УДК 656.1

THE ROLE OF AUTONOMOUS TRANSPORT IN LOGISTICS

Vitsiaz D.V., student
Aliseyko E. V., student
Scientific supervisor – Slesaryonok E.V. senior lecturer
English language department №1
Belarusian National University of Technology
Minsk, Republic of Belarus

Modern logistics stands on the brink of radical transformation. We are witnessing how autonomous transport systems are gradually reshaping the industry, offering fundamentally new approaches to freight transportation. This is not merely a technological upgrade – it represents a paradigm shift in transport logistics itself. Today, the industry is actively testing various forms of autonomous transport, namely:

1. Self-driving trucks
2. Autonomous aerial systems (drones)
3. Robotic last-mile delivery platforms

It is important to note that the transition to autonomous freight is not an overnight event but a gradual process. We are already seeing how individual elements of automation are being integrated into traditional logistics chains (Fig. 1).

Figure 1 – Fully autonomous Einride truck

To take into account transition process, there must be considered several key advantages of this process, namely, operational efficiency can be achieved through thorough an d careful following the route assigned

to a vehicle; due to the previous fact an optimal fuel consumption is expected. Downtime can be significantly eliminated thanks to elimination of human presence in a vehicle.

Another important set of factors to be considered deals with economic benefits that are as follows: insurance costs can be much lower due to a high care during maintenance. And, consequently, the maintenance expenses themselves reduced significantly due to a cooperation of highly qualified maintenance commitment.

As a huge outcome of al mutual combination of mentioned above factors enhance safety of vehicles is seen as a benefit. That can be easily derived from removing of human errors, thorough and continuous monitoring of system performance and timely reaction to any faults; quite fast response of vehicle to sudden changes of road conditions. Despite the promising future of such highly popular and innovative technologies, it seems reasonable to accept the current limitations. From a technological side, existing AI systems still encounter difficulties when navigating complex traffic scenarios. Considering the existing infrastructure, many regions possess bad facilities for the extensive proper and reasonable functioning of autonomous vehicles. Legal aspect assumes that regulations cannot keep up with rapid advancements in technology, creating gaps that must be referred to regularly. Furthermore, on a psychological level, society remains hesitant and cautious about the adoption of driverless freight systems. These multifaceted challenges must be confronted to fully realize the potential of autonomous transportation.

In conclusion it must be underlined that fast developing current world should not consider autonomous transport as just another playful but still technological innovation.

A special care must be addressed to see it as a new step in the fast developing logistics sector. As some limitation still exist in this sphere, a significant number of steps must be undertaken to support current technological innovation in the logistics that, undoubtedly lead to an economic benefit not only to a separate transportation company but may bring the economy of the whole country to a much advantageous level.

References

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