ANALYSIS OF FUNCTIONING OF TECHNICAL PERIPHERAL MEANS OF AUTOMATED TRAFFIC CONTROL SYSTEMS

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Taking into consideration the constant increase of motorization rates and high intensity of movement the question of adaptive traffic control requires special attention. An essential element for the implementation of this control is the availability of transport detectors (TD), which belong to the technical peripherals of the Industrial traffic control system ((ITCS). TD are intended to identify types of vehicles and determine their movement characteristics in the controlled street and road network area[1].

Five main types of detectors have been widely used to record traffic: radar, ultrasonic, infrared, video detector, and inductive loop detector.

Sensors based on inductive loops are relatively inexpensive, very accurate, insensitive to weather conditions, and expensive and difficult to install and repair because it requires paving. Pair-mounted inductive loops allow a fairly accurate classification. To connect your own adapters, the output data is presented in pulse form: there is / no vehicle. Unfortunately, weather conditions and the average quality of the road surface in Ukraine make such detectors practically unsuitable [2].

Different types of sensors that are installed above the road, such as ultrasonic are of medium accuracy, have a small coverage area, however, due to the low cost, can be effectively used for certain tasks. The information issued is similar to inductive loops. There are specialized sensors for highways, but their cost does not allow them to be considered as a possible alternative. Infrared, sound sensors, etc. at the moment, do not show acceptable accuracy and are replaced by more advanced devices. Laser sensors provide very high accuracy (more than required), but are still too expensive.

Video detectors are one of the fastest growing areas, in many cases providing the best value for money. They were developed to replace induction loops, so they have a similar algorithm - determine the presence or absence of machines in specified areas - the so-called virtual loops. The information is issued similarly to inductive loops in the pulse mode, there are / no vehicles in the corresponding zone. At the same time one camera can control up to 3-4 strips at a distance of up to 70 m, up to 16 zones, depending on the selected optics and installation height. Independent studies show an accuracy of 95% of the inductive loops. The latest models of cameras are almost not inferior to inductive loops in terms of accuracy, can work around the

clock - at night working on headlights. In conditions of poor visibility, heavy rainfall will reduce accuracy.

In addition, many manufacturers supply cameras with different functionality on the same hardware implementation: to detect the presence of machines; to detect incidents, accidents, dangerous situations; to collect statistics on elementary classification; to calculate the length of the queue and other additional features.

Some camera models allow you to output video streams, but often its quality is lower than in conventional CCTV cameras, because this feature in such detectors is essentially indirect.

Radar sensors provide high accuracy of detection and tracking of vehicles, have the longest detection range and can provide related information - speed, type and more. Structurallycannottrackobjectsthat have stopped, which in advanced models is compensated algorithmically. For mobile machines, the accuracy is quite high, slightly deteriorates with removal from the detectors, does not depend on precipitation and light. Have a dead zone near the detectors, which size depends on the height of the installation and the pattern. Can issue both a pulse signal on virtual loops, and the full information on each accompanied object (speed and a direction of movement, the sizes of the vehicle), depending on the connection interface. Moreover, it is possible to visualize the road situation in real time, including overlaying video.

Modern surveillance camera models allow you to output a picture with a resolution of two megapixels and above, at a frequencyof 25 framespersecond. In most cases, the greatest investment is required not by the cameras themselves, but by the corresponding communication channel, because for one camera the flow is from 0.5 to 8 Mbps, depending on the resolution. In practice, an effective and stable video surveillance system can be implemented only on the basis of fiber-optic communication lines. Furthermore, with the help of special software it is possible to analyze the recorded video to determine the intensity of movement. If there are sufficient computing capabilities, the video surveillance system can determine the parameters of traffic flows, acting as detectors.

However the constant increase in the number of modern technical peripheral traffic controls, which have more functions and accuracy, leads to the problem of choosing the best: price - quality.

Therefore, in the existing variety of automated traffic control systems there is a problem of choosing the most optimal, which would ensure the accuracy of information about the availability and parameters of traffic in controlled areas.

Comparative analysis of modern transport detectors showed that:

1. Ultrasonic sensors are used at single- and two-lane exits, on the sensor on the strip, if it is possible to place the sensor directly above the control point. A typical situation - leaving the store / gas station with a small flow of cars, in which case the green signal to leave is given only by the signal from the sensor.

2. Surveillance cameras, if possible, are placed on all intersections, which are equipped with fiber-optic communication - so, it is possible to visually monitor the situation at intersections. In addition, when considering conflict situations, it is difficult to overestimate the importance of the video archive. In this case, you need to think about the appropriate recording equipment with sufficient disk space. The same videos can be analyzed using special software, receiving traffic statistics. Such data, of course, are not suitable for use by the road controller, because they come out with a significant delay, but are very useful when updating / creating a traffic organization, or to account for global changes in traffic flows. If you only need traffic statistics, you can do without fiber - a mobile kit with a camera and DVR will allow you to quickly remove traffic statistics at moderate costs.

3. Cameras - detectors, perhaps the most versatile and optimal in terms of "price-quality" version of the detector. Easy to install and configure, cope well with most tasks - stop-line control, detection of machine queues (requires a separate camera).

4. Radar detectors - the latest models are almost an uncompromising solution. They compensate for their high price with a long range, up to 160 m, wide grip, the ability not just to control certain areas, but to fully accompany the car, controlling the condition and speed. The detector is insensitive to weather and light, does not require maintenance. Setting up is a little trickier than in the camera, but the amount of modern power plants in transport and technology and equipment to service them 114 issued data is much more. The best option for important intersections, major highways.

5. Bluetooth - detectors detect all enabled Bluetooth devices within a radius of 150 m and determine the unique code (MAC address) of each of them. Comparing the codes of devices from different detectors, you can estimate the time spent traveling from one intersection to another - thus it is possible to instrumentally assess the effectiveness of adaptive control [2].

Appropriate software and a powerful server are required for the complete operation of the entire system and obtaining maximum information from video cameras. As traffic management is now on the agenda, smart video technologies have high hopes. As a result of research the problem of necessity of a choice of optimum technical peripheral means in the form of which the comparative analysis of modern detectors of transport is carried out is marked. This allows you to further solve a

number of tasks, including the implementation of adaptive and dynamic management, statistical data collection, accident detection and more.

LITERATURE

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PECULIARITIES OF LOGISTICS INTERMEDIARY SELECTION CRITERIA

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The choice of logistics intermediaries, including logistics operators, can be considered as a private task of supplier selection. The peculiarity of this task consists in the formation of such a set of indicators (criteria) that would correspond as much as possible to the specifics of the specific functions or processes that are transferred to the "third party".

The choice of a logistics intermediary as a service provider depends directly on the list of logistics functions transferred to the intermediary and the scale of cargo flows under given constraints, which are determined by the objectives of the firm's logistics strategy or factors in the surrounding macroeconomic and microeconomic environment. A considerable number of indicators for evaluating the performance of possible suppliers must also be taken into account. Each company, when transferring logistics functions to an intermediary, considers it best to contract only one intermediary providing the whole range of services, including warehousing, which will ensure the best coordination and management of cargo flows and reduce transaction costs. However, as domestic practice shows, the choice of logistics intermediaries depends on the quality of provision of a number of services. In fact, all services must be at the highest level. Naturally, the set of indicators in this case will be different. In order to determine the maximum set of indicators for the selection of an intermediary with a full range of services, it makes sense to consider the set of all indicators of the services provided by specialized intermediaries. This will create a more comprehensive set of indicators and thus provide a more accurate assessment of potential options.

The greatest experience in evaluation and selection of service providers is gained in the transport services market, as it has a longer history (both in foreign and domestic practice) than the warehousing services market. The choice of a freight forwarding service provider is made on the basis of one or a system of criteria, taking into account the constraints set by the company selecting the provider. Restrictions are closely related to the type of company's activity and external business environment. For example, in the distribution system such constraints may be the