Train(ing) up

by Olga Olegovna Gopkalo, *Ph.D., Lead Specialist at Morstoytechnology Ltd.*

Photo: Commercial Sea Port of Vladivostok

April 26th, 1956, marks the official birthday of container transport, that day Malcolm McLean shipped the first batch of aluminium containers loaded on the *Ideal-X*. Over the period of 1986-2013, the global container turnover increased nearly 10 times and exceeded 600 mln TEU. In 2013, the volume of cargo carried worldwide was close to 181.8 mln TEU[1] (each container being handled two or more times in a port).

The idea of containerization gained its maximum momentum namely at sea, with the process of globalization being a significant contributor to this development.

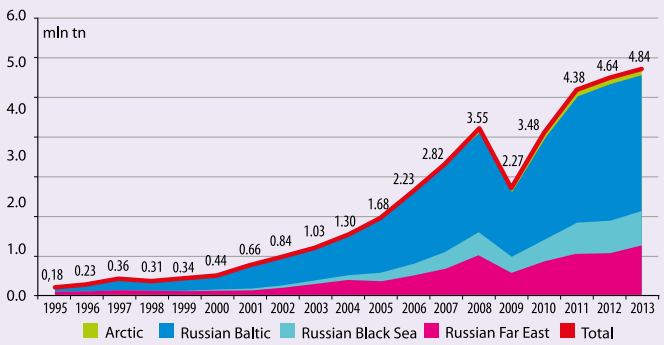
Sea: the engine of trade

In the early 2000s, the growing revenue from exports was correlated with an increasing demand for imported goods, being prevalently carried in containers. After the dissolution of the USSR, Russia's container handling potential was limited, therefore shipments were transiting terminals of the Baltic States and Finland. In 2000, some 439 thou. TEU were handled in Russian ports. This situation has given rise to the development of container infrastructure in Russian ports, achieved mainly owing to the efforts of domestic transport corporations; concurrently, the key players of the container market began taking shape. This complex process involved the formation of major Russian transport holdings, focusing on container shipping and the operation of sea container terminals, as well as alliances being set up, cargo handling capacities being split and consolidated again. The repartitioning of port assets was the other side of the process: any infrastructure not fitting the container market profile was transferred to other interested parties – exporters and cargo owners (read more on this in the BTJ 4-2014).

Dreaming big

Currently, the major Russian container terminals are planning to continue their dynamic growth. According to Saint Petersburg's First Container Terminal's development programme, the facility's throughput is expected to rise from 1,350 up to 1,600 thou. TEU in the nearest future. In the case of Petrolesport, a growth from 1,200 up to 1,500 thou. TEU is forecasted. Saint Petersburg Container Terminal plans to expand its capacity from 500 to 1,500 thou. TEU, Moby Dick – from 250 to 370 thou. TEU. The Port of Bronka, currently under construction, is planning to achieve a target of 1,400 thou. TEU capacity. It is also possible that the Ust-Luga Container Terminal will increase its aptitude from 440 to 2,600 thou. TEU. Moving slightly south, Kaliningrad's Baltic Stevedoring Company announced a plan to increase its capacity from 200 to 468 thou. TEU. Moreover, a new container terminal to be constructed for Avtotor, an automotive factory in Kaliningrad, is expected to handle up to 800 thou. TEU per year.

Fig. 1. Container cargo turnover dynamics in Russian ports, [mln TEU]



As regards the Russian Black Sea – in Novorossiysk all major market players have plans – more or less realistic – to increase their capacities. Novoroslesexport is hoping for a growth from 350 to 500 thou. TEU, NUTEP – from 350 to 600 thou. TEU (by 2015), the Novorossiysk

Commercial Sea Port – from 170 to 700 thou. TEU by 2018 (earliest). One cannot fail to mention one of the major projects recently – the dry cargo district of the Port of Taman, with UCL Port and Global Ports (the National Container Company) as potential investors. If the project enters its implementation phase, the total throughput of container terminals will be close to 2 mln TEU.

In the Far East, the Vostochnaya Stevedoring Company is planning to increase its capacity up to 2 mln TEU, the Port of Vladivostok's container terminal on the other hand is targeting a growth from 500 to 650 thou. TEU.

Should all these plans come true, the total throughput capacity of Russian container terminals would almost double, growing to some 11-12 mln TEU by 2020. Obviously, not all the projects will be implemented as announced, owing both to their technical complexity and market inadequacy as well. Nevertheless, the existing situation can already be described as a container handling capacity surplus, which can be expected to grow in the future. Presumably, this will lead to an intensified competition in the box segment and make the market players restructure their development plans.

Road carriage of containers

The road segment of the container transport market is mostly open to new players but, at the same time, highly shut in terms of access to information. No statistics of domestic carriage are recorded and data available from sea ports are the only evidence of how many containers are forwarded or received there. The market is not inconsiderable – about 3.4 mln TEU according to the 2013 reports. Accordingly, the volume of containers loaded on trucks and forwarded from inland container terminals was similar (or even greater).

Rail container transportation

In the Soviet period, the regular use of containers in railway transport in Russia began after the country's Great Patriotic War (1941-45). However, initially medium-tonnage units were mainly used – 3 and 5 tn, and only later 20 and 30 tn (20- and 40-foot, or large tonnage containers), more common today, were added. For these and other reasons, the infrastructure for containerized carriage of goods, similarly to the railway infrastructure on a whole, developed intensely in the Soviet period, turned out unsuitable for the powerful growth of the large-tonnage box transport. Railway stations were designed to accommodate other cargo structure, and the loading yards arranged at most places were too small to handle the traffic. Since it was not always possible to expand the existing yards, further development was often hindered by territorial restrictions, especially in major cities.

To handle container trains, sidings at least 850 m long (corresponding to 57 rail cars) are needed. But contemporary development of railway stations and private rail tracks rarely fit this requirement. The Soviet container transport system worked differently. Neither speed nor regularity of carriage – so characteristic for the modern line services – were a priority. Container trains used to travel with long delays, stopping at marshalling yards on their way to separate cars. Light- and medium-tonnage units represented a major share of the Russian Ministry of Railways' fleet of containers. The scale of the "sea size" – or so called large tonnage units – use was insignificant in those days.

The first block trains with large tonnage containers were shipped in 1971 on a testing track between Moscow-Leningrad and in 1972 two more routes were added: Moscow-Kharkov and Moscow-Riga. Yet, container trains have never come into use on a mass scale.

As a result, in the beginning of 21st century container yards started to be built at private railway sidings. The situation where some traditional cargo recipients – various manufacturing plants – were winding down under the new market conditions, releasing their infrastructural reserves – was also conducive to this process. This brief historical review allows for understanding one of the key problems of the Russian container market – the deficit of infrastructure and the existing barriers to its development. The future of railway carriage of containers is connected to the development of new terminals and yards.

Railway box transport – directions and dynamics

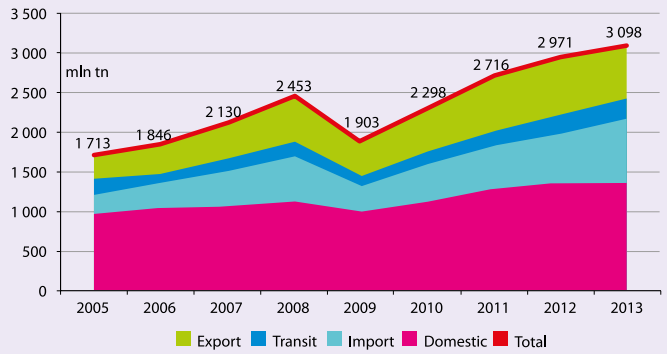
Domestic carriage represents the bulk of railway transportation of containers in Russia (and we are talking about large tonnage containers here) – 1,374 thou. TEU in 2013. Over a period of 9 years, from 2005 to 2013, a 41% growth in volume was recorded in this category, i.e. almost 400 thou. TEU. Close to 8% of all in-Russia railway transportation is directed towards sea ports and intended for further shipping by sea transport (coastal shipping) or receiving cargo from sea. These volumes have been tending to increase over the last years – by some 90% from 2005 to 2013.

Import is the second-largest category in the railway box transportation volume, having more than tripled over the period between 2005 and 2013, up to 804 thou. TEU. Around one half of the imported cargo arrives on seaborne vessels and is reloaded to rail, while 45% – via land border crossings. Over the last five years, the volume of containerized cargo transported on rail from seaports increased 2.8 times, while via land border crossings – 2.3 times.

In 2013, the volume of export amounted to 685 thou. TEU, having recorded a 2.6 x growth over the period of 2005-2013 (i.e. 500 thou. TEU). The volume of containerized export cargo transported by rail towards sea ports increased 2.8 times, while towards land border crossings – by 46%.

Transit accounts for less than 8% of the total volume of railway transport of containers, i.e. 235 thou. TEU. Out of this, around 40% is directed towards ports. Not long ago, in 2009, transit via seaports barely existed. Transit via land border crossings increased by 20% over the years 2009-2013.

Fig. 2. Dynamics of the railway carriage of containers volume [thou. TEU]



Over the past 9 years (2005-2013), the main growth was owing to domestic carriage of goods, with the volume of import and export cargoes transported towards ports increasing at a rapid pace. Although the domestic market of railway transportation of containers prevails in terms of absolute values, the development of seaborne transport of containers can also be regarded as a stimulus for the internal market and this is true with respect to both rail and road transport. The growth of container throughput in seaports was conducive to the concentration of cargo flows and to the development of fast container train technology on a more mass scale. Initially, most intermodal freight trains were assembled in conjunction with consolidated international cargo flows.

[1] *Source: TransContainer, Drewry*

Also, due to the specificity of Russia's geography, high-speed container trains have gained significance on the Trans-Siberian Railway, especially over the recent years.

In 2013, 571.6 thou. TEU was carried by high-speed block trains on Trans-Sib, which is 39.9% more than in 2012[2]. For comparison, according to data published by TransContainer, the total volume of cargo transported by high-speed intermodal freight trains amounted to 165 thou. TEU in 2002.

In 2009 a project aimed at launching the "Trans-Siberian in 7 Days" product was initiated. The main original objective of the initiative was to develop the export of transport services. Nevertheless, for the time being, Russian clients are those who have benefitted from the project most of all, as the volume of cargo carried to and from seaports exceeds transit. According to data published by the Russian Railways, the distance covered by trains under the "Trans-Siberian in 7 Days" programme averages 1,051 km/day. For comparison, the average distance covered by fast container trains travelling within the national rail system is 861 km/day. According to the company, development of container transport is impeded by the insufficient supply of wagons capable of travelling at a speed of 100 km/h, speed limits on rail curves for empty cars, as well as the limited polygon (only 7%) with speed limits of 90 km/h or more. Furthermore, with the existing infrastructure, it is not easy to combine high-speed freight train traffic with high-speed passenger traffic. From the point of view of the high-speed freight train traffic organization, the train has to travel along the main route without stopping. In the case of one of the most important connections – Saint Petersburg-Moscow – the possibilities to improve the traffic of high-speed freight trains have been almost exhausted due to the development of rapid passenger traffic.

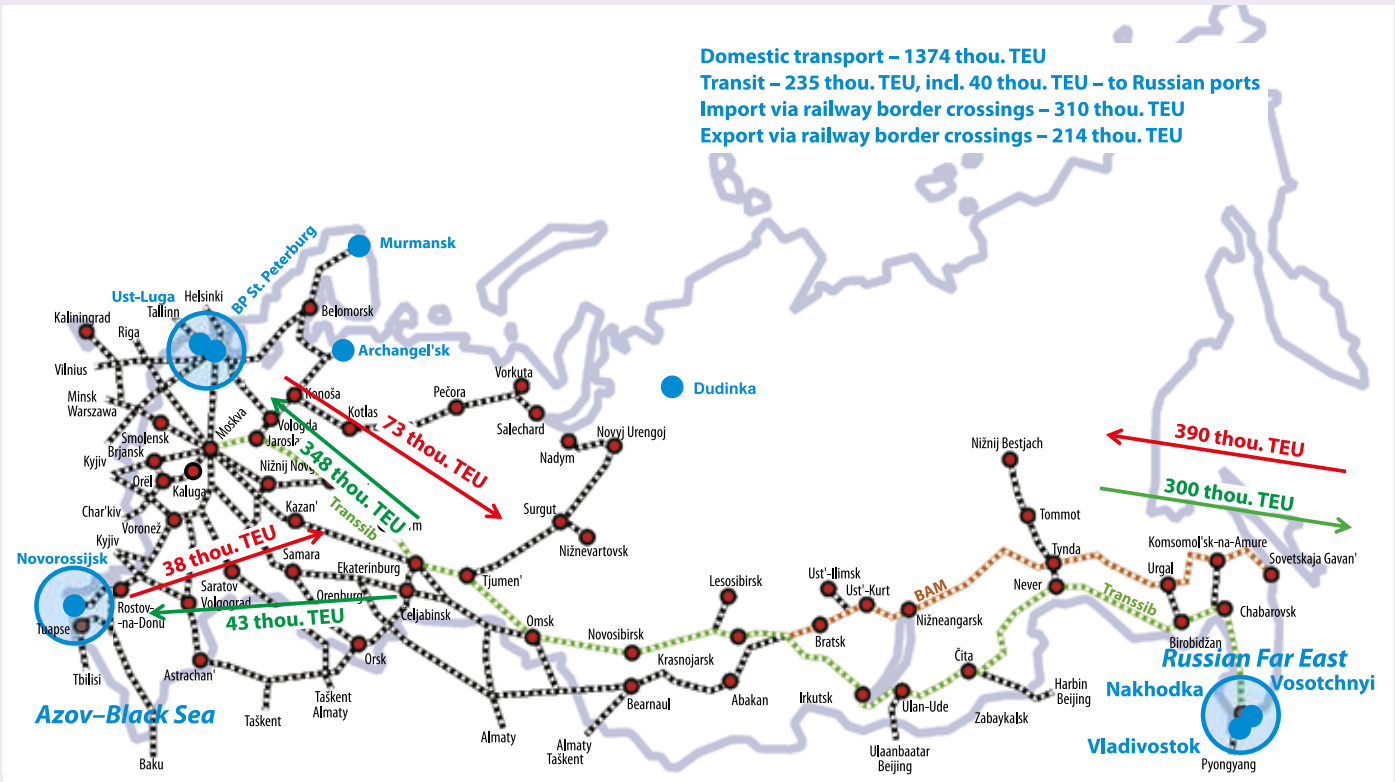
Railway container terminals

The prospects for development of railway container terminals are determined by direction-specific dynamics of traffic and by the cargo structure by the categories of goods, according to data provided by cargo forwarders.

In export directions, up to 80% of freight consists of four main cargo groups: paper (30%), chemicals (18%), non-ferrous and ferrous metals (17%), and timber (14%). Containerization of these cargoes is very much a result of the Russian Railways' tariff setting system, which makes transportation of these categories in containers more cost efficient than in traditional cars. Shipment takes place, as a rule, on manufacturing companies' own railway sidings. Industrial enterprises represent a major segment of container terminal operators and owners in Russia. It should be added here that the above-listed categories of cargo are successfully transported via domestic connections too.

In import directions, around 80% of freight is represented by the following four categories: automotive parts (38%), consumer goods

Fig. 3. The structure of the Russian railway container market cargo flows in 2013



(16%), metal products (12%), and chemicals (12%). The first group is imported by car manufacturers, who own their own container terminals, often operated by logistics operators. Volkswagen, for example, receives automotive components at Perspectivnaya railway station. As far as the remaining categories of cargo are concerned, the importers – trading companies as a rule – do not have their own railway container yards and use services provided by other operators.

In the case of domestic railway connections, the range of cargo types is much more diverse and the process of transportation is mainly based on operators' terminals, TransContainer being the largest among them. Moscow, with its surrounding regions is the unquestioned leader in terms of container terminals development, owing to its status of the major consumption and distribution centre. Saint Petersburg, another major consumer centre, a port and home to automotive assembly plants, is also a point of container flow concentrations.

Ural and Siberia are similarly important directions for rail transportation of containers. Cities with a population exceeding one million situated along the Trans-Siberian Railway are major container hubs with a high potential for growth. Furthermore, border crossings between Russia and China (Zabaykalsk) and areas close to the Russia-Kazakhstan frontier should be referred to as important development zones. Kazakhstan is active in developing container transit and transport and logistics centres of Chelyabinsk and Samara are oriented towards these cargo flows.

Automotive assembly plants in Russia – Saint Petersburg, Kaluga, Kaliningrad and other locations – represent a growing point for container transport too (automotive parts account for 38% of the containerized imports volume).

Traditionally, significant volumes of container shipments are forwarded to provide supply to hard to access regions, including further transshipment to river transport. Here, small- and medium-tonnage containers are still common today, but the share of large-tonnage units is growing. Besides regional demand for supply, development of transport in such areas is stimulated by oil and gas projects, with delivery of materials and equipment, as well as dispatch of oil products in tank containers (from the Nyagan railway station, for example).

The potential for further expansion of container terminals is related to the growth and modernization of throughput capacities within the key directions of transportation referred to here. Nevertheless, development of container terminals for serving the existing and future oil and chemical clusters in Tobolsk, Tomsk, Ufa, Samara, etc., can become another prospective direction of growth. As a result of the global crisis and a slowdown in globalization, domestic traffic may become a reserve for container market growth. This is an even a more up-to-date issue for such a geographically extended country as Russia. ■

[2] *Source: Coordinating Council on Transsiberian Transportation*

Fig. 4. Key points of the railway container terminals' growth in the Russian Federation