Planning and Projects in Transport in Germany
International Transportation Workshop

DB International GmbH

Wolfgang Franz Pelousek

Brasilia, May 9, 2012

Agenda

- **Deutsche Bahn at a glance**
- Development since the 1994 Railway Reform
- German Railway Regulation and Funding
- Principles of German Railway Operation
- Project Examples

Deutsche Bahn is a leading passenger and logistics company with a long standing history in railway operation

1835

The railway era in Germany began with the inauguration of the six-kilometer long track between Nuremberg and Fürth

2012

Deutsche Bahn is a leading passenger and logistics company

DB's organizational structure consists of three divisions and nine business units

DB BAHN

Passenger transport:
Domestic and European-wide mobility services

DB Bahn Long Distance
Long-distance rail passenger transport[1]

DB Bahn Regional
Regional/urban passenger transport (Germany)

DB Arriva
Regional/urban passenger transport (Europe)[2]

DB NETZE

Infrastructure:
Efficient and future-oriented rail infrastructure in Germany

DB Netze Track
Rail network

DB Netze Stations
Railroad stations

DB Netze Energy
Traction current

DB SCHENKER

Transport and logistics:
Intelligent logistics services via land, air and the sea

DB Schenker Rail
European rail freight transport

DB Schenker Logistics
Global logistics services

DB Services[3]
Integrated range of services

1 Within Germany as well as cross border traffic; 2 In UK with 'Cross Country' long-distance passenger transport as well;
3 Business unit is assigned to the Rail Technology and Services division

Back up: DB is the second biggest provider in the entire European passenger transport market

- **2.7**
  billion passengers per year in trains and buses
- **26,000**
  passenger trains per day
- **Once**
  around the world – the distance traveled by every ICE train per month
- **9**
  neighboring countries can be reached directly via DB

DB BAHN

DB Bahn Long Distance

DB Bahn Regional

DB Arriva

DB Bahn Sales[1]

As of December 31, 2011; Figures on the left side are rounded and exclude Arriva; 1 DB Bahn Sales is a service center within the passenger transport division

Back up: DB operates the biggest rail network in the heart of Europe

- **5,700**
  train stations serve as railway gateways in Germany
- **33,600**
  km long rail network – three times as long as the German Autobahn network
- **48,500**
  heated switches out of a total 72,000
- **5th**
  largest provider of energy in Germany – annual volume of available energy equal to energy consumed by Berlin metropolitan area

DB NETZE

DB Netze Track

DB Netze Stations

DB Netze Energy

DB Netze Projects[1]

As of December 31, 2011; Figures are rounded; 1 DB Netze Projects is a service center within the infrastructure division

Back up: DB is the second biggest worldwide provider of transport and logistics services

DB Mobility Networks Logistics

- **More than 2,000**
  locations in over 130 countries
- **412**
  million tonnes of freight transported via rail per year
- **96**
  million shipments sent per year via European land transport
- **More than 5**
  million square meters of storage space around the world

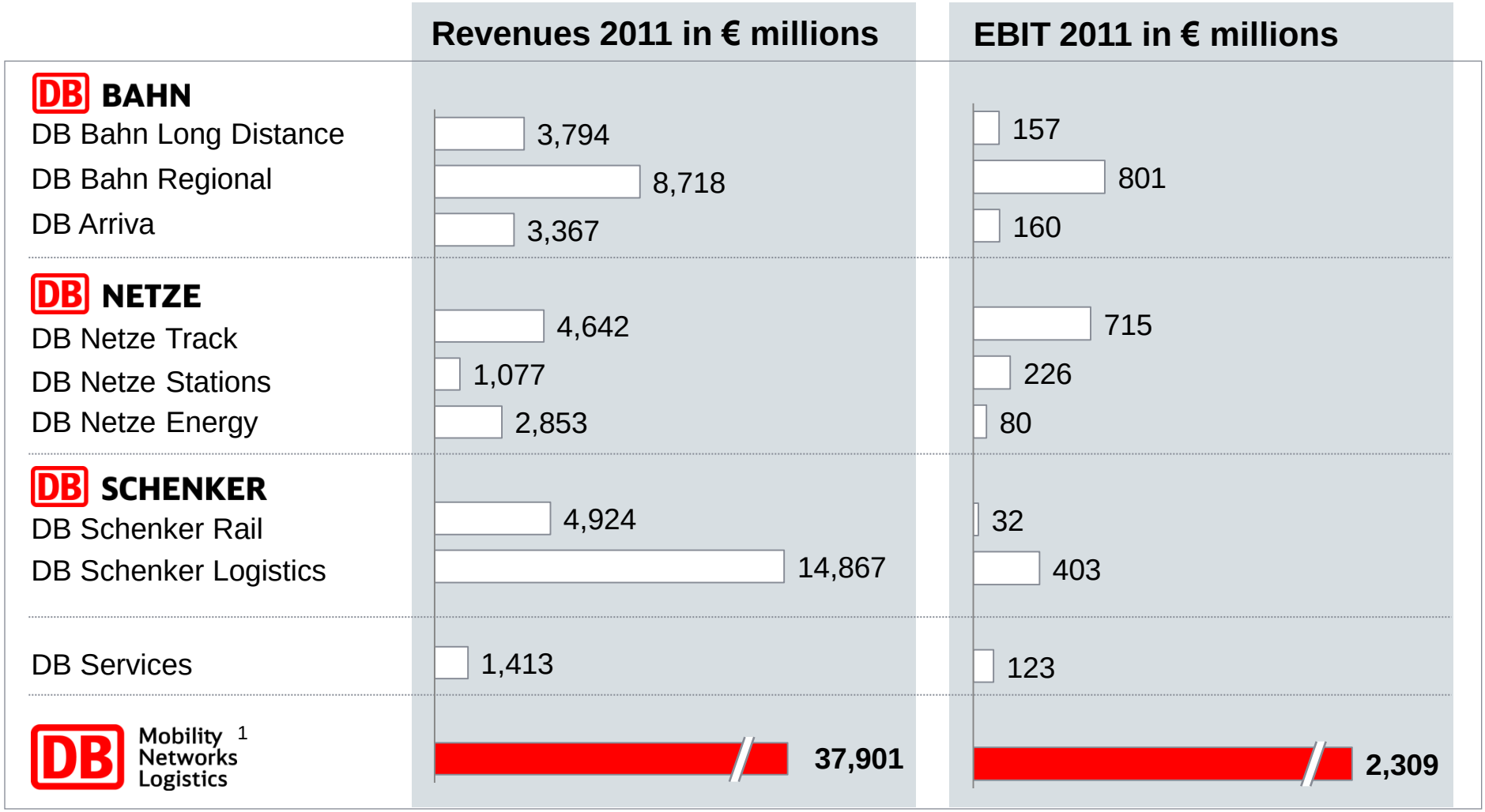
DB SCHENKER

DB Schenker Rail

DB Schenker Logistics

As of December 31, 2011; Figures are rounded; 1 Twenty-foot Equivalent Unit

Record revenues in 2011 – EBIT increased about 24% compared to 2010



As of December 31, 2011; 1 Difference between total for divisions and DB Group due to other activities/consolidation

Agenda

Deutsche Bahn at a glance

Development since the 1994 Railway Reform

German Railway Regulation and Funding

Principles of German Railway Operation

Project Examples

DB's history began 1835 with the opening of the six kilometer-long Nuremberg-Fuerth line

The history of the railway in Germany

1835

START
Nuremberg-Fuerth with the Adler locomotive

1920

Founding of the Deutsche Reichsbahn

1949

Split up into Bundesbahn and Reichsbahn

1994

Deutsche Bundesbahn and Deutsche Reichsbahn merge to become Deutsche Bahn AG

TODAY

Leading international passenger and logistics company

The Railway Reform Act of 1994 marked the beginning of a new railway era in Germany and the creation of Deutsche Bahn AG

Before Rail Reform

- Bureaucratic structures
- Monopoly structure
- Heavy government influence
- High losses – personnel expenses exceeded revenues
- More than EUR 30 bn in debt
- Rail was losing market share

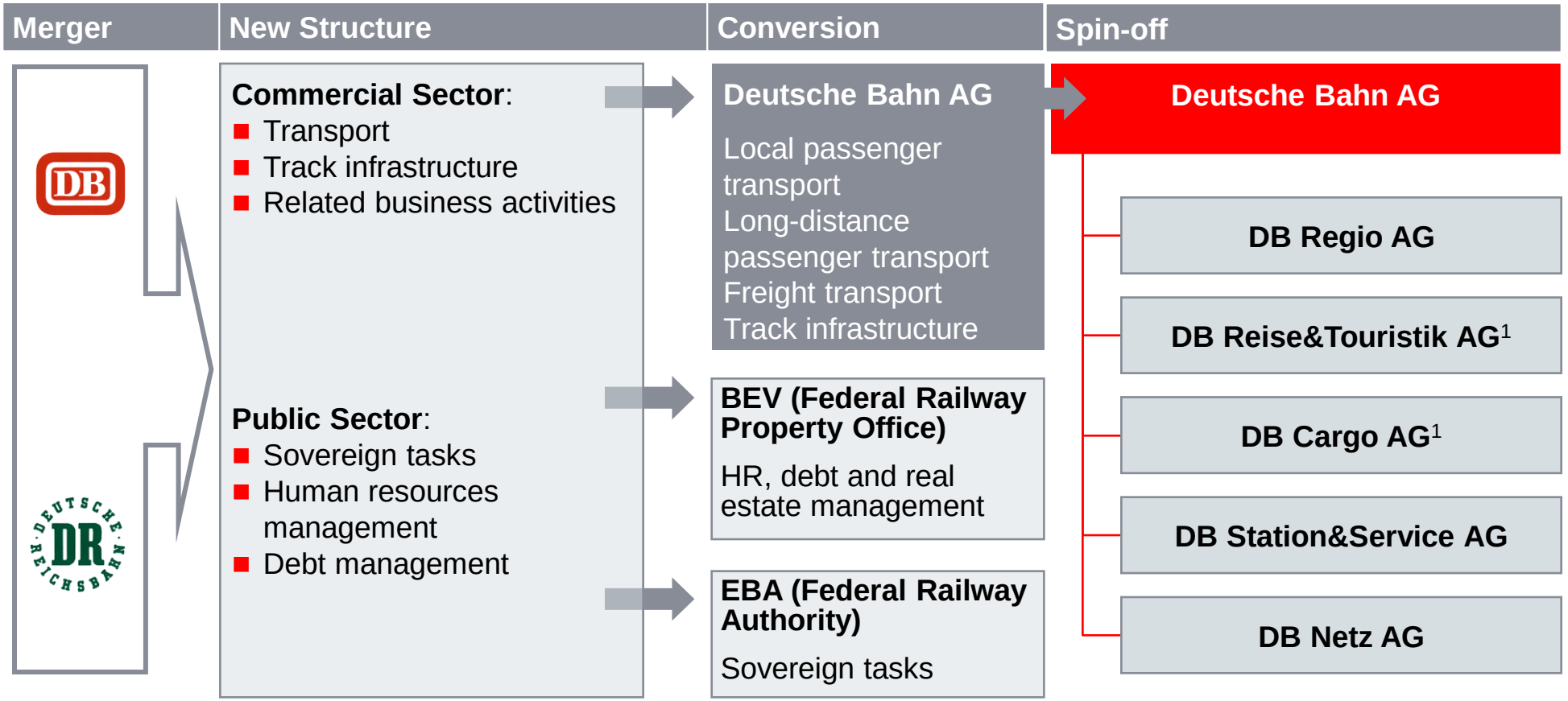
- ✓ Implemented entrepreneurial structures
- ✓ Rail opened up to competition
- ✓ Responsibility for local rail passenger transport delegated to regional levels

Today

- Modern and efficient organization
- Competition is expanding
- Value-driven decision making
- Greater profitability
- Debt is continuously shrinking
- Rail is enjoying a renaissance

During the Rail Reform, the commercial and public sectors were separated and a holding company structure was implemented

Rail Reform

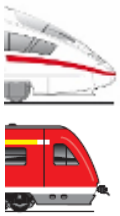


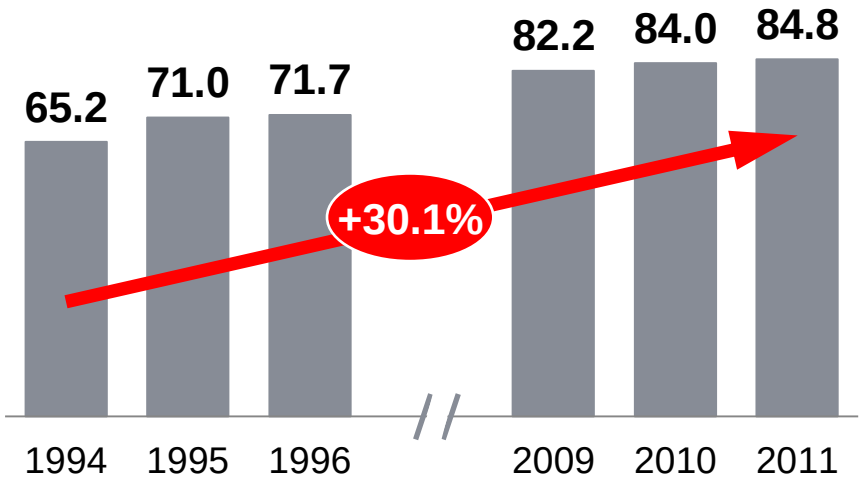
[1] Since then renamed DB Fernverkehr AG and DB Schenker Rail Deutschland AG

DB's success story since the 1994 Rail Reform has made it possible to sustainably strengthen rail transport in Germany

Volumes sold rail passenger transport

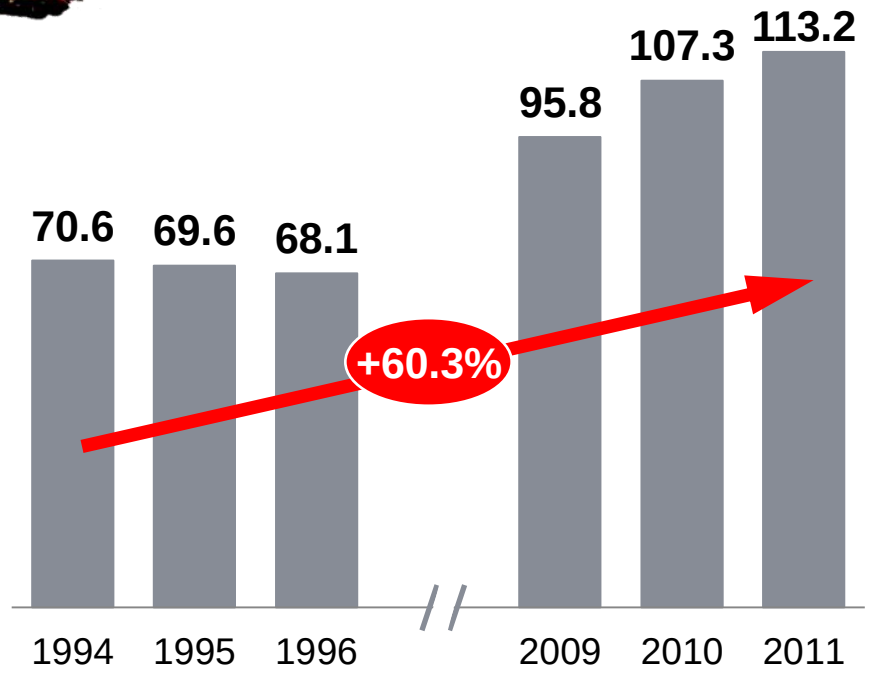
Germany, in bn passenger kilometers





Volumes sold rail freight transport[1]

Germany, in bn tonne kilometer



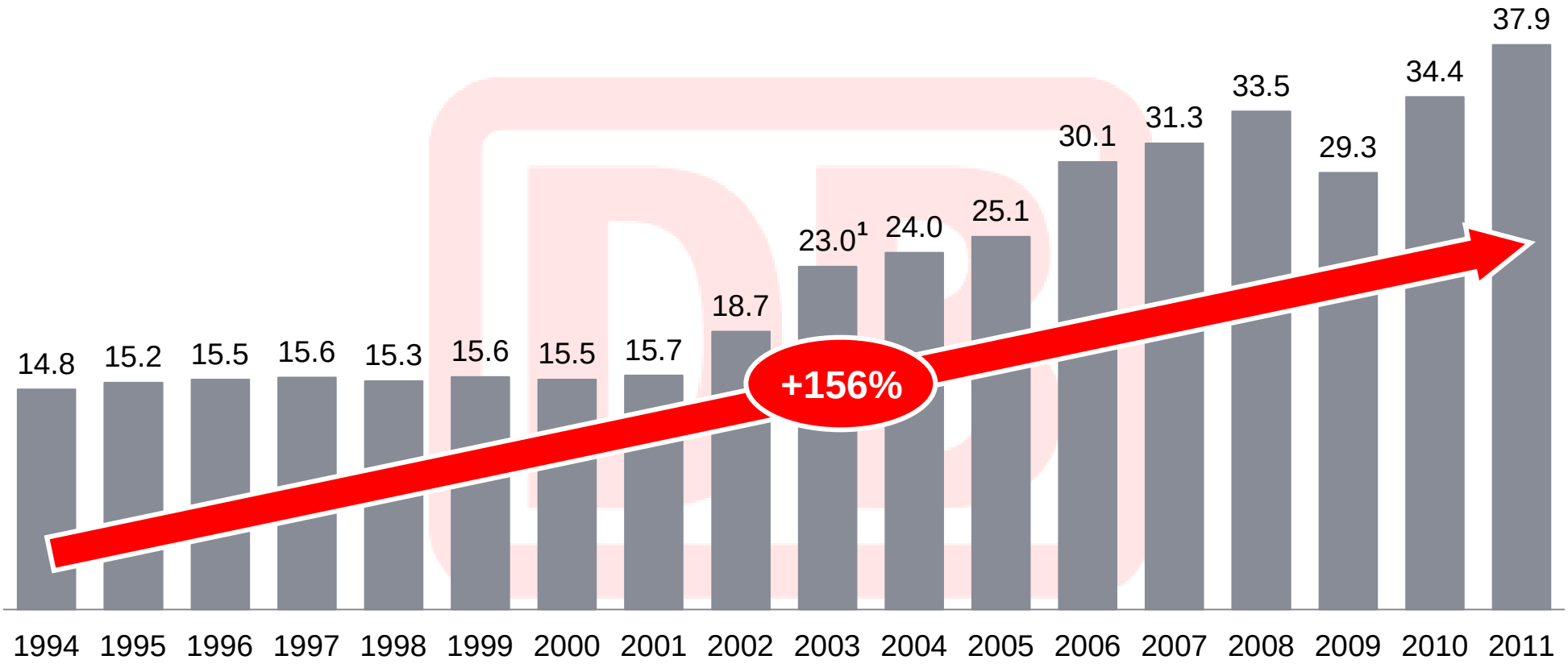
Sources: DB AG, Federal Statistical Office, BMVBS/BAG

As of March 2012; 1 Up to 1998 net transportation performance, from 1999 gross transportation performance = gross weight includes weight of freight plus container weight

DB Group's revenues have risen continuously since 1994 – with just one exception in 2009 due to the global economic crisis

Development of DB Group revenues

in bn €

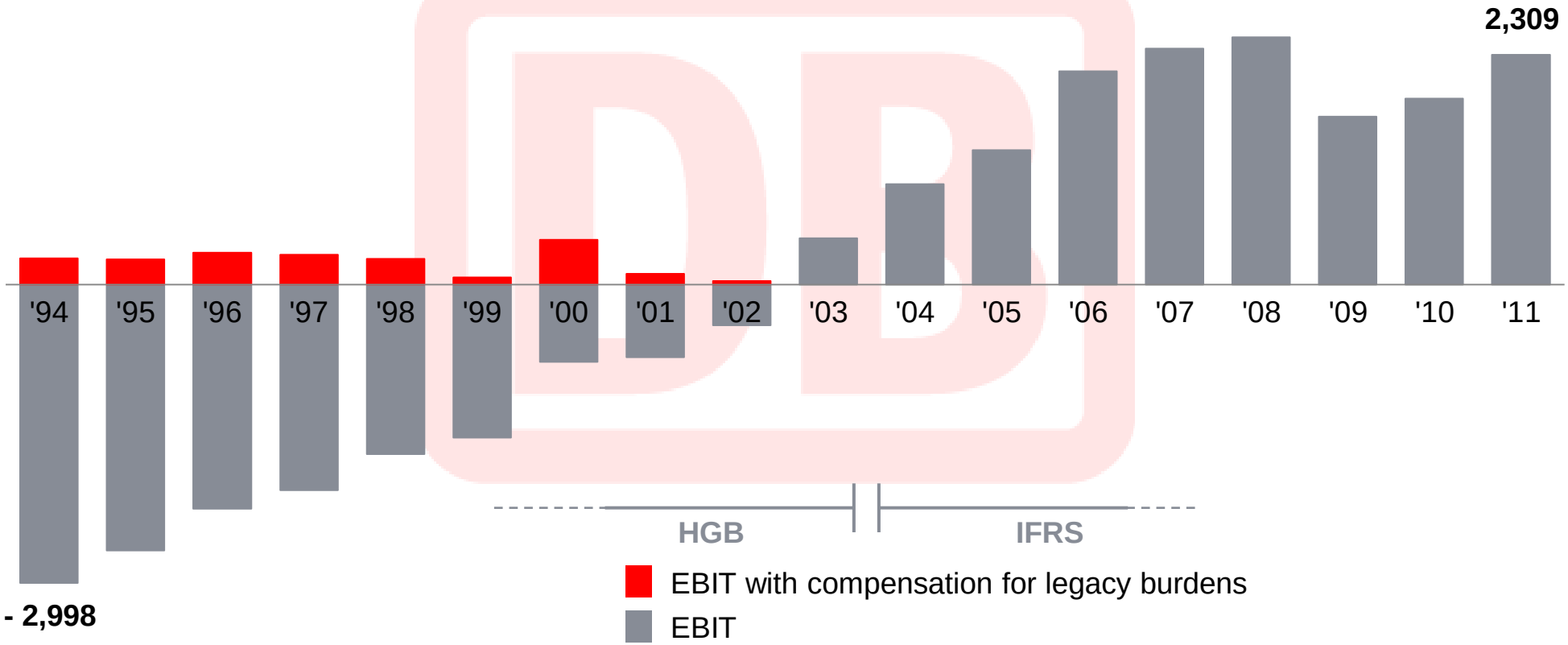


As of December 31, 2011; 1 Revenue 2003 has been adjusted for effects from Stinnes acquisition

The favorable development of earnings before interest and taxes made it possible to substantially reduce the burden on the federal budget

Development of DB Group EBIT

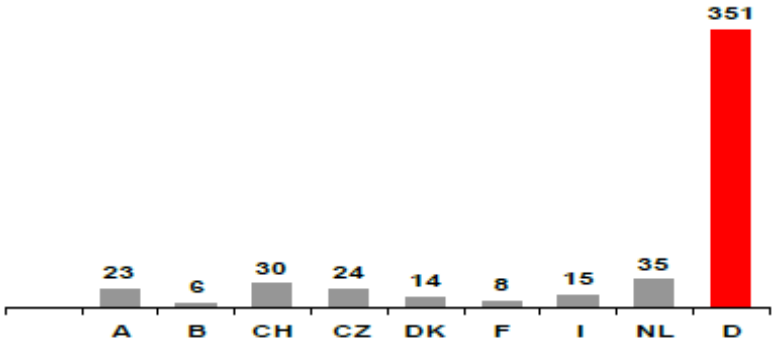
Earnings before interest and taxes, in € millions



As of December 31, 2011; Adjusted EBIT shown

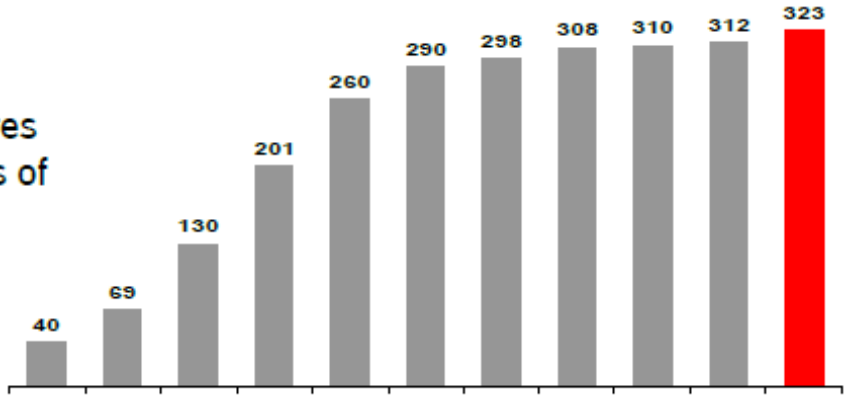
Liberalization on rail works – the number of external rail operators on DB tracks grew continuously since 1994

Deutsche Bahn is one of the pioneers of railway liberalisation in Europe.



Number of licensed RUs by European country in 2009

In 2009, ca. 15% of train path kilometres were ordered and used by competitors of Deutsche Bahn.

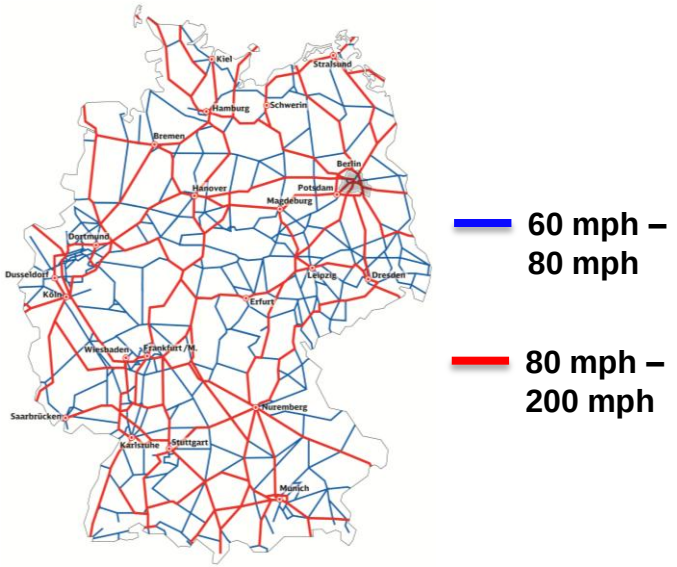


Number of Group-external RUs on the DB network

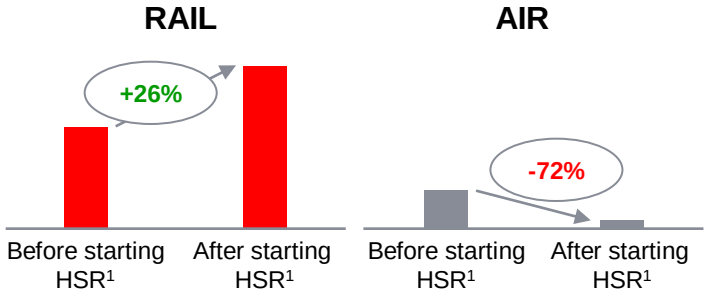
More than 340 customers use DB Netz AG's rail network; of these, over 300 RUs do not belong to the DB Group

The German rail network is one of the largest in Europe and one of the most modern worldwide

Rail network in Germany



Modal split (i.e. Cologne – Frankfurt)



1) Start HSR Cologne – Frankfurt am Main in 2002

- **German land use patterns require a dense long distance network and regional feeder systems**
- **The passenger rail market in Germany is fully liberalized** since 1994 – market entry by more than 50 competitors
- Since the operation of the first ICE-line in 1991 **the HSR network has been enhanced step by step** – further upgrade started (i.e. Berlin – Nuremberg)
- **Rail market share in long distance traffic over 11%** – strong ICE-lines exceed 50%

Agenda

Deutsche Bahn at a glance

Development since the 1994 Railway Reform

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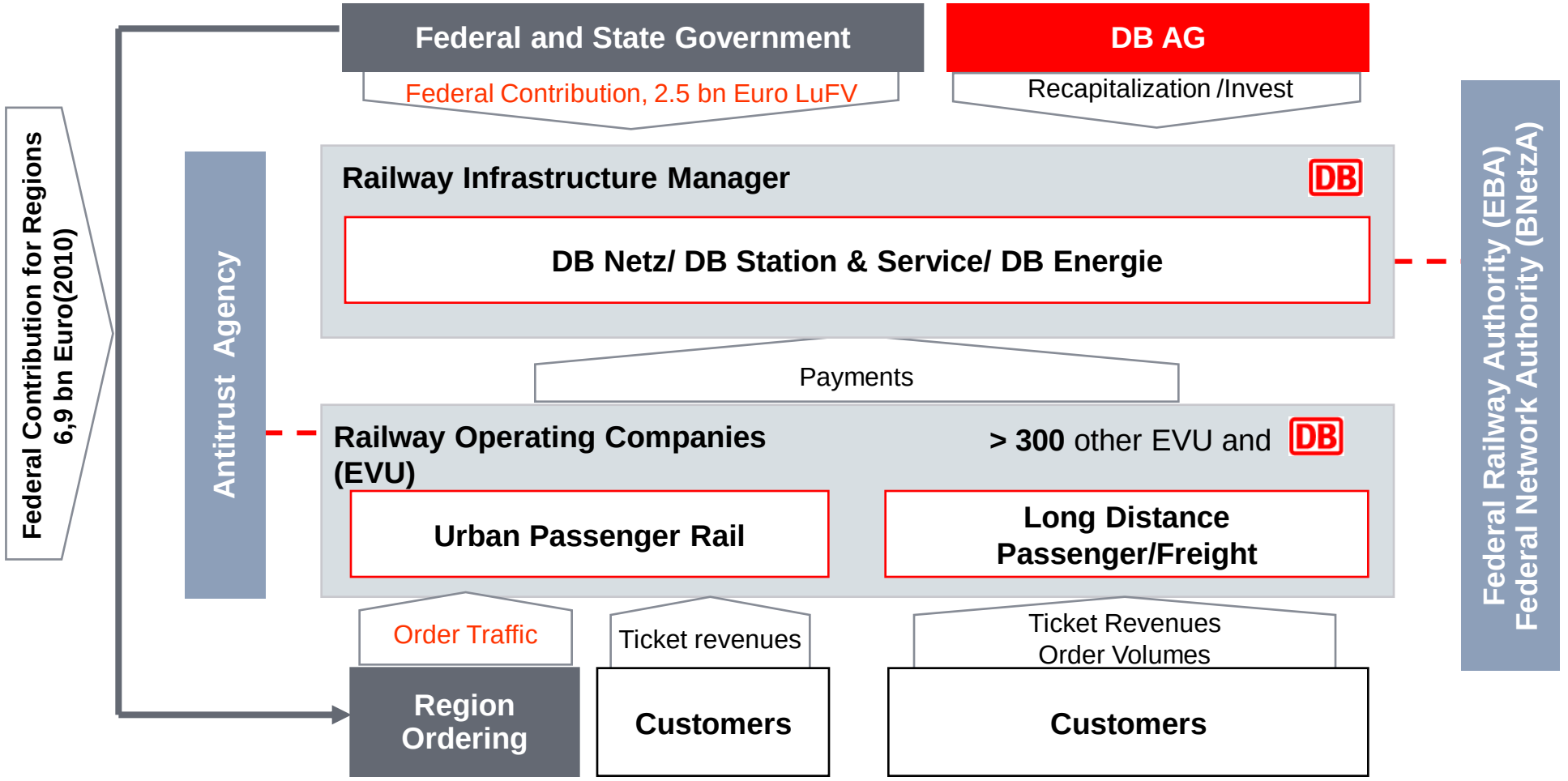
Principles of German Railway Operation

Project Examples

Interfaces between federal, state government and DB AG were clearly defined since the Railway Reform Act in 1994



* Federal Contribution LufV, 2.5 bn Euro p.a unil 2013

The Federal Railway Authority (EBA) and Federal Network Authority (BNetzA) complement eachother in German Railway Regulation

Federal Railway Authority (EBA)

Eisenbahn-Bundesamt

Safety Body

- **Monitoring**, promoting and enhance the **safety regulatory framework i**ncluding the system of national safety rules
- **Authorizing technical rail systems** (new, altered) in accordance with legal requirements and **interoperability**
- **Advice and consultation** concerning interpretation of legal requirements and implementation **,** Rail **accident investigation**
- Part of Federal Ministry of Transport, Building and Urban Development (BMVBS**)**
- 300 employees in HQ, 1000 employees in 15 regional offices

Federal Network Agency (BNetzA)

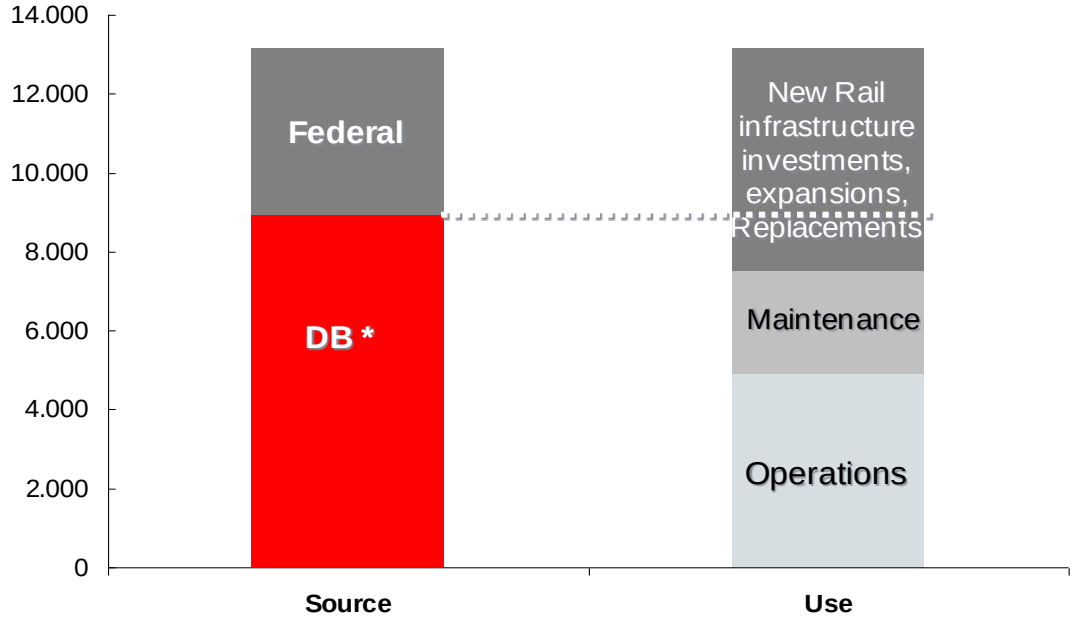
Regulatory Body

Bundesnetzagentur

- **Ensuring non-discriminatory access** to the rail infrastructure
- **Monitoring compliance of access rules** to infrastructure, train schedule compilation, access of stations, maintenance facilities
- Monitoring of **rate principles** and rate levels
- **Regulatory power**, part of Federal Ministery of Economics and Technology (BMWI)
- Department of rail sector approx. **45 employees**

Capital expenditures in rail infrastructure, operations and maintenance reached 13.2 billion Euro in 2010

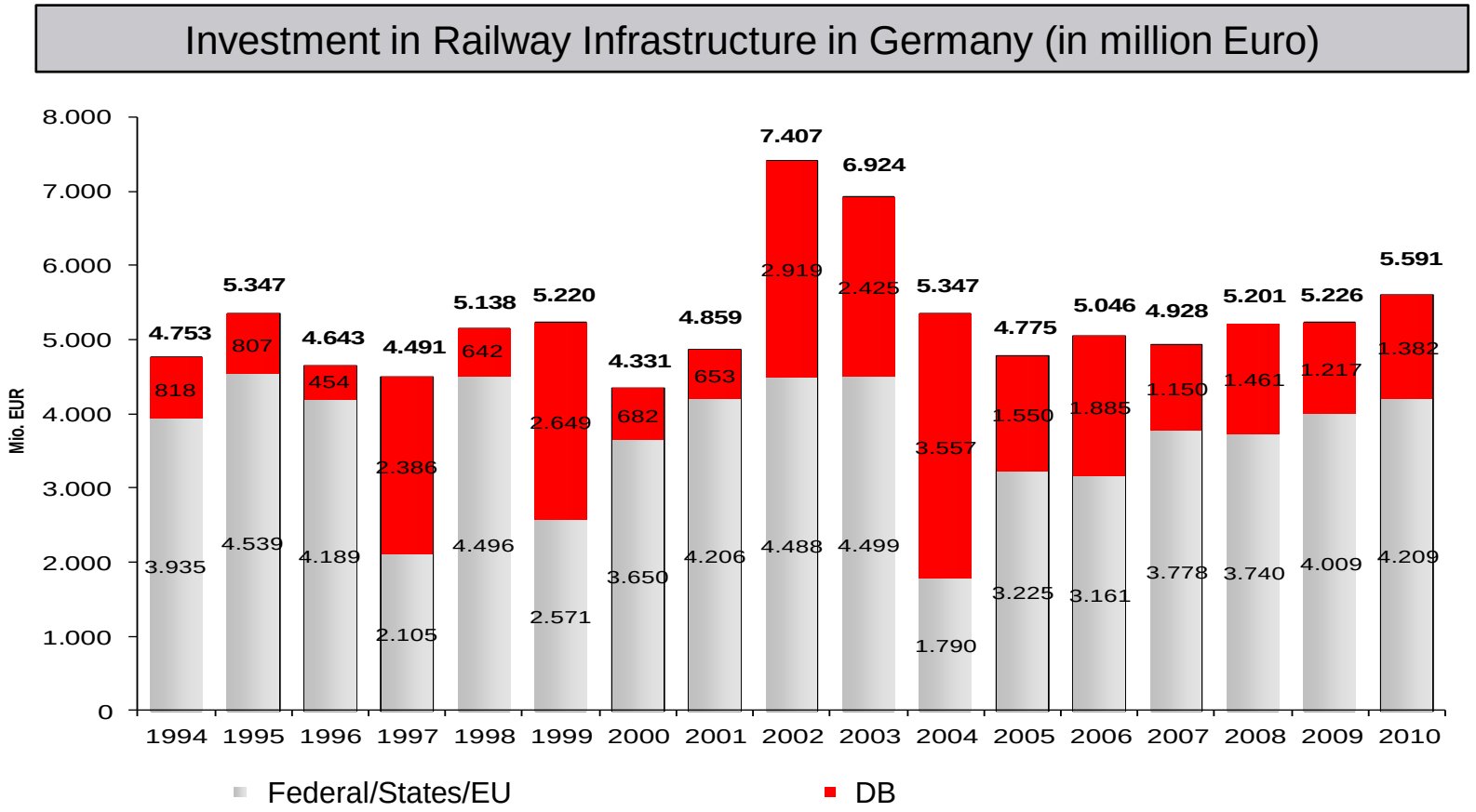
CAPEX of Rail infrastructure, operations and maintenance in Germany 2010 (in Million Euro)



- Federal, States and EU grant partial funding for new rail infrastructue, expansions and replacements (4.2 bn Euro in 2010)
- DB finances maintence and operations of the existing rail infrastructure through its operations. DB receives 2.5 bn Euro federal contribution (LuFv). Futhermore, DB contributes to new rail infrastructure investments, expansions and replacements

* Federal contribution LufV, 2.5 bn Euro p.a unil 2013

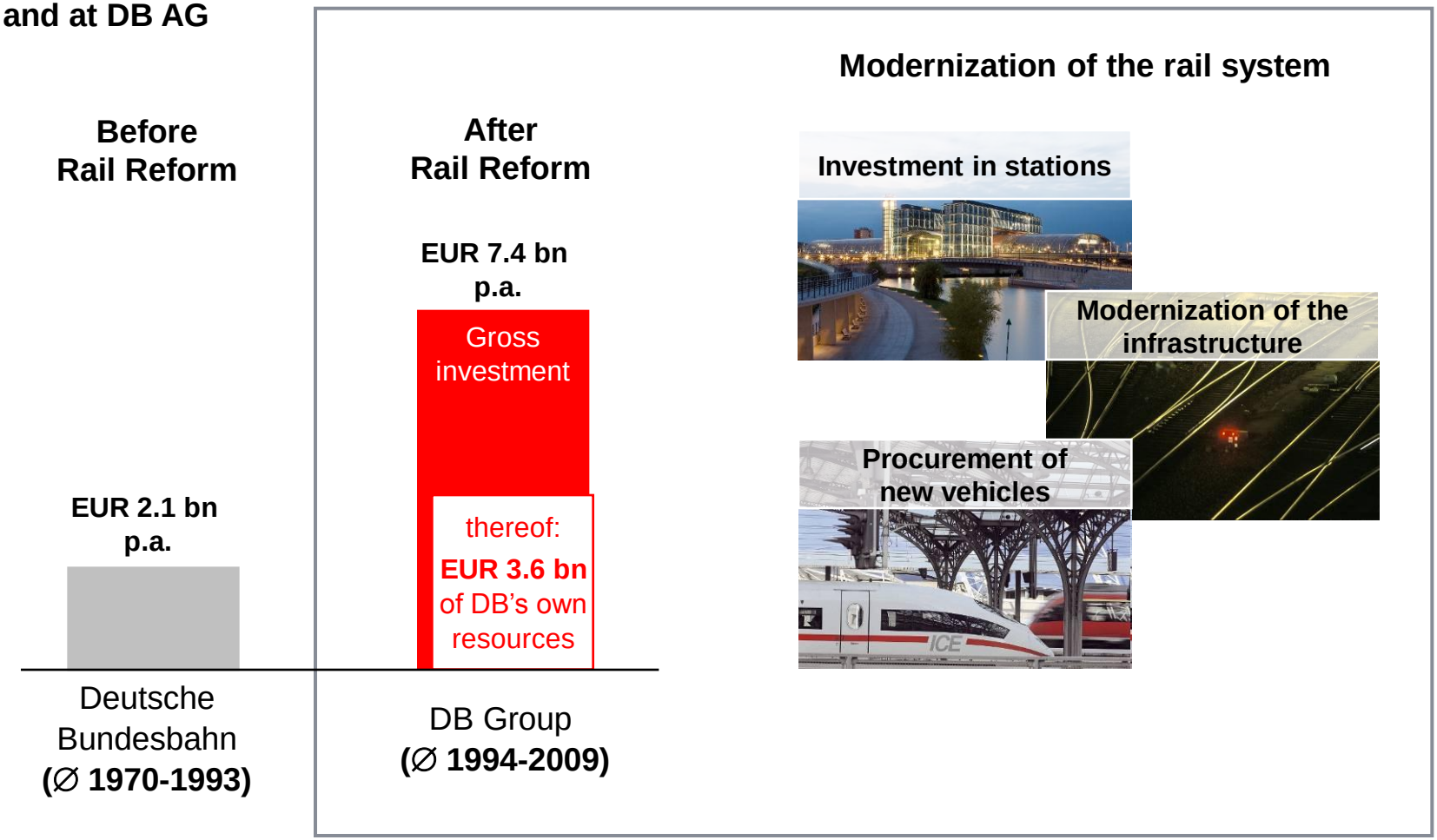
Since 1994 DB continuously contributed to investments railway infrastructure – participation approximately 30 % of 89.2 bn Euro



- **Cumulative expenditures in railway infrastructure since 1994: 89.2 bn Euro**
- **Approximately 5.2 bn Euro/year; DB share of own resources 1.6 bn Euro/year (30%)**

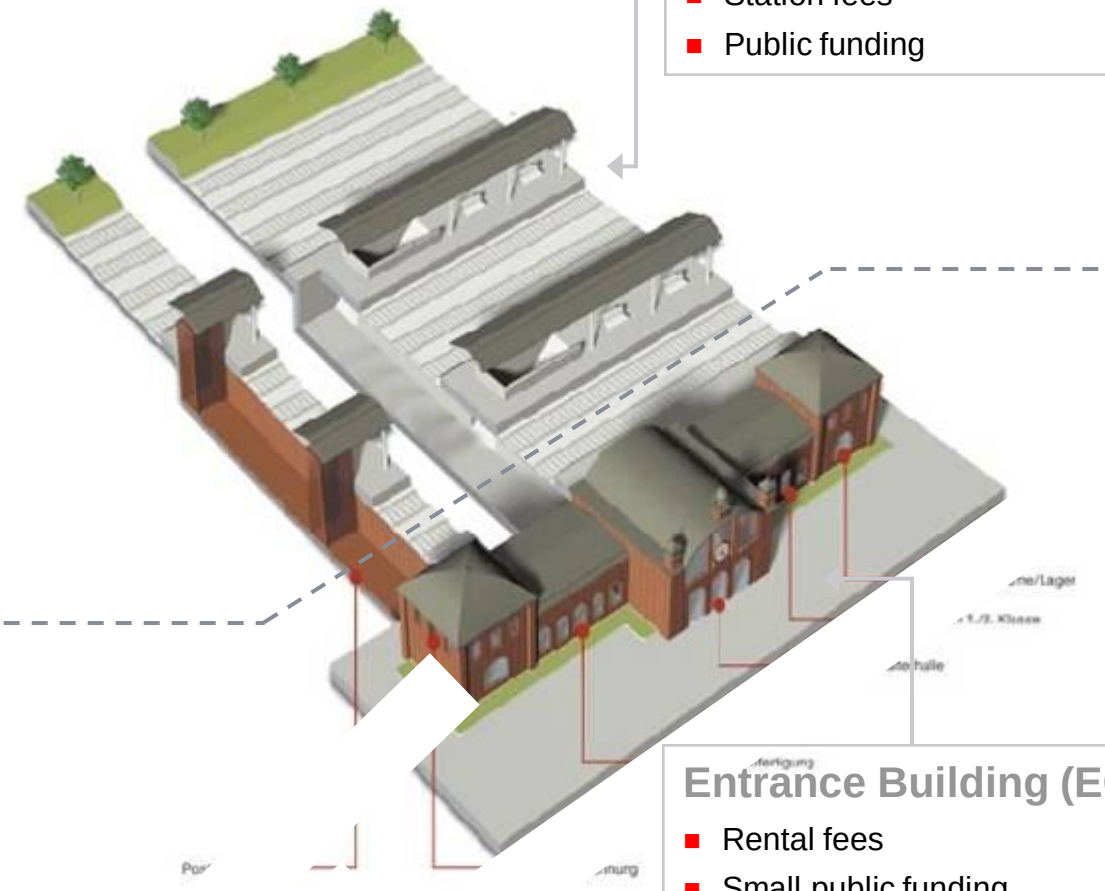
Since the Rail Reform, DB has invested extensively in the rail system and improved the railway infrastructure

Comparison of average annual capital expenditure at Deutsche Bundesbahn and at DB AG



Financing of railway stations is complex and applies different sources of funding – federal, state, municipalities, EU and DB

	Financing Investments	Financing Operations
Plattforms	**DB Station&Service AG** (own resourrces) **EU** (EFRE) **Federal** (LuFV etc.) **States** (GVFG etc.) **Municipalities**	**DB Station&Service AG** (Station fees)
EG	**DB Station&Service AG** **Investors/Rent**	**DB Station&Service AG** (Mieteinnahmen) **Investors/Rent**



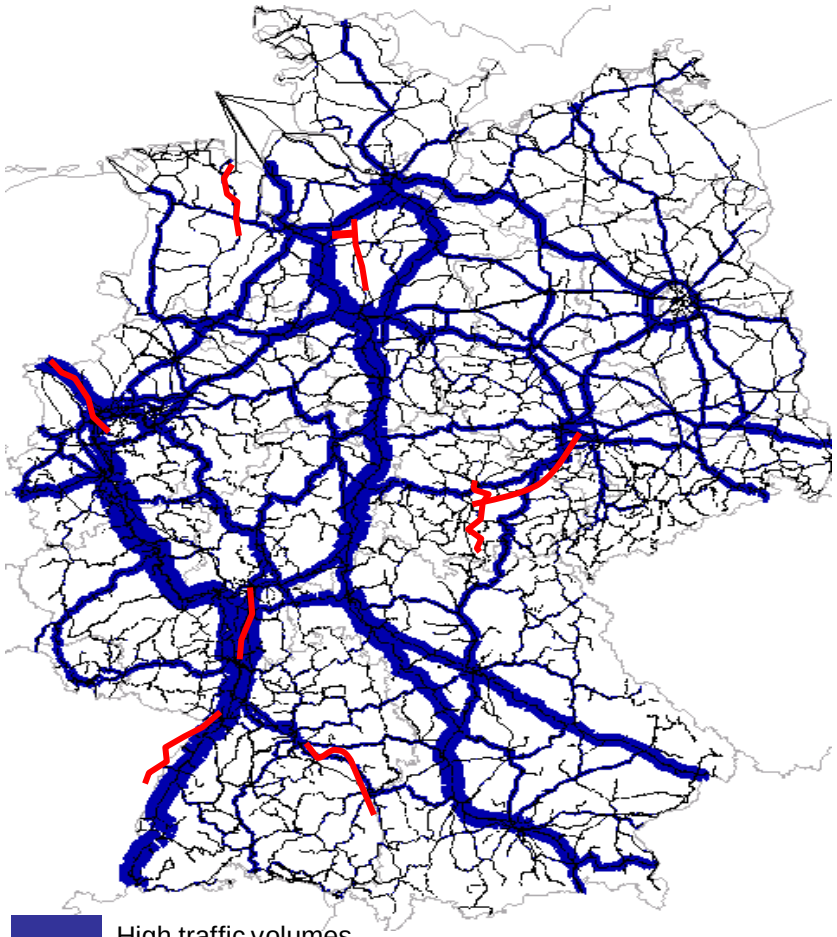
Plattforms

- Station fees
- Public funding

Entrance Building (EG)

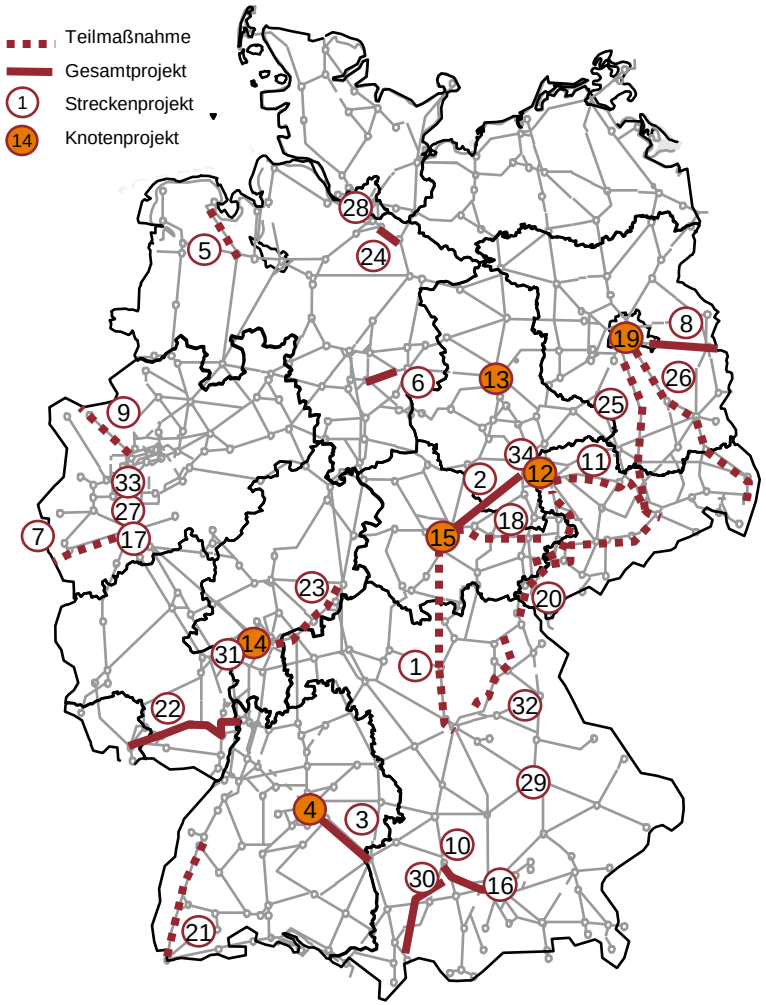
- Rental fees
- Small public funding

The infrastructure in Germany will be expanded along growth corridors – need for further investments



- **Eliminate bottlenecks along transportation corridors** and around hubs with **high growth forecasts** for passenger and freight transport
- **Create capacity for additional north-south traffic** along alternative routes using measures from the **growth program**
- Link core German network with **international transportation corridors**
- **Expand hinterland feeder routes** to key European sea ports in order to realize full growth potential available in rail freight transport (current sea port hinterland traffic program)
- **Improve connections between sea ports and the transportation infrastructure** (expand maritime terminals, sea port hinterland transport), i.e. **increase multimodality**

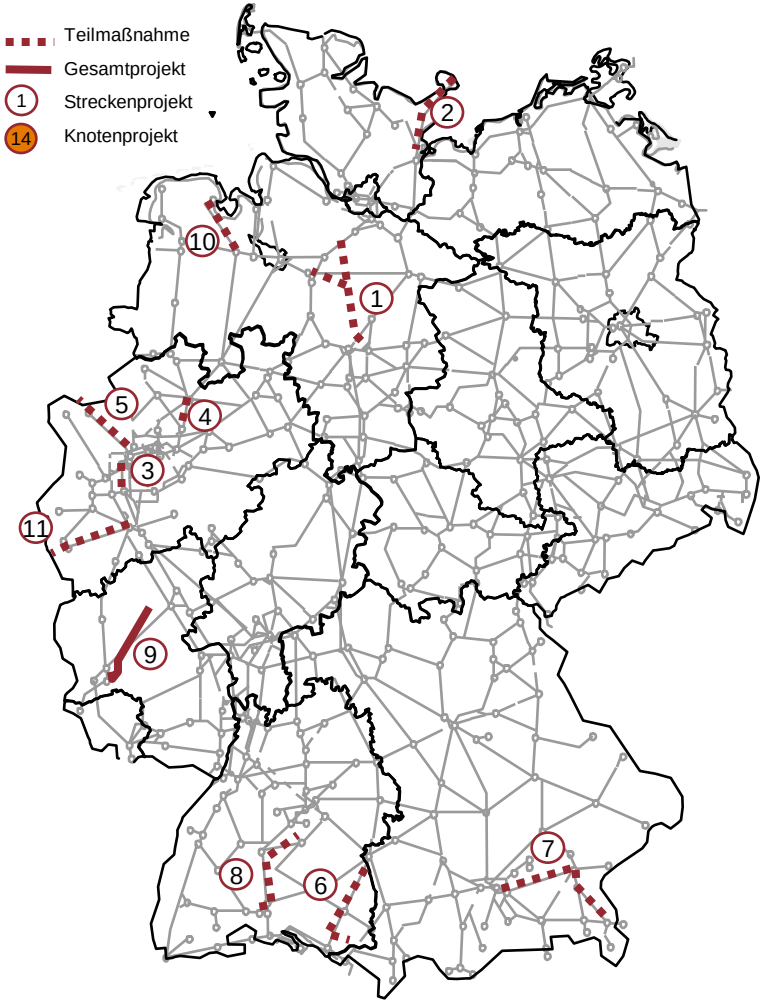
Currently 34 rail infrastructure projects are being financed and constructed in Germany – estimated invest of approx. 15 bn Euro



	Maßnahmen	Abschnitt
1	VDE 8.1 Nürnberg – Erfurt	NBS, Anteile ABS Nürnberg – Erfurt (inkl. Anteile KP)
2	VDE 8.2 Erfurt –Halle/ Leipzig	inkl. Anteile KP
3	ABS/NBS Stuttgart – Ulm – Augsburg	NBS Wendlingen – Ulm
4	ABS/NBS Stuttgart – Ulm - Augsburg	Stuttgart 21
5	ABS Oldenburg – Wilhelmshaven	BS II (inkl. Anteile KP), BS III a (Zweigleisigkeit)
6	ABS Löhne – Braunschweig – Wolfsburg	Hildesheim – Groß Gleidingen
7	ABS Köln – Aachen	Aachen – Landesgrenze inkl. Buschtunnel (AA III)
8	ABS Berlin – Frankfurt/Oder	
9	ABS D/NL Emmerich – Oberhausen	ESTW Emmerich, ETCS
10	ABS Augsburg – München (1. Baustufe)	Mehring - Olching
11	VDE 9 Leipzig – Dresden	2. BS, Teile der 3. BS
12	Knoten Halle/ Leipzig	1. BS Leipzig, 3.BS Leipzig (Einbindung VDE, 1.Teil)
13	Knoten Magdeburg	2. BS
14	Knoten Frankfurt/Main	1. BS FFM Sportfeld, Galluswarte (KP)
15	Knoten Erfurt	2.BS (Umbau Bhf), 3.BS (Einb. VDE 8.1/8.2 inkl. Anteile KP)
16	Ubf München-Riem	3. Modul
17	ZBA Gremberg	
18	ABS Paderborn – Chemnitz	2. + 3. RS, ESTW Meerane (inkl. Anteile KP)
19	Knoten Berlin	Ostkreuz
20	ABS Karlsruhe – Stuttgart – Nürnberg – Leipzig/Dresden	1.BS Gaschwitz – Crimmitzschau; Hohenstein-Ernstthal - St. Egidien (KP), Knoten Chemnitz
21	ABS/NBS Karlsruhe – Basel	PfA 9.1 (Schliengen – Eimeldingen; Katzenbergtunnel), "Anbindung 2. Rheinbrücke Basel" und 4-gleisiger Ausbau bis Basel in PfA 9.2 und 9.3
22	ABS Saarbrücken – Ludwigshafen	POS Nord
23	ABS Fulda – Frankfurt/Main	Bahnhof Neuhof
24	ABS Stelle – Lüneburg	3gl. Ausbau
25	ABS Berlin – Dresden	1. Baustufe, 2. Realisierungsstufe mit anteiliger "Vorziehung" vom Maßnahmen der 2. Baustufe
26	ABS Berlin – Cottbus – Görlitz	Königs Wusterhausen – Lübbenau (KP)
27	Ubf Köln-Eifeltor	3. Modul (KP)
28	Ubf Hamburg-Billwerder	3. Modul (KP)
29	Ubf Regensburg	Erweiterung (KP)
30	ABS München – Lindau – Grenze D/A	Elektrifizierung
31	ABS Mainz – Mannheim	Nordkopf Mainz (KP)
32	ABS Nürnberg – Marktredwitz – Reichenbach /Grenze D/CZ (-Prag)	Elektrifizierung Reichenbach – Hof (KP)
33	KLV-Drehscheibe Rhein/Ruhr	1. und 2. BS
34	ZBA Halle-Nord	

Dezember 2011

For further 11 railway projects financing of the planning has been granted – construction financing needs to be approved



Dezember 2011

Existing Railway Infrastructure Planning Projects

	Maßnahmen	Vereinbarung mit
1	ABS/NBS Hamburg/Bremen - Hannover	Bund/ Land
2	Feste Fehmarnbeltquerung (FBQ)	Bund
3	ABS Düsseldorf – Duisburg (RRX)	Bund/ Land
4	ABS Münster – Lünen	Land
5	ABS D/NL Emmerich – Oberhausen	Land/ TEN-Förderung
6	ABS Ulm – Friedrichshafen - Lindau	Land
7	ABS München – Mühldorf - Freilassing	Bund/ TEN-Förderung
8	ABS Stuttgart – Singen	Land/ Gemeinden
9	ABS Luxemburg – Trier – Koblenz, Igel – Igel West (SV 35 KP)	Bund
10	ABS Oldenburg – Wilhelmshaven, 3. BS (SV 35 KP)	Bund
11	ABS Köln – Aachen, AA II Düren – Aachen (SV 35 KP)	Bund

Financing for construction needs to be approved!

Agenda

Deutsche Bahn at a glance

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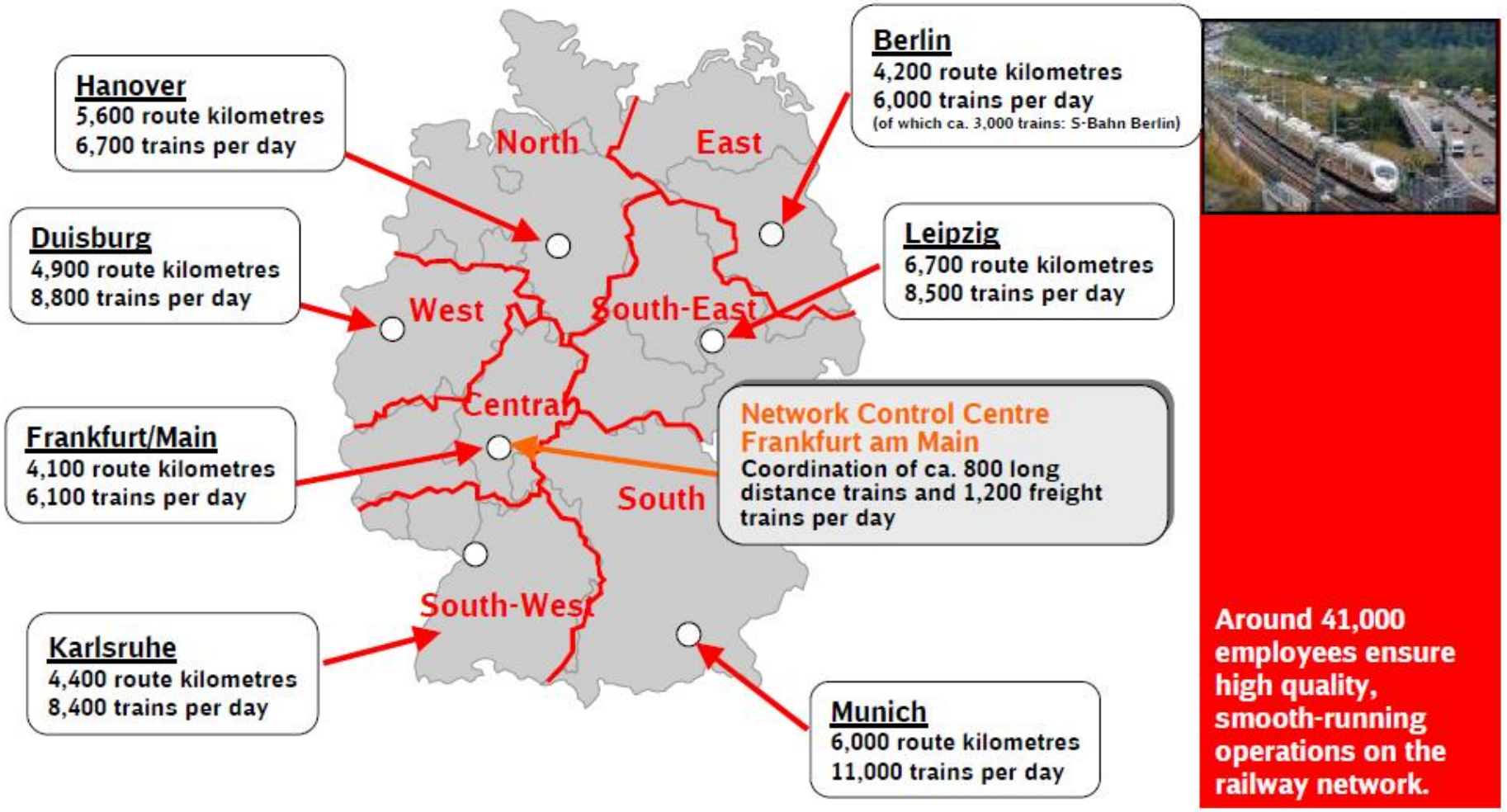
Project Examples

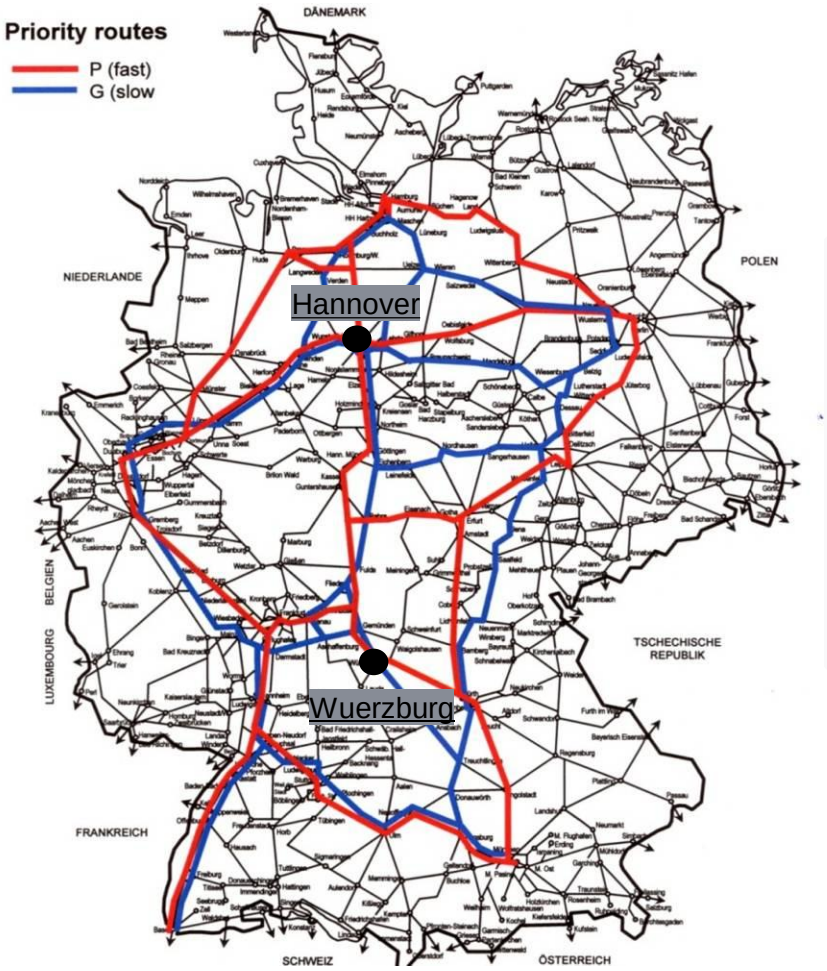
German railway applies mixed traffic operation to provide maximal capacity utilization with minimal Investments

- DB as infrastructure manager has to guarantee free access to all rail operators by **centralized slot management**
- **Optimized planning** of future traffic by using complex traffic forecast models
- Enhancement of production capacity by **smart technologies e.g. maintenance and signalling strategies**
- **Mixed operation** enables freight services on HSR lines in night hours

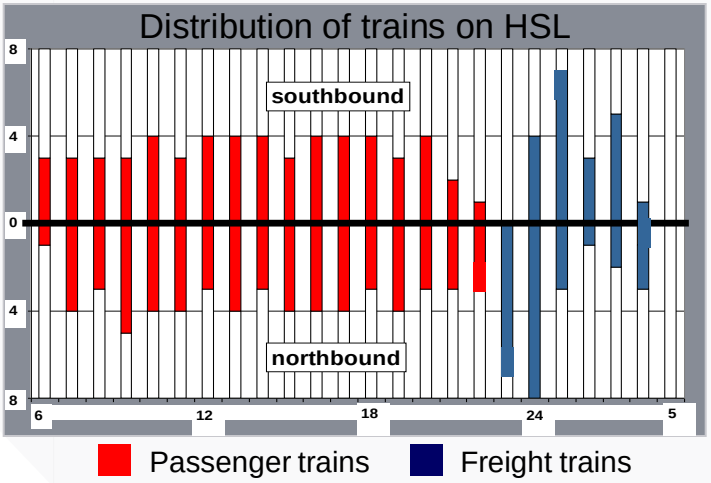
Back Up: Modern technology in seven Operations Centers and Network Contol Centers ensure safe an smooth traffic flow



Integration and segregation of passenger and freight trains on High Speed Line Hannover-Wuerzburg

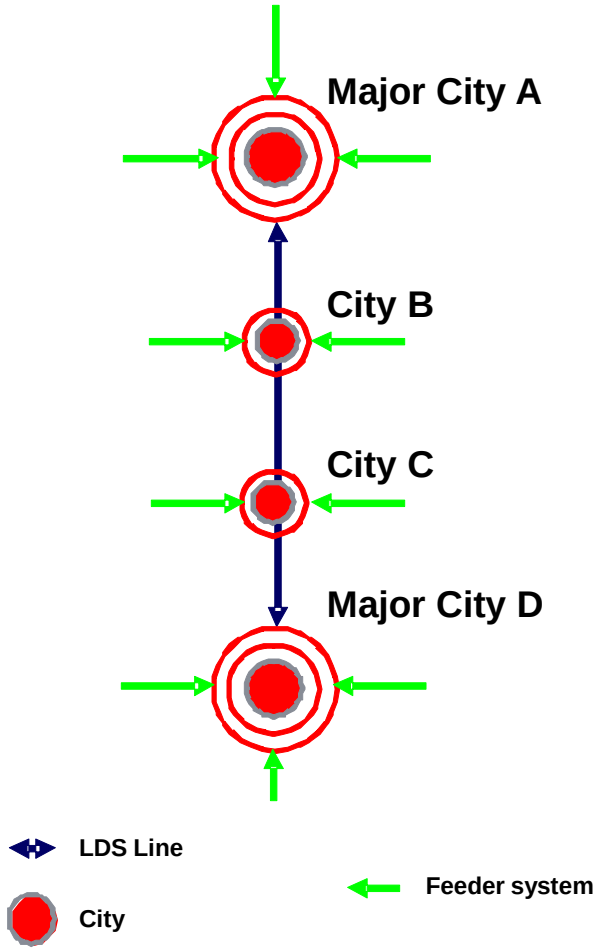


The old conventional line
is used by freight trains 24x7
On daytime the new High Speed Line
running in parallel is used by HSR trains
and fast passenger trains only
At night the High Speed Line is used
by freight train as well



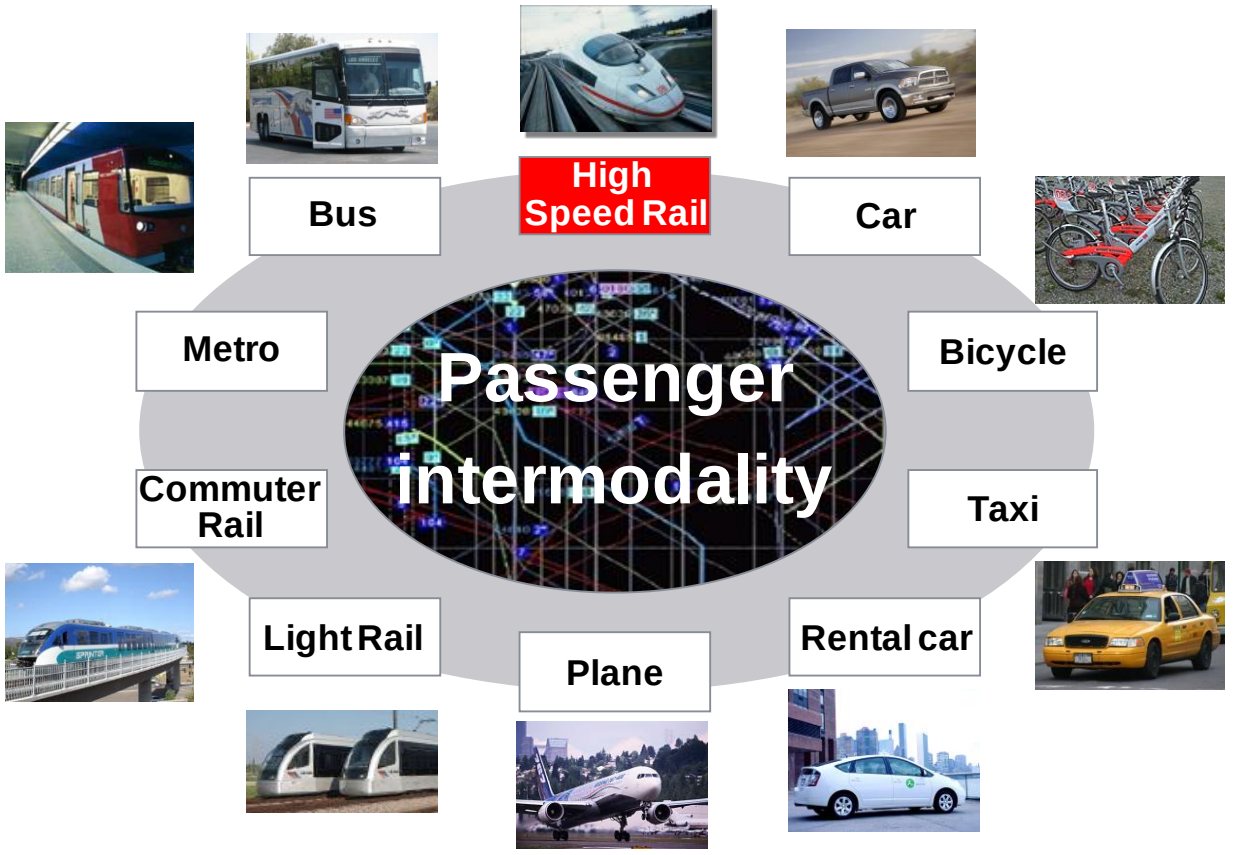
Long Distance Service is the backbone of a passenger rail system – regions get interconnected by attractive feeder systems

Integrated Feeder System



Passenger Intermodality is the key for an effective rail network operations

- Interchange Stations to link with Feeder Systems
- Direct connection of airline hubs by rail
- Park & Rail facilities for commuters
- Car Rental / Car sharing at station
- New ticket systems, e.g. Integrated City Transit & HSR tickets



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- **Project Examples**

Project Example – Berlin Central Station

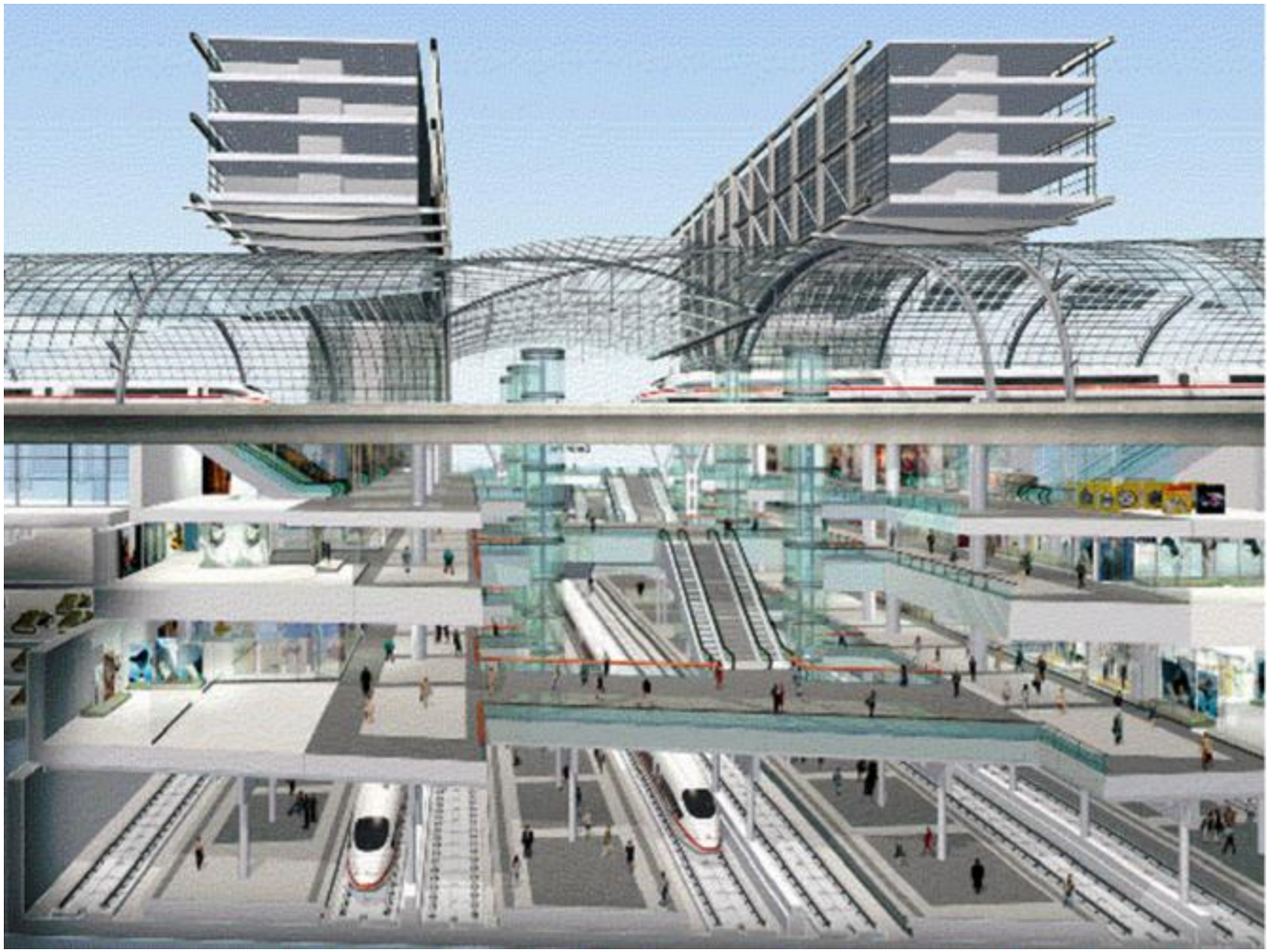
Project Example – Berlin Central Station

Construction	1997 – 2006
Passengers per day	350,000
Built up covered area of all floors	60,000 sq. m.
Estimated cost of the project	~ 975 Mio €

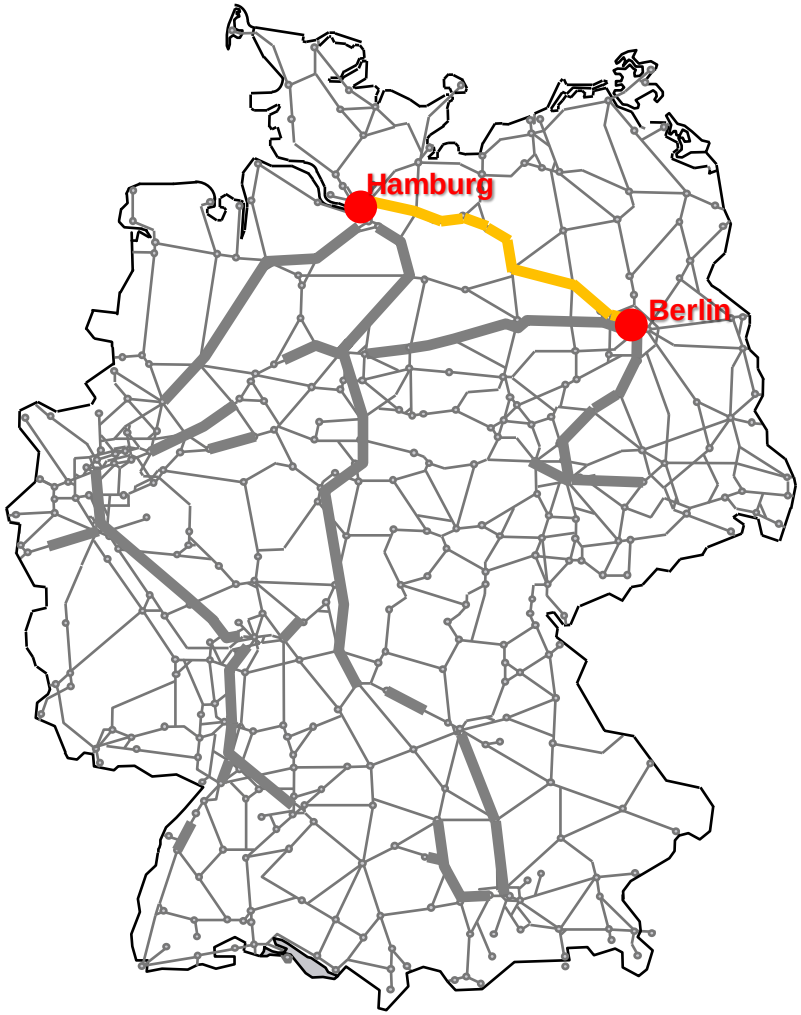
- World's largest intersection station in the heart of reunited Berlin, Germanys capital
- Lower level 25 m below ground, 4 platforms, 8 tracks
- Upper level 15 m above ground, 3 platforms, 6 tracks
- Three level shopping centre between the two platform levels with 15,000 sq. m. retail and services
- Two high-rise buildings above the tracks with 45,000 sq. m. office space




Project Example
– Station and urban development projects



Example HSR Upgrade: The Berlin – Hamburg Line gives a good example for our focused Investment Strategy

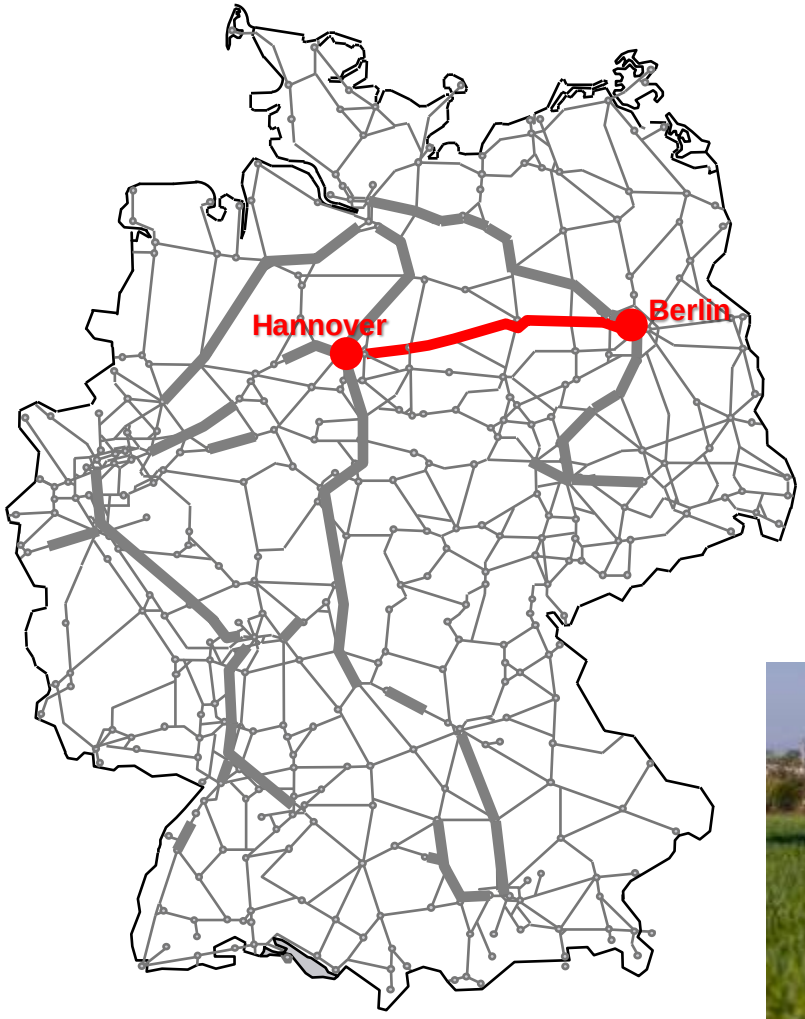


Case Study: Berlin – Hamburg

- Upgrade of an existing Railway Line
- Mixed Operation
- Terrain: rather flat
- Length: 270 km
- Operational: Speed 230 km/h
- Travel Time: 90 min.

- Investments: 650 mio. €
- Costs per Km: 2.4 Mio. € per km

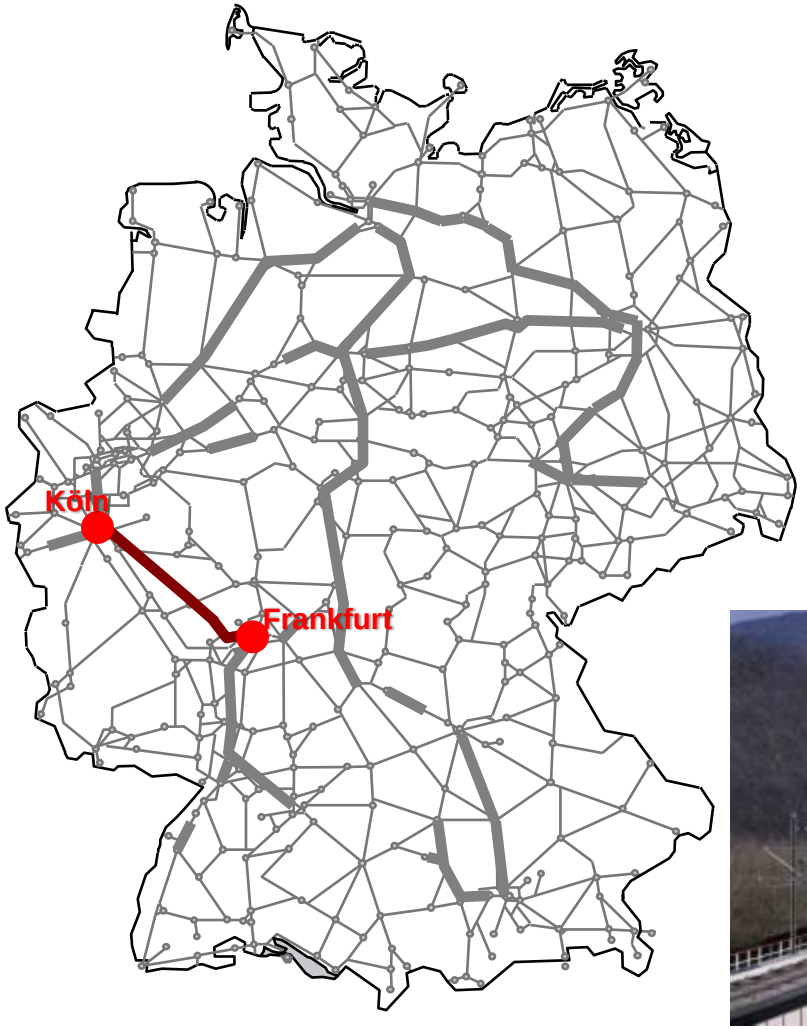
Example HSR new easy construction : In flat terrain also High Speed Lines have reasonable costs



Case Study: Berlin – Hannover

- New Construction of a High Speed Line
- Mixed Operation
- Terrain: rather flat
- Length: 260 km
  (200 km new, 70 km upgrade)
- Operational Speed: up to 250 km/h
- Travel Time: 90 min.
- Investments: 2.6 bn. € (1992-1998)
- Costs per Km: 9.7 Mio. € per km

Example HSR complex construction: Hilly terrain is challenging for High Speed Traffic and results in a higher construction effort



Case Study: Frankfurt – Köln

- New Construction of a High Speed Line
- Passenger Dedicated High Speed Line
- Terrain: hilly
- Length: 180 km
- Operational Speed: 300 km/h
- Travel Time: 75 min.
- Investments: 5.1 bn. € (1995-2002)
- Costs per Km: 28.3 Mio. € per km

Obrigado pela atenção!

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