

DESIGN A SMART PEDESTRIAN CROSSING

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***Annotation:** This article discusses the basics of designing regulated and unpaved pedestrian crossings on highways with modern technology, their commissioning and their role in improving traffic safety.*

***Keywords:** barrier, pavement, barrier, intensity, energy, safety.*

Introduction

What a terrible oppression of pedestrians in Europe. In any emergency on Russian roads, it is common to first blame the driver and then begin to understand. There are bill or Legislative initiatives every month that are aimed at increasing penalties for those behind the wheel. However, pedestrians, as a rule, are a priori white and pink. And how are things in Europe? Of course, pedestrians in Russia are not good, but drivers are bad. Our population is characterized by intense illiteracy in everything when it comes to the rules of behavior at the wheel - most of them have a history of car communication limited to only one generation of experience. So there is evil and rudeness on the roads, but less and less every year. The driver of the local spill is paying more and more attention to the other participants in the movement, trying to demonstrate his superiority and increasingly politeness.[1]

Materials and methods

In the preparation of this article, the methods of project analysis, study and nationalization of foreign experience, study and orientation of technology

opportunities, logic and generalization methods were used, and a proposal to implement measures based on the geography of the region. was given.

The main part

The control mode determines the order in which certain cycles and phases alternate. Traffic lights can be controlled manually or automatically. When the traffic light is controlled automatically, it is equipped with special mechanisms. Manual traffic lights are sometimes used, for example, to reduce traffic congestion. If the traffic light operates in a given mode before the exchange of signals, then such traffic lights are said to operate in a constant mode.

It is advisable to use the traffic lights in constant mode when the total traffic at the intersection is 750-800 cars per hour. It is recommended to install a single-section yellow traffic light at a speed of 400-750 rpm. If the speed is less than 400 rpm, it is not advisable to control the traffic using traffic light signals.

The modern method of controlling traffic lights is automatic control, which is called variable control. In this mode, the time of the green signal may decrease or increase depending on the amount. Information about vehicles approaching the intersection is obtained using detectors installed at a distance of 20-40 m from the stop line. [2]

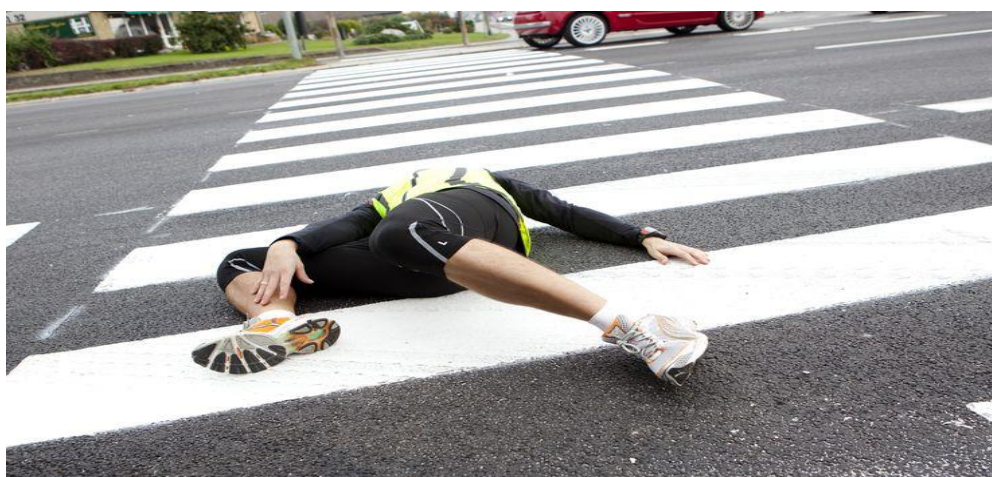


Figure 1. An incident on an unregulated pedestrian crossing.

The design of overpasses and underpasses shall be designed in accordance with the requirements of SNiP 2.05.03-84. Appearance, type, size and location of the pedestrian crossing, category of the road, intensity of pedestrian and motor

traffic, longitudinal and transverse profile (appearance) of the highway, local conditions and requirements, depending on hydrogeological and climatic conditions. The type and layout of the crosswalk should be selected based on feasibility studies to ensure that pedestrian traffic is comfortable and safe. If, according to long-term data, 200 m³ / m of snow falls in winter, the width of sidewalks should not be less than 3 meters.

The width of the lane for sidewalks and sidewalks will be 0.75 m, and the width of the crosswalks and stairs will be 1 m. If the pedestrian traffic in both directions is less than 100 people / hour, the width of the sidewalks can be increased to 1 m.

In any case, outside the settlements, the width of the crossing shall be at least 2.5 m on the part of the road where the speed is less than 60 km / h, and at least 4 m when it is more than 60 km / h. . The width of the pedestrian crossing in populated areas is also calculated, but not less than 6 meters on the general city highways, where traffic is regulated, and 4 meters on the highways of district significance. [3]



Figure 2. Smart pedestrian crossing view

The main engineering equipment of the overpass includes road signs, road markings, traffic lights, audible signals, safety islands, barriers. Depending on the type of transition, different combinations of the above engineering equipment

elements can be used. The optimal version of the equipment is determined taking into account the local conditions when developing the design option.

Pedestrian crossings are not regulated or equipped when the traffic speed is less than 300 cars / hour. Such crossings shall be marked with 5.16.1 or 5.16.2 "Pedestrian crossing" and a horizontal line shall be drawn or only the sign itself shall be marked.

Results

When traffic is heavy, equipped, unregulated or regulated pedestrian crossings are held. Pedestrian crossing is marked by line 1.14 - "zebra", 1.12 "stop line" where vehicles stop. The stop line should not be more than 1 meter from the edge of the pedestrian crossing.

In addition to the signs 5.16.1 (left) and 5.16.2 (right), a 1.20 "Pedestrian Crossing" warning sign shall be placed 50 and 150 m away from the crossing to mark the pedestrian crossing outside the settlements. If there is no demarcation line on the carriageway, on the opposite side of the road, at a distance of 1 m from the border of the crossing, signs 5.16 indicate the width of the crossing.

When the speed of pedestrians is 200 people / hour, the speed of vehicles approaching the crossing will be limited. To do this, on both sides of the crosswalk, between 100 and 150 m, a 3.24 "Maximum speed limit" sign will be placed, resulting in a reduction in speed of at least 20 km / h.

Conclusion

Smartpass leverages technology into pedestrian traffic safety improvement. The system consists of several modules that can be added to the pedestrian crossing depending on the location. It uses a passive infrared system to detect approaching person and activate warning lights on top of the sign as well as those along the passage. It can also be equipped with a radar measuring the velocity of approaching vehicles, sound warning system and a camera monitoring the crossing in real time.

Each year there are approximately 4 000 accidents on pedestrian crossings in Poland alone that cause 260 fatalities. Smartpass is an enhanced system of active

pedestrian crossings previously known as APP Zebra that have been installed in over 150 places in Poland. With its upgraded version, the company is ready to deploy its systems worldwide. The study made by Warsaw Polytechnic states that developed system increases pedestrian's safety by up to 25%.

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