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**FEATURES OF THE ROAD CONSTRUCTION DEVELOPMENT  
IN THE REPUBLIC OF KAZAKHSTAN*****Annotation***

**Introduction.** The geographical location of the Republic of Kazakhstan makes it a natural crossroad for the main transit corridors and creates favorable conditions for the use of transport routes of emerging transcontinental routes in Asia-Europe communications. According to the assessment of international analytical institutions, the volume of trade between the European Union and the Asia-Pacific region, especially China, will reach \$ 1 trillion in the near future. At present, only 1 % of the total volume of these cargoes falls on the EEU international transport corridors.

**Topic.** The location and territorial dimensions of the republic, which does not have access to the open sea, occur a number of problems in the means of transport communications: low density of roads — 0.035 km/km<sup>2</sup>, large distances between settlements — on average, the distance between regional centers is about 1400 km, the remoteness of the base productions from markets. For this reason, the economy of Kazakhstan is characterized by a high transport component, while more than 80 % of the freight transported by land transport. Over the past decade, investments in the transport sector accounted for about 30 % of the republican volume of fixed capital investments, which is explained by an increase in budget investments in transport due to the high multiplier effect on economic growth and employment.

**Goal.** The goal is a development of roads of the Republic of Kazakhstan on the basis of developed strategic documents with the possibility of identifying priority of roads of road of state status, which are considered the main ones for ensuring inter-regional communication with the subsequent inclusion of these roads in the main republican road network, which will be converted into I or II technical categories.

**Materials and methods.** In accordance with one of the directions of the Nurdy Zhol State Infrastructure Development Program for 2020–2025, the development of transit transport infrastructure will be carried with consideration of regional integration initiatives, including the One Belt – One Way initiative. Within 5 years, the Program will implement investment projects for the construction and reconstruction of 6.9 thousand km of roads of international and national significance.

**Results.** The result is the necessity of consideration the socio-economic and territorial development of the Republic with a forecast of simple traffic on highways within 3 % per year. As well as the focusing on topical issues of the quality of road structures and their compliance with increasing transport traffic.

**Key words:** international corridors, length of roads, public roads, traffic intensity, type of coverage.

**Introduction**

The geographical position of the Republic of Kazakhstan makes it a natural crossroad for the main transit corridors from East to West, from North to South, which creates favorable conditions for the use of transport highways of emerging transcontinental routes in Asia-Europe communications.

According to the estimates of international analytical centers, the volume of trade between the two macro-regions of the continent — the European Union and the Asia-Pacific region, especially China, will

reach \$ 1 trillion in the near future. At present, only 1 % of the total volume of these cargoes falls on the international transport corridors of the EEU [1].

The location and territorial dimensions of Kazakhstan, which has no access to the open sea, has a number of problems in the field of transport:

- low density of roads — 0.035 km/km<sup>2</sup>, combined with a low population density — 6.72 people/km<sup>2</sup>;
- large distances between settlements — average the distance between regional centers is about 1400 km;
- remoteness of the base production from sales markets. For this reason, the economy of Kazakhstan is characterized by a high transport component, also more than 80 % of the cargo logistics is applied by land transport.

Recently, investments in the transport sector accounted for about 30 % of the republican investment in fixed assets. This trend can be explained by the increase in budget investments in transport due to the high multiplier effect on economic growth and employment [2].

Based on the analysis of the economic and geographical position of Kazakhstan, it can be concluded that transport is one of the sectors that form the infrastructure of the economy, which expands the possibilities of its economic growth.

Road transport has a priority for development due to the issues of transportations goods and passengers directly to production facilities. Road construction is actively developing in order to solve this issues.

### Road network development

The total length of the roads of the Republic of Kazakhstan is 128.3 thousand km, more than 97.4 thousand km of them are public roads. The Republican road network of Kazakhstan as of 01.01.2018 is 24.4 thousand km, 12.1 thousand km of them have asphalt concrete pavement, 1 452 km have cement concrete and 10.8 thousand km have light types of pavement (table 1).

*Table 1*

*The network of highways of republican significance*

Region	Length, km	Type of coating			
		Asphalt concrete	Cement concrete	Lightweight	Unpaved
Akmola	2 286	1 376	267	606	37
Aktobe	1 894	1 166		728	
Almaty	2 822	1 110	409	1 276	27
Atyrau	990	546		427	17
East Kazakhstan	3 414	710		2 697	7
Jambyl	1 237	503	350	384	
West Kazakhstan	1 393	905	21	467	
Karaganda	2 785	1 006	66	1 373	341
Kostanay	1 410	683		727	

*The end of table 1*

Region	Length, km	Type of coating			
		Asphalt concrete	Cement concrete	Lightweight	Unpaved
Kyzylorda	1 107	815		274	18
Mangystau	1 049	832		188	29
Pavlodar	1 663	643		1 021	
North Kazakhstan	1 468	1 468			
Turkistan	866	384	340	143	
<b>Total</b>	<b>24 383</b>	<b>12 145</b>	<b>1 452</b>	<b>10 310</b>	<b>476</b>

The republican road network includes 6 international corridors with a total length of about 8.3 thousand km. They serve mainly as international transit flows between China, Kyrgyzstan, Uzbekistan, Turkmenistan and Russia and then lead to Europe. They were developed in accordance with international agreements: Asian Highway Agreement, Europe-Caucasus-Asia Transport Corridor (TRACECA), Central Asian Regional Economic Cooperation (CAREC) and others (table 2).

*Table 2*

*International road corridors of Kazakhstan*

Name of the international corridor	Road index	Length, km	Traffic (PBX/day)
Border with Uzbekistan – Shymkent – Taraz – Bishkek – Almaty – Khorgos – Chinese border	A2	970,1	> 7 500
Border with Uzbekistan – Shymkent – Kyzylorda – Aktobe – Uralsk – border with the Russian Federation	M-32	2 083,1	> 3 000
Almaty - Karaganda - Astana - Petropavlovsk	M-36/A1 M-51	1 700,6	>5 000
Border with the Russian Federation – Atyrau – Aktau – border with Turkmenistan	A27/A33 A34	1 413	> 2 000
Border with the Russian Federation – Pavlodar – Semipalatinsk – Maykapchagai – border with Chinese	M-38	1 094	> 2 400
Astana – Kostanay – border with the Russian Federation	M36/P36	626	> 2 100

International corridors and the most important republican roads, taking into account their development [3], are shown in Figure 1.

Based on the strategic documents [4, 5] on the development of roads of the Republic of Kazakhstan, it is possible to identify the main roads of republican status, which are considered the main ones for ensuring inter-regional communication. These roads are planned to be included in the main republican road network, which will be converted into I or II technical categories (table 3).

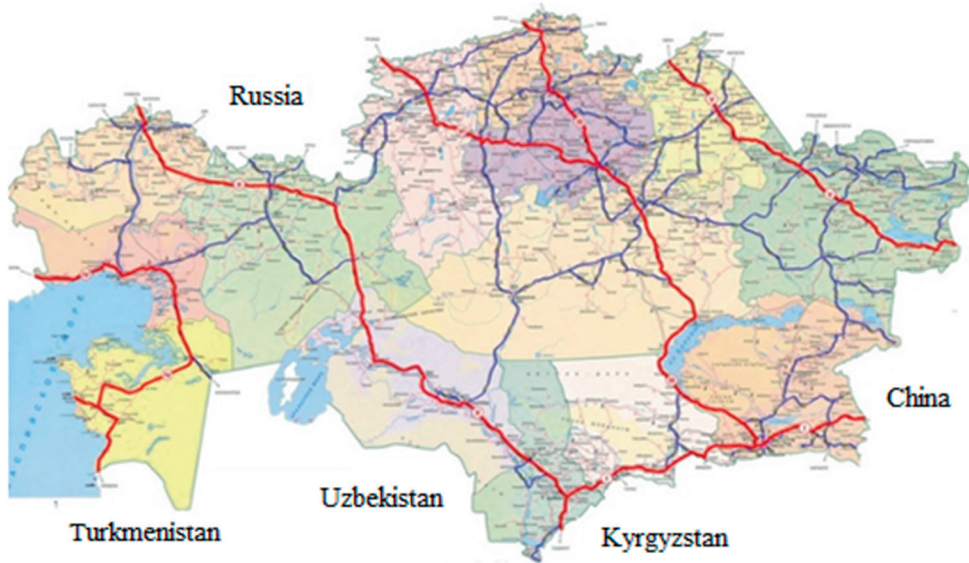


Figure 1 — Map of the main republican roads in Kazakhstan

Table 3

The main republican road network, developed according to strategic documents

Road name	Road index	Length, km	Corridor
Border with the Republic of Uzbekistan (to Tashkent) – Shymkent – Taraz – Almaty – Khorgos	A2	1,197	WE-WC
Border with the Russian Federation (to Samara) – Shymkent, through the cities of Uralsk, Aktoobe, Kyzylorda	M-32	2,029	WE-WC
Taskesken – Bahty (border of China)	A8	187	
Border with the Russian Federation (to Omsk) – Майкапчaгaй (exit to China), through the cities of Pavlodar and Semey	M-38	1,099	CS
Atyrau – Aktau	A33	798	
Aktau – Bekdash (Turkmenistan)	A34	115	
Aktoobe – Martuk – border with the Russian Federation (in the city of Orenburg)	A24	102	WE-WC
Almaty Ring Road	-	65	
Border with the Russian Federation (to Yekaterinburg) – Almaty, through the cities of Kostanay, Astana, Karaganda	M-36	2,032	CS

Road name	Road index	Length, km	Corridor
Astana – Yereymentau – Shiderty	P4	243	CE
Kyzylorda – Pavlodar – Uspenka – border of the Russian Federation	A17	184	CE
Astana – Arkalyk – Shalkar – Beineu – Aktau	-	1,652	CW
Almaty – Ust-Kamenogorsk	A3	1,036	
Astana – Petropavlovsk, through the city of Kokshetau	A1	452	
Uralsk – Kamenka – border of the Russian Federation (in Ozinki)	A29	100	
Usharal – Dostyk	A7	184	
Kyzylorda – Zhezkazgan – Karaganda	A17	925	
Aktobe – Atyrau – border of the Russian Federation (on Astrakhan)	A27	871	
Uralsk – Atyrau	A28	487	
Merke – Burylbaital	P-29	273	
Beineu – Akzhigit – border with the Republic of Uzbekistan (on Nukus)	P-1	84	
Southwest bypass of Astana	-	31	
<b>Total</b>		<b>14,146</b>	

Expenses on the republican road network over the past 16 years amounted to 2.8 trillion tenge, of which: 2.2 trillion tenge — for construction and reconstruction; 252 billion tenge — for full reconstruction and 348 billion tenge — for operation and maintenance.

According to one of the directions of the «Nurly Zhol» State Infrastructural Development Program for 2020–2025, the development of transit transport infrastructure will be carried out with consideration of regional integration initiatives with the participation of the Republic of Kazakhstan, including the «One Belt – One Way» initiative. At the same time, during 2020–2025 within the framework of the Program, investment projects will be implemented for the construction and reconstruction of 6.9 thousand km of roads of international and republican status [6].

Along with the general trend of increasing investments in the road sector, the total expenses on road infrastructure in the next 10 years will arise to ~ 4.9 trillion tenge [7], ~ 2.2 trillion tenge of them will be spent on construction and reconstruction (Figure 2).

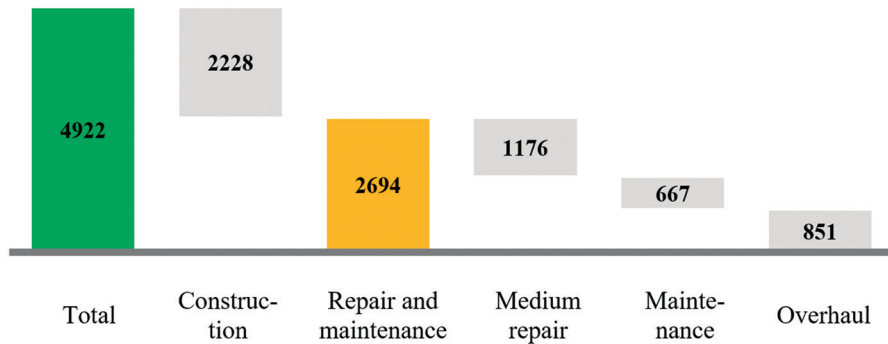


Figure 2 — The total cost of roads of national importance for 2019–2028, billion tenge

The priority transport corridor “Western Europe – Western China” began to operate fully since 2016. Moreover, for the most part, reconstruction was carried out in the period 2011–2014. Currently, the average intensity along the corridor is over 10 thousand cars/day, about 30 % falls on freight vehicles. In the area of Almaty city, the intensity is from 35 to 45 thousand cars / day, in the Almaty – Khorgos section — from 3 to thousand cars/day, decreasing to the border with China, in the Taraz – Kainar section, the traffic intensity is more than 7 thousand cars/day, on the Shymkent – Taraz section — more than 16 thousand cars/day and on the Shymkent – border of the Republic of Uzbekistan — more than 10 thousand cars/day, in the areas of Kyzylorda – Shymkent and Kyzylorda – Aktobe — from 5 to 16 thousand cars/day.

For the rest of the republican roads, the traffic intensity is shown in Figure 3.



Figure 3 — Map of the intensity of roads of the Republic of Kazakhstan

An analysis of traffic intensity showed that considered roads have the average percentage of cars, vans and motorcycles averages is equal 57 %, buses — 2 %, the percentage of trucks — 26 %, road trains — 10 %, truck vehicles with a semi-trailer — 15 %, tractors — 2 %. In general, the size of traffic flows reaches 46 thousand cars /day.



### Conclusion

In the future, given the socio-economic and territorial development of the Republic of Kazakhstan, an increase in the intensity of traffic on public roads of international and republican status is expected to arise within 3 % per year. The issue of quality of road structures and their conformity to increasing transport loads becomes highly important.

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### ОСОБЛИВОСТІ РОЗВИТКУ БУДІВНИЦТВА ДОРІГ У РЕСПУБЛІЦІ КАЗАХСТАН

#### Анотація

**Вступ.** Географічне розташування Республіки Казахстан є природним перехрестям основних транзитних коридорів і створює сприятливі умови для використання транспортних шляхів у нових трансконтинентальних маршрутах, що з'єднують Азію з Європою. За оцінкою міжнародних аналітичних установ, обсяг торгівлі між Європейським Союзом та Азійсько-Тихоокеанським регіоном, особливо з Китаєм, найближчим часом сягне 1 трлн. доларів США. На даний час лише 1 % від загального обсягу цих вантажів припадає на міжнародні транспортні коридори ЄС.

**Тема.** Географічне розташування та територія республіки, яка не має доступу до відкритого моря, створюють низку проблем транспортного сполучення: низька щільність мережі доріг — 0,035 км/км<sup>2</sup>, великі відстані між населеними пунктами — в середньому, відстань між обласними центрами становить біля 1400 км, віддаленість базових виробництв від ринків. З цієї причини економіка Казахстану характеризується високою транспортною складовою, тому понад 80 % вантажів перевозять наземним транспортом. За останнє десятиліття інвестиції в транспортний сектор становили біля 30 % за обсягом інвестицій республіки в основний капітал, що пояснюється збільшенням бюджетних інвестицій у транспорт через високий багатоскладовий вплив на економічне зростання та зайнятість.

**Мета.** Метою є розбудова доріг Республіки Казахстан на основі розроблених стратегічних документів з можливістю визначення пріоритетності доріг державного значення, які вважаються головними для забезпечення поєднання регіонів із подальшим включенням цих доріг до основної республіканської дорожньої мережі, що відповідатимуть I або II технічним категоріям.

**Матеріали та методи.** Відповідно до одного з напрямків Державної програми розвитку інфраструктури Нуралі Жол на 2020–2025 роки, розвиток транзитної транспортної інфраструктури здійснюватимуть із урахуванням регіональних інтеграційних програм, включаючи програму «Один Пояс – Один Шлях». Протягом 5 років Програма передбачає реалізацію інвестиційних проєктів будівництва та реконструкції 6,9 тис. км доріг міжнародного та національного значення.

**Результати.** Результатом є необхідність врахування соціально-економічного та територіального розвитку республіки з прогнозом зростання стандартного транспортного руху на автомобільних дорогах в межах 3 % на рік. Крім того, актуальним є акцентування уваги на актуальних питаннях якості дорожніх споруд і їх відповідності потребам у зростанні обсягів транспортного руху.

**Ключові слова:** міжнародні коридори, довжина доріг, дороги загального користування, інтенсивність руху, тип покриття.