

# Technical Solutions for dual-purpose High Speed Lines in Germany



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Prague, 14th November 2007  
Mobility Networks Logistics

# InterCity Express (ICE) at HSL Hannover – Würzburg (1991)



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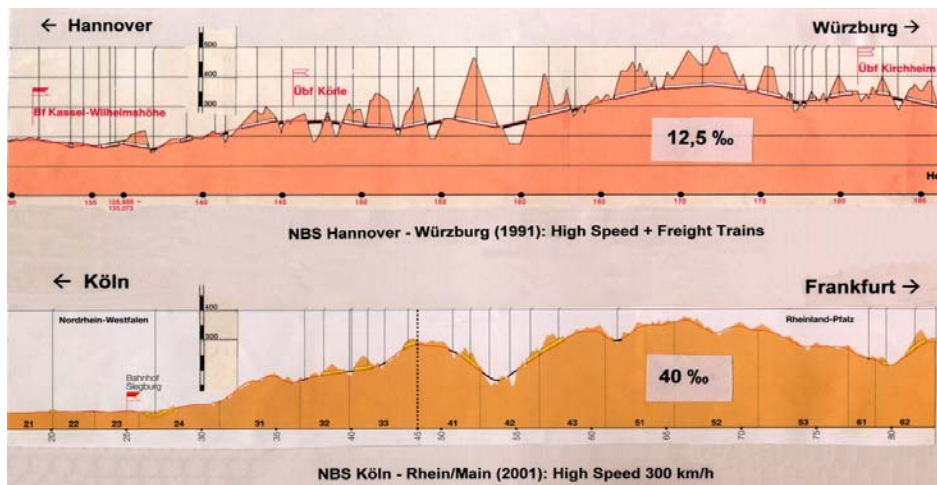
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**InterCity Cargo Express (160 km/h)  
on new line Hannover – Würzburg (1988)**



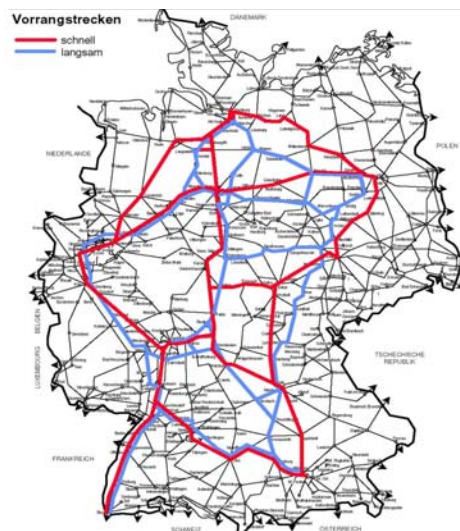
**Gradients of HS Lines**



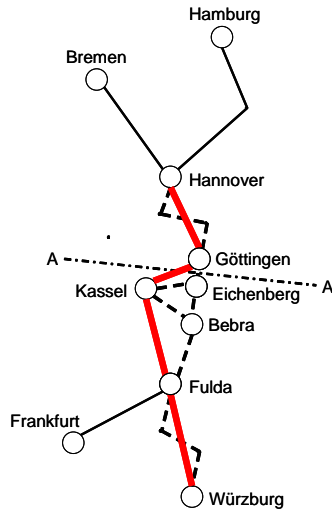
### Maximum cant and minimum radius on new lines

- Mixed traffic lines Hanover-Würzburg and Mannheim-Stuttgart:  
cant 87 mm; R min = 5100 m
- Mixed traffic line Nuremberg-Ingolstadt:  
cant 160 mm, R min = 4085 m
- Dedicated passenger traffic line Köln-Frankfurt:  
cant 170 mm, R min = 3350 m

## Strategy Netz 21: segregation of traffic, priority lines „fast“ and „slow“, final stage



## Regularly scheduled passenger and freight train pairs on working days



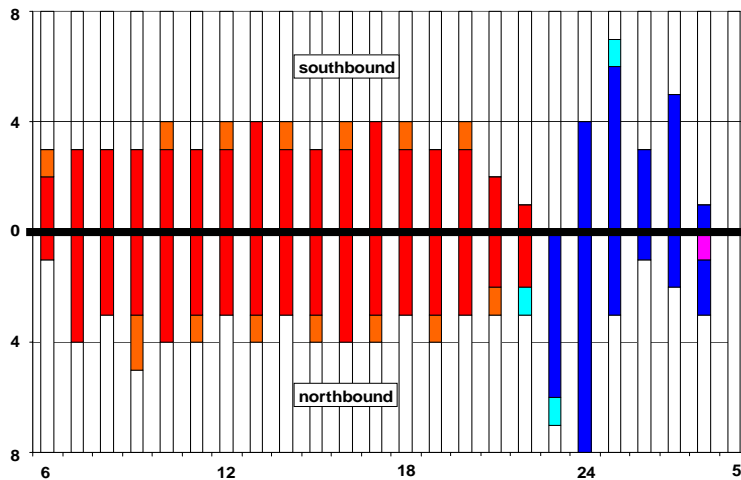
### Hannover – Würzburg old & new line in parallel

	1990	1992	2007
North-south line, freight	77	66	77
North-south line, passenger	68	45	19
New line, freight trains	0	35	18
New line, passenger trains	0	38	53

Trains per day and direction between Göttingen and Kassel / Eichenberg

— New line (NBS) 1991

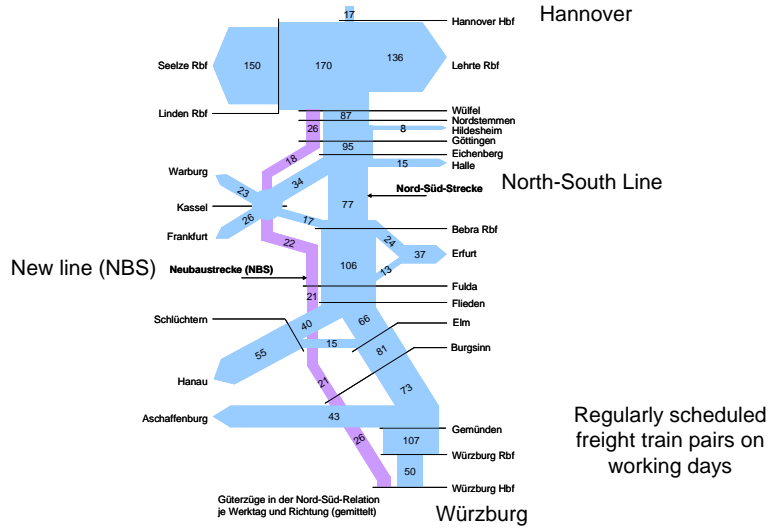
## Distribution of regularly scheduled trains on the new line



work days on HSL  
Hannover – Würzburg  
Göttingen – Kassel section 2003

■ Passenger trains  
■ Freight trains

# Hanover-Würzburg, Freight trains on the new line (NBS) and the North-South-Line, 2007

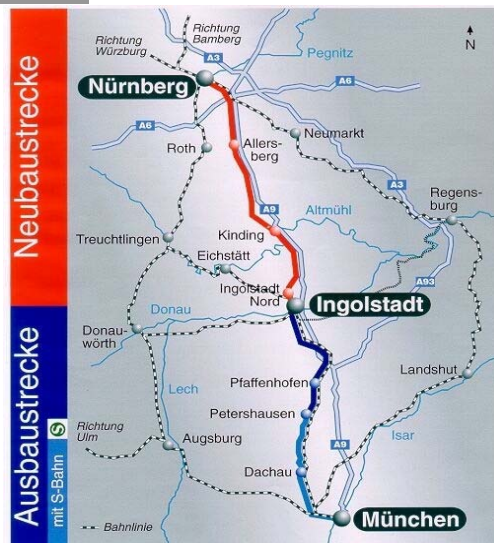


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# New and upgraded line Nuremberg - Ingolstadt – Munich



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# Freight trains between Würzburg and Munich, 2007

