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**NAMANGAN ENGINEERING CONSTRUCTION  
INSTITUTE**

**TRANSPORT LOGISTICS  
DEPARTMENT**

**GENERAL TRANSPORT COURSE  
for practical training in science**

**METHODOLOGY GUIDE**

**NAMANGAN- 2024**

Methodical instruction on practical training of the general transport course.

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This methodical instruction is intended for students of "61040100 - Transport logistics" and it was prepared on the basis of the State educational standard, curriculum and science program of this course.

This methodological instruction helps students to strengthen their theoretical and practical knowledge in the field of "Transport General Course", understanding through discussion, and students' ability to use literature.

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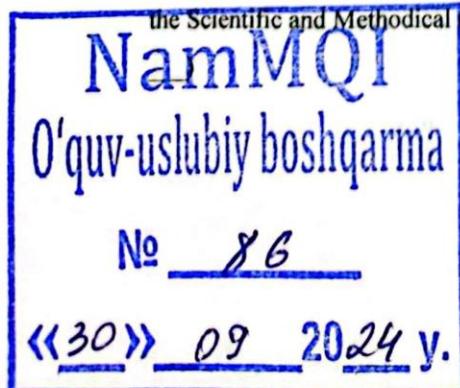
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## **1-PRACTICAL TRAINING.**

### **TOPIC: GENERAL DESCRIPTION OF THE TRANSPORT SYSTEM**

**Purpose of work:** The role of the transport market in the country's economy. Structural and functional description of the transport system. The essence and development of the construction of the unity of the transport system. The role of Uzbekistan's transport in the world transport system.

**General part.**

1. Information about the emergence and development of transport.
2. Concept of modern transport system, its composition and description.
3. Specific characteristics of transport in the production of material goods.

**Key words:** Transport system; types of transport; city transport; industrial transport; highway transport; roads; transport network; vehicle; equipment and facilities in transport; freight turnover; passenger turnover; average transportation distance.

#### **Information about the emergence and development of transport.**

The vehicle is closely related to the history of human society. Without the movement of labor tools and tools and people from one place to another, there can be no creation of any consumer product or any other rational activity.

In the early times, people met their transportation needs with simple means. Those who carried or dragged their own food, labor tools, materials necessary for making clothes or creating comfortable housing conditions, as well as fuel (mainly firewood) . Later, by training various animals and breeding them, they transported loads and people using them more.

Over time, the increase in labor productivity, the appearance and improvement of metal weapons, the development of animal husbandry, and the further expansion and development of vehicles required.

Over time, some types of transport were improved. With the growth of production forces, large cities appeared, and crafts and trade began to develop in them.

Later, due to a number of factors, the decline in goods intended for sale increased the need for transport. For this reason, in most countries, great importance has been attached to the expansion of sea and river, road and water facilities for cargo transportation.

#### **Global transportation system.**

The transport infrastructure of all countries of the world is integrated into a high-level global system. The global transport network is unevenly distributed across continents and states. Thus, the transport system of Europe (in particular, the West), as well as North America, is the densest. the transport network differs mainly in Asia. In the structure of the world transport system, road transport dominates (86%).

The total length of the global transport network, including all types of transport (except sea transport), exceeds 31 million km, of which about 25 million km are land (not including connecting lines).

#### **Railway transport**

The length of the world railway network is about 1.2 million km. The length of Russian railways is only 7% of this number, but they account for 35% of world freight traffic and 18% of passenger traffic

It can be seen that for many countries with a developed transport system (including European countries), railway transport occupies a leading position in terms of cargo transportation. The first place in the use of rail transport is Ukraine, where 75% of freight traffic is carried out by rail.

### **Automobile transport**

In Russia, road transport is used to transport 85% of the total volume of cargo transportation, as well as more than 50% of the volume of domestic passenger transportation. Road transport is the main component of the transport system of many European countries.

The development of motor transport depends on three main factors: population growth, intensive urbanization and an increase in the number of individual cars. Researchers note that in countries and regions where there is an intensive growth rate of the three criteria mentioned above, there may be problems related to the provision of transport infrastructure.

### **Pipe line**

The modern economy's dependence on oil and gas production has led to the rapid development of pipelines around the world. Thus, the length of the Russian pipeline system is 65 thousand km, and in the USA it is more than 340 thousand km.

### **Air transportation**

The vast territory of Russia, as well as the low level of development of transport networks in the eastern and northern parts of the country, contribute to the development of the system. The length of the air routes of the Russian Federation is about 800 thousand kilometers, of which 200 thousand km are on international routes. The largest air base in Russia is Moscow. Every year it sends more than fifteen million passengers.

Conditions for the formation of a transport system.

The development of transport networks (water, land or air) depends on the following factors.

- ⊗ climatic features;
- ⊗ geographical location;
- ⊗ standard of living and level of population in the region;
- ⊗ turnover rate;
- ⊗ population mobility;

⊗ availability of natural communication routes (for example, river network), etc.

The formation of a unified transport system in Russia is based on several conditions, the main of which are:

- ⊗ large area;
- ⊗ high population (large population);
- ⊗ unevenness of demographic levels in federal districts;
- ⊗ speed of industrial development of the industry;
- ⊗ uneven distribution of raw materials and energy sources;
- ⊗ geographical location of production centers;
- ⊗ gross product volume in the state;
- ⊗ historically established communication system.

The transport system is a complex of all types of transport that are interdependent during the transport process. Usually, the term "transport system" is used in the sense of a country, region or big city. The current transport system includes the following types of transport: railway; the sea; the river; car; air; pipeline transport.

Highway transport means transport that transports goods and passengers over long distances for the benefit of economic relations of enterprises that produce and consume material products. Main transport of Uzbekistan includes railway, automobile, air, pipeline transport.

Roads are specially adapted (or built) and equipped railways, highways, river and other waterways for the movement of vehicles.

A transport hub is defined as a place where different transports connect. Such junctions are mainly located in large cities, residential areas, industrial and resort centers and river ports, road and railway stations.

A means of transport means a railway and road locomotive, wagon, car, trailer, ship, plane, etc. intended for the transportation of goods and passengers.

Transportation equipment and facilities include transport-related factories (mainly repair plants), workshops, warehouses, loading and unloading areas, stations, ports, airport buildings, their equipment, road equipment, structures (bridges, tunnels, channels, gateways) etc. are understood.

Cargo turnover is the work performed during cargo transportation, which is determined by multiplying the volume of transported cargo, measured in tons, by the average transportation distance. The unit of measurement is ton kilometer (tkm).

Passenger turnover is the work done in the process of transporting passengers, and it is determined by multiplying the number of transported passengers by the average transportation distance. The unit of measurement is passenger-kilometer (pass-km).

The average transportation distance of 1t of cargo is the average transportation distance of each ton of cargo, which is determined by dividing the passenger turnover in ton-kilometers by the total volume of transported cargo in tons.

The average distance traveled by 1 passenger is the average distance traveled by each passenger, which is determined by dividing all completed passenger turns by the total number of transported passengers.

The main operations of cargo and passenger transport in transport are divided into the following three elements:

- 1) Loading or unloading passengers on vehicles;
- 2) The process of transporting cargo and passengers from one place to another;
- 3) Unloading cargo or passengers from vehicles.

When transporting cargo and passengers from one place to another, elements of loading (unloading) and unloading them are an integral part of the transportation process.

Transportation of goods and passengers from one place to another in transport covers both production and circulation.

#### **Questions for discussion and conclusions:**

1. When did the first transport appear?
2. What does a transport system mean?

3. What types of transport are included in the transport system?
4. What do you mean by highway transport?
5. Where are transport hubs organized?
6. What can be included in the transport equipment?
7. What is cargo turnover measured?
8. What does passenger turnover mean?

## **2-PRACTICAL TRAINING.**

### **TOPIC: PROVISION OF TRANSPORT AND TRANSPORT ACTIVITIES MANAGEMENT SYSTEM**

**Purpose of the work:** Transport availability and accessibility indicators. A brief history of the development of transport types. Impact of transport on the market economy. Coordination and competition in transportation. Basics of transport-expedition work.

#### **General part.**

1. General concepts about transportation.
2. Transport types are the main elements of the development process.
3. Basics of transport-expedition work.

#### **Transport availability and accessibility indicators**

Transport availability and accessibility indicators reflect the level of transport services to economic facilities and the population and the length of the network of connecting roads, their transfer and transport capacity, the configuration of the location of transport lines and depends on other factors. It can be seen that the higher these indicators are, the more developed the network of communication routes is. Differences in the supply of communication routes between individual countries and regions are characterized by the network density index  $d_s$ , km/1000 sq km, which is measured by the ratio of the operational length of the network  $L_e$  to the area  $S$  of the area:

However, when the areas of two regions are equal, the need for transportation will be higher in the region with a large population. Then the density index of the network, which characterizes the population's transportation, will be equal to the following, km/10,000 people,

German statistician E. Engel  $d_s$  proposed a formula for determining the single indicator of network density, taking into account the area of the area and the number of inhabitants, for a generalized description of the area's transport availability:

At the same time, it can be seen that when the population and the area of the territory are the same, the need for transportation may vary depending on the structure, volume and location of production. To take these factors into account, the Russian engineer Yu. I. Uspensky modified Engel's formula by including in the denominator  $Q$ , thousand t, the volume of cargo provided for transportation:

Although the given formulas do not reflect the sufficiency or optimality of the development of the transport network, they are considered to be an important indicator of the level of provision of the regions with connection roads of certain types of transport. In order to determine the aggregate index (km) of the density of the network of different types of transport, it is suggested to indicate the length of the connecting roads  $\xi_{kelt}$ , km, and take into account the area of the considered area with only  $SO$  people. made by:

JI. I. Vasilevsky proposed the following coefficients for bringing transport lines to 1 km of railway, taking into account the comparable levels of their transmission and transport capabilities: for an improved highway - 0.45, for a normal paved road - 0,15, for the river road — 0.25, for the main gas pipeline network — 0.30, and for the medium diameter oil pipeline network — 1.

Using the formula for determining the aggregate density of the network  $dK$ , although with a high level of conditionality, it is possible to compare the transport provision of different countries and regions of the world (table 2.1).

It can be seen that Uzbekistan has the smallest indicators of transport provision, which can be compared only with the indicators of African and Asian countries. This undoubtedly indicates the low level of providing transport services to consumers in the country and the need to develop communication routes in the Republic of Uzbekistan in the future. However, the 1:5 ratio of the transport network density of Russia and the USA (2.0 and 10.5 km) does not fully reflect the discontinuity in the levels of transport provision of these countries. It is also necessary to take into account the intensity of use of means of transport and their accessibility for consumers.

2.1-table

Regions and countries					
Universal	1,81	15,6	8,2	11,5	3,1
MDH	0,65	5,2	5,0	10,6	2,6
uzbekistan	0,51	2,4	4,2	6,8	2,0
USA	2,27	62,3	28,4	54,3	10,5
Asia	1,35	13,8	5,7	4,4	1,4
Africa	0,50	2,1	1,2	2,8	1,1

Notes: 1. as, us, us are (general) density indicators for rail transport, road transport and all types of transport, respectively. 2 In the table, indicators are given per 100 sq km, N-10,000 people.

It is possible to calculate the ratio of the specific cargo turnover to 1000 square km of area, 10000 inhabitants and 1000 t of products transported in the area, which are the relative indicators of the intensity of transport use:

the given freight turnover is created by means of "double-bringing" by the corresponding coefficients of ton-kilometers of operation of various types of transport with cargo and passengers and the corrected length of transport lines (taking into account their carrying capacity).

size, in essence, reflects the volume of transport services provided to consumers in the considered area of the main transport activity. In some cases, instead of cargo turnover, that is, instead of transport work, the volume of transportation, income or transport costs are used.

The  $dM$  macroeconomic indicator of the provision of transport services can be calculated as the amount of delivered cargo (in ton-kilometers) corresponding to 1 ruble (1 dollar) of the country's national income (gross domestic product):

## 2.2. Principles of transport management in market economy conditions

The strategic goal of transportation development at the current modern stage is the formation of a transportation system that provides full satisfaction of transportation needs and can meet the requirements of society from the point of view of safety and ecology. In order to achieve this goal, the following tasks should be implemented: the formation of the market of transport services based

on competition and mutual actions of all transport enterprises with different forms of ownership; creation of a legislative, legal and regulatory basis for the development of transport, which guarantees the provision of public transport services to all people who need transport services; ensuring the safety and environmental friendliness of transportation; technical rearmament of transport and introduction of highly efficient transport technologies; Integration of the transport and road complex of Uzbekistan into the world transport system under mutually beneficial conditions.

Since the tasks listed above must be solved in new economic conditions, their implementation should be based on new principles of transport management in market economy conditions. These principles are expressed as follows:

1. Transport is one of the most important sectors of economic infrastructure, which is considered a priority sector by the state, because its operation affects economic development.

2. Equal conditions, legal guarantees and economic independence for enterprises with all forms of ownership to operate and develop in the network. Unexceptional equality of all market subjects in the provision of transport services.

3. Economic regulation of transport networks and enterprises by the state. Strict vertical structuring, the distribution of financial and material resources of the state, which is characteristic of the planned-command economy, will be replaced by effective regulatory mechanisms. State regulation is carried out in the following spheres: organization of the market of transport services and control of placing enterprises on the market; regulation of price formation in transport (determining the rules for the formation of tariffs and establishing a mandatory tariff); regulation of taxes (tax benefits for the costs of modernization and development of transport facilities, introduction of special regional taxes); investment regulation (government participation in the implementation of projects requiring more funds).

4. Transfer of state-level powers to regional management bodies. The level of local administrations is empowered to resolve the following issues: centralized subsidies, distribution of material resources among transport enterprises; control of local tariffs; issuing licenses for local types of transport activities; management of state-owned enterprises; participation in the management of joint-stock enterprises on behalf of state bodies.

Implementation of these principles of transport management in practice lays the foundation stone for the formation of a modern transport system capable of working effectively in the conditions of the country's market economy.

The following are the specific features of transport management:

- the process of wide (space) placement of transport objects interacting in a large area and continuous operation of most of them (for example, railways);

- the need to accurately perform technological functions related to the safety of transportation;

- unified leadership, discipline and dispatching in the management of transport processes;

- gypsum interconnection and interconnection of all links of the transport conveyor.

It follows from this that it is necessary to use administrative (organizational-saving), economic and social-psychological management methods in transport. In this case, the disposal methods should be rationally combined with the economic and psychological methods that ensure work motivation, work efficiency, corporate unity, initiative and entrepreneurship.

### **Questions for discussion and conclusions:**

1. Indicators of transport provision.

2. List the main elements of the development process of transport types

3. Explain the basics of transport-expedition work

### 3-PRACTICAL TRAINING.

#### TOPIC: TRANSPORTATION OF PASSENGERS

**The purpose of the work:** Distribution of passenger transportation between modes of transport. Descriptions of the main passenger flows. Mobility of the population. Determining the transport mobility of the population. Average distance of passengers. Criteria for evaluating the quality of providing transport services to passengers. Adequate assessment of the quality of providing transport services to passengers.

#### Distribution of passenger transportation between types of transport

Passenger transport is of great social importance, as it satisfies one of the most important human needs - the need to move. Conducted passenger transportation more clearly characterizes this or that type of transport, because passengers, based on their judgment, evaluate its achievements and shortcomings differently. The competition between the types of transport in the passenger transport market is much stronger than in the cargo transport.

The passenger transport market offers services of various types of transport, which are often unequal in terms of price, speed, regularity and comfort. The passenger chooses one or another type of transport based on his capabilities, goals and taste, and sometimes in a forced manner. In this case, quality characteristics of transport types are often decisive, not economic ones, therefore, when analyzing the transport market of passengers, not only the economic side of transport, but also the quality of transport services, demographic, social-household, production emission factors and other factors must also be taken into account.

Passenger transport transports people on international, intercity, suburban and intra-city connections. All passenger transportation is usually divided into extra-city and intra-city transportation. Transportation of passengers outside the city is carried out by various types of highway transport. The distribution of passenger transportation between types of transport is presented in tables 3.1 and 3.2.

If in previous years the volume of passenger transportation in the country has always increased, in the next decade it decreased in all types of transport due to the economic crisis and the deterioration of the population's financial situation. Certain changes have also occurred in the distribution of passenger volumes and passenger traffic between modes of transport.

#### Volumes of passenger transportation, million people (%).

Table 3.1.

Type of transport	1985 y	1990 y	1993 y	1994 y
	According to RSFSR			
Railway	3035 (10,4)	3143 (9,8)	2586 (9,6)	2365 (9,2)
Car (with buses, including intra-city transportation)	26018 (89,1)	28626 (89,5)	24124 (90,0)	23438 (90,6)
Air	73 (0,2)	91 (0,3)	42 (0,17)	29 (0,09)
Domestic water	98 (0,3)	90 (0,3)	40 (0,16)	4 (0,01)
Sea	18 (0,1)	16 (0,1)	6 (0,02)	
Total	29242(100)	31966 (100)	26798 (100)	25706 (100)

#### Passenger turnover, billion passenger-km (%).

Table 3.2.

Type of Transport	1985 y	1990 y	1993 y	1994 y
	According to RSFSR			
Railway	246,3 (40,1)	274,4 (39,1)	272,2 (35,9)	228,0 (39,0)
Car (with buses, including	240,3 (39,2)	262,2 (37,4)	200,3 (48,8)	192,7 (46,1)

intra-city transportation)				
Air	121,5 (19,8)	159,5 (22,7)	83,2 (14,9)	72,2 (14,6)
Domestic water	5,1 (0,8)	4,8 (0,7)	1,6(0,3)	1,2(0,2)
Sea	0,9 (0,1)	0,6(0,1)	0,3(0,1)	0,3(0,1)
Total	614,1 (100)	701,5 (100)	557,6(100)	494,4(100)

In terms of passenger traffic in Uzbekistan, the first place is occupied by road transport - more than 46%. However, if transportation by buses within the city is not taken into account, then the first place belongs to railways, its share in passenger turnover increases to 60%. In the next decade, the absolute volume of passenger transportation by rail decreased by 38%. This was caused by the severe socio-economic situation in the country, a significant increase in passenger fares (although less than in other modes of transport) and a decrease in the standard of living of the population. At the same time, railways remain one of the most accessible modes of transport for Uzbeks. It carries out a large volume of transportation around the city and the main part of long-distance intercity transportation with relatively low tariffs.

Air transport plays an important role in passenger transportation. Its share in the total passenger turnover is 14%. However, the number of passengers transported by air transport has decreased by almost 3 times in the following years due to the significant increase in the price of tickets and the decrease in the payment capacity of the population. The disintegration of the Aeroflot airline, which was once the largest in the world, and the decrease in the safety of flights and the quality of passenger service also had their say. However, in the future, the volume of long-distance air transportation of passengers in the vast airspace of Uzbekistan and the CIS countries should increase significantly.

A very small share corresponds to the transportation of passengers by river and sea transport (less than 1%). Navy ships are increasingly used for tourism, including cruises, leisure and excursions. River ships, in particular ships with underwater wings, are widely used for passenger transportation on inland waterways in the Volga Bay, North-West and other regions of the country. Although the volume of passenger transportation by water transport will decrease more sharply (by 3-4 times) in the next decade, it is possible to transport passengers by this comfortable mode of transportation in the future when there are long stretches of waterways. one can hope that the frozen positions will be restored.

The strategy for the development of passenger transport in Uzbekistan is not only to increase the volume of transport, but also to significantly increase the quality of passenger services, increase the speed of movement, expand the range of services accompanying transport (hotels, catering, recreation, etc.) should keep in mind. Transportation of passengers by various types of transport on the basis of a single ticket should be widely developed.

### **3.2. Descriptions of the main passenger flows and population mobility**

Passenger flow is defined as the number of passengers traveling in a certain direction. It is characterized by dimensions, birth and extinction points. Passenger flows can be constant or variable, one-way and two-way, even and uneven, periodically arising and ending.

Studying the nature of the fluctuation of passenger flows in space and time, determining their quantitative changes in terms of hours of the day, days of the week, months of the year and the length of the routes, both for the entire transport network and for each route taken separately. allows revealing the main factors affecting the formation of passenger flows. Systematic study of passenger flows allows to determine their main fluctuation laws, to use the results of studies in organizing passenger transportation in the future.

Periodic research is conducted to obtain current information about fluctuations in passenger flows. The most common methods of researching passenger flows are questionnaires, vouchers, schet-natural (tabular), visual and automatic methods using EHM

Transportation around the city is the largest category of passenger connections served by rail and road transport. The distribution of transportation of passengers around the city on the territory of Uzbekistan is determined by the location of large cities. A large volume of transportation of

passengers around the city, including transportation on parallel routes with the railway, is served by road transport. In the southern regions of Uzbekistan, transportation of passengers around the city by railways is relatively small. The main part of transportation is carried out by road transport.

### **3.3. Quality indicators of providing transport services to passengers**

The quality of passenger service depends on the organization of the transport process, the structural characteristics and condition of the rolling stock and road, the development of the route network and other factors. Reliability and timeliness of transportation is one of the main indicators of evaluating the quality of passenger service. The movement of passenger transport according to the schedule without breaking the regularity creates the conditions for guaranteed participation of the population in time. This increases the demand for transportation and helps to increase the efficiency of transport work. Rail passenger transport has such important economic and environmental advantages and such high safety indicators that it will undoubtedly maintain its competitiveness in Uzbekistan not only for the next 10-15 years, but also in the long future. The concept of simple, complex and integral quality can be applied to passenger transportation.

The simple quality of passenger transportation with some important natural characteristic (indicator) of their consumption value, for example, the speed (time) of moving passengers when serving them on the road or at stations, or characterized by the level of comfort.

Complex quality is characterized by all the main natural characteristics (indicators) of their consumer value - safety, speed (time), level of service on the road and at stations, etc.

The integral quality of passenger transportation is characterized not only by the above-mentioned natural indicators of their consumption value, but also by the indicators of the costs (operational, capital or quoted) of their implementation.

In order to quantitatively assess the quality of passenger transportation, it is appropriate to divide the set of its descriptions into four subsets, each of which includes separate categories of the quality of passenger transportation, namely - safety (harmless to human health number of transports) or traffic accidents; the level of organization of the time movement of vehicles (frequency, rhythmicity, regularity, accuracy of movement, as well as the dependence of movement on external conditions); taking into account the waiting time or the speed of movement of passengers; ease of use of transport - a set of amenities provided to passengers at stations and roads, i.e. provides comfort.

Solving issues of improving the quality of passenger transportation requires synthesizing individual assessments within separate categories of transportation quality and then bringing them to a general quality indicator. Private indicators of the quality of passenger transport services are obtained on the basis of synthesizing the results of official statistical data, calculations and research of passenger flows. In the study of passenger flow, it is important to assess the quality of service both at stations and on the road with the participation of passengers themselves. Proposals made by passengers to improve service can be considered as passengers' demands for the quality of transportation.

#### **Questions for discussion and conclusions:**

1. Explain the characteristics of passenger transportation types of transport.
2. How are the descriptions of the main passenger flows reflected.
3. How is the average travel distance of passengers determined.

## **4-PRACTICAL TRAINING.**

### **TOPIC: CARGO TRANSPORTATION.**

**The purpose of the work:** Distribution of cargo transportation between modes of transport. Classification of main load currents. Shipping volume and turnover. Accurate door-to-door shipments. Quality indicators of transport services to cargo owners. Maintaining the quality of goods.

#### **General part.**

1. Characteristics of cargo transport types.
2. Shipping volume and turnover.
3. Problems of maintaining the quality of goods.

### **Distribution of cargo transportation between modes of transport**

The distribution of cargo transportation between modes of transport determines the place of each of them in the country's economy. The main quantitative indicators describing this distribution are the volume of cargo transportation (in tons) and cargo turnover (in ton-kilometers) carried out by one or another type of transport. The more generalizing of these two natural indicators is cargo turnover, which takes into account not only the volume of transported cargo, but also the distance of their transportation. The location of productive forces, development of natural resources in new regions, industrial and agricultural production in the country, development of capital construction and trade turnover have a great influence on the cargo circulation of all types of transport.

Over the past 25 years, cargo turnover in all types of transport in Uzbekistan has increased more than 60 times. In the country, railway transport is the historically leading type of transport, its share in the cargo turnover of all types of transport increased from 50% at the beginning of the 20th century to 85% by 1950. Later, with the development of new types of transport, especially road and pipeline transport, its share decreased to 53.2% in 1985. However, the absolute values of transportation and freight turnover on the railways of the USSR were constantly growing and in 1988, respectively, amounted to more than 4 billion tons and 3869 billion t-km. By this time, the cargo turnover of all types of transport in the USSR exceeded 7.8 trillion t-km, and the volume of transportation was approximately 32 billion tons. Then, in 1991, the disintegration of the USSR and the economic crisis had a negative impact on the volumes of cargo transportation in all modes of transport (they decreased in all former Union Republics). The change in economic relations also had a certain effect on the distribution of cargo transportation among the types of transport in Uzbekistan (tables 4.1, 4.2). The following can be seen from the tables: the general direction of these changes in the next 10 years is a sharp decrease in transportation and freight turnover in all types of transport, with relatively small changes in the share of each type of transport in the transport work.

In 1995, the share of railways in the cargo turnover of Uzbekistan's transport system decreased by approximately 3.4% compared to 1985 (from 53.2 to 49.8%), and in the volume of transportation - by 3.3% (12, from 3 to 9.0%). During this period, the share of motor transport increased by 3 and 4.5%, respectively. The share of pipeline transport in cargo turnover has increased (by about 5.5%, including gas pipeline networks). In terms of transport, the volume of work of river transport, although the value of export transport has increased by almost 2 times, has sharply decreased (more than 1.5 times).

It is also clear from the given data that in the transportation market of Uzbekistan, railway transport is the leading position as before in terms of the volume of transport work of the goods transfer system (in terms of cargo turnover). In this case, if for an objective comparison we exclude domestically produced (technological) transportation of automobile transport, then the share of railways in domestic freight turnover is two-thirds.

In terms of the size of the transport work, the pipeline transport has taken the second place in Uzbekistan. In 1995, taking into account the cargo turnover of main gas pipeline networks, its share in the work of the country's transport system was 26.7%, while the share of railways decreased to 49.8%.

The average distance of cargo transportation is of great importance in determining the place and role of one or another type of transport in the transport market. For example, it is about 1200 km on railways, and about 21 km in road transport. Therefore, road transport, occupying the first place among all types of transport in terms of the volume of transported goods takes the fourth place after railways, pipelines and sea transport in terms of cargo turnover. In the following years, it is necessary to note that the average distance of transportation in railway, marine transport and other types of transport has increased significantly. For example, in railways, it increased by 27% in 1995, compared to 1988, which was 940 km, despite the fact that the length of railways in the USSR was much larger. , especially explained by a sharp increase in the export of fuel and raw materials, an

increase in contradictory, excessively long, repetitive and other irrational transportations (they have increased by about 2 times and make up about 15-18% of the cargo turnover of railways) .

The average distance of cargo transportation in sea transport is the highest - about 4000 km. This is explained by the large share (almost 70%) of foreign trade carried out by the merchant marine fleet. However, its overall traffic volumes, especially in cabotage, have been declining in recent years.

Despite the fact that Uzbekistan has a large number of navigable rivers, the volume of transportation is relatively small compared to the share of domestic water transport, the main cargo flows with the directions of the rivers. It is connected with the incompatibility of the directions, for example, in the north of Siberia and the Far East, the Volga and the Chekka North, it is considered one of the main types of transport during the period of navigation (commuting) of bulk cargo.

Air transport is currently used sparingly in cargo transportation (its share in total cargo turnover is 0.05%). Its main purpose is to transport passengers. However, in the future, taking into account the vast expanses of Uzbekistan and the insufficient development of road infrastructure, especially in the eastern regions of the country, we can expect an increase in the transportation of some heavy goods by air transport. In the USA, more than 12 million tons of cargo are transported by this type of transport every year, and in Uzbekistan, this figure is on average 1.5-2 million tons. These are mainly urgent and extremely valuable cargoes, mail, matrices of newspapers, etc.

Cargo flows provide a concrete representation of transport-economic relations between production and cargo shippers and receivers, which arise in the process of commodity exchange and are distributed along various communication routes. They are characterized by the direction and dimensions of load transfer. These directions and dimensions depend on the location of production, shipping points, consumption points, storage bases, technological features of production and its specialization, the location of communication roads and the carrying capacity of transport, as well as the movement of goods. depends on the system of organization.

It is necessary to study cargo flows by analyzing the transport market, identifying excessive irrational transportation, determining the spheres of effective use of one or another type of transport and justifying their development prospects.

Cargo flows can be classified according to their destination, types of cargo and types of transport.

International, inter-regional, local and intra-household transport-economic links are distinguished by their purpose. International cargo flows provide transportation of goods between different countries and continents. Currently, interstate transportation between the CIS countries stands out among them. Inter-regional transportation of goods means exchange of goods between economic regions and regions of Uzbekistan. Sometimes these cargo flows are called interregional flows. Transports between points located within a single economic district, republic, country, region or transport union (railway, shipyard) are called intra-district, intra-regional or local transport. Intra-household or intra-production transport is the movement of goods within one enterprise.

**Questions for discussion and conclusions:**

1. Characteristics of cargo transport types.
2. Shipping volume and turnover.
3. Problems of maintaining the quality of goods.

## **5-PRACTICAL TRAINING.**

### **TOPIC: TECHNICAL AND ECONOMIC DESCRIPTION OF HIGHWAY TRANSPORT TYPES (RAILWAY, AUTOMOBILE Transport).**

**Purpose of work:** Technical and economic indicators of railway transport, development of railway transport, problems of railway transport. Technical and economic characteristics of motor transport. Formation of students' knowledge and skills about the problems of motor transport development.

## **General part.**

1. Railway transport, its characteristics and main indicators
2. Main technical and operational characteristics and technical equipment of railway transport.
3. Prospects of freight and passenger transportation by rail.
4. Prospects for the development of railway transport.
5. Motor transport basic technical equipment.
6. Special car transport.

### Main technical and operational characteristics and technical equipment of railway transport

The main elements of railway transport equipment include road devices (tracks), artificial structures, stations, vehicles, power supply devices, special tools for regulating train traffic and managing its operation.

The internal width between the tracks of the railway transport of our country, that is, the width of the track (track) is equal to 1520 mm according to the approved technical conditions. The width of railway tracks of other countries is 1435-1676 mm. Action in organizing the transportation process of all types of transport

safety requirements must be strictly observed. In accordance with the requirements of traffic safety, there is a special requirement for the distances of their approaches to railway tracks when building bridges and tunnels, freight and passenger platforms on railways. According to this requirement, the height of the devices on the main railways should not be less than 6400 mm and the width should not be less than 4900 mm.

According to the requirements of DSt, the overall height of vehicles (taking into account the loaded loads) is 4280-5300 mm and the width is 3150-3600 mm. Such designation is intended to ensure traffic safety.

Stations (places that receive trains and transfer them) separate railways into certain peregons (the distance between two adjacent stations or stations). At the same time, stations are one of the main production enterprises in railway transport, and in many cases represent the quality and volume of the work performed.

Railway transport stations are divided into an intermediate station, a section station, a train and wagon sorting station, a passenger station and a freight station.

An intermediate station is the smallest station in railway transport, in which, in addition to the main track, there are 2...3 stations, a smaller passenger building, and a freight department (loading-unloading and storage areas) depending on the size and nature of the work. , there will be communication and signaling devices.

Stations are built at intervals of 100-150 km, with 10 to 20 tracks, depot for locomotives, fuel and lubricants, water, sand, etc. there will be a farm and receiving and shipping warehouses, complex communication and signaling devices. Train and wagon sorting stations are established mainly in large urban and industrial centers, near river ports, at junctions and junctions of large cargo flows. Sorting stations are mainly involved in rerouting most of the trains that pass through the station.

Passenger stations are built in large cities and industrial centers and mainly or entirely serve passengers. They will have equipment and facilities for transporting passengers and their luggage.

Cargo stations are mainly stations that carry out large-scale loading and unloading operations.

In turn, cargo stops can be as follows:

cargo receiving stations - cargo loading and unloading stations - such stations are often organized in cargo transfer areas or interstate border areas, and cargo is transferred from one transport to another in such places;

stations intended for sending and receiving goods - the amount of sent and received goods at such stations is approximately equal.

Freight stations at major railway hubs are specialized for receiving and sending only certain types of cargo: stone (gravel), coal, wood, grain, construction materials, bulk cargo, containers, etc.

Vehicles in railway transport include locomotives, wagons and self-propelled motor-cars. Locomotives are the main active unit of railway transport and serve to move wagons. Locomotives specialize in passenger or cargo transportation. Locomotives specializing in freight transportation must have high acceleration dynamics, and locomotives hauling passenger trains must have high speed.

Motor cars are mainly electric cars and are used for short-distance passenger transportation.

Closed wagons, semi-closed wagons, platform or low-board wagons, tanks and isothermal wagons are used for cargo transportation.

The palace of passenger carriages includes soft carriages, compartment carriages, sitting carriages and restaurant, mail and baggage carriages. Apart from these, there are also special wagons in the wagon palaces.



compartment wagon



a wagon without a compartment

The main elements of road transport equipment include vehicles, highways and road transport enterprises.

Vehicles consist of cars, trucks, trailers and semi-trailers, which account for 60-70% of all investments. Cars and bikes are complex, have their own moving engines, and being an active unit of vehicles, characterizes the level of its technical development and operational and economic aspects. Semi-trailers and trailers do not have their own running engines, but consist of carts intended for the transportation of cargo and passengers. Trucks, in turn, can be used with trailers.

According to DSt requirements, all vehicles are divided into groups "A" and "B" operating on public roads and the third group operating outside public roads.

When the distance between axles is 2.5 meters and more, the force falling on the road surface from each axle of vehicles operating on roads of group "A" should not exceed 10 tk. So, such cars are designed to work on I and II categories, that is, on cement-concrete and asphalt-concrete roads.

When the distance between the axles of "B" cars is 2.5 meters or more, the force falling on the road surface from each of its axles should not exceed 6 tk. Therefore, such cars can work on all roads of the lower category (lightened surface) as well as high-category highways.

If the pavement is subjected to more than the above limit, it can fail quickly.

Group 3 or off-road vehicles are mainly heavy-duty vehicles that can only operate in quarries and on specially constructed quarry roads.

Special cars also include sports cars, and their main function is focused on the ability to increase speed.

The use of trucks and trucks as a train is one of the real ways to increase the productivity of vehicles.

Cars and trailers (semi-trailers) intended for cargo transportation are mainly classified according to their carrying capacity and body types.

The nominal load carrying capacity of the car and trailer (semi-trailer) is determined by the constructors of the factory that manufactures them. In this case, the main criterion should be the possibility of maximum loading of vehicles even in difficult road conditions.

The maximum dimensions of cars and auto-trains are limited to 24 meters in length, 2.5 meters in width and 3.8 meters in height (even when loaded) according to the requirements of DSt.

Road constructions will be built according to these gauge requirements.

Buses are vehicles intended for the transportation of a large number of passengers, and they are classified according to the capacity of the body according to the DSt requirement mentioned above:

- the smallest buses (passenger capacity up to 10 seats or gauge length up to 5 meters);
- small buses (passenger capacity 10...35 seats or gauge length 6.0...7.5 meters);
- medium-capacity buses (passenger capacity 35...60 seats or gauge length 8.0...9.5 meters);
- large-capacity buses (passenger capacity 60...100 seats or gauge length 10.5...12 meters);
- buses with the largest capacity (passenger capacity of more than 100 seats or overall length of 12...16.5 meters);
- the largest capacity and semi-trailer (combined) buses (with a passenger capacity of 160...190 seats or a gauge length of 16.5 meters or more).

Due to the fact that traffic safety is very important in the transportation of passengers, trailer bus trains have not been used until now, and their detailed construction has not been developed.

Special buses include buses designed for excursions, tourist trips and similar trips.

Depending on their functions and places of use, buses are divided into intra-city buses and inter-city buses.

Intercity buses are mostly wagon-type with a large capacity cabin.

The main requirement for buses traveling within the city is their quick departure from the station and the necessary acceleration. Because buses running on inner-city routes often stop and operate.

Therefore, it is very important for them to have the ability to move quickly and accelerate. The doors of city buses, the passage and accommodation of passengers should be widened, the number of doors should not be less than two, because one of them is used for getting off and the other for getting off.

Buses traveling on intercity routes should be designed for fast travel and maximum comfort and convenience for passengers. The maximum speed of such buses can be 120 km/h and more.

#### **Questions for discussion and conclusions:**

1. What are the main technical equipment of motor transport?
2. What types of cars are divided according to their function?
3. How are trucks grouped according to carrying capacity?
4. What are the classes of buses?

## **6-PRACTICAL TRAINING.**

## **TOPIC: TECHNICAL AND ECONOMIC DESCRIPTION OF INDUSTRIAL TRANSPORT AND DEVELOPMENT PROBLEMS**

**The purpose of the work:** The formation of students' knowledge and skills about the description and technical means of industrial transport, the specific technical and economic characteristics of industrial transport.

### **General part.**

1. Description of industrial transport and technical means
2. Specific technical and economic characteristics of industrial transport

**Key words:** external transport, intra-enterprise transport, conveyor, transporter, kara, dumkar, pipeline, cableways

### **Description of industrial transport and equipment**

The embodied concept of "industrial transport" refers to non-public vehicles serving industry, construction, agriculture and other enterprises.

Industrial transport is divided into external and internal transport according to its location and tasks.

External industrial vehicles carry out the transportation of raw materials, semi-finished products, fuel and other various goods brought to the enterprise from the general highway transport to the enterprise and finished products and empty wagons to the highways.

Industrial transport within the enterprise deals with the transportation of raw materials, semi-finished products, various parts, fuel and other goods from warehouses to workshops, between workshops and within workshops, and finished goods from workshops to warehouses.

Industrial transport can be different in terms of technical equipment - a complex of railway, car, water, pipeline and special transport (monorail, cable car, etc.) or some of them. . In addition, it can include various conveyors and conveyors operating within and between workshops, trucks working with electric or car power, and others.

Foreign industrial transport mainly consists of railway and road transport. Enterprises on the banks of waterways use water transport vehicles, may have their own water ships and stations. Railway stations and vehicles inside enterprises and shops are used for transportation of large cargoes and certain types of cargoes.

Now, more than 95 percent of industrial external transport and inter-industry cargo transportation is carried out by rail and road transport. In 2000, the total length of railway substations within industrial and construction enterprises in the Republic of Uzbekistan was 2.6 thousand kilometers. This indicator approaches the length of the main railway line in general use. According to statistical data, the number of industrial railway stations decreased by 1100 km by 2000 compared to 1995. It is said that 1100 km of industrial railway transport substations have been put under temporary conservation. This situation has a negative impact on the economy of the owners of these railway stations. That's why it is necessary to carefully study this issue together with the owners of the railway branch property, their high-level shareholders' associations and local authorities, and to restore the work of the railway branches and help improve the economy of the local owners.

More than half of the vehicles owned by industrial enterprises are electric locomotives and diesel locomotives.

Electric off-road trucks and dump trucks are used as industrial transport in the open-pit mining areas of most mines.

The wagons used in industrial railway transport are mainly composed of wagons of the main railway transport, one third of which are open platforms with small boards, and one part of the network is dumkars (engines are installed on each axle and the load is tipping wagons), one-fifth are semi-wagons, about ten percent are tanks, and the rest are other types of wagons.

Japanese Kamatsu, German TR-60 Terex, US Caterpillar, and Swedish Euclid models with a lifting capacity of 70...170 t for working in deep areas of open pit mines car trains are used. In the future, it should be assumed that the carrying capacity of motor trains will be 200 tons and more. In

addition, there are about 10 water vessels and other transport equipment at the industrial enterprises along the Amudarya waterways.

Specific technical and economic characteristics of industrial transport

Transport belonging to industrial enterprises differs from highway transport by a number of specific features.

Transports belonging to industrial enterprises use different types of transport both for external and internal transport, as well as for short-distance transport. In many cases, the tasks of industrial transport are performed by railway and road transports, they are engaged in the transportation of large quantities of goods within enterprises or on railway transport highways and external communication routes between enterprises. For example, in 2000, 144.1 mln. It was noted that a ton of cargo was transported for an average distance of 9.5 kilometers, and this was 2.93 times more than the total amount of cargo transported on the main railways. 80 percent of the total volume of loading and unloading works on railways is carried out at industrial railway stations.

According to the above, due to the presence of many thousands of workers in industrial transport, the share of expenses spent on them in the cost of production products is also large.

Industrial enterprises have transport equipment adapted or specialized for the type and description of transported loads.

The cost of transportation of goods in transport belonging to industrial enterprises is much higher (expensive) than the cost of transportation of goods in types of highway transport. This is explained by the fact that short-distance cargo transportation, with the costs of initial and final work being equal, has less turnover in the same period of time.

Industrial railway transport makes about half of the total foreign transport. The rest of the external cargo transport connections are carried out using cars, conveyors and other types of transport in industrial enterprises.

Wider development of industrial railway transport (especially electrified) with economic efficiency is desirable for transportation of large quantities of goods. The economic significance of the expansion of electrified railways is especially great in places where open-pit mining is carried out.

Among the specific aspects of industrial railway transport, the following can be included: low total weight of trains and speed (15..40 km/h); small cargo capacity; the turning points of the traces are in small radii, and the magnitude of the relative elevations; short distances between stations; the fact that in many places railway tracks are crossed by highways; non-transportation of passengers, etc.

#### **Questions for discussion and conclusions:**

1. What are the main technical equipment of industrial transport?
2. What are the types of industrial transport according to its function?
3. What types of transport are included in foreign industrial transport?
4. What are the specific features of industrial railway transport?
5. What is the disadvantage of industrial transport?

## **7-PRACTICAL TRAINING.**

### **TOPIC: URBAN AND SUBURBAN TRANSPORT.**

**The purpose of the work:** Specific features of providing transport services to the city and other population centers. Areas of rational use of various types of urban and suburban transport. Design of integrated transport schemes of cities. Transport network design sequence. Transport nodes.

#### **General part.**

1. City transport networks and technical equipment
2. Specific features of providing transport services to population centers
3. Areas of rational use of various types of suburban transport

#### 4. Problems of further development of urban transport

##### **Peculiarities of providing transport services to cities and other settlements**

A city is a settlement whose population has reached a certain value (usually not less than 2-5 thousand) and which mainly performs industrial, transport, trade, cultural, administrative and political functions. District, regional, country and republican cities are different. According to the calculations of sociologists, in 2000, 80% of the world's population lived in cities, and 53% of the urban population in Uzbekistan. With the growth of cities and the concentration of population in them, the problem of transportation grows in them. The flow of passengers in cities is 15 times higher than the flow of passengers on highways. Urban and suburban transport provides a transport system that combines several types of transport, which carries out transportation of people and goods in the city and near-city areas, as well as works on the improvement of the city. The city transport system is a part of the multi-sectoral urban economy and means of transport (rolling stock); road facilities (railways, tunnels, flyovers, bridges, overpasses, stations, parking places); wharves and boat stations; power supply devices (electric substations, cable and contact networks, gas stations); repair workshops and factories; depot, garages, service stations; car rental points; includes line communication tools, signaling tools, blocking tools, traffic dispatch control. The city transport system also includes bicycles, and in developed countries, special bicycle lanes are allocated for it on sidewalks.

City transport is classified according to the following: by the type of traction (electric transport, road transport); in relation to the territory of the city (street transport, transport on separate lanes, non-street transport); by speed (normal, fast, high-speed); according to the technology of route organization (ordinary, semi-express, express); by carrying capacity (low, small, medium, high).

Transportation of passengers in the cities of Uzbekistan is carried out by all types of modern transport. In recent years, the share of transportation by private vehicles is increasing. In 1995, passenger transportation was distributed among types of urban transport as follows, %:

Bus 42

Trolleybus 12.8

Tram 10.2

Metropolitan 6.0

Taxi, departmental and private vehicles 29

The working volume of passenger transport depends on the following main factors: the number of inhabitants, the character of the settlement of the population, the organization of urban planning, the mutual location of residential and industrial zones, terrain conditions - and is determined according to the following formula:

Here,  $N$  is the number of city residents,  $b$  is traffic mobility, and  $L$  is the average distance traveled by a passenger.

Transport mobility is the number of trips per resident per year. The transport mobility of the population is affected not only by the main factors that determine the volume of work of passenger transport, but also by the well-being of the population, the level of development of the urban transport network, and its social and cultural importance. A characteristic feature of the formation of the city's passenger flow is two clearly expressed time periods: morning and evening rush hour (going to work and returning). Half of all passenger transportation is work-related, which is important because of its obligation, punctuality, repeatability, and regularity.

In the city, goods are transported mainly by road transport. The traffic speed and the capacity of the streets decrease in the mixed flow of freight transport with cars, for example, when the share of freight traffic increases from 20% to 70%, the speed of the flow decreases to 10 km/h. In many cities of the world, the movement of goods is prohibited or limited in the central regions on holidays and weekends. Some cargoes are delivered at night (when the intensity of traffic decreases), transit movement through the city is prohibited.

Transportation of goods in the city can be carried out by railway. The main disadvantage of such transports is the occupation of the city area and the inconvenience of interactions with other traffic, as well as significant noise. In the city, the movement of goods along ropeways is limited. A freight trolley is sometimes involved in the transportation of commercial goods from warehouses and enterprises to stores. Passenger-cargo buses are used in suburban connections.

#### **Areas of rational use of various types of urban and suburban transport**

Electrified railways are used as the main type of transport for suburban passengers and their correspondence with the city. In large cities of the country and abroad, the starting sections of railway lines are widely used as urban transport. Electric trains carry out a large volume of passenger transportation around the city. This type of transport is characterized by relatively low cost, high throughput and high connection speeds. The length of railways in the city area can be 15 km or more, which creates additional convenience for commuters traveling around the city (possibility of getting there without changing). In order to make it convenient for passengers, it is very important to connect railways with other types of transport, in particular with the metro, at single transport nodes.

Metro is generally considered non-street transport, which provides fast, safe and comfortable connections (in Moscow and Tokyo 80-90% of all roads, in London, Paris and New York - 50- 60% is underground). In some lines, automatic train control and speed regulation are possible. Abroad (England, Switzerland, the USA and other countries) there is a freight metro (a 10.5 km metro line in London connects two post offices with major communication enterprises, a 100 km Chicago freight metro has three coal loading stations and includes 96 vertical elevators, it is connected to warehouses, commodity bases, railway stations). Moscow, Berlin, Warsaw, Sofia, Zurich and other cities have local systems of underground tunnels for cargo and mail, which significantly reduces the need for surface transport. In some countries, high-speed metro lines have been built (sometimes parallel to existing lines to reduce the load on them) to quickly connect with distant regions, for example, RER in Paris, BART in San Francisco.

In cities with a population of over 500,000, the tram is used as the main mode of transport when the steady flow of passengers exceeds 9,000 passengers/hour. When the industrial zone is far from the main area and there are sufficiently powerful and stable currents, it is appropriate to use a fast tram, in the central parts of the city its routes can go underground

Monorail transport is suitable for connecting large residential areas with industrial zones located far from them, settlements with places of work, as well as external lines connecting the last stations of urban transport with suburbs, airports, recreation areas, satellite towns. . In the built-up parts of the city, it will not be appropriate (sometimes impossible) to use it due to the huge supports on which the hammer-monorail rides, large turning radii, vibration and noise. According to many experts, it is unlikely that it will be appropriate to use monorails in their pure form in the future. However, today his idea is widely used in new urban transport systems.

Hang-glider transport is one of the oldest types of transport (appeared since the 14th century). The first ropeway in Europe was built in 1866. Funiculars (type of rail transport) and ropeways are used to connect with recreation zones, residential areas, and sports complexes in cities located in mountains and hills. Their carrying capacity is not so great, therefore they are considered auxiliary transport of local importance.

Due to its seasonality, water transport does not play a significant role in the transportation of passengers in the city and is used to connect the city with recreational areas (inside or outside the city).

Air transport (helicopter) is of very limited importance. It is used to connect regions with airports, places of work (for example, with oil fields in the case of time-based work). If noise is reduced in urban conditions and flight safety is increased, the role of helicopter connections in the future may increase as a fast transport.

Bicycles are widely used as cargo transport (taxi-rickshaws) for small batches of passengers and goods in eastern countries. It is also used in Europe as an individual transport (city and suburban). For example, in Germany there are 650 bicycles per 100 inhabitants, in the USA - 430, in Switzerland - 350, in Eastern European countries - 150-200.

The field of taxi transport is determined by high connection speeds, comfort, and "door-to-door" delivery of passengers. It is used for emergency services, for transportation of passengers with luggage, in emergency situations, during public transport breaks. The average taxi distance is 3-8 km in the city, 15-20 km outside the city. Car-taxi is characterized by a high intensity of operation (13-14 hours per day with 300-400 km of travel). In recent years, the number of private taxis operating under licenses in Uzbekistan is increasing.

The transport network should help solve the task of reducing the total time spent on commuting, which includes the main task of transport - walking, waiting, commuting and sitting. Therefore, accessibility to transport is a very important indicator for passenger transportation. It is the inverse of the average time spent by a passenger to get to a certain attraction point. Requirements for transport accessibility are as follows. In very large and large cities, up to 80% of work-related migrations should be carried out within 1 hour, in large and medium-sized cities - within 40 minutes (at most); when going to recreation areas, this time should not exceed 120 minutes for large cities, and 90 minutes for large and medium-sized cities.

In order to obtain reliable data for the design of collective transport schemes, periodic full and partial research of passenger flows and vehicle traffic in order to reorganize the load intensity and traffic of highways, in particular, to increase the speed of mass passenger transport will be held.

The following requirements are imposed on the transport network: ensuring the standard time of connection to work and all residential areas with the main attraction areas; compliance of transportation capacity with the calculated passenger flow at peak times; designing transport stops by approximately 500 m, and in the case of fast transport types - with an increase in the distance between stops (1-2 km); taking intersections from a complex node to an edge.

### **Environmental problems**

Transport is the main source of pollution in cities. Transport facilities occupy up to 7% of the territory, and in cities - up to 20-30% (in the central parts of some cities - up to 40-50%), therefore land pollution is considered the first environmental problem. One of the ways to effectively solve the problem of urban area occupancy, for example, is the use of underground space for temporary and permanent parking places for vehicles, high-speed tram, bus routes, etc. 4.5-7 hectares of land is required for 1 km of six-lane highway above ground, and 0.1 ha for underground.

Abroad (especially in England, Indonesia, and Japan), the practice of building suspension roads or roads on artificial floating islands in the sea area for various types of transport is becoming more and more widespread. However, bringing transport systems into tunnels or overpasses increases their cost by 4 times or more.

Disruption of the soil water system (natural water circulation) during the construction of transport facilities can be considered a major environmental problem, which damages the land and the facilities themselves due to the great erosive power of water. It will be necessary to build expensive water removal facilities.

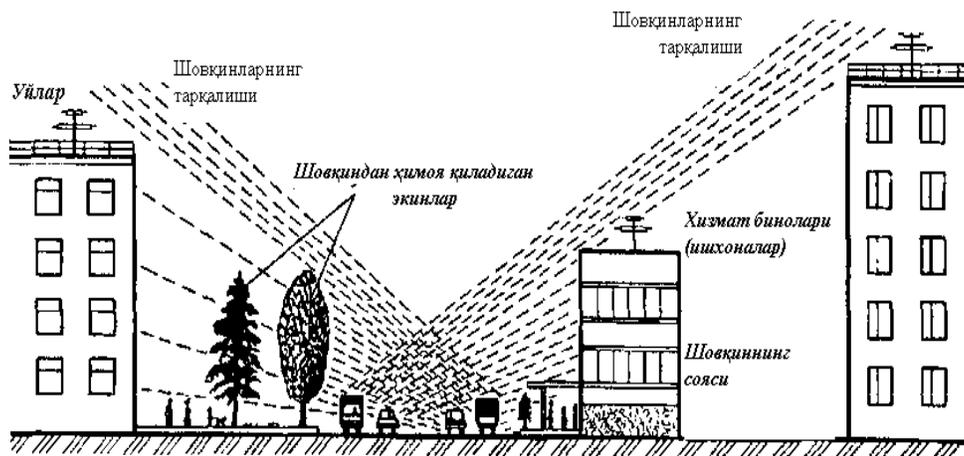
Contamination of soil with gasoline, oils, solid and liquid structural components, salts used in the fight against freezing is considered an acute problem (3-4 tons of salt are sprinkled per 1 km of the road in a year, and up to 100 tons of salt in the years when the winter is unfavorable).

The second environmental problem is water pollution. 95% of the water used for technological needs in transport becomes unsuitable for drinking (gasoline soaks into the soil 7 times faster than water). Water transport types pollute water bodies with ballast and washing waters (75-80% of pollution), and evaporation of crude oil (3%) and gasoline (2%) during their transportation and intermediate storage. One ton of oil pollutes up to 10-12 square km of water surface, and petroleum oils spread more than 300 km from the source of pollution. The International Convention on Civil Liability for Oil Pollution Damage has strictly defined the list of substances whose residues can only be disposed of at reception facilities. According to US researchers, ships produce up to 1.5 kg of dry waste and up to 2 kg of food waste per person, while in coastal conditions this figure is 0.04 and 0.27 kg.

The third environmental problem is air pollution (91.3% of pollution is caused by road transport, 3.7% by rail transport, 2.7% by sea transport, 0.9% by river transport and 1.4% corresponds to the share of air transport).

Table 7.4 shows the comparative emissions of harmful substances released from cars for Uzbekistan and Western European countries.

One car consumes the same amount of oxygen as one person consumes in a year to travel 900 km. According to American researchers, up to 50,000 people die prematurely from smoke poisoning every year. In Switzerland, it was found that people who live near a busy highway are 9 times more likely to get cancer than people who live 400 m away from it. An increase in traffic intensity from 400 to 1000 cars/hour increases the emission of toxic gases by 4 times, which requires changing the organization of traffic, moving transit traffic out of the city, and reducing the intensity of traffic in the central parts of the city.



**Distribution scheme of street noise.**

Noise pollution is a relatively new problem. Noise is called an invisible poison, it harms people's health. Noise is a physical pollution like vibration, electromagnetic and radioactive radiation. According to foreign data, transport produces 45%, aviation - up to 2%, industry - 30% of urban noise. Noise from transport is growing faster than its speed.

Reversible hearing loss occurs at 100 dB of constant noise (for this reason, for example, shooting training should be carried out in special helmets that protect against noise): the most extreme level of noise intensity that causes pain sensations is 130 dB; Death can occur at 200 dB of noise.

**Questions for discussion and conclusions:**

1. Negative consequences of automobileization of the urban environment.
2. Norms of noise propagation in cars in the urban environment.
3. What are the main measures to reduce air pollution.

**8- PRACTICAL TRAINING.**

**TOPIC: PRINCIPLES AND METHODS OF SELECTION OF TRANSPORT TYPES.**

**The purpose of the work:** Principles of choice of transport types by consumers of transport services. Methods of choosing the type of transport for transporting goods. Methods of choosing the type of transport for passenger transportation. Areas of effective use of various types of transport.

**General part.**

1. Principles of choosing transport types by consumers of transport services.
2. Ways to choose the type of transport for cargo transportation.
3. Ways of choosing the type of transport for transporting passengers.
4. Areas of effective use of various types of transport.

Principles of choice of transport types by consumers of transport services. The problem of delivering goods and moving passengers is one of the main problems in the creation of production and economic systems and settlements in the country. It is necessary to distinguish between the current and future (strategic) conditions of such a choice. In the first case, consumers of transport

services make a choice from the existing modes of transport in the country or region, and in the second case, they choose taking into account their possible development and the creation of new ways of moving goods and people. Accordingly, the consideration of moving expenses is also different. In the current conditions, when choosing the channels for the movement of goods or passengers, tariff payments for transportation and other services are taken into account, and in the calculations for the future, the mentioned operation and construction costs are taken into account. In both cases, in addition to the cost of transportation, the distance, terms and speed of delivery, universality and productivity of transport, level of storage of cargo and safety of transportation, comprehensiveness and convenience of providing transport services to customers and other indicators are taken into account.

Such a choice can significantly expand during the period of structural reconstruction of the economy and significant changes in the volume and geography of transportation. It can have a serious impact on the development of the country's transport and road complex. For example, the competition between railway transport and road transport has grown significantly not only for short-distance, but also for medium and long-distance transportation. The competition between railways and air transport in passenger transportation is also growing. Competition between railways and road transport is also increasing in suburban and local connections. This gives a new impetus to the search for new intermodal technologies, the improvement of the quality of transport services to consumers of transport services, the use of logistics and marketing principles in the organization of transport. Accordingly, the possibility of choosing the type of transport, taking into account the technical and economic indicators and competitiveness of each of them, also increases.

So, what are the main principles of choosing modes of transport?

The first and fundamental principle is that the choice of the type of transport or the method of movement is carried out by the consumers of transport services themselves, in contrast to the centralized distribution that was previously practiced in the field of cargo transportation. This means that transport workers will have to learn to sell (not distribute) transport services in the transport market.

From this comes the second principle - the main criterion for choosing the type of transport is the cost of transport services. Additional (in some cases, decisive) criteria may be minimum moving periods, transportation reliability, safety, environmental friendliness, cargo storage and other indicators.

The third principle is that comparable transport options can be compared in terms of value indicators and natural indicators. When moving cargo from the shipper's warehouse to the consignee's warehouse ("door-to-door") or the passenger's "door-to-door" journey, all elements of the cost of the entire journey are compared, including possible intermediate reloading of the cargo and either The transfer of passengers to another transport is also taken into account. In this case, it will be necessary to make the differences in the content of costs comparable to the types of transport and the operations of the transportation process. It is necessary to carry out the calculations according to the options for the same volume of transportation between the same points.

The fourth principle is that consumers of transport services, in particular through advertising, have a good forwarding service in terms of customer service, and due to the development of marketing approaches in the work of a transport company, reliable and ensure sufficient awareness. Objective information about transport services is more convenient for consumers to perform comparative calculations to optimize their transport costs, to rationalize transport and to place orders more efficiently, to sell their products. it allows to determine the markets, control the transport composition in the price of goods and services.

The listed principles determine to a large extent the method of selecting transport types, these methods differ among themselves in the way and completeness of taking into account one or another comparable factors (indicators). Taking into account the fact that it is very difficult to take into account a large number of factors that affect the choice of the type of transport at the same time, in practice, first generalizing value indicators are considered, and then, depending on the needs and opportunities, natural and operational-technical factors. indicators are compared.

### **Methods of choosing the type of transport for transporting goods**

When choosing the type of transport for cargo transportation, it is necessary to distinguish between the methods of calculating the economic effect of the selected transport option (type of transport) and the methods of determining the rational spheres of using this or that type of transport or the distances of equal benefit. Although in both cases the costs of transportation of goods for each of the considered types of transport are compared, the calculation methods and algorithms are different. In addition, depending on the calculation period or conditions (current or future), the content of the cost elements in the compared transportation options may change.

The main elements of transport costs of cargo owners are divided into four groups: costs of loading-unloading or reloading operations; the costs of bringing goods to and from highway transport; expenses for moving the cargo itself, including initial and final operations and movement operations; additional costs associated with cargo loss, environmental protection, etc.

In addition to the listed costs, cargo owners may incur different costs depending on the type of transport. They include, for example, the cost of the container, fees for cargo storage at the initial, intermediate and final points, insurance fees, etc.

Taking into account some specific features of the determination of aggregate costs in the option of railway transportation, the number of the scheme	Transportation scheme	Number of cargo operations	
		Total	Including reloading
1	P1 - m - p2	2	0
2	P1 - M - A,	4	2
3	A1 - M - P2	4	2
4	A1 - M - A2	6	4
5	P1 - m - p2- a2	4	2
6	a, - P, - m - P2	4	2
7	A[- M - P2- A2	6	4
8	A1 - P, - M - A2	6	4
9	A1 - P, - M - P2- A2	6	4

The transport option is determined by the type of transport that performs the main part of the transport work in terms of the distance of moving the load. There are rail, road, river (water), pipeline and mixed options of transportation. The simplest scheme of transportation is transportation by car option, in which the delivery of goods, as a rule, is carried out directly from the warehouse of the sender to the warehouse of the recipient without reloading. The railway and mixed (railway-water, pipeline-railway, etc.) transportation scheme is considered the most complicated. True, the rail option also has a simple and efficient transportation scheme, where the senders and receivers of goods will have inbound and outbound railways connecting them with the main railways. More than 75% of all cargo is transported under this scheme. However, it should be taken into account that even in these cases it is often necessary to deliver goods directly from rail warehouses to places of consumption by road transport.

There are four modes of transportation in mixed rail-water connections (rail-water and water-rail with one reloading of cargo; water-railway-water with double reloading of cargo and rail-water-rail). A large number of calculations show that transport with mixed connection with double reloading is not profitable, as a rule, in terms of economic indicators. Calculating the costs of each correspondence and all possible options of transportation is a huge task, but it is more accurate, because it allows to take into account the specific conditions of transportation and not the "average" and determine the real savings in transportation costs. . In order to simplify the procedure for selecting transport modes, in practice, predetermined rational spheres of the use of transport modes

or equally useful (most extreme) distances are often used. The outermost distances are especially used when deciding whether to use the rail or road transportation option.

Equally useful distance that limits the spheres of use of transport types when other (additional) costs are equal under typical transportation conditions:

$$l_p = [(Z_{HKJ} + z_{пер} Z_{пер}) - Z_{HKa}] / (Z_{да} - Z_{дж}),$$

where  $Z_{nkj}$ ,  $Z_{nka}$  - comparative costs (tariff rates) of the initial and final operations of the transport process, loading and unloading, as well as the costs of providing the rolling stock on the entry-exit routes, respectively, in the case of rail and road transportation including, r./t;  $Z_{per}$  is the number of reloading operations related to railway transport schemes (see table 10.1);  $Z_{per}$  — relative costs (tariff rates) of transshipment operations from road transport to rail transport and vice versa, r /t,  $Z_{dj}$ ,  $Z_{da}$  — relative costs (tariff rates) of traffic operations in rail and road transport options, respectively, p /t • km.

### **Methods of choosing the type of transport for passenger transportation**

The main factors affecting the choice of the type of transport for transporting passengers are: the purpose of the passenger's trip; duration (time) of walking on the road; convenience of the traffic schedule; quality of service at ticket offices, stations and on the road; comfort and convenience of participation; the proximity of the point of departure and the point of destination and the ease of arrival and departure to these points, etc.

Saving the working time of the population and rational use of their free time will be equally strong as the development of production forces and the increase of the national wealth of the society. Saving time includes all savings in a broad sense. Based on this, the proper organization of passenger transportation is an important socio-economic problem of the country. Every year, the population of Uzbekistan spends about 9 billion man-hours on commuting outside the city by all types of transport, which is equivalent to more than 1 million people on the road day and night. Even if the working population is half of this number, it is self-evident that this is a huge loss of productive forces in the country. therefore, the time or speed of passengers' movement is one of the decisive criteria for choosing the type of transport for transporting passengers.

It is necessary to distinguish the conditions under which the decision to choose the type of transport for passenger transportation is made: for the present and for the future. In the first case, the decision is made by the passenger based on his opinion about the services provided to him by this or that type of transport, focusing on the convenience of the schedule, the prices of participation, that is, tickets and baggage allowance. walking prices are compared. Various tariff preferences, discounts, advertising and other methods of attracting passengers have a great influence on the choice.

### **Areas of effective use of various types of transport**

The spheres of more effective use of various types of transport are determined by their technical and economic characteristics, transport prices and the location of the transport infrastructure across the country. In this case, it is about spheres established by competing transport lines based on the calculation of the comparative efficiency of several transport options. In some cases, there is a natural monopoly of certain types of transport, in such conditions, determining the field of application of transport does not require special calculations. For example, mass intercontinental transportation and communication of the country with the islands is mainly carried out by sea transport. Air transport is used more for the delivery of urgent and valuable goods, as well as for the transportation of passengers over long distances. Gas pipeline networks and, in most cases, oil pipeline networks are natural monopolists. It is considered appropriate to carry out mass transportation of fuel and raw materials on land by rail transport.

At the same time, when planning and organizing transportation, it is often necessary to choose between competing options for cargo delivery and passenger transportation. Since it is not always possible to carry out detailed comparative calculations, pre-based typified spheres of the use of transport types are used for cargo transportation. They differ in terms of types of cargo, possible spheres of transportation, types of connections and conditions of transportation.

Transport distances of 100-200 km are considered to be conditionally short, 200 to 800 km are average, 800 to 1500 km are long, and distances of more than 1500-2000 km are considered to be extremely long distances. According to this classification of distances for cargo transportation, the following main spheres of economically appropriate use of various types of transport are included.

Railway transport is used more efficiently for medium and long distances, and when cargo owners who correspond with cargo have inbound and outbound railways - for short distances. Railways are very useful for long-distance transportation of coal, iron ore, ferrous and non-ferrous metal ores, wood materials, chemical and mineral fertilizers and some other goods. In some cases, in intermodal transportation, when there are technological routes and stable cargo flows, railways can compete both in medium-distance and short-distance delivery of goods.

The traditional field of automobile transport is short distances. If earlier distances of 50-100 km were considered short distances, now they have increased to 200-300 km due to technical development in the automobile industry and the expansion of the road network.

A unique advantage of the vehicle is the direct delivery of goods according to the "door-to-door" scheme. This significantly increases its competitiveness and expands the field of use. Road transport is especially widely used in industrial centers, in mining and agricultural regions, as well as for bringing goods to highway transport and delivering them to consumers. Trucks are used for long intercity and international transportation. However, the increase in fuel prices and the low environmental friendliness of motor vehicles require additional justification of the spheres of its use.

Spheres where river transport is used more often are direct transportation of bulk cargo between points located on the same river route, in regions without other modes of transport, as well as in mixed connections with other modes of transport without reloading by one mode of transport. is medium and long distance transportation in routes that are more efficient than direct transportation. The use of "river-sea" mixed floating ships, connecting the basins of different rivers with canals, construction of hydrotechnical structures, etc., significantly expands the spheres of application of river transport.

It is effective to use air transport to transport valuable, urgent and perishable goods over long and extremely long distances to industrial centers and the far northern regions of the country. The main field of air transport is the transportation of passengers, therefore, a large part of cargo transportation is carried out in the order of additional loading on passenger planes.

Pipeline transport can be used for short, medium, long and ultra-long distances. It all depends on the type of load, the power of the load flow and the diameter of the pipe. Natural gas is usually transported over long distances, including export, through pipelines with a diameter of 1220 and 1400 mm, and over short distances through small diameter pipelines. Oil and oil products are driven from 500 to 3-5 thousand km. Dry cargo (coal, ore, sand, crushed stone, gravel) is transported by hydraulic or pneumatic container pipeline transport for a distance of 20-50 km. Coal is transported along pipelines up to 250 km and more.

The spheres of the use of types of transport in the field of passenger transportation include the development of the transport infrastructure of the regions, the presence of highway transport types with settlements, passenger delivery speeds, tariffs, the regularity and convenience of the traffic schedule, the purpose of travel, the quality of transport services, etc. depends. Rail transport is used for short distances (suburban), medium (local) and long distances. Most of the transportation within the city and around the city, especially in the directions without railway connections, is carried out by bus transport. Intercity transport by buses often competes with railway transport at distances of 500-800 km. Carrying out long- and ultra-long-distance transportation by air is more profitable in many respects. However, if it is necessary to travel a long distance (800-1000 km) in one night (10-12 hours) and normal rest and sleep are provided on the train, then the passenger prefers the railway.

#### **Questions for discussion and conclusions:**

1. Principles of choosing transport types by consumers of transport services.
2. Ways to choose the type of transport for cargo transportation.
3. Ways of choosing the type of transport for transporting passengers.

4. Areas of effective use of various types of transport.

## 9-PRACTICAL TRAINING

### TOPIC: ROAD INFRASTRUCTURE

**Purpose of the work:** Classification of highways. The main elements of highways. Road transport is taking an increasingly important place in the transportation of goods and passengers. There is a constant increase in the volume and assortment of automobile transport.

#### General part.

1. Classification of highways. The main elements of highways.
2. Automobile transport is taking an increasingly important place in the transportation of goods and passengers.
3. There is a constant increase in the volume and assortment of automobile transport.

The technical and economic characteristics of the main road transport are as follows:

- high mobility (maneuverability allows you to quickly concentrate the required number of vehicles and, if necessary, quickly move them to another place);
- the ability to receive cargo and passengers directly at the place of their origin and deliver them to the "door-to-door" address, without intermediate loading and unloading operations and passenger transfers, therefore without additional costs for these operations;
- ability to provide service to individual and small load generating points;
- sufficiently high speed.

The following requirements are imposed on the car on the road:

- possibility of safe movement of vehicles with design speed;
- ensuring transition from the given prospective intensity of traffic;
- ensuring the passage of vehicles with a certain transport capacity without accumulation of plastic deformations and damage to the road surface during the service life of the pavement;
- ease of movement for drivers and passengers;
- the road must be in harmony with the landscape, must be viewed along the road at a distance not less than the sight distance of the car, without defects;
- the surrounding traffic situation should convey the most optimal information in order not to overload the driver's mind, as well as not to give him the opportunity to fall into a sluggish state.

In accordance with the Federal Law of the Russian Federation dated November 8, 2007 No. 257-FZ "On Motorways and Traffic in the Russian Federation and on Amendments to Certain Legislation of the Russian Federation". highway is a transport infrastructure object designed for the movement of vehicles and its technological part, highways and structural elements located under them or under them (road bed, road surface, etc. similar elements) and includes land plots within the boundaries of road structures. , - protective road structures, artificial road structures, production buildings, road construction elements.

Depending on the tasks to be solved, highways are classified as follows:

- according to administrative importance;
- travel conditions and access to them;
- functional purpose;
- categories based on transport and operational and consumer characteristics.

Federal laws No. 257-FZ "On highways and traffic in the Russian Federation" and "On the general principles of the organization of local self-government in the Russian Federation" Kv 131 According to FZ, highways are divided into three groups depending on their importance:

- of federal importance;
- regional or intercity importance;
- of local importance (motorways of municipalities), which in turn are divided into roads of rural settlements; roads of urban settlements, including urban districts and intercity roads.

Depending on the type of permitted use, they are divided into public access roads and non-public access roads.

Motorways refer to highways that are not intended to serve contiguous areas. Highways have multiple carriageways along their entire length, and the non-traffic central divide does not intersect other highways at the same level, as well as railways, tramways, bicycle and footpaths. Access to highways is done through grade crossings with other highways no more than every 5 km. It is prohibited to stop and park in the traffic section or the traffic section of the roads. Motorways are equipped with special rest areas and parking spaces for vehicles.

Motorways belonging to highways must be specifically designated as highways.

High-speed highways are multi-lane carriageways along their entire length, with a central dividing line and with highways, railways, tramways, bicycle and pedestrian paths. paths that do not intersect at the same level. Access to the expressways is through intersections of different levels and intersections of the same level (without directly crossing the flow of traffic) located at a distance of 3 km from each other. It is prohibited to stop and park vehicles in the traffic area or in the traffic area.

Regular roads Motorways not classified as motorways and expressways. They can have one or more traffic sections.

Roads are divided into the following categories, depending on their importance in the general transport network of the Russian Federation and the volume of estimated traffic intensity

Classification of roads

Class I roads with multi-lane carriageway are designed for high-speed transport of goods and passengers, connecting the main economic regions and major cities of the country. They form the basis of the country's road network - 1.4% of the total road length.

Class II-III roads are used for intercity road traffic between some subjects of the Russian Federation and the busiest routes within the subjects of the Russian Federation, which is 27.6% of total roads.

The road category is determined based on prospective (for 20 years) calculated traffic intensity, for which the average annual daily traffic intensity obtained on the basis of the data of total economic studies in both directions is reduced to passenger cars according to the formula.

**Questions for discussion and conclusion:**

1. Classification of highways. Main elements of highways.
2. The role of road transport in the transportation of goods and passengers
3. Volume and assortment of road transport

## **10-PRACTICAL TRAINING.**

### **TOPIC: LEGAL RELATIONS IN TRANSPORT.**

**Purpose of work:** Contractual relations in domestic and international transportation. Documents in transport. Responsibility of cargo owners and carriers for timely delivery of cargo and passengers. Importance of the Incoterms-2010 rule in international transportation.

**General part.**

Transport is a multi-faceted and complex industry. Special norms are needed for the legal regulation of its activities and relations related to the use of vehicles.

At this point, it is appropriate to comment on the definition of law. Law-enforcement is established rules of conduct, behavior. Mandatory law is established and enforced by the state.

The concept of right is divided into constitutional or ordinary rights when applied to citizens. Constitutional rights are regulated by constitutional norms, ordinary rights are regulated by ordinary laws. Law, in turn, is divided into branches: constitutional law, administrative law, civil law, criminal law, transport law, etc.

Transport rights consist of a set of norms, transport regulates social relations arising from the reason for the organization of its activity and work, relations between transport enterprises and their numerous clients who use transport means, and relations between transport enterprises of the same

and different types. Thus, the subject (subject) of transport law consists of social relations between transport enterprises and customers of transport, which arise due to the use of transport vehicles.

Property arising from the operation of the vehicle relations correspond to the general conditions of civil law. The most important part of motor transport law - the contract of carriage is based on the legal foundation of FC. The methods of regulating property relations in motor vehicles do not differ significantly from the methods described in FC. Transport law consists of a set of legal norms of various branches of jurisprudence - civil, administrative, international, labor and other. The law of motor transport is a special part of the law of transport (like the law of railway, sea, water, air transport). The rules of the law of transport are characterized by their versatility and complexity, therefore, their study, It is set aside as a special independent course with its own system and topic. The system of transport law reflects the unique methods of regulating social relations that arise in the process of cargo, passenger and baggage transportation. The transport activity of the motor vehicle is based on the contract, like other branches of the national economy. The transport contract is recognized as a legal method regulating the organization of transport. Therefore, strengthening the importance of contractual relations in the organization of transportation is recognized as a legal guarantee that the participants of transportation will fulfill their contractual obligations properly.

Sources of law are documents in which legal norms are recorded, sources of law are the Constitution, constitutional laws, decrees and documents of authorities.

Law of the Republic of Uzbekistan "On Motor Transport".

The Law of the Republic of Uzbekistan "On Automobile Transport" implemented on August 29, 1998 based on the decision of the Oliy Majlis of the Republic of Uzbekistan is considered one of the main sources of transport law. The purpose of this law is to form the legal basis of road transport in the Republic of Uzbekistan (Article 1). The Law of the Republic of Uzbekistan "On Motor Transport" consists of 31 articles

Law of the Republic of Uzbekistan "On urban passenger transport".

The purpose of this law is to form the legal basis of urban passenger transport in the Republic of Uzbekistan. The law entered into force on April 25, 1997 and consists of 27 articles.

Law of the Republic of Uzbekistan "On traffic safety".

The Law of the Republic of Uzbekistan "On Road Safety" entered into force on August 19, 1999, and its main purpose is to regulate relations arising in the field of road safety and to protect the life and health of citizens. ensuring the protection of life and property, defining their rights and legal interests, as well as the legal basis of environmental protection.

Depending on the type of transport, the cargo is divided into railway, sea, river, air and car transportation. Such a classification is related to the fact that relations related to cargo transportation are regulated by the laws applicable to the relevant type of transportation.

Local, direct and direct mixed transports are distinguished.

Transportation within one transport enterprise (railway, steamship, etc.) is called local. Transport carried out in one type of transport is called proper transport. For example, transportation of cargo from Tashkent to Karshi with one document (shipment) is the correct transportation, because in this case the cargo is transported by several railway transport companies (Tashkent and Karshi railways).

Transportation carried out by several types of transport companies on the basis of one document is called proper transportation. An example of this type of transport is the transportation of cargo from Tashkent to Turkmanbashi by rail, from Turkmanbashi to Baku by sea from the Caspian Sea.

1. Legal bases of the contract of carriage. It is required to have certain organizational bases for concluding a cargo transportation contract. Expenses related to the organization of cargo transportation cannot be performed without prior agreement with the carriers and shippers. This is achieved in the process of organizing the fulfillment of transportation obligations and is expressed in a specific legal form, as a result of which the volume of transported cargo is specified and the terms are determined.

Documents regulating the organization of cargo transportation have different legal forms, taking into account the cost of transportation in different types of transport: in the case of

transportation along the right communication routes, this is an application (order), on the organization of cargo transportation contract; in transportation through the right mixed communication channels - a daily application, a weekly calendar, a plan, a monthly schedule for issuing ships. The application plays an important role in the fulfillment of cargo transportation obligations with the participation of the shipper and the carrier.

The grounds for evaluating the place of domestic law are reflected in the following 2 rules:

1. Domestic law applies to all types of transportation within the country;
2. Domestic law has extraterritorial effect, that is, domestic law applies to interstate transportation (even if such transportation is outside the territory of the relevant state). There may be certain differences in the internal legal documents of countries in determining the power of this extraterritorial influence. The legal norms that domestic law has extraterritorial effect can be found in the Civil Codes of some countries. The rules of the extraterritorial effect of domestic law are fully reflected in the legal documents on air and sea transport. These types of transport are directly related to international travel.

Incoterms 2010 is an international regulation recognized by government bodies, legal companies and business representatives around the world as the interpretation of the most commonly used terms in international trade.

Its field of application applies to the rights and obligations of the parties in terms of delivery of goods (delivery conditions) under the sales contract. They are an important element of international trade agreements.

The main principles used in the rules of Incoterms:

- describes the costs and risks involved in the delivery of goods from the seller to the buyer, as well as regulates the obligations of the parties regarding loading and unloading, transportation of goods, their insurance and customs clearance.
- Determines the stage of transfer of the risk of damage, loss and accidental death of the cargo from the seller to the buyer.
- Determines the date of delivery of the goods, that is, the seller determines the stage at which the goods are handed over to the buyer or his representative, for example, a transport organization, and therefore, which party will first perform or not fulfill its obligations during the period of delivery of the goods specifies.

Each term of Incoterms 2010 is an abbreviation consisting of three letters, the first letter of which indicates the conditions for the transfer of responsibility from the seller to the buyer:

- E— in front of departure (from the English word departure),
- F— at the main cargo transportation terminals, main carriage unpaid (from the English word main carriage unpaid).
- C— at the arrival terminals of the main carriage, the main carriage paid (from the English word main carriage paid).
- D— complete delivery to the door (from the English word arrival).

Incoterms 2010 defines 11 terms, 7 of which are used for any type of transport of the main cargo.

#### **Questions for discussion and conclusion:**

1. Contractual relations in domestic and international transportation.
2. Documents in transport.
3. Responsibility of cargo owners and carriers for timely delivery of cargo and passengers.
4. Importance of the Incoterms-2010 rule in international transportation.

## **11-PRACTICAL TRAINING.**

### **TOPIC: SCIENCE, ENVIRONMENTAL AND SAFETY IN TRANSPORT.**

**The purpose of the work:** scientific solutions to problems arising in various transports, ecological problems in transport, water, air and land pollution. Formation of students' knowledge and skills about noise, vibration and electromagnetic radiation, safety problems in transport and scientific aspects of their solution.

**General part.**

1. Scientific solutions to problems arising in various transports.
2. Environmental problems in transport.
3. Pollution of water, air and land. Noise, vibration and electromagnetic radiation.
4. Safety problems in transport and scientific aspects of their solution.

**Key words:** Environmental problems, Water, air and land pollution, noise, vibration, electromagnetic radiation, safety.

### **Environmental problems**

Transport is the main source of pollution in cities. transport facilities occupy up to 7% of the territory, and in cities - up to 20-30% (in the central parts of some cities - up to 40-50%), therefore land pollution is considered the first environmental problem. One of the ways to effectively solve the problem of urban area occupancy, for example, is the use of underground space for temporary and permanent parking places for vehicles, high-speed tram, bus routes, etc. 4.5-7 hectares of land is required for 1 km of six-lane highway above ground, and 0.1 ha for underground.

Abroad (especially in England, Indonesia, and Japan), the practice of building suspension roads or roads on artificial floating islands in the sea area for various types of transport is becoming more and more widespread. However, bringing transport systems into tunnels or overpasses increases their cost by 4 times or more.

Disruption of the soil water system (natural water circulation) during the construction of transport facilities can be considered a major environmental problem, which damages the land and the facilities themselves due to the great erosive power of water. It will be necessary to build expensive water removal facilities.

Contamination of soil with gasoline, oils, solid and liquid structural components, salts used in the fight against freezing is considered an acute problem (3-4 tons of salt are sprinkled per 1 km of the road in a year, and up to 100 tons of salt in the years when the winter is unfavorable).

The second environmental problem is water pollution. 95% of the water used for technological needs in transport becomes unsuitable for drinking (gasoline soaks into the soil 7 times faster than water). Water transport types pollute water bodies with ballast and washing waters (75-80% of pollution), and evaporation of crude oil (3%) and gasoline (2%) during their transportation and intermediate storage. One ton of oil pollutes up to 10-12 square km of water surface, and petroleum oils spread more than 300 km from the source of pollution. The International Convention on Civil Liability for Oil Pollution Damage has strictly defined the list of substances whose residues can only be disposed of at reception facilities. According to US researchers, ships produce up to 1.5 kg of dry waste and up to 2 kg of food waste per person, while in coastal conditions this figure is 0.04 and 0.27 kg.

The third environmental problem is air pollution (91.3% of pollution is caused by road transport, 3.7% by rail transport, 2.7% by sea transport, 0.9% by river transport and 1.4% corresponds to the share of air transport).

Comparative emissions of harmful substances released from cars for Uzbekistan and Western European countries are presented in Table 1.

One car consumes the same amount of oxygen as one person consumes in a year to travel 900 km. According to American researchers, up to 50,000 people die prematurely from smoke poisoning every year. In Switzerland, it was found that people who live near a busy highway are 9 times more likely to get cancer than people who live 400 m away from it. An increase in traffic intensity from 400 to 1000 cars/hour increases the emission of toxic gases by 4 times, which requires changing the organization of traffic, moving transit traffic out of the city, and reducing the intensity of traffic in the central parts of the city.

The main measures to reduce air pollution include the use of neutralizers that reduce the amount of harmful emissions up to 70%, the improvement of the design of engines and combustion systems, the replacement of gasoline engines and traditional types of fuel. The use of electric transport in cities significantly improves their air quality.

**Questions for discussion and conclusion:**

1. Explain the problems that arise in various forms of transport.
2. Environmental problems in transport.
3. Water, air and land pollution.
4. Noise, vibration and electromagnetic radiation.

## **12-PRACTICAL TRAINING.**

### **TOPIC: TRANSPORTATION COSTS**

**Purpose of work:** Consumers' transport costs and costs of transport. Factors affecting the cost of transportation. Types of tariff. Tariff rate. Methods of providing competitive advantages of transport types.

#### **Consumer transport costs and transport costs**

Tariff (price of transport product) is a system of rates charged for transport services. Transport tariffs form transport revenues and are considered as transport costs of the consumer of transport services. The difference between the income (tariff) and costs of transport constitutes the profit of transport enterprises, it is considered a conflict between the consumer and the goals of transport. This conflict can be resolved only by coordinating their interests, taking into account economic factors and the necessary labor costs in various types of transport. Therefore, it is clear that in any system of price formation, the cost of transportation essentially serves as the starting base for determining the price (tariff), and in the conditions of the market economy, the cost of transport services is often lower than the cost of transport services. considered as a limit.

In the production-economic and commercial activities of the transport company, the expenses are primarily determined by the costs of carrying out the transport process and the purchase of various resources (fuel, equipment, materials, etc.) for this process. In addition, costs are required for the sale of products, disposal of infrastructure, payment of taxes and various contributions.

Transportation costs consist of movement operations, loading and unloading operations, storage, as well as costs for services that increase the quality of transportation. As a rule, this differentiation of costs is taken into account when building tariffs. Naturally, these costs should be taken into account first of all in the cost of the transport product.

The cost of transportation is affected by the type of vehicle and the level of its use, the time it takes for transportation operations, the speed of cargo delivery, the form of transportation process organization, transportation distance, as well as the composition of cargo, the quality of roads, the quality of traffic organization, etc. shows. For example, the cost of transporting goods by road on improved paved roads is 12-15% lower than on other roads. In railway transport, 10% of the total road network is made up of under-utilized lines, which have only 0 of the total freight turnover with transport costs 20 times higher than the network average, 4% is done, which makes them work by causing damage.

The share of transportation costs in the final value of the goods depends on the factors listed above. With the annual production of 4 billion tons of goods in Uzbekistan, the volume of transport work is 12 billion tons, that is, each ton of products is transported three times before reaching the consumer sector. This applies primarily to the transportation of raw materials and semi-finished products. The increase of the transport component in the final price makes such a product uncompetitive in the market, which is especially evident in foreign markets.

The distribution of transport costs in economic sectors by types of transport is shown in table 12.1, as can be seen from the table, road transport is the most expensive, and pipeline transport is the cheapest type of transport.

As mentioned above, the share of transport costs in the final price of goods in Uzbekistan is on average about 15-20%, but for some types of cargo it is up to 50% and even more. enough (coal, agricultural products, etc.). Transport tariffs are based on current costs of transport enterprises (cost of transportation) and a certain amount of profit (profitability). Tariff rate

$$T = C(1 + \frac{r}{100}),$$

where S is the cost of transportation, r/t; r is the profitability determined by the ratio of profit to cost, %.

The appropriate level of profitability allows the transport enterprise not only to maintain a certain level of transport resources, but also to create funds for social and scientific and technical development and reserves for force majeure cases associated with the specific nature of the transport product. It should also be noted that the performance of transport depends to a large extent on the quality performance of partners in loading and unloading and warehouse work, which also requires the creation of a reserve of transport productivity.

The cost of a transport product differs from the cost of any other product in that it does not include the value of raw materials (due to its absence in transport), as well as the share of wages and the size of depreciation allowances, which in railway transport 70 %, it reaches 40-50% in road transport. For comparison, it can be said that the share of wages in heavy industry is on average 20% of the product cost, and in light industry and food industry - about 10%. The size of the tariff rate depends on the conjuncture of the transport market, demand and supply of transport services. Despite this, one should not forget the certain administrative and social role of transport tariffs, they affect the placement of production, rational placement and use of certain types of transport, formation of prices in specific sectors of the national economy, etc. Therefore, in all countries of the world, taking into account the important economic and social importance of transport tariffs, the states implement a certain regulation of prices for some types of transport services, especially in the field of passenger transportation.

The specific features of the formation of transport tariffs are manifested in their differentiation according to a number of symptoms. Transport tariffs are state tariffs regulated by federal authorities; local and regional tariffs established in accordance with regional bodies; network tariffs established by network transport authorities; It is divided into free tariffs and contractual (abroad the term "contract" is used) tariffs for one-time or long-term transports established on the basis of a contract with consumers of transport services.

#### **Principles of formation of transport tariffs in market economy conditions**

The price (tariff) policy should provide the necessary financial support to transport enterprises to return the necessary costs incurred for the public and to maintain the country's transport potential and reduce transport costs in the final price of the manufactured product.

The experience of formation and application of transport tariffs in the developed countries of the world shows that the tariff policy is considered not as a single price policy, as an element of the economic mechanism within the network, but as an important factor of the stable development of the entire economy and social sphere. In this case, price solutions are one of the main concerns of a concrete enterprise (firm), because competitiveness, product sales volume, and, as a result, the enterprise's income, market situation, business and financial stability depend on the price.

The price performs the functions of measurement, regulation, promotion and orientation in any economic system.

Two principles of price formation are distinguished - cost and marginalist (in English, marginal - the most marginal). According to the first principle underlying the labor theory of value, price is the monetary expression of goods (services). Before the economic reform in the country, all transportation tariffs were built according to this principle, based on the average cost of transportation and a certain level of profitability. The profitability of transportation of various types of cargo by railway is from -10 to +50% of costs. Mass construction and wood materials, grain, ore,

ferrous metals were transported with lower than average profitability. Transportation of mineral fertilizers, perishable goods in refrigerators and other goods caused damage. At the same time, the profitability of transporting products of the light, chemical, radio engineering and electronics industries is unreasonably high. The transition of the country to the conditions of the market economy required a change in the approach to the construction of transport tariffs. The cost mechanism envisages the administrative formation of the price, which is also confirmed by the fact that it was used in the economy for a long time during the Soviet era. Such a concept of the mechanism of formation of transport tariffs can be implemented even in market conditions with subsidized support from the state budget.

In the marginalist (as opposed to cost theory, or market) theory of price formation, the basis of price formation is supply and demand, where supply is what a producer is willing and able to produce and is likely to produce over a given period of time. among the prices is the quantity of the product offered for sale in the market at a specific price; demand is the amount of a product that consumers are willing and able to buy at any of the possible prices during a certain period of time. This theory is based on the idea of the limit states of the main variables of the market (productivity, income, costs, utility, demand, supply), and the principle is based on the fact that these variables, first of all, price, then increasing the production volume for the firm, demand and for the farmer, it will be to find such a limit at which increasing the amount of consumption becomes unprofitable.

It is necessary to observe the methodological uniformity of formation and differentiation of tariffs in various types of transport, the uniformity of methods of determining regulatory costs, the uniformity of methods of accounting for price-forming factors, as well as the uniformity of methods of applying tariff sanctions and incentives.

Tariffs are based on the characteristics of transportation (type of shipment, characteristics of cargo, methods of packing, type of rolling stock, delivery terms, transportation conditions) that affect the level of transportation costs, and to encourage the construction and effective transportation options. should keep in mind. The final price is determined by the market. We will consider its specific features with application to transport.

The market is a field of exchange according to the laws of commodity production. Subjects of market relations - free producers of goods - coordinate their activities with the needs of the market, determine prices and their behavior. Along with the transport market, the market for infrastructure services (forwarding, transshipment, provision of warehouses and terminals, etc.) is developing in the transport market. According to studies conducted abroad, attempts to form and regulate prices in free enterprise conditions depend on the production and consumption of transport services, that is, on the type of market.

The market has the following models:

- a pure (free) competitive market, where there are many sellers and buyers of the same (homogeneous) product. In this case, none of them can seriously affect the market price (this includes, for example, transportation of goods);

- different forms of the monopoly market with differentiation of goods according to various characteristics (monopolies in the entire market or in a certain segment of the market). Here, one consumer sets the price, and the producer sets the volume of his sales (for example, passenger transportation). In a monopolistic market, as a rule, regulation by the public (state or federal and local) is applied;

- an oligopolistic competitive market of a small number of producers and a large number of consumers that do not allow others to enter the given market (the transport market corresponds to this type of market to a greater extent).

Since the conditions of production and sale of transport products are not the same in different types of transport, the transport market will not be the same, therefore, each type of transport will have its own width market. Researching the markets in our country and abroad allows to determine the market share of the entity and the conditions under which it can control the market, thus the degree of monopolization and price policy. According to these studies, railway transport is a natural monopolist. True, it is not protected from competition with other types of transport. The objectivity of its monopoly stems from the fact that a large part of the country is integrated with railway

networks, and as a result, railway transport provides the maximum flow of cargo. Monopolists include firms (enterprises) whose market share exceeds 35% (Uzbekistan railways occupy half of the cargo transportation market).

The market of maritime transport services is represented by the freight market (sailing to foreign countries) and regional markets (cabotage sailing). When sailing abroad, maritime transport operates under conditions of oligopoly competition, and at the regional level - under conditions of a monopoly market.

Road transport services market has industry description and regional description. Its role increases significantly in regional conditions. There is competition in the automobile transport market, as public transport, departmental transport and individual (private) transport offer their services. In addition to its advantages - high delivery speed and the possibility of "door-to-door" transport - road transport increases the distance of service, thereby gaining new segments of the market.

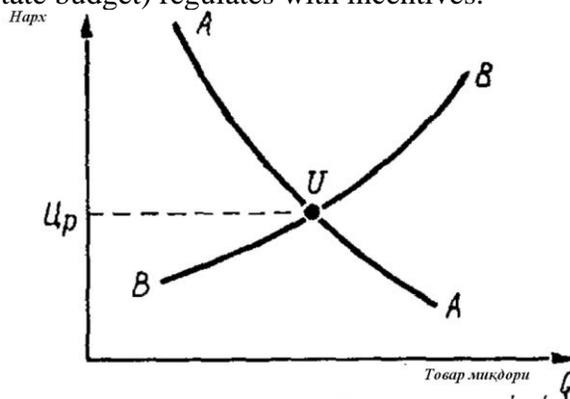
Air transport is a monopolist in long-distance passenger transportation and specific types of work (fields of activity).

Due to its specificity, river transport is a monopolist in the regions adjacent to the rivers for certain groups of goods. In the main areas of its activity, railway transport is its main competitor.

The pricing strategy consists of logically connecting the goals, capabilities and funds of the firm or enterprise when there is an opportunity to make options with prices depending on the situation. It is necessary to constantly monitor the effectiveness of the price policy, and if necessary, change it depending on market conditions, demand, price analysis and competitors' goods. It should be noted that in the socialist economy, transport tariffs are periodically revised due to changes in conditions, in particular, changes in the composition of the fleet, the introduction of new technologies of the transport process, etc. Prices in the market can fluctuate in large intervals, which is connected with changes in supply and demand. Price discrimination is the granting of benefits and preferences (preferences), for example, seasonal discounts on transport tariffs, according to certain age groups, depending on the current conditions of sales and, above all, the volume of consumption or the income of customers. It is widely used to mark with consideration of giving discounts, giving discounts to regular customers, etc.

The direct calculation of the price is carried out on the basis of various methods, in particular, full costs (costs plus profit), marginal costs, provision of target profit, consideration of competitors' tariffs, consumption value of transport services, etc.

Restriction of competition in the market can go along the lines of patenting and licensing of firms. Uncontrolled growth of market prices brings economic and social risks to the state. Therefore, price regulation is one of the functions of the state. The government sets prices to the desired level of prices and production volumes directly (establishing directive prices of the state) or indirectly (establishing the level of profitability, taxes, quotas, to compensate for the losses of producers or consumers subsidies from the state budget) regulates with incentives.



**Balanced pricing scheme.**

Subsidies can be general or targeted (for example, in some cities, free travel of pensioners in transport is subsidized from the budget of these cities). When regulating prices through taxes, it is first necessary to separate taxes that are included in the cost of transport, for example, profit tax.

It is necessary to add the following to the negative realities that hinder the development of transport services: high level of consumption of production funds; decrease in production volume, and as a result, decrease in transportation volume; insufficient information on transport markets and sales markets and the redistribution of tariff levels; enterprises are not ready to conduct an independent tariff policy; low level of demand in remote regions that do not have alternative types of transport (at regulated prices, transport in these regions should be subsidized in time, and at free tariffs, the demand for transport services is limited by the population's ability to pay).

The impossibility of fully subsidizing transport enterprises in Uzbekistan (due to the lack of state budget) and the presence of regions deprived of the opportunity to choose the type of transport, that is, the low solvency of the population due to the monopoly in the transport market, in the conditions of the free formation of prices in the tariff system will have to be regulated.

**Questions for discussion and conclusion:**

1. Consumer transportation costs
2. The concept of profitability
3. Types of tariffs

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