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Development of Single and Externally Integrated Transport Area in Central Asia

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ABSTRACT

Competently built strategy for development of international transport corridors passing through the countries of Central Asia ensures economic development of not only the states located in this region, but also of other countries participating in transportation processes.

At the same time, the practices of development of international transport corridors reveal several problems which comprise inconsistency of regulatory acts of the parties involved, differences in technical standards, lack of uniformity of railway gauge, duration of customs clearance.

The objective of the work was to study transport corridors of Central, Western and South Asia and the existing infrastructural, organizational, and technological limitations for their development. The methods of economic, statistical, and engineering analysis were used.

The research has considered problems in development of international transport corridors and possible solutions there-of through organization of intermodal transportation by a single transport operator of Uzbekistan, as well as the current state of transport corridors linking Central, Western, South Asia and China with the EU countries, including development of China–EU railway corridors. In that context, the article suggests the analysis of several legal, organizational, technological factors, as well as of infrastructural restrictions using the example of the Kashgar (China)–Osh (Kyrgyzstan) railway section, prior to construction of which it is proposed to use intermodal transportation.

The proposals refer to creating the Shanghai Cooperation Organisation (SCO) transport and logistics association and to developing the design of universal wagons with variable gauge wheel sets adapted for operation on railways of various gauges.

Keywords: transport, transport corridors, railway corridors, Uzbekistan, construction of railways, competitive route, intermodal transportation, specific tariff, cost of transportation, container, variable gauge wheel sets.

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For the original Russian text please see p. 148.

Background. Geographic location considerably determines the opportunities and directions of development of individual countries. There are more than 40 countries in the world that do not have direct access to sea transportation and hence they are separated from the cheapest type of transport links. Eight of 11 countries in Central and Western Asia are landlocked and are suffering similar problems. Meanwhile they have potential and possibilities to participate in international transport corridors [1].

As it was mentioned by one of the authors of the study in his speech at the international conference «Central Asia in the system of international transport corridors: strategic outlooks and missed opportunities» held in 2018 in Tashkent, «a competent strategy for development of international transport corridors provides economic development not only for the countries of Central Asia, but also for other countries participating in transportation».

Meanwhile, the practices of international transport corridors formation face some problems which are inconsistency of the regulatory basis of various countries involved in transportation process; unmatched technical standards; the lack of a unified railway track gauge along the entire route, as well as downtime of transit goods at the borders due to the time-taking customs clearance process.

Objective. *The objective* of the article is to study the transport corridors of Central, Western and South Asia and infrastructural, organizational and process resctrictions obstructing their development.

Methods. Economical, statistical and engineering *methods* of analysis were used.

Results.

Analysis of the transportation market status

Currently, the share of goods originating in China leads within the total amount of international cargo transportation through the Asian countries (Pic. 1).

It is commonly known that at present about 83 % of all goods sent from China, which is the main country generating transit cargo flow through Central Asian countries, are transported to Europe by sea.

In the meantime there are considerable prerequisites for development of land transcontinental trade routes, determined by the following factors:

• limited throughput capacity of the Suez canal;

• political and military situation in Bab-el-Mandeb strait, through which the ships enter the Suez Canal;

• congestion of the main Eurasian ports;

• dynamic development of the economies of Western China, India and Pakistan.

Currently, there are routes **from China to Europe** involving the **railway infrastructure of Kazakhstan and Russia** (Pic. 2). Their main advantages are the low cost of goods transportation, the absence of customs duties within the Customs Union, as well as short time spent at border crossing points. The disadvantages are longer time for cargo delivery and long tariff distances, especially on the route along the Trans-Siberian Railway.

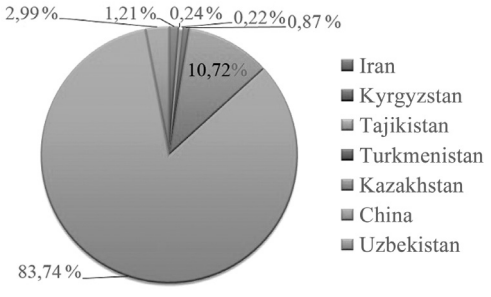
Another transport corridor passing through Kazakhstan has a maritime component. Besides, the transit goods arrive at the existing border terminals Dostyk–Alashankou and Khorgos–Altynkol. However, in the nearest future their throughput capacity will probably not comply with the dynamics of traffic between China and Europe (Table1).

Totally, by the year of 2020 more than 9 million tons of transit cargo are forecasted to pass through China–Kazakhstan interstate crossing points to the Central Asian countries and the EU countries. By 2035, a four-fold increase is expected compared to 2020 (Pic. 3).

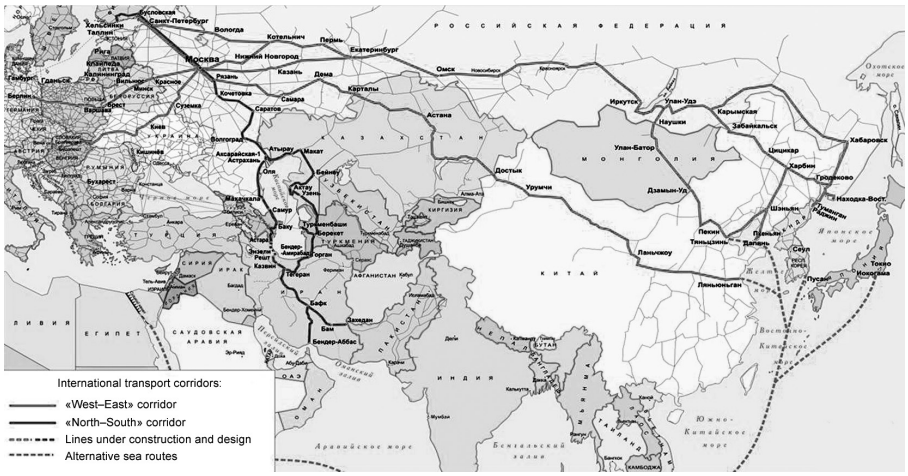
As a result, there is a growing need for alternative land routes through which it will be possible to deliver goods to Europe and vice versa.

Pakistan–Afghanistan–Uzbekistan corridor

Mutual trade turnover of two most economically developed countries of **South Asia, India and Pakistan,** with the EU countries

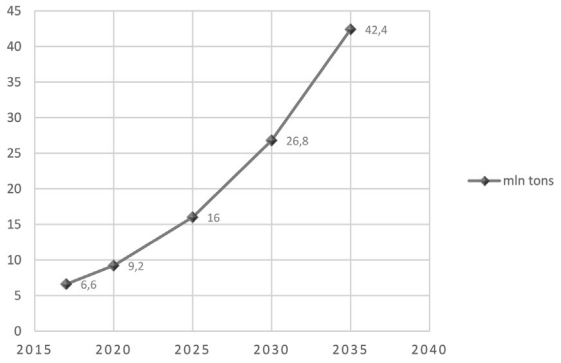


Pic. 1. The share of countries of origin of goods within the total amount of international cargo transportation passing through the territory of Central Asian countries.



Pic. 2. The existing routes from China to Europe involving railway infrastructure of Kazakhstan and Russia.

years	mln tons
2017	6,6
2020	9,2
2025	16
2030	26,8
2035	42,4



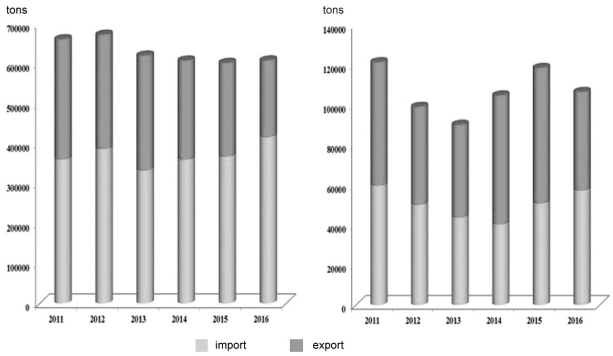
Pic. 3. Forecasted amount of transit cargo through the corridor China–Kazakstan.

Table 1

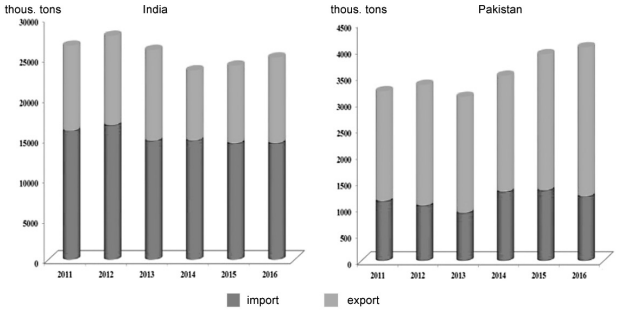
Calculation of the expected traffic flow through interstate crossing point Dostyk–Alashankou (Kazakstan–China) up to the year of 2035.

Year	GDP of the countries, billion USD									Traffic volume, thous. tons
	Kazakhstan X_1	China X_2	Japan X_3	Germany X_4	Russia X_5	Australia X_6	Korea X_7	Indonesia X_8	Uzbekistan X_9	
Forecast*										
2020	315	13014	6454	3770	2758	1839	1443	1378	94	41281
2021	333	13782	6518	3819	2868	1883	1487	1458	102	45598
2022	352	14595	6584	3869	2983	1928	1533	1543	110	50264
2023	372	15456	6649	3919	3102	1974	1581	1632	119	55306
2024	393	16368	6716	3970	3226	2022	1630	1727	128	60755
2025	415	17334	6783	4022	3355	2070	1681	1827	139	66645
2026	439	18356	6851	4074	3489	2120	1733	1933	150	73012
2027	464	19439	6919	4127	3629	2171	1786	2045	162	79893
2028	490	20586	6989	4181	3774	2223	1842	2164	175	87331
2029	518	21801	7058	4235	3925	2276	1899	2290	189	95371
2030	548	23087	7129	4290	4082	2331	1958	2422	204	104062
2031	579	24449	7200	4346	4245	2387	2018	2563	220	113457
2032	612	25892	7272	4402	4415	2444	2081	2711	238	123613
2033	647	27419	7345	4459	4592	2503	2145	2869	257	134591
2034	684	29037	7419	4517	4775	2563	2212	3035	277	146458
2035	723	30750	74933	4576	4966	2624	2280	3211	299	159286

Source: www.pwc.co.uk/economics.



Pic. 4. The current state of transportation from South Asia to EU countries.



Pic. 5. Dynamics of export-import transportation by sea transport between India and Pakistan and EU countries.

shows steady growth (Pic. 4, 5), which is also a factor of demand for alternative transportation modes: by air, road and rail.

At the same time, it should be noted that in 2017 India and Pakistan became full-fledged members of the SCO, which may become an inducement for the trade development and the growth of transport links [2].

Pakistan–Afghanistan–Uzbekistan corridor might be regarded as a revival of the ancient Great Indian Route. One of the solutions to the problem of the lack of a railway connection between India and Pakistan with Central Asia and other states may pass through construction of Mazar-i-Sharif–Khulm–Pul-i-Khumri–Doshi–Surobi–Jalalabad–Torkham railway line (Pakistan), with a branch from Surobi to Kabul. The significance of the existing Torkham railway station (Pakistan) is that it is a connection point giving access to a large port on the Arabian Sea and a connection to the Indian railway network.

The construction of a new railway line may stimulate the interest of Russia, the EU and other countries, as well as in terms of development of Eurasian economic space southward and of using this itinerary for transit transportation. Russia, e.g., has already been considering the Indo-Volga railway project at the end of the 19th century.

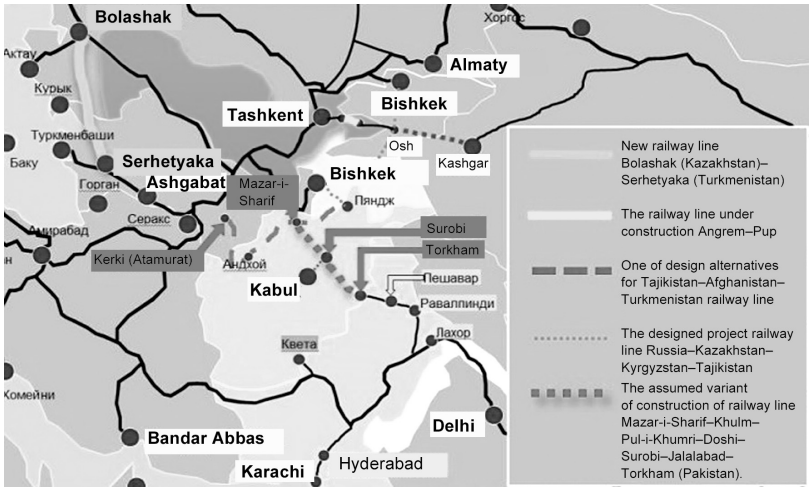
However, the construction of this line is complicated by some problems, for instance, the instability of the geopolitical situation in Afghanistan and the high cost of construction of some railway sections.

Meanwhile, it is possible to use the existing international motor road route prior to construction of a railway line. The logistic centers at the station of Mazar-i-Sharif (Afhanistan) and at the station of Torkham (Pakistan) for arrangement of multimodal transportations (both by rail and motor roads) will attract interest to cargo transportation using this itinerary [3].

The length of this section is 673 km, where as the length of the whole road from Peshawar up to Termez (including railway part as well) is 748 km (tariff distance Mazar-i-Sharif–Hairatan is 75 km).

Development of this route may be economically beneficial for Uzbekistan, also in case if motor transportation will be rated at the tariffs equivalent to railway tariffs until the railway is constructed (Tables 2, 3, 4) [5].

At the same time, without connecting the railways of China and Uzbekistan through Kyrgyzstan, it will be very difficult for the proposed Mazar-i-Sharif–Herat railway line



Pic. 6. The project of railway line Mazar-i-Sharif–Khulm–Pul-i-Khumri–Doshi–Surobi–Jalalabad–Torkham (Pakistan).

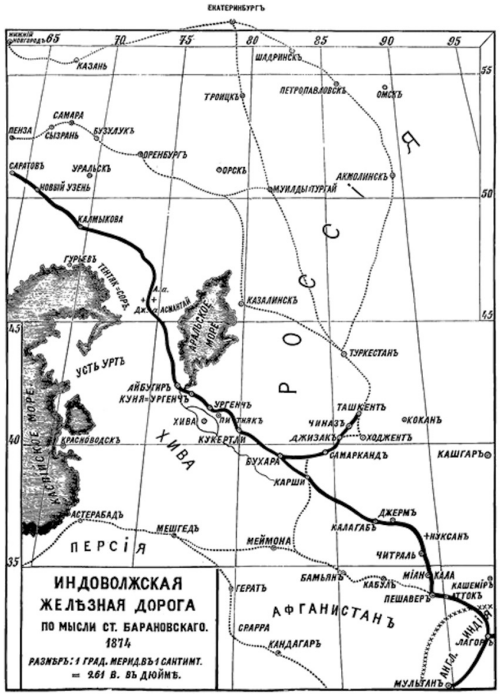
to compete with Kazakhstan–Turkmenistan–Iran railway.

China–Kyrgyzstan–Uzbekistan Corridor

This corridor could be considered as one of the branches of the ancient «Great Silk Road».

For a long time China and India have been interested in transport access to Europe using the shortest land roads. These two great countries are not connected by railway and Indian and Pakistan railways do not have access to the railways of Central Asia and other regions [4].

In case of successful implementation of the project for construction of China–Kyrgyzstan–Uzbekistan railway line, one more corridor will be created ensuring the connection of Central Asia with China.



Pic. 7. Baranovsky's Indo-Volga railway project (1874).

Kashgar railway station is considered as the start point of the route, since the area near city of Kashgar (Kashi) is one of the most dynamically developing parts in the West of China. The developed corridor is much shorter than the existing ones.

Meanwhile, until the railway line is constructed, it is possible to use the existing international highway from the existing Andijon logistics center to Kashgar, which was open for freight traffic in February 2018. Goods are transported along this route from Uzbekistan to China and vice versa [7].

We suggest calculation of road transportation tariffs in case they are equal to railway tariff rates, the last ones being currently much lower than road ones. We also calculated the difference in subsidy volumes for motor and railway transportation. The results have shown the profitability of transportation if a share of goods now transported via interstate border crossing points between Kazakhstan and China will be redirected to that road facility (Pic. 10: for case of redirecting respectively 10, 20 and 30 % of cargo flow).

Technical solutions

Development of transport corridors throughout the Central Asia will result in formation of a single transport system and will lead to search of new ways for product access to the international markets.

Moreover, ports in Iran are located on the Persian Gulf and for cargo delivery to the Suez Canal it is required to navigate round the Arabian Peninsula and cross the Arabian Sea to reach the ports of the Indian Ocean.

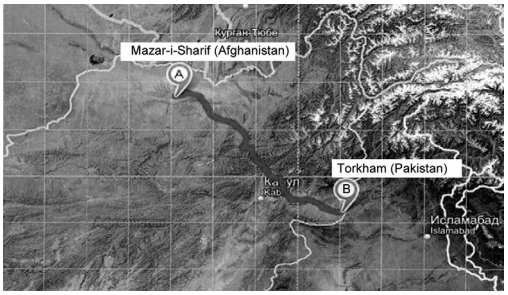
Under these conditions construction of the railway line from Mazar-i-Sharif to Herat in Afghanistan will ensure access of Central Asian railways to Iran and its ports. As a result, it will make it possible to connect the routes with Qatar, Oman, and to ensure access to the EU through Turkey via the Trans-Afghan transport corridor [8].

The international conference «Central Asia in the system of international transport corridors: strategic outlooks and missed opportunities» discussed among other problems the issue of difference in rail track gauge. As it is well known, the track gauge in China, Iran, the EU is 1435 mm, in India, Pakistan – 1676 mm, and in countries of Central Asia and in Russia it is 1520 mm. At present, different countries of the region apply the following methods to solve this issue at the railway border crossings:

• manual transshipment of cargo or mechanical transshipment of containers from wagons designed for one type of the track gauge to wagons designed for different gauge (China–Kazakhstan: interstate border crossing points Dostyk–Alashankou, Altynkul–Khorgos),

• change of railway bogies, when cars are lifted for change of bogies of one gauge to another (Iran–Turkmenistan: interstate border crossing point Serakhs).

It is suggested to arrange production of new universal wagons with variable gauge wheel sets at the car manufacturing enterprises in Central Asia (Kazakhstan, Uzbekistan). As a result, it will be possible to install railway switch devices for operation of transshipment centers at the connection stations of Kyrgyzstan and Afghanistan.



Pic. 8. Motor road Mazar-i-Sharif (Afghanistan)–Torkham (Pakistan border).

Table 2

Cost of multimodal transportation of a 40-feet container loaded with general cargo along the Karakalpakstan–Peshawar route, divided into three sections with different tariffs

Route	Tariff distance (km)	Cost of delivery of 40-feet container (US dollar)
Peshawar–Mazar-i-Sharif	673 km	1950
Mazar-i-Sharif –Galaba	75 km	500
Galaba–Karakalpakstan	1735 km	3900

Conclusion and suggestions

Development of transport corridors throughout the Central Asia is highly promising with regard to development of the integrated transport system and expansion of international commerce.

Table 3

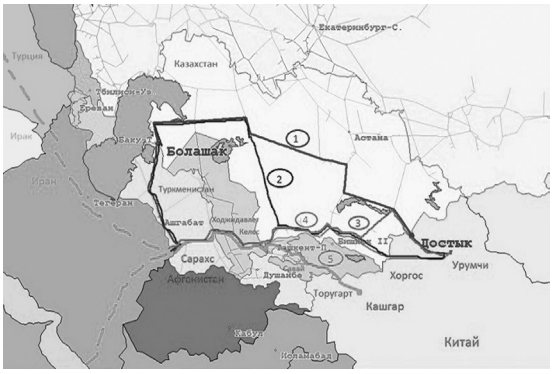
Expected revenues from transportation of transit goods through Uzbekistan

Year	Revenues from transportation of transit goods by railroads of Uzbekistan, mln USD	Fee for the goods transit by motor road Mazar-i-Sharif–Peshawar, mln USD	Mazar-i-Sharif–Galaba (600 US dollars for 40-foot container, mln USD)	The cost of transportation a 40-foot container by motor road, if charged at tariffs equivalent to railroad tariffs	Loss from subsidizing the costof road transport across Afghanistan through transportation revenues, mln USD	Total revenue from transportaion of transit goods along the Galaba–Karakalpakstan route, mln USD
2019	525,39	260,83	66,66	202,55	58,29	467,1
2020	546,69	271,51	69,62	210,84	60,67	486,22
2021	569,24	282,6	72,46	219,45	63,15	506,09
2022	592,66	294,24	75,45	228,49	65,75	526,93
2023	617,05	306,34	78,55	237,86	68,46	548,6
2024	642,47	318,96	81,78	247,66	71,27	571,19
2025	666,96	332,12	85,16	257,9	74,22	594,76

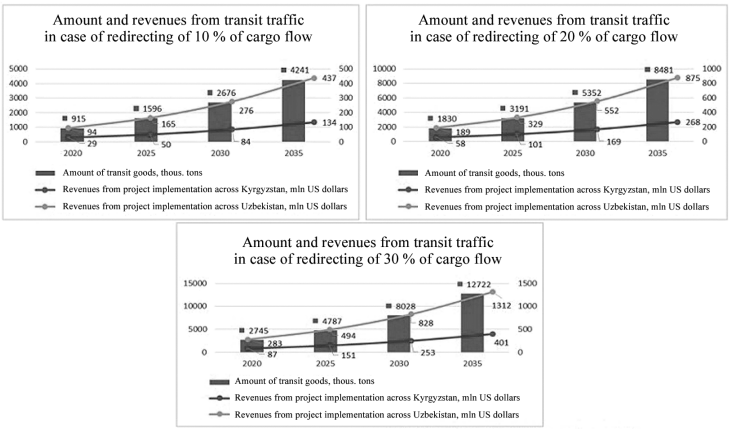
Table 4

Forecast of transportation volume between India, Pakistan and the EU by modes of transport

	Years					Total increase
	2016	2018	2020	2022	2025	
	Basic	Forecast, thous. tons				
Total trade volume	31272,32	34150,16	37292,82	40724,7	46473,64	62,3
Sea transport thous. tons	30616,67	33562,27	36791,26	40330,92	46289,03	72,9
Automobile transport, thous. tons	728,12	762	797,45	834,56	893,48	28,4
In terms of TEU, thous.	128,5	139,2	1509	163,6	184,1	61,5
Hypothetical redistribution of traffic flow portion to the route running along «O'zbekistonTemirYo'llari» JSC facilities, thous. tons	3855,5	4177	4526,7	4907	5522,4	61,6



Pic. 9. Comparison of various transport corridors China–Uzbekistan: 1. Urumqi–Dostyk–Bolashak–Serhetyaka–Sarakhs; 2. Urumqi–Khorgos–Bolashak–Serhetyaka–Sarakhs; 3. Urumqi–Dostyk–Saryagach–Khojidavlet–Sarakhs; 4. Kashgar–Torugart–Karasu–Savay–Khojidavlet–Sarahs; 5. Urumqi–Khorgos–Saryagach–Khojidavlet–Sarakhs.



Pic. 10. Forecast of amount and revenue from redirecting cargo flows.

1. Bogie prototype with variable gauge wheel sets

2. Talgo (Spain) bogie with variable gauge wheel sets

3. General view of SUW 2000 (Poland) variable gauge wheel sets

4. SUW 2000 (Poland) track gauge-changing facility

Pic. 11. Bogies with variable gauge wheel sets.

Table 5

Cost and delivery time of 40-foot container by automobile transport

Route	Total distance	Cost of 40-foot container delivery (USD)	Delivery time* (hour)
Kashgar–Symkana–Irkeshtam–Sarytash–Osh–Andijon	572 km	1950	40

* Currently, Kyrgyzstan has a road-transport infrastructure Irkeshtam–Sarytash–Osh, which connects Kashgar (China) and Andijon (Uzbekistan). The distance of this section is 258 km, whereas the total length of the road from Kashgar to Andijon (including the railway distance as well) is 572 km.

Table 6

Revenues of expected transient cargo transportation throughout Uzbekistan

Year	Revenue from transit cargo transportation via railway of Uzbekistan, mln USD	Freight costs of transit cargo transportation by motor transport through Kyrgyzstan, mln USD	Freight costs of transit cargo transportation throughout Kyrgyzstan, if the applied tariff will be equal to the tariff for railway transportation, mln USD	Loss from allocating subsidy for road transportation via Kyrgyzstan at the expense of income from the railway transportation via Uzbekistan, mln USD	Total revenue from transit cargo transportation on route Kashgar–Hikmet, mln USD
2019	367,625	414,375	193,375	221	146,625
2020	410,875	463,125	216,125	247	163,875
2021	454,125	511,875	238,875	273	181,125
2022	497,375	560,625	261,625	299	198,375
2023	547,112	616,687	287,875	328	218,212

According to the authors' opinion it is advisable:

Firstly, to establish «International transportation logistics association of the SCO», which will include all countries involved in the transportation process, and to develop «Single on-line portal of transportation logistics services» accessible via Internet.

Secondly, to arrange cargo transportation via existing roads from Kashgar (China) to Andijon (Uzbekistan) and from Torkham (Pakistan) to Mazar-i-Sharif (Afghanistan) using the rates equivalent to the railway tarrif. It will allow to refocus cargo owners to goods transportation via land route.

Thirdly, it is required to develop with the assistance of research institutions design of universal wagons with variable gauge wheel sets adapted for operation at railways with different track gauges.

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