

UIC Map of India's Planned High-Speed Rail Lines

## INTERNATIONAL UNION OF RAILWAYS (UIC) AS A SOURCE FOR PLANNED SYSTEMS

The International Union of Railways (UIC) provides an extensive library of statistics and reports related to high-speed rail systems around the world. Identified in the *High-Speed Lines in the World*, the following countries with planned high-speed rail systems are briefly described below:

- India.
- Iran.
- Poland.
- Portugal.
- Sweden.

### India

Located in Southern Asia bordering Bangladesh, Bhutan, Burma, China, Nepal, and Pakistan, India ranks the second largest populated country in the world with 1.2 billion

people and boasts the fourth largest gross domestic product (GDP) at \$4.46 trillion. The largest city is New Delhi, its capital, with 21.72 million people (29,155 people per square km or 75,512 people per square mile), followed by Mumbai (19.695 million people, with a density of 22,937 people per square km or 59,406 people per square mile), and Kolkata (15.294 million people, with a density of approximately 24,000 people per square km or 63,000 people per square mile). With a GDP per capita of \$3,700, India ranks 163rd in the World. Slightly more than one-third the size of the U.S., India has an extensive passenger and freight rail network. The figure above shows the International Union of Railways (UIC) map of planned high-speed rail lines in India.



Mumbai Skyline, India

### India's Rail System Improvement Plans

The UIC notes four separate high speed networks in India on the above map; however, only one corridor is listed in its High-Speed Lines in the World report. That corridor is the 495 km (309 mile) corridor between Mumbai and Ahmedabad that would operate at a speed of 250 km/h (155 mph).

UIC Table of India's High-Speed Rail Lines

Stage	Speed		Year Opened	Length	
	km/h	mph		km	miles
<b>Planned:</b>					
Mumbai – Amehdabad	250	155	–	495	308

A recent report from its Ministry of Railways highlights the extent of the Indian conventional freight and passenger railway network by stating that the Indian Railways is “the third largest railway network in the world with 7,083 railway stations, 131,205 railway bridges, 9,000 locomotives, 51,030 passenger coaches, 219,931 freight cars and 63,974 route kilometers. Today Indian Railways operates 19,000 trains per day, comprising 12,000 passenger trains and 7,000 freight trains. It transports 2.65 million metric tons of freight traffic and 23 million passengers every day and 7.2 billion passengers per year.”

In December 2009, the India Ministry of Railways released a comprehensive plan to upgrade the rail network in the country, titled *Vision 2020*. This complete system-wide approach to improve both passenger and freight operations addresses four strategic national goals:

- Inclusive development, both geographically and socially.
- Strengthening national integration.
- Large-scale generation of productive employment.
- Environmental sustainability.

Capacity improvements that are a part of this plan include the doubling and quadrupling of tracklines, complete segregation of passenger and freight lines on High Density Network routes, substantial segregation on other routes, and electrification on busy trunk lines. The maximum freight train speeds would increase from 60–70 km/h (37–43 mph) to over 100 km/h (62 mph), while passenger train speeds would increase from 100–130 km/h (62–80 mph) to 160–200 km/h (100–125 mph).

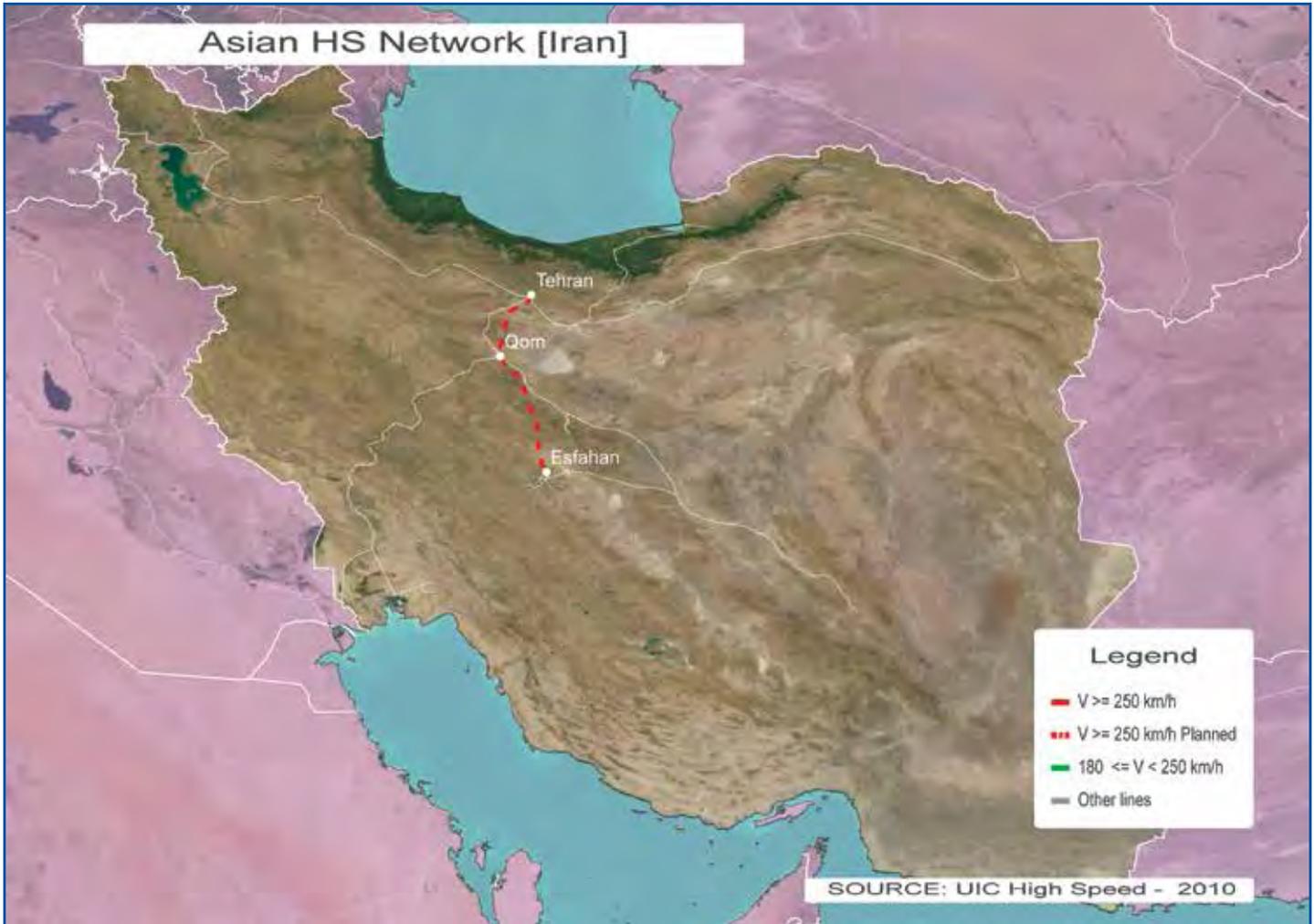
The plan also sets a goal of four high-speed rail projects consisting of six corridors to provide passenger service at 250–350 km/h (155–220 mph). The six corridors included in the report for technical study are shown in the UIC map. The shortest corridor is the 85-mile corridor between Howrah and Haldia, while the longest is 615 miles. In total, the six corridors proposed for study are over 2,200 miles in length.

The *Vision 2020* plan indicates that these corridors could be “built as elevated corridors in keeping with the pattern of habitation and the constraints of land in India.” It also proposes a public-private partnership model for investment and execution and could draw on frontier technologies incorporating the highest standards of safety and service quality. The table below summarizes the planned routes and the length of each corridor.

Six Proposed HSR Corridors Included in the Vision 2020 Plan

Stage	Length	
	km	miles
Delhi-Chandigarh-Amritsar	450	280
Pune-Mumbai-Ahmedabad	650	405
Hyderabad-Dornakai-Vijayawada-Chennai	665	415
Howrah-Haldia	135	85
Chennai-Bangalore-Coimbatore-Ernakulam	650	405
Delhi-Agra-Lucknow-Varanasi-Patna	990	615
<b>GRAND TOTAL</b>	<b>3,540</b>	<b>2,205</b>

One recent article indicates that, as a step closer to developing high speed passenger rail services, the Indian Ministry of Railways is planning to create a National High Speed Rail Authority by the end of 2012.



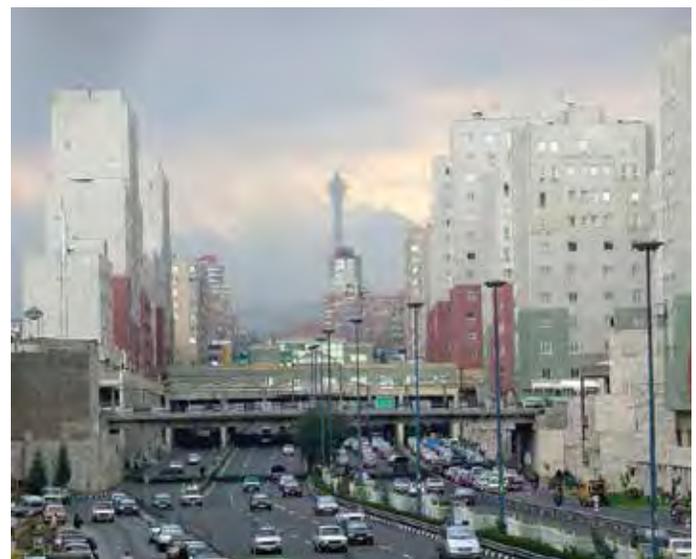
**UIC Map of Iran's Planned High-Speed Rail Lines**

### Iran

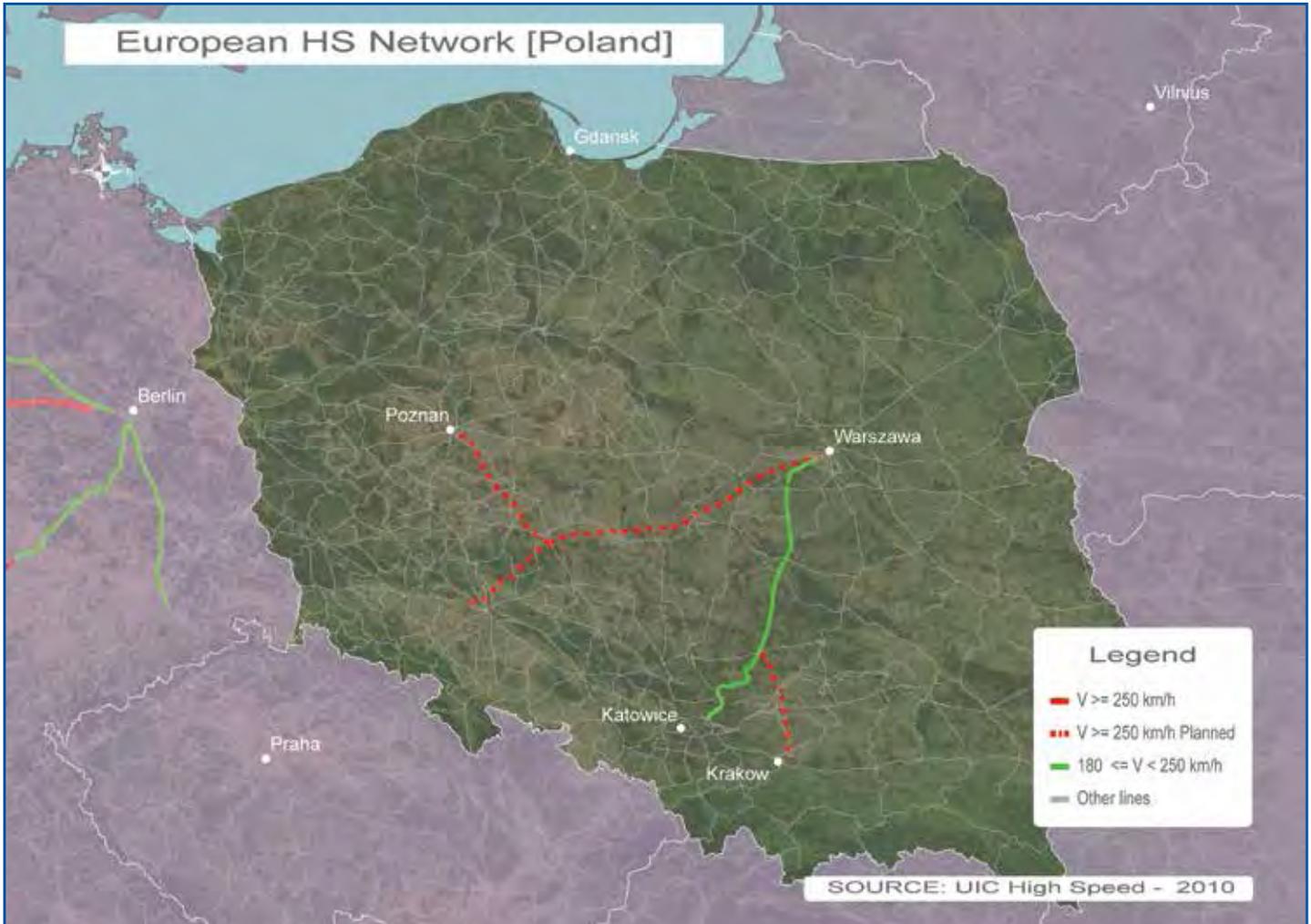
Located in the Middle East, Iran has a total population of 78.9 million people, of which 71 percent are designated as living in urban areas. The largest populated cities include Tehran (capital) with 7.2 million people and Mashhad with 2.6 million people. Tehran maintains a population density of approximately 10,300 people per square km or 26,750 people per square mile. Iran's economy ranks 18th in the world with \$928.9 billion GDP and ranks 99th with a GDP per capita of \$12,200. Iran is bordered by Afghanistan, Iraq, Pakistan, and Turkey. The planned high-speed rail system includes a 475 km (295 mile) line between Tehran and Esfahan. Details are shown in the map above and contained in the table below.

**UIC Table of Iran's High-Speed Rail Lines**

Stage	Speed		Year Opened	Length	
	km/h	mph		km	miles
<b>Planned:</b>					
Tehran – Isfahan	250	155	-	475	295



**Navvab Street, Tehran, Iran. Milad Tower in the distance is the world's 4th tallest.**



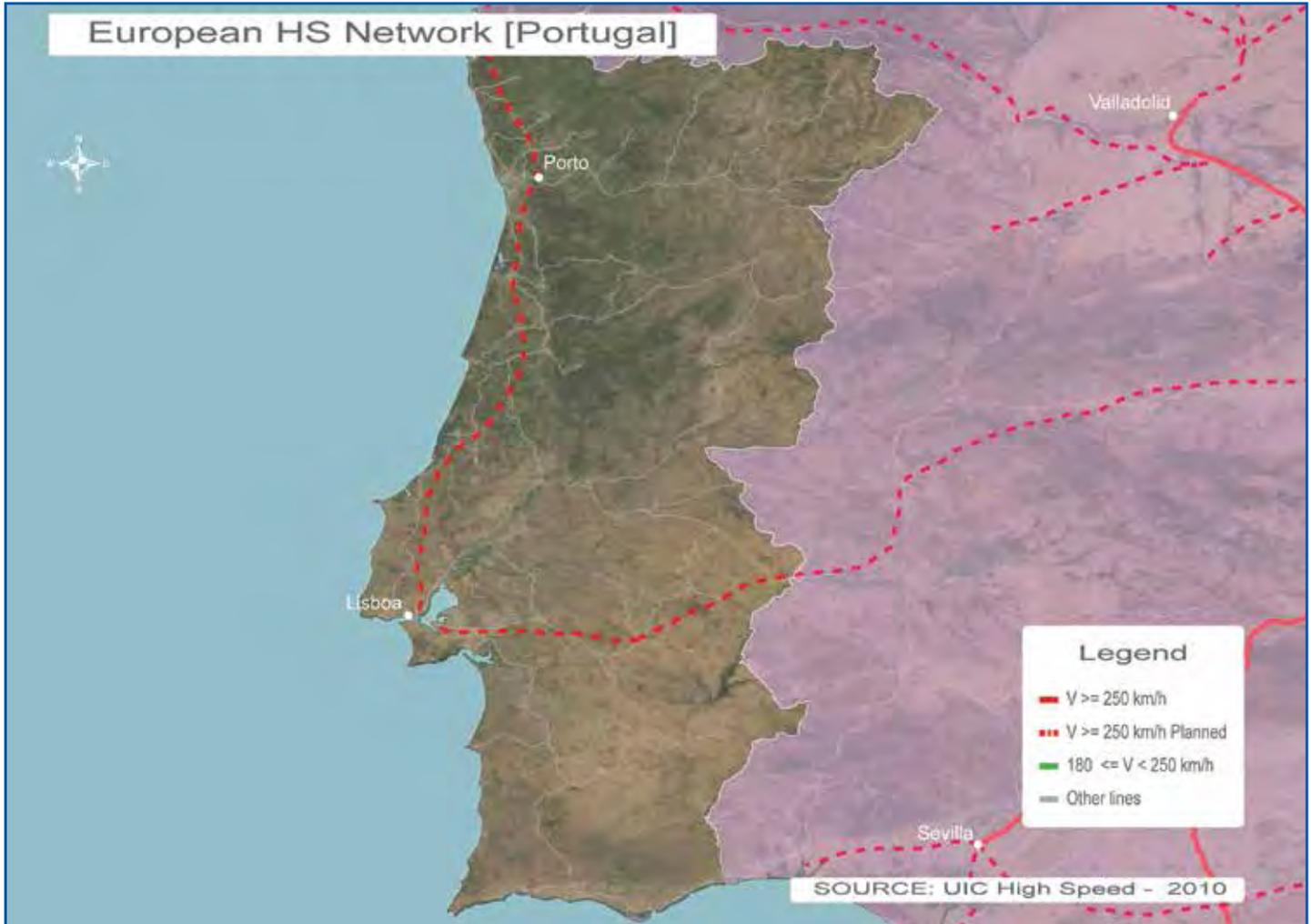
**UIC Map of Poland's High-Speed Rail Lines**

**Poland**

Poland has a population of 38.4 million people, ranking 33rd in the world. The most populated cities include the capital of Warsaw with 1.7 million people, with a population density of approximately 3,300 people per square km or 8,650 people per square mile, and Krakow with 756,000 people. The country's GDP of \$756.6 billion ranks 21st in the world and GDP per capita of \$20,100 ranks 63rd. Located in Central Europe, Poland shares borders with the Czech Republic, Germany, Lithuania, Slovakia, and Ukraine. The indicated planned high-speed rail network would consist of two segments totaling over 700 km (440 miles). The following map and table provide additional content related to Poland's planned high-speed rail network.

**UIC Table of Poland's High-Speed Rail Lines**

Stage	Speed		Year Opened	Length	
	km/h	mph		km	miles
<b>Planned:</b>					
Warsaw – Lodz – Wroclaw – Poznan	300	185	2015	500	311
Warsaw – Ktowice/ Krakow	300	185	2015	212	132
<b>GRAND TOTAL</b>				<b>712</b>	<b>442</b>



**UIC Map of Portugal's High-Speed Rail Line**

**Portugal**

Portugal has a population of 10.8 million people, with the largest cities being Lisbon, the capital, with 2.8 million (population density equals 6,458 people per square km or 16,726 people per square mile) and Porto with 1.3 million. The country's GDP of \$246.9 billion ranks as the 51st largest economy in the world, and its \$23,200 GDP per capita ranks 58th. Located in far Southwestern Europe, Portugal borders only Spain and has a lengthy coastline with the North Atlantic Ocean. The planned high-speed rail system in Portugal, as reported by the UIC, consists of over 1,000 km (635 miles) of lines, several of which would connect to planned high-speed rail segments in Spain. The map and table on this page provide additional details on the planned system.

**UIC Table of Portugal's High-Speed Rail Lines**

Stage	Speed		Year Opened	Length	
	km/h	mph		km	miles
<b>Planned:</b>					
Lisboa – Caia (- Madrid)	350	215	-	206	128
Porto – Valença (- Vigo) first phase	250	155	-	55	34
Lisboa – Porto	300	185	-	290	180
Porto – Valença (- Vigo) second phase	250	155	-	45	28
Aveiro – Almeida (- Salamanca)	250	155	-	170	106
Evora – Faro – Vila Real de SA (- Huelva)	250	155	-	240	149
<b>GRAND TOTAL</b>				<b>1,006</b>	<b>625</b>

## Sweden

Located in Northern Europe between Finland and Norway on the Scandinavian Peninsula, Sweden has a proposed high-speed rail link between the capital of Stockholm (population of 1.3 million) and Malmo and Goteborg. Aspects of Sweden include a total population of 9.1 million, of which 85 percent are considered urban; a GDP of \$379.4 billion (ranks 34th); and GDP per capita of \$40,600 (ranks 21st). Additional details on the proposed 750 km (466 mile) high-speed rail segment are provided in the map and table below.

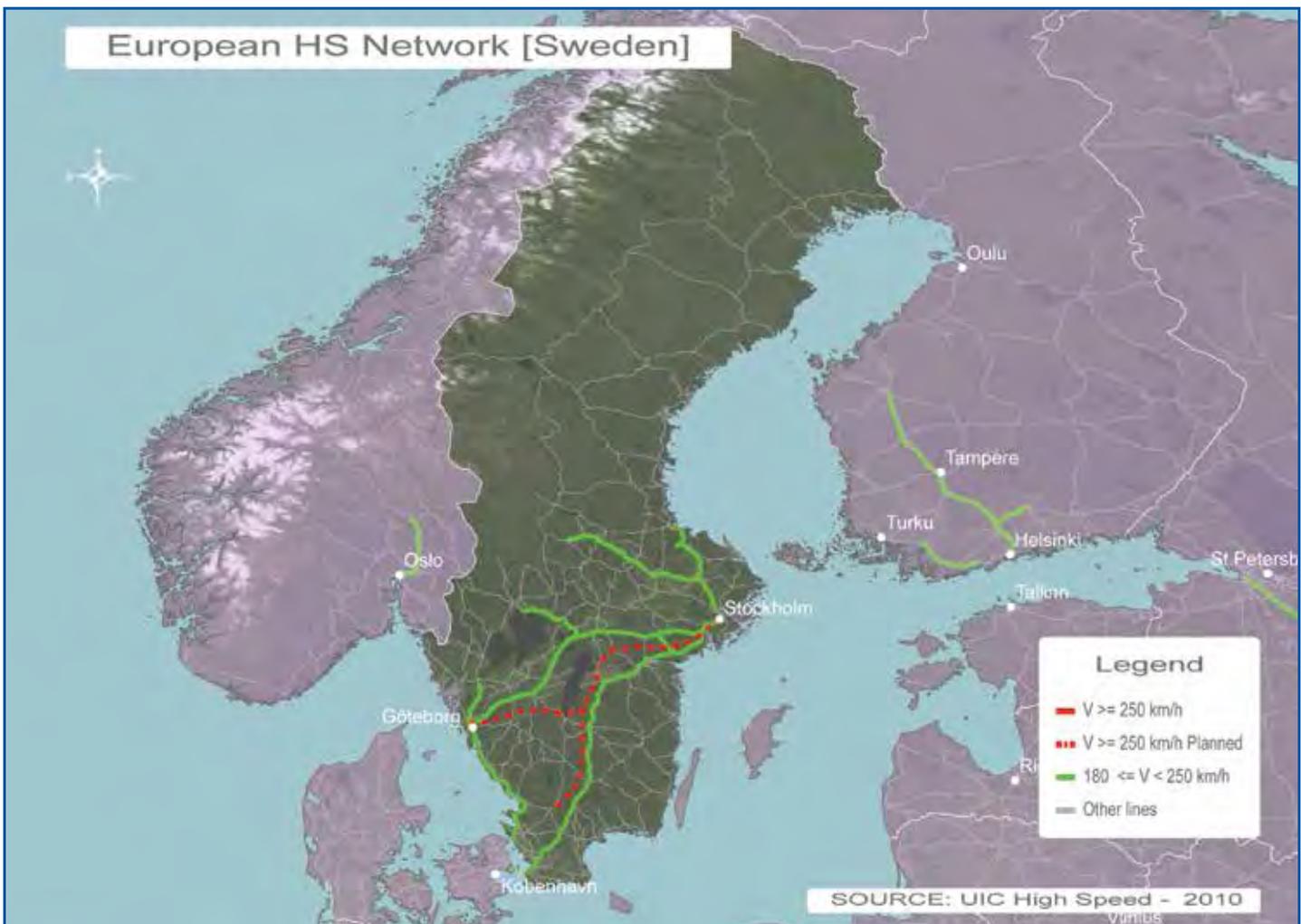
**UIC Table of Sweden's High-Speed Rail Lines**

Stage	Speed		Year Opened	Length	
	km/h	mph		km	miles
<b>Planned:</b>					
Stockholm – Malmö/Goteborg	300	185	-	750	466

## Other International Planned Systems

Through research and review of news items and other sources beyond the UIC-reported systems, the following countries appear to currently be formulating or have long-term plans for high-speed rail:

- Argentina.
- Australia.
- Brazil.
- Canada.
- Denmark.
- Ireland.
- Luxembourg.
- South Africa.
- Tunisia.



**UIC Map of the Sweden's High-Speed Rail Lines**

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