Development of an on-Board System for Monitoring the Condition of the Road Surface

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Annotation: In this paper, the development of an on-board system for monitoring the condition of the road surface, the evaluation of the longitudinal smoothness and the coefficient of bite of the road surface, the evaluation of the longitudinal smoothness and the coefficient of the bite of the road surface, the evaluation of the strength of the road surface and the determination of the road structure and the measurement of the rut of the road surface and information about identifying defects is given.

Keywords: road, on-board system, coating, system, tool - equipment, measuring instrument, pavement, state register.

INTRODUCTION.
Monitoring and description works are carried out using 2 road diagnostics mobile laboratories and special equipment for road inspection.

The tools used in monitoring and diagnosis are included in the state register and undergo periodic attestation in accordance with the legislation on ensuring compliance of measurements with the standard.

Processing of the results of field work of observation and description and drawing up a technical report on diagnostic work, complex measurement software and complex software for managing the condition of highways and artificial structures are performed [1-5].

MAIN PART.
Evaluation of the longitudinal smoothness and bite coefficient of the road surface.
The bite property of the coating is evaluated with a trailer device PKRS-2U. The obtained values of the bite coefficient are brought to the calculation temperature of 20°C in accordance with IKN 05-2011 "Rules for diagnosis and assessment of the condition of highways". A detailed instrumental examination is performed using the IKSP small-sized instrument.

Assessment of the longitudinal smoothness of the coating is carried out in two ways: "Integrirovaniya" method, smoothness is determined using a mobile road laboratory equipped with a laser profilometer and PKRS-2U trailer device;

The ordinates of microprofiles are determined using the "IRI" method and profilometric devices. The international index of flatness "IRI" is calculated in 100 and 1000 meter parts [6-11].

In order to improve the quality of the work performed, all equipment for measuring the longitudinal plane of the pavement is calibrated in special polygons prepared using high-precision levels and invar rails.
During road diagnostics, a digital video image is additionally taken using one to three cameras or a panoramic video camera.

The processing program allows you to take a panoramic image of the road and create a single video bank of the road system. Measurements of the volume of road patching works, covering, and the width of the road edge are carried out by means of video footage.

Assessment of the strength of the road surface and determination of the road structure

The strength of the Nobikr road surface is carried out using a long-base bending measuring device (progibomer) and dynamic loading devices Dina-3M, Dina-4. In order to assess the conditions of the base of the road surface and the soil base, the dimensions of the bend pit are determined at 5 points.

Determining the structure of the road surface is performed using a corer. Determination of the composition and moisture content of road base soils is performed by a certified laboratory of road construction materials [12-15].

Measurement of the track of the road surface and identification of defects
A detailed instrumental inspection of the transverse smoothness of the road and determination of the bending depth is carried out using the IK-2S track gauge.

Video recording of pavement defects is performed using a high-speed camera with a width of 4.0 m and a resolution of 1 mm. Data processing is performed in semi-automatic mode.

The high accuracy of the equipment makes it possible to detect even the smallest defects within the guaranteed period.

REFERENCES.


