the oil every 10,000 kilometers, check the tires every week, and check the brakes every month. When a vehicle is well-maintained, it works better. For example, tires with the right amount of air make the truck use less fuel. An engine that is clean and has new oil also uses less fuel. This is good for saving money and for the environment because it creates less pollution. If a company does not do regular maintenance, small problems can become big problems. A small problem with the engine can become a big problem that costs thousands of dollars to fix it. Also, when a truck breaks down on the road, the driver cannot finish the deliveries. The company must send another truck, which costs more money, and the customers get their cargo late. So, looking after the vehicles is not an extra cost, it is a way to save money. Regular maintenance keeps vehicles on the road longer, uses less fuel, prevents big, expensive problems, and makes sure deliveries are on time. It is a very important part of an efficient transport organization.

There are many ways for a transport organization to become more efficient. This report looked at four important methods. First, using modern technology like GPS helps companies track vehicles and manage work better. Second, planning better routes saves time and fuel. Third, training drivers in safe and eco-friendly driving saves money and prevents accidents and finally, maintaining vehicles regularly keeps them working well and prevents breakdowns.

All these ideas work together. If a company uses them, they will save money, make their customers happier, and help their drivers. The world of transport is always changing, and companies must try to be better every day. By focusing on these four areas, any transport organization can improve its efficiency and be more successful in the future.

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USING THE METHOD OF PARTIAL ACCELERATIONS FOR A MORE PRECISE CONDUCT OF A DYNAMIC ANALYSIS OF VEHICLES.

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The incorporation of body mass into the International System of Units (SU) has generated a certain degree of ambiguity among both researchers and students. For instance, one frequently encounters questions such as: “On levers, do we measure body mass or weight?” If the quantity in question is indeed weight, then why is it expressed in kilograms rather than in newtons?

In accordance with Newton’s second law, mass and weight are related by the following equation:

$$G = m \times g \tag{1}$$

or

$$m = \frac{G}{g} \tag{2}$$

where (G) is the weight of the body;

(m) is the mass of the body;

(g) is the gravity acceleration.

The weight of a body is understood as the force with which a resting relatively to the Earth body acts upon a support or suspension. The proportionality coefficient between the mass of a body and its weight is not constant; it depends on the geographic latitude at which the body is located. The variability of the g-value is caused by the both deviation of the Earth shape from a perfect sphere and the inclination of the Earth's rotational axis.

The latter gives rise to centrifugal accelerations that depend on the latitude, i.e., the radius of the body rotation.

Under terrestrial conditions, both acceleration in general and the gravitational acceleration, in particular, play a decisive role when carrying out analyses of vehicle dynamics.

In the both Newtonian physics and theory of relativity, the existence of inertial reference frames is postulated [1]. An inertial reference frame is the one where bodies move uniformly and rectilinearly (without acceleration) [1]. But how can this be achieved? To do this, it is necessary to distant the body (test body) from other bodies sufficiently, the forces that decrease and tend to zero at a sufficient distance from the source of these forces [1].

According to Newton's gravitation law the Earth forms a potential (gravitational) field. Based on A. Einstein's theory of relativity, the emergence of a gravitational field [1] is possible in reference frames moving at an accelerated rate.

The method of partial accelerations [2] arose as an alternative to Hermann-D'Alembert-Euler method known in mechanics as the principle of kinetostatics or the principle of quasistatic equilibrium.

D'Alembert principle has been widely used due to its simplicity and the ability to consider a homogeneous vector space that is the space of forces.

Some scientists are so by the principle of kinetostatics that they use inertial forces as moving ones, forgetting that they are reactive and also fictitious.

However, using the method of partial accelerations, it is possible to avoid this incorrectness. Let’s consider as an example the movement of a vehicle on a convex bridge (Figure 1). It is necessary to determine the normal reaction of the road to the vehicle.

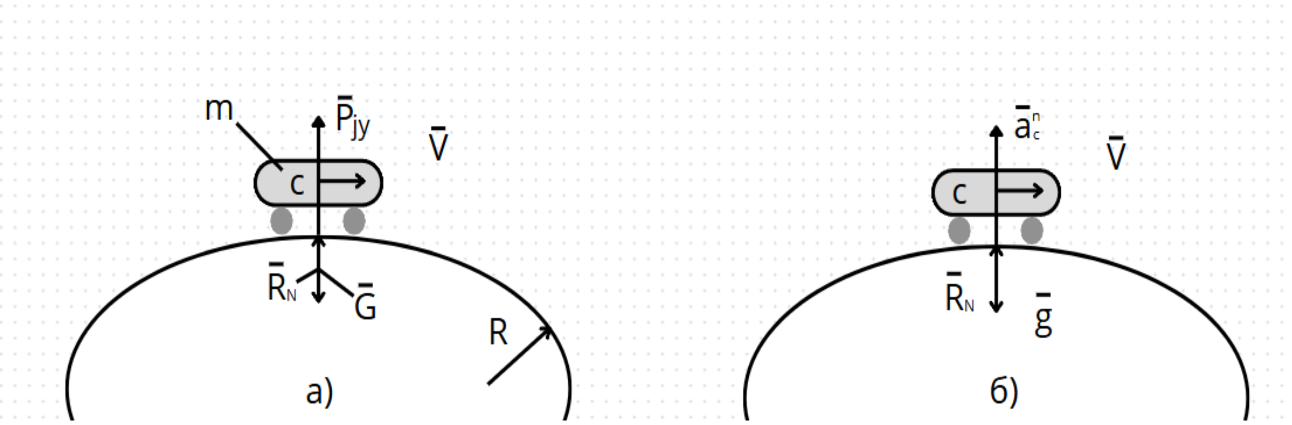

Figure 1 Car movement on a convex bridge

When using the principle of kinetostatics.

$$R_N = G - P_{jy} = G - m\frac{V^2}{R} \quad (3)$$

where G is the vehicle weight ;

m is the vehicle mass ;

V is the linear velocity of the center of mass C in the vehicle;

R is the radius of curvature of the bridge support surface;

P_{jy} is the vehicle centrifugal inertia force.

When using the method of partial accelerations.

$$R_N = m\,(g - a_c^n) = m\left(g - \frac{V^2}{R}\right) , \quad (4)$$

a_c^n is the centrifugal acceleration of the center of mass in the vehicle,

$$a_c^u = \frac{V^2}{R} . \quad (5)$$

The method of partial accelerations represents a more correct approach to the vehicle dynamic analysis compared to the principle of kinetostatics (D'Alembert's principle). Although the mathematical expressions for calculating the normal reaction when a vehicle moves on a convex bridge give the same result in both cases. The advantage of the method of partial accelerations consists in avoiding the incorrect interpretation of inertial forces as driving forces.

Thus, this approach makes it possible to form a true picture of the surrounding world in the taught person.

The method of partial accelerations works directly with real physical quantities (accelerations), but not with fictitious forces of inertia, that makes the analysis more visual and physically grounded. This is especially important in the study of the vehicle dynamics, where a correct understanding of the acting forces and accelerations is crutial to the correct design and operation of vehicles

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