



Bundesministerium
für Verkehr und
digitale Infrastruktur



International high-speed and overnight
rail services to promote climate change
mitigation

Secretariat of the Federal Government
Commissioner for Rail Transport

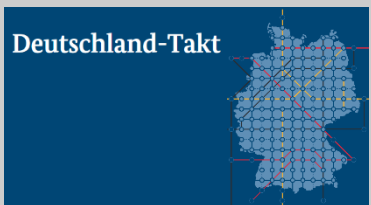
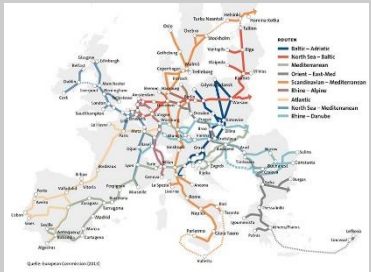
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4. Conclusion and next steps

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Societal change in travel behaviour – wider clientele



Changes in travel choices due to effects such as

- greater awareness of climate change (“flying shame”)
- shorter journey times thanks to growing high-speed networks
- direct links to and from smaller towns and cities located along the routes of the mainlines

Opportunity for new message from railways – new TEE network

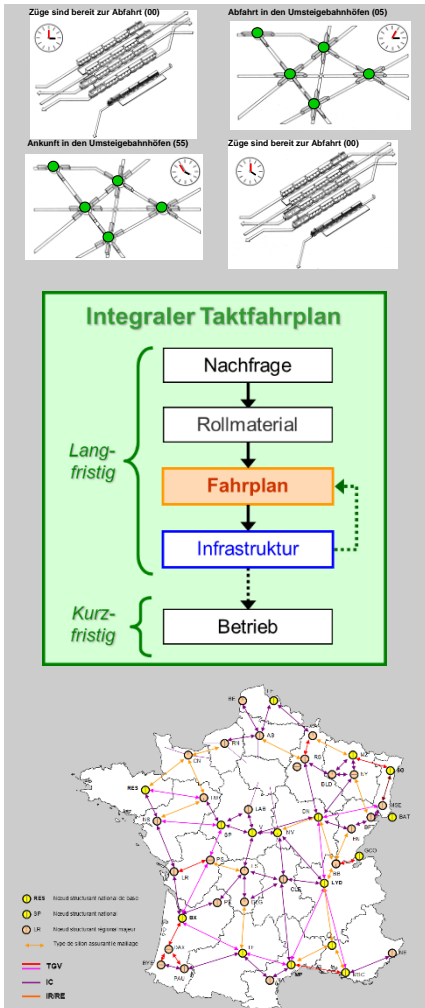
High-speed trains over long distances (passing through 4, but at least 3 countries)

The **TransEuropExpress 2.0**, or **TEE 2.0** for short, is thus a symbol of cohesion and further European integration.

Opportunity presented by the German clock-face timetable

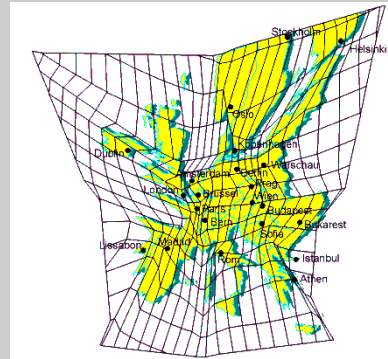
TEE 2.0 and attractive overnight services can be integrated in the German clock-face timetable and will not use any paths at the expense of freight trains.

Clock-face timetabling such as the “Deutschlandtakt” to form the basis of new TEE network



- “More frequent – faster – everywhere”: clock-face timetable will establish a new, transparent principle of upgrading and capacity management.
- For all types of traffic, reserved capacity will be available that ensures good connections in passenger traffic and reliable paths in goods traffic. The basis will be a clock-face system with trains running hourly or half-hourly.
- Infrastructure schemes derived from the timetable will significantly enhance the capacity of the overall network and appreciably increase the nationwide system speed.
- Numerous neighbouring countries are using such planning methods or already have a network of highly frequent long-distance trains.
- *TEE 2.0* will interlink the individual optimized systems to form a range of European services designed to reduce international journey times

Analysis of the situation and blueprint for the *TEE 2.0* network in Europe



- Identify origin-destination pairs that have inadequate rail services today (existing lines are not called into question)
- Develop international lines that reflect the European blueprint and have the following objectives:
 - Interlink national high-speed lines to form international lines that stimulate great demand while using as few additional paths on the domestic networks as possible.
 - Identify opportunities and risks plus the need for action
 - Reduce journey times significantly and lift transfer restrictions
- Identify the technical and timetable-based challenges posed by the lines identified
- Derive infrastructure schemes and identify possible rolling stock blueprints for the lines identified

Supplementary steps for the blueprint of a Europe overnight train network



Objectives for the blueprint of a Europe overnight train network

- Identify possible rolling stock and production blueprints for the lines identified
- Identify the necessary planning steps for the way forward

Planning bases for overnight train lines

- Maximum speed 160 – 230 km/h (Talgo: 250 km/h)
- Existing overnight trains operating satisfactorily (Austria/Switzerland – Germany) will not be re-addressed. Rather, it will be assumed that they will be evolved and continue to operate



Source: <https://blog.oebb.at/die-nightjets-der-neuen-generation/>

EuroNight

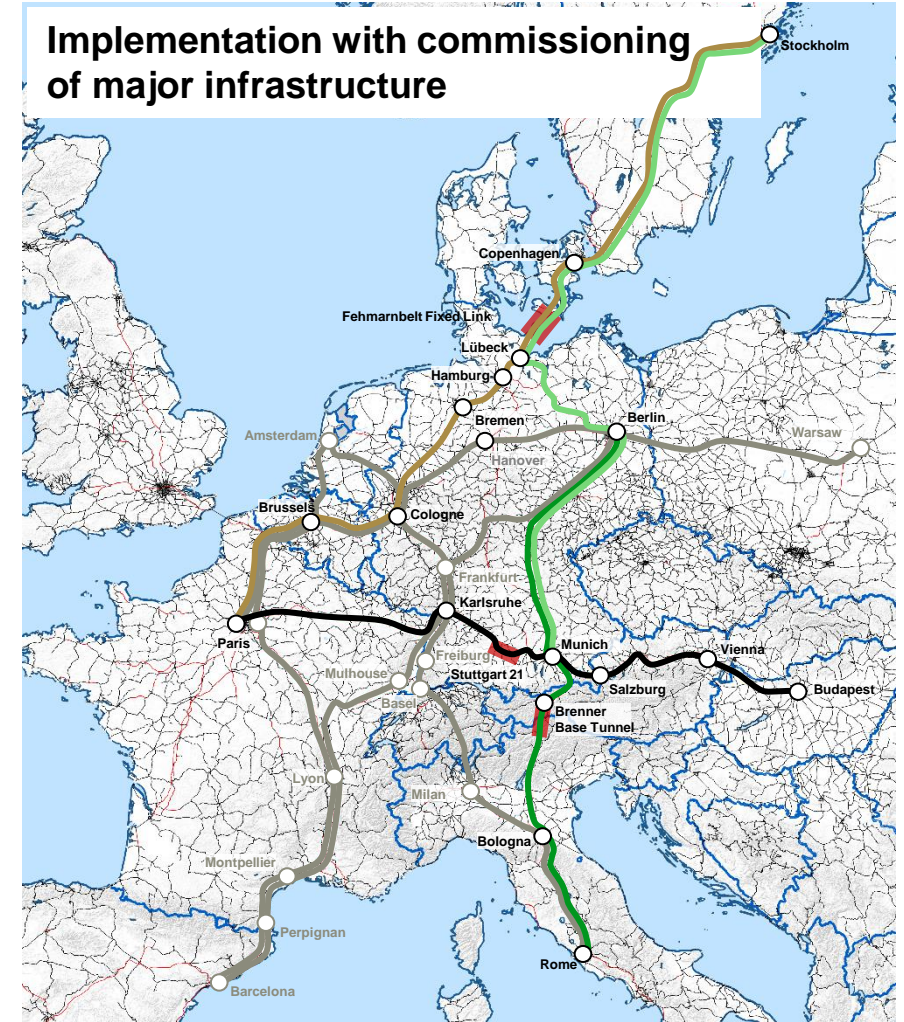
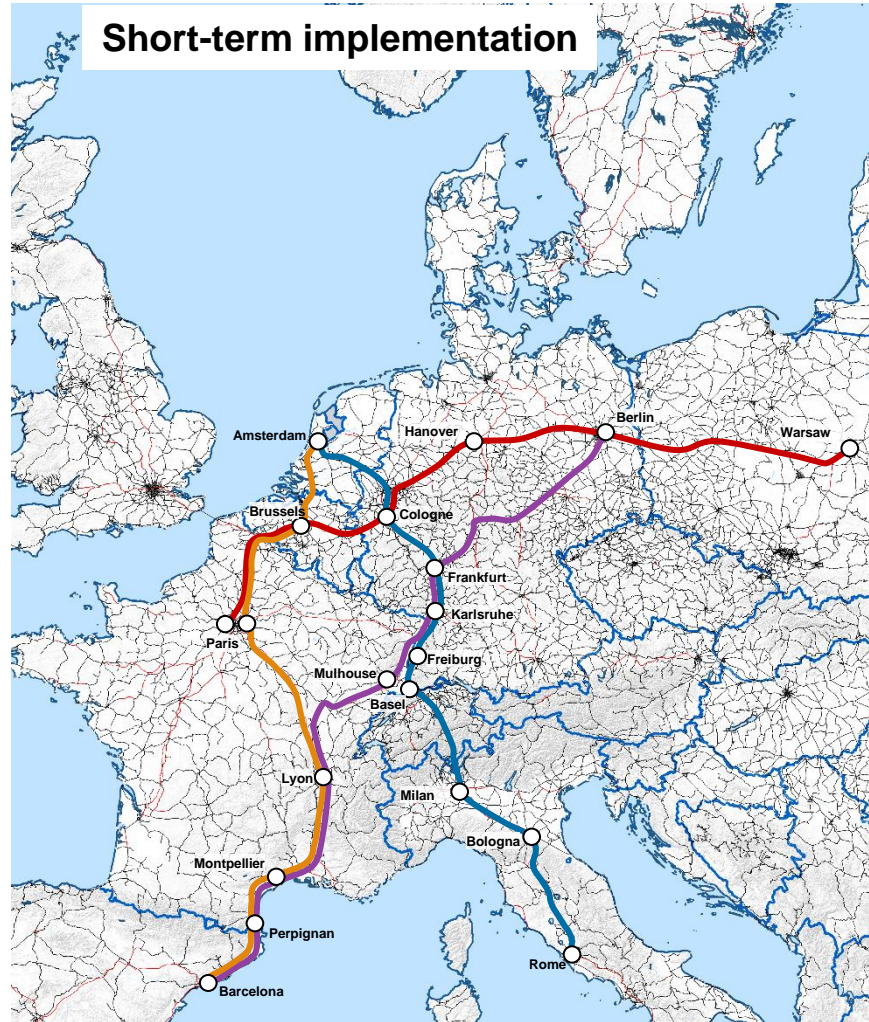
The development of additional overnight trains is to be welcomed, but their economic challenge is not to be underestimated: sleeping berths can only be sold once per journey, whereas on *TEE 2.0* trains, it will be possible to market one seat several times for shorter journeys. In addition, the space required per passenger is significantly greater.

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The TEE network will be implemented in two phases

- TEE 1 / TEE 2** █
Paris – Brussels – Cologne –
Berlin – Warsaw
- TEE 3 / TEE 4** █
Amsterdam – Cologne – Basel
– Milan – Rome
- TEE 5 / TEE 6** █
Berlin – Frankfurt – Lyon –
Montpellier – Barcelona
- TEE 7 / TEE 8** █
Amsterdam – Brussels – Paris
– Lyon – Barcelona
- TEE 9 / TEE 10** █
Berlin – Munich – Innsbruck –
Bologna – Rome
- TEE 11 / TEE 12** █
Paris – Strasbourg – Stuttgart
– Munich – Vienna – Budapest
- TEE 13 / TEE 14** █
Paris – Brussels – Hamburg –
Copenhagen – Stockholm
- TEE 15 / TEE 16** █
Stockholm – Copenhagen –
Berlin – Munich



2ND IMPLEMENTATION PHASE

The second phase of the TEE network will use major infrastructure upgrades under construction

TEE 9 / TEE 10

Berlin – Munich – Innsbruck –
Bologna – Rome

TEE 11 / TEE 12

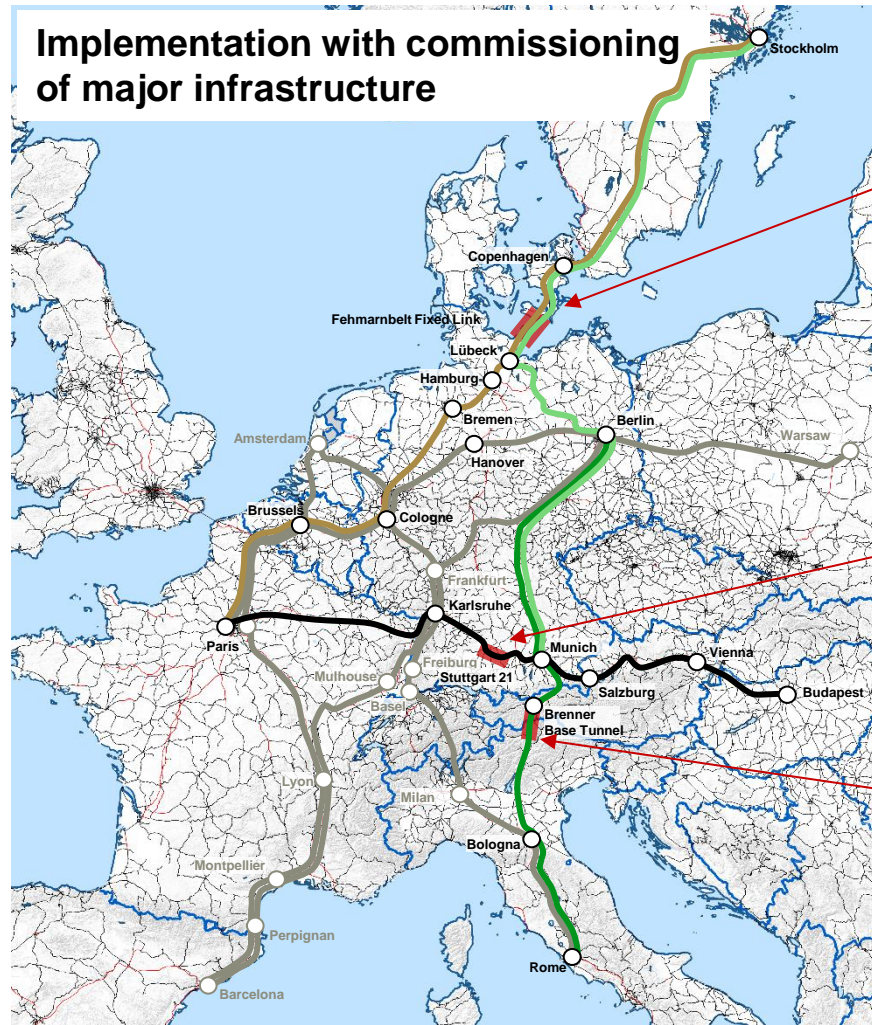
Paris – Strasbourg – Stuttgart
– Munich – Vienna – Budapest

TEE 13 / TEE 14

Paris – Brussels – Hamburg –
Copenhagen – Stockholm

TEE 15 / TEE 16

Stockholm – Copenhagen –
Berlin – Munich



Links to and from Scandinavia

Once the fixed Fehmarn Belt Fixed Link between Germany (Puttgarden) and Denmark (Rødbyhavn) has been commissioned, it will be possible to reduce journey times on this route

East-West corridor via Southern Germany

Services between Paris and Budapest will benefit from Stuttgart 21 and the new Stuttgart – Ulm high-speed line because (a) trains will no longer have to reverse and (b) it will be possible to reduce journey times.

Base tunnel on the Brenner artery

The Brenner Base Tunnel will likewise make it possible to operate trains between Berlin, Munich and Rome at high speeds on most sections, thereby enhancing attractiveness.

Key long-term infrastructure projects of the “Deutschlandtakt” to accelerate the TEE in Germany



The lines that can be constructed in the short term will be significantly accelerated by the following infrastructure projects:

- Hanover – Bielefeld – Hamm
- Karlsruhe – Basel (Rhine Valley Line)
- Mannheim – Erfurt (incl. mainline tunnel in Frankfurt)

The *TEE 2.0* trains will take you right to the heart of European capitals

Short-term implementation

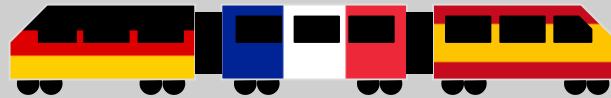
TEE 1/2: Paris – Brussels – Cologne – Berlin – Warsaw



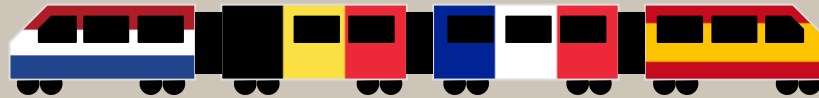
TEE 3/4: Amsterdam – Cologne – Basel – Milan – Rome



TEE 5/6: Berlin – Frankfurt – Lyon – Barcelona



TEE 7/8: Amsterdam – Brussels – Paris – Lyon – Barcelona



Implementation with commissioning of major infrastructure

TEE 9/10: Berlin – Munich – Innsbruck – Bologna – Rome



TEE 11/12: Paris – Stuttgart – Munich – Vienna – Budapest



TEE 13/14: Paris – Brussels – Hamburg – Stockholm



TEE 15/16: Stockholm – Copenhagen – Berlin – Munich



There is already rolling stock today that can operate in many countries of Europe

Minimum requirement 300 km/h

Many European high-speed networks are designed for a speed of around 300 km/h. For this reason, rolling stock designs that do not achieve this threshold are not included in the adjacent table.

High-speed in Eastern Europe

In the Czech Republic and Poland, Pendolino trains are in operation today that can run at a maximum speed of 230 km/h and 250 km/h respectively.

Designation		TGV Euroduplex and similar	Velaro and similar	Zefiro 380 and similar	Smile / Giruno
Manufacturer		Alstom	Siemens	Bombardier / Hitachi Rail	Stadler
Certified in	FR	X (various classes)	X (class 406/407)	X (Frecciarossa 1000)	
	DE	X (TGV POS)	X (various classes)		(X) (medium to long term)
	BE	X (various classes, Thalys)	X (class 406/407, Eurostar)		
	NL	X (Thalys, single-decker!)	X (class 406/407, Eurostar)		
	ESP	X (TGV Duplex)	X (Velaro ESP)		
	CH	X (TGV Lyria)			X
	AT		X (various classes)		(X) (medium to long term)
	IT			X (Frecciarossa 1000)	(X) (medium to long term)
	PO				
	HU				
DK					
SWE					
Maximum speed		320 km/h	350 km/h (Velaro ESP)	360 km/h	250 km/h (poss. 300)

Operator: establishment of a company to operate the new TEE network

Proposal

Establishment of a company, for instance by SNCF and DB, in which other interested and ambitious railways (e.g. NS, ÖBB, SBB) could take a holding. This company would be approved as an independent railway undertaking and purchase services from the parent companies for production.

Opportunities presented by this proposal

- Use national expertise of the individual partners
- No need for staff of its own to operate the services
- Experience specific to countries and rolling stock can inform rolling stock certification
- Use of existing rolling stock for short-term launch of the TEE network
- Symbol of European cooperation

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Modern rolling stock for overnight train services is available on the market

New overnight trainsets procured by ÖBB



Source: <https://www.nightjet.com/de/komfortkategorien/nightjetzukunft>

Manufacturer: Siemens

Sleeping cars for Azerbaijan



Source: www.bahnonline.ch

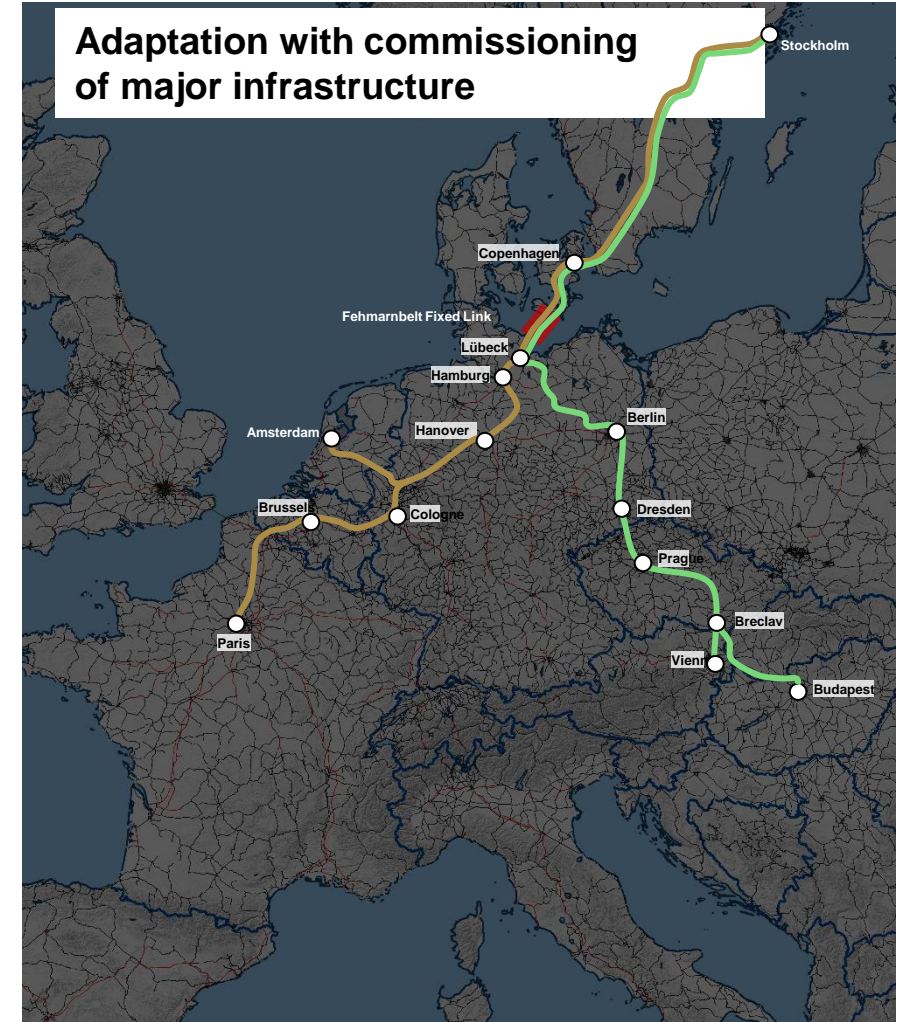
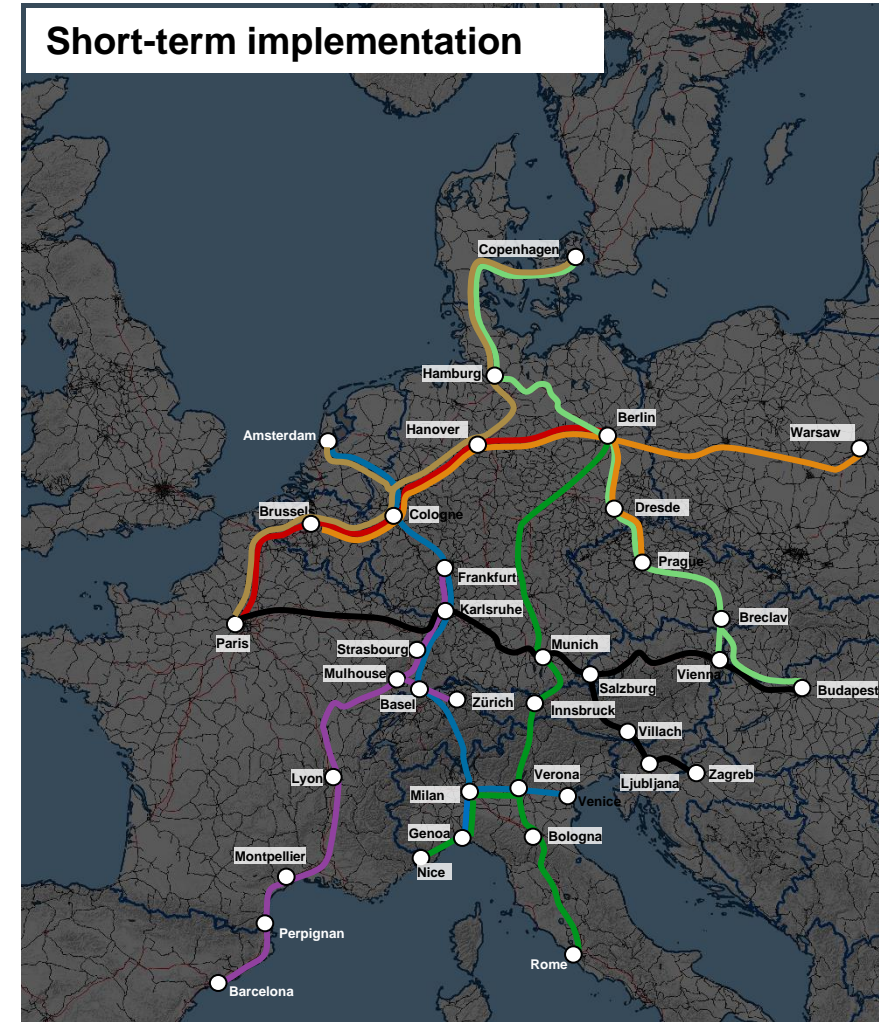
Manufacturer: Stadler



EuroNight overnight network comprising 8 lines of which 2 with medium-term extension option

- 21 / 22** Paris – Brussels – Cologne – Berlin
- 23 / 24** Brussels – Cologne – Berlin – Prague/Warsaw
- 25 / 26** Amsterdam – Cologne – Basel – Milan – Venice/Genoa
- 27 / 28** Frankfurt – Strasbourg/Zürich – Mulhouse – Lyon – Montpellier – Barcelona
- 29 / 30** Berlin – Munich – Innsbruck – Bologna – Rome/Nice
- 31 / 32** Paris – Strasbourg – Stuttgart – Munich – Vienna – Budapest/Zagreb
- 33 / 34** Paris – Brussels/Amsterdam – Hamburg – Copenhagen – Stockholm*
- 35 / 36** Stockholm* – Copenhagen – Berlin – Prague – Vienna/Budapest

*If no Fehmarnbelt link, only to Copenhagen (see subdivision into A and B)

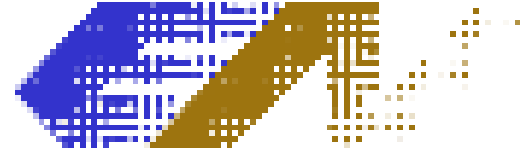


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Conclusion and next steps

- An attractive range of services could be created using present-day infrastructure and timetables.
- For business and leisure travellers, these services could very soon represent a climate-friendly alternative to air travel.
- Since implementation requires “merely” coordination between railway undertakings with regard to timetables, certification issues, through trains and fares, implementation in the near future would appear conceivable.
- Facilitation by the EU Member States as owners of the railway undertakings and/or regulatory authorities would appear helpful with regard to speedy implementation.
- Implementation of the infrastructure projects envisaged for the “Deutschlandtakt” target timetable will make it possible to deliver significant journey time reductions and improved services at the heart of the European network, which will have a direct and positive impact on the new *TEE 2.0* blueprint.



Detailed descriptions of the lines

Paris – Brussels – Cologne – Berlin – Warsaw



Only one direction considered

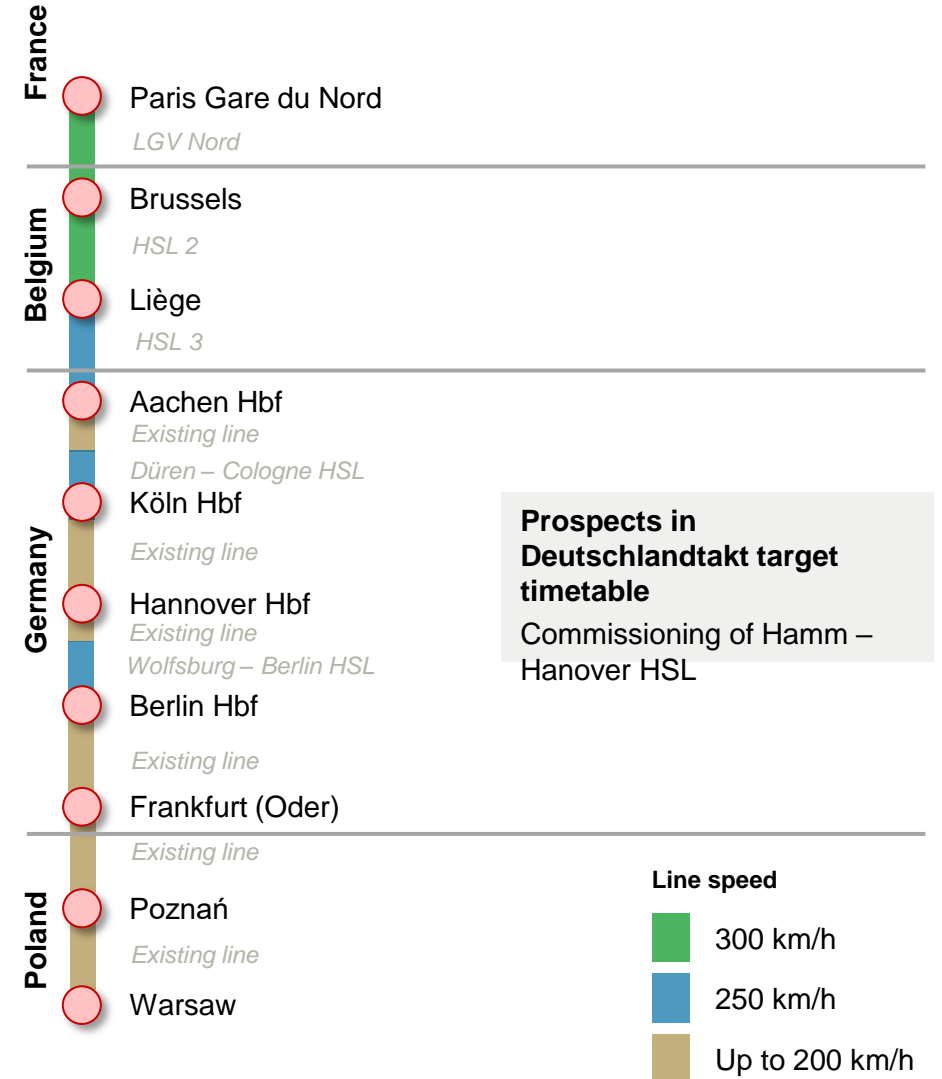
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction. The train crosses the train travelling in the opposite direction at 14:00 hrs.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEE 1/2 is based on present-day infrastructure.



Prospects in Deutschlandtakt target timetable
Commissioning of Hamm – Hanover HSL

TEE 1/2

Links to and from France and Belgium



Toulouse, dep. 22:20 hrs (arr. 06:52 hrs)
Briançon, dep. 20:03 hrs (arr. 06:55 hrs)
(Change stations in Paris)

London, dep. 07:16 hrs (arr. 10:12 hrs)
Rotterdam, dep. 08:58 hrs (arr. 10:08 hrs)
Bruges, dep. 09:10 hrs (arr. 10:07 hrs)
Gent, dep. 09:39 hrs (arr. 10:07 hrs)

10:18 hrs (arr. 11:09 hrs)

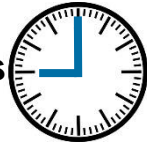
Paris Gare du Nord, 9:00 hrs

Brussels, 10:30 hrs

Liège, 11:15 hrs

Aachen 11:40 hrs

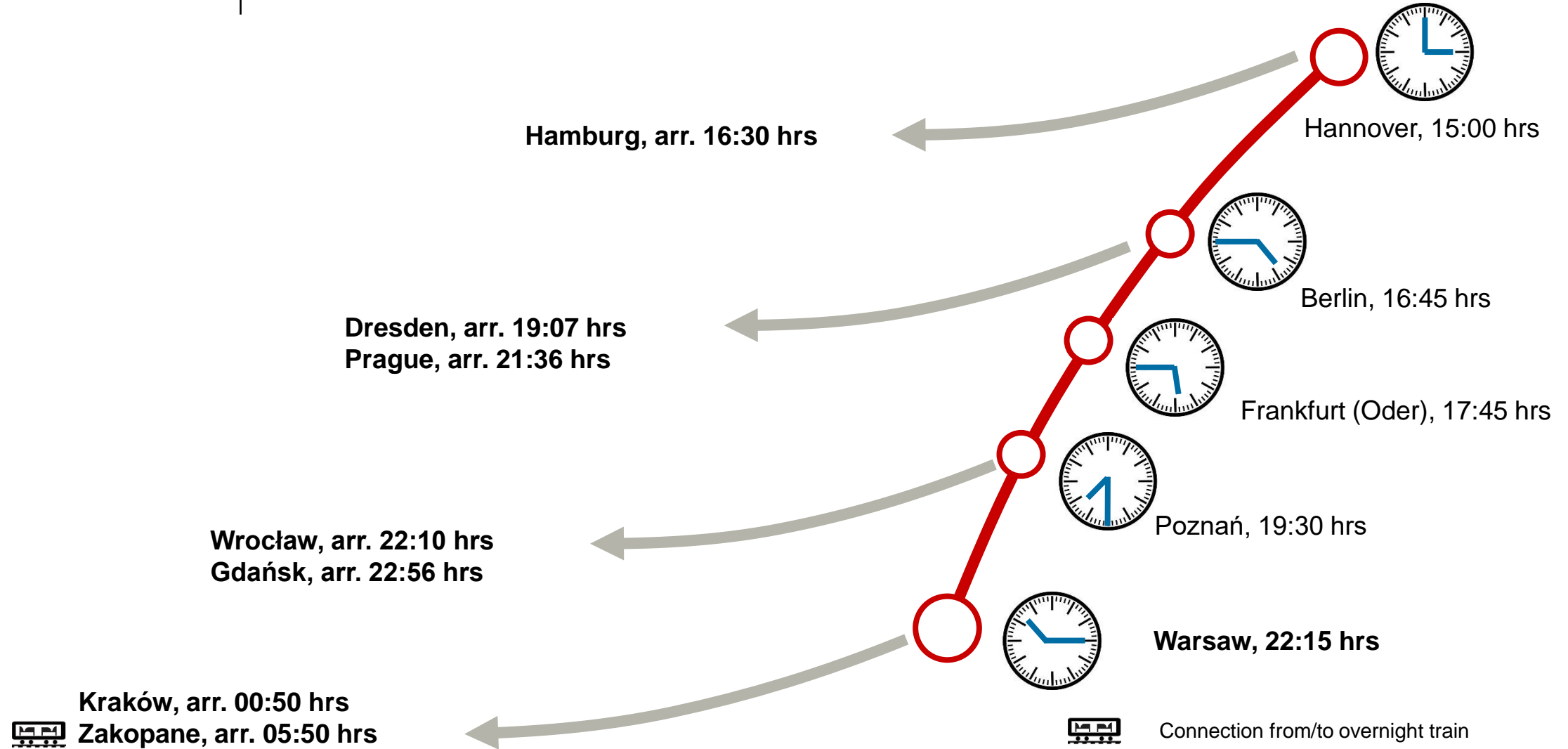
Köln 12:15 hrs



Connection from/to overnight train

TEE 1/2

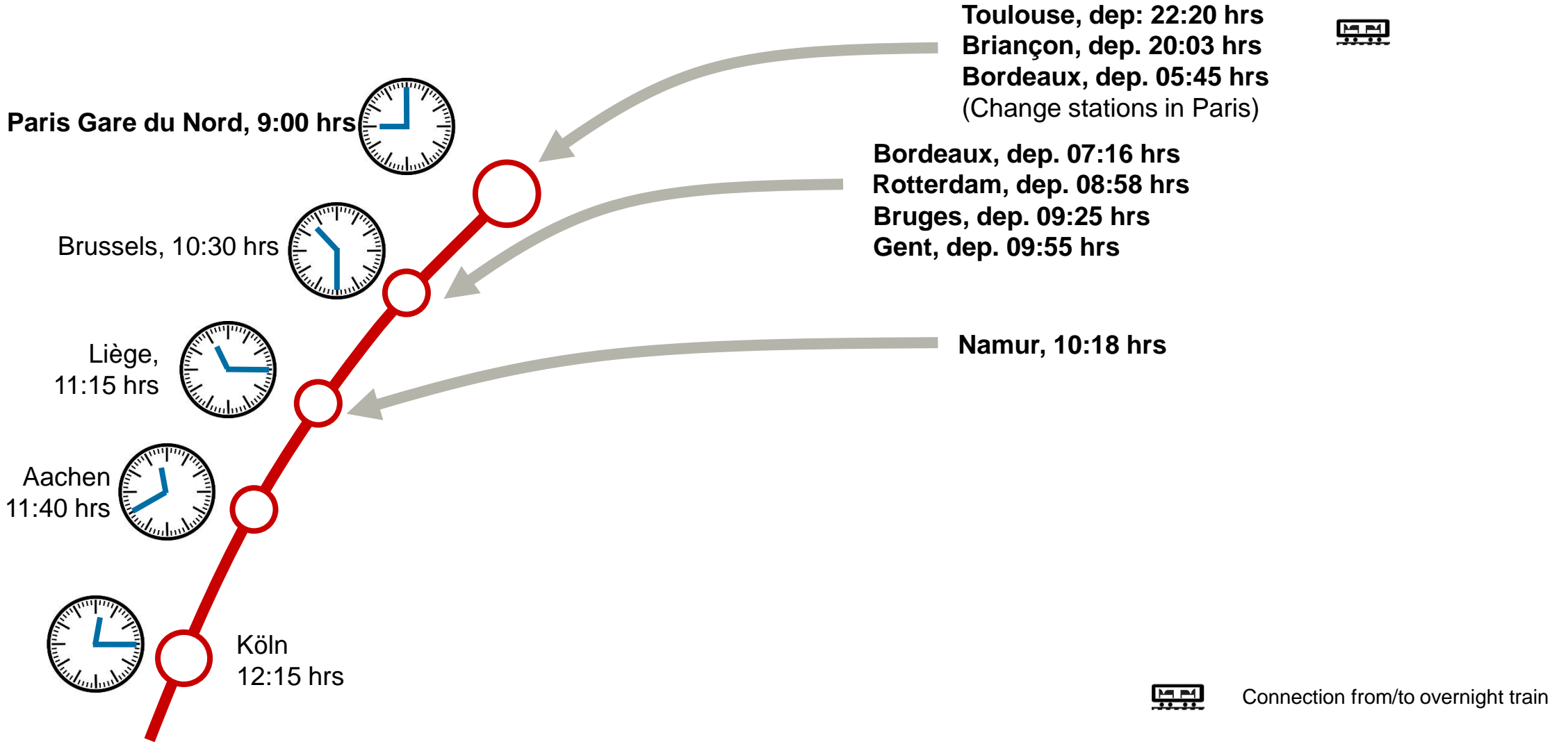
Links to and from Poland and Germany



TEE 1/2



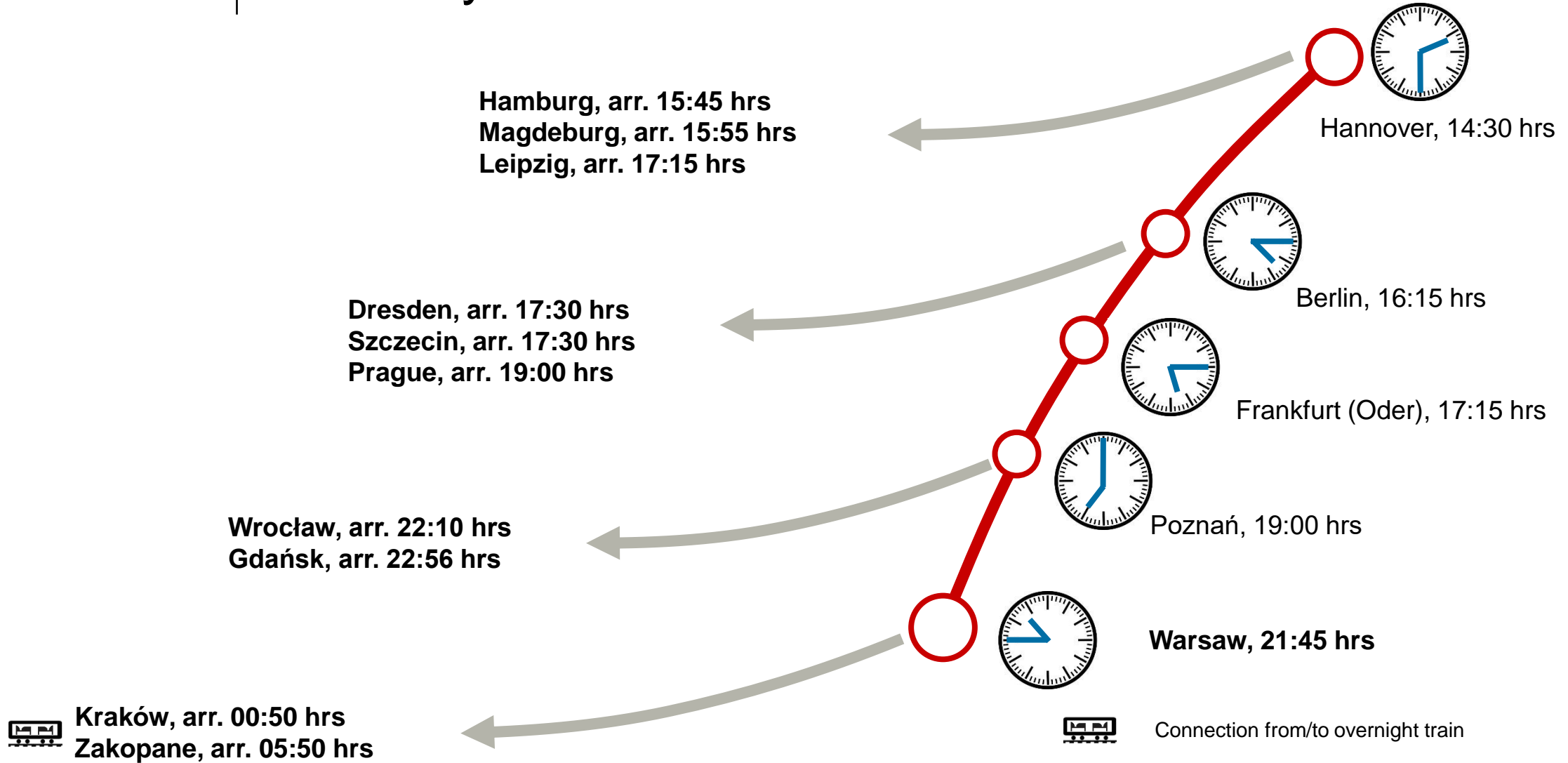
Further improvement in links to and from France and Belgium in the Deutschlandtakt



TEE 1/2



Further improvement in links to and from Germany and Poland in the Deutschlandtakt





A through service from Paris – Warsaw with a journey time of 13h and 15 min will be possible in the short term

Today

- Journey time: 15h31
- No of changes: 2
 - Change in Cologne
 - Change in Berlin

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Paris Nord	ab 07:55		THA 9413
Köln Hbf	an 11:16	5	
↳ Umsteigezeit 32 Min.			
Köln Hbf	ab 11:48	2 A-C	ICE 859
Berlin Hbf (tief)	an 16:10	5	
↳ Fußweg 9 Min.			
Berlin Hbf	ab 17:43	11	EC 249
Warszawa Centralna	an 23:26		

TEE network

- Journey time: 13h15
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Paris Nord	ab 09:00		TEE 1
Warszawa Centralna	an 22:15		
> Zwischenhalte einblenden			
Hinweise Free onboard WiFi Free onboard entertainment system Restaurant car and at-seat service of light refreshments Seats facing the direction of travel			
<input type="checkbox"/> Bahnhofsinformationen		<input type="checkbox"/> Kartenansicht	

TEE network (target timetable)

- Journey time: 12h45
- Through service
- Hamm – Hanover and Hanover – Berlin HSL 300 km/h

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Paris Nord	ab 09:00		TEE 1
Warszawa Centralna	an 21:45		
> Zwischenhalte einblenden			
Hinweise Free onboard WiFi Free onboard entertainment system Restaurant car and at-seat service of light refreshments Seats facing the direction of travel			
<input type="checkbox"/> Bahnhofsinformationen		<input type="checkbox"/> Kartenansicht	

TEE 3/4



Amsterdam – Cologne – Basel – Milan – Rome

Only one direction considered

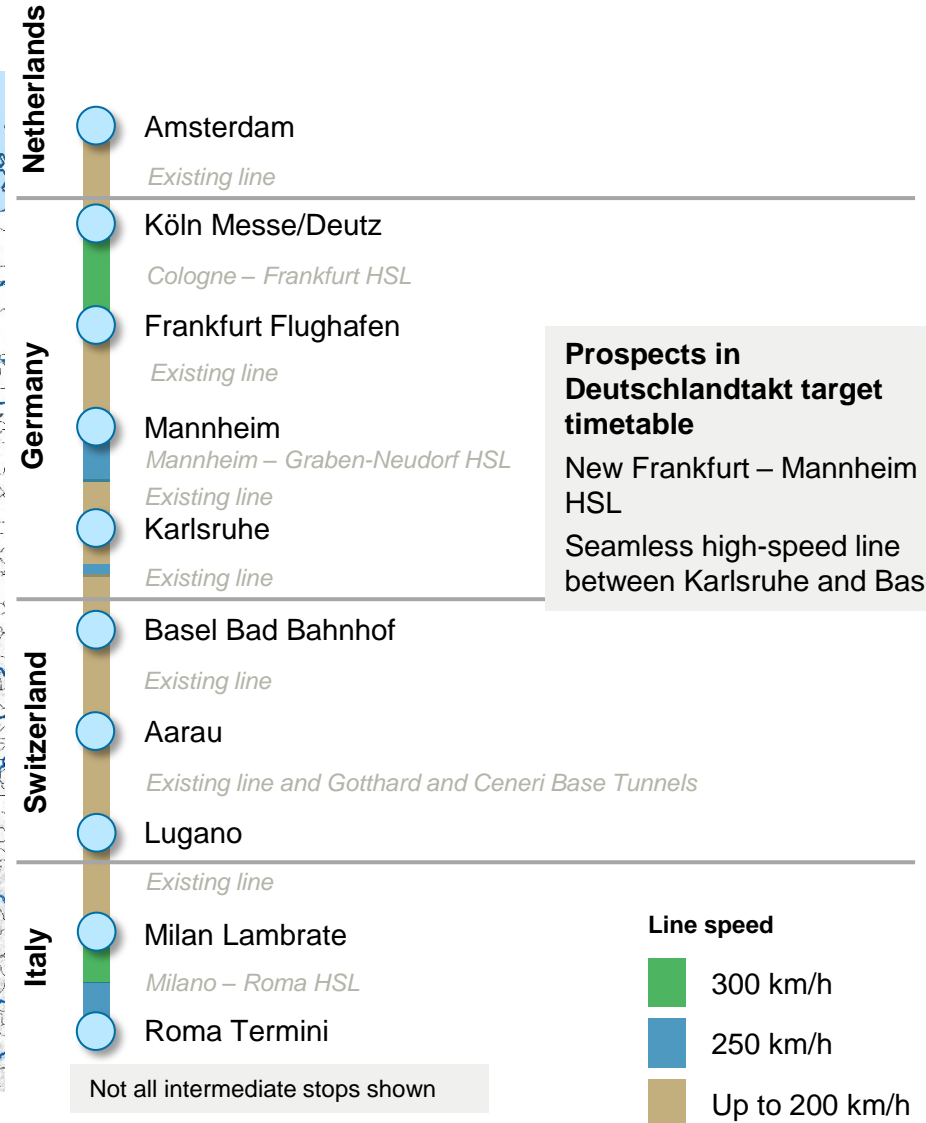
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Infrastructure basis

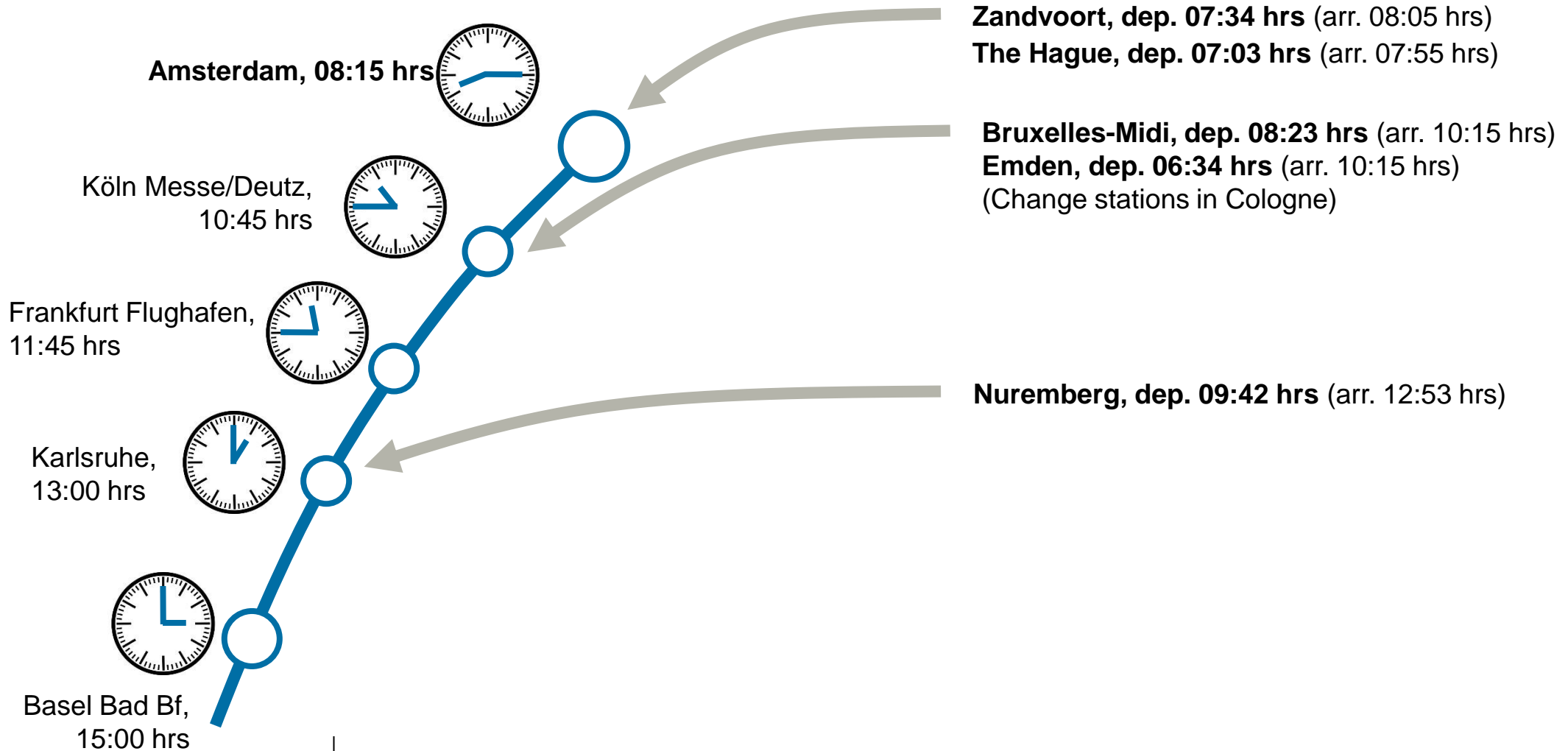
The blueprint for trains TEE 3/4 is based on the infrastructure as at the end of 2020 (commissioning of the Ceneri Base Tunnel)



Prospects in Deutschlandtakt target timetable
 New Frankfurt – Mannheim HSL
 Seamless high-speed line between Karlsruhe and Basel

TEE 3/4

Links to and from the Netherlands and Germany



TEE 3/4

Links to and from Switzerland and Italy



Naples, arr. 23:15 hrs
Siracusa, arr. 11:30 hrs
Palermo, arr. 12:00 hrs

Turin, arr. 20:38 hrs
Venice, arr. 21:55 hrs
(Change stations in Milan)

Locarno, arr. 17:42 hrs

Zürich, arr. 16:00 hrs
Zürich, dep. 15:40 hrs
Lucerne, dep. 15:40 hrs

Rome, 22:00 hrs



Connection from/to overnight train



Milan Lambrate, 18:45 hrs



Bologna, 19:45 hrs



Florence Campo di Marte, 20:30 hrs



Lugano, 17:30 hrs



Bellinzona, 17:15 hrs



Arth-Goldau, 16:15 hrs

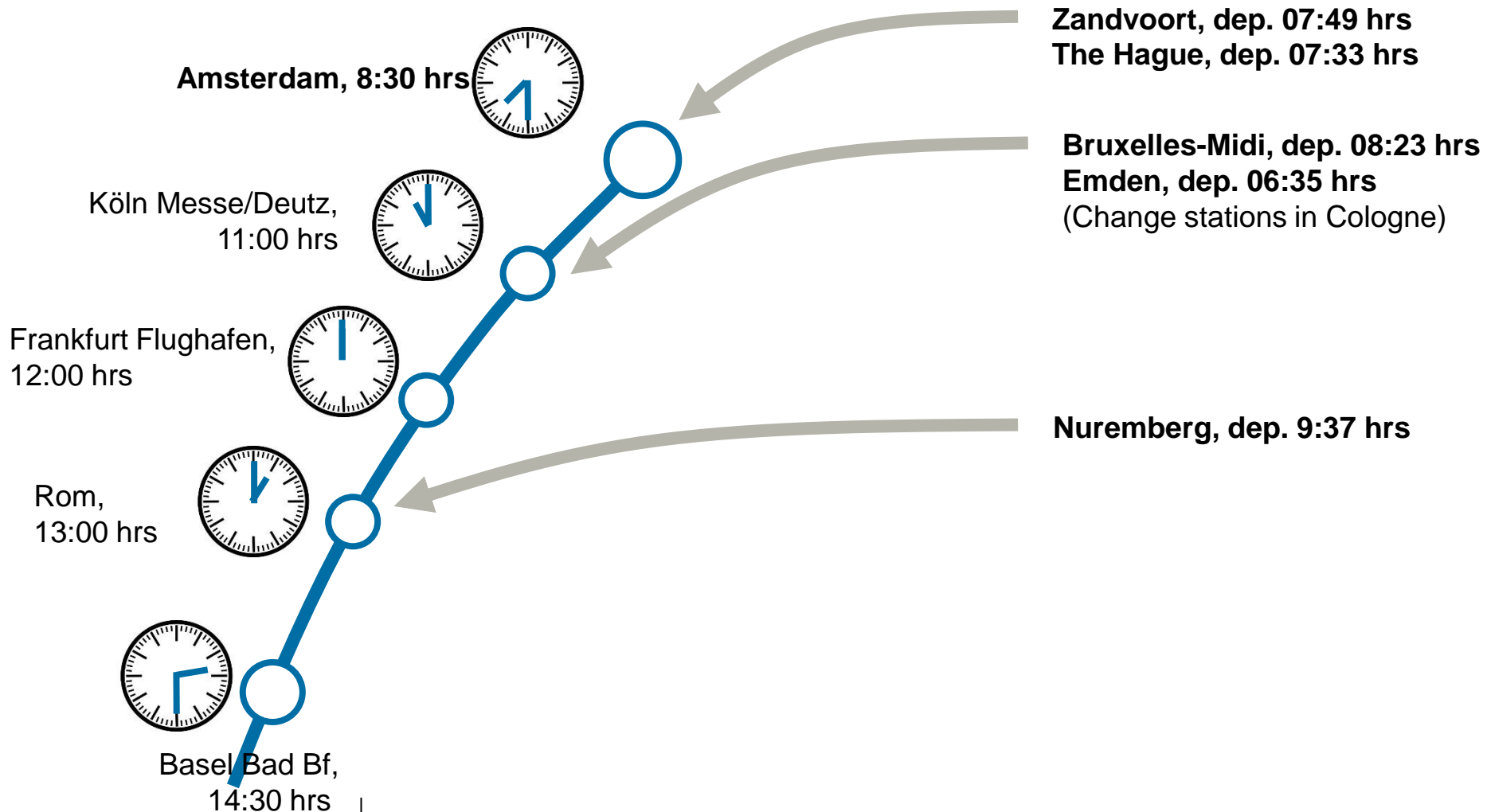


Aarau, 15:30 hrs

TEE 3/4



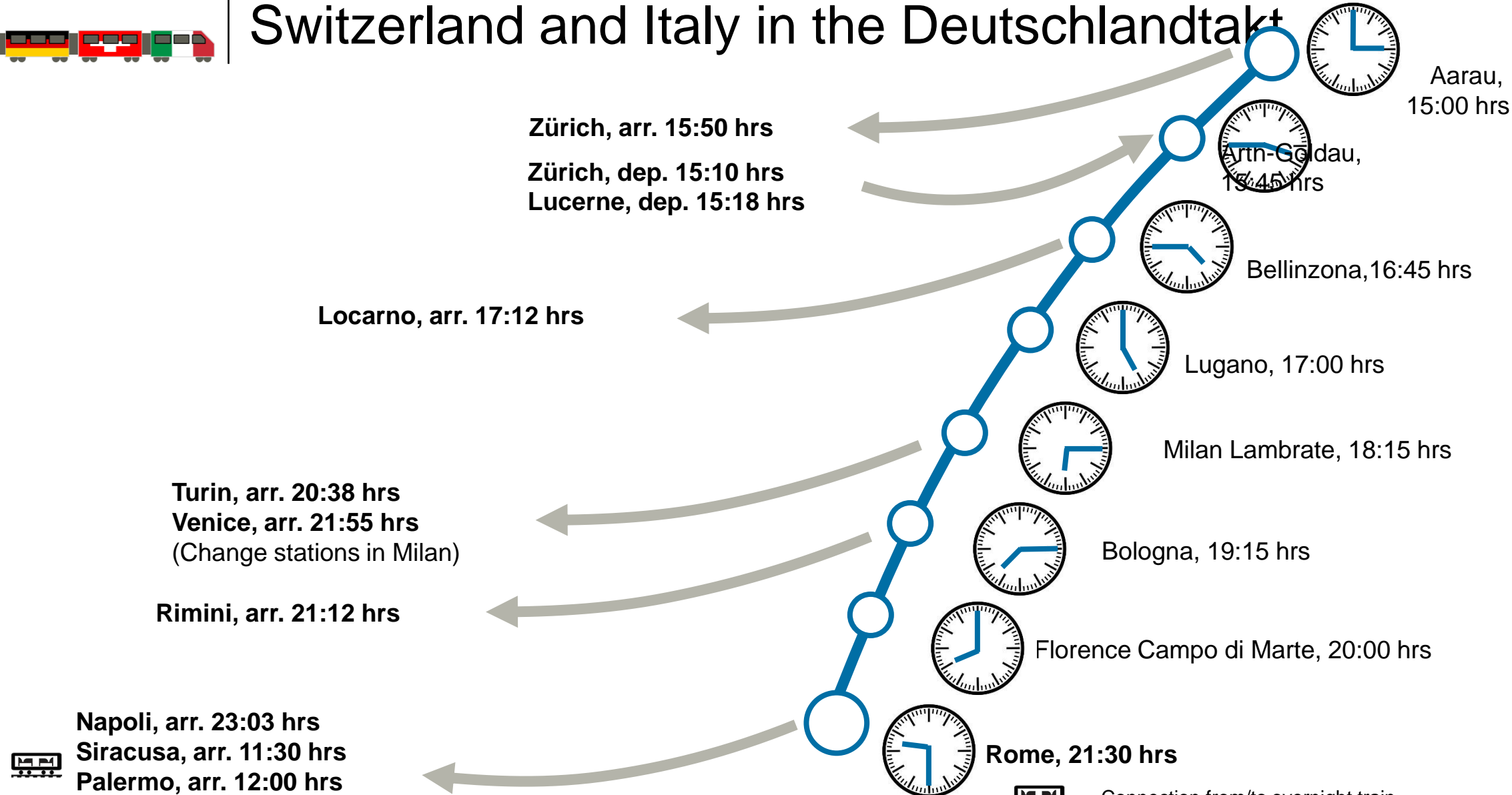
Further improvement in links to and from the Netherlands and Germany in the Deutschlandtakt



TEE 3/4



Further improvement in links to and from Switzerland and Italy in the Deutschlandtakt



Connection from/to overnight train

Blueprint TEE 2.0 | 27.01.2020 | SMA



A through service from Amsterdam – Rome with a journey time of 13h and 45min will be possible in the short term

Today

- Journey time: 16h02
- No of changes: 4

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Amsterdam Centraal	ab 06:38	7b	ICE 121
Frankfurt(Main)Hbf	an 10:31	18	
☰ Umsteigezeit 19 Min.			
Frankfurt(Main)Hbf	ab 10:50	9	ICE 277
Basel SBB	an 13:47	12	
☰ Umsteigezeit 16 Min.			
Basel SBB	ab 14:03	7	IR 2327
Arth-Goldau	an 15:51	5	
☰ Umsteigezeit 14 Min.			
Arth-Goldau	ab 16:05	6	EC 321
Milano Centrale	an 18:50		
☰ Umsteigezeit 35 Min.			
Milano Centrale	ab 19:25		FR 9663
Roma Termini	an 22:40		

TEE network

- Journey time: 13h45
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Amsterdam Centraal	ab 08:15	7b	TEE 3
Roma Termini	an 22:00		

> Zwischenhalte einblenden

Hinweise

- Free onboard WiFi
- Free onboard entertainment system
- Restaurant car and at-seat service of light refreshments
- Seats facing the direction of travel

☑ Bahnhofsinformationen

☑ Kartenansicht

TEE network (target timetable)

- Journey time: 13h00
- Through service
- New Frankfurt – Mannheim HSL
- Seamless Karlsruhe – Basel HSL

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Amsterdam Centraal	ab 08:30	7b	TEE 3
Roma Termini	an 21:30		

> Zwischenhalte einblenden

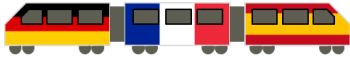
Hinweise

- Free onboard WiFi
- Free onboard entertainment system
- Restaurant car and at-seat service of light refreshments
- Seats facing the direction of travel

☑ Bahnhofsinformationen

☑ Kartenansicht

Berlin – Frankfurt – Lyon – Montpellier – Barcelona



Only one direction considered

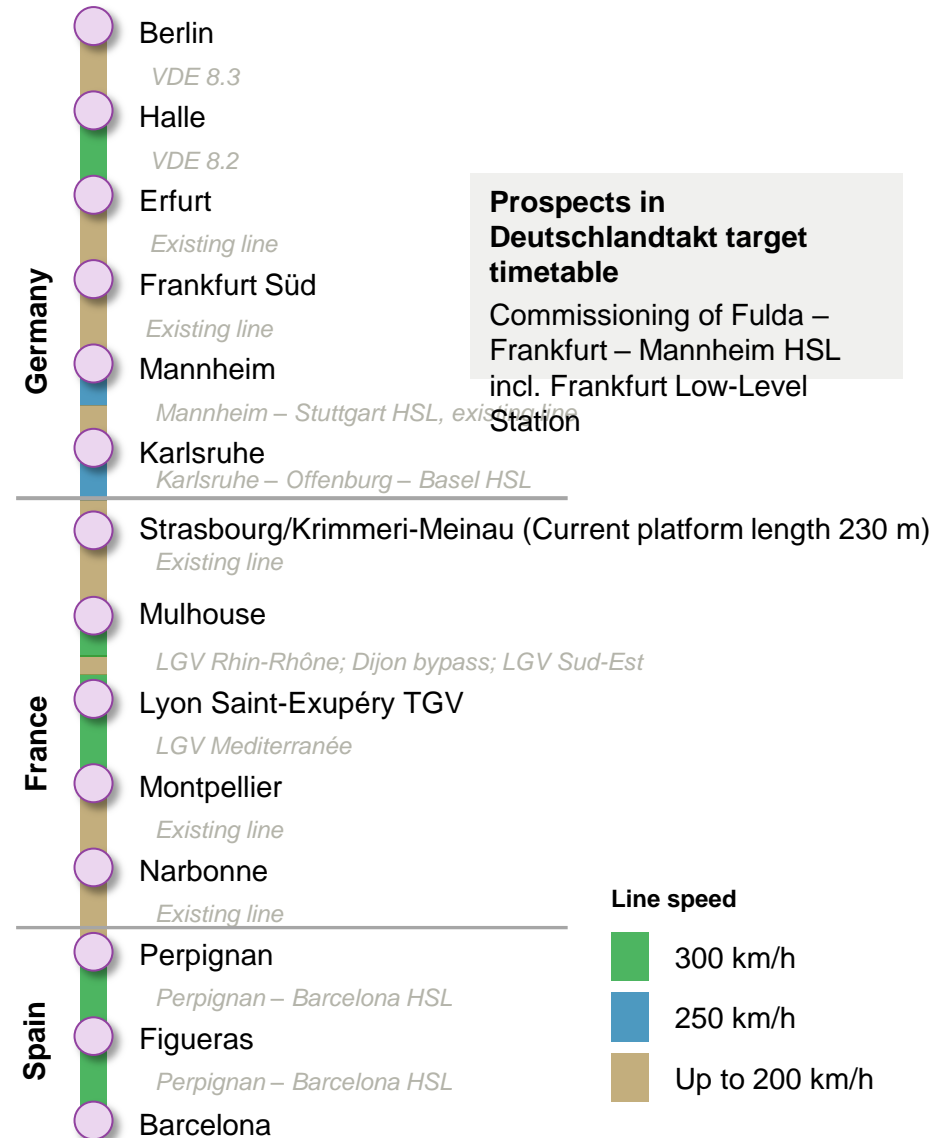
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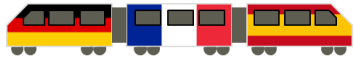
Infrastructure basis

The blueprint for trains TEE 5/6 is based on present-day infrastructure.



Prospects in Deutschlandtakt target timetable
 Commissioning of Fulda – Frankfurt – Mannheim HSL incl. Frankfurt Low-Level Station

TEE 5/6



Starting in Berlin and picking up travellers from Germany and Switzerland

Berlin Hbf, 06.00



Erfurt, 07:45 hrs



Frankfurt Süd, 10.00 hrs



Mannheim, 10:30 hrs



Karlsruhe, 11.00 hrs



Strasbourg /Krimmeri-Meinau, 11:30 hrs



Mulhouse, 12:15 hrs

35

Dresden, dep. 05:10 hrs (arr. 07:28 hrs)
Leipzig, dep. 06:48 hrs (arr. 07:28 hrs)

Hamburg, dep. 06:07 hrs (arr. 09:28 hrs)
(Change stations in Frankfurt)

Cologne, dep. 08:55 hrs (arr. 10:23 hrs)

Stuttgart, dep. 09:58 hrs (arr. 10:53 hrs)
Munich, dep. 07:28 hrs (Change in Stuttgart)

Luxembourg, dep. 09:24 hrs (additional regular interval train)
(Change stations in Strasbourg)

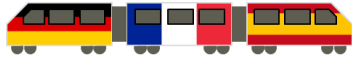
Basel, dep. 11:30 hrs (arr. 12:09 hrs)

Zürich, dep. 10:30 hrs

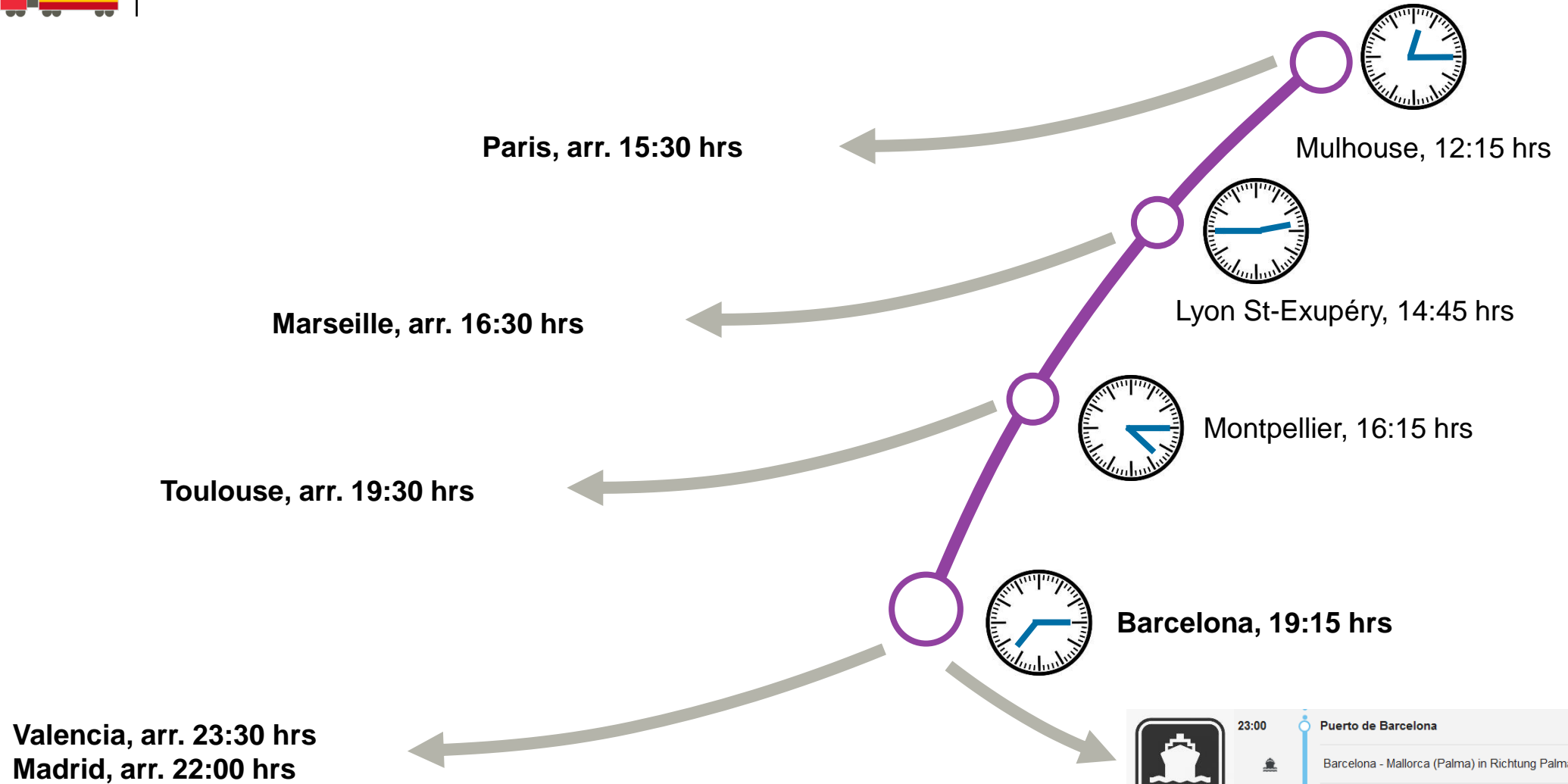
Bern, dep. 10:30 hrs (Change in Basel)



TEE 5/6



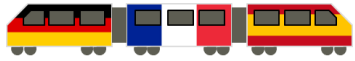
Distributing travellers in France and Spain



	23:00	○ Puerto de Barcelona
		○ Barcelona - Mallorca (Palma) in Richtung Palma
	06:45	○ Estación Marítima Mallorca

Other ferry services to Ibiza and North Africa not yet analysed.

TEE 5/6



Further improvements between Berlin and Barcelona in the Deutschlandtakt

Berlin Hbf, 06.15 hrs



Erfurt, 8:00 hrs



Frankfurt Hbf (low-level),
9:45 hrs



Mannheim,
10:15 hrs



Karlsruhe,
10:45 hrs



Strasbourg
/Kimmeri-
Meinau,
11:15 hrs



Mulhouse,
12:00 hrs



Dresden, dep. 05:34 hrs
Leipzig, dep. 07:13 hrs

Hamburg, dep. 06:04 hrs

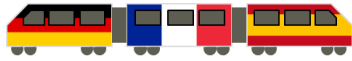
Cologne, dep. 08:33 hrs

Stuttgart, dep. 09:25 hrs
Munich, dep. 07:41 hrs (Change in Stuttgart)

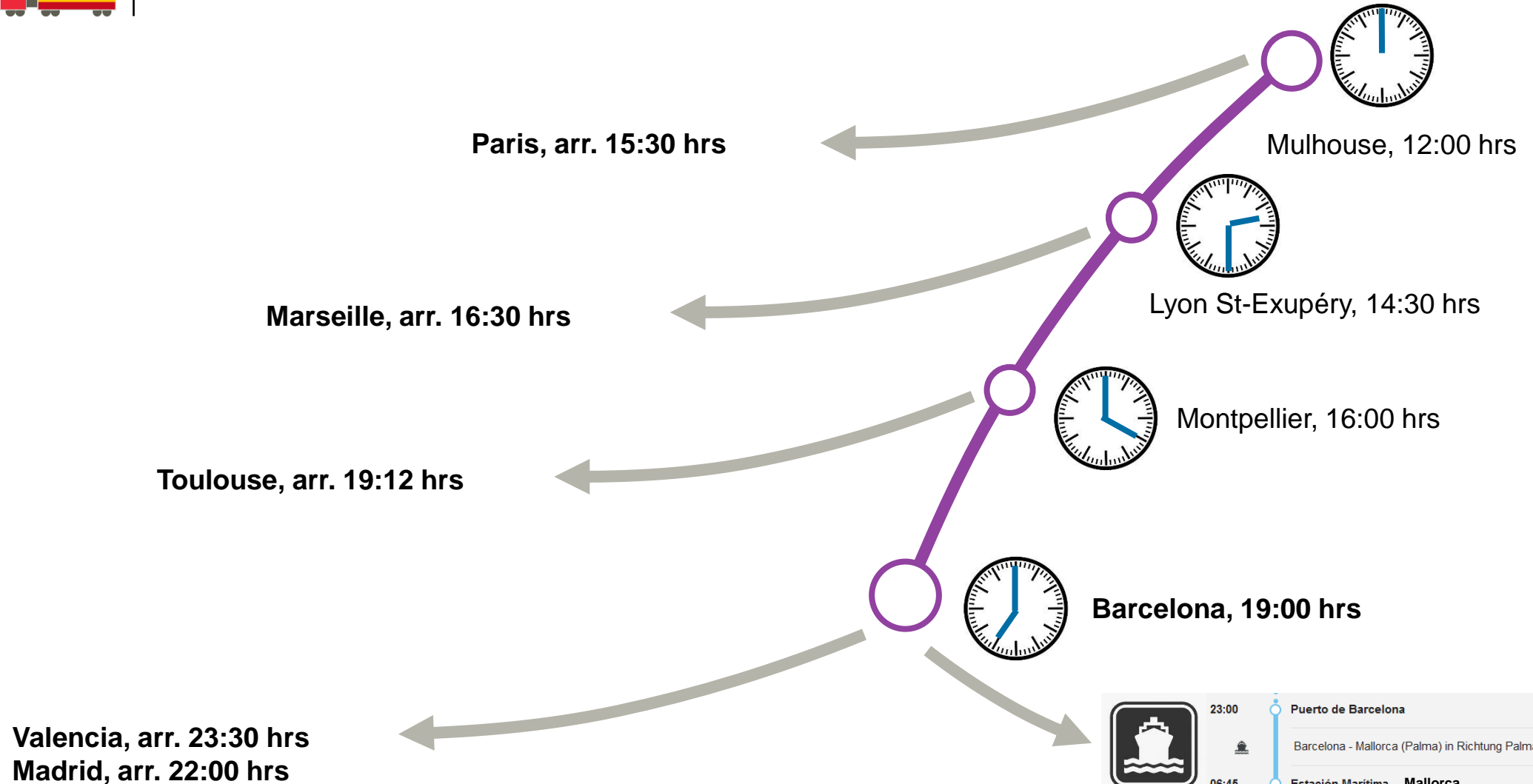
Luxembourg, dep. 09:24 hrs (additional regular interval train)
(Change stations in Strasbourg)

Basel, dep. 11:30 hrs
Zürich, dep. 10:30 hrs
Bern, dep. 10:30 hrs (Change in Basel)

TEE 5/6

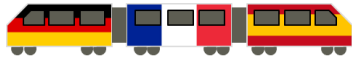


Further improvements between Berlin and Barcelona in the Deutschlandtakt



Other ferry services to Ibiza and North Africa not yet analysed.

TEE 5/6



A through service from Berlin – Barcelona with a journey time of 13h and 15min will be possible in the short term

Today

- Journey time: 15h45
- No of changes 4

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Berlin Hbf (tief)	ab 06:01	1	ICE 938
Frankfurt(Main)Hbf	an 09:56	13	
🔄 Umsteigezeit 10 Min.			
Frankfurt(Main)Hbf	ab 10:06	6	ICE 71
Karlsruhe Hbf	an 11:09	2	
🔄 Umsteigezeit 23 Min.			
Karlsruhe Hbf	ab 11:32	6	ICE 9574
Paris Est	an 14:05		
🚶 Übergang 30 Min.			
Weg 800 m			
Paris Nord RER	ab 14:36		RER55852
Paris Lyon Banlieue	an 14:45		
🚶 Fußweg 15 Min.			
Paris Gare de Lyon	ab 15:08		TGV 9715
Barcelona Sants	an 21:46		

TEE network

- Journey time: 13h15
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Berlin Hbf (tief)	ab 06:00	1	TEE 5
Barcelona Sants	an 19:15		

> Zwischenhalte einblenden

Hinweise

Free onboard WiFi
 Free onboard entertainment system
 Restaurant car and at-seat service of light refreshments
 Seats facing the direction of travel

Bahnhofsinformationen
 Kartenansicht

TEE network (target timetable)

- Journey time: 12h45
- Through service
- Fulda – Mannheim HSL
- Frankfurt Low-Level Station

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Berlin Hbf (tief)	ab 06:15	1	TEE 5
Barcelona Sants	an 19:00		

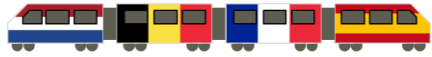
> Zwischenhalte einblenden

Hinweise

Free onboard WiFi
 Free onboard entertainment system
 Restaurant car and at-seat service of light refreshments
 Seats facing the direction of travel

Bahnhofsinformationen
 Kartenansicht

TEE 7/8



Amsterdam – Brussels – Paris – Lyon – Barcelona

Only one direction considered

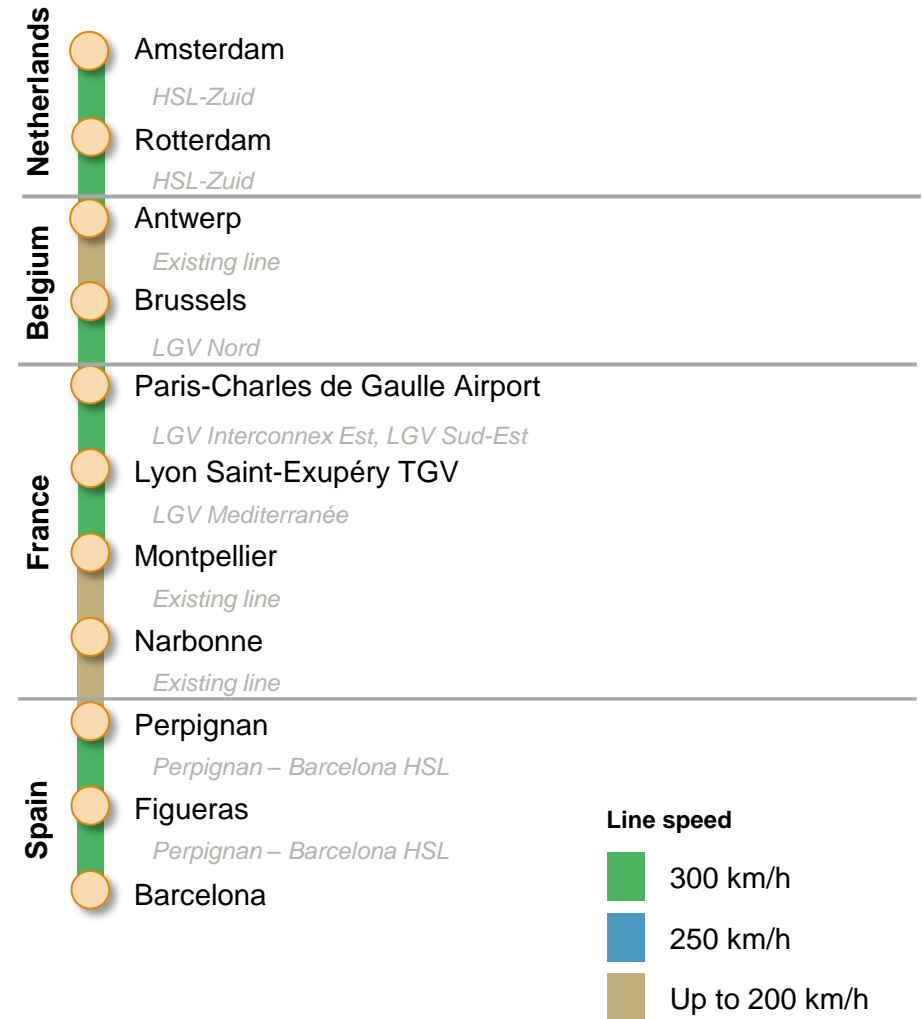
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction. The train crosses the train travelling in the opposite direction at 14:00 hrs.

Basis: 1 daily pair of trains

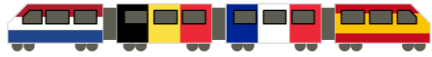
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

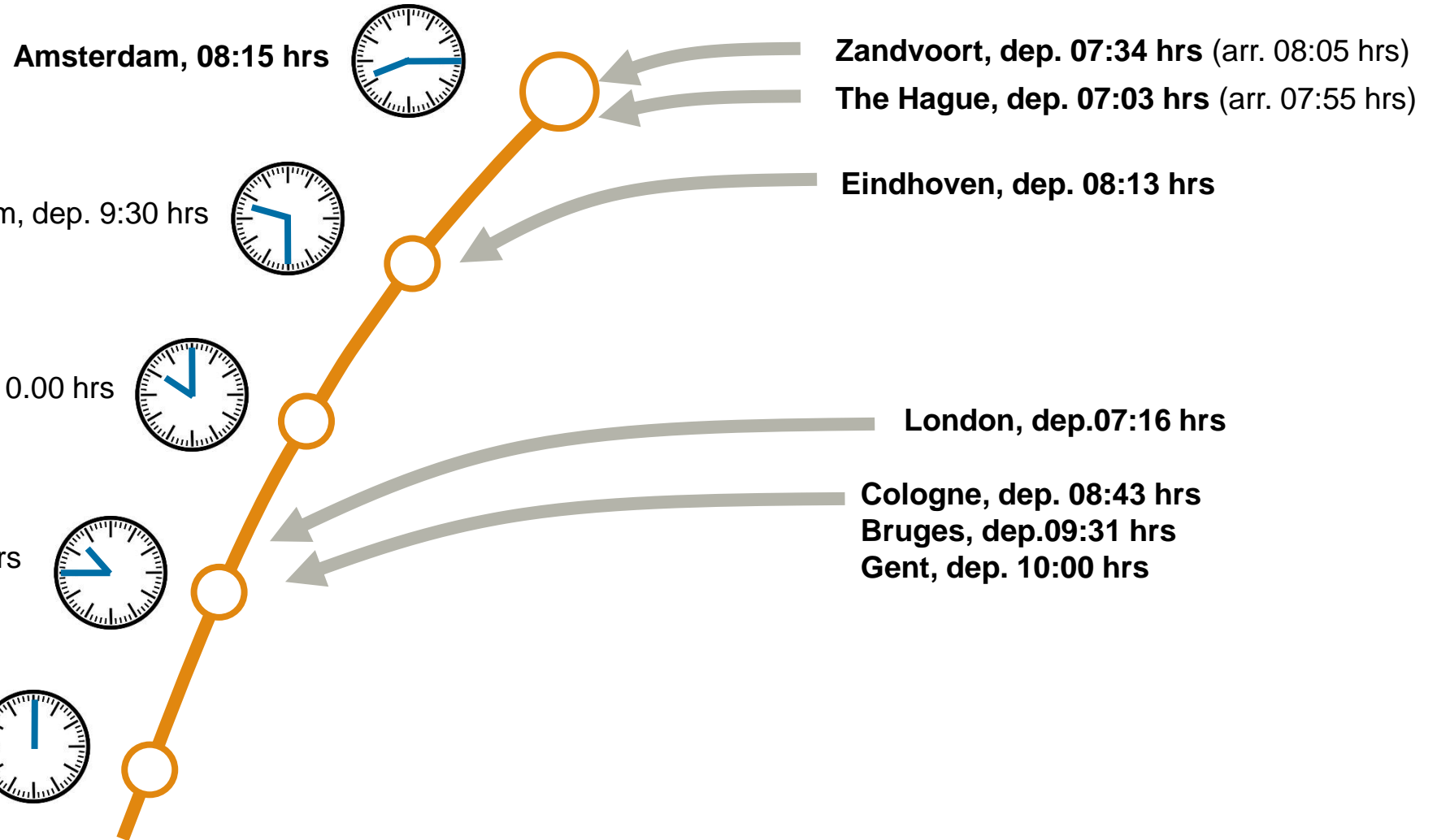
The blueprint for trains TEE 7/8 is based on present-day infrastructure.



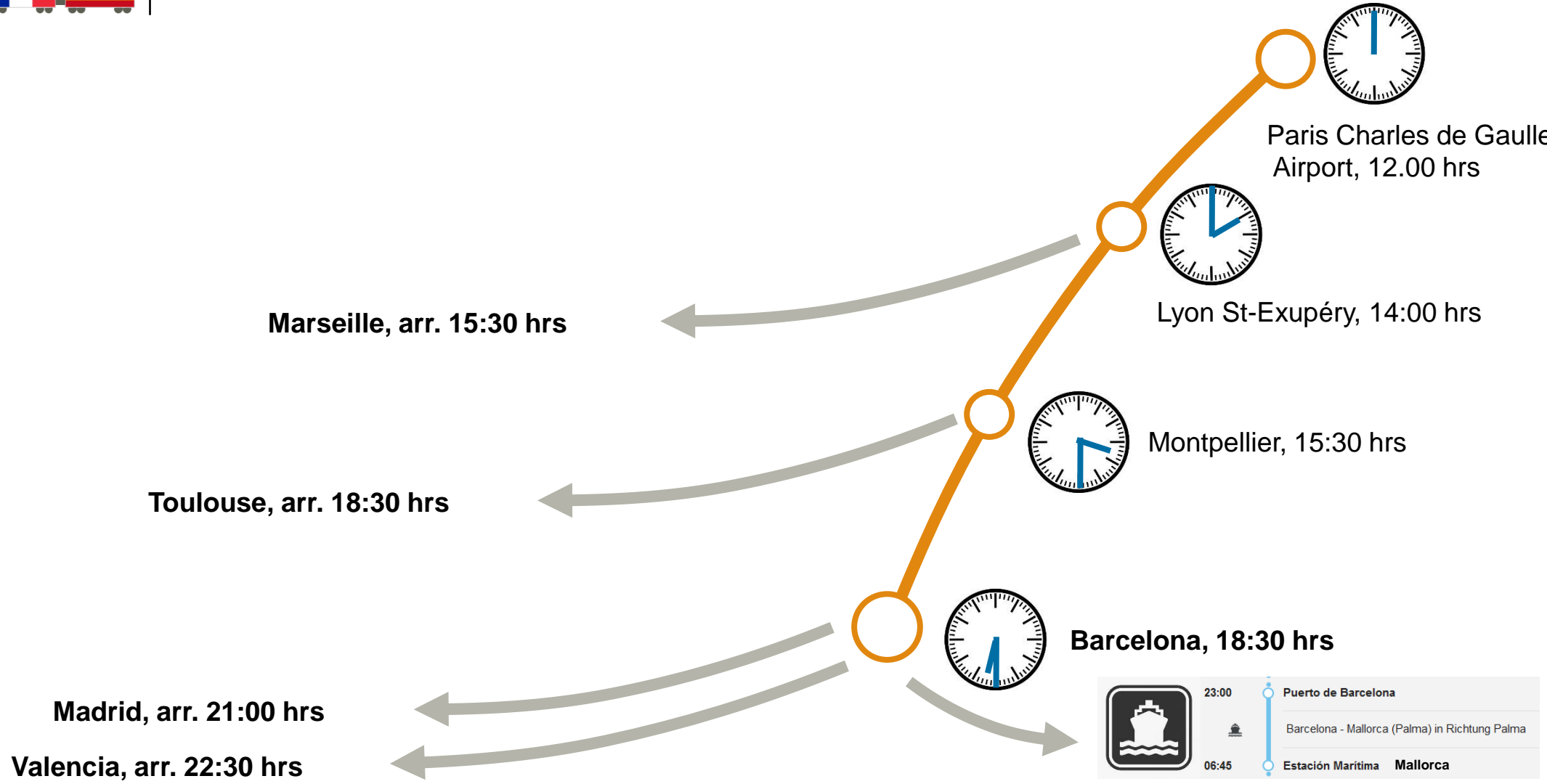
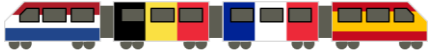
TEE 7/8



Picking up travellers from the Netherlands and Belgium

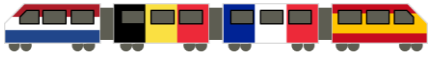


Distributing travellers in France and Spain



	23:00	Puerto de Barcelona
		Barcelona - Mallorca (Palma) in Richtung Palma
	06:45	Estación Marítima Mallorca

Other ferry services to Ibiza and North Africa not yet analysed.



A through service between Amsterdam – Barcelona with a journey time of 10h and 15m will be possible

Today

- Journey time: 11h18
- No of changes: 2 (Brussels und Lyon)

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Amsterdam Centraal	ab 08:15	15a	THA 9322
Bruxelles Midi	an 10:08	6	
☰ Umsteigezeit 9 Min.			
Bruxelles Midi	ab 10:17	4	TGV 9826
Lyon Part Dieu	an 14:00		
☰ Umsteigezeit 28 Min.			
Lyon Part Dieu	ab 14:28		AVE 9743
Barcelona Sants	an 19:33		
> Zwischenhalte einblenden			
Hinweise			
fährt nicht täglich, > Verkehrstage Übg.: Roosendaal(fr), Blandain(fr)			

TEE network (blueprint and target timetable)

- Journey time: 10h15
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Amsterdam Centraal	ab 08:15	15a	TEE 7
Barcelona Sants	an 18:30		
> Zwischenhalte einblenden			
Hinweise			
Free onboard WiFi Free onboard entertainment system Restaurant car and at-seat service of light refreshments Seats facing the direction of travel			

Prospects for line TEE 7/8

Potential for upgrade on Montpellier – Perpignan section
Implementation not foreseeable



Berlin – Munich – Innsbruck – Bologna – Rome

Only one direction considered

The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction. The train crosses the train travelling in the opposite direction at 14:00 hrs.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEE 9/10 is based on the infrastructure as at the end of the 2020s (commissioning of the Brenner Base Tunnel)

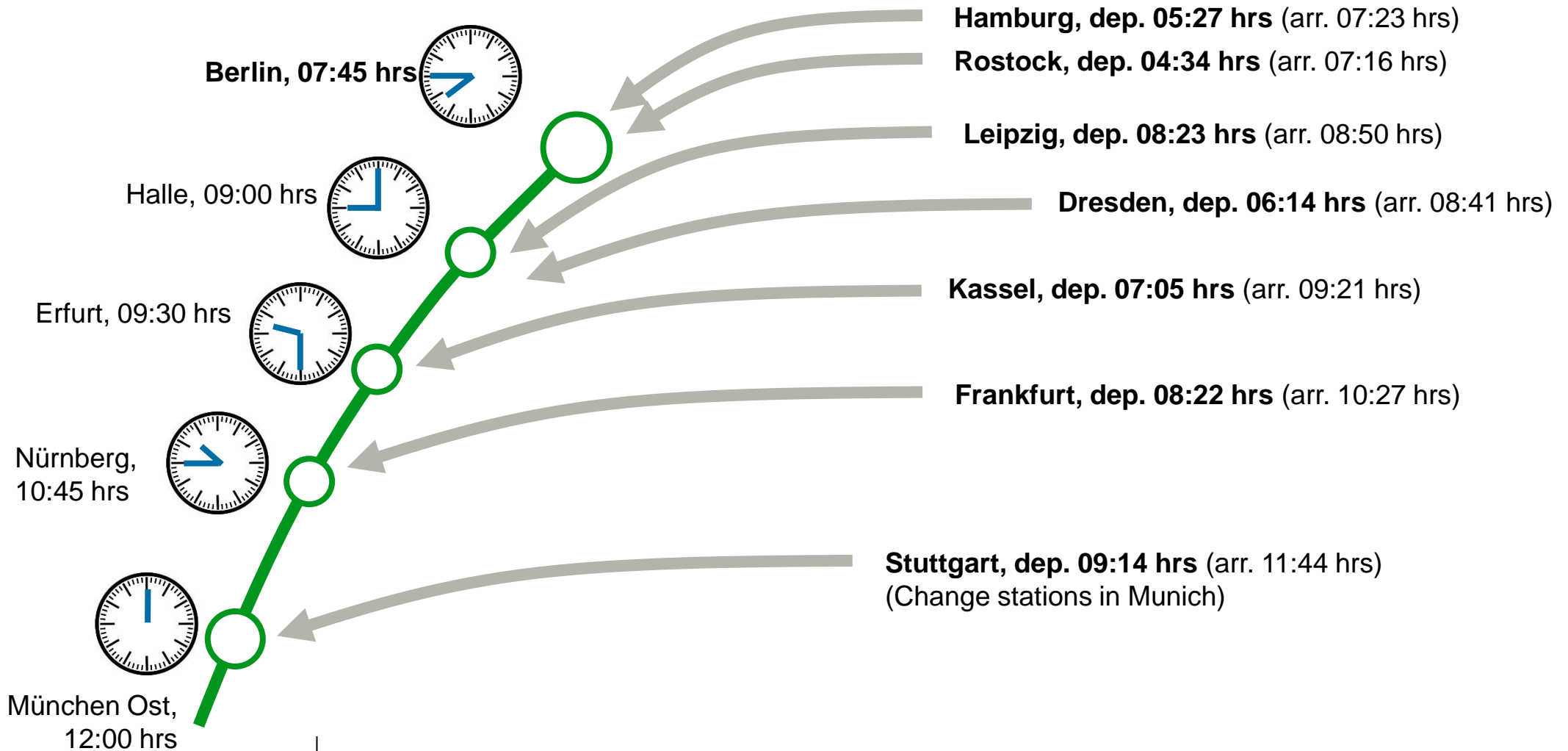


Prospects in Deutschlandtakt target timetable

- Completion of upgrade on Erfurt – Munich corridor
- Completion of Brenner northern feeder line in Germany

TEE 9/10

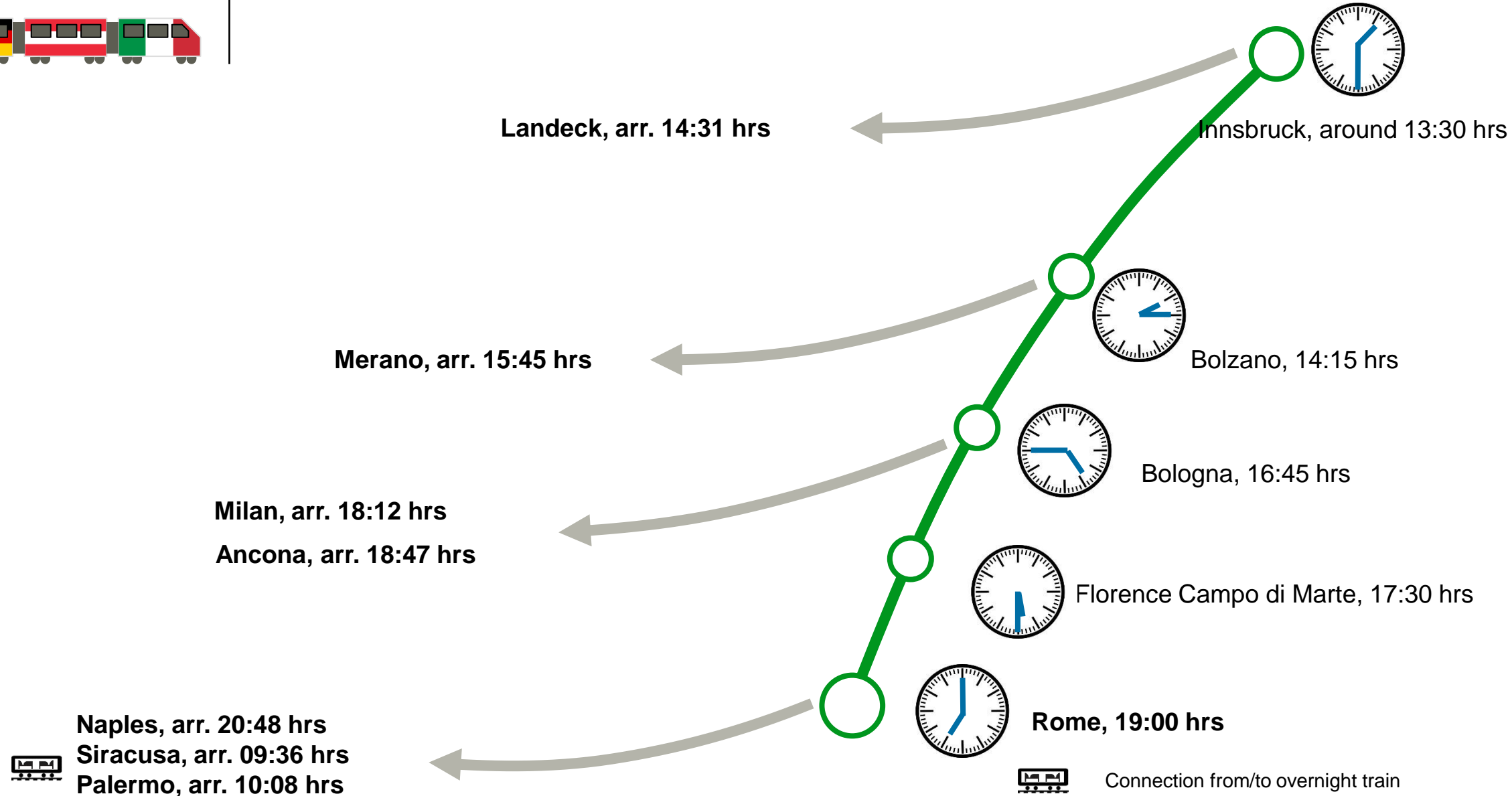
Links to and from Germany



TEE 9/10



Links to and from Austria and Italy





Prospects: through service between Berlin and Rome with a journey time of 10 hours and 15 minutes

Today

- Journey time: 14h40
- No of changes: 2 (Munich and Verona)

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Berlin Hbf (tief)	ab 06:30	1	ICE 503
München Hbf	an 11:02	20	
↳ Umsteigezeit 32 Min.			
München Hbf	ab 11:34	13	EC 87
Verona Porta Nuova	an 16:58		
↳ Umsteigezeit 54 Min.			
Verona Porta Nuova	ab 17:52		FA 8527
Roma Termini	an 21:10		

TEE network

- Journey time: 10h15
- Through service
- With Brenner Base Tunnel

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Berlin Hbf (tief)	ab 07:45		TEE 9
Roma Termini	arr. 19:00		
> Zwischenhalte einblenden			
Hinweise			
Free onboard WiFi			
Free onboard entertainment system			
Restaurant car and at-seat service of light refreshments			

Prospects for line TEE 9/10

- Reduction in journey time through completion of Brenner northern feeder line in Germany
- Following completion of the upgrade on the Erfurt – Munich line, the journey time will be reduced by 15 minutes



Paris – Stuttgart – Munich – Vienna – Budapest

Only one direction considered

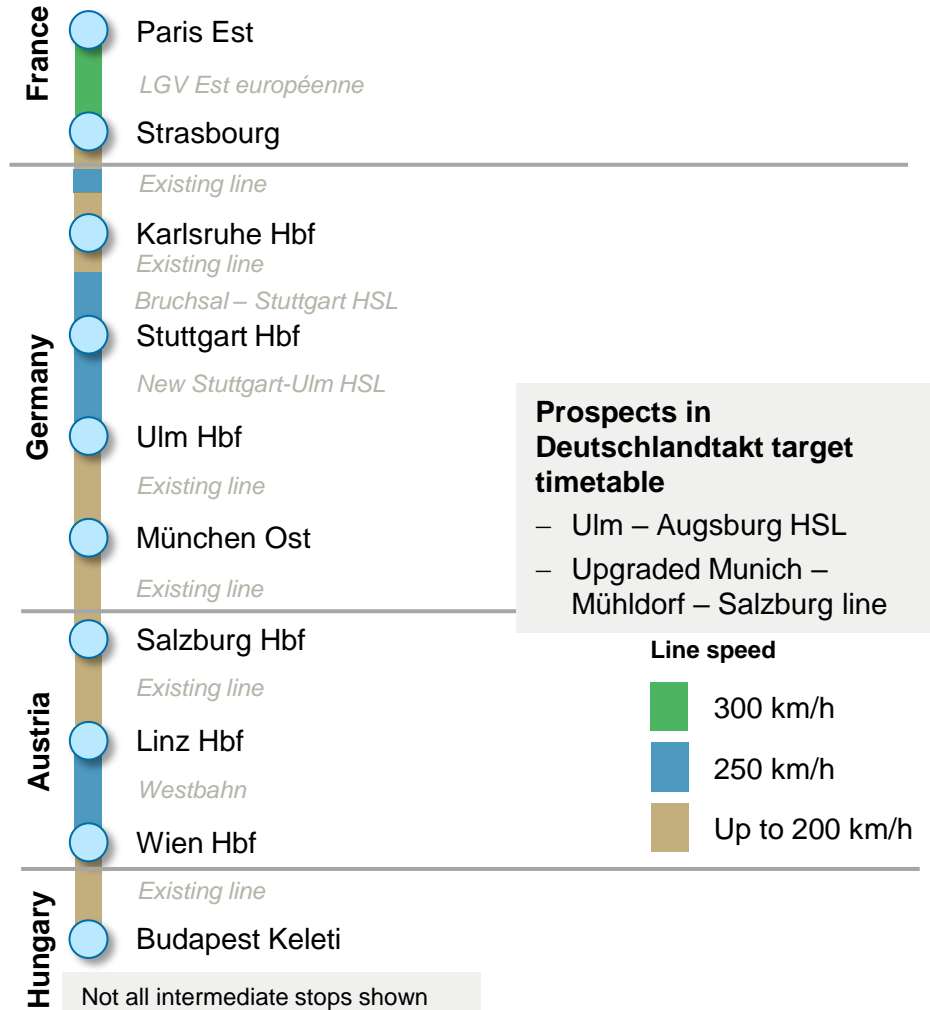
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction. The train crosses the train travelling in the opposite direction at 14:00 hrs.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEE 11/12 is based on the infrastructure including Stuttgart 21 and the new Stuttgart–Ulm high-speed line

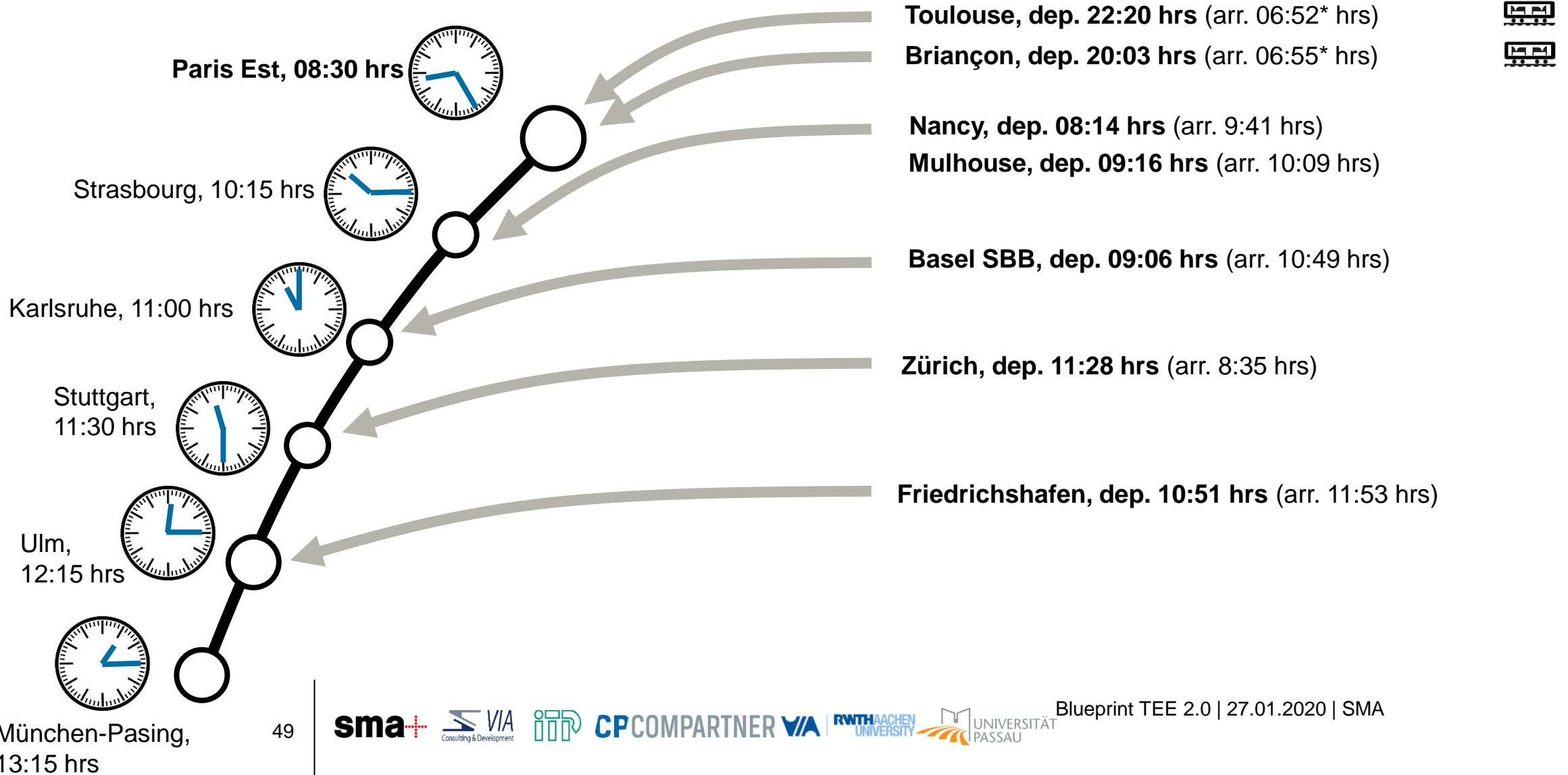


TEE 11/12

Links to and from France and Germany

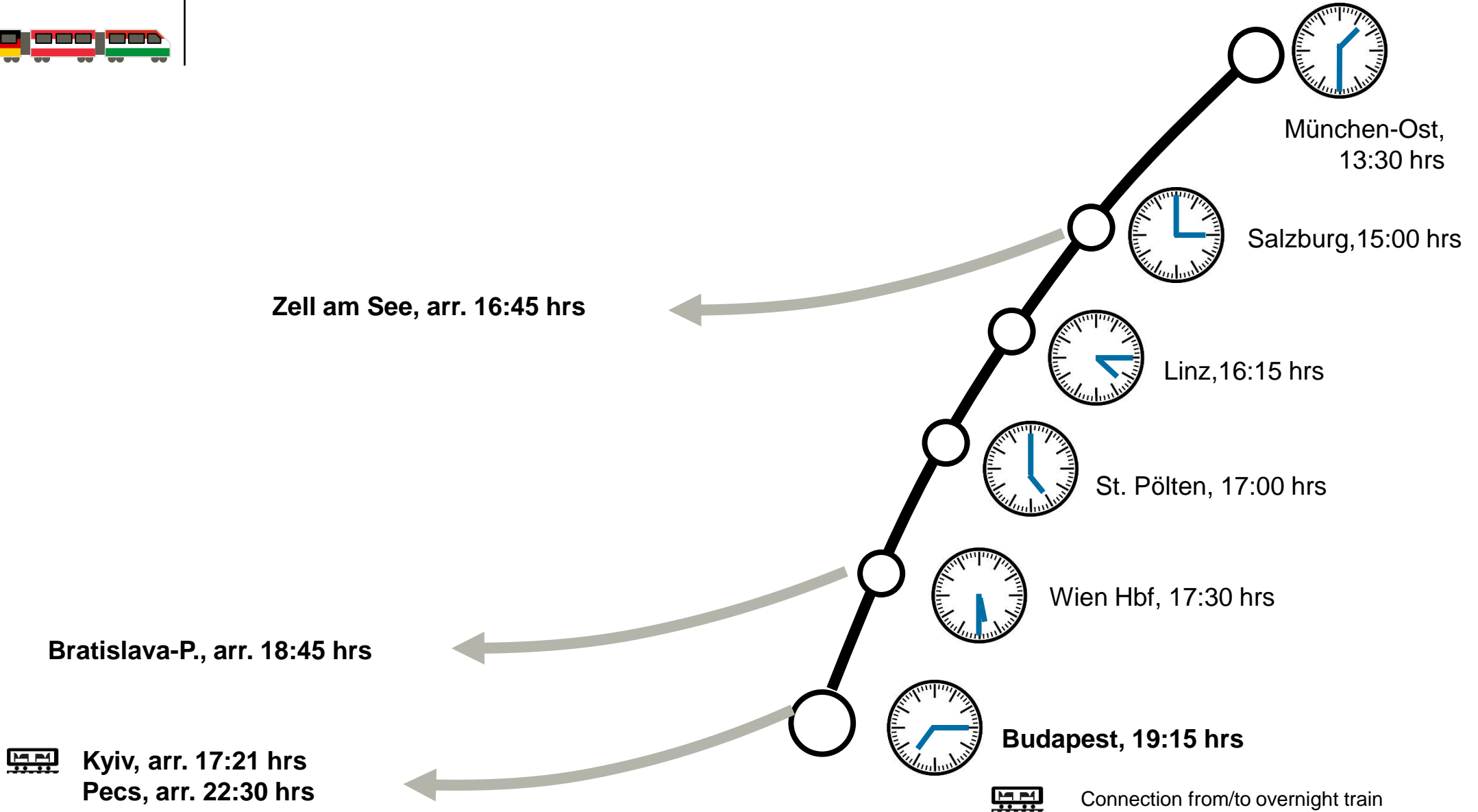


*Paris Austerlitz



TEE 11/12

Links to and From Austria and Hungary





Prospects: through service from Paris – Budapest with a journey time of 10h and 55 min

Today

- Journey time: 12h39
- No of changes: 3

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Paris Est	ab 06:40		ICE 9571
Stuttgart Hbf	an 09:49	7	
↻ Umsteigezeit 9 Min.			
Stuttgart Hbf	ab 09:58	14	EC 113
Salzburg Hbf	an 13:59	9	
↻ Umsteigezeit 9 Min.			
Salzburg Hbf	ab 14:08	4	RJX 563
Wien Hbf	an 16:30	9A-B	
↻ Umsteigezeit 12 Min.			
Wien Hbf	ab 16:42	10A-B	EC 147
Budapest-Keleti	an 19:19		

TEE network

- Journey time: 10h55
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Paris Est	ab 08:25		TEE 3
Budapest-Keleti	an 19:20		

> Zwischenhalte einblenden

Hinweise

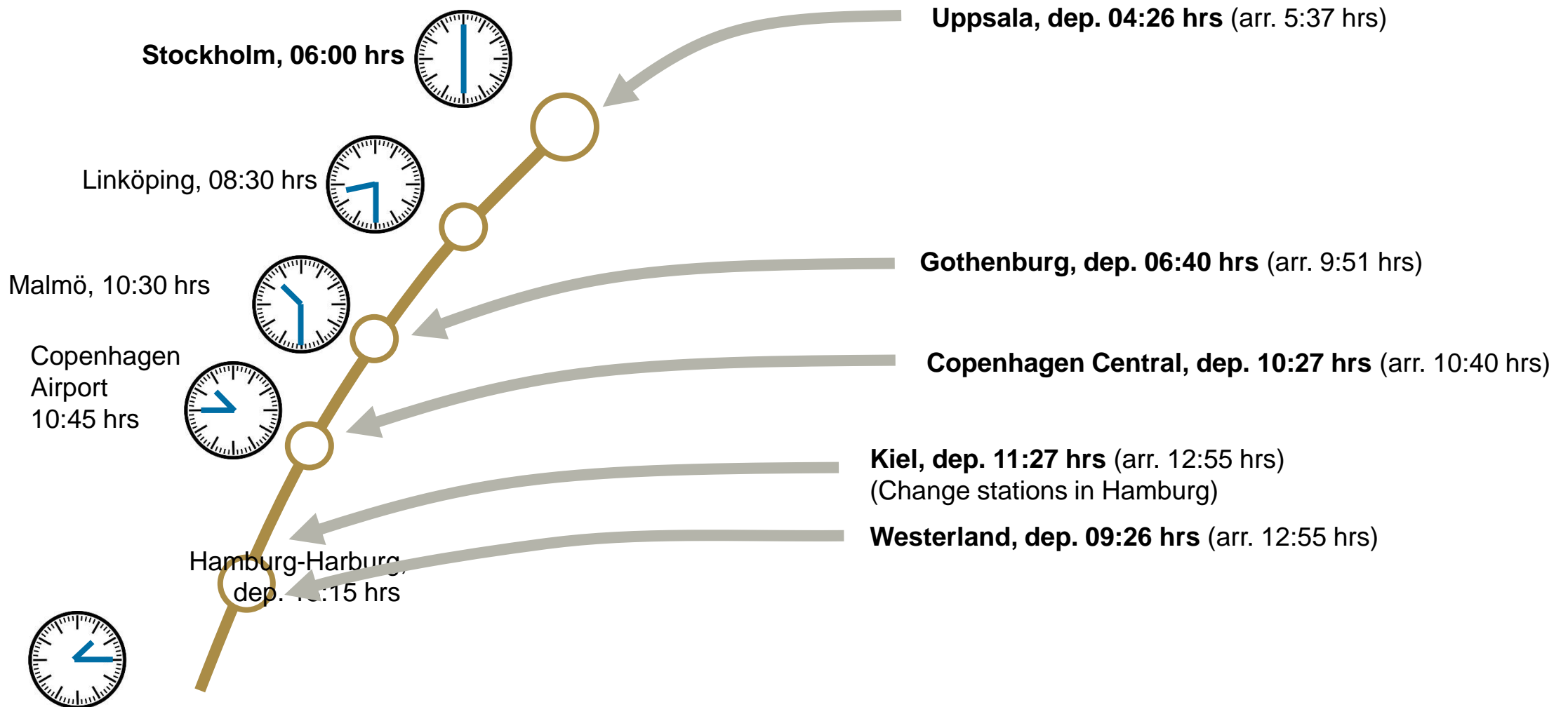
- Free onboard WiFi
- Free onboard entertainment system
- Restaurant car and at-seat service of light refreshments
- Seats facing the direction of travel

Bahnhofsinformationen
 Kartenansicht

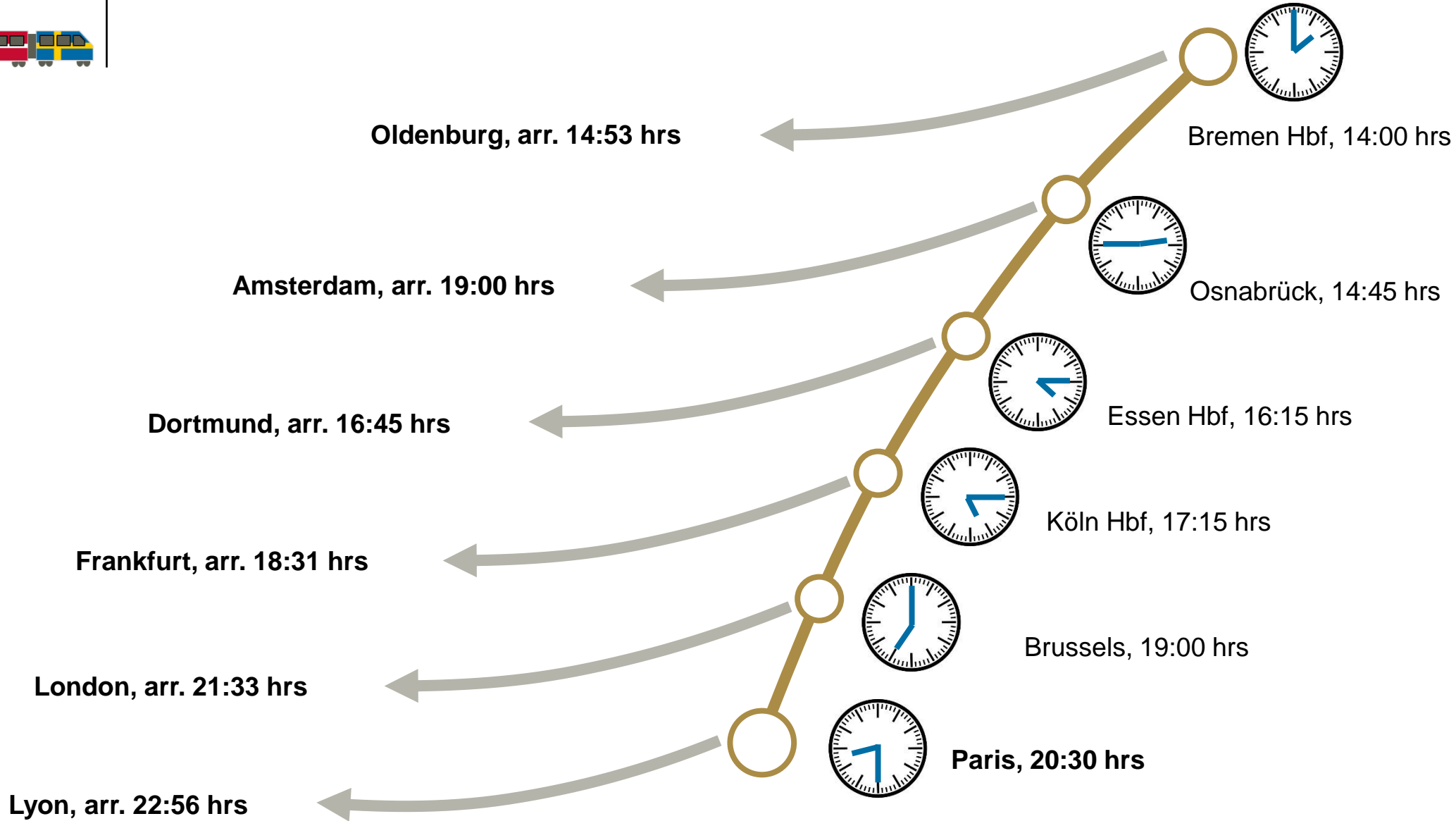
Prospects for line TEE 11/12

- Acceleration in D-Takt with Ulm – Augsburg HSL by 10 minutes
- Acceleration through upgraded Munich – Mühldorf – Salzburg line by 15 minutes

Links to and from Sweden, Denmark and Germany



Links to and from Germany, Belgium and France





Prospects: through service between Stockholm – Paris with a journey time of 14h and 25 min

Today

- Journey time: 23h
- No of changes: 4

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Stockholm Central	ab 23:09		D 1
	+ 1 Tag		
Malmö Central	an 05:59		
↳ Umsteigezeit 34 Min.			
Malmö Central	ab 06:33		R 1019
København H	an 07:09	1	
↳ Umsteigezeit 17 Min.			
København H	ab 07:26	4	IC 393
Hamburg Hbf	an 12:02	12	
↳ Umsteigezeit 1:59 h			
Hamburg Hbf	ab 14:01	14	ICE 79
Karlsruhe Hbf	an 19:09	2	
↳ Umsteigezeit 23 Min.			
Karlsruhe Hbf	ab 19:32	6	TGV 9570
Paris Est	an 22:06		

TEE network

- Journey time: 14h25
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Stockholm Central	ab 06:00		TEE 9
Paris Est	arr. 20:35		

> Zwischenhalte einblenden

Hinweise

Free onboard WiFi
Free onboard entertainment system
Restaurant car and at-seat service of light refreshments

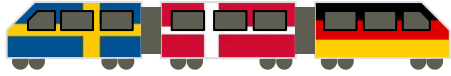
▾ Bahnhofsinformationen

▾ Kartenansicht

Prospects for line TEE 11/12

- Operation in the D-Takt via Hanover rather than Bremen is around 40 minutes faster
 - Acceleration with Hamm – Hanover HSL
 - Acceleration with Hamburg – Hanover HSL

Stockholm – Copenhagen – Berlin – Munich



Only one direction considered

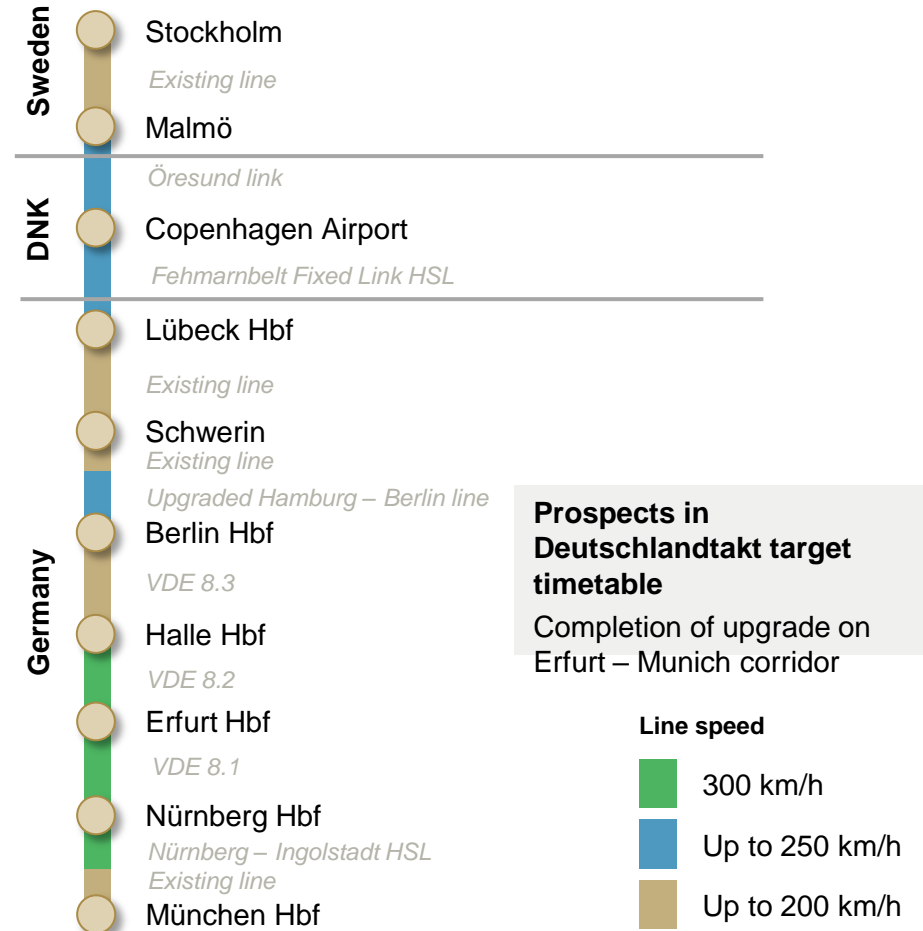
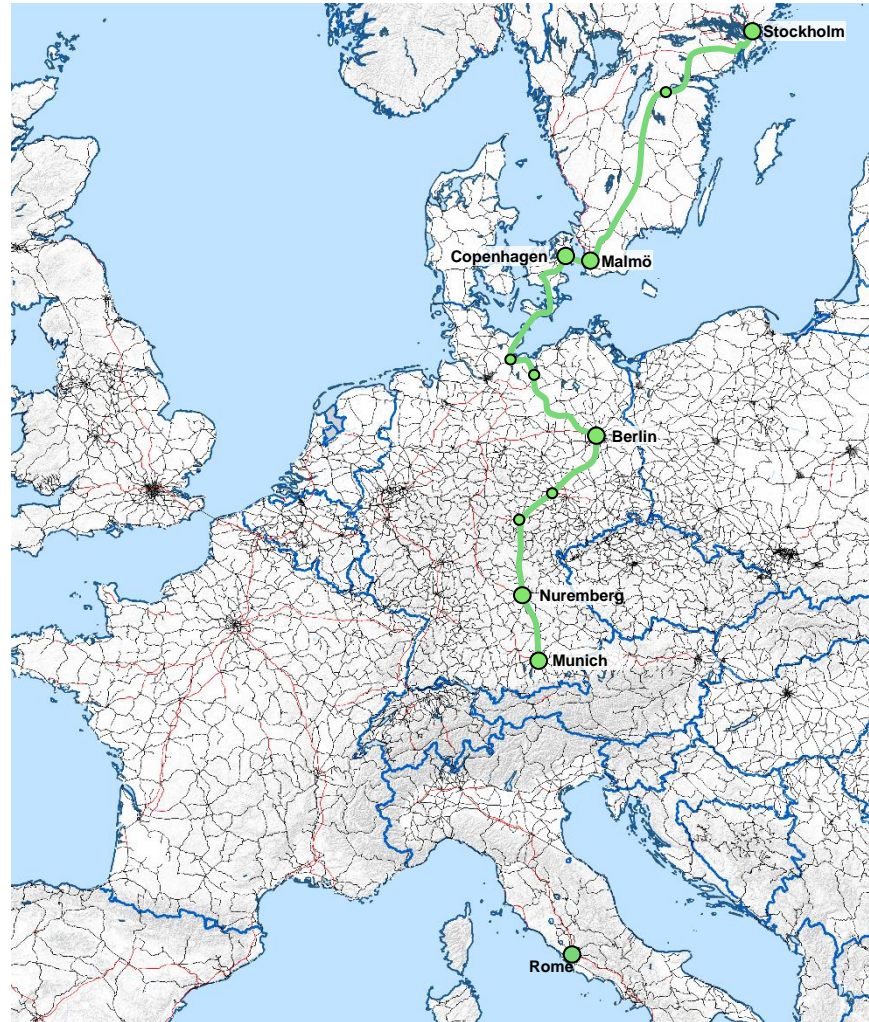
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction. The train crosses the train travelling in the opposite direction at 14:00 hrs.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

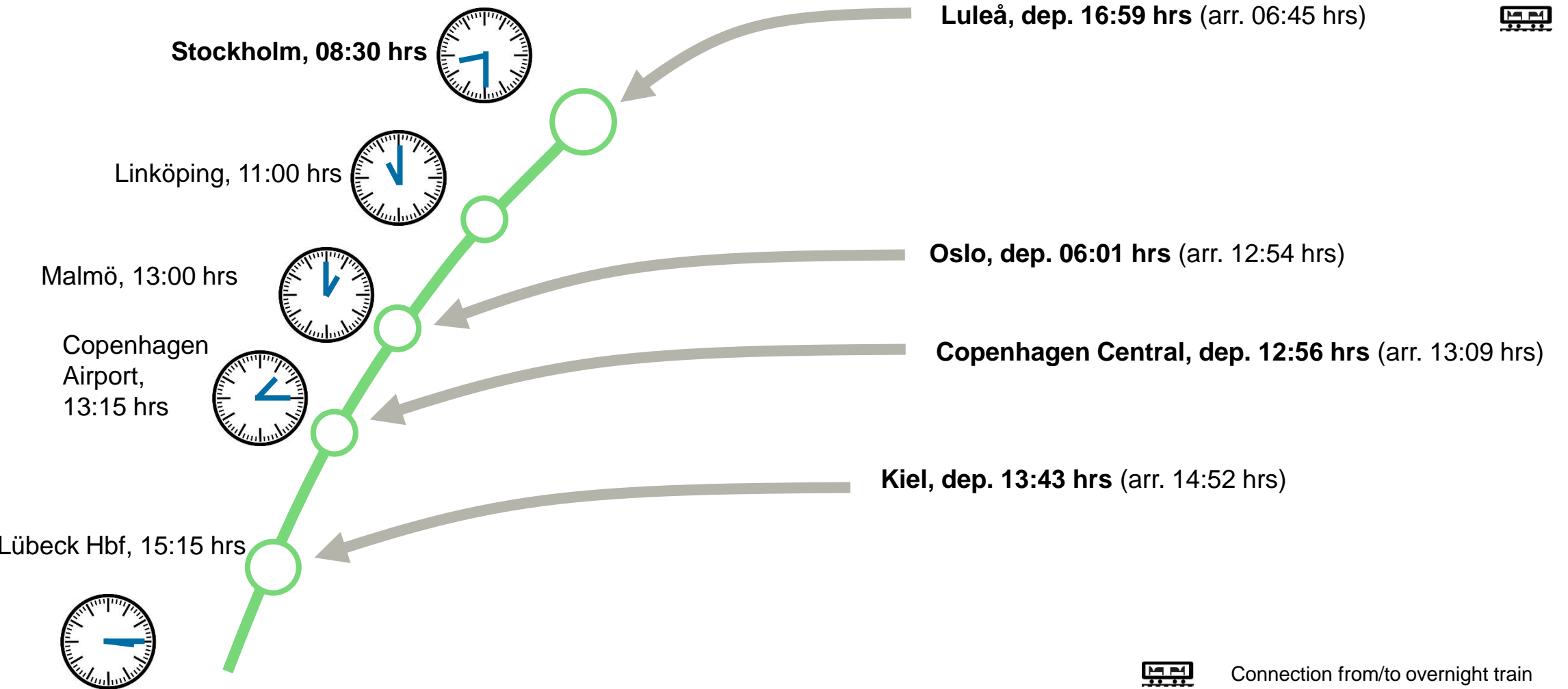
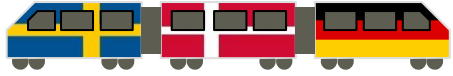
Infrastructure basis

The blueprint for trains TEE 15/16 is based on the infrastructure as at the end of the 2020s (commissioning of the Fehmarn Belt Fixed Link and electrification between Lübeck and Bad Kleinen. incl. "Bad Kleinen" curve)



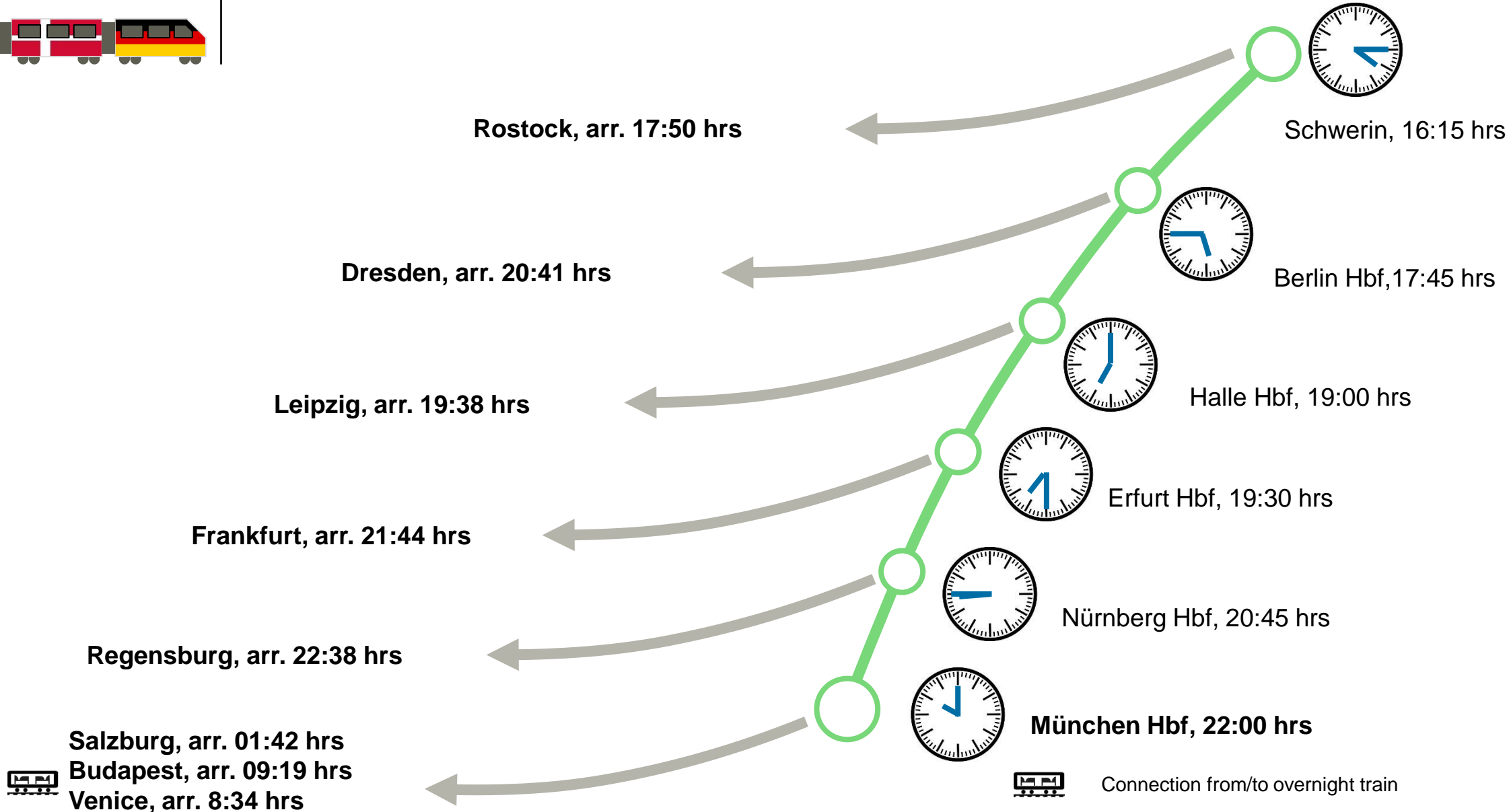
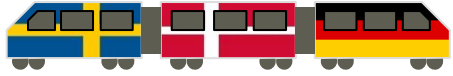
TEE 15/16

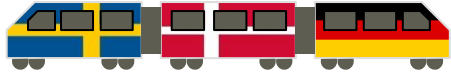
Links to and from Sweden, Denmark and Germany



TEE 15/16

Links to and from Germany





Prospects: through service between Stockholm – Munich with a journey time of 13h and 30 min

Today

- Journey time: 17h17h
- No of changes: 3

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Stockholm Central	ab 05:21		X2 519
Malmö Central	an 09:54		
🔄 Umsteigezeit 19 Min.			
Malmö Central	ab 10:13		R 1041
København H	an 10:49	2	
🔄 Umsteigezeit 37 Min.			
København H	ab 11:26	5	IC 395
Hamburg Hbf	an 16:02	12C-F	
🔄 Umsteigezeit 59 Min.			
Hamburg Hbf	ab 17:01	14	ICE 683
München Hbf	an 22:38	19	

TEE network

- Journey time: 13h30
- Through service

Bahnhof/Haltestelle	Zeit	Gleis	Produkte
Stockholm Central	ab 08:30		TEE 15
München Hbf	arr. 22:00		

> Zwischenhalte einblenden

Hinweise

Free onboard WiFi
 Free onboard entertainment system
 Restaurant car and at-seat service of light refreshments

Bahnhofsinformationen
 Kartenansicht


Prospects for line TEE 15/16

Following completion of the upgrade on the Erfurt – Munich line, the journey time will be reduced by 15 minutes

Certification of rolling stock for deployment on the TEE network

Legend

- X** National certification already exists in some cases
- X** National certification not yet available for the proposed rolling stock blueprint

	TEE 1/2 Paris – Warsaw	TEE 3/4 Amsterdam – Rome	TEE 5/6 Berlin – Barcelona	TEE 7/8 Amsterdam – Barcelona
FR	X		X	X
BE	X			X
DE	X	X	X	
PO	X			
NL		X		X
CH		X		
IT		X		
ESP			X	X
Proposed rolling stock blueprint	 <p>TGV-TEE with certification for Poland</p>	 <p>Velaro-TEE certification for Switzerland and Italy</p>	 <p>Velaro-TEE</p>	 <p>Velaro-TEE</p>





Certification of rolling stock for deployment on the TEE network

Legend

X National certification already exists in some cases

X National certification not yet available for the proposed rolling stock blueprint

* = Brenner Base Tunnel is electrified at 25 kV AC

	TEE 9/10 Berlin – Rome	TEE 11/12 Paris – Budapest	TEE 13/14 Paris – Stockholm	TEE 15/16 Stockholm - Munich
FR		X	X	
BE			X	
DE	X	X	X	X
AT	X *	X		
HU		X		
DK			X	X
SWE			X	X
IT	X			
Proposed rolling stock blueprint	 <p>Velaro-TEE certification for Switzerland and Italy</p>	 <p>TGV-TEE with certification for Austria and Hungary</p>	 <p>TGV-TEE with certification for Scandinavia</p>	 <p>Velaro-TEE with certification for Scandinavia</p>

In Western Europe, there are currently only a few operators of overnight train services

Minimum requirement – 2 lines



Rolling stock that operates on only one overnight line is not taken into account in the adjacent table.

General comment: overnight train services are operated only by locomotive-hauled trains.

New NightJet

ÖBB is planning to purchase new sleeper and couchette cars for operation in Austria, Germany, Switzerland and Italy.



			
Designation		UIC standard cars (wide range of different cars and country combinations)	Trenhotel, Talgo RZD, InterCityNight (no longer in operation)
Manufacturer		Various	Talgo
Licensed in	FR	X	X (Trenhotel)
	DE	X	X (InterCityNight, Talgo RZD)
	BE	X	
	NL	X	
	ESP	X	X (Trenhotel)
	CH	X	X (Trenhotel)
	AT	X	
	IT	X	X (Trenhotel)
	PO	X	X (Talgo RZD)
	HU	X	
	DK	X	
	SWE	X	
Maximum speed		up to 200 km/h	140-250 km/h

Paris – Brussels – Cologne – Berlin

Only one direction considered

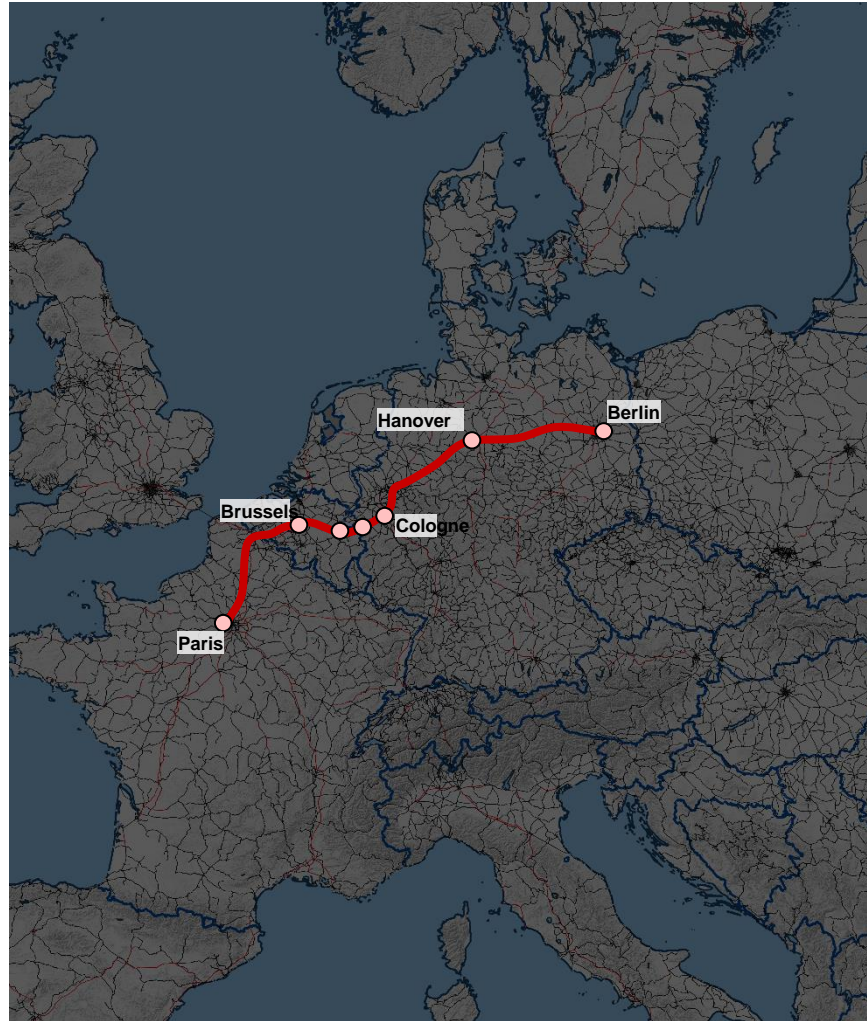
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

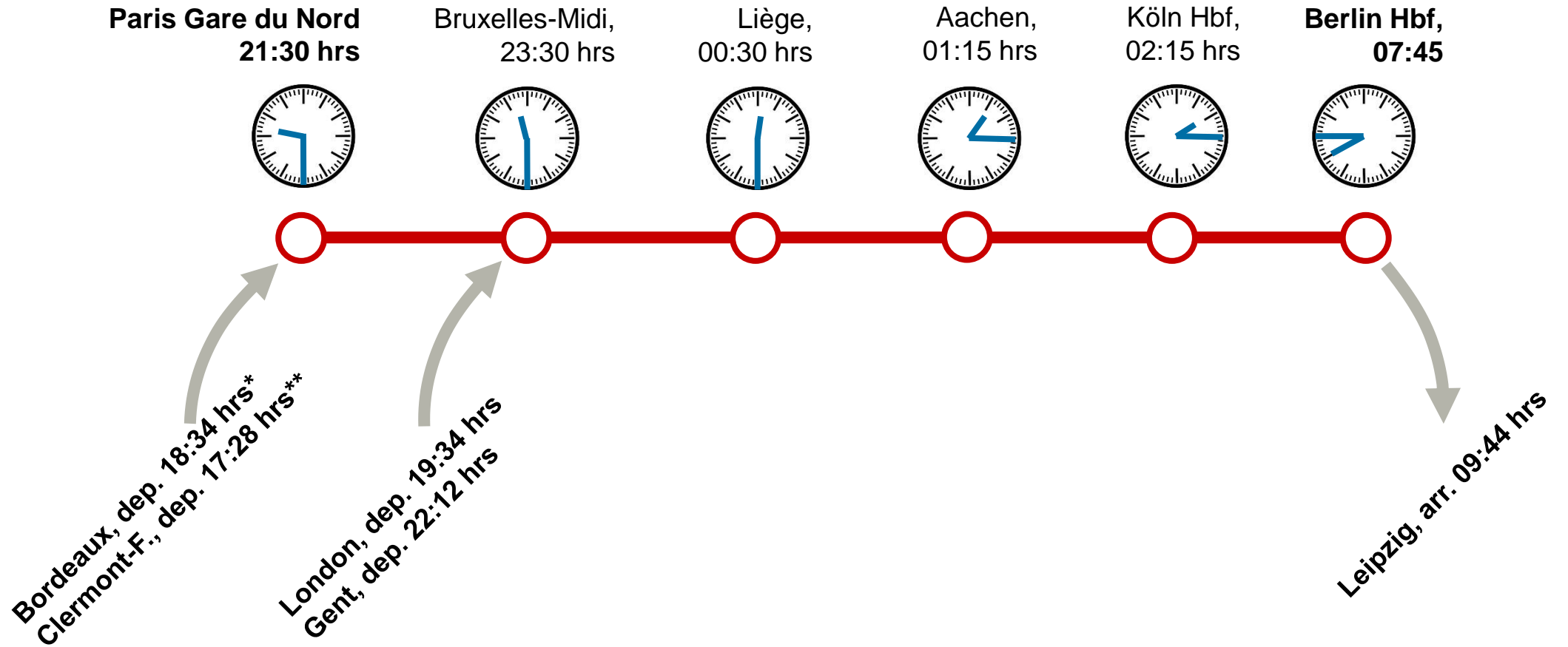
Infrastructure basis

The blueprint for trains TEEN 21/22 is based on present-day infrastructure.



Not all intermediate stops shown

Paris – Brussels – Cologne – Berlin



Journey time Paris – Berlin 10 h15 min

Blueprint TEE 2.0 | 27.01.2020 | SMA

Brussels – Cologne – Berlin – Prague/Warsaw

Only one direction considered

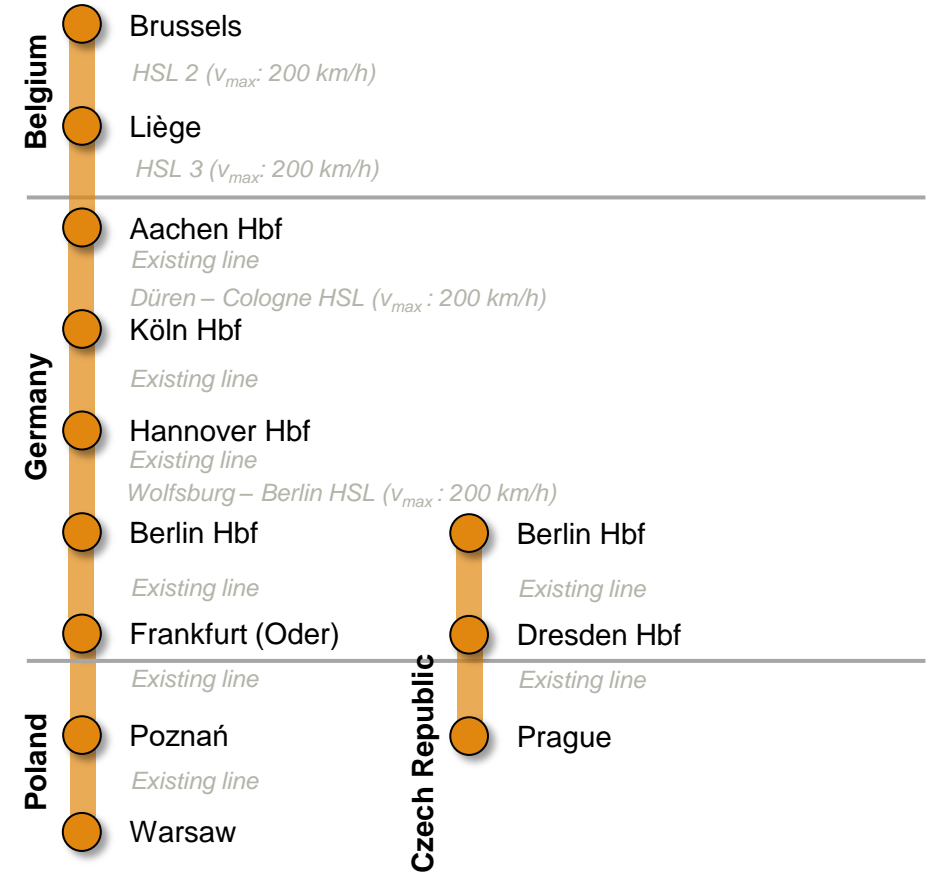
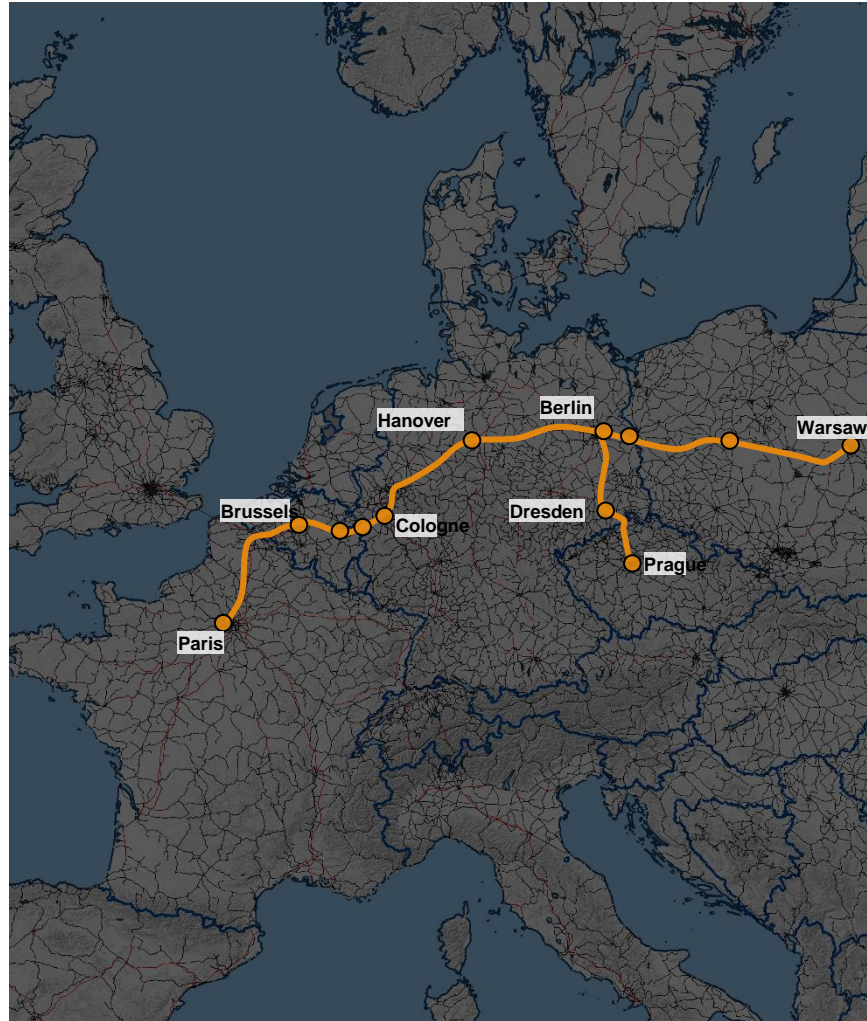
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

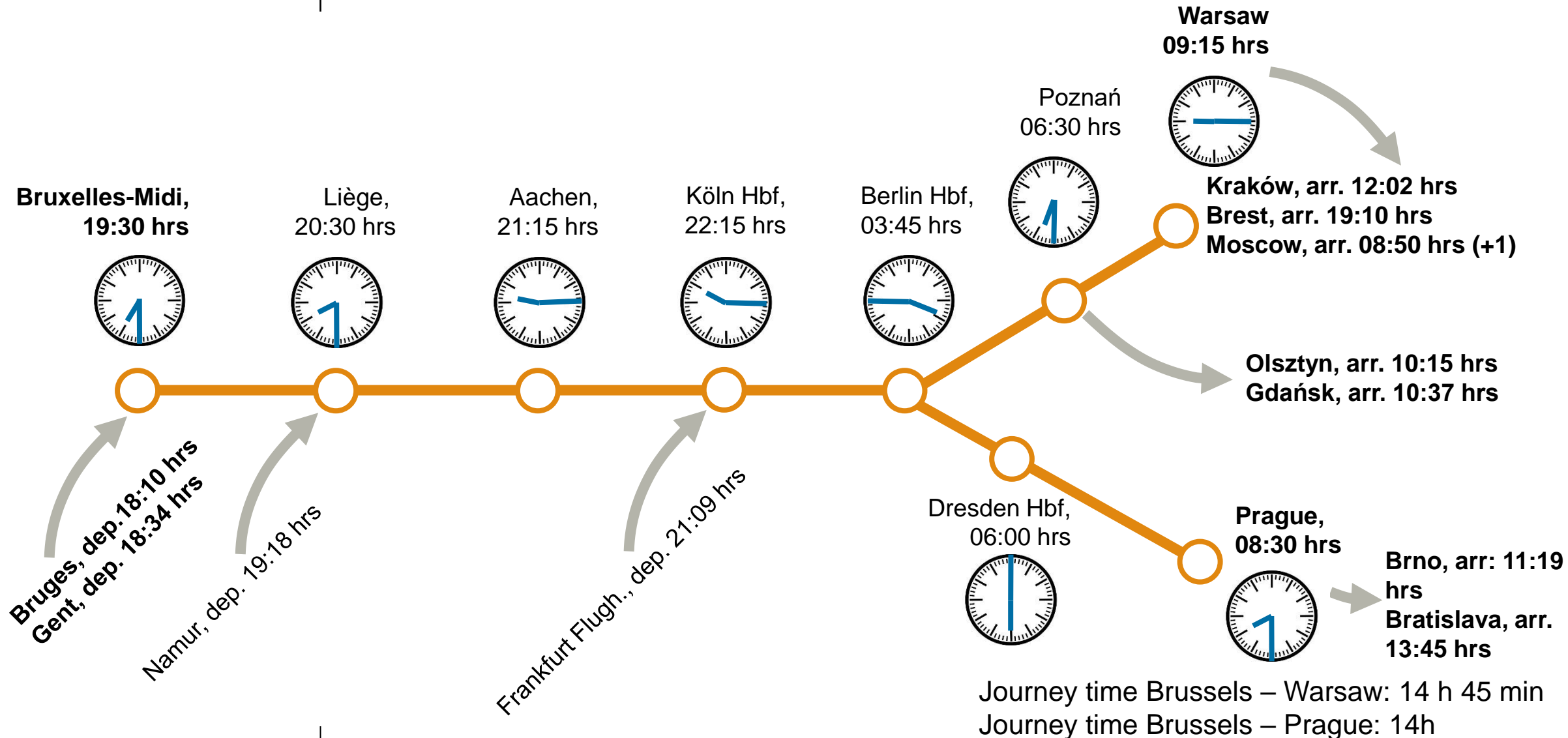
Infrastructure basis

The blueprint for trains TEEN 23/24 is based on present-day infrastructure.



Not all intermediate stops shown

Brussels – Cologne – Berlin – Prague/Warsaw



Amsterdam – Cologne – Basel – Milan – Venice/Genoa

Only one direction considered

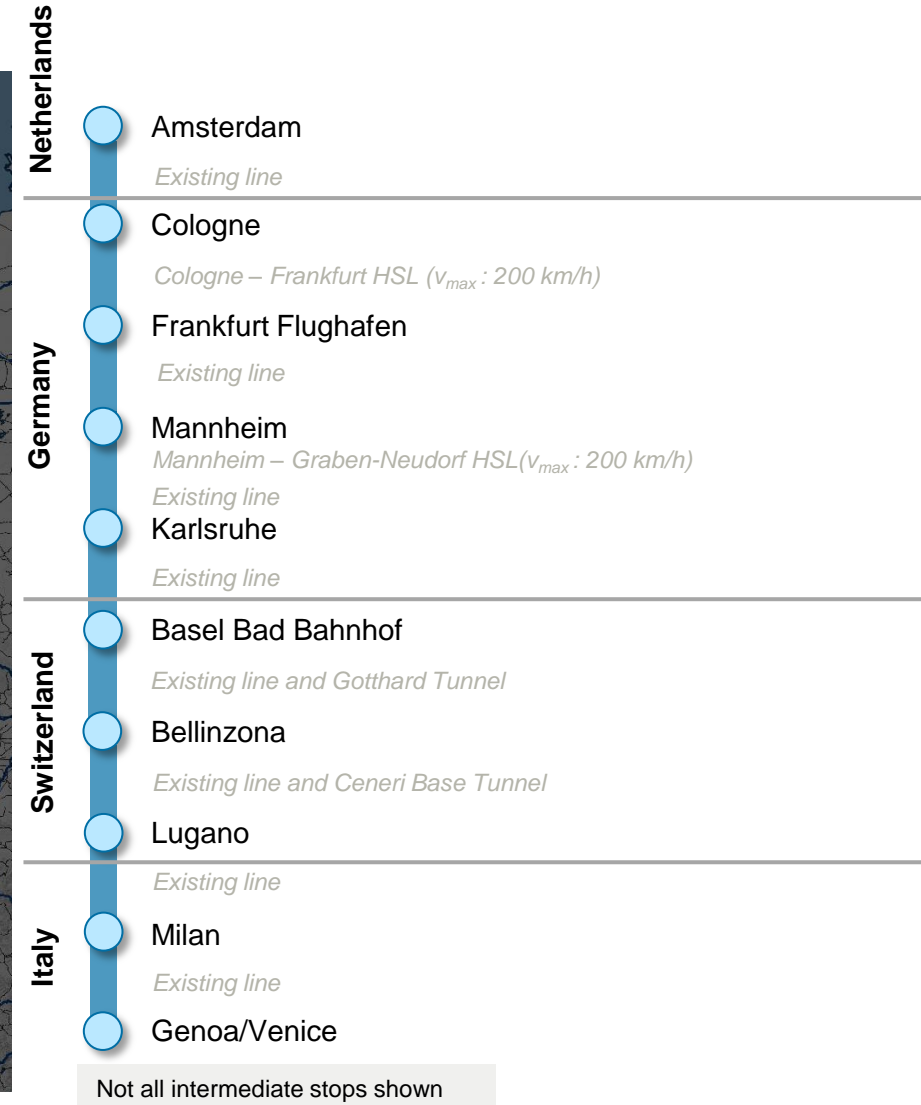
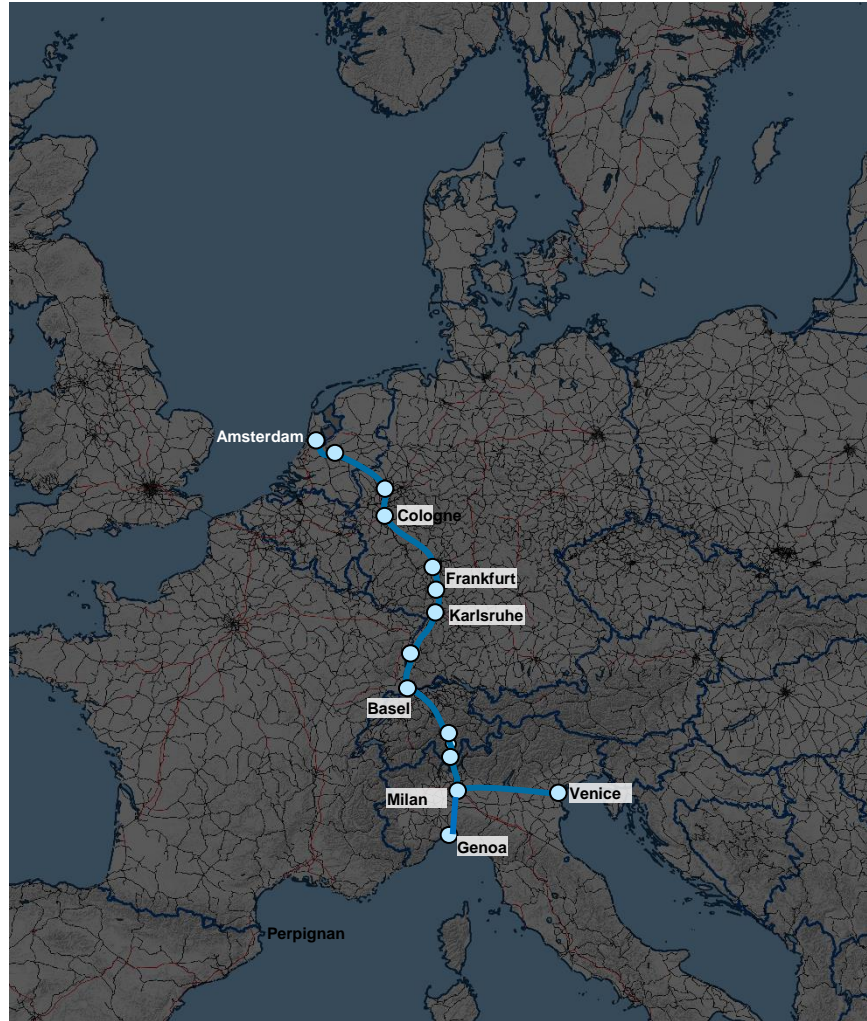
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

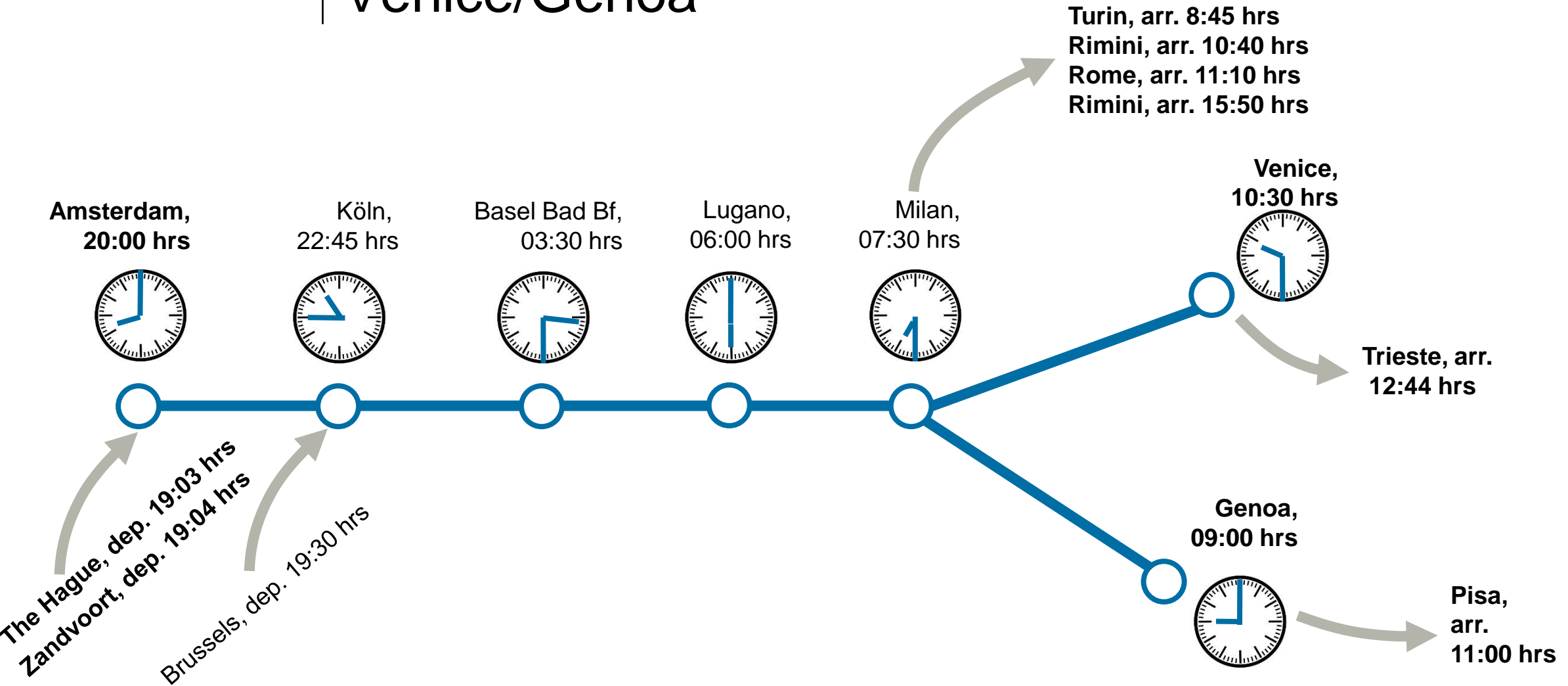
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEEN 25/26 is based on the infrastructure as at the end of 2020 (commissioning of the Ceneri Base Tunnel)



Amsterdam – Cologne – Basel – Milan – Venice/Genoa



Journey time Amsterdam – Venice: 14 h 30 min
 Journey time Amsterdam – Genoa: 13 h

Frankfurt/Zürich – Lyon – Montpellier – Barcelona

Only one direction considered

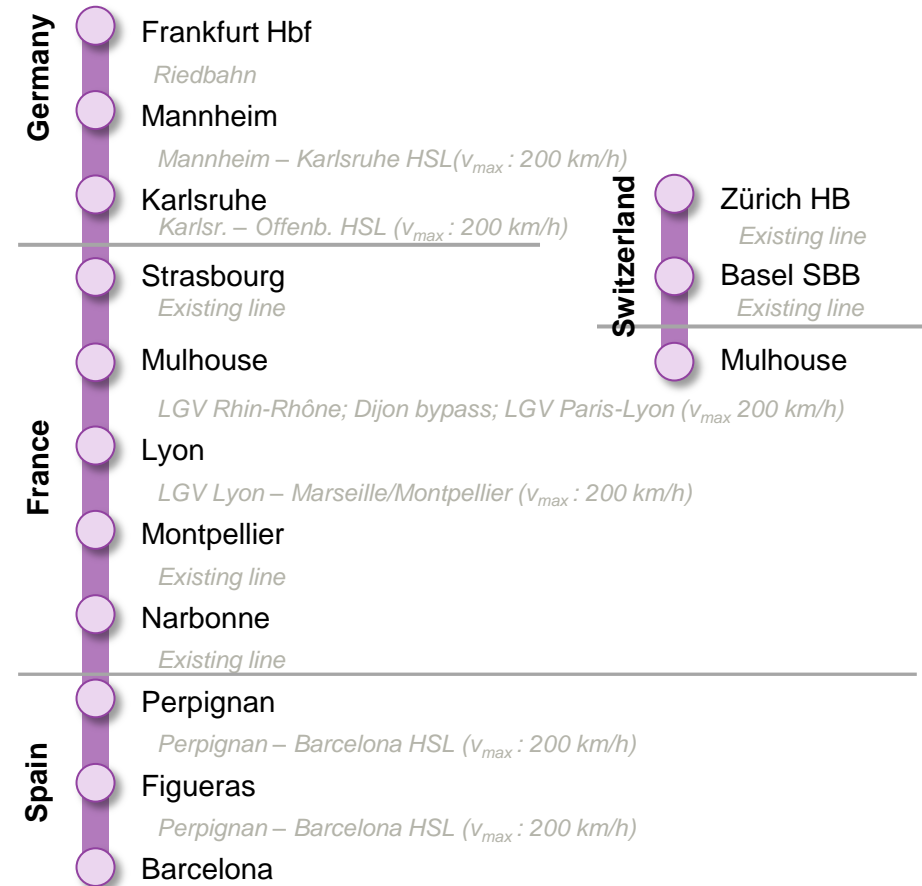
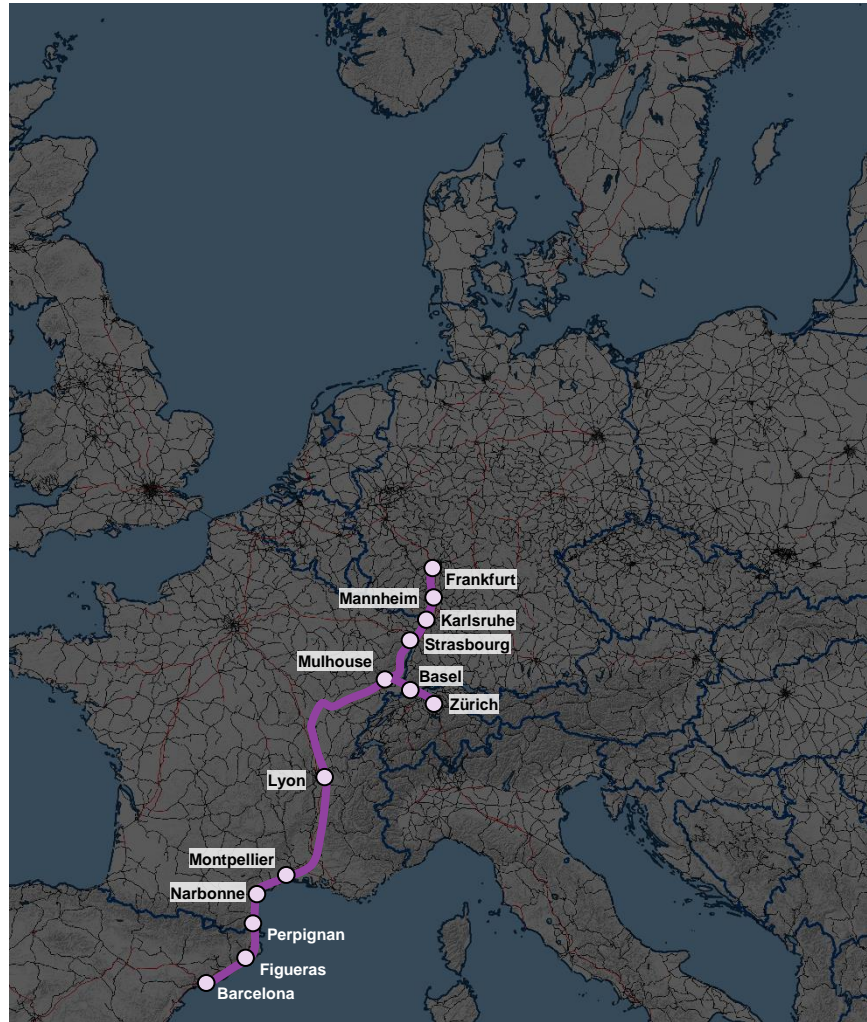
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

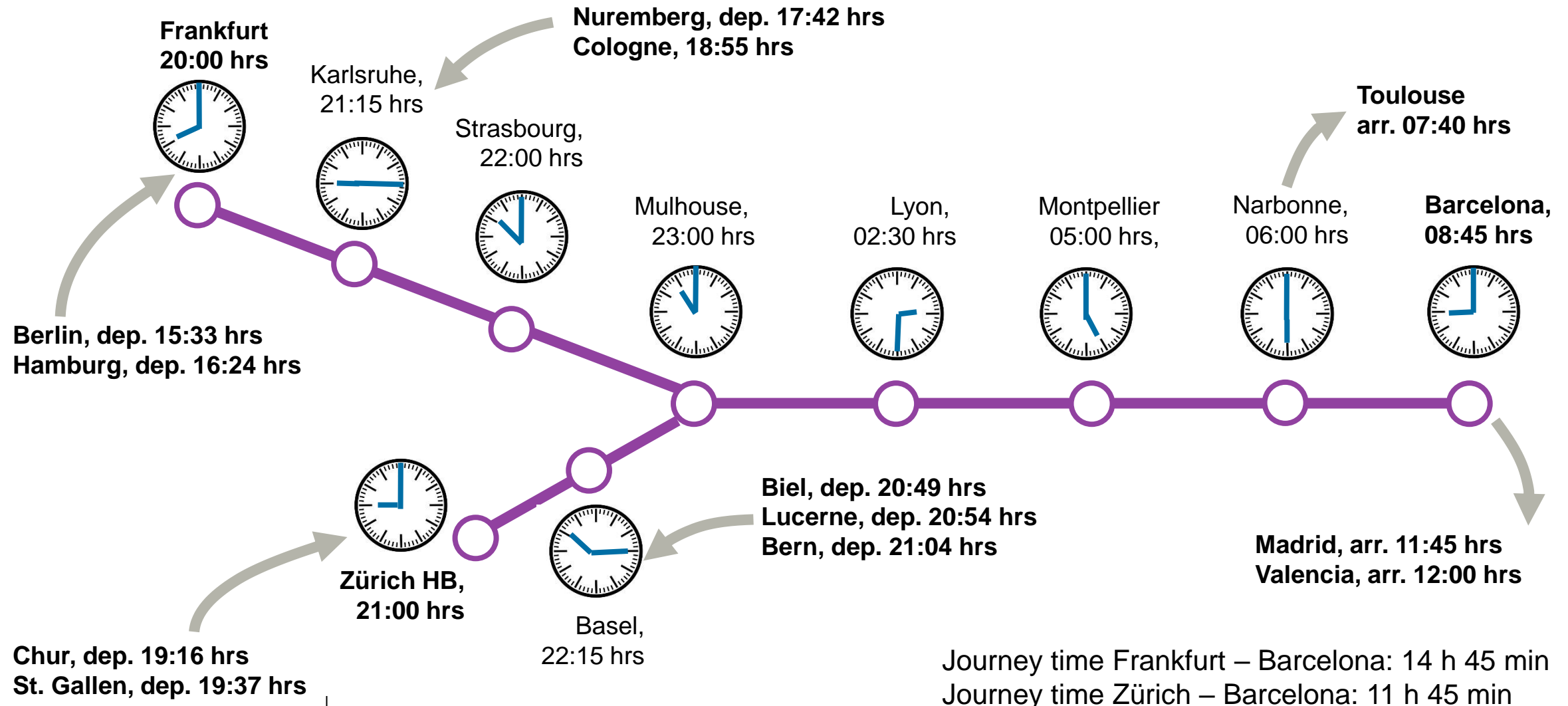
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEEN 27/28 is based on present-day infrastructure.



Frankfurt/Zürich – Lyon – Montpellier – Barcelona



Journey time Frankfurt – Barcelona: 14 h 45 min
 Journey time Zürich – Barcelona: 11 h 45 min

Berlin – Munich – Innsbruck – Bologna – Rome/Genoa – Nice

Only one direction considered

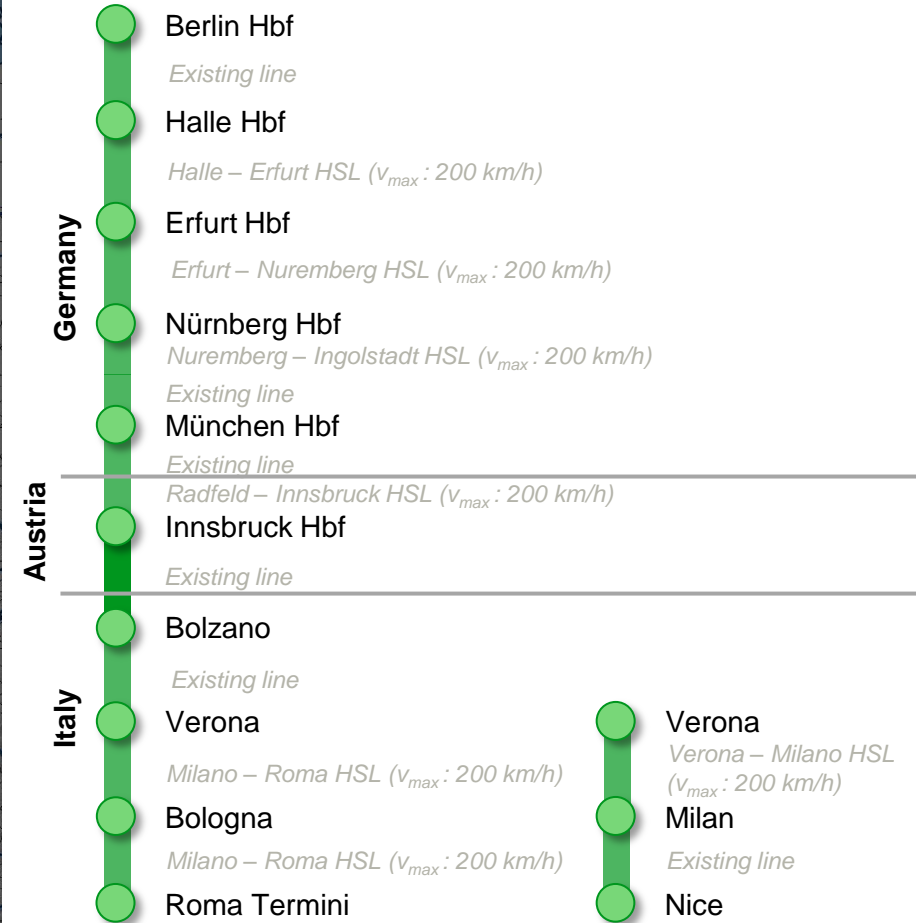
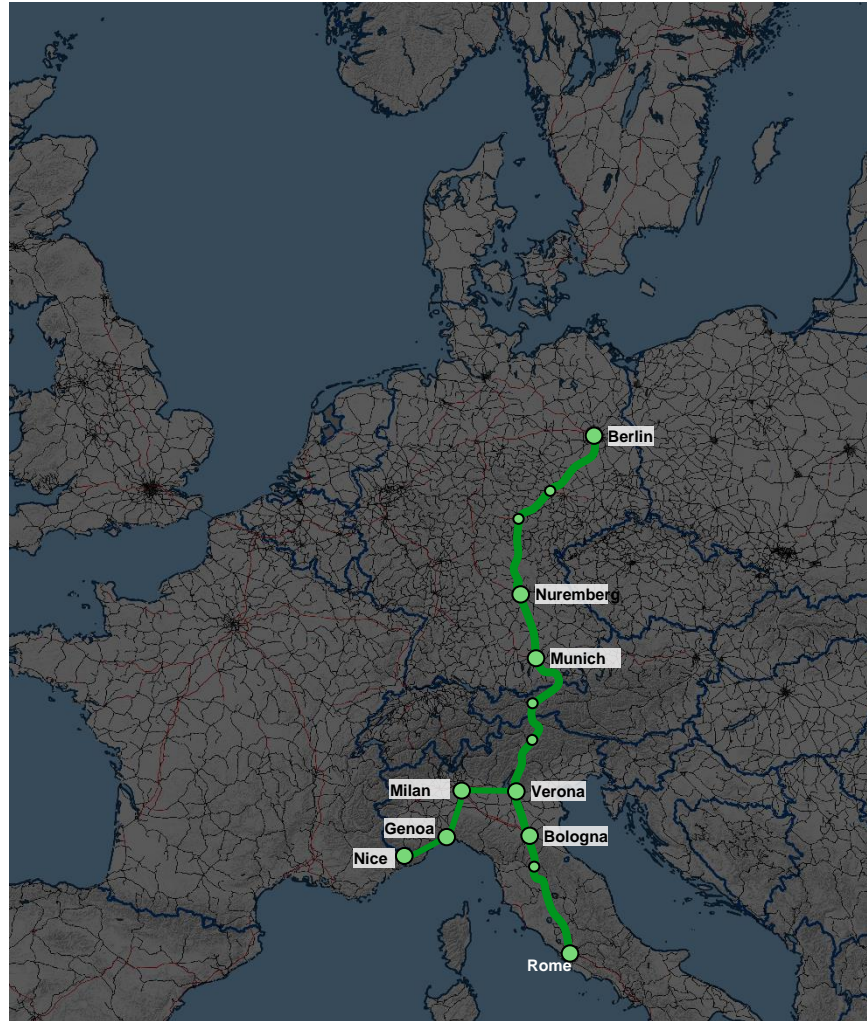
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

The basis of the considerations is the assumption of a daily pair of trains for each line.

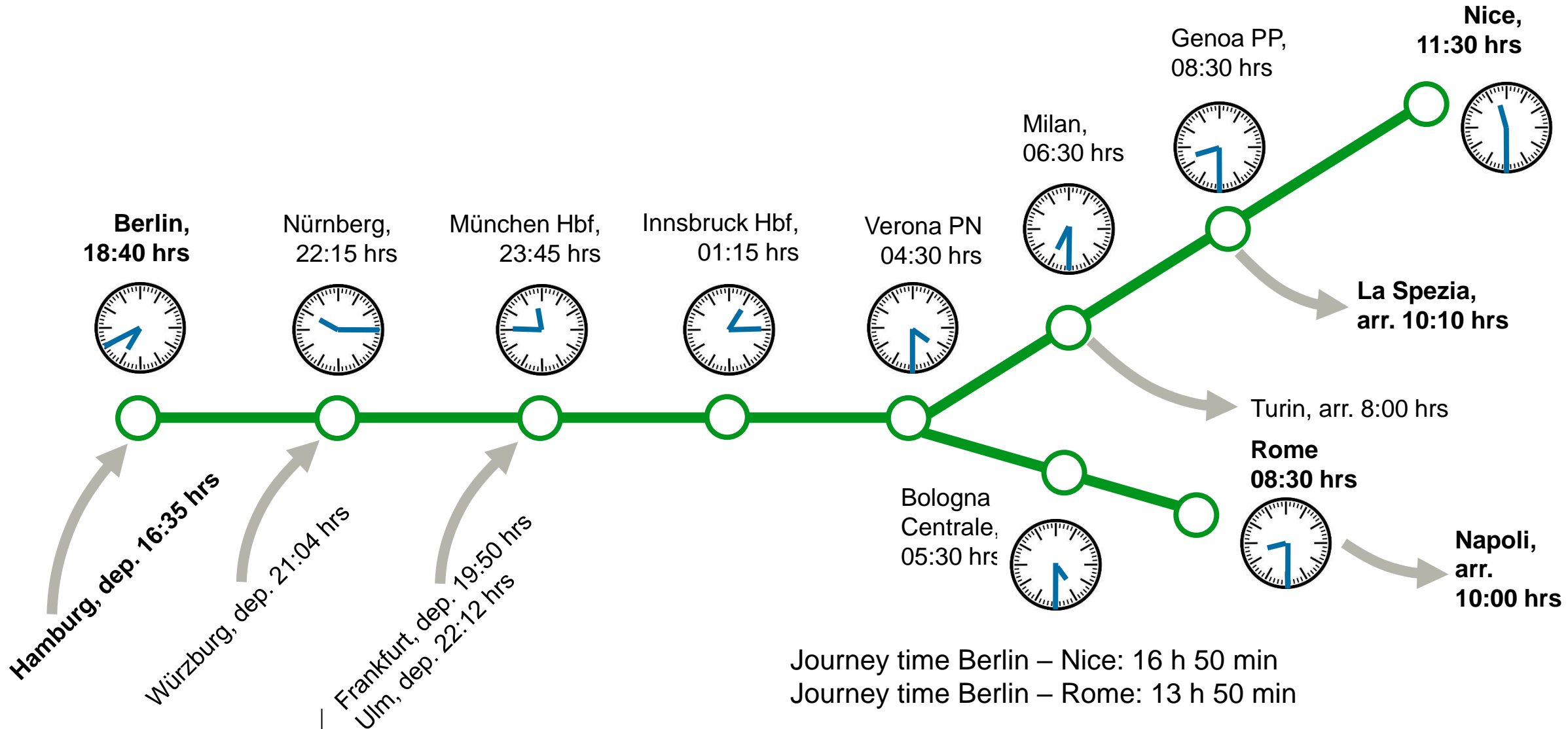
Infrastructure basis

The blueprint for trains TEEN 29/30 is based on present-day infrastructure.

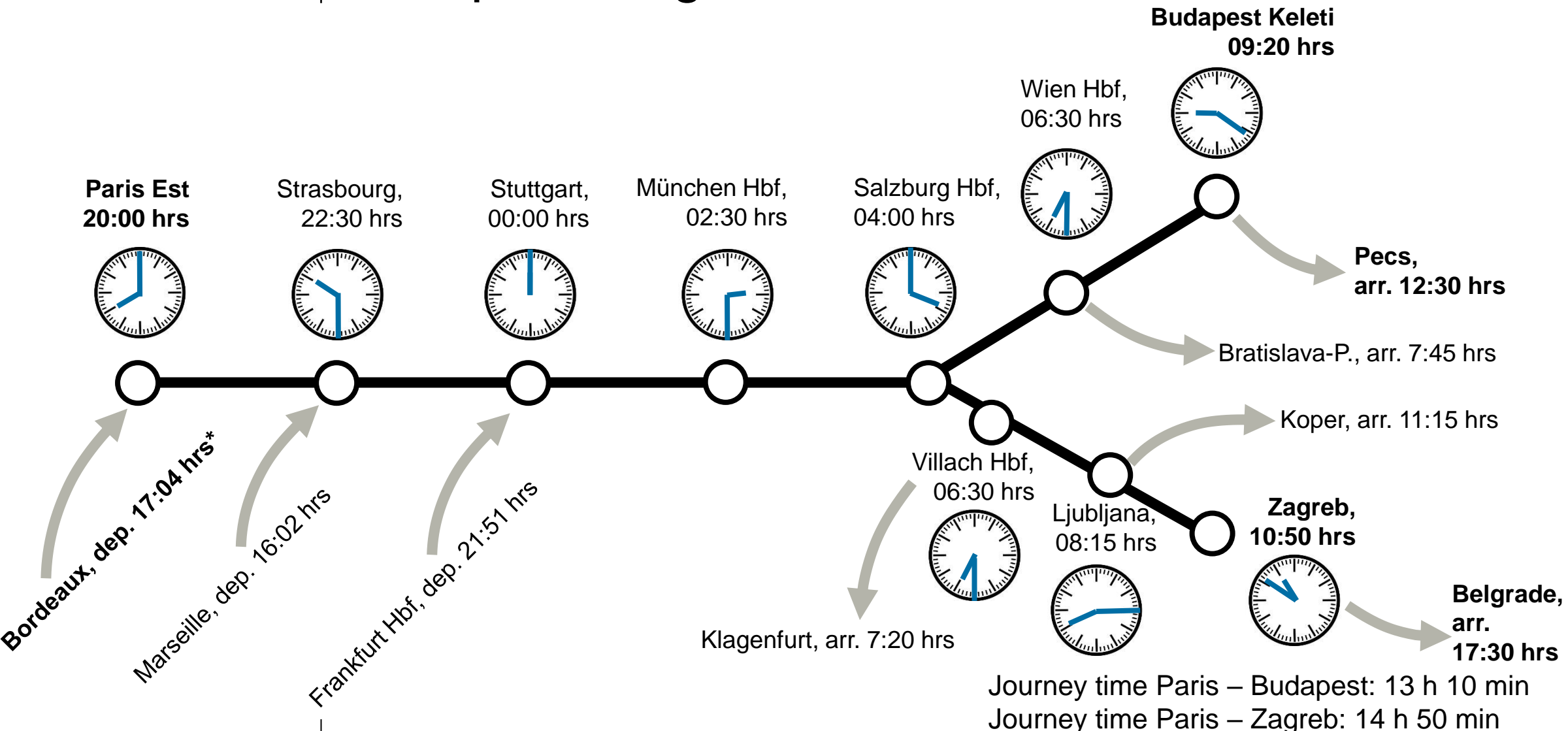


Not all intermediate stops shown

Berlin – Munich – Innsbruck – Bologna – Rome/Genoa – Nice



Paris – Stuttgart – Munich – Vienna – Budapest/ Zagreb



* Paris Montparnasse

Copenhagen – Hamburg – Brussels – Paris/ Amsterdam

Only one direction considered

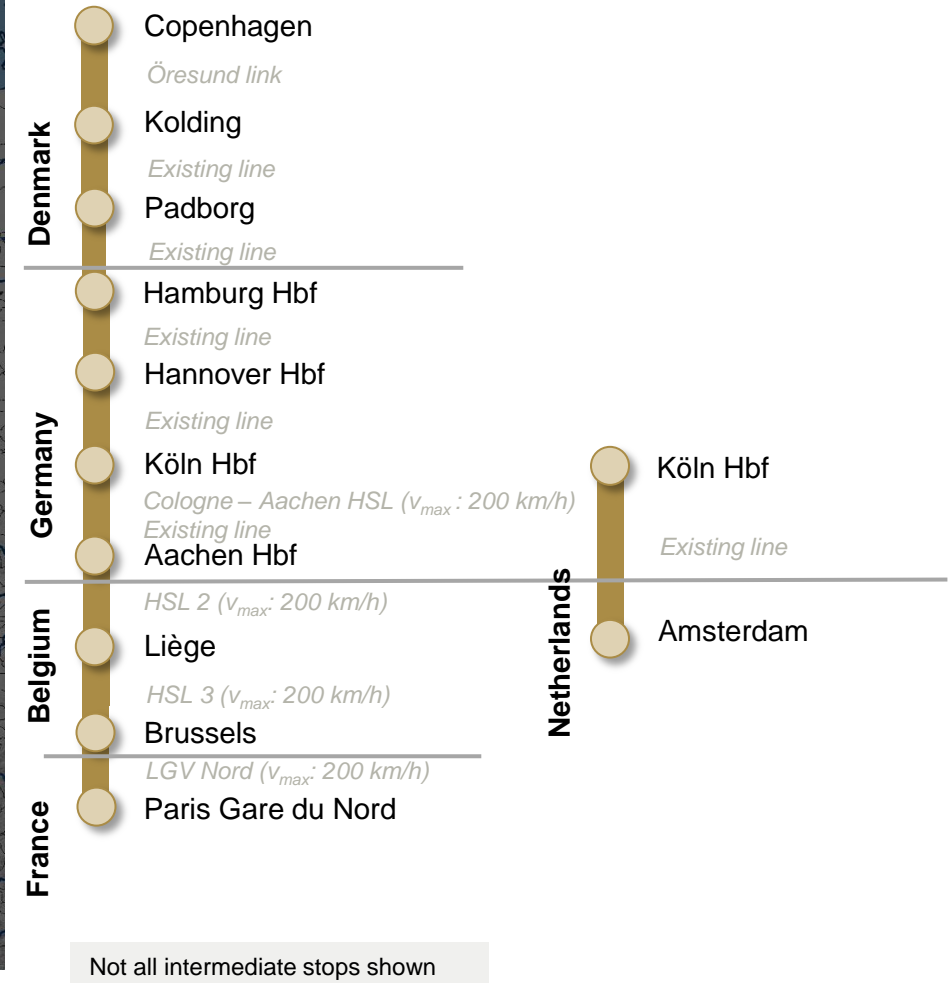
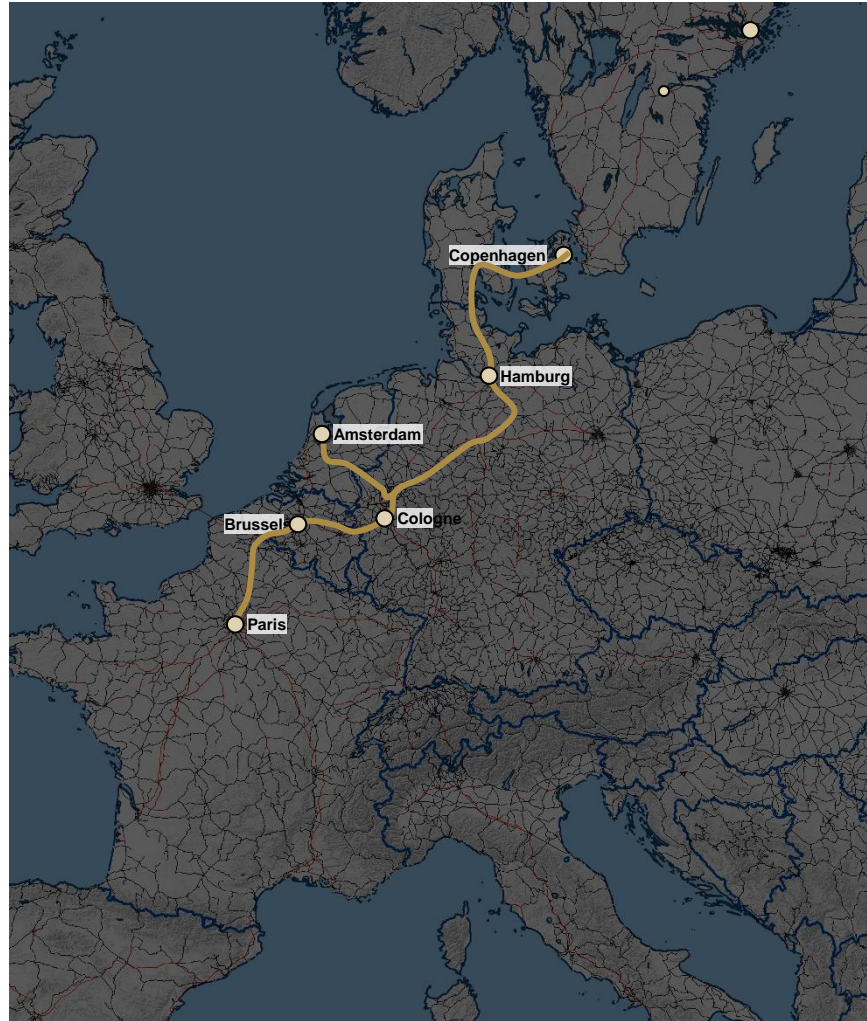
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

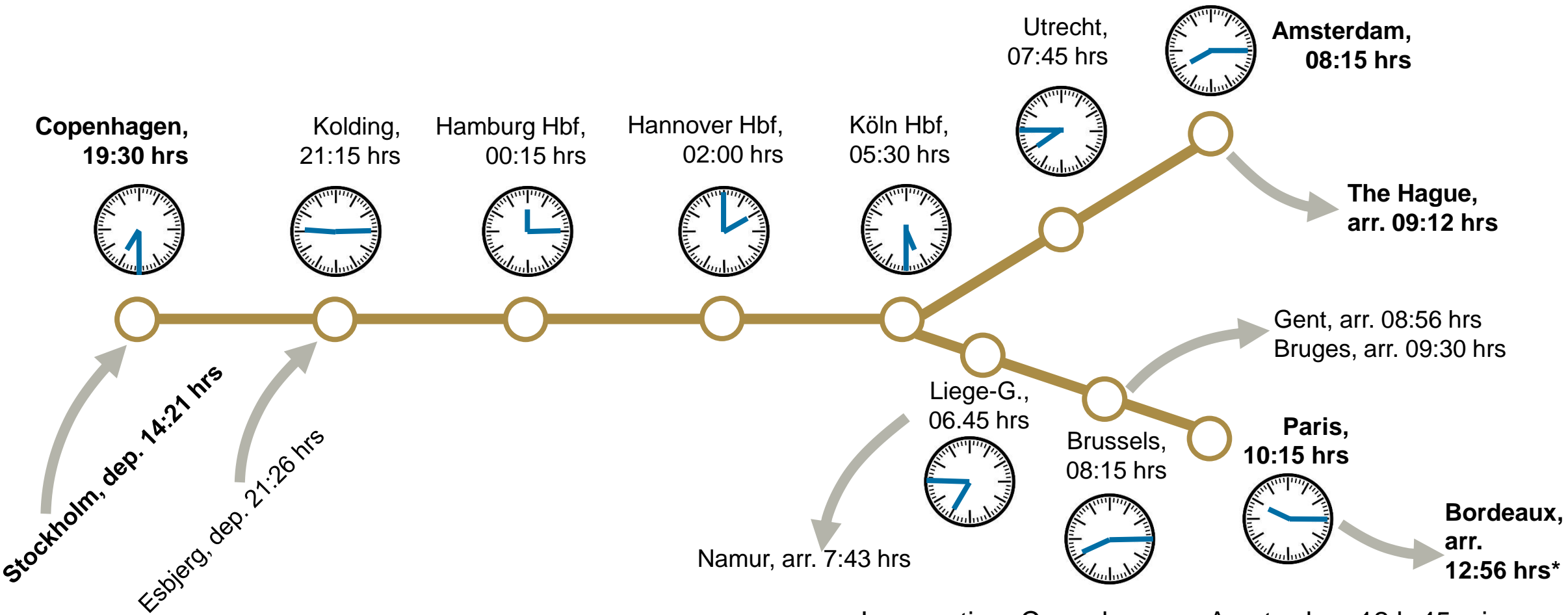
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEEN 33A/34A is based on present-day infrastructure.



Copenhagen – Hamburg – Brussels – Paris/ Amsterdam



Journey time Copenhagen – Amsterdam 12 h 45 min

Journey time Copenhagen – Paris 14 h 45 min

Blueprint TEE 2.0 | 27.01.2020 | SMA

Stockholm – Copenhagen – Hamburg – Brussels – Paris

Only one direction considered

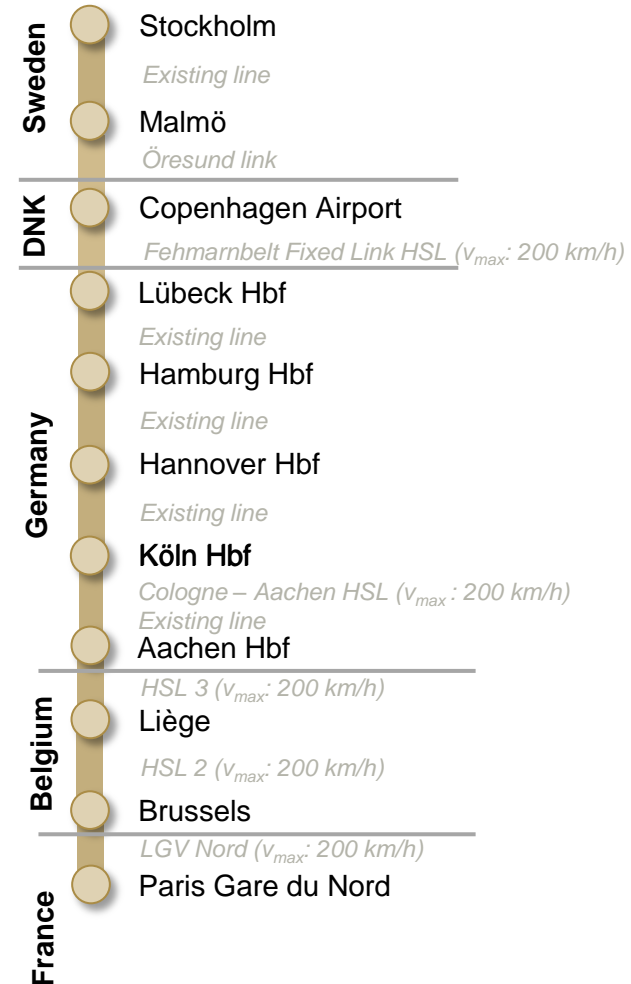
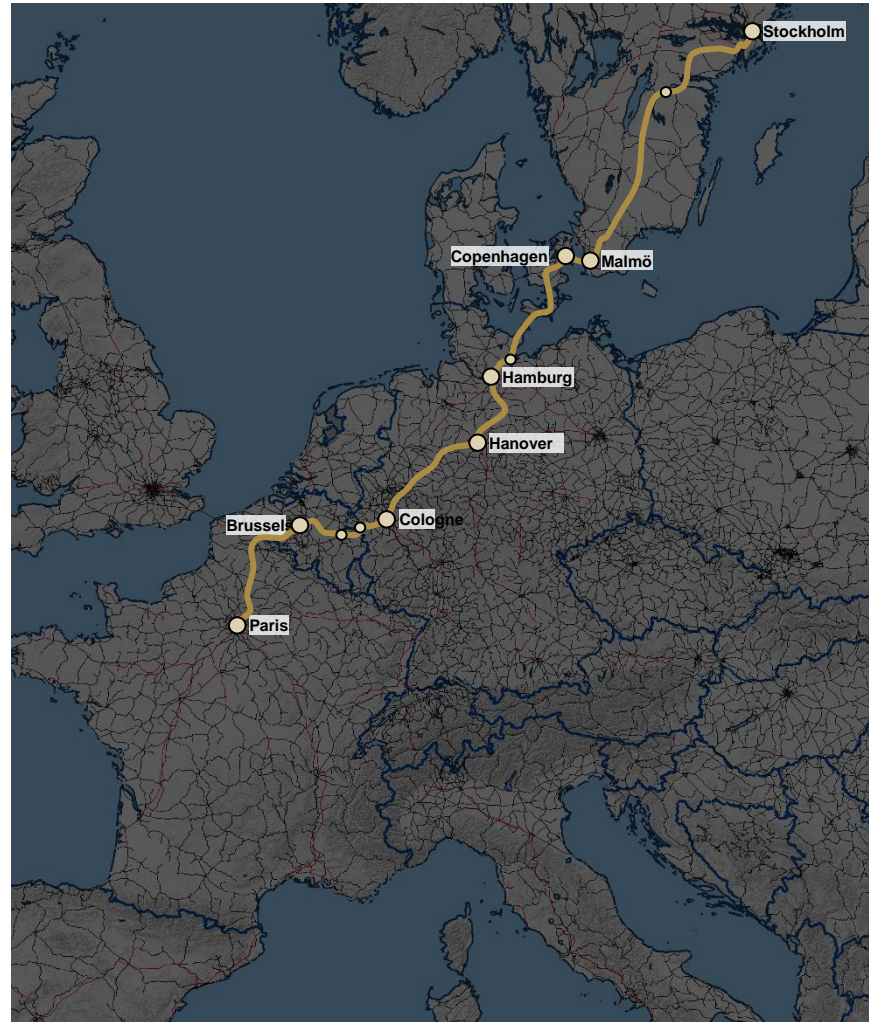
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction. The train crosses the train travelling in the opposite direction at 14:00 hrs.

Basis: 1 daily pair of trains

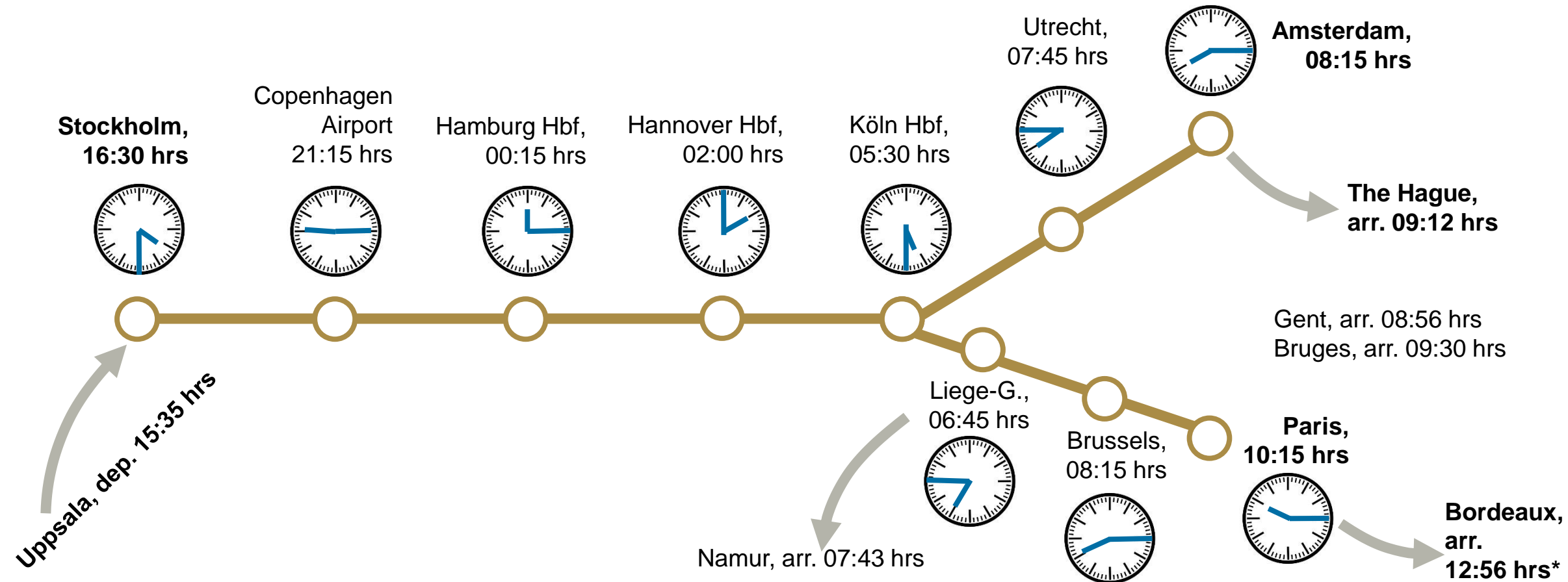
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEEN 33B/34B is based on the infrastructure as at the end of the 2020s (commissioning of the Fehmarn Belt Fixed Link)



Stockholm – Copenhagen – Hamburg – Brussels – Paris



Copenhagen – Berlin – Prague – Vienna/Budapest

Only one direction considered

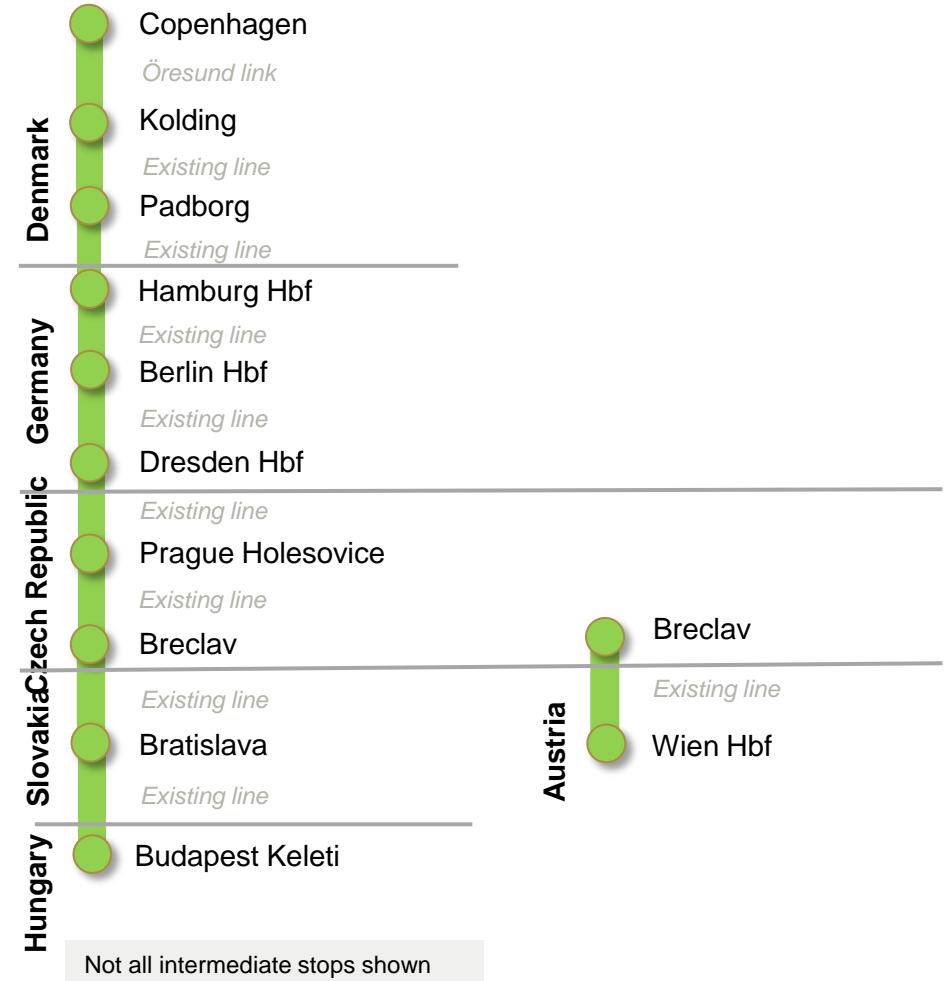
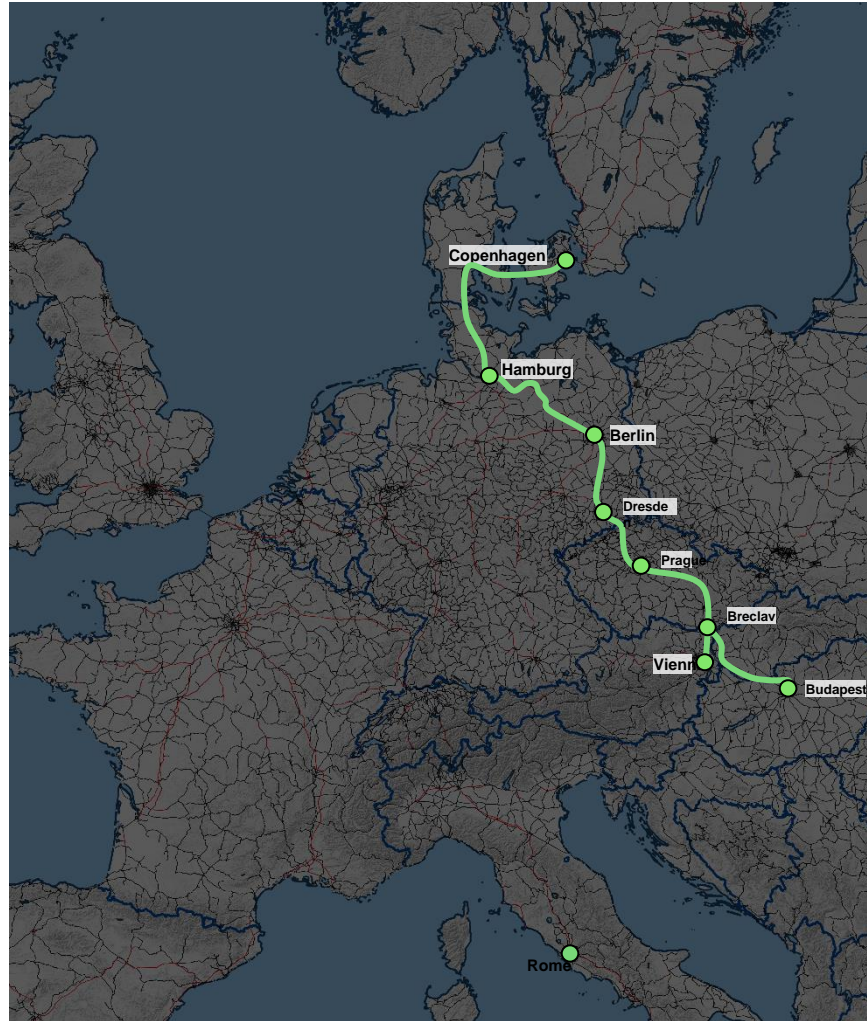
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

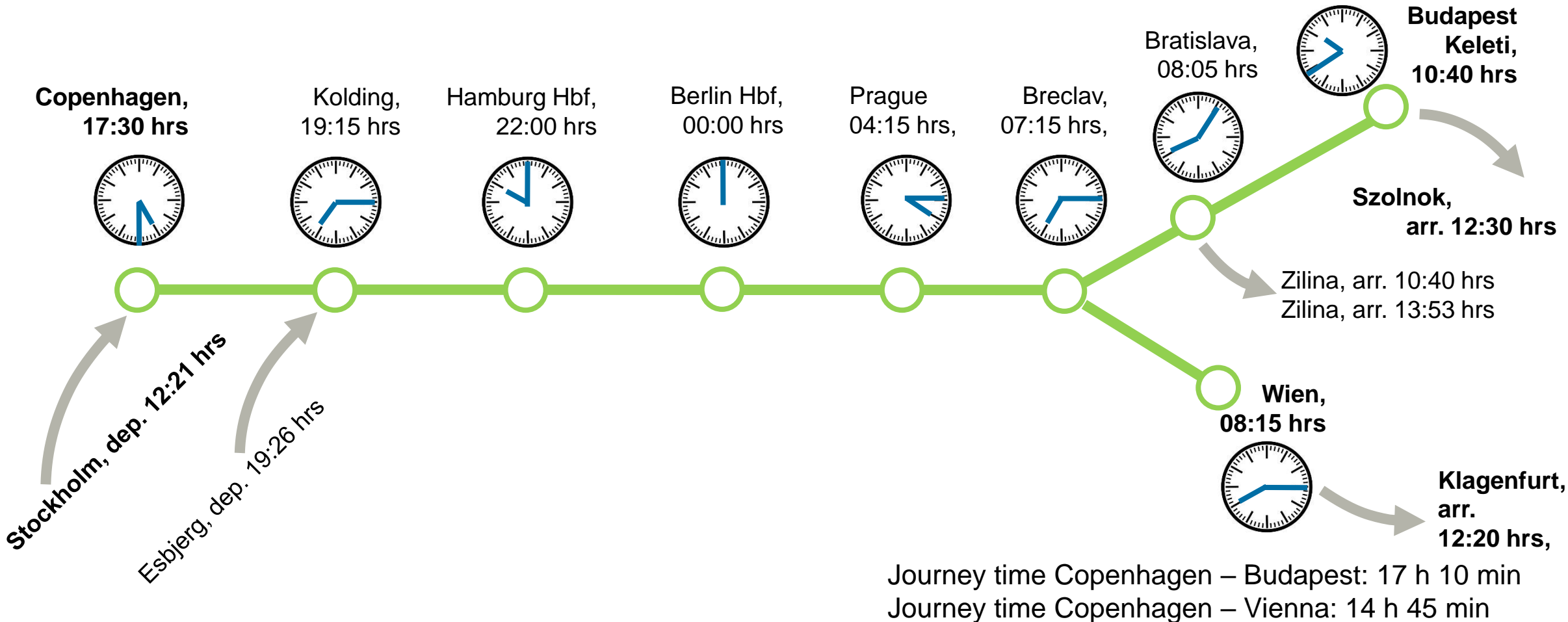
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEEN 35A/36A is based on present-day infrastructure.



Copenhagen – Berlin – Prague – Vienna/Budapest



Stockholm – Copenhagen – Berlin – Prague – Vienna/Budapest

Only one direction considered

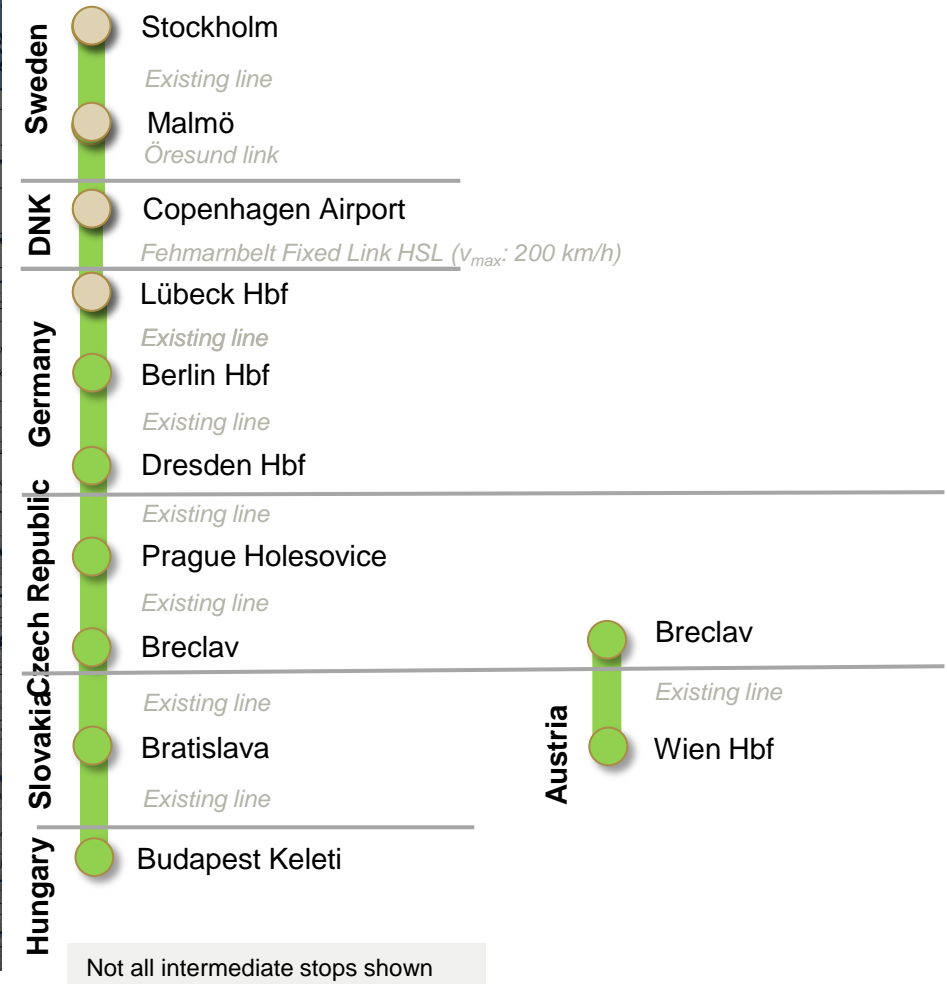
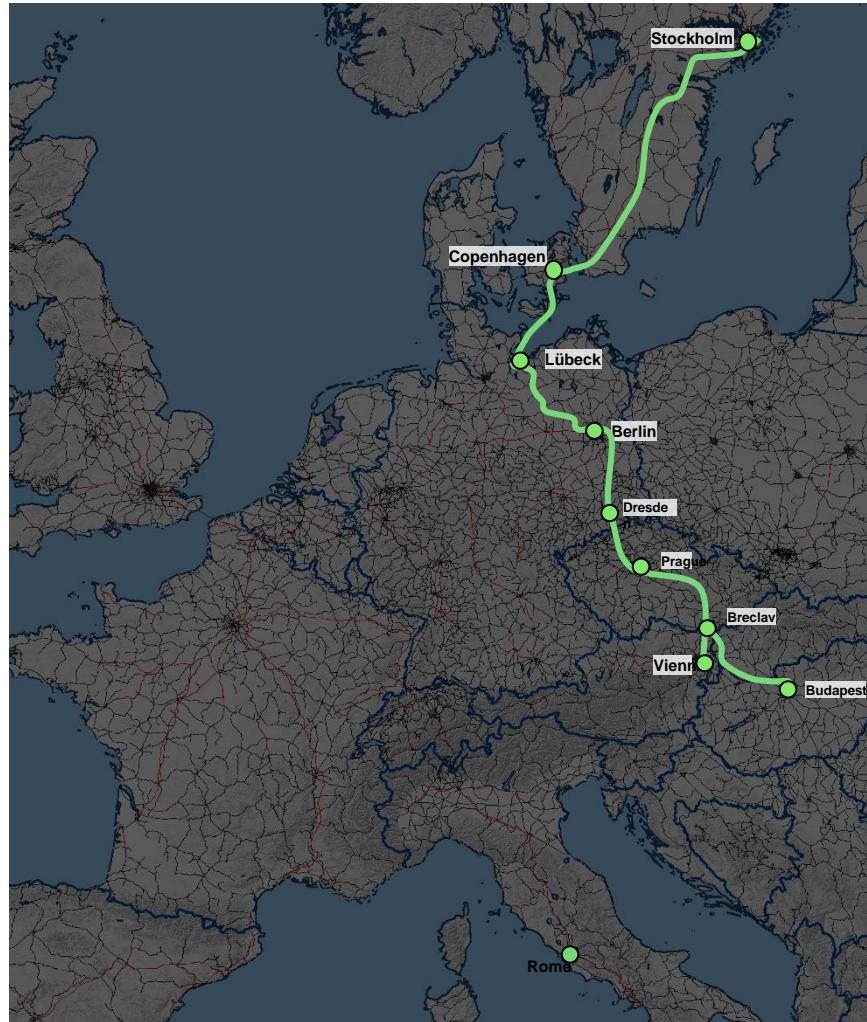
The following slides describe the blueprint based on a train travelling in one direction. The information also applies to the opposite direction.

Basis: 1 daily pair of trains

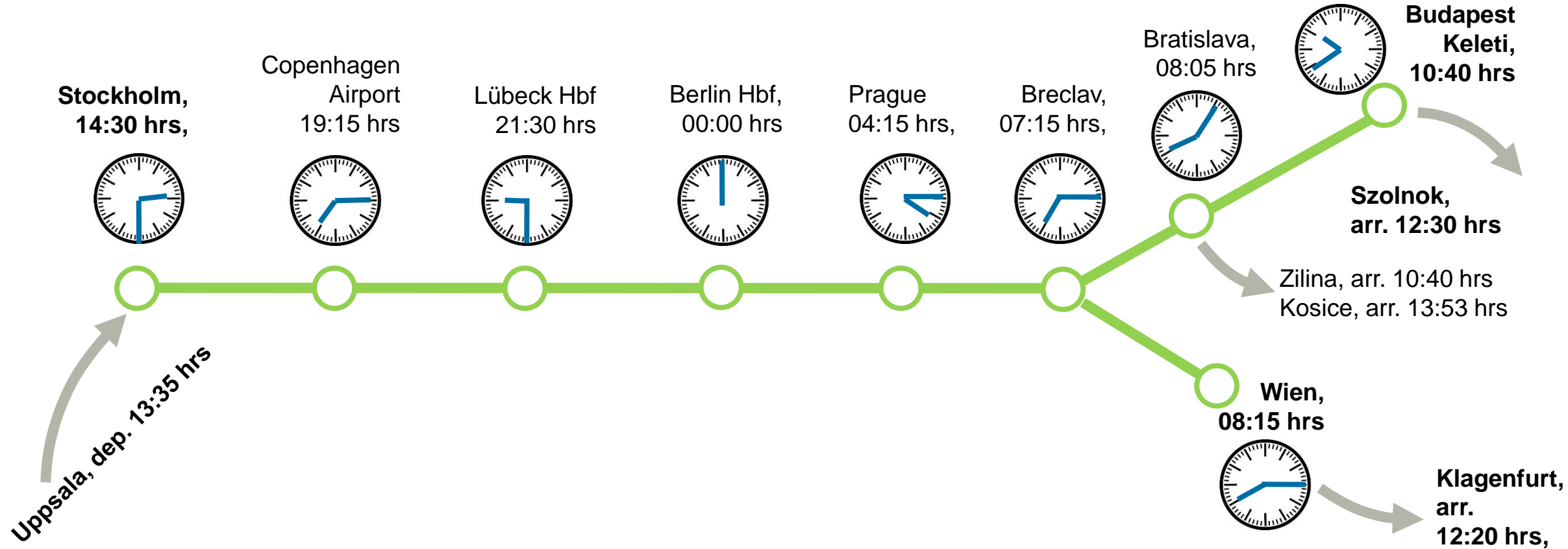
The basis of the considerations is the assumption of a daily pair of trains for each line.

Infrastructure basis

The blueprint for trains TEE 35B/36B is based on the infrastructure as at the end of the 2020s (commissioning of the Fehmarn Belt Fixed Link)



Stockholm – Copenhagen – Berlin – Prague – Vienna/Budapest



Journey time Stockholm – Budapest: 20 h 10 min
 Journey time Copenhagen – Vienna: 17 h 45 min