TECHNICAL AND ECONOMIC ASSESSMENT OF EFFICIENCY OF MEASURES ON REGULATION OF TRAFFIC ON MOUNTAIN ROADS

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Abstract:. The article deals with measures to reduce the cost of road transport. When comparing different methods and regulatory regimes to count the total number and value of time lost on all approaches to the controlled junctions based on the weighted average cost of parking hours. The calculations are the main indicators, the economic effect is calculated.

INTRODUCNION

The economic effect of the measures on regulation of traffic can be obtained by reducing the delay (hangings speed messages) of vehicles, reducing their mileage and the number of road traffic accidents (RTA).

In the study of delays at intersections for the feasibility assessment of the effectiveness of different means and methods of traffic management should be carried out with selective investigations in the following sequence[1]:

1) at the appointed time of the survey (usually a rush hour for example in 17 h) to count the number of vehicles standing in the survey of the approach to the intersection in anticipation of the possibility of travel; the result record;

2) start the stopwatch and after 15 sec again to calculate the standing of the vehicle and record the result;

3) in the same way to count and record every 15 sec for 5 min (vehicle standing for more than 15 seconds will be counted twice or three times);

4) during these 5 minutes, keep a record of the total number of vehicles passed in the surveyed direction (directions) including, without stopping;

5) The results of calculations are tabulated in (table. 1);

Table. 1

The time of observation	The number of vehicles standing at the crossroads in these times				The total number of vehicles passing through the intersection with the approach being considered
	0 sec	15 sec	30 sec	45 sec	
17.00-01	0	2	7	9	17
01-02	4	0	0	3	20
02-03	9	16	14	6	18
03-04	1	4	9	13	17
04-05	5	0	0	2	21
Sum…..			104		93

6) multiply the total number of registered parked vehicles by 15, which gives a total loss of time in seconds (in this example: 104*15=1560 sec).

MATERIAL AND METHODS

To compare the different methods and modes of regulation it is required to count the total number and costs of wasted time at all approaches to regulated intersection with the weighted average cost machine-hours.

To assess the effectiveness of the coordinated management of traffic light signalling we should compare the total delays at isolated signalized intersections and

the total latency at those same intersections after the introduction of coordinated regulation.

Economic losses from the accident consists of direct costs incurred by vehicle owners, shippers, service operation of the road network, judicial and medical institutions in the event of an incident, as well as indirect costs, including loss of national economy due to temporary or complete exclusion of a member of the society from the sphere of material production.

To determine the size of the economic damage from an accident, depending on the nature of the consequences you should use the data table 2

Table 2. The size of the losses of the national economy from road traffic accidents[2].

Table. 2

The nature of consequences of accident	The loss of the national economy in sum.
1	2
The death of a person who owns a family… The death of a person who does not own a family… The death of a baby or teenager…… Injury of one person with a disability and receipt of disability... Injury of one person without disability, but obtaining invalidity…… Injury not resulting disability..... Damage to the bus downtime..... without downtime..... Damage to car: downtime..... without downtime..... Damage to the truck:	The data amount of the loss opredelaetsa in a market economy from included in statistical reporting

downtime..... without downtime.....	

In the absence of detailed information on casualties and property damage should use average figures of the losses of the national economy from the accident.

In the absence of information about victims should take economic damage from one accident included in statistical reporting, in the amount of certain amounts.

RESULTS AND DISCUSSION

To assess the effectiveness of planned activities necessary to determine the estimated reduction in the number of accidents, deaths and injuries from past experience and based on the analysis of traffic conditions before and after the event.Для приближенных расчетов следует руководствоваться следующими данными[2,3]:

Δk - reducing the number of accidents in %

evice "pockets" for public transport stops…….....44

Installation of pedestrian fencing.....75

The construction of an underground pedestrian crossing.....73

The construction of the sidewalk.....79

The installation of signs "passing without stopping prohibited" 59

The introduction of traffic-light signalling.....65

The imposition of unilateral movements.....60

Equipment tram stops.....51

Roadway layout.....47

The construction of bike lanes.....93

The expected reduction in the number of accidents is determined by the formula

2,3

$$n = N \frac{\Delta k}{100} \cdot \frac{M_2}{M_1}$$

where

n - the expected reduction in the number of accidents per 1 year;

N-the number of accidents prior to the event for 1 year;

Δk -% reduction in road accidents;

M1, M2-average daily traffic volume respectively before and after the event in the ed-day.

To identify the most dangerous parts of streets for the purpose of carrying out priority measures this formula should be used.

$$S = \frac{\rho_1 n_1 + \rho_2 n_2 + \rho_3 n_3 + \rho_4 n_4 + \rho_5 n_5}{365M},$$

where

S - is the index of risk;

M - average daily traffic volume in thousands IU/day;

$n_1, n_2 ....., n_5$ – the number of accidents of this type;

$\rho_1, \rho_2, ..., \rho_5$ – severity rate of accidents of this type.

You must take the following values of the coefficients of the severity of the accident.

Property damage damage to one car (by accident, included in the statements), ρ_1 1

A slight wound, ρ_2 1,2

Wound with obtaining disability, ρ_4 28

The death of an adult, ρ_5 81

The death of a child or young person up to 16 years, ...106

CONCLUSIONS

The annual economic effect EEF from measures to regulate traffic including the cost for these activities is determined by formula.

$$Э_{эф} = Э - (C + E_H K),$$

where

e-total annual savings from the implementation of the event, calculated in accordance with statistical reporting the amounts.;

C- annual operating costs (repair costs, maintenance, electricity, spare parts and materials, depreciation and amortization) in the amounts;

$E_и$ -regulatory efficiency ratio (0.1 -0.15);

Э-Capital expenditures in the amounts.

The payback period T is determined by formula.

$$T = \frac{K}{Э - C} < T_H = 6{,}6 years$$

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