getzner
engineering a quiet future

Elastic Solutions for High Speed Lines

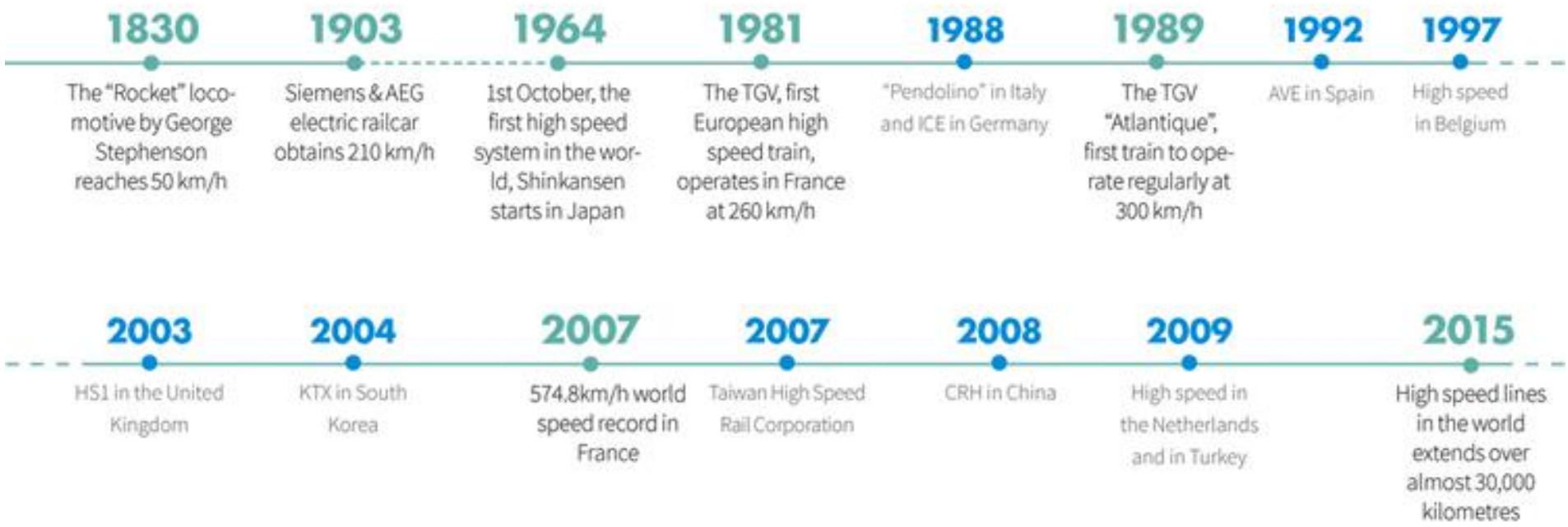
Target group: decision maker superstructure

High Speed Trains are an Important Part of Solving Tomorrow‘s Mobility Challenges

source: Siemens

High-Speed Principles
UIC (International Union of Railways)

- High-Speed Railways are not elements, but complex systems, comprising:
  - Infrastructure
  - Rolling Stock
  - Signalling
  - Maintenance
  - Operation rules
  - Financing
  - Management
  - Legal aspects



High-Speed Advantages
UIC (International Union of Railways)

- High capacity: up to 400,000 passengers per day
- Total time of travel: from door to door
- Frequency
- Freedom: during the trip you are free to go anywhere in the train
- Comfort: highest level of comfort of all modes of transport
- Environmentally friendly:
  - 1/3 use of the land of a motorway
  - 1/9 of the energy need of planes
  - 1/4 of the energy need of cars
- High safety:
  - HS trains are the safest transport medium
  - Up to date no accidents with injured passengers at more than 200 km/h

source: Siemens

Source: High-Speed principles and advantages | UIC - International union of railways

In order to tap into the full potential of HS trains
a **state-of-the-art superstructure**
is of paramount importance.

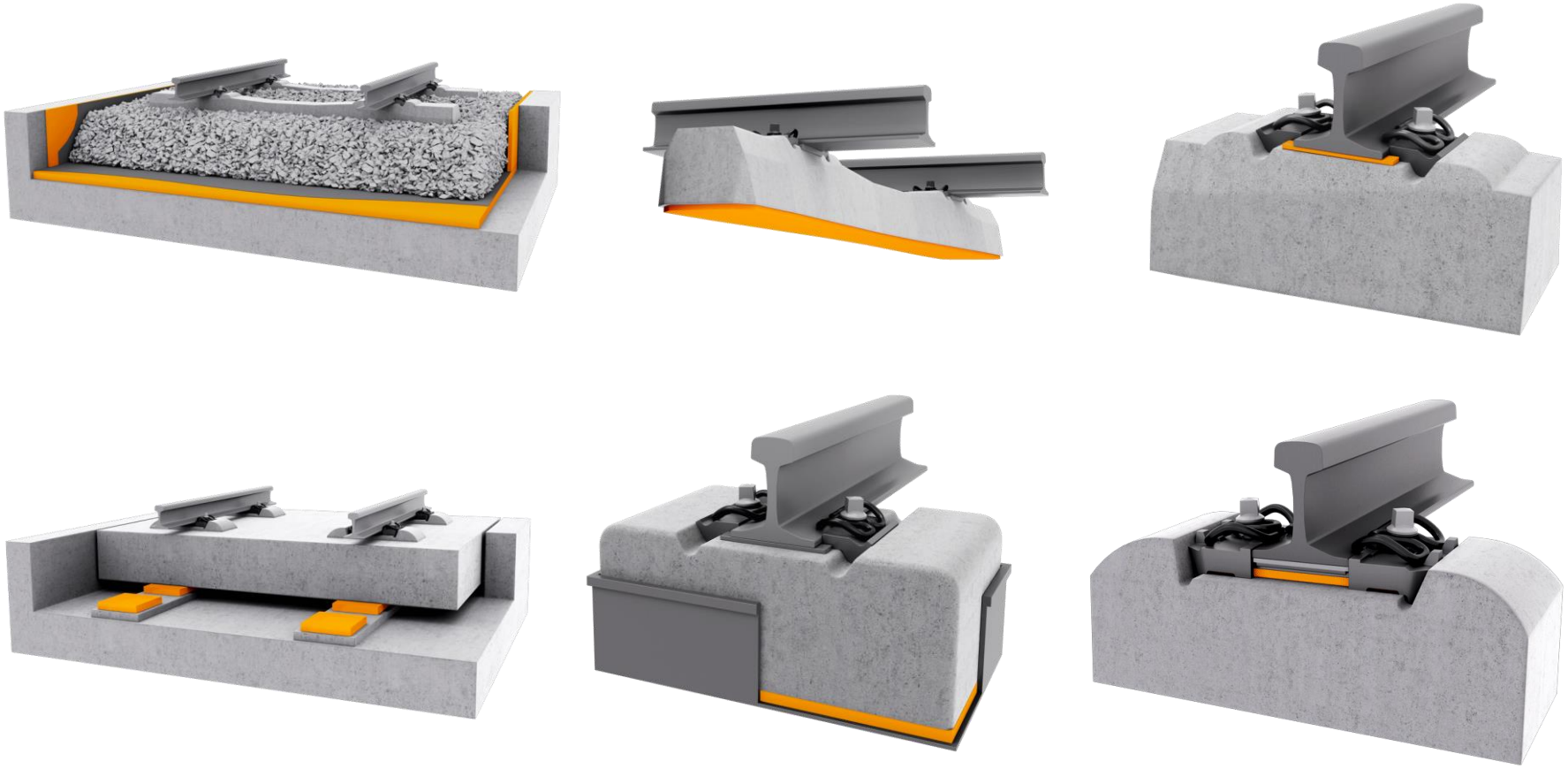

Broken Sleepers


Broken Clips

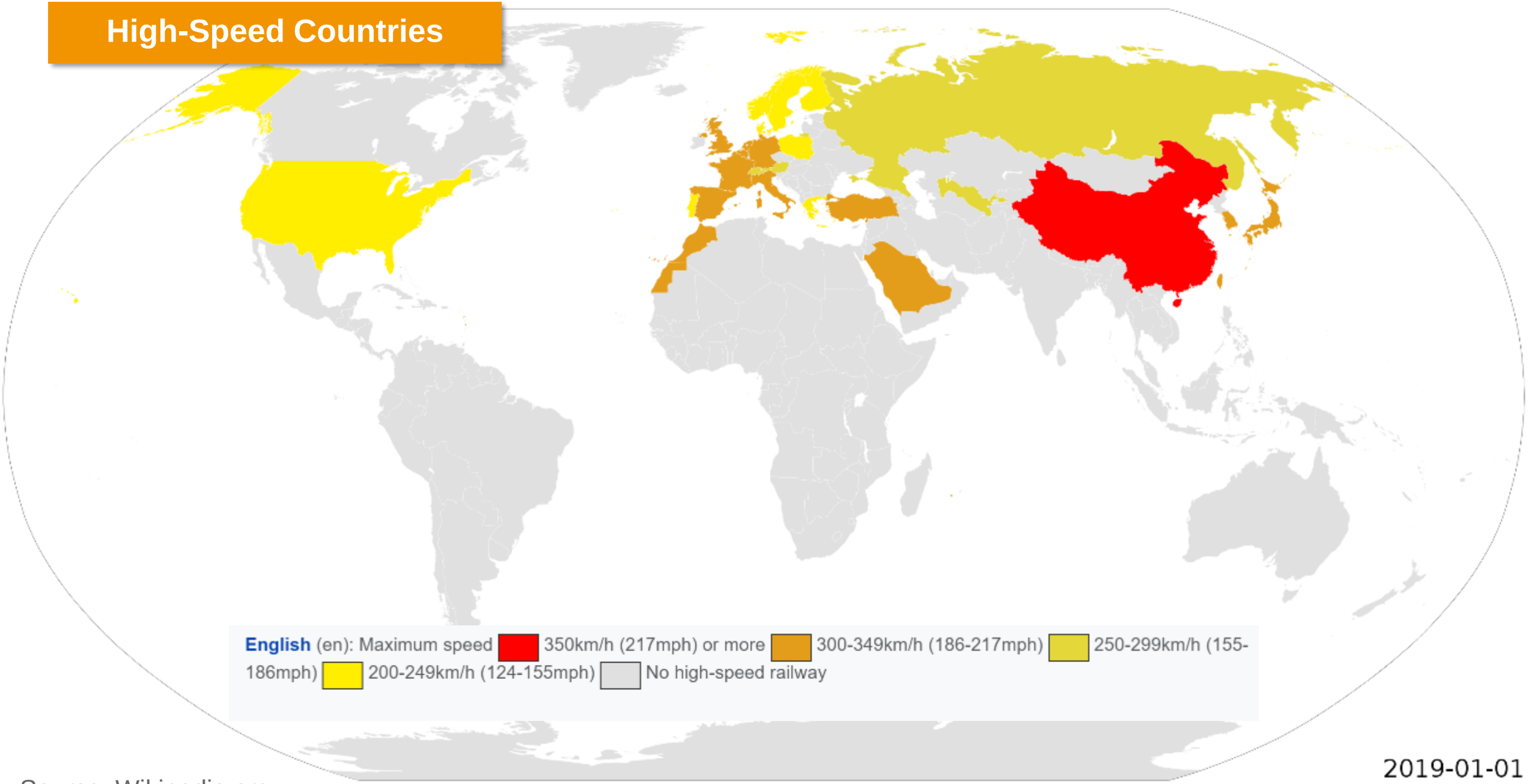

Voids under Sleepers

Settlements

Elastic Solutions For Railway Superstructure



High-Speed Countries



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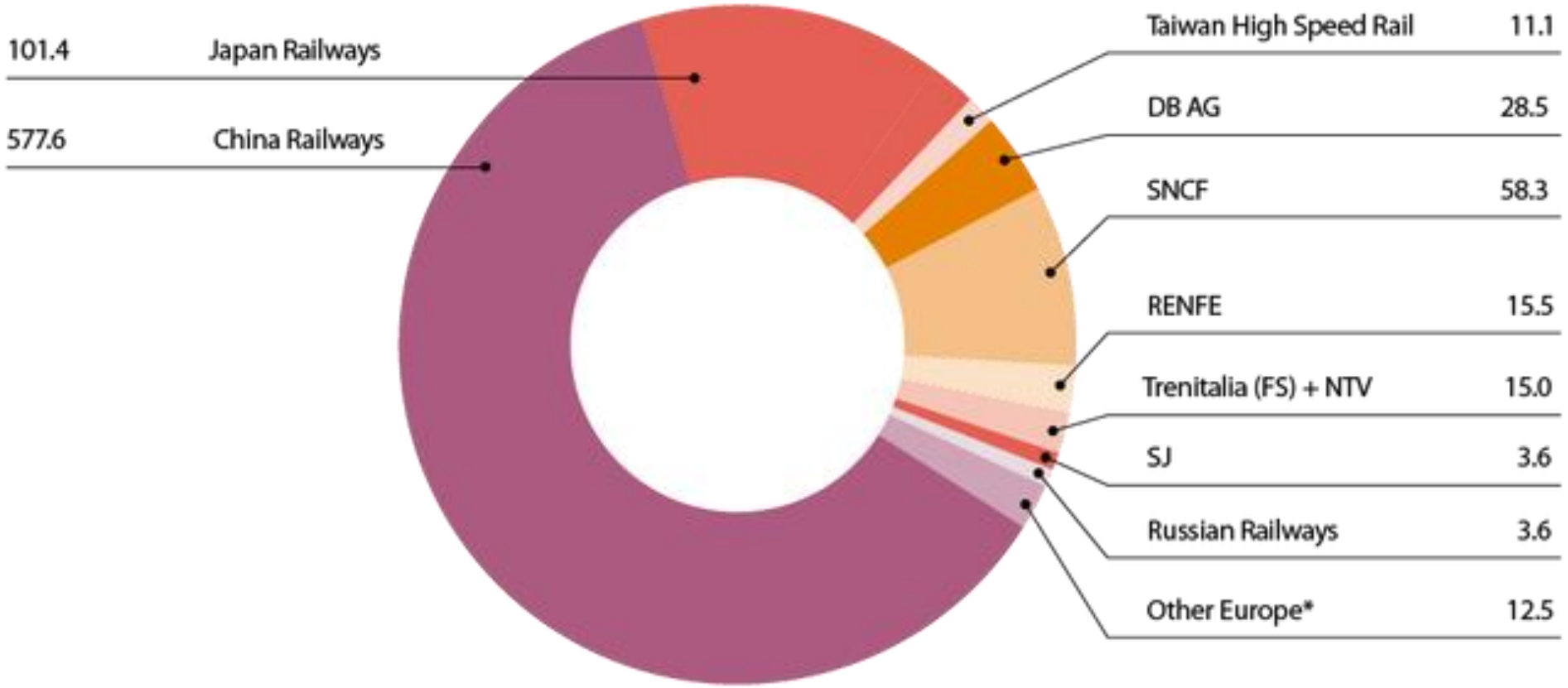
Source: Wikipedia.org

Getzner has been supplying the main HS networks globally since decades.

Rank	Country	Existing HS network (km)	HS lines under construction (km)	Future HS network	Density (m/km²)	Max. speed
1	Volksrepublik China[3]	31.000	7.207	38.207	3,23	350[4]
2	Frankreich	3.300	570	3.870	5,98	320
3	Spanien	3.240	2.285	4.900	6,40	310
4	Deutschland	3.046	550	3.596	8,53	300
5	Japan	2.765	657	3.422	9,00	320
6	Schweden	1.706[5]	710	2.416	3,79	205
7	Vereinigtes Königreich	1.377	620	1.377	5,67	300
8	Türkei	1.213	3.798[6]	5.011	1,50	250
9	Italien[7][8]	1.192	125	1.475	3,96	300
10	Südkorea	1.048	376	1.481	11,03	305
11	Finnland	944	95	1039	1,80	220
12	Russland	845	1.181	2.026	0,04	250
13	Griechenland	700	0	700	5,00	200
14	Portugal	624	0	624	6,77	220
15	Usbekistan	600	0	600	0,77	250
16	Saudi-Arabien	453	663	1.116	0,21	300
17	Österreich	352	208	560	4,20	250

Getzner has references in 9/10 of the top high speed countries

High-speed traffic passenger-kilometres (billions) published by UIC



High-Speed Reference SNCF
SNCF has been using USP since 1989

“Tamping Ratio” is number of km tamped for 100km per year.

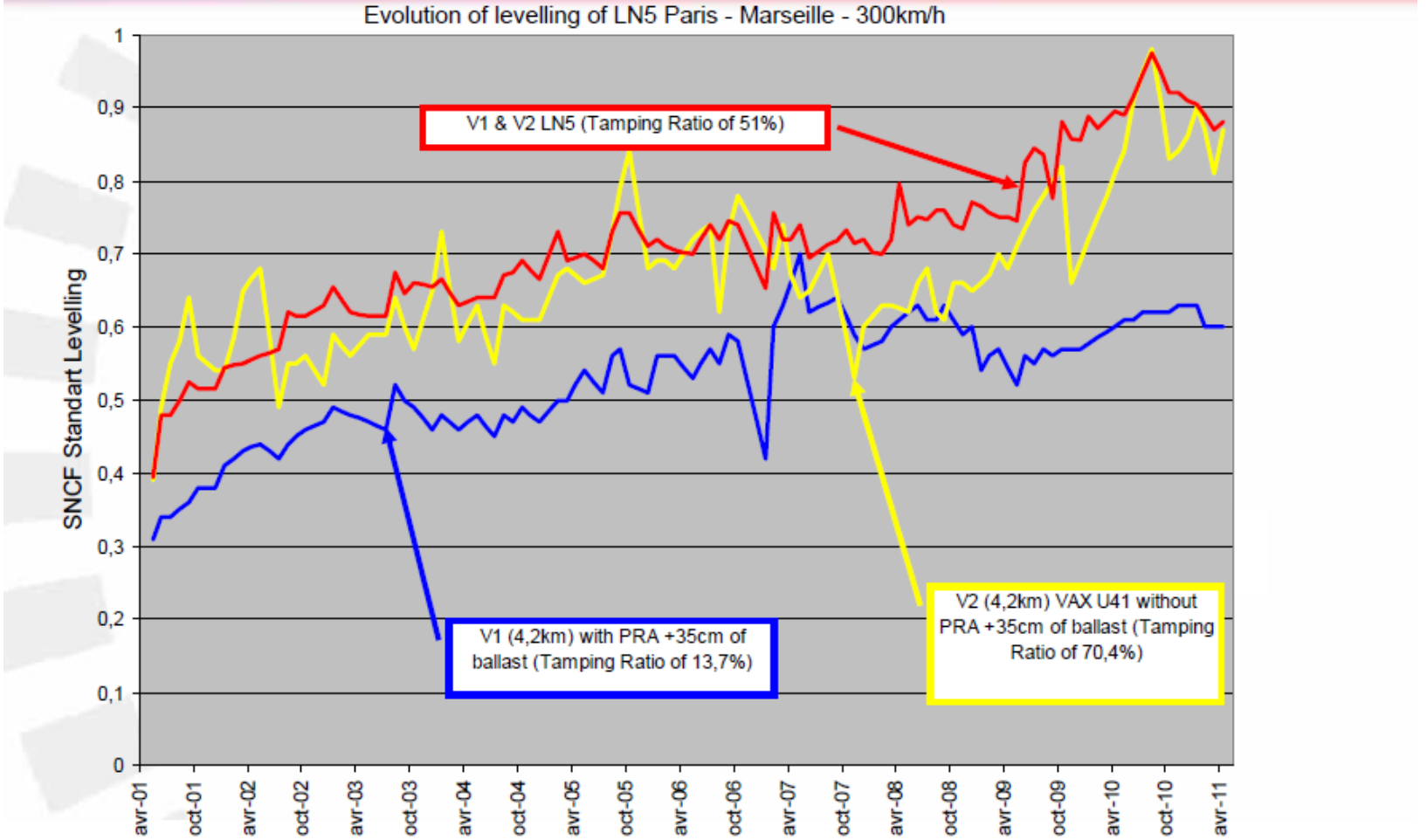
➔ A track with a Tamping Ratio of 20% =
20% of the track is tamped every year

- **Red** and **Yellow** without pads

Blue = with pads

History of 2000 to 2010: Tests in LGV5

(Tamping Ratio: tamped km for 100km track per year)



Thank you
for your attention!