

EAEU international transport corridors in the sustainable development of a regional economy

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Abstract. The International Transport Corridors (ITC) have traditionally addressed the challenges of inter-state integration and the creation of trade and economic partnerships at the global and national levels. Moreover, regional growth is only possible in the case of the development of ITCs as a multi-level system, in whose «zone of attraction» the economy of a Russian subject can increase external economic potential. As a result, the solution of this task requires a holistic approach to the development of transport plans, and transport sections of the strategies for socio-economic development of the Russian subjects, which is the purpose of the article. The scientific novelty of the results is achieved by setting the task - to substantiate the potential of ITCs in providing a sustainable type of regional development, the differentiation of sectoral and territorial directions of ITCs influencing the regional economy, proposed characteristics of the potential (diversification of development objectives, «an attractiveness zone of an ITC», infrastructure projects), which have to be included into an ITC as an economic system providing a targeted type of regional dynamics.

1 Introduction

International Transport Corridors (ITCs) play a key role in the development of the global market for transport services. As one of the fastest growing sectors of the economy and a part of the national or international transport systems, ITCs provide uninterrupted operation and large volumes of international freight and passenger transport, stable transport links of geographical areas, and thus the sustainable development of national economies of the states through which the national part of an ITC passes [1].

In a technological sense, an ITC is a complex of rolling stock (vehicles adapted for transport on rail tracks, and road routes), stationary devices (equipment of all modes of transport that work in this direction), and a set of technological and legal and organizational conditions necessary for the transportation process [2].

According to the Transport Strategy of the Russian Federation, the structure of an ITC includes a set of routes passing through the territory of several states, providing passengers and goods in international traffic in the directions of their greatest concentration, including

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the conditions of these transport operations [3].

According to Vardomsky L.B., Turaeva M.O., the initial preconditions for the formation of an ITC as an economic phenomenon contained conditions that made the state borders more transparent for international transport and included: (1) interstate integration, (2) building trade and economic partnerships [4].

With the progressive development of transport infrastructure, changes in the spatial structure of international trade, and the «container revolution» in freight transport, the economic structure of an ITC has been transformed into a multi-level system functioning on the principle of «hub and spoke» - a transport node, with countries and regions that are actively involved in international trade, especially intermediate goods (components, semi-finished products, parts).

The formation of transport and logistics chains within the multi-level ITC system has stimulated new transport technologies and new modes of transport:

- multimodal (several modes of transport, one or more operators, on a single transport document and the liability of one carrier),
- intermodal (multi-modal transport of goods with the responsibility of two or more carriers),
- piggyback transport (combined rail-road transport using one vehicle of another vehicle technology),
- «seamless» (organized on the basis of a logistic approach and digital technologies, a single service, uniting various transport and technological elements).

The subsequent development of a multi-level ITC system led, according to P.H. Jung, J.C. Thill, to the global reduction of transport space, to the saving of transport costs in shipping [5], according to S. Zhou, B. Ji, Y. Song, S.S. Yu, D. Zhang, to strengthening the role of waterways in the organization of ITCs [6], to the possibility of optimizing the location of intermodal transport hubs (L. Li, J. Wang, H. Wang, X. Jin, L. Du [7]), to new approaches to the design of the location of a hub network of national airlines (M. Nasrollahi, A.A. Kordani [8]), to the development of optimum domestic flight routes based on hub airports (G Sugiyanto, PB Santoso, A Wibowo [9]), to more economical container routing schemes in rail transport (R. Elbert, H. Wu [10]).

In addition to the sectoral effects noted, the development of ITCs as an economic system has a territorial dimension. The influence of an ITC on the growth of national transit capacity, noted by L. B. Vardomsky, is limited to an increase in the export of transit services, a problem in which the role of an ITC is central, to the coordination of the transport and foreign trade policy of Russia with the policy-makers of neighboring countries, the co-ordinated activity of Eurasian regional associations: Eurasian Economic Union (EAEU), Commonwealth of Independent States (CIS), Shanghai Cooperation Organization (SCO), the megaprojects «One Belt, One Way», «The Caspian Five».

The development of trade as a stimulus to economic growth is researched by M.E. Balbaa, U. Dadabaev, N. Ismailova, B. Tursunov, who conclude that the reduction of customs procedures and the growth of the share of transport services in the operation of an ITC lead to GDP growth of 1.8% and 7.4% respectively, which empirically confirms the importance of ITCs in boosting Africa's economic growth [11].

The investment in ITC transport infrastructure is important for regional development, as confirmed by the results obtained by T. Komornicki, G. Sławomir, who consider ITCs to be *the transport links of major mega-cities, growth poles* that move the progress from mega-cities to peripheral areas [12].

According to E Katysheva [13], ITCs play an important role in *developing the Russian industrial potential*, including in the sparsely developed, inaccessible regions of the Arctic; in *overcoming regional differences in development level*, as stated by M. Zuopeng, L. Chenggu, Z. Pingyu, Z. Jing, L. Daqian, X. Mingke [14]; in *bridging the rural development*

gap, according to M.B. Siddiqui, M. Khokhar [15].

2 Materials and methods

The consensus in scientific research on the possibilities of ITCs to ensure territorial development can be characterized as positive effects and progressive tendencies of the national economy formed by the technical and technological, organizational and legal development of ITCs.

According to the authors, the depth and detail of the research of an ITC as an economic system functioning at the territorial level requires that efforts be directed towards two objectives:

(1) differentiate the impact of ITC on the economies of the regions of the countries through which routes run, whose infrastructure of the national component of an ITC is laid, and assess the contribution of an ITC to regional development, taking into account economic specialization and spatial organization of the regional economy;

(2) assess the role of an ITC in ensuring the sustainable type of development of regional economies, and their ability to respond to the challenges formed at the level of national and global economies.

The solution of these research tasks is necessary for the scientific support of the following objectives: (1) the strategic planning of regional development; (2) the transport planning, which has theoretical gaps. As the transport component of the strategies for the socio-economic development of Russian regions insufficiently reflects their participation in ITC projects, they do not provide a description and evaluation of the potential and effect of an ITC factor in a sustainable type of regional development. In long-term transport plans, the spatial location of an ITC infrastructure, the choice of ITC routes is tied to cargo or passenger flows, and the sectoral tasks of an ITC are poorly integrated with the challenges of regional development.

The methods of the study are the method of aggregation, applied for the generalization of sectoral and territorial strategies, affiliated with the development of ITCs; the method of qualitative assessment - for the characterization of the potential of an ITC; the method of construction of generalized statistical indicators - to analyze the risks of sustainable regional development, to substantiate a set of measures to involve the economy of a region into the «attraction zone» of an ITC.

3 Results

3.1 The strategic potential of ITCs in the development of the economy of Russian regions

The assessment of the potential of an ITC as an economic system for territorial development is based on the aggregation of sectoral and territorial development strategies. The systematization of provisions related to the development of (1) an ITC infrastructure (includes railway, road, water, combined transport facilities, main and access roads, border crossing points, service centers, terminals, and other infrastructure facilities providing transport of goods along certain routes); (2) routes within the boundaries of territorial units (constituent entities of the Russian Federation, agglomerations, cities, rural settlements), allowing to determine the range of positive effects of territorial development related to the implementation of ITC projects on a wide range of strategic objectives (Table 1).

Table 1. Territorial units in the ITC “attractiveness zone”, territorial effects of an ITC development in the context of sectoral strategies.

The EAEU ITCs, implementation of the ITC projects	Territorial units in the «zone of attraction» of an ITC, territorial consequences of the development of an ITC
The comprehensive plan for upgrading and expansion of backbone infrastructure (Section 1 «Transport infrastructure»)	
Europe – Western China ITC	the construction of the high-speed road «Moscow – Nizhny Novgorod – Kazan»; bypass of the city of Togliatti with a bridge across the Volga river; the Russian section of the toll highway «Meridian” in the borders of the Samara – Togliatti agglomeration, the cities of Saratov, Volgograd, Bryansk, the Krasnodar Krai
the North-South ITC	the development of transit and international rail freight flows on the route Buslovskaya – Saint Petersburg – Moscow – Ryazan – Kochetovka – Rtishchevo – Saratov – Volgograd – Astrakhan; the construction of bypasses of the cities of Vladikavkaz, Astrakhan, Makhachkala, Derbent, Khasavyurt; the reconstruction of the Karaozek border crossing on the Russia-Kazakhstan border, the Trubnoe-Baskunchak railway section in the Astrakhan region, the railway bridges across the Volga river on the Aksaray – Astrakhan section; the regularization of the inland waterway section of the Unified Deep-Sea System of Russia and the Volgo-Caspian Canal; the modernization of railway approaches to the ports of Astrakhan, Olya; the construction of a multifunctional port and logistics complex on the territory of the port of Olya; the reconstruction of sections of the roads «Scandinavia» in the Leningrad region, «Don», and «Caspian» on the section of the route Tambov – Volgograd – Astrakhan
the East-West ITC	the construction of the Russian section of the road corridor «Europe-West China» due to the construction of new roads, the reconstruction of existing roads for seamless road communication border of Belarus – Smolensk – Moscow – Kazan – Ekaterinburg – Omsk – Novosibirsk – Irkutsk; the development of a high-speed road route on the section of the federal route «Volga» Moscow – Vladimir – Nizhny Novgorod – Kazan – Ufa in the borders of the Republics of Tatarstan, Bashkortostan, the Perm – Yekaterinburg section within the borders of the Sverdlovsk Oblast
Russian transport strategy	
infrastructure	the modernization of border crossing points; the technological «linkage» into a single system of the Russian ITC sections
spatial development	the formation of ITCs, based on production, commodity, and agro-industrial centers, capable of carrying out the following tasks: (1) spatial development, (2) the development of economic growth centers, (3) the growth of export potential of the Russian regions

economic impact by 2035	the total volume of trade between the countries tending to transport through Russia along the «East-West» ITC to reach 3-5 mln 20 pound equivalent containers; growth of transit potential, creating an additional effect for the Russian economy in the amount of 220-650 bln rubles, along the «North-South» ITC – up to 400 thousand 20-pound equivalent containers, of which 50 thousand are the products with high added value
Strategy for the Development of Russian Railway Transport	
infrastructure	the development of the transport infrastructure of the territory in the Trans-Siberian Railway zone, in the Trans-Korean Railway completion zone
transport market development	the improvement of transport services along the ITC
foreign economic relations	transport support of foreign economic relations of the Russian Federation through freight transport on ITC routes
Strategy for the development of road transport and urban land-based electric transport	
infrastructure	the establishment of recreational areas for drivers and road service facilities along roads belonging to an ITC in accordance with established standards, in accordance with the requirements of the European Agreement on the Operation of Vehicles
transit potential	ensuring the effective use and development of Russia's transit potential within the EAEU (ensuring smooth year-round passage of cargo vehicles with a single axle load of 11.5 t on Russia's ITC roads)

Source: worked out by the authors on the contents of the strategic planning documents of the Russian Federation

From the strategic point of view, the influence of the EAEU ITCs on the economy of the regions is realized in the «attraction zones» of territorial units to infrastructure projects, routes of international transport, international technological and environmental standards of the work of ITC's transport and logistics companies. The analysis of territorial units included in the «zones of attraction» of the EAEU ITCs, passing through the territory of the Russian Federation, presented in the transport plans, in the development strategies of the transport industries shows a wide coverage of the subjects of the Russian Federation, urban agglomerations, large cities, economic development centers by ITC projects (Table 1).

New construction, reconstruction, and modernization of transport infrastructure facilities along the routes of the «Europe-West China», «North-South», and «West-East» ITCs provide a wide range of opportunities for regional growth. The development of the regional transport services market, foreign economic activity, export and transit potentials, spatial concentration of advanced centers of economic growth (e.g., multifunctional port and logistics complexes), the organization of seamless and high-speed traffic comprise a list that fully realizes the paths of socio-economic development caused by the transport factor.

The territorial focus of an ITC's contribution to regional development is presented in the spatial development strategy, in the strategies of socio-economic development of the constituent entities of the Russian Federation (Table 2).

Table 2. «Zones of attraction», economic consequences of ITC development in terms of territorial strategies.

Goals, and tasks, affiliated with the development of the EAEU ITCs	Territorial units in the «zone of attraction» of an ITC, territorial consequences of the development of an ITC
Spatial Development Strategy of the Russian Federation	
overcoming throughput limitations of main railways and highways forming the «North-South», and «West-East» ITCs on sections of federal highways	the central, southern, and north-western regions of the Russian Federation, the Volga region, the Urals, the southern regions of Siberia and the Far East, certain sections of the Trans-Siberian and Baikal-Amur Railways, access to major sea ports, major transport hubs, and international border crossing points
removal of transport barriers to increased economic development	the development of Arctic zones, the Northern Sea Route as an ITC
the development of the «North-South», and «West-East» ITCs to ensure effective entry of Russian enterprises and businesses into foreign markets	increasing the volume of cargo transit between Asia and Europe on the territory of the Russian Federation
growth of transport services exports	involvement of prospective major centers of economic growth, centers of economic growth of the Russian subjects (the cities of Vladivostok, Voronezh, Volgograd, Yekaterinburg, Irkutsk, Kazan, Krasnoyarsk, Naberezhnye Chelny, Nizhny Novgorod, Novosibirsk, Omsk, Perm, Rostov-na-Donu, Samara-Tolyatti, Tyumen, Chelyabinsk, Ufa, St Petersburg and the cities of the Leningrad Oblast, Moscow and the cities of the Moscow Oblast) into the development of the export potential of the Russian Federation
priority development of high-speed transport links	the construction of the sections of high-speed lines Moscow-Kazan, Yekaterinburg-Chelyabinsk, the road route «Europe-West China», the railway and road routes of the «North-South» corridor
increase in freight traffic	the development of the Northern Sea Route as a full-fledged ITC
Strategy for the socio-economic development of the Samara region	
spatial development	the development of a holistic transport model clustering of the TLC
clustering of the TLC	the support of interaction of transport business participants the construction of new TLC facilities
transport services market	the activation of public-private partnership mechanisms in the construction of TLC facilities; attracting significant investments to the region from the budgets of all levels, development institutions, and the budgets of leading logistics operators
the construction of new TLC facilities	the development of high-technology export capabilities; the support for export-oriented TLC companies; the expansion of markets for regional products based on transport and logistics

Source: worked out by the authors on the contents of the strategic planning documents of the Russian Federation and the Samara region

Overcoming the capacity constraints of transport highways in areas where ITC infrastructure projects are implemented, as presented in the Spatial Development Strategy,

and transport constraints are directly linked to the economic development of new - Arctic - territories, with the accelerated development of already developed territories. The intensification of foreign economic activity and the growth of export potential is defined as a strategic goal in the «zone of attraction» of the ITC for prospective major centers of economic growth of the Russian Federation, centers of economic growth of the Russian subjects. For the Samara region, the transit geographical position and location in the «attraction zone» of the «North-South» ITC, in the prospects of the «Europe-West China» ITC, may strategically ensure spatial improvement, development of the transport market, interregional and external economic cooperation, as well as stimulate new development mechanisms and institutions.

3.2 ITC’s potential for sustainable regional development

The conditions for the implementation of sectoral and territorial strategies are adjusted by threats that create risks of loss of regional sustainability. Among them, unprecedented restrictions, caused by sanctions pressure, form a new model of business for the subjects of the Russian Federation - a «limited open economy». Defined by the level of economic integration, this model is characterized, according to the concept proposed by Afanasiev A.A., by a combination of global openness, free trade, unhindered cross-border movement, and access to international markets with mechanisms to ensure national security, achieved primarily by technological sovereignty [16].

Based on the key constraint - the decline in the level of integration into the global economic system, the potential of the ITC is a key factor for the sustainability of the «limited open economy» of the constituent entities of the Russian Federation. The developed transport infrastructure of the EAEU ITCs located on the territory of a region, and the inclusion of its economy into the route network of the EAEU ITCs are of stabilizing importance, giving the required stability to the vector of regional growth by means of cross-border integration, creation of new trade and trade and economic partnerships.

In the given model, the economy of the Samara region is «limited open», which is confirmed by the indicators presented in Table 3.

Table 3. Foreign trade indicators of the Samara region, percent.

Performance indicators	2019	2020	2021	Absolute deviation over the period
Foreign trade quota (ratio of foreign trade turnover to GRP)	10.3	9.2	10.4	0.1
Export quota (ratio of exports to GRP)	6.8	5.7	6.7	-0.1
Import quota (ratio of imports to GRP)	3.5	3.4	3.7	0.2

Source: calculated by the authors based on the data: <https://rosstat.gov.ru/>

The general assessment of the level of openness of the economy of the Samara region, necessary for understanding the scope of limitations of the open economy, is based on a universal scale, linked by Afanasiev A.A. to the stages of integration of the national economy into the world economy and modified for the GRP indicator (Table 4).

Table 4. The modified scale of the openness assessment of the Russian Federation economy, percent.

Indicators based on GDP (according to the method by Afanasiev A.A.)	2019	2020	2021	Indicators based on GRP (modified by authors)	2019	2020	2021
Foreign trade quota (ratio of foreign trade turnover to GDP at current prices)	39.5	38.1	44.2	Foreign trade quota (ratio of foreign trade turnover to GRP at current prices)	47.2	43.7	47.7
Foreign trade quota (ratio of foreign trade turnover to GDP by purchasing power parity)	15.2	13.0	16.4	Foreign trade quota (ratio of foreign trade turnover to GRP in purchasing power parity)	17.5	14.8	17.7

Source: calculated by the authors based on the data: <https://rosstat.gov.ru/>

The assessment of the openness level of the economy of the Samara region concludes that the values of the foreign trade quota (9.2-10.4% for the modified indicator) are significantly lower than those typical for the open economy (14.8-17.7). The reason that the economy of the Samara region has achieved the characteristics inherent in the model of a «limited open economy» is the low foreign trade potential and negative dynamics of exports.

In the current conditions, the risks of loss of sustainability for regional development can be overcome by a set of measures related to the inclusion of the economy of the Samara region in the «attraction zone» of the EAEU ITC «Europe-West China»:

1. Completed in 2023, the project of constructing the bypass of the city of Togliatti with a bridge across the river Volga in the area of Klimovka may realize the potential of border cooperation.
2. A proactive investment initiative to create a federal port and logistics hub in the region (PLH) may realize the potential of the unique geographical position of the Samara region in the area of a major railway hub with access to the Trans-Siberian Railway, federal routes M5 and M12, possibilities of inland water transport, operating ports, and berths. The PLH infrastructure will include possible sites in the cities of Syzran, Oktyabrsk with existing and new transport and logistics centers, three river ports for ships of class «river-sea», having access to the Volga-Don and Belomorsk-Baltic shipping channels.

The infrastructure of the EAEU ITC, along with the involvement of investors in the format of public-private partnership, and geography, creates unique conditions for overcoming the negative consequences of restrictions of the open economy. Ensuring the sustainability of the economic development of the Samara region is achieved in the direction of foreign economic relations, including the growth of transit potential, the potential for cross-border cooperation, transport links with the countries of the Caspian basin, and through Iran, Azerbaijan, and Turkey with other Gulf States.

4 Discussion

The discussion of the conclusions, grounded in the article, is connected with the open question about the priorities of the ITC development, about the priority of sectoral or territorial strategies in planning the location of the ITC infrastructure in the territory of the Russian subjects. In answering this question, the authors agree with the position of S.A. Verigo, A.B. Kudryashov [17]. The opinion of the said authors consists in the need to integrate the development of the EAEU ITCs into the priorities of expanding cooperation with the states of any continent, and it is necessary to create conditions for the accelerated development of the Russian regions, adjacent to ITCs, by attracting investments for the development of transport infrastructure. The ITC infrastructure projects, which are designed to address sectoral and regional priorities through harmonized strategies, serve as a vehicle for such integration. Here, however, the type of regional development, defined by respected scientists as «advanced», requires clarification. According to the authors, the formation of a «limited-open economy» as new conditions require solving the task of increasing the role of the ITCs in regional development based on the goals of sustainability - the ability of the economy to respond to challenges and threats, without losing economic growth. The objectives defined in this context form a multi-level ITC system capable of addressing a set of interrelated objectives. On the sectoral horizon are the tasks of technological development, creation of new and modernization of existing vehicles and technical devices, implemented by the tools of engineering and construction projects. On the territorial horizon are the tasks of spatial development, and socio-economic development of the constituent entities of the Russian Federation, implemented by investment projects, and PPP (public-private partnership) projects. The diverse objectives in a multi-level ITC system can ensure the sustainability of regional development, with the transport factor, national economic conditions, and global challenges.

5 Conclusion

The article develops a holistic approach to the development of transport plans, transport sections of the strategies of socio-economic development of the Russian regions, based on the capabilities of an ITC to provide sustainable development of the regional economy:

- theoretical provisions of an ITC's functioning as an economic system, an object of strategic planning at the level of a Russian region have been supplemented;
- the ITC impact on the economy of a region in the composition of sectoral and territorial strategies has been differentiated;
- the potential of an ITC in ensuring sustainable regional development has been characterized, by the risks of the «limited open economy» model;
- a set of measures to involve the economy of a region in the «attraction zone» of the EAEU ITCs, project tools, and practical recommendations for their use in the development of strategic planning documents have been worked out.

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