

Development of the Express and High-Speed Rail Network in Russia

The decision taken in 2012 to create a dedicated express and high-speed rail infrastructure has opened up new areas of innovative development for the industry.

Express rail projects (up to 200 km/h) have been implemented on the routes Saint Petersburg — Moscow — Nizhny Novgorod and Saint Petersburg — Boguslovskaya (and onwards to Helsinki).

The service is popular with passengers: for example, 7.8 mln of 8.9 mln seats on the Sapsan train have been sold (87.6%). Given the high demand for express passenger services, JSC "Russian Railways" has taken the decision to double the fleet of Sapsan trains servicing the Moscow — Saint Petersburg line.

On 3 December 2012, the production of a batch of Sapsan high-speed trains was officially launched by Siemens AG in Krefeld (Germany). Each of the eight new trains consists of 10 cars, and they can be doubled in height, which increases the carrying capacity of express tracks without increasing the number of trains.

SIGNIFICANCE OF THE PROJECT:

Express services are in demand and on average, 80-90% of train seats are filled

Faster services between the largest agglomerations are important to maintain the competitiveness of railways

Dedicated high-speed rail infrastructure will free up capacity for freight lines

The Lastochka train is one of the major technology transfer projects and is localized in Russia

Production of 5th generation electric locomotives has started

Renovation of the rolling stock and locomotive fleet will reduce costs of maintenance and repair of rolling stock

Express transport increases the mobility of the population, aligning labor, goods and services markets

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THE DEMAND FOR EXPRESS SERVICES REMAINS HIGH

Route	number of trips, total	occupancy rate, %	tickets sold in 2012, th. (versus 2011, %)
Sapsan (8 trains)	15,619	85.4	3,000% (+8.2%)
Moscow — Saint Petersburg (since 17.12.09)		89.9	2,300
Moscow — Nizhny Novgorod (since 30.06.10)		79.1	700
Allegro (4 trains) Saint Petersburg — Buslovskaya — Helsinki (since 12.12.10)	5,312	36.9	350% (+13.0%)

National high-speed and express passenger service development program for the period up to 2020

The development of the express and high-speed services is determined by the National High-Speed and Express Rail Network Development Program for the Period up to 2020 and the Strategy of Development of the Railway Transport in the Russian Federation for the Period up to 2030.

The forthcoming global sports events — 2014 Olympic Games and 2018 FIFA World Cup — have triggered the development of the relevant National Program.

In April 2012, at the initiative of JSC "Russian Railways", the Public Council of the President of JSC "Russian Railways" was established to address issues of the development of express and high-speed railway services. This advisory and consultative body includes representatives of the management of federal executive authorities, administrations of constituent entities of the Russian Federation, businesses, financial institutions and scientific organizations, including RAS institutes. In addition, prospects for the development of high-speed railway services in Russia were considered at the joint meeting of the Public Chamber of the Russian Federation and the Public Council at the President of JSC "Russian Railways".

At the Government's request, an interagency working group was created to develop a long-term state target program.

In May 2012, the Russian Ministry of Transport introduced agreed propositions concerning the development of the National High-Speed and Express Passenger Service Development Program for the Period up to 2020 for consideration by the Government.

High-speed rail projects (350-400 km/h) to be implemented by 2030

The financial model for the development of express services was considered at a meeting with the Deputy Prime Minister of the Russian Federation, A.V. Dvorkovich, in October 2012. Taking into account the cities where 2018 FIFA World Cup events will be held, it was decided to establish a rationale for investment in the construction of high-speed railway lines serving Moscow — Yekaterinburg and Moscow — Adler. These decisions were recorded in the minutes of the final meeting of the Executive Board of JSC "Russian Railways" for 2012.

In November 2012 the provision of transport services required during the 2018 FIFA World Cup were

considered at a meeting with the First Deputy Prime Minister, I.I. Shuvalov.

According to the request of the Minister, V.V. Putin, the Transport Strategy of the Russian Federation for the Period up to 2030 was updated.

In 2012 a principally new regulation was adopted to create a dedicated express and high-speed railway infrastructure. The dedicated lines will allow super high-speed traffic (up to 400 km/h) and will free up lines for freight trains that are currently occupied. High-speed rail services will trigger the innovative development of the industry, regions and markets in Russia.

In 2030 the length of high-speed and express railway lines in JSC "Russian Railways" network will reach 11.2 th. km, and they will be used by 44 mln people each year.

Development of express and high-speed passenger service

By 2020 the total length of express and high-speed lines in JSC "Russian Railways" network will have increased by 3.5 times to 4.5 th. km. Express and high-speed trains will be used by 18.8 mln people each year.

High-speed services (up to 300-400 km/h) on dedicated railway lines:

- ▶ Moscow — Saint Petersburg,
- ▶ Moscow — Nizhny Novgorod — Kazan.

Express services (160-200 km/h) using existing infrastructure between major regional centers on the following routes:

- ▶ Moscow — Tula — Oryol — Kursk,
- ▶ Moscow — Yaroslavl,
- ▶ Moscow — Suzemka (with a further extension to Kiev),
- ▶ Moscow — Krasnoye (with a further extension to Minsk and subsequently to Europe).

By 2030:

Additional high-speed services on dedicated railway lines will be provided on the following routes:

- ▶ Moscow — Rostov — Adler,
- ▶ Kazan — Yekaterinburg, with a Kazan — Samara branch and a potential branch to Perm and Ufa.

The following additional high-speed routes will be opened:

- ▶ to the Volga Region (Moscow — Saratov, Samara — Saransk, Samara — Penza, Samara — Saratov, Saratov — Volgograd),
- ▶ in the Urals (Yekaterinburg — Chelyabinsk),
- ▶ in Siberia (Omsk — Novosibirsk — Krasnoyarsk and links between Novosibirsk, Barnaul, Kemerovo and Novokuznetsk),
- ▶ In the Far East (Khabarovsk — Vladivostok).

Renovation of express rolling stock

The railway development strategy for the period up to 2030 provides for the renovation of JSC "Russian Railways" obsolete locomotive and rolling stock fleet for suburban services, replacing it with brand new electric trains. Siemens AG has become the key partner of the Holding Company in this area.

The first contract with the German company was entered into on 17 December 2009 for the design and supply of 38 electric five-car trains of the ES1 Lastochka series (Siemens Desiro RUS) with a maximum speed of 160 km/h. The trains will carry passengers during the 2014 Olympic and Paralympic Games in Sochi.

The optimal traction characteristics (power, acceleration, maximum speed) allow the ES1 electric train to reach its maximum speed within a short time (acceleration 0.7 m/s²) and manage gradients up to a maximum of 40% to ensure a high service for the "Olympic" traffic.

By the end of 2012, 17 Lastochka electric trains had been supplied to Russia. Preliminary, acceptance and certification tests were conducted in the TCh-10 Metallostroy Electric Multiple Unit Depot of the Oktyabrskaya Railway. On 7 December 2012 the acceptance commission signed the Certificate of Compliance of the Electric Trains with the Design Specification.

On 17 December, at the final meeting of the Executive Board of JSC "Russian Railways", the Russian Minister of Transport, M.Yu. Sokolov, presented the compliance certificate of the Lastochka trains.

The trains will be maintained in a new electric multiple unit depot at the Adler Station that was commissioned in 2012.

the total length of express and high-speed lines in JSC "Russian Railways" network by 2030.

11.2 th. km

passenger flows serviced by express and high-speed lines in 2030

44 mln people each year

The length of express and high-speed lines will increase by almost 9 times in the Far East (Khabarovsk — Vladivostok)

3.35 mln passengers used express railways in 2012

The second contract between JSC "Russian Railways" and Siemens AG signed in 2010 provides for the supply of an additional batch of 16 electric trains of the same design, but with a production localization rate in Russia of not less than 20% of the cost of the trains. JSC "Russian Railways" will start accepting the trains in the first half of 2014.

On 7 September 2011, JSC "Russian Railways" and LLC Ural Locomotives signed an agreement for the supply of 1,200 cars for Lastochka trains. The company will receive the design and technological documentation under a license agreement with Siemens AG.

Under the terms of the agreement, the production localization rate at the Ural Locomotives will have reached at least 80% of the cost of the electric train by the end of 2017. The technology transfer and support of the launch of the production of electric train components in Russian companies will be provided by the engineering center created at the basis of the company.

The first Lastochka train produced in Russia will be supplied to the customer — JSC "Russian Railways" — in the first half of 2015. All models of the electric trains will be designed to operate at speeds up to 160 km/h.

In 2012, LLC Ural Locomotives constructed new production facilities for the manufacture of the trains. The Electric Train Draft Design was approved and the Electric Train Contract Design was submitted for approval by JSC "Russian Railways".

High-speed passenger services require brand new locomotives. Their production has been started at the Novocheboksak Electric Locomotive Plant (a group company of CJSC Transmashholding).

The EP20 Olympus electric locomotive, capable of hauling passenger trains at speeds up to 200 km/h, was developed by specialists of TRTrans Engineering Center, established by Transmashholding (TMH) and the French engineering company Alstom on a pari passu basis.

A contract for the supply of 200 EP20 electric locomotives during 2010–2020 was signed by the President of JSC "Russian Railways", V.I. Yakunin, and the Chairman of the Board of Directors of CJSC Transmashholding, A.R. Bokarev, on 27 May 2010 in Sochi at the V International Business Forum Strategic Partnership 1520.

On 30 November 2012, the first EP20 electric locomotive was handed over to JSC "Russian Railways" at a formal ceremony in the presence of the Prime Minister, Dmitry Medvedev.

On 14 December 2012, the locomotive made its first trip with the Nevsky Express train.

JSC "Russian Railways" is planning to receive 36 of these locomotives during 2012-2013 to manage passenger services on the route Moscow — Sochi, including during the Winter Olympic Games.