

History of development High Speed Railways. UIC impact



World speed record: 573,6 km/h, France, April 2007, Source: UIC

The 10th jubilee congress of the HS is a good opportunity to present the influence of the UIC on the development of high-speed railways and the history of cyclic congresses. UIC (International Railway Union (fr. Union International des Chemin de fer), as the worldwide professional association representing the railway sector and promoting rail transport, leads an innovative and dynamic sector. Since 1922, UIC supports their Members in their efforts to develop new business and areas of activities, as well as proposes new ways to improve technical and environmental performance of rail transport.

Already at the turn of 1950s and 1960s, the rapid growth of motorisation rate has reduced the role of railway in fulfilling its mission of serving to the society. This state has been caused by social changes, economic development and increasing value of time. Temporary activities aimed the improvement of value of existing infrastructure, slight shortening of the journey time and increasing the frequency of trains, had not solved the intensified problems. In turn, they led to a diminution of attractiveness of rail offer and caused a loss of shares in market.

If in 1950s and 1960s most of problems were linked to the insufficient capacity of the lines, in 1970s and 1980s it was clearly visible that transportation, especially in terms of passenger transportation at medium and long distances, is not competitive in relation to car and air transport. A deteriorating situation of rail companies, the increasing loss of market and unpromising prognoses without explicit changes in the offer (travel time!) were the reason for building High Speed Lines (HSL). In the next years the willingness to establish a Trans-European network became significant as it would contribute to fulfilling the assumptions of creating a common economic area, and, especially, a free movement of passengers and goods, and also it would support the intensification of cultural, economic and political cooperation between the linked countries [2]. The first high speed

international project was the construction of HSL North (LGV Nord, fr. *ligne à grande vitesse*), line from Paris to Lille and further to London and Brussels [7].

In parallel with the construction of high-speed lines and the creation of international passenger transport operators in Europe, strategic projects for the development of the high-speed rail network were prepared as part of UIC's work. In 1972, it was developed by the specially appointed Commission Directional Plan for European Infrastructure resulting from the intense work of representatives of the European railways. It was based on the analysis of the existing and potential links of the most urbanized and economically developed regions in Europe. Their goal was to indicate the relations that forecast the largest volume of transport. The subject of the analysis was both the complementarity of the railway with the transport chain and the definition of the connection network allowing guarantee of the use of the most important advantages of the railway: convenience of travel, frequency of connections, security and the possibility of convenient communication. The result of the work was the designation of a core network covering 40,000 km of main railway lines [10].

In 1985, work began on the preparation of a proposal for a European high-speed network. This initiative coincided with the will to quickly develop the European network which in the communication COM/ 86/341 of June 30, 1986 [3] was expressed by the Commission of the European Communities. The project was implemented with the participation of 12 national railway countries associated in the European Community. A working group created as part of the European Railways Community officially presented a plan to the governments and leaders of the European Community in January 1989. In December 1989, a European working group passed a resolution based on the creation of a top-level group to carry on the high speed rail development researches on a European scale. The first stage of rapport was ready in December 1990 and included a European draft master plan for the 2010 horizon [9]. In February 1991 Proposal for a Council Decision concerning the establishment of a network of high

Tab. 1. High Speed Lines in the world

Country	Distances				Total
	In operation	Under construction	Planned	Long term planning	
ASIA (16)	31 875	12 988	6 174	14 382	65 419
Bahrain&Qatar	-	-	-	180	180
China ¹⁾	26 869	10 738	1 268	257	39 132
India	-	-	508	4 126	4 634
Indonesia	-	-	712	-	712
Iran	-	-	1 351	1 499	2 850
Japan	3 041	402	194	-	3 637
Kazakistan	-	-	-	1 011	1 011
Malaysia&Singapore	-	-	350	-	350
Saudi Arabia	-	453	-	-	453
South Korea	887	-	49	-	936
Taiwan	354	-	-	-	354
Thailand	-	-	615	2 262	2 877
Turkey	724	1 395	1 127	3 447	6 693
Vietnam	-	-	-	1 600	1 600
EUROPE (19)	9 236	1 697	2 659	8 172	21 764
Austria	244	243	24	-	511
Belgium	209	-	-	-	209
Czech Republic	-	-	-	810	810
Denmark	-	56	-	-	56
Estonia&Latvia &Lithuania	-	-	-	870	870
France	2 776	-	-	1 786	4 562
Germany	1 658	185	-	210	2 053
Italy	896	53	-	152	1 101
Norway	-	-	-	333	333
Poland	224	-	484	598	1 306
Portugal	-	-	-	596	596
Russia	-	-	770	2 208	2 978
Spain	2 852	904	1 061	-	4 817
Sweden	-	11	-	739	750
Switzerland	144	15	-	-	159
The Netherlands	120	-	-	-	120
United Kindom	113	230	320	-	663
OTHER (8)	735	392	624	7 474	9 225
Australia	-	-	-	1 749	1 749
Brazil	-	-	-	511	511
Canada	-	-	-	290	290
Egypt	-	-	-	1 210	1 210
Mexico	-	-	-	210	210
Morocco	-	200	-	1 114	1 314
South Africa	-	-	-	2 390	2 390
USA	735	192	624	-	1 551
TOTAL (43)	41 846	15 077	9 457	30 028	96 408

¹⁾ passenger dedicated lines.

Source: self - study, based on data of UIC Passenger Department, 01.04.2018.

speed trains was presented in Brussels by the Commission of the European Communities [1].

In 1988, UIC created The High Speed Mission (fr. Mission grande vitesse) with the aim of inciting the idea of the European high speed network and coordinating the action of the railway companies in a geographic environment going beyond the European Community borders. By a close examination of the economic, technical, financial fields, it ended up in enlarging the first draft master plan to West and Central Europe, Scandinavia and Balkans. Lately, thanks to a new

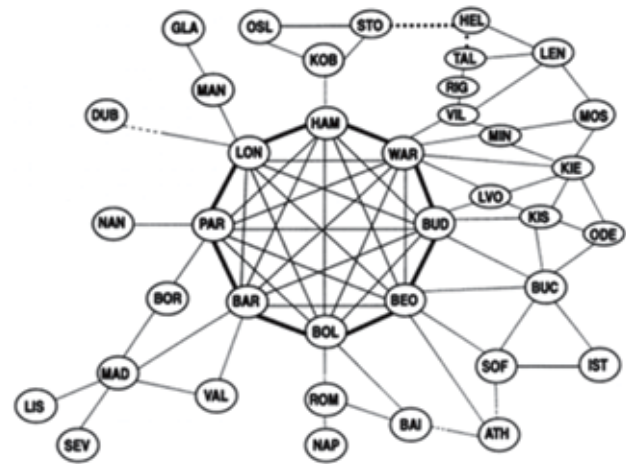


Fig. 1. Links in the network showing the eight main gateways [10, p. 393]

extension stage of the researches, the Baltic Countries, Belarus, Ukraine, Moldavia and Russia have been involved in the project [9].

In 1992, UIC presented the long term master plan, which was prepared in occasion of EURAILSPEED 92. The network idea, initially based on North-South axis and in relation with main routes of the European Community, has later on evolved in order to satisfy the new need of development of East-West routes. In its central part, corresponding to the most crowded area (from London, Paris and Barcelona in the West, till Warsaw, Budapest and Belgrade in the East), they are also the main gateways to the more peripheral regions (Fig. 1):

- ◆ London for the British Isles,
- ◆ Hamburg towards Scandinavia,
- ◆ Warsaw and Budapest for extensions towards the East,
- ◆ Belgrade to the Balkans,
- ◆ Bologna for Italy,
- ◆ Barcelona and Paris for the Iberian Peninsula and the „Atlantic side”.

In this way, UIC proposed a linked network, connecting three types of lines: very high speed: 300–350 km/h, upgraded lines for about 200 km/h, already existing lines acting as connection and spreading instruments [9].

The next stage of work to improve transport links in Europe was to prioritize transport corridors during the second pan-European transport conference in Crete (1994) and to develop and complete them 10th corridor during the third pan-European conference in Helsinki (1997). Further on, in order to expand the transport network to the candidate countries for the European Union, the Transport Infrastructure Needs Assessment (TINA) was established. The works on the creation of a single European transport area were finalized by the Regulation No 1315/2013 adopted by the European Parliament and the Council of the European Union, and sets the European high speed rail network in the 2030 and 2050 perspective.

High Speed Railway today

The pace of work and the direct reasons for the decision of building the first high-speed lines in particular countries were different. Each of them, in their own rhythm, in accordance with prevailing customs and organizational culture, prepared the first concepts and projects. High-speed rail systems, although based on the same ideas and meeting the same needs, differs in the organizational, technical and financing arrangements. The detailed information on this topic can be found in the works of M. Leboeuf [5] and prof. A. López Pita [6].

The further development of high-speed rail systems and the decisions made to build them in other countries is the best testimony confirming the rightness of this idea.

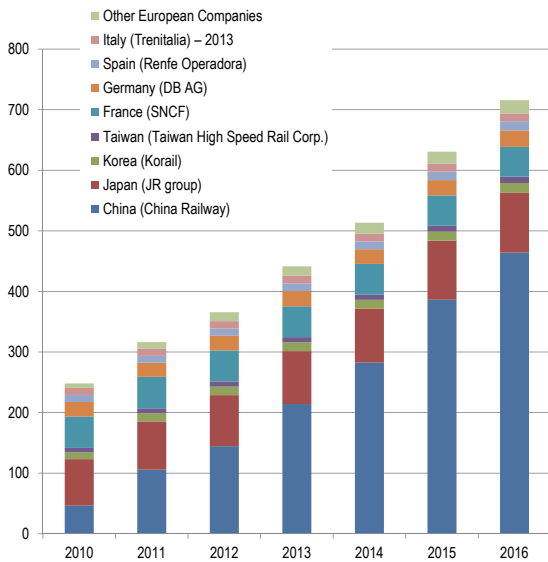


Fig. 2. High Speed Traffic in the world in 2016 [passenger-km (billions)]
Source: self - study, based on data of UIC Passenger Department

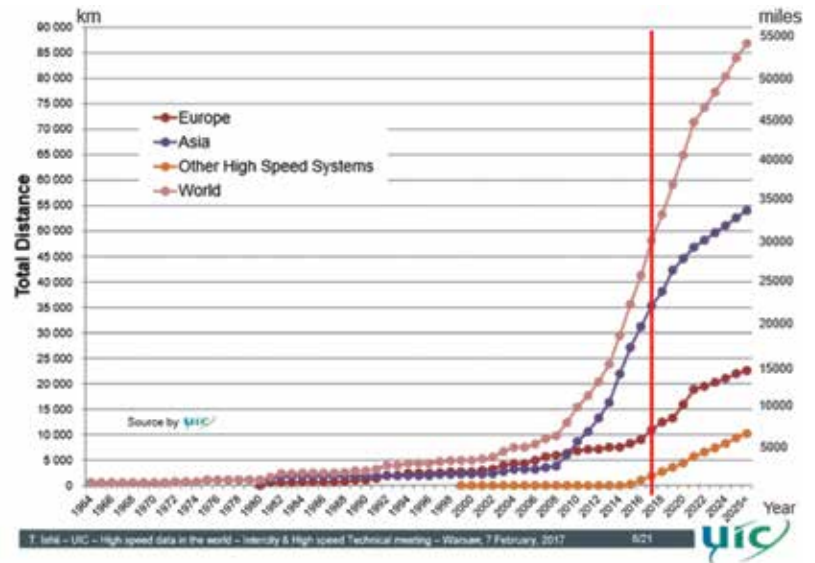


Fig. 3. Evolution of the world High Speed Rail network [4]

The congresses organized by UIC related to the development of high-speed railways are held cyclically every 2–3 years in different countries of the world. Their summary contain Fig. 2.

Tab. 2. High Speed Congresses

Name	Date	Location
EURAILSPEED 1992	27–29 April 1992	Belgium, Bruxelles
EURAILSPEED 1995	4–6 October 1995	France, Lille
EURAILSPEED 1998	28–30 October 1998	Germany, Berlin
EURAILSPEED 2002	23–25 October 2002	Spain, Madrid
EURAILSPEED 2005	7–9 November 2005	Italy, Milano
UIC HIGHSPEED 2008	17–19 March 2008	Netherlands, Amsterdam
7 th World Congress on High Speed Rail	6–9 December 2010	China, Beijing
8 th World Congress on High Speed Rail	10–13 September 2012	USA, Washington
9 th World Congress on High Speed Rail	7–10 July 2015	Japan, Tokyo
10 th World Congress on High Speed Rail	8–11 May 2018	Turkey, Ankara

Source: [8, p. 46].

Tab. 3. The first high Speer lines in selected countries

Country	Section	Speed [km/h]	Inauguration
Japan	Tokyo–Osaka	from 210 up to 270	October 1964
Italy	Florence–Rome	250	24 th February 1977 (first section)
France	LN1 Paris South–East	300	22 nd September 1981
Germany	Fulda–Würzburg	280	1988
Spain	Madrid–Seville	270	1992
Belgium	Brussels–French border	300	1997
China	Qinhuangdao–Shenyang	250	2003
United Kingdom	Channel Tunnel–Fawkhan Junction	300	2003
South Korea	Seul–Dongdaegu	300	2004
Taiwan	Taipei–Kaohsiung	300	2007
Netherlands	Schiphol–Belgian border	300	2009
Turkey	(Ankara)–Sinkan–Eskisehir	250	2009
Austria	Vienna–Sankt Pölten	230	2012

Source: self-study based on [5].

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Agata Pomykala

Agata Pomykala works in Railway Institute in Warsaw. She is a graduate of the Technical University in Lublin (Management and Marketing) and postgraduate of French-Polish School Organisation and Management/EDHEC Business School (Master en Management European). In 2009-2011 as a project director in the High Speed Centre, PKP PLK S.A., she was in charge of strategy planning and communication. In 2011-2012 she was the project manager in PKP INTERCITY and was responsible for development and marketing of passenger service between Poland and Czech Republic, Germany and Austria. In years 2013-2014 she was the General Secretary of the Polish Association of Transport Engineers & Technicians.