The multi-dimensional nature of Tatarstan’s entry into the trans-continental transport corridor

G S Samigullina
Institute of Management, Economics and Finance, Kazan, 420011 Russia
E-mail: galinaterra@yandex.ru

Abstract. The aim of the article is to reveal the problems of the Republic of Tatarstan’s entry into the transcontinental transport corridor, taking into account the infrastructural potential of the republic. The following factors provide opportunities for integrating Tatarstan into the global transport network: positioning the republic as a globally competitive and sustainable region with a favourable investment climate, a national tourist rating, a favourable physical, economic and geographical location, a significant share of transport services in the gross domestic product, and the availability of logistics centres and terminal and warehouse complexes. The construction of the transport corridor Europe – Western China – part of Russia – Kazakhstan – China section will allow Tatarstan to be included in transcontinental transportation. The article also touches on environmental issues, recognising the importance of people living in harmony with nature. There are about 30 settlements in the route’s area, some of them will be divided, it is necessary to consider nature conservation areas: rivers, woodlands, natural zoological (hunting) reserves and natural monuments of regional importance, emission load factor of chemical carcinogens in atmosphere and level of traffic load.

1. Introduction
The Republic of Tatarstan’s Social and Economic Development Strategy through 2030 outlines the goal of positioning itself as a globally competitive, sustainable region, the driver of the ‘Volga-Kama’ growth pole. In 2020, the republic was ranked among the top five regions in terms of the competitiveness index, ranking 4th after Moscow, St Petersburg and the Moscow Region.

In the national invest climate rating among Russian regions (2019), the Republic of Tatarstan takes second place after Moscow. National Tourist rating of Tatarstan (at end of 2019) was evaluated according to the level of development of the hotel business, the profitability of the tourism and hospitality industry, the popularity of the region among domestic and foreign tourists, tourist uniqueness, etc.; and has placed the republic in the top 20 regions (Top 20), ranking 8th. In addition, the Republic of Tatarstan is located at the crossroads of the main transport routes connecting the Siberian regions, the Urals, Eastern Europe, and western Russia. The capital of Tatarstan, Kazan, is in the centre of the largest densely populated industrial basin with large settlements.

The favourable geographical position allows the republic to make a profit from the implementation of transit traffic through its communications. Transport in the republic is a priority sector of the economy. The share of transport in the main production assets of Tatarstan, the share of transport services in the gross domestic product, investments in the development of economic sectors, the
The number of employed workers remain high. Transboundary processes have occurred at different stages of historical development, including the Republic of Tatarstan, changing vectors, intensity and content depending on various factors, primarily political, economic, environmental, ethno-cultural, etc. [1].

Kazan International Airport has put into operation a new runway that can accommodate all types of aircraft, including Boeing. Its length is 3.7 km, width - 44 m, thickness - 0.96 m. Currently, the airport is completing the commissioning of the electronic system of air traffic control of the French company “Thomson”, an omnidirectional radio beacon, instrumental landing system, route radar, which registers ships within a radius of 400 km. Kazan Airport will be assigned Class A, the runway will be increased from 2,500x45 metres to 3,750x60 metres.

Two transit routes, North-South and East-West, will run through Russia. Of the three routes to the Urals (via Nizhny Novgorod, north of Tatarstan, Tatarstan, Samara), the Moscow-Kazan-Yekaterinburg railway is the one with the highest capacity. The North-South transport corridor is represented by waterways: from Kazan, for example, there are easy access to 200 ports in Europe, Asia and Africa. Mechanised ports operate in Kazan, Naberezhnye Chelny, Nizhnekamsk. The largest of them is Naberezhnochelninsk, which has not been put into full operation due to the partial filling of the Nizhnekamsk reservoir.

The transport situation in Tatarstan in the Volga Federal District could significantly improve after the implementation of the “Big Water Ring” project (Volga-Danube-Rhine) proposed by the Ministry of Transport of the Russian Federation by inland water transport means – river-sea class mixed navigation vessels along the ring: the Baltic Sea with branch lines to the Caspian Sea, Western European ports, Northern Sea Route.

2. Models and Methods
Construction of the Kazan-Moscow M-12 Mainline, which is part of the comprehensive plan for the modernization of the main infrastructure of Russia until 2024, will become a key part of the transport corridor Europe - Western China - Russia - Kazakhstan - China section, which will run from the ports of Finland through the Baltic countries, through Kazan, Orenburg and Kazakhstan.

In Russia, the route will pass through the Moscow, Vladimir, Nizhny Novgorod regions, Chuvashia and Tatarstan. In Tatarstan, the route will end with docking with the Shali-Bavly road under construction. The four-lane highway with a permitted travel speed of 150 km/h will stretch 142 km across Tatarstan and pass through Apastovsky, Verkheuslonsky, Kamsko-Ustinsky, Laishovsky and Pestrechinsky municipal districts.

M-12 will cross Tatarstan on five federal roads, including Tsivilsk - Ulyanovsk, Kazan - Buinsk - Ulyanovsk, Kazan - Orenburg, Sorochi Gory - Shali. Due to the construction of a transcontinental highway, travel time Kazan-Moscow will be reduced by 2 times. Travel time to St. Petersburg will be 12 hours. Because of Avtodor’s tenders, the construction of a highway will have 8 stages and it is about 794-kilometre. The 7th (586–663 km) and 8th (663–729 km) stages will be constructed in the Republic of Tatarstan and the length of it will be 145 km. The 7th stage of the highway construction will connect Tatarstan and Chuvashia, the 8th stage is associated with the construction of a bridge over the Volga near Kazan. The route will stretch from the cross with the R-241 Kazan - Buinsk - Ulyanovsk highway to the cross with the Sorochi Gory - Shali regional highway.

In this work we used a method of content analysis of online publications, periodicals. The method of content analysis of the emerging regional socio-ecological-economic system (SES) in the conditions of the Republic of Tatarstan joining the transboundary processes has revealed the need to solve environmental, archaeological, social, logistical, investment and other economic problems.

3. Results and Discussion
The construction of the Kazan-Moscow M-12 link is due to the presence of several existing logistics centres (mainly Class A) and terminal and warehouse complexes in the republic. Among the largest and most significant logistics centres, there are five that are important for the economy of
the republic. First, it is the Q-Park Kazan logistics complex that is in the Laishevsky district near the Kazan international airport. The second and the third are “Biek-Tau” and “Konstantinovsky” which are in Vysokogorsky district. The fourth one is “Logicians” which is in Naberezhnye Chelny. And the last one but not the least is the distribution centre of the well-known network “Magnit” that is in Zelenodolsk. The total area of warehouse premises is 22,500 m². The Sviyazhsk interregional multimodal logistics centre is under construction, the Agromir Kazan wholesale and distribution centre of agricultural products trade in the Pestrecha district of the Republic of Tatarstan.

The estimated cost of the Tatarstan section is about 162 billion rubles that are because of the features of the relief and the hydraulic network that require the construction of 352 artificial structures. The share of investments by private investors in the form of public-private partnerships will be 30-40%. The increase in the cost and length of the Tatarstan section is also because the route, developed by the St. Petersburg research institute Soyuzdorproekt and St. Petersburg Roads, had to be changed, as the route cut through the village of Nikolskoye, where the annual Karavon festival is held.

The concept of sustainable socio-ecological-economic development, was officially recognized at the UN Conference on Environment and Development (Rio de Janeiro, 1992). It is based on the recognition that people should live in harmony with nature and must save the environment [2].

Around the highway, there are about 30 settlements (there are 16 villages on the right bank of Volga and 14 villages on the left bank). That is why it is important to save the protected areas. Special attention must be paid to such rivers as Mesha, Sviyaga, Uryum, Kubnya, Birlia, Berlya, Kabelka, Imeli, Sharatka, where fish spawning is inevitable. Also, the most difficult areas are the forests in the Pigoli area and the Mullanur Vakhitov’s villages.

According to the research of S A Kurolap, P M Vinogradov, O V Klepikov technogenic pollution of the urban environment is formed due to the natural and ecological factor, as well as the features of the functional planning infrastructure and industrial and transport complex [3]. Quality criteria of the atmosphere and soil more than other factors give a “response” to the industrial and transport impact. The ratios of emission of chemical carcinogen in the atmosphere, and the level of traffic congestion are priority health risk factors [3].

The active interest of people about all issues that are related to the environmental problems and the problems that are caused with the construction of the M-12 show first the mental qualities of the population, and that people are interested in good conditions of life in the place where they live [4]. According to N Mingazova, head of the Department of Environmental Engineering and Water Use of the Kazan Federal University in Tatarstan, such facilities are built in the cheapest and most environmentally friendly way [5-6, 11]. One of the acute problems of our time is the eutrophication of water that causes such problems as algal blooms and cyanobacteria and higher plants. Methods of Earth remote sensing allow detecting accumulations of phytoplankton in water and thickets of higher plants and monitor the pattern of their development [6].

The construction of bridges across the Kama, Volga, Sviyaga, Millennium through Kazanka by filling a dam, then a bridge span as the results in some areas several stagnant zones are caused by the rapid blooming of blue-green algae and water pollution with suspended substances and fish death and cessation of self-purification and waterlogging. Ideally, one should follow the path of the world’s green practice of building a bridge from coast to coast, the expert said. The expert admits that there should be a bridge that leads to the southern entrance of Kazan from the Volga region. Eco-activist Yulia Fayzrakhmanova who is an urban and territorial development specialist thinks that the bridge over the Volga can cause serious problems in the river’s ecosystem. Moreover, during the period of Covid-19, the Republic of Tatarstan must solve other socio-economic problems. Eco-activists noticed that on the banks of the Laishevsky district there are lots of forests of State Forest Fund that are protected and the construction of bridges can destroy them.

The axis of the highway passes through the territories of the natural zoological (hunting) reserve of regional significance “Lesnoy Klyuch”, natural monuments of regional significance “Birlya River”, “Sviyaga River”, “Sulitsa River”, “Mesha River”, Arkhiereiskoye and Sapugali lakes.
According to the regulation on the Special Protected Natural Areas that was approved by the Government of the Republic of Tatarstan and according to paragraph 10 of Article 2 of the Federal Law of the Russian Federation on March 14, 1995 No. 33-FZ “On Specially Protected Natural Areas”, it is allowed to locate within the boundaries of protected areas the objects of capital construction and highway if they are necessary for state needs. According to the estimated results by eco-activists because of the construction from 128 to 172 hectares of forests will be cut down in the Laishevsky district. This forest is known as the “lungs” of Kazan and animals like moose, wild boars, foxes and others will suffer because of construction too [7].

The catchment area will decrease for the region, which ranks first in the republic in terms of specially protected water bodies (about 10). There are about 160 lakes in total in this region. 71 hectares of forest will fall under felling in the Oryol rural settlement in Nikolskoye will be about 18.8 hectares and in Yegoryevsky will be 65.2 hectares. The Minister of Forestry says as a counterargument to eco-activists that the annual construction of linear objects in the republic is always conducted with the subsequent compensatory planting of felled plantations.

Moreover, for builders who arrived from other regions of Russia there should be houses where they can live. Highways that are located at 15 meters are irritating for hearing and can lead to nervous exhaustion, mental depression, autonomic neurosis, peptic ulcer, endocrine and cardiovascular disorders [8]. Where the road is located close to villages there will be installed noise barriers and in houses too. All appeals to the Ministry of Transport of the Republic of Tatarstan from citizens are forwarded to the customer that is the state-owned company Avtodor and the residents will not be able to influence the routing. The law does not provide for public hearings on federal projects [12].

Residents also are afraid that the maintenance of the Tatarstan section of the federal highway M-7 that will be constructed in the republic may cost a lot and the region does not have much of a budget. The next counterargument is that 130 km/h for the trucks is a lot and they have their cruising speed that is 90-100 km/h. Eco-activists advise paying attention to the planned private highway “Meridian”, which bypasses Tatarstan through the Orenburg, Saratov, Tambov, Lipetsk, Bryansk, Oryol and Smolensk regions.

The highway will pass through 10 settlements like Tarlashi, Eagle, Turgai, Grebeni, Svetly, and several garden partnerships. And it means that for example the Eagle will be separated by this highway into 2 parts so the hospital and the school will remain on another part of the highway. Also, the important fact is that the overpass will be more than 300 meters wide and people with limited mobility in the village of Oryol will have to climb the stairs of the ground crossing and overcome this distance to get to a hospital or school.

In the Sarajevo settlement, one of the passageways is blocked at all, which is contrary to current regulations; fire passageways in cottage settlements must be through. The road crosses the borders of several settlements and goes through the lands of individual housing construction: in the Oryol settlement through 514, in Nikolskoye through 855 and in Yegoryevsky through 858 land plots. Some objects are located dangerously close to the road like SMW landfill, a fur farm, a child’s health camp “Selet”, a rest zone for animals of the hunting farm “Raduga”, a cattle farm. Residents have questioned why, with the wording “for state needs”, the Tatarstan authorities have reserved 406 encumbered plots of land for the construction of the M12 Moscow-Kazan highway, located quite far from the highway (Gabishevo, Voronovki or Novye Polyany).

The activists offered a “people’s route” as a sparing option for highway so the settlements of the Laishevsky and Verkhneuslonsky districts were not affected, and half of the forest plantations were not cut down. However, the designers of the project are not satisfied with such an offer, because the highway will not pass near the logistics centre located near the airport. In addition, all this process of designing a new project will need new material costs for surveys and collection of documentation for the new route.

In the opinion of B I Kochurov and other researchers there are two areas of effective environmental management. The first one is for personal enrichment and the second one that is suitable for our case is the use of natural resources in excess [9].
The territory of the Republic of Tatarstan is a rich part of the country for historical, archaeological, geological and stratigraphic findings. During the works and archaeological explorations on the Moscow-Kazan route, 23 archaeological monuments from the Stone Age to the late Middle Ages and the Modern Age were discovered. According to the law, during construction work, the territory must be checked for archaeological monuments. Until experts have concluded that there are no remains of ancient people or settlements under the structure being built, the pouring of concrete is forbidden [10].

According to eco-activists, the villagers are trying to reinforce the idea that the M-12 is an opportunity for locals to work in a roadside service, or even just trade on the side-lines, which is impossible when the toll road is closed with a solid fence. According to locals, the TAIF Company, which leases 250 hectares of land along the route for the construction of petrol stations, auto shops and other infrastructure for the convenience of drivers, could benefit from the construction of the route. The designers also assured that the route of the highway in the Laishevsky district was changed according to the wishes of residents. Also, they promise to deepen the track and install noise-reflecting screens, compensatory planting of trees. Under the future four-lane route there will be two eco-ducts - special reinforced concrete tunnels for animals to cross.

4. Conclusion

Political, economic, ecological, ethnocultural factors made it possible to include the Republic of Tatarstan in transboundary processes. The existing regional socio-ecological-economic system has become a part of transnational socio-ecological-economic systems, requiring solutions to environmental, social, archaeological, logistic, investment and other economic problems [2].

The option of building a bridge over the Volga using the bank reclamation method will obviously have unfavourable environmental consequences. Completion of construction of M-12 will require monitoring of the environment: pollution of air, soil, snow cover; condition of springs, radiation background, phytotoxic effects, and the state of the biota. The construction is expected to attract tourist flows and investments, stimulate business development and create new jobs along the highway.

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