

technology advancement and innovation as drivers of growth and productivity, although the strategy looks to obtain foreign expertise to fill key technology gaps. The plan promotes diverse forms of state ownership and control and allows Chinese firms flexibility to access global markets, potentially obscuring the full extent of the role of the state.

China seeks to upgrade its economy from one that largely assembles goods for foreign firms to one that increasingly invents the products it makes. MIC 2025 notes that "China's manufacturing sector is large but not strong." The plan prioritizes upgrading manufacturing through advances in technology innovation (smart manufacturing) and manufacturing-tied services.

#### References

1. Chen, J., Xie, L. Industrial policy, structural transformation and economic growth: evidence from China. *Front. Bus. Res. China* 13, 18 (2019). <https://doi.org/10.1186/s11782-019-0065-y>.
2. Higuchi, Y., Shimada, G. (2019), Industrial Policy, Industrial Development, and Structural Transformation in Asia and Africa. In: Otsuka, K., Sugihara, K. (eds) *Paths to the Emerging State in Asia and Africa. Emerging-Economy State and International Policy Studies*. Springer, Singapore. [https://doi.org/10.1007/978-981-13-3131-2\\_9](https://doi.org/10.1007/978-981-13-3131-2_9).
3. Krugman, P. R., Obstfeld, M. *International economics: Trade and policy*. (7th ed.). Boston: Pearson Addison Wesley, 2006.
4. Ross, A. *The Industries of the Future* [M]. Simon & Schuster, 2016: 320.

UDC 656.078

## ASSESSMENT OF THE TRANSPORT INFRASTRUCTURE OF THE WORLD MARKET ОЦЕНКА ТРАНСПОРТНОЙ ИНФРАСТРУКТУРЫ МИРОВОГО РЫНКА

**Zhuchkevich O.**

*Vitebsk State Technological University, Belarus*

*e-mail: olga\_zh17@mail.ru*

**Жучкевич О.Н.**

*Витебский государственный технологический университет, Республика Беларусь*

*Keywords: cargo transportation, transport infrastructure, transport routes, transport corridors, investments, gross domestic product, efficiency.*

*Ключевые слова: грузоперевозки, транспортная инфраструктура, транспортные пути, транспортные коридоры, инвестиции, валовой внутренний продукт, эффективность.*

*Abstract. The importance of transport infrastructure in the economy is considered. The assessment of the elements of the transport infrastructure of the world market has been carried out. The level of investments in transport infrastructure by countries and types of transport has been analyzed. A comparative assessment of the dynamics of GDP and investments in transport infrastructure of individual countries has been made.*

*Аннотация. Рассмотрено значение транспортной инфраструктуры в экономике. Осуществлена оценка элементов транспортной инфраструктуры мирового рынка. Проанализирован уровень инвестиций в транспортную инфраструктуру по странам и видам транспорта. Произведена сравнительная оценка динамики ВВП и инвестиций в транспортную инфраструктуру отдельных стран.*

In the context of economic growth an increase in industrial output, sales and income growth, the demand for cargo transportation is also growing. The factors that increase the demand for transport also include globalization, the integration of international markets, the improvement of vehicles and transportation technologies, including through the development of logistics.

An increase in the efficiency of transport functioning is possible only with the sustainable development of the region, since this creates prerequisites for additional investments in transport infrastructure, additional opportunities for optimizing transport flows. In addition, it becomes really possible to solve environmental problems of the functioning of transport. As a result, there is a decrease in the level of the transport component in the final price of goods, the elimination of economic imbalances between individual regions, an increase in access to new markets, the development of cooperation, which is a significant competitive advantage of the region and affects economic growth.

Thus, there is a relationship between the level of development of the transport complex and the degree of sustainability of the region, between the quality of transport infrastructure and the country's macroeconomic indicators. Transport infrastructure is a set of elements that ensure the implementation and management of the transport process. At the same time, such elements of transport infrastructure as roads, railways and waterways, hubs, ports, as well as transport corridors are considered as factors of direct influence on the level of transport system development (Table 1).

A significant part of the world transport infrastructure is made up of transport corridors which combine several types of transport at once and pass through the territory of several countries. These are not only important transport routes, but also a special system of transport process management.

So, the implementation of large infrastructure projects in the Eurasian region includes transport routes of the Chinese initiative "One Belt – One Road" in the East-West directions, international road corridors of the Shanghai Cooperation Organization and transport corridors of the Central Asian Economic Cooperation Program (CAREC), "Europe - Caucasus – Asia "(TRACECA)," North-South " [1].

Table 1 – TOP-10 countries: total length of transport routes (2019)

Country	Railways lines, km	Country	Motorways, km	Country	Inland waterways, km
USA	149407,0*	USA	107227	USA	40000
Canada	62959,0*	Kazakhstan	95629	Finland	8125
Germany	38394,0	Uzbekistan	42695	Germany	7675
France	27483,0	Azerbaijan	19176	Netherlands	6297
Ukraine	19799,0	Spain	15585*	France	4827
Poland	19398,0	Germany	13183	Kazakhstan	4106
Italy	16779,0	France	11671	Poland	3722
United Kingdom	16289,0*	Italy	6966	Romania	2635
Kazakhstan	16060,8	United Kingdom	3838*	Belarus	1889
Spain	15526,0	Portugal	3065	Ukraine	1888

Note: \* – data 2018.

Source: compiled by the author based on [2].

As for ports, the largest container processing takes place in the ports of China, as well as the Netherlands and South Korea (Table 2).

Table 2 – Leading global container ports

Container ports	In million TEU		
	2018	2019	Rate of increase, %
Shanghai, China	42,01	43,30	3,1
Singapore	36,6	37,2	1,6
Ningbo Zhoushan, China	26,35	27,49	4,5
Shenzhen, China	27,74	25,77	0,1
Guangzhou, China	21,87	23,23	5,9
Busan, Южная Корея	21,66	21,99	1,5
Hong Kong, China	19,6	18,30	-6,6
Qingdao, China	21,01	18,26	8,8
Tianjin, China	16,01	17,30	8,0
Rotterdam, Netherlands	14,51	14,82	2,1

Source: compiled by the author based on [3].

As can be seen from the Table, China leads both in the number of seaports and in the volume of containerized cargo handling. At the same time, European and North American ports represented only 12,4 % and 6,6 % of the total, respectively.

**SECTION 2. SOCIAL AND ECONOMIC PROBLEMS OF EDUCATION  
AND SCIENCE DEVELOPMENT IN THE 21<sup>st</sup> CENTURY**

At the present stage of the dynamics of economic development, the effective functioning of the transport complex and ensuring a high level of the economic development depend on the the scale of investments in transport infrastructure. Infrastructure investment covers spending on new transport construction and the improvement of the existing network. Infrastructure investment is a key determinant of performance in the transport sector. Inland infrastructure includes road, rail, inland waterways, maritime ports and airports and takes account of all sources of financing.

Efficient transport infrastructure provides economic and social benefits to both advanced and emerging economies by improving market accessibility and productivity, ensuring balanced regional economic development, creating employment, promoting labour mobility and connecting communities.

Table 3 presents the volume of investments in the transport infrastructure of the leading countries of the world transport market.

Table 3 – Transport infrastructure investments (2019)

In million euros

Country	Rail	Road	Maritime ports	Inland waterways	Airports	Total
China	95008,7	614669,9	*	*	26678,7	736357,3
USA	11587,2	93962,1	*	294,7	*	105549,3
United Kingdom	13298,4	9642,6	*	*	*	22941,0
India	10368,6	12461,4	79,7	*	*	22909,7
Japan	9174,7	30027,3	2774,9	*	1882,4	43859,3
Germany	6948,0	16650,0	510,0	1100,0	1880,0	27088,0
Russia	6677,9	6710,8	469,4	121,8	472,8	14452,7
Turkey	1732,7	6138,7	91,2	*	2539,7	10502,3
Canada	1366,4	7543,2	944,3	*	1177,9	11031,8
Belarus	236,2	1157,8	*	0,598	5,1	1399,7

Note: \* – no data.

Source: compiled by the author based on [4].

The volumes of investments show the importance of certain types of transport in the economies of different countries and differ significantly in absolute value. A more accurate assessment of the effectiveness of infrastructure policy in transport requires a comparison of investment growth rates and GDP growth rates (Table 4).

The analysis shows that in countries where there is a high increase in investment in the development of transport, there is also a significant increase in GDP. And Belarus takes leading positions in this assessment.

Table 4 – The dynamics of GDP and transport infrastructure investments (2016–2019)

Country	Growth rate, %	
	GDP	Transport infrastructure investments
China	128,3	126,1
USA	114,4	109,7
United Kingdom	104,7	103,9
Japan	103,2	95,3
Germany	111,3	133,5
Russia	132,9	108,9
Turkey	88,4	92,5
Canada	113,6	115,7
Belarus	134,9	130,1

Source: compiled by the author based on [4, 5].

#### References

1. The main directions and prospects for the development of the world market of transport services [Electronic resource]. – Access mode: [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_331686/a03b48911feb97ed333ec5e1db1e9ff011e2b669/](http://www.consultant.ru/document/cons_doc_LAW_331686/a03b48911feb97ed333ec5e1db1e9ff011e2b669/).
2. UNECE Transport Statistics Database [Electronic resource]. – Access mode: <https://w3.unece.org/PXWeb/en/CountryRanking?IndicatorCode=42>.
3. The Top-10 Container Ports [Electronic resource]. – Access mode: <https://www.worldshipping.org/top-50-ports>.
4. OECD Data. Fr [Electronic resource]. – Access mode: <https://data.oecd.org/transport/freight-transport.htm>.
5. World GDP Rankin [Electronic resource]. – Access mode: <https://knoema.com/nwnfkne/world-gdp-ranking-2020-gdp-by-country-data-and-charts-2015-2019>.