

Performance of Automobile Roads

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Abstract: This article examines the passability of highways, traffic modes of cars on roads, and the level of road loading.

Key words: conductivity, free flow, partially dependent flow, connected flow, dense and saturated flow, degree of loading.

Today, highways play a very important role in our economy. In today's modern world, the importance of highways is increasing. Because highways are communication channels for the state. That is, one country mainly uses highways for mutual trade with another. Car transport is the most convenient type of transport in the world. Highways are the lifeblood of the state's economy. When these roads can meet world standards, vehicles passing through these roads will reach their destination safely. For this, it is necessary to make an accurate account book in the construction of roads.

A highway is an engineering facility designed for motor vehicle traffic. Depending on their importance, highways are divided into international, state (republic) and local roads. The International Motorway includes roads that connect countries, large industrial centers and are of great economic importance. Roads of state importance include roads connecting large industrial centers, important railway stations, wharves, and others, and local roads include roads of regions, villages, and collective farms.

Roads play an important role in the economic life of our country. Today, 85% of goods and 96% of passengers are transported by highways in the Republic. The total highway network in Uzbekistan is more than 209,500 km long, of which 42,869 kilometers are public highways, 141,883 kilometers are inter-household, rural, urban and village highways. 24,745 km is the departmental inspection road network. During the years of independence, several decisions were made to improve the condition of highways.

According to this law, 209.5 km long highways in our Republic are classified as follows.

- Public highways.
- Cities and other settlements.

- Economic highways.

The category of highways in this use is adopted according to Table 2 of ShNQ 2.05.02-07, depending on their assigned function and future speed of traffic.

- Roads of international importance - 3626 km;
- Roads of state importance - 17033 km;
- Roads of local importance - 21,995 km [1].

The number of cars that can pass on the road in a certain period of time depends on their speed and the level of traffic organization. Therefore, it should be clearly understood that the bandwidth is not an unambiguous indicator that describes the road, it can vary within wide limits.

The number of cars that can pass on a certain section of the road in a unit of time, it is determined in vehicles/hour or vehicles/day. It is planned to increase the capacity of roads, ensure traffic safety, prevent traffic accidents and create comfortable conditions for road users. Capacity depends on their speed and level of organization of movement.

The maximum theoretical throughput is the number of vehicles that can be transported in an idealized manner through favorable road conditions. It is determined using the dynamic formula of traffic flow. P_{max} is the throughput capacity calculated according to the formulas of the dynamic theory of movement of traffic flows composed of a column of cars of the same type for a benchmark horizontal road section.

The maximum theoretical carrying capacity of the highway is determined by the following empirical formula:

$$P_{max}=1000*V/L$$

Here is the speed of cars moving in the V-belt, km/h; Dynamic dimensions of L-cars, m.

Practical capacity is the maximum number of cars that can be carried on a specific road section in a certain traffic pattern under favorable weather conditions. P - practical carrying capacity - this is the maximum number of vehicles that a section of road can carry under real-life road and weather conditions. To calculate practical conductivity, prof. V.V. Silyanov offers the following formula:

$$P=k \times P_{max}$$

where: k is the coefficient of total reduction of conductivity. This coefficient consists of the multiplication of 15 special coefficients characterizing various road parameters and road conditions. The value of k varies from 0.3 to 1.0. With the increase in the density of the traffic flow, the interactions between the vehicles increase, the speed of movement decreases, the throughput and the speed of movement decrease [2].

The ability to transfer motion. The typical bandwidth of the traffic lane describes the maximum traffic speed in the partially connected mode of traffic flow, where the speed is slightly reduced compared to the speed of individual vehicles.

Depending on the speed of traffic on the road, the number of mutual interferences for cars and their modes of movement will change. When designing the roads, the lower the speed in one lane of the carriageway, the greater the convenience for road users. .

The absolute throughput of the traffic lane can reach 3600 v/s when the traffic interval between cars is $t=1$ s. In such real conditions, the following values of throughput are accepted: 2,000 v/s in both directions for two-lane roads, 4,000 v/s in both directions for three-lane roads; for multi-lane highways, 1250 v/s for the extreme right lane, 1800 v/s for the extreme right lane, 1500-1700 v/s for the middle lanes [3].

Traffic modes of cars on roads. Depending on the level of vehicle occupancy of the road, there are several specific traffic flows. Free flow-(comfort level of movement A). .

In general, the following phenomena are observed in free flow. Individual cars move on the roads at a distance that does not affect the traffic conditions. Driving on the road will not be tiring for drivers and passengers.

Partially dependent flow - (comfort level of movement B). In a partially dependent flow. It consists of the traffic flow of groups of several cars, which differ in their dynamic qualities and travel at a close distance from each other.

This is usually because a slower car in front is holding up the oncoming traffic. Their drivers are forced to slow down, wait for an opportune moment to pass, overtake by pulling into the side lane, and continue to drive in single-car mode until they catch up with the group ahead. The average speed of the stream decreases, driving the car becomes more difficult. If a group of drivers is ordered to move at the same speed at a relatively close distance to each other, this corresponds to organized convoy movement.

Connected flow - (comfort level of movement V). In a connected flow, a large group consists of a flow of traffic. All cars interact with each other, and after passing a single car or a group of cars, the car's speed will again depend on the speed of the car in front of it. The greater the speed of traffic, the more difficult and dangerous it is to overtake, and drivers must be more attentive.

Dense and saturated flow - (comfort level of movement G). In general, the following phenomena are observed in a dense or concentrated flow. Cars follow each other. Overtaking will be practically impossible. The speed of movement will decrease sharply, and traffic jams may occur in places where the conditions have worsened. It certainly requires high attention from drivers for safety [4].

Load level of the road. Carrying capacity is the main calculation indicator of the road, which depends on the condition of the road and the level of traffic organization. The load level of the road can be estimated as follows.

$$Z=N/P$$

Here: P-throughput, avt/h;

Amount of N-movement, avt/h.

According to the values of Z, free flow, partially bound flow, bound flow and saturated flow are as follows. If the transport current is less than free $Z=0.2$, $Z=0.2-0.45$ transport current is partially coupled current, $Z=0.45-0.7$ is coupled current, $Z=0.7-1.0$ is saturated is called flow or dense flow [5].

Table 1

Ease of movement	Speed of movement in the tape	Current state	Traffic conditions of vehicles	Load factor z	The speed of the current relative to the speed of the car	Driver's working condition
A	360	Free	Loads of mutual interference	less than 0.2	0,9-1,0	light
B	900	Partially connected	A group of cars is formed, there are frequent overtakings	0,2-0,45	0,7-0,9	normal
V	1200	Connected	The group of cars will increase. Intervals are kept between them. The condition of passing becomes complicated	0,45-0,70	0,55-0,7	has become difficult

G	1600	dense	There will be a full flow of cars, the speed will decrease significantly, and traffic jams may occur in areas with complicated conditions.	0,7-1,0	0,4-0,55	difficult (aggravated)
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