

транспорту, а галузь авіаційного страхування набуває свого розвитку, було б доцільно крім законів загального характеру щодо страхування, розробити та прийняти безпосередньо Закон України "Про авіаційне страхування", який би чітко врегулював відносини у даній сфері, врахувавши досвід як вітчизняних, так і закордонних авіаперевізників, а також потреби споживачів авіаційних послуг. Адже політика держави щодо приведення національного законодавства у відповідність до вимог міжнародного, забезпечить формування стабільного та прозорого ринку авіаційного страхування.

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## **LEGAL REGULATION OF DRONES**

The drone is an unmanned aerial vehicle (UAV). Its appointment was initially military, mainly of an intelligence nature, a kind of military robot, so to speak. The purpose of such systems of autonomous action, intended for flight, is the performance of operations potentially dangerous to humans. Quite often in the literature, military-style drones are called UAVs, civilian aircraft of smaller sizes are commonly called drones. Drones are most often equipped with cameras, various sensors, devices for carrying cargo, scanners, and in exceptional cases - weapons. More often, a drone needs an operator who could customize the software for the task, which is necessary in a certain situation, to analyze the data coming from the onboard equipment.

This article discusses in detail the possible functions that drones could perform on the railway and at its infrastructure, the practical necessity of using drones, and also analyzed the experience of using drones of foreign railway companies.

Function number 1. (Law enforcement and infrastructure)

The main advantage of drones compared to traditional methods of holding such events is increased mobility and autonomy. In this regard, with the help of drones equipped with specialized hinged technical means, it is possible to periodically patrol the rail track in order to analyze its technical condition, to collect statistical indicators of the use of railway and transport and logistics facilities. UAVs can be used to patrol large areas, including warehouse and terminal complexes, space yards, passenger stations, depots, and customs zones. Thus, warning of cases of illegal entry, theft or terrorist acts on railway facilities. Any society suffers from such a phenomenon as crime, and as far as possible struggles with it. Unmanned aerial vehicles can facilitate the investigation of crimes, increase the effectiveness of preventive measures to

prevent them, and provide “controlled” monitoring in areas with high crime risk, especially at passenger stations and train stations.

Nowadays, there is an urgent problem: trains standing in a depot or at dead-end stations are constantly exposed to murals of graffiti. In 2013, about 14,000 wagons were damaged. In order to paint over all the drawings, we had to spend \$ 9.8 million. The company realized that traditional patrol methods were inefficient, and for \$ 77,000 bought small drones to fly over the tracks at a height of 150 meters at a speed of 15 m / s and descend if they notice something suspicious. On accusations of unethicalness of such surveillance, representatives of the company responded that it was not against the law to control their territory. The drone can work autonomously or be controlled remotely by a human operator. Drones engines produce little noise, making them ideal for surveillance.

#### Function number 2 (Research and inspection)

Unmanned devices are used for a variety of purposes, such as drawing up various maps, geodesic terrain plans, measuring temperature or pollution levels, monitoring weather phenomena, and monitoring high-risk areas. Such technologies could help simplify topological studies for laying the optimal route when designing new railway lines, various types of stations, especially in hard-to-reach environmental conditions. Drones are often used for aerial photography. Where previously it was necessary to fly a helicopter or a plane into the sky, now it is possible to use drones. Instead of using human resources, heavy equipment, and expensive surveying equipment, drones can do the job in significantly less time and much less money, and accuracy will be higher.

With the help of drones you can collect important analytical and static data when other methods of collection are difficult. For example, modeling of passenger traffic (in station buildings, on the platforms). The obtained data can help to improve the existing infrastructure, thereby increasing the usability of the object in question. The use of drones could be required during the inspection of the technical condition of engineering structures, in particular bridges, power lines. Thermal survey of passenger buildings and cars, the study of the technical condition of warehouses and repair hangars that have hard-to-reach or dangerous areas for humans.

#### Function number 3. (Rescue people in emergency situations)

The railway is a place of heightened danger, and, unfortunately, emergency situations occur on it. It could be fires, a train derailment, a terrorist act, etc. The railway and its infrastructure should be equipped with the most effective technical means to prevent such situations or to promptly resolve incidents. When people’s lives are endangered, prompt response is the key to minimizing losses and to solving the problem as soon as possible.

Drones are useful where people get very difficult or dangerous. For example, in areas contaminated by radiation, chemicals, or territories affected by natural disasters. There, they can search for victims and collect the necessary analytical data that could be of great help to the rescue services in localizing the

emergency situation. Small drones can be extremely useful in warehouse fires. They are able to make accurate maps of even smoke-filled, narrow and dimly lit rooms, marking fires and the location of victims on them. Having collected the necessary information and after returning to the operator, the drone will deliver the data, vital to rescuers and firefighters.

Function number 4. (Delivery of small loads)

American companies such as FedEx and UPS are based mainly at major ports or airports. Technology unmanned devices would allow them to expand their fleet of vehicles, get new opportunities for the delivery of goods and documents. Such a technology can be implemented on a terminal-logistic complex to facilitate the sorting or movement of relatively small in size and weight of goods in situational cases. When working in workshops, drones can automate some of the operations that people do, for example, moving parts or documentation when a large area of a room is being operated. When you need to move quickly to different work sites or you have some important buildings being built at the same time, launching a drone will be indispensable. In rare cases, the use of drones is possible for the delivery of urgent information messages on the railway in emergency situations when there are problems with other means of communication between stations or dispatchers.

So, delivery drones more and more capture the attention of transport enterprises and mass media, but due to some security and technological problems will not be a major factor for recent years. The return on investment has been just partly proven, operational costs and a single customer delivery still hard to calculate because lots of indicators are changing every day and more and more technologies are appearing. Also Ukrainian government has no plans of implementing the law regulation of UAVs in nearest years. This question needs additional research.

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## **A GENERAL CHARACTERISTIC OF MULTIMODAL TRANSPORTATION IN UKRAINE AND EU COUNTRIES. COMPARATIVE CHARACTERISTIC**

Multimodal transportation is a means of transportation in which the carrier organizing the entire delivery process accepts the responsibility for all transportation with the issuance of a multimodal transport document.

In modern conditions effective ways of optimizing the transportation process and create a competitive market of transport and logistics services is the development of multimodal transportation that contribute to the unification of