GENNADY BESSONOV
TER Project Manager

Trans-Siberian Infrastructure’s Resilience

UNECE and EUSDR PA1b
WORKSHOP
How to develop resilient infrastructure (Global SDG 9)
Thursday and Friday, 16-17 November 2017
Ljubljana, Slovenia
China-Europe international transport corridors in 2020*

- Trans-Siberian Railway
- Trans-Siberian Railway – Kazakhstan
- Central Railway
- Northern Sea Route
- Southern Sea Route

Width of lines depend on freight traffic volume
Figures on map indicate share of overall freight traffic of main railways
Freight volumes carried along the Trans-Siberian Railway

2016:
517,000 TEU (+2.5 %)

January-August 2017:
482,000 TEU (+51.3 %)

China – Europe: 65%
Europe – China: 35%
Ensuring the increase of freight shipped from the main fields of the Eastern Polygon to 67 mln tons by 2020

**Mariinsk – Tayshet**
- reconstruction of 7 stations;
- construction of a second bridge over the Yenisey

**Tayshet – Tynda – Bamovskaya**
- construction of 684.4 km of second tracks and 8 passing loops;
- reconstruction of 8 stations

**Eastern section of the Baikal-Amur Railway**
- construction of 497.6 km of second tracks;
- construction of 17 passing loops

**West-Siberian Railways**
- construction of 26 km of second tracks;
- reconstruction of 5 stations;
- renovation of a passing loop

**Trans-Siberian Railway (Tayshet – Bamovskaya)**
- construction of 3.4 km of third tracks and 13 track posts;
- reconstruction of 54 stations;

**Trans-Siberian Railway (Bamovskaya - Nakhodka)**
- construction of 12 km of third tracks, 2 passing loops and 4 track posts;
- reconstruction of 51 stations

**Mezhdurechensk – Tayshet**
- construction of 199.5 km of second tracks, 3 passing loops and a marshalling yard;
- reconstruction of 10 stations

**Development of Trans-Siberian and Baikal-Amur Mainlines**

**Legend**
- First stage events for period until 2020
- Second stage events for period until 2025
- Construction of second tracks
- Construction and reconstruction of bridge crossings
- Construction and reconstruction of tunnels
- Automatic signaling section equipment
- Future electrification of sections
- Construction and renovation of passing loops
Terminal and warehouse infrastructure on the Trans-Siberian Railway Mainline

- Construction of the Baltiysky railway port at Shushary station
- Construction of Doskino TLC
- Construction of a warehouse complex at Novosibirsk Main station
- Construction of a warehouse facility at Irkutsk Passenger station
- Reconstruction of container terminal at Nakhodka station
- Reconstruction of container terminal at Artem-Primorsky-1 station
- Construction of Primorsky railway port at Ussuriysk-2 station
- Construction of Bely Rast TLC, Kuntsavo-II warehouse facility and Severin TLC
Establishing Integrated Network of Transport-Logistics Centers (TLCs)
**High-Speed Freight Transport**

**HSR Eurasia construction schedule**

*Beijing – Moscow – Berlin distance, including the anticipated 4,851-km Dostyk – Brest section*
High-Speed Freight Transport

High-speed freight rolling stock

- Cargo allocation in special containers at freight hubs
- Convenient and efficient loading and unloading
- High-speed train:
  - 16 wagons
  - Speeds of up to 300 km/h
  - Payload of up to 600 tons
### Moscow – Kazan – Yekaterinburg High-Speed Railway with Extension to Beijing

<table>
<thead>
<tr>
<th></th>
<th>Moscow</th>
<th>Kazan</th>
<th>Yekaterinburg</th>
<th>Chelyabinsk</th>
<th>Astana</th>
<th>Urumchi</th>
<th>Beijing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance, km</strong></td>
<td>762</td>
<td>767</td>
<td>271</td>
<td>1,057</td>
<td>1,734</td>
<td>3,170</td>
<td></td>
</tr>
<tr>
<td><strong>Travel time, hours</strong></td>
<td>14.25</td>
<td>13.9</td>
<td>4.3</td>
<td>19.2</td>
<td>31.5</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td><strong>Travel time via HSR, hours</strong></td>
<td>3.3</td>
<td>3.5</td>
<td>1.7</td>
<td>6.6</td>
<td>6.2</td>
<td>11.3</td>
<td>32.6</td>
</tr>
</tbody>
</table>

**TOTAL**: 7,761 km, 132.2 hours

**A FOUR-FOLD REDUCTION IN JOURNEY TIME ON THE HSR**

- **1,345** engineering structures, including:
  - **255** bridges
  - **223** trestles
  - **102** overpasses
PROJECT DESCRIPTION

Promoting the mobilization of the workforce, creating prerequisites to stabilize demographic trends, increasing the mobility of the population and creating new jobs.

The project is to be implemented using the Public-Private Partnership mechanism in the form of a private concession initiative.

FINANCING STRUCTURE

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity capital</td>
<td>254.0</td>
</tr>
<tr>
<td>Loans from the Development Bank of China</td>
<td>400.0</td>
</tr>
<tr>
<td>NPF funds</td>
<td>90.0</td>
</tr>
<tr>
<td>Infrastructure bonds</td>
<td>140.0</td>
</tr>
<tr>
<td>Loans from development banks</td>
<td>100.0</td>
</tr>
<tr>
<td>Commercial loans</td>
<td>304.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,288.9</strong></td>
</tr>
</tbody>
</table>

CURRENT STATUS

- The project is being implemented in accordance with the network schedule of events approved by Decree No. 5-r of the Russian Government dated January 13th, 2016.
- At present, design is under way, matters concerning the construction of rolling stock are being resolved and work to raise financing is in progress.
Innovative Rolling Stock

- Growth of network carrying capacity 8-15%
- Reduction of the locomotive traction costs
- Reduction of the impact on the track
- Reduction of the wagon maintenance costs

Overall dimensions of wagons 1-BM
Unhindered loading and unloading throughout the network

Innovative park growth rates on the network of the JSC “Russian Railways”

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Gondolas</th>
<th>Grain Wagons</th>
<th>Mineral hoppers</th>
<th>Tanks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>4.316</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>19.492</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>33.765</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>60.937</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>81.383</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Challenges in Trans-Eurasian Rail Network

- Width of tracks
- Length of trains
- Accepted Loading gauge
- Lines capacity
- Requirement for efficient, polyvalent and flexible intermodal terminals
- Reduction of environmental impact
- Harmonization and simplification of administrative formalities and social legislation
- Lack of unified operation management and tracking (through ITS) system
- Rolling stock adaptation
Eurasian Transportations via Trans-Siberian Mainline
Thank you for your attention!