INTERNATIONAL UNION
OF RAILWAYS

unity, solidarity, universality

High Speed Rail and Low Cost Air Intermodality

EUI workshop
Florence, 3 March 2014

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Coordinator Latin American Region, UIC

Agenda

The UIC
Railways principles
Capacity
Intermodality
Concluding remarks

The UIC

Railways principles

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Intermodality

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What's the UIC?

The UIC is a professional organisation serving the needs of rail transport through international cooperation at the global level

Since 1922
240 members on all continents
Members are:

- Railways
- Rail operators
- Infrastructure managers
- Railway service providers
- Public transport companies

UIC Mission

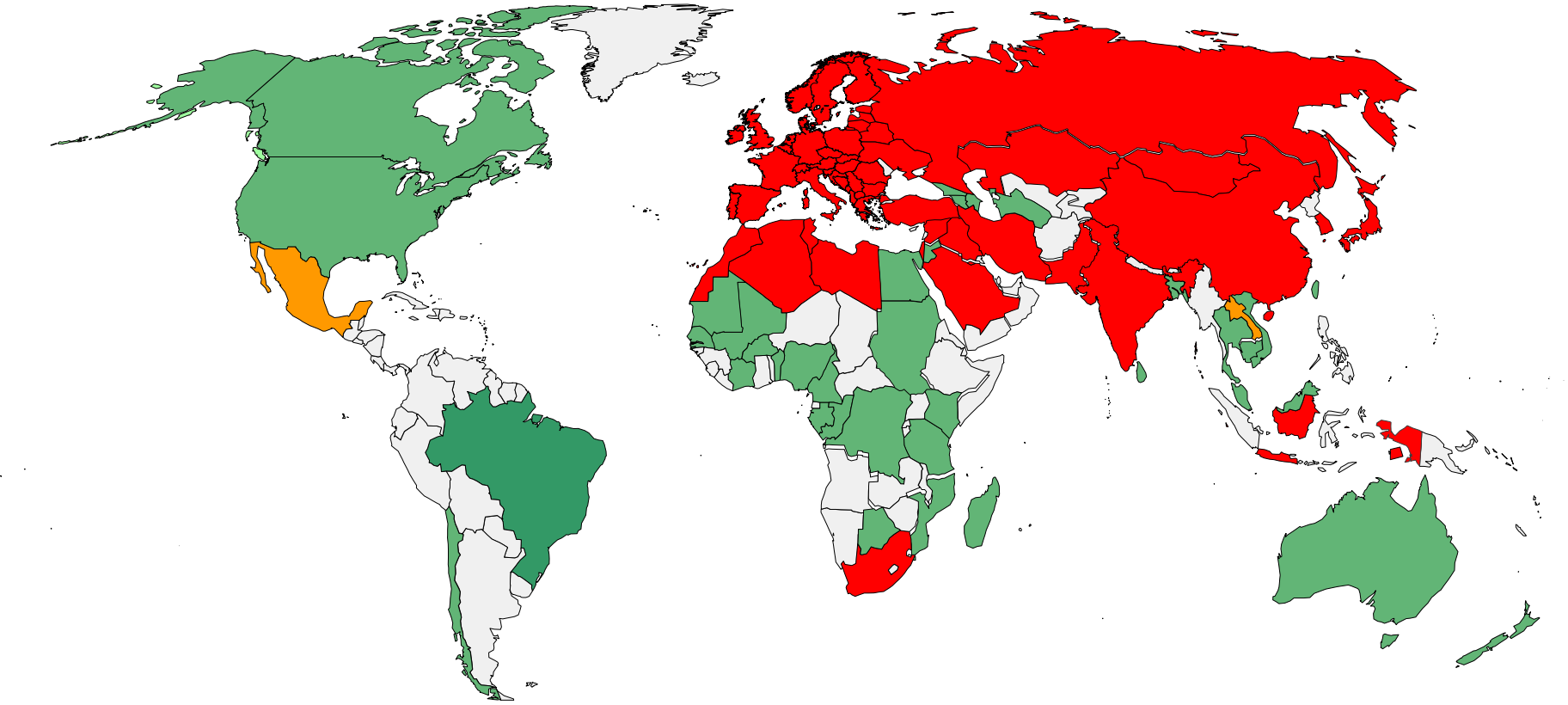
Promoting the development of rail transport

at world level,

in order to meet challenges

of mobility and sustainable development

UIC in 2014



Members Active Associate Affiliate

www.uic.org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UNION INTERNATIONALE DES CHEMINS DE FER

UIC – Intercity & High Speed

Working group in activity since 1995
Studies on strategic issues
www.uic.org/highspeed

Activities:
- Benchmarking & data bases
- System analyses & researches
- Technical workshops
- Training programs
- World Congress on High Speed

High Speed:
- Systems in operation
- Future developments

UIC – Intercity & High Speed

<u>High speed reports</u>. Recent examples:

- High speed and the City (I & II)
- High speed handbook
- High speed contribution to sustainable mobility
- Optimal speed on high speed systems
- Infrastructure cost for Intercity & HS services
- Etc.

Full Library of studies & reports available online: www.uic.org/highspeed

<u>Tourist OPportunities on Rail Transport (TOPRAIL)</u>

New activity to explore and promote the potential of traffic on rail for leisure: High Speed, seasonal, charter, safety on vintage trains, cruise trains,… New chairmanship (Catalonian Railways)

Training on High Speed Systems

THSS Basic **10th edition - June 2014, Paris**

One week (5 days) Training Seminar, in which all the elements involved in a high speed system are analysed.



THSS Advanced **2nd edition - March 2014, Spain**

One week (5 days) Training Seminar, focused on strategic aspects in a high speed system: traffic forecasting, station policy, environment, financing, etc.

Practical cases discussion.

Technical visits

www.uic.org/highspeed

World Congress on HS Rail WCHS

TOKYO 2015
HIGHSPEED
9th World Congress on High Speed Rail

July 2015 in Tokyo, Japan
Organized by the UIC & East Japan Rail

The UIC

Railways principles

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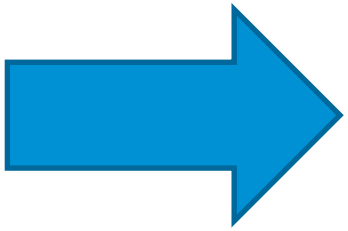
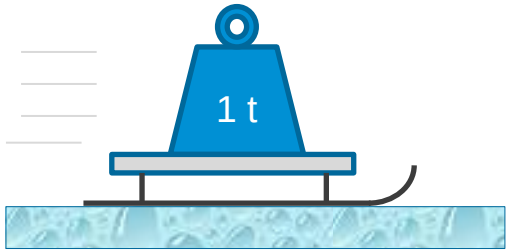
Concluding remarks

Basic principles of Railways

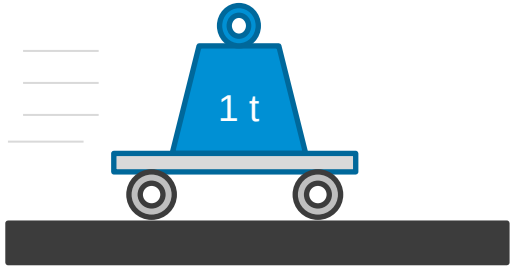
- Self-guided
  ("Surprising")
- Low deformation and
  low friction between wheel and rail
  ("300 - 15 - 3")

300 kg

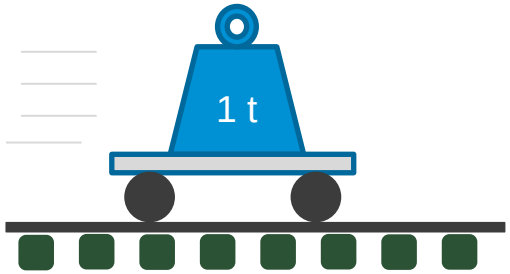




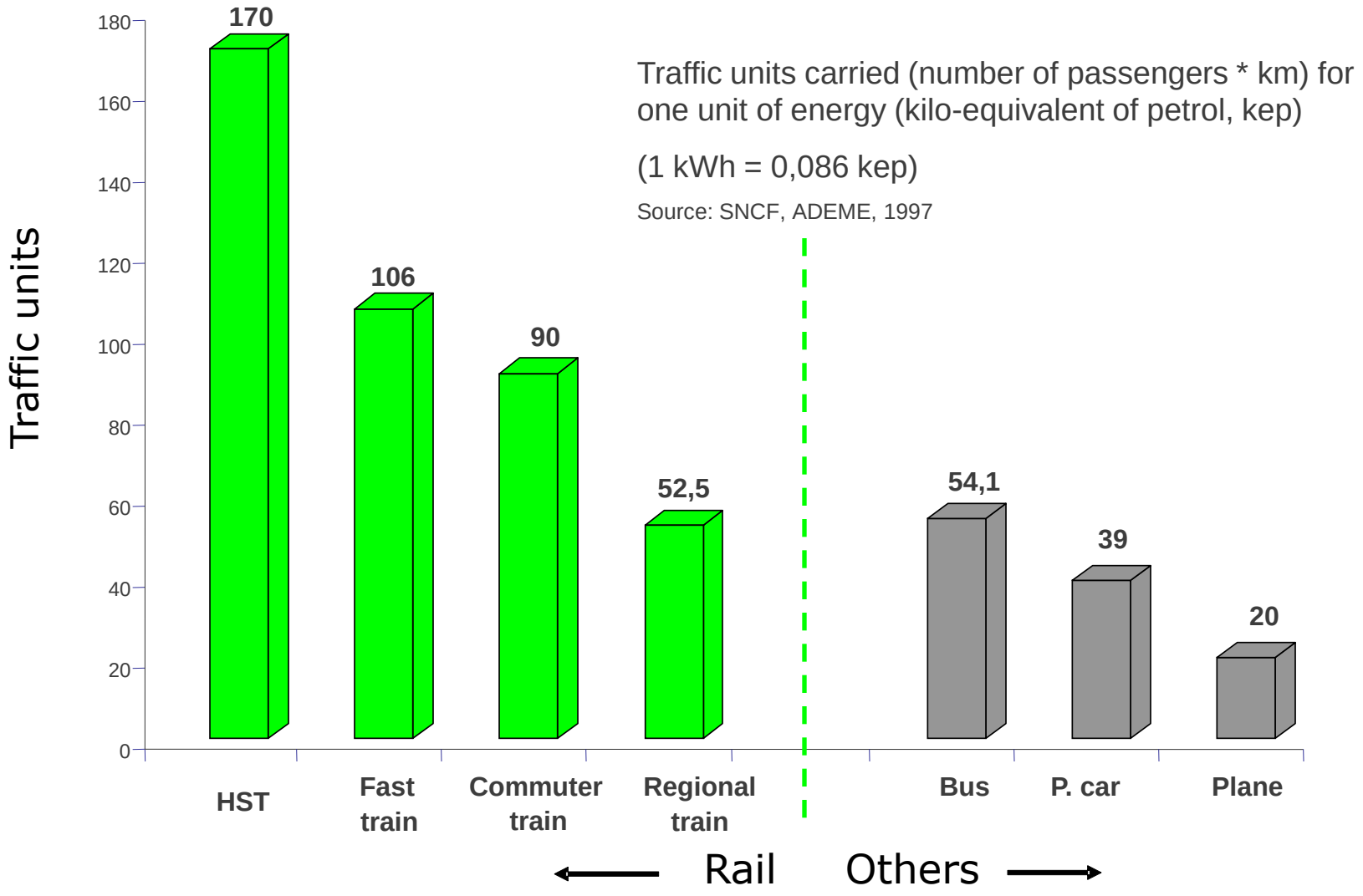
15 kg



3 kg



Energy efficiency comparison



Advantages and disadvantages

- Advantages:
  - High Capacity of transport
  - Power (few energy, origin)
    - Respect for the environment
  - Easy automation. Safety
- Disadvantages:
  - Limits in layout: gradients
  - Traction and breaking: capacity and distances
  - One degree of liberty: few alternatives

Advantages and disadvantages

Capacity

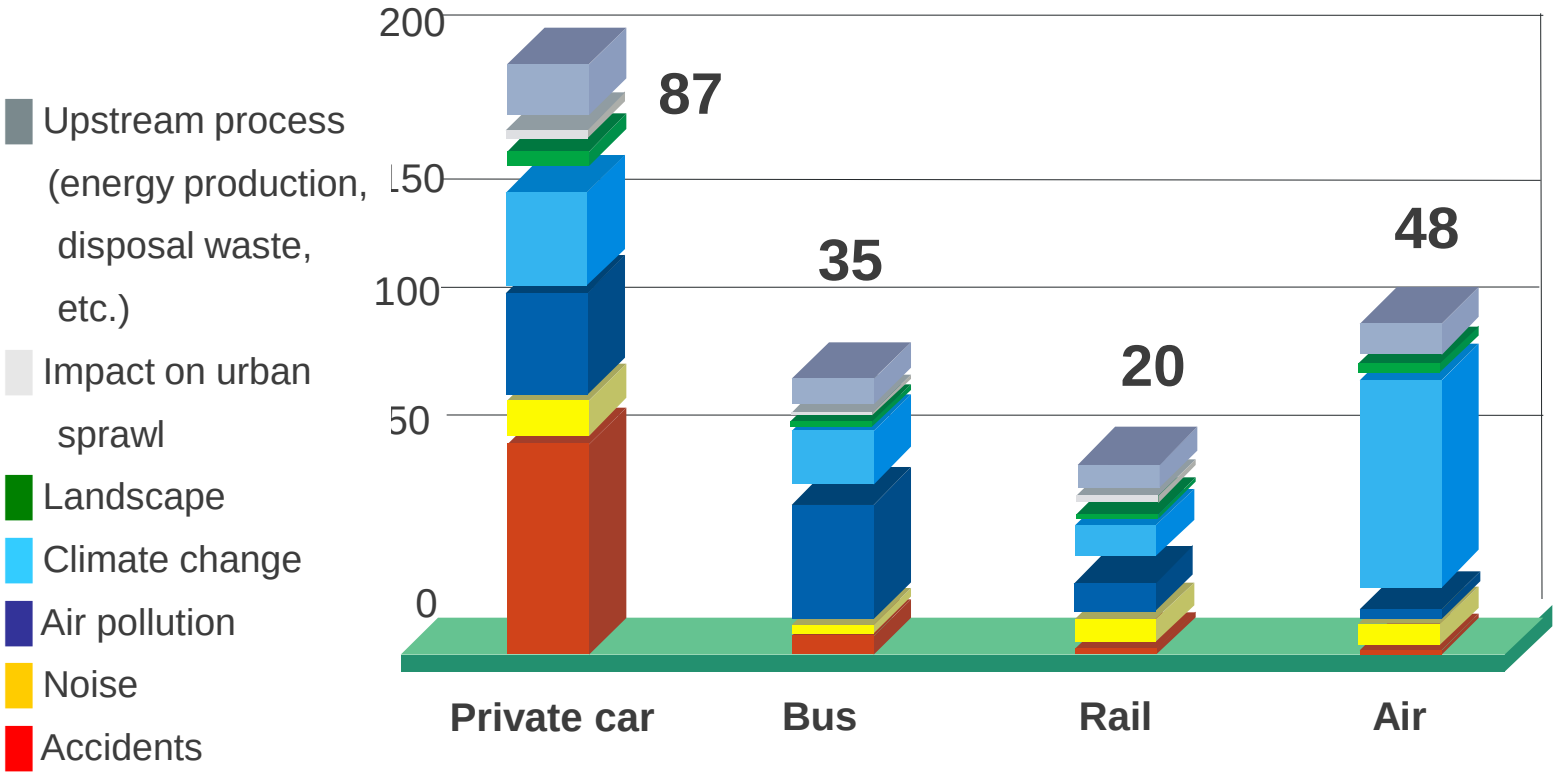
Respect for the environment

Safety

Railways = CAPACITY + sustainability

External costs (average)

External costs = Part of the ticket paid by society



Magnitude of external costs in a medium-distance corridor, non-rush hour and without considering congestion (€ per 1000 passenger km)

Understanding high speed rail 1

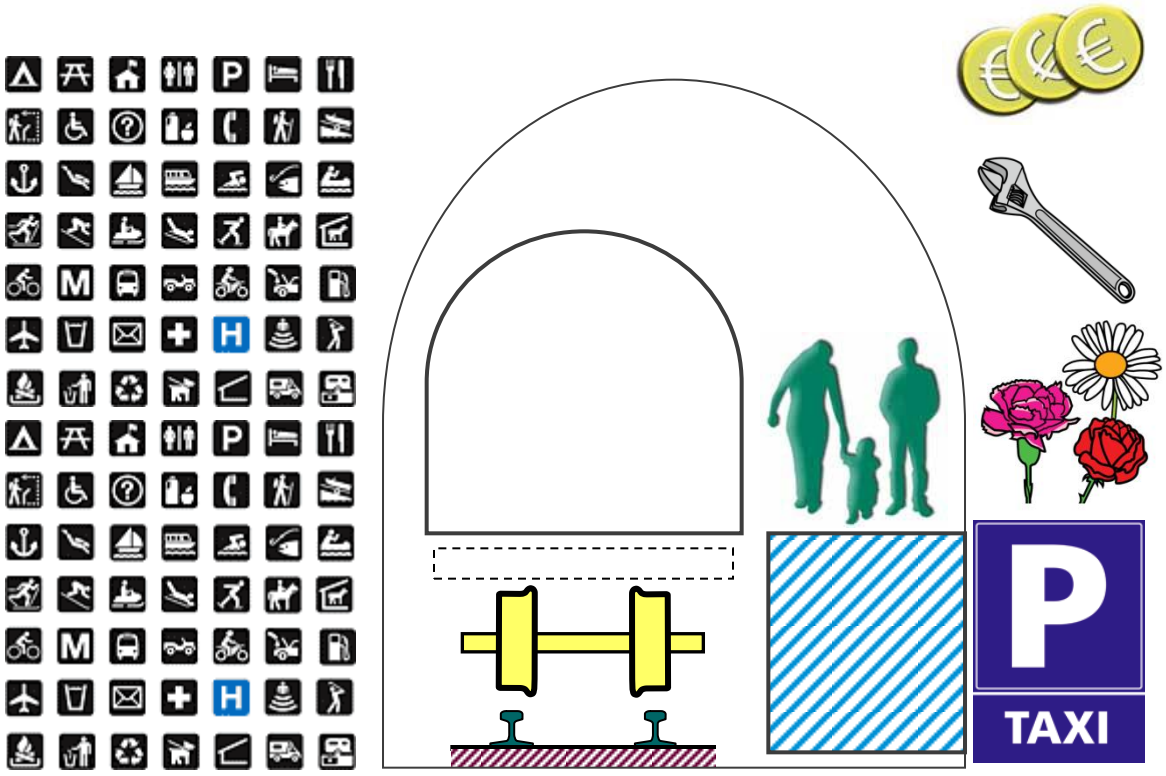
High speed is a system

A very complex system, comprised by the state of the art of:

- Infrastructure
- Rolling stock
- Signalling systems
- Maintenance systems
- Management
- …
- Station emplacement
- Operations rules
- Marketing
- Financing
- Legal issues

Considering all of them is fundamental

High Speed is a system



Understanding high speed rail 2

High speed is not unique

- Many different commercial concepts of high speed (including services to customers, marketing, etc.)
- Many different types of operations (maximum speed, stops, etc.)
- Different ways to operate classic trains (in particular, the impact on freight traffic)
- Capacity and cost vary in each case

High speed world network

World network (V ≥ 250 km):

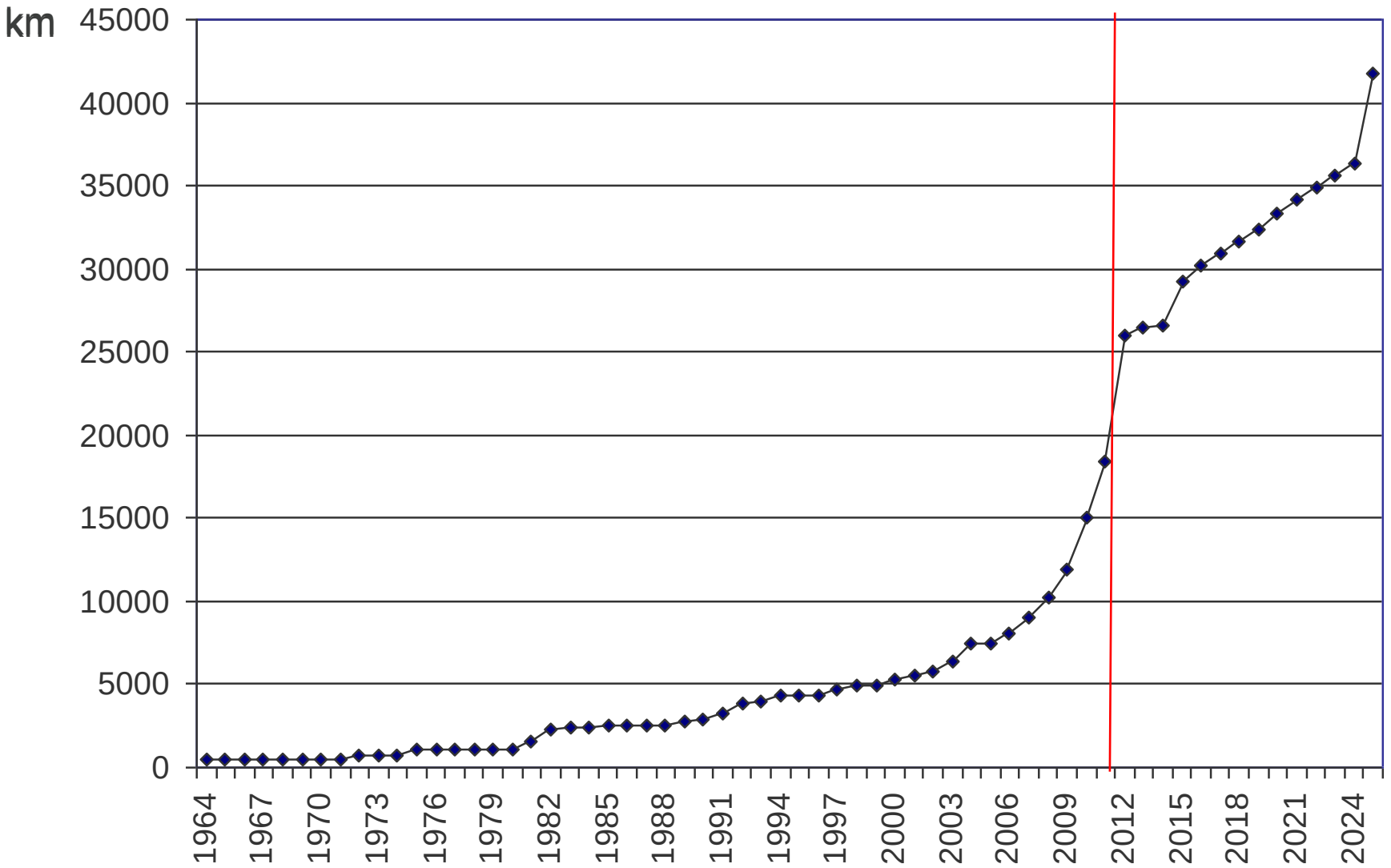
21 472 km of lines in operation

13 964 km of lines under construction

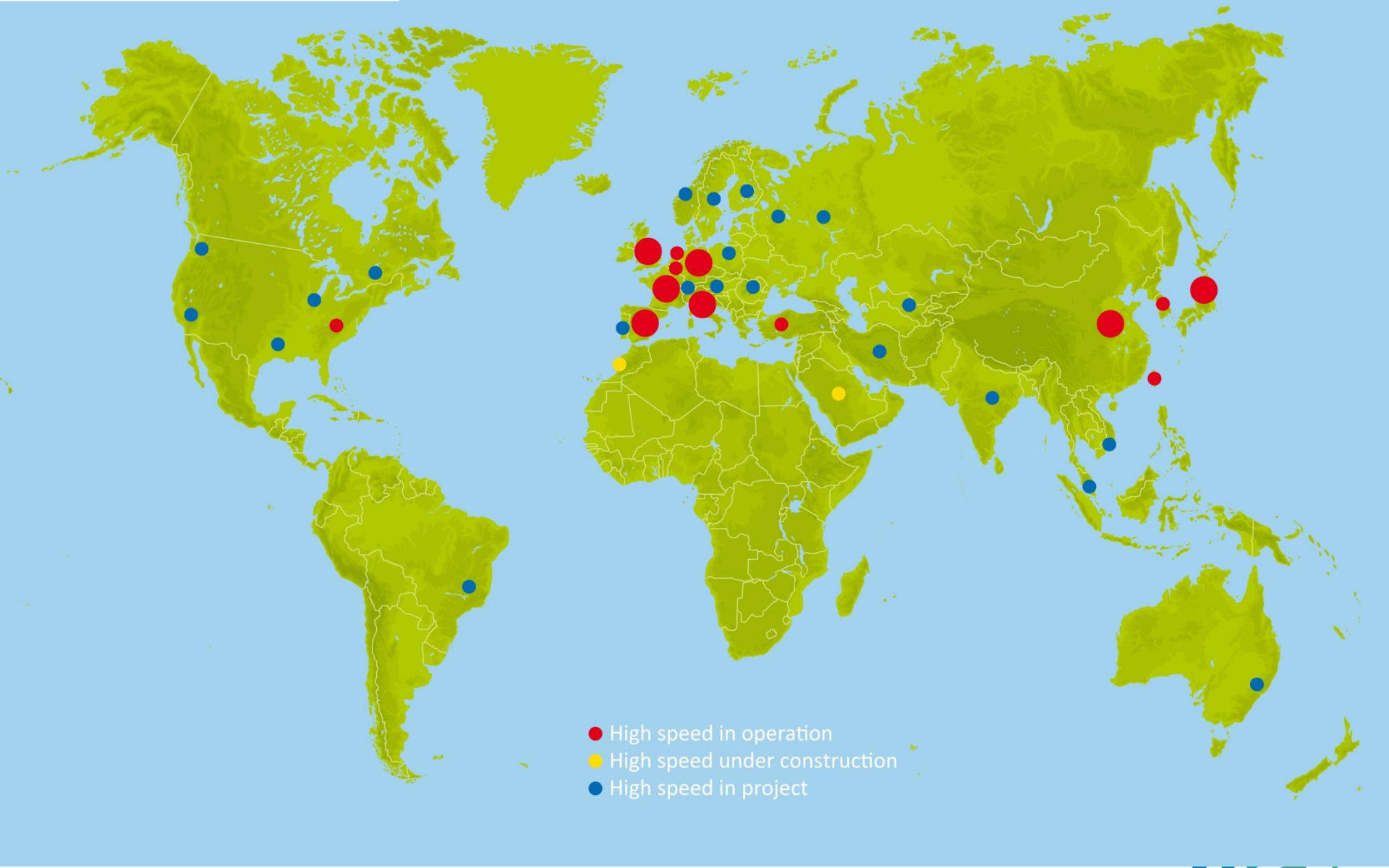
16 347 km of lines planned

November 2013

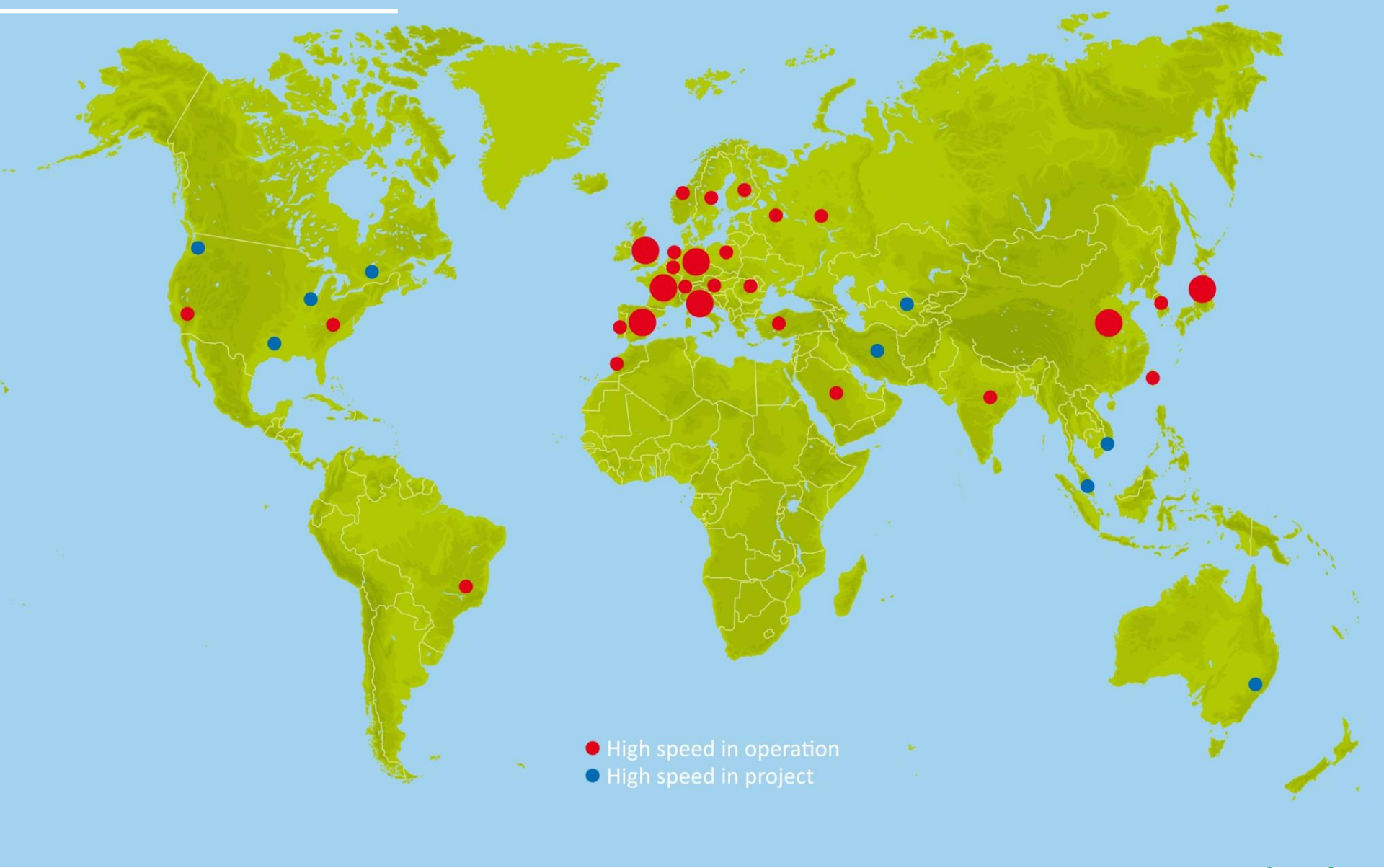
Evolution of the world HS network



2014


High speed in operation
High speed under construction
High speed in project

2025



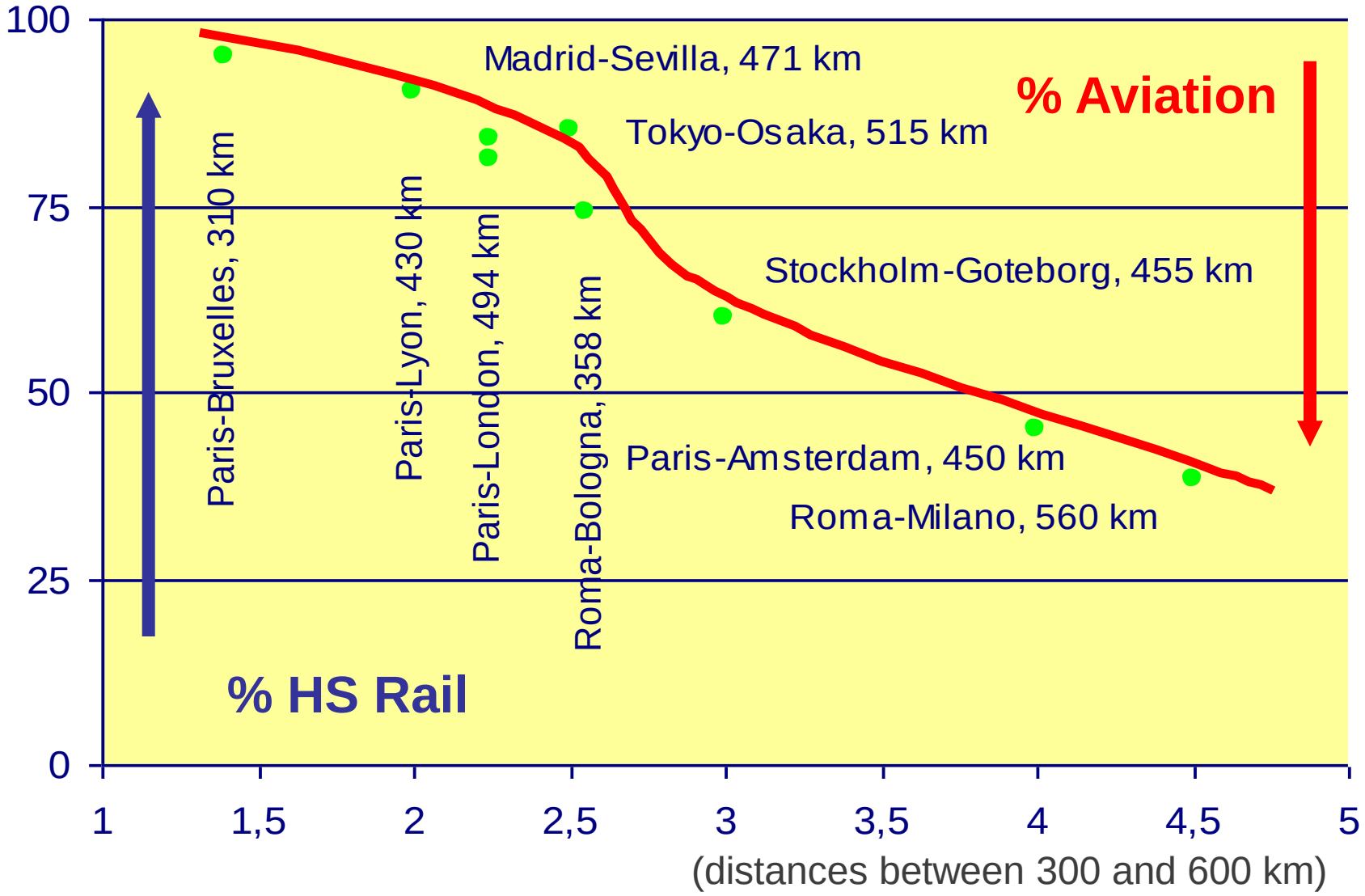
High Speed traffic volume

- 1.28 Billion passengers per year in HS trains
  - → 600 Million in China
  - → 300 Million in Japan
  - → 130 Million in France
  - → 250 Million in the rest of the world

- 15 Billion passengers have already travelled in HS trains

Twice the population of the Earth

Modal split HS train vs Aviation



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Generalities on Railways – Resume

(High Speed) Railways = CAPACITY

High Speed (Railways) are systems

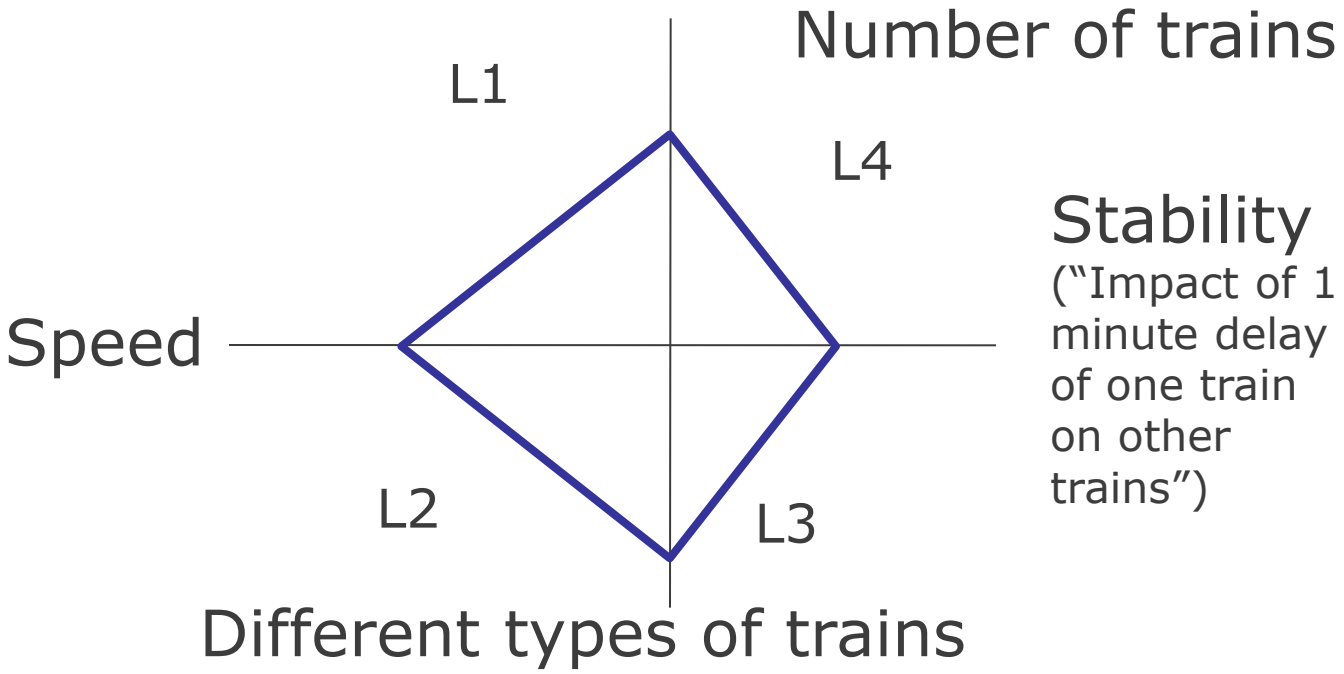
All (HS) Railways are equal but different

Most adequate domains for railways

Big passengers transportation
(urban and suburban trains)
Big cargo transports on long distances
High speed

Monorails, magnetic trains, pneumatic trains:
cannot compete

Balancing capacity



L1 + L2 + L3 + L4 = Constant

UIC Leaflet 406

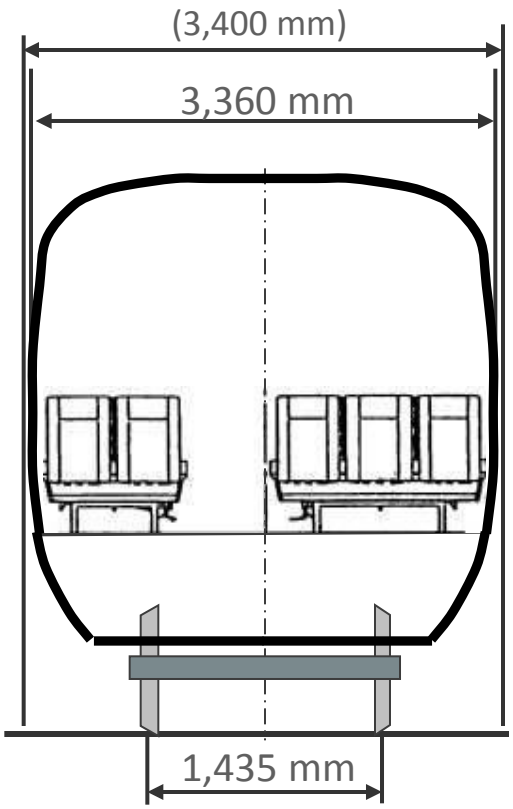
Capacity

Shinkansen

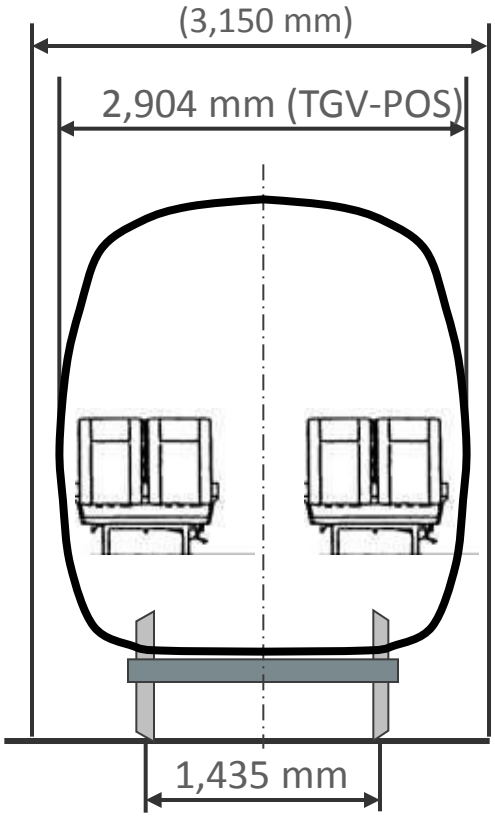
European HST

Capacity

Shinkansen loading gauge



European loading gauge



Evolution of sizes

The railway is the only transportation mode that has not grown in size in recent 50 years:

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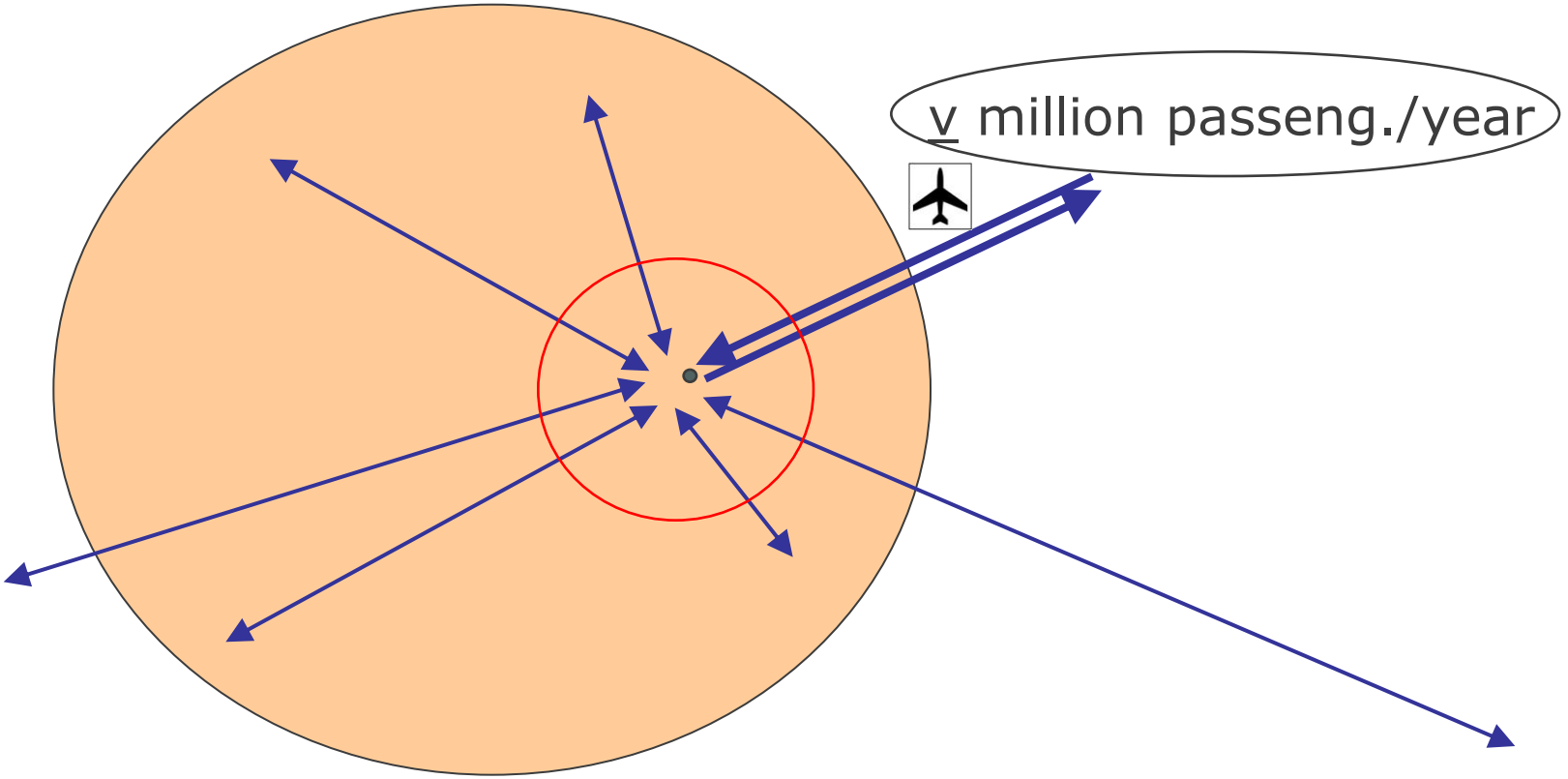
High speed railways in the city

City C (h million inhabitants)



High speed railways in the city

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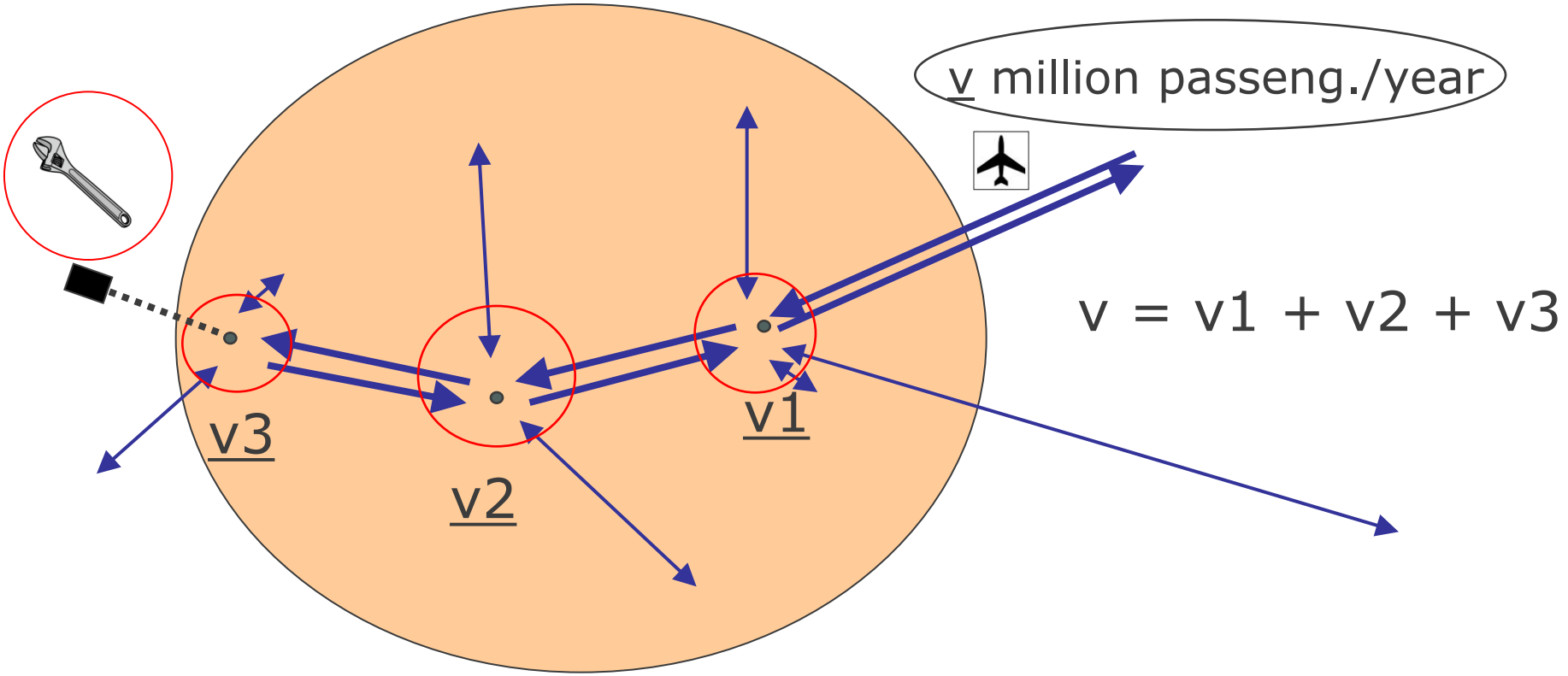

Intermodality rail / air – main challenges

Traffic volume

Rail

high capacity

Air

low capacity

Trains HS,
IC, Regio,
Commuters

Long range
Air shuttle
Regional

Balance between traffic volumes

Frequencies and seasonality

Balance between types of traffic by rail:

- Passengers: going to to city or hub
- Staff
- Other

Intermodality rail / air – main challenges

Commercial

Rail	Air
"style" of travel	"style" of travel

Fare policy
Ticketing, reservation, boarding pass
Companies/Alliances: transfer conditions
Security conditions
Baggage: type, sizes, operation

Intermodality rail / air – main challenges

Operations

Rail

logistics operator

Air

logistics operator

Boarding gates / platforms
Distance to walk and times
Boarding procedures
Accessibility conditions
Regularity (expected & actual)

Conditions for connexion

(Train to plane)
(Plane to train)

Intermodality rail / air – main challenges

Conception

Rail

train station

Air

airport-Σ terminals

Design
Functionality
Business opportunities
Accessibility
Other intermodalities

Governance

Airports connected to long distance rail

Europe
Paris CDG
Lyon Sat.
Frankfurt
Cologne
Zurich
Geneva
Amsterdam
Brussels
Copenhague
Stockholm Arlanda
Oslo Gardermoen
Birmingham

Other Regions
Newark NJ
Baltimore (BWI)

Shanghai Hongqiao
Shanghai Pudong (Maglev)

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Conclusion

- Railways are **highly beneficial transport system for society**
- Railways provides **capacity and sustainability**
- Railways are **complex system**
- Transport conception is **not unique** and it must be adapted to each case
- Capabilities of each transport mode must be **optimised**
- All different transport modes should **not necessarily compete but should be complementary**

Complement and not compete

■ ■ ■ Thank you for your kind attention

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