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## **Trends in the development of railway services in the current conditions of economic development**

This article examines the trends in the development of rail transport in the current conditions of economic development. The dynamics of the main indicators of the development of the railway transport in Kazakhstan and the indicators characterizing the technical equipment of the railroad in Kazakhstan are given. The analysis of the structure of cargo transportation by rail, both on the territory of the country, and on international communications is carried out. Conclusions are made on the status of these indicators. It was revealed that the structure of cargo transportation by rail is the most diversified, since not only raw materials are transported: coal, metals, ores, oil, but also food products - furniture, fertilizers, food products. The main objective is to ensure the conditions (economic and political) for an additional sustained inflow of transit cargoes to Kazakhstani routes from those countries that are currently carrying out the transportation of their goods through Kazakhstan or used these routes in the past, as well as those most attracted to Kazakhstani cargo routes.

*Keywords:* railway transport, passenger turnover, freight turnover, income from rail transport, transit potential.

Development of transport system of Kazakhstan is one of the important conditions for the further restructuring of the economy, improving the competitiveness of domestic goods and services in world markets and the integration of the country. Globalization of economic relations in the early 21st century, allows to consider transport as one of the most important integration processes. Development of these processes along with international and domestic competition imposes additional requirements on transport to accelerate the movement of goods, improve the quality of transport services, and reduce transport costs in the final price of products. The transport complex of the Republic of Kazakhstan now provides the overall needs of the national economy and population in transport services. The main goal of the state policy in the transport sector is to create a transport system capable of meeting an increasing in volume and qualitatively changing demand for passengers and cargo effectively and safe for humans and environment [1].

In the transport system of Kazakhstan, railway transport has a leading role. Longer transportation distances, relatively cheaper tariffs for the transportation of passengers and goods make rail transport popular with users [2].

Railway transport in Kazakhstan is one of the leading components of the transport infrastructure of the national economy, which is of decisive importance for ensuring economic ties and the effective demand of citizens for transportation. Railway transport ensures sustainable development of material production, increasing the efficiency of resource use, reduction due to a reduction in the transport component of unit costs in product costs, increased mobility and other social tasks.

The main difference of the transport complex of Kazakhstan from most countries of the world is the leading role of the main railways in servicing the real sector of the economy. This determines the role and importance of rail transport in ensuring the economic security of the country. In the aspect of ensuring national economic security, it is important to assess the role of rail transport in the sustainable functioning of strategic branches of material production, which requires the transport of own products [3].

Dynamics of the main indicators of the development of railway services in Kazakhstan for 2013-2016. is reflected in Table 1.

Table 1 shows that in 2016 there was a decrease in cargo transportation by 0.7 % and cargo turnover by 4.7 %, which amounted to 338.9 million tons and 267.4 billion tone-kilometers respectively. As for the transportation of passengers: there was an increase of 2.6 %, freight turnover by 5.3 %, which amounted to 23.1 million people. and 17914 million passenger-kilometers respectively.

The raw orientation of the economy of Kazakhstan, along with large distances and low population density, makes the economy highly dependent on transport. If during the economic recession the transport complex provided all the needs of the state economy, and also provided support through the containment of tariffs and prices for transport services, at the present time, substantial state support is needed for the rehabilitation and recovery of the transport industry.

Table 1

**Dynamics of the main indicators of the development of railway services of Kazakhstan**

Indicators	2013	2014	2015	2016	2016–2015 %
Passengers carried, million people	28,6	23,2	22,5	23,1	102,6
Passenger turnover, million passenger-kilometers	20 625	18 999	17 012	17 914	105,3
Freight turnover billions tonne-kilometers	235,9	231,3	280,7	267,4	95,3
Cargoes transported, millions tons	293,7	390,7	341,4	338,9	99,3

Note. Compiled by the authors according to the source [4].

During the period under review, the indicators of the technical equipment of the domestic railroad decreased. Table 2 presents the indicators characterizing the technical equipment of the Kazakhstani railway.

Table 2

**Indicators characterizing technical equipment railway of Kazakhstan**

Indicators	2011	2012	2013	2014	2015	2016
1. Operational length of railway lines, km	14 892	15 333	15 341	15 341	15341	16104
2. Locomotive park, units:	1 772	1 865,5	1 896,5	1 892,5	1 803,5	1 725,0
- electric locomotives	571	552	563	577	549,5	539,0
3. Diesel locomotives	1 202	1 313,5	1 333,5	1 315,5	1 254,0	1 186,0
4. Freight car fleet, units:	55 909	66 503	65 803	60 940	59 025	56 504
- open-top wagons	32 413	32 329	30 982	23 727	30 797	30 146
- covered	10 145	9 801	9 051	7 809	8 806	8 415
- platforms	3 992	3 725	3 360	4 823	3 360	3 000
- cisterns	6 634	6 492	5 769	6 280	5 657	5 438
- other	13 319	13 453	11 775	10 465	10 762	10 224
5. Passenger wagons, units	2 306	2 302	2 217	2 214	2 590	286

Note. Compiled by the authors according to the source [4].

So, the locomotive park in 2015 was 1803.5 units, in 2016 there was a decrease in the locomotive fleet by 763 units or 4.3 %. Physical and moral wear and tear of fixed assets of JSC «Kazakhstan temir zholy» testifies to the necessity of technical re-equipment of railway transport with more modern, corresponding to the world level.

The largest share in fixed assets of railway transport is occupied by buildings and facilities - 63.3 %, vehicles - 13.1 %, machinery and equipment - 6.7 %, other basic means - 7.9 %.

As of January 1, 2017, the length of the main roads, including the republic's roads on the territory of Kazakhstan, was 16,1 thousand km, 34,7 % of which are double-track and multi-track lines, 3,8 thousand km - electrified. The density of the railways in Kazakhstan is 5.2 km per 1000 km<sup>2</sup> of the territory. In recent years, several sites have been built, which reduce the range of transportation (Khomtau-Altynsarin, Shar-Ust-Kamenogorsk).

The configuration of the railway network of Kazakhstan was formed under the influence of two factors:

- inter-regional and inter-republican cargo flows of minerals, including coal, oil products, oil and grain;
- transit transport.

The structure of cargo transportation by rail is the most diversified. Rail transport carries as raw materials: hard coal, metals, ores, oil, and food products - furniture, fertilizers, food products, presented in Table 3.

Table 3 shows that in 2016 there was an increase in freight traffic for intra-republican communications by 3935.7 thousand tons or 1.9 %, which amounted to 208320.8 thousand tons of products. This was affected

by the increase in natural gas transportation by 52.9 %, coke by 9.2 %, ferrous metals by 19.2 %, ferrous scrap by 1.9 %, timber cargo by 0.9 %, construction cargo by 5 % 7 %, grain by 4.7 %, frozen or cooled products by 1.9 %.

Table 3  
Structure of cargo transportation by rail on the territory of Kazakhstan  
(thousand tons)

Name of products	2015	2016	2016 to 2015, %
Raw oil	249,2	206,0	82,6
Oil products	9165,2	9 115,6	99,5
Natural gas	472,2	722,3	152,9
Liquid or gaseous loads in mass	355,9	325,4	91,4
Coal	63 593,3	61 271,3	96,3
Coke	342,0	373,4	109,2
Iron ore	10 418,3	10 402,2	99,8
Manganese ore	298,4	261,1	87,5
Ores of non-ferrous metals	15 391,1	14 015,5	91,1
Black metals	1 014,3	1 208,8	119,2
Scrap of ferrous metals	734,1	748,0	101,9
Fluxes	4 409,1	4 086,7	92,7
Timber cargoes	303,8	306,4	100,9
Construction cargo	27 484,6	29 043,5	105,7
Chemical and mineral fertilizers	2 175,2	1 627,0	74,5
Grain	2 948,5	3 086,0	104,7
Frozen or cooled products	218,5	222,7	101,9
Mail	0,1	0,3	3 times
Fruit and vegetable products	29,3	20,7	70,6
Furniture	1,3	0,8	61,5
Other cargoes	64 780,8	71 277,0	115,4
Total for the Republic of Kazakhstan	204385,1	208 320,8	101,9

*Note.* Compiled by the authors according to the source [4].

As a result, revenues from transportation vary depending on the market segment, determined by the type of message and the type of cargo. Of these segments of transportation can be divided into three groups.

1 group — low-profit transportations: coal (export, inter-regional communication), ore (export, inter-regional communication), construction cargo (import), grain (export, inter-oblast communication), other cargo (inter-oblast communication);

2 group — high-yield transportation: oil exports (exports), ferrous metals (exports, imports, inter-oblast communication), chemical and mineral fertilizers (exports, imports, inter-oblast communication), other goods (imports);

3 group — self-supporting transportation: coal (import), oil cargo (import, inter-regional communication), ore (import), construction cargo (export, inter-regional communication), grain cargo (import), other goods (exports). The railway network of Kazakhstan connects not only the industrial and urbanized territories of the republic, but also neighboring states. The structure of international cargo transportation by rail in Kazakhstan is presented in Table 4.

Table 4 shows that the volume of international cargo transportation has decreased. So, in 2016 compared to 2015, there was a decrease of 6,384,400 tons or 4.7 %, which amounted to 130607, 8 thousand tons. However, in spite of this, in the structure of cargo transportation there was an increase in some types of products, namely: liquid or gaseous cargo by 6.1 %, manganese ores by 59.2 %, non-ferrous metal ores by 12.3 %, ferrous metals by 2, 4 %, fluxes by 42.6 %, chemical and mineral fertilizers by 24.3 % and grain by 19.2 %.

In our opinion, the increase in freight traffic for these products is associated with a satisfactory global market environment for these products.

In 2009–2016, revenues from passenger rail transport are increasing. If in 2009 the revenues amounted to 55.8 billion tenge, then in 2016 we saw 89.2 billion tenge. the increase was 59.8 %. In addition, we see a decline in revenue for passenger transportation from 2014 to 2015; there was a decrease in revenues by 25.5 %, which amounted to 82848 million tenge.

Table 4

**Structure of international cargo transportation by rail in Kazakhstan**

(thousand tons)

Name of products	2015	2016	2016 to 2015, %
Raw oil	2 099,0	718,9	34,2
Oil products	9 047,8	8 479,4	93,7
Natural gas	2 482,9	2 412,8	97,2
Liquid or gaseous loads in mass	730,9	775,8	106,1
Coal	34 095,7	30 473,9	89,3
Coke	1 074,1	1 010,4	94,1
Iron ore	9 412,7	9 314,7	98,95
Manganese ore	214,7	341,7	159,2
Ores of non-ferrous metals	2 779,2	3 121,6	112,3
Black metals	7 684,1	7 872,2	102,4
Scrap of ferrous metals	343,6	710,4	2 times
Fluxes	29,3	41,8	142,6
Timber cargoes	4 943,3	4 180,6	84,6
Construction cargo	6 467,6	5 856,8	90,6
Chemical and mineral fertilizers	854,0	1 061,2	124,3
Grain	4 905,5	5 846,9	119,2
Frozen or cooled products	362,7	323,8	89,3
Mail	2,2	1,3	59,1
Fruit and vegetable products	584,4	562,9	96,3
Furniture	73,5	61,5	83,7
Other cargoes	48 805	47 439,0	97,2
Total international traffic	136 992,2	130 607,8	95,3

Note. Compiled by the authors according to the source [4].

However, in 2016, incomes increased by 6345.1 million tenge. or 7.7 %, which was 89193.1 million tenge. Revenues from rail transport are shown in Figure 1.

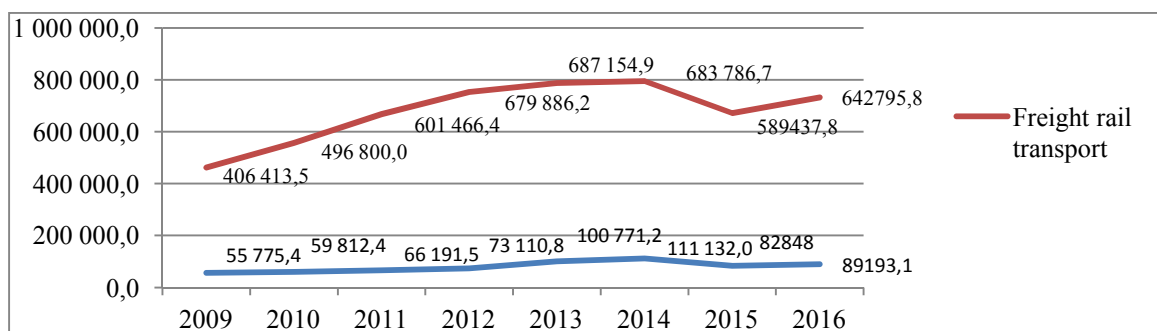


Figure 1. Income from transportation of railway transport (million tenge) (compiled by the authors according to the source [4])

As for income from transportation of goods by rail, which we see, the decrease from 2014 to 2015 by 13.8 %, which amounted to 58.9 billion tenge. Then in 2016, these revenues also increased by 9.1 %, which amounted to 64.3 billion tenge. These changes in income for transportation by rail are associated with the dynamics of movement of passengers and the volume of cargo transportation.

Kazakhstan railways that provide the opportunity for commodity flows to enter international markets (through Druzhba — to China, North and South Korea, Chingeldy — to Uzbekistan, Turkmenistan and Serakhs - to Iran and to the ports of the Persian Gulf, then through Turkey — the Black Sea and the Mediterranean, through Russia — to the Baltic countries, Ukraine, the Caucasus, Europe and the Pacific), already today represent a base for the realization of the transit potential of the republic.

Transit potential is a powerful tool for realizing the country's ability to provide and maintain international transport flows between different regions [5].

Transit through Kazakhstan has a number of advantages:

- reducing the speed and distance from the manufacturer to the consumer from Asia to Europe. Unlike the sea route in this direction, where the cargo is on the road for 35–40 days, the time of delivery by land is reduced by 2–3 times;

- stable political situation and favorable investment climate in the country;

- the development of the Eurasian Economic Union has made it possible to create a common customs border between China and the EU countries, facilitates the procedure for customs clearance.

Revenues from cargo transit through Kazakhstan are shown in Figure 2.

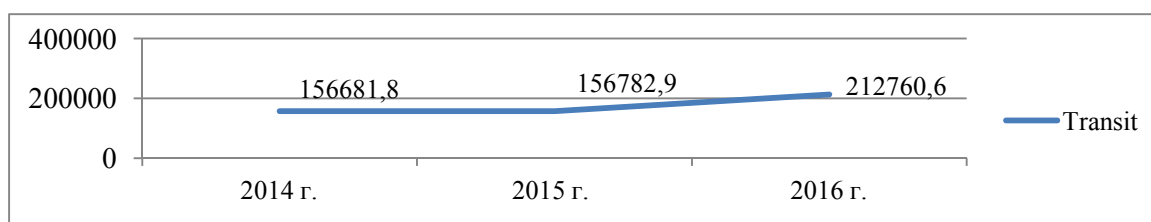


Figure 2. Incomes from transit of goods through the territory of Kazakhstan (million tenge) (compiled by the authors according to the source [4])

Figure 2 shows that Kazakhstan receives income from the transit of goods by rail. At the same time, these revenues are increasing every year. So, in 2016, there was an increase in revenue from cargo transit in comparison with 2015 by 55977.7 million tenge or 35.7 %, which was 212760.6 million tenge. Revenues from transit account for 33 % of all rail revenue.

Kazakhstan intends to get a considerable benefit from the transit of goods and to increase the share in freight flows between them from 1 % to 8 % by 2020. The impetus for increasing transit through Kazakhstan should be given to the construction and launch of promising infrastructure projects: «Western Europe and Western China», which links Asia and Europe; Uzen-Bereket-Gorgan railway, which allows to reduce the route of transit trains in the direction of North-South by 600 km. And opening for Kazakhstan a direct overland exit to the Persian Gulf. The participation of Kazakhstan in the Chinese Silk Road project will increase the volumes of transit traffic.

It is necessary to conduct a regular study of the flow of goods, which Kazakhstan can count on. It is advisable in this case to build a transit policy in two main directions:

1. Stabilization and escalation of transit cargo flows already transported through the territory of Kazakhstan.

2. Assessment of potential transit through the territory of Kazakhstan and development of measures to attract it.

In the first direction, the main task is to ensure the conditions (economic and political) for an additional sustained inflow of transit cargoes to Kazakhstani transit routes of those countries that are already currently transporting their cargo through Kazakhstan or have used these routes in the past, as well as the most gravitating to Kazakhstani cargo routes.

In this context, at present Kazakhstan can really carry out measures aimed at ensuring a steady inflow of mainly goods from Russia, China and four Central Asian republics (Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan) to its transport routes. These flows can be quite stable due to certain geographical reasons.

To further ensure the volume of freight and passenger traffic by 2018, taking into account the compensation for the disposal of locomotives by service, more than 1,000 locomotives will be acquired. At the same time, JSC «KTZ-Freight transportation» plans to purchase about 500 locomotives in passenger and cargo traffic, as well as overhaul of over 350 diesel locomotives and electric locomotives, at the expense of budget funds, it is planned to purchase 20 locomotives in passenger traffic. Possible adjustment when changing in-

ternal and external parameters. As part of the modernization of the infrastructure, measures will be taken to develop telecommunications systems for railway transport and to introduce innovative technologies for organizing and managing the transportation process on its basis.

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### Экономиканың осы заманғы даму жағдайында теміржол қызметін дамыту үрдістері

Мақалада экономиканың қазіргі заманда даму жағдайында теміржол көлігінің даму үрдістері қарастырылды. Қазақстанның теміржол көлігінің дамуының негізгі көрсеткіштерінің серпіні және елдің темір жолының техникалық жарактануын сипаттайтын көрсеткіштер келтірілген. Теміржол көлігімен жүк тасымалының құрылымына ел аумағы бойынша талдау жүргізілген. Алынған нәтижелер бойынша қорытындылар жасалған. Теміржол көлігімен жүк тасымалының құрылымы әртарапандырылғандығы анықталған, мысалы, тек қана шикізат тауарлары: тас көмір, металл, кен, мұнай ғана емес, сонымен қатар халық тұтынатын тауарлар — жиһаз, тыңайтқыштар, азық-түлік тауарлары да тасымалданады. Қазіргі кезде өз жүктерінің тасымалын Қазақстан арқылы іске асыратын немесе ол бағыттарды өткенде пайдаланған және де жүктері қазақстандық бағытқа тартылатын елдердің транзиттік жүктерінің қазақстандық маршрутқа тұрақты ағындарын қамтамасыз ету жағдайы (экономикалық және саяси) басты міндет болып табылады.

*Кілт сөздер:* теміржол көлігі, жолаушы айналысы, жүк айналысы, теміржол көлігімен тасымалдаудан табыс, транзиттік әлеует.

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### Тенденции развития железнодорожных услуг в современных условиях развития экономики

В статье рассматриваются тенденции развития железнодорожного транспорта в современных условиях развития экономики. Приведены динамика основных показателей развития железнодорожного транспорта и показатели, характеризующие техническую оснащенность железной дороги Казахстана. Дан анализ структуры грузоперевозок железнодорожным транспортом как по территории страны, так и по международным сообщениям. Сделаны выводы по состоянию данных показателей. Выявлено, что структура грузоперевозок железнодорожным транспортом самая диверсифицированная, так как перевозятся не только сырьевые товары — каменный уголь, металлы, руды, нефть, но и товары народного потребления — мебель, удобрения, пищевые продукты. Основной задачей является обеспечение условий (экономических и политических) для дополнительного устойчивого притока на казахстанские маршруты транзитных грузов из тех стран, которые уже в настоящее время осуществляют транспортировку своих грузов через Казахстан или использовали эти маршруты в прошлом, а также наиболее тяготеющих к казахстанским маршрутам перевозки грузов.

*Ключевые слова:* железнодорожный транспорт, пассажирооборот, грузооборот, доходы от железнодорожного транспорта, транзитный потенциал.

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