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THE NEGATIVE EFFECT OF THE TRAFFIC GROWTH TO THE AIR BASSIN*G.U. Baitasheva¹, A.M. Sharipbaeva²*¹Cand. Sci. (Agriculture), Associate Professor²MSc student, 6M011300 - Biology^{1,2}Kazakh State Women's Teacher Training University,
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The paper considers the negative impact of the road transport to the air in urban area. The calculation of harmful substances of the traffic flow of cars, trucks and buses while driving through the city of Almaty was carried out. The study is based on calculations of the volume of freons released. Observation was conducted in four points of the city. As a result of three measurements, the average value of the traffic flow was determined. As a control point, a micro-district was taken on the eastern outskirts of Almaty with an average traffic flow. The authors reveal a direct relationship between the state of the air basin and the intensity of the traffic flow.

Key words: Almaty, environment, atmosphere, freon, carbon dioxide, traffic, control

The main source of environmental pollution is the economic activity of the human being. The transport and road complex has contributed significantly to the atmosphere, creating significant pollutants, contributing to the contamination and degradation of the environment. Due to the advancement of entrepreneurial activity in the field of transport and road complexes, there is a growing number of private refueling stations, regular parking spaces, permanent and temporary parking spaces and other structures throughout the city and in many settlements. It also contains pollutants with toxic substances such as residual gases, dust particles, aerosols, and causes harm to human health, flora and fauna. And now, in Almaty, it is obvious that the number of automobiles will increase in competition. Almaty is one of the largest industrial cities in the south-east of the Republic of Kazakhstan. According to the statistics of the automobile industry of Kazakhstan "KazAvtoIndustry", in January-August 2017 administrative bodies registered 747,365 vehicles of all categories. This is 20.1% higher than in the previous year. The proportion of vehicles over 20 years has increased from 31.7 to 35.9 percent [1].

At present, the share of vehicles in pollution of carbon dioxide, nitrogen oxides, hydrocarbons, technogenic substances is 70-80%. The concentration of the above-mentioned toxic substances has recently increased several times around large cities and large roads. Their increase is largely dependent on the transport conditions of motor roads and engineering structures [2].

Air pollution by air is caused by a wide distribution of CO₂ concentrations in the environment, from the various activities of people, by intense motor vehicle movement and production processes, by incorrect combustion of vehicles, as well as the release of methane (CH₄), nitrogen oxides (N₂O) [3].

According to the global research of industrial processes in 2006-2015, conducted by Global Atmospheric Research Database (EDGAR-Emission Database for Global Atmospheric Research), Joint Research Center (JRC) and European Commission (EC), the main sources of air pollution are following: cement production, fuel consumption, chemical and metallic processes, solvents, waste and fossil fuels, biomass burning (e.g. burning of agricultural waste), biomass burning (e.g. forest fires) and vehicle emissions.

The volume of toxic gas emissions in different countries is shown in the Table 1 [4].

Table 1. Amount of CO₂ emitted to air 2006-2015 in different countries

Country	The amount of CO ₂ distributed annually									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
China	6,870,759	7,515,037	7,699,949	8,246,582	8,986,614	9,844,525	10,056,756	10,503,137	10,711,037	10,641,789
USA	5,765,135	5,847,966	5,659,277	5,243,236	5,519,484	5,391,417	5,164,192	5,255,530	5,312,226	5,172,338

India	1,367,406	1,439,192	1,536,650	1,738,106	1,848,710	1,961,663	2,090,857	2,191,277	2,334,381	2,454,968
Russia	1,764,650	1,766,346	1,743,343	1,652,898	1,735,583	1,820,098	1,833,976	1,824,579	1,822,210	1,760,895
Japan	1,289,035	1,310,630	1,226,781	1,163,613	1,219,095	1,258,289	1,293,511	1,312,750	1,281,569	1,252,890
Germany	844,435	817,319	828,292	768,284	811,861	793,891	801,677	815,812	773,020	777,905
Iran	500,311	534,178	544,451	565,166	568,920	578,502	591,310	600,055	625,021	633,750
Canada	545,677	570,974	563,980	532,609	545,088	551,261	556,797	568,364	572,262	555,401
Brazil	363,134	379,565	399,717	373,531	423,798	442,313	457,077	485,620	505,395	486,229
Italy	489,493	482,151	466,539	413,512	422,825	412,039	395,145	362,512	335,610	352,886
Kazakhstan	216,166	225,573	259,843	232,848	249,093	269,958	256,771	267,585	274,067	267,978

According to the data in this table, Kazakhstan occupies the 11th place in terms of emissions of CO₂ from cars. The main source of pollution is of course Almaty. On the basis of our special plan to improve the ecological situation in Almaty, there are three checkpoints of atmospheric air pollution, which operates since March 2000. Taking into account the abundance of urban and industrial parks, alternative energy sources are being utilized. There are Almaty city administration, KazTransGas, a subsidiary of KazTransGasCJSC, plans to build 15 automotive gas compressor stations in the city and transfer one thousand cars to alternative fuel at the first stage which guaranteed to clean the air of Almaty [5].

It is expected that in the near future, the use of globally updated biofuels will increase rapidly. The use of renewable biofuels is very beneficial and effective. Because they are environmentally friendly, low in toxicity and are an indispensable alternative to some fuels. We refer to the biofuels that are substantially applicable to biodiesel. The growth and production of biodiesel has a great impact on the environment. The use of biodiesel vehicles reduces the greenhouse gas mission [6]. Of course, there are such specially planned works, but now the level of pollution by automobile emissions in Almaty is increasing.

By the 2017 BTEX brand, about 20 cities are included in the study. These studies focus on the city of Almaty in Kazakhstan. The ecological data from Almaty are compared to 19 major cities in the world. As a result, benzene in Almaty is a high level of toxic gas. It is the 8th most polluted city in the city [7].

According to our available data, the level of pollution in Almaty has reached its peak (IZA-13.1). Often polluting Almaty air: carbon dioxide, sulfur dioxide, hydrocarbons, carbon monoxide, oxides of nitrogen and smoke. AHC, CHP-1 system, which is a source of constant heat sources, emits 8253 tons of harmful emissions. These hazardous wastes form chemical compounds in the air and form new compounds that are even more dangerous[8].

It is also necessary to look for ways to increase oxygen content in the atmosphere. At present, the oxygen in the atmosphere (O₂) is stable at 21%. This quantity is a sufficient and necessary environmental resource factor for the breathing of plants, animals and insects, human beings and microorganisms. According to the results of modern research, oxygen in the atmosphere is accumulated by photosynthesis of plants. For example, as a result of photosynthesis of continental vegetation cover, an average of 280-320 billion cubic meters a year tons of oxygen is added. As a result, the oxygen produced by the photosynthesis of the continental plants can not replenish the amount of oxygen burned for the energy of humanity, with the amount of gas (oxygen) in the air decreasing from year to year. If fuel extraction is not limited to the energy obtained in these industries, the oxygen content may be reduced from 21% to 8-12%. [9].

Gasemitted contains about 200 substances. One of them is hydrocarbons burning. Blown hydrocarbons are heavily distributed in the smoke, especially when the engine is slow. The gas released from high quality

gasoline will be 2.7% oxide of non-combustible hydrocarbon. When the machine speed slows, its size will increase to 6.9%. This is often the case when the car slows down, so carbon dioxide is heavily distributed in the city's air [8]. According to data from the training manual "Measures of environmental protection in the transport and road complex" written by Kiyalbaev, Tokkulov, Teltaev, Talgatbekova, harmful substances emitted by various engines are following (see Table 2).

Table 2. The amount of harmful substances emitted by various engines from vehicles

Air Pollutants	In the following modes, the amount of harmful substances emitted by the engine %			
	in the free circle	at speeds	stable speed movement	braking
Gasoline engines				
Carbon monoxide	6,9	2,9	2,7	3,9
Hydrocarbons	0,53	0,16	0,10	1,0
Nitrogen oxide	$3 \cdot 10^3$	0,1	C.065	0,02
Aldehydes	$3 \cdot 10^3$	$2 \cdot 10^{-3}$	$1 \cdot 10^{-3}$	0,03
Diesel engines				
Carbon Dioxide	Footprints	1000	footprints	footprints
Hydrocarbons	0,04	0,02	0,01	0,03
Nitrogen oxide	$6 \cdot 10^{-3}$	$35 \cdot 10^{-3}$	$24 \cdot 10^{-3}$	$3 \cdot 10^{-3}$
Aldehydes	$1 \cdot 10^{-3}$	$2 \cdot 10^{-3}$	$1 \cdot 10^{-3}$	$3 \cdot 10^{-3}$

If air polluted with oxides of nitrogen and sulfur, if it is 0.2-0.5 mg/m in the air, it affects the respiratory system, the eyelids, causes pulmonary diseases. It also slows down the photosynthesis of the leaves of the plants and causes chlorosis to be damaged [8].

Effects of freons, which were separated from cars on the air layer of Almaty, were observed. The control was conducted in the last decade of October 2017. At the points mentioned below, cars were counted.

This will undoubtedly undermine the ecological situation of the city. Therefore, in order to control the current ecological situation of the city, the number of vehicles in the streets of the city during the time period has been determined and shown in Table 3.

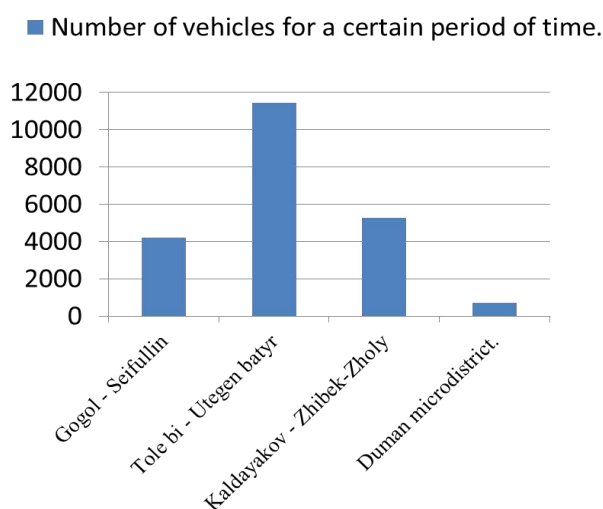
Table 3. Number of cars on the route

Point 1. Gogol – Seifullin				
Time	Trucks	Bus	Cars	Total number of vehicles at a specified time
8:00-10:00	7	42	1345	1394
12:00-13:00	5	39	1292	1336
17:00-19:00	9	45	1435	1489
				Total: 4219
Point 2. Tole bi - Utegen batyr				
8:00-11:00	17	174	3348	3539
12:00-15:00	8	87	1674	1769
17:00-20:00	28	232	5856	6116
				Total: 11424
Point 3. Kaldayakov - Zhibek-Zholy				
8:00-09:00	4	37	1254	1295
12:00-13:00	6	42	1350	1398
17:00-19:00	8	74	2508	2590
				Total: 5283
Control Point. Duman microdistrict, Khan Tengri - Kazygurt				
8:00-09:00	10	39	178	227
12:00-13:00	11	39	182	232
17:00-19:00	5	39	210	254
				Total: 718
Total number of results found: 21644				
Regions with high levels of pollution are: 20926				
By point of reference: 718				

The census was carried out at a distance of 5 meters at 20 minutes per hour. Repeated by three times in a month, average score was counted according to the schedule.

- 1 point. Gogol - Seifullin. The population is concentrated, traffic jams range from 8 to 10 am, 12-13 in the afternoon and 17-19 in the evening.
- 2 point. Tole bi - Utegen batyr. The population is very concentrated, traffic jams range from 8 to 11 in the morning, 12-15 in the afternoon and 17-21 in the evening. Especially in the evening, busy buses depart from different directions.
- 3 point. Kaldayakov - Zhibek-zholy. The population is concentrated, traffic jams range from 8-9 in the morning, 12-13 in the afternoon, and 17-19 in the evening.
- Control. Duman microdistrict, Khan Tengri - Kazygurt streets, there is no traffic congestion, everyday people, a clear zone of Ili Alatau slopes.

In our research, it has been proven that the Duman micro district is also a clean area during census. By the way, we can see that the cars we used to travel were designed by the graphic designs - the Tole bi - Utegen batyr, where the vehicle is heavily concentrated, is the intersection of the Zhibek zholy and Kaldayakov streets. It is known that the level of pollution of Gogol-Seifullin streets is very high (picture 1).



In this regard, according to the literature, we present in Table 4 the quantities of harmful substances produced by cars, trucks and buses in cities:

Table 4. Amount of harmful substances produced by light and trucks, buses in cities

Type of fuel, bus class	Cities with a population of more than 1 million	Urban population 0.1-1 million cities		The population is less than 0.1 million inhabitants
Fuel type	Passenger cars			
AI-80, -92, -95,	10,74	9,25	8,86	
AI-7v (E),	43,38	39,85	37,42	
AI-93 (E) 10.74	84,18	76,57	72,10	
Cargo weight, t	Fuel	Cargo Trucks		
up to 2 tons of	Gasoline	77,07	69,22	68,25
2-5 tons of	Gasoline	101,54	91,95	83,61
	gas	16,64	6,03	13,00
	diesel	41,51	37,46	30,58
5-8 tons of	gasoline	135,0	120,89	108,96
	gas	32,1	26,51	22,44
	diesel	55,05	48,93	40,27
18-16 tons of	gasoline	170,79	153,93	138,90
	diesel	232,61	66,57	58,57
More than 16 t	diesel	78,58	69,45	58,15

Busclass	Fuel	Bus		
Small	gasoline	131,01	118,28	106,24
Subsea	gasoline	136,64	165,39	109,87
average	gasoline	185,64	163,39	150,05
large	diesel	57,1	45,96	38,78
	gasoline	232,61	209,24	188,56
	diesel	68,57	61,6	32,71
very large	diesel	76,94	67,21	53,19

As seen in the table, automobiles using ethylene gasoline are 8 times more likely to harm the environment than petrol consumers. Minimal fuel and gas damage belongs to trucks. The truck is 1.5-2 times more harmful to the environment than cars and large buses. Therefore, the number of vehicles passing through the points of Almaty has been significantly higher than the control and literary data, and it is clear that trucks and buses exceed the amount of harmful substances produced in the city. It is difficult to exchange air in the pictures que city near the beautiful Alatau mountains. The worst hit of Almaty air is the fault of cars with major technical defects. And experts warn that the majority of hydrocarbons in the automobile engines will become black, since smoke from technical malfunctions will cause hydrocarbons to be highly poisonous benzopyrin. In the city it is necessary to find ways to utilize excessive cars. It is necessary to reduce the concentrated gas stations and increase the use of alternative energy sources. In our opinion, gasoline-driven vehicles should be equipped with control-regulating equipment and all types of transport should be transferred to the gas-carrying method.

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НЕГАТИВНОЕ ВЛИЯНИЕ УВЕЛИЧЕНИЯ КОЛИЧЕСТВА АВТОТРАНСПОРТА НА ВОЗДУШНЫЙ БАССЕЙН

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В статье рассматривается негативное влияние дорожно-транспортного комплекса на качество окружающей среды. Проведен расчет вредных веществ транспортного потока легковых и грузовых автомобилей, автобусов при движении по городу Алматы. Исследование основано на расчетах объема выделяемых фреонов. Наблюдение велось в четырех точках города. В результате трех замеров было определено среднее значение транспортного потока. В качестве контрольной точки был взят микрорайон на восточной окраине Алматы со средним транспортным потоком. Авторы выявляют прямую зависимость между состоянием воздушного бассейна и интенсивностью транспортного потока.

Ключевые слова: Алматы, окружающая среда, атмосфера, фреон, CO₂, автотранспорт, контроль

АВТОКӨЛІКТЕРДІҢ САНДЫҚ МӨЛШЕРІНІҢ АРТУЫНЫҢ АУА БАССЕЙІНІНЕ КЕРІ ӘСЕРІ

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Бұл мақалада көлік жол кешенінің қоршаған ортаның сапасына кері әсері баяндалды. Фреондардың ауаға бөлінген мөлшері сараланды. Жеңіл және жүк автомобильдерінің, автобустардың қалаларда жүргенде шығаратын зиянды заттарының мөлшері қарастырылып сараптама жасалды. Осыған орай бақылауға алынған нүктелердегі автокөліктер саны анықталды. Автокөліктер саны үш реттік қайталанумен саналып орта есебі алынды. Бақылауға алынған нүктелердің қоршаған орта жағдайына сараптама жасалды. Бақылау нүктесі ретінде Алматы қаласының шығыс аймағындағы автокөліктер ағымы аз Думан бқшам ауданы алынды. Авторлар автокөліктер ағыны мен ауа бассейні арасындағы тікелей қатынасты анықтаған.

Түйін сөздер: Алматы, қоршаған орта, атмосфера, фреон, CO₂, автокөлік, бақылау