

ASSESSMENT OF THE CONDITION OF URBAN ROADS AND STREETS, AS WELL AS TRAFFIC USE INDICATORS USING ARTIFICIAL INTELLIGENCE (AI)***Khalimov Javohirbek Abdusamat ugli****Assistant Teacher of the Department of automotive and Transport
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Abstract: This study focuses on the use of Artificial Intelligence (AI) to assess the condition of urban roads and streets, as well as analyze traffic use indicators. It explores how AI technologies—such as image recognition, sensors, and data analytics—are employed to detect road surface damage, monitor infrastructure health, and evaluate traffic patterns. The research highlights the benefits of AI in enabling timely maintenance, improving road safety, and optimizing urban mobility planning. By integrating AI with geographic information systems (GIS) and smart sensors, the study demonstrates improved accuracy and efficiency in urban road condition monitoring and traffic management decision-making processes.

Key words: AI, indicator, transport, load, car, time, speed, distance.

Introduction

Modern urban roads and streets are complex engineering structures. They are needed to provide vehicles with high-speed traffic flow capabilities. In the operation of urban roads and streets, it is necessary to achieve a reduction in the cost of freight transportation by increasing the technical and operational condition of the road in accordance with the speed of movement of vehicles and the growth of cargo transportation, as well as increasing the efficiency and productivity of work with maintenance. Depending on the modern state of the existing urban road network and traffic flow traffic safety under the Republic, the state of use of the road network does not meet the comfort, safety and economy requirements of the automobile traffic conditions. To ensure comfortable and safe traffic conditions on city roads today, first of all, the rule Organization of storage work, the implementation of large-scale repair and reconstruction work.

Method

The operational status of the road is the level of compliance with regulatory requirements depending on the impact of vehicles and meteorological conditions (road bed condition, road surface condition, Traffic part and road edge actual use width, coating fluency and bite quality, road sign line, state of emergency vehicles) and meteorological conditions, as well as the level of storage. To ensure the necessary level of technical and operational condition of the road and its facilities, a road maintenance and maintenance service is organized. The main purpose of the road repair and maintenance service is to increase and maintain the technical and operational condition of the road in accordance with the speed of movement and increasing loads, while increasing the efficiency and productivity of cars, reducing the cost of freight transport recognition[1].

The technical condition of the road is the level of compliance of the indicators of the road and its facilities constant (which do not change in the process of operation or change only after Reconstruction and repair) (the project width of the road base and the carriageway, the correct and curved length, the slope and length of the steep waiting and landing areas, the height of the In order to ensure the safety of movement on the roads and streets of the city, work is carried out to assess the state of transport and operation of its roads. The assessment of the state of

transport and exploration of urban roads and streets is carried out on the order of design or research organizations of road enterprises and is attended by engineering and technical personnel of road enterprises and heads of departments.

When assessing the state of transport and operation of urban roads and streets, it is necessary to measure the following indicators:

- Road bed fluency; - Road bed strength;
- The coefficient of bite of the car ' wheel with a coating;
- Car Speed[2].

The assessment of the state of Transport and exploitation is carried out on the entire network under the jurisdiction of the road enterprise. The design of the transport and operation status of the road or is carried out using the highway Laboratory of the scientific research institute.

In the following cases, the condition of the city road or its plot is not assessed:

- when it is broken by a natural disaster;
- if under reconstruction, capital or current repair during the period of study;

The head of the road enterprise must provide the following documents to the traffic-exploitation State Examiner of the road:

- passport of the city road being checked;
- working drawings on roadbed construction;
- acts indicating the dates of inspection for the operation after the construction of urban roads and streets, reconstruction;
- approved layout scheme of road signs and facilities in accordance with the established procedure;

-a card of examination of the previous state of roads and streets of the city, it is considered a primary document in assessing the state of transport and operation of the road[3].

The fluidity and robustness of the roadbed is closely related to each other by the formation of traces (Colea) on the carriageway (transverse fluidity). Therefore, changing the fluidity of the roadbed depends on the strength and the formation of traces. In addition, at high temperatures in the summer, due to the deformation of asphalt concrete plastic, fluency is broken in the sloping areas of the road. For this reason, it is necessary to measure the fluidity of the roadbed twice a year (in late winter and early spring, during the summer heat).

The strength of the roadbed is determined by the end of winter and the beginning of spring, when the accounting period for the Republic is considered. In this case, the humidity of the grunt will be at the highest level.

The traffic-operation indicators under consideration are the fluency and strength of the road bed, the coefficient of contact of the car' wheel with the coating and the formation of traces on the carriageway are the most important factors affecting the speed and safe movement of vehicles [4].

Therefore, during the assessment of fluency and strength, the formation of traces, it is also necessary to determine the speed of cars on the sections of the road under consideration.

Result

Each parameter indicating the state of Transport and operation of urban roads (fluidity and strength of the roadbed the coefficient of involvement of the car' wheel with the coating, the formation of traces on the carriageway (transverse fluidity), the speed of cars) is carried out by special groups.

The density of the traffic flow is determined by aerofotos'emka or Kinos'emka from a high place from the side of the road.

As the density of the traffic flow increases, a decrease in the intermediate distance of vehicles, a decrease in speed, difficulty of the psychological mode of operation of drivers leads to the discomfort of general road traffic.

Permeability is the main accounting indicator of the road, which depends on the state of the road and the degree of Organization of movement [5].

The passability of a track is the number of cars that can pass through a certain cross - section of track within a unit of time, which is determined in avt/hour or avt/day. The throughput of a track depends in many ways on the speed of movement and the organization of movement.

The bandwidth can be classified into the following types:

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- maximum theoretical throughput-the number of light-type cars that can be passed in an idealized order from favorable road conditions. It is determined using the dynamic formula of transport flow;

- practical transfer ability-the maximum number of possible transfers of cars according to a certain order of movement from a concrete road segment in favorable weather conditions.

The maximum theoretical transfer capacity of a motorway is determined by the following empirical formula [6].

$$P = \frac{1000 \cdot V}{L_d}$$

here: the speed of the car moving in V-Polo, km / h;

L_d-dynamic gabarite of the car, m.

$$L_d = l_a + l_t + S_t + l_x$$

where: l_a is the static length of the car; l_t is the distance the driver passes during the reaction time; S_t is the braking path of the car; l_x is the safety distance; d is the safety range.

The organizers of the dynamic gabarite of the car are shown in Figure 1.

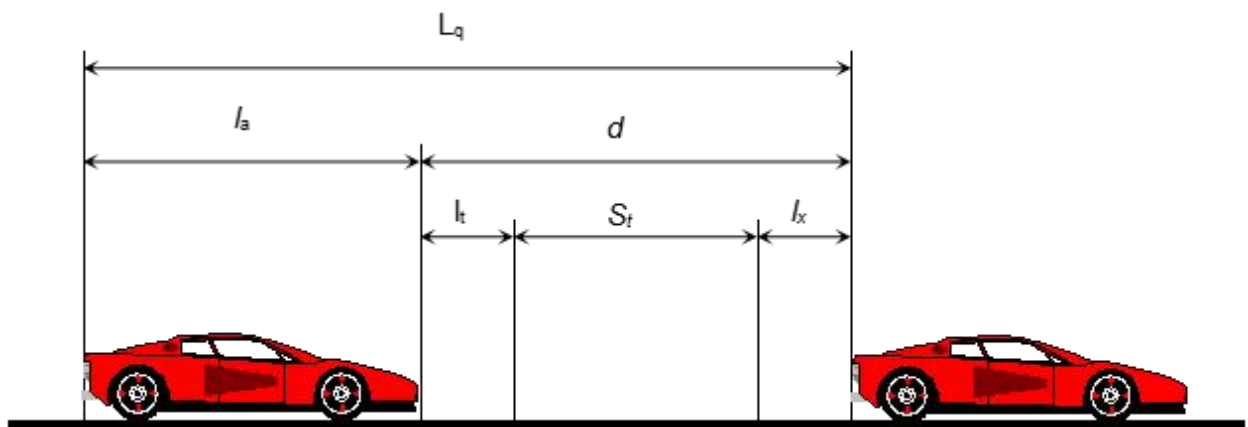


Figure 1. Dynamic gabarite of the car

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The load rating of the track can be estimated as follows.

$$Z=N / P;$$

where: P is the band width, avt/H ; N is the amount of motion, avt/H .

If the transport flow is free, $Z=0.2-0.45$ transport flow is called partially connected flow, $Z=0.45-0.7$ connected flow, $Z = 0.7-1.0$ saturated flow, or dense flow.

After years of scientific research, the optimal value of the load level of the road was determined to be 0.45 - 0.55 for roads outside the city. In the organization of movement in different road conditions, work is carried out based on the indicators of the degree of load[7].

Accounting speed-the maximum possible speed movement of individual cars (under the condition of safety and priority) in the event of a normative bite with the surface of the road traffic part of the car' tire, on sections of the road with the most inconvenient permissible elements is said. By this speed, all geometric elements of the road in plan, longitudinal and transverse sections are designed.

The maximum constructive speed of the car V_{max} depends on the power of its engine. Observations show that drivers with V_{max} / speed only move in the short term in some cases. In good road conditions, the speed of vehicles is 0.7-0.85 V_{max} . Such speed is mainly observed singly in horizontal straight track sections.

In practice, road conditions are formed from small curvatures in ascending, descending, plan, visibility distance below the norm, vertical curvatures, as well as the fact that the amount and composition of movement are different affects the value of instantaneous speed. In Real road conditions, the speed of cars moving alone can vary from 150-120 km/h to 40-30 km/h[8].

Conclusion

The development and progress of its economy depends first on the state of the road network of the urban roads of womb. The fact that the bulk of the cargo transported by our republic is transported by means of transport to its destinations through urban roads determines the importance of urban roads in the development of the economy in the national economy. Modern urban roads and streets are complex engineering structures. They are needed to provide vehicles with high-speed traffic flow capabilities. In the operation of urban roads and streets, it is necessary to achieve a reduction in the cost of freight transportation by increasing the technical and operational condition of the road in accordance with the speed of movement of vehicles and the growth of cargo transportation, as well as increasing the efficiency and productivity of work with maintenance. The main purpose of the service for the repair and maintenance of roads is to increase the intensity of movement and loads.

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