

the logistics process.

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## **LOGISTICS AS A KEY FACTOR IN MILITARY CONFLICTS**

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Logistics plays a crucial role in all military conflicts. Since ancient times, organizing proper resource management has allowed even a small army to win difficult battles and even wars. Unfortunately, war has come to our land, and we must defend our independence with our own lives. However, we can also witness the work of the logistics system firsthand. In this article, I will outline the main problems that Ukraine faces in this area, as well as discuss possible solutions to them.

Why is logistics so important in military conflicts?

To conduct warfare, enormous resources are needed. Weapons, ammunition, fuel, food - these are just a few of the army's needs during wartime. This substantial volume of resources requires the creation of a global system for managing and distributing components among combat units. Ammunition delivered to the front on time can change the outcome of a battle. Food supplied to exhausted troops can prolong the defense of a crucial position. Mobility of troops is also crucial, as it allows for the efficient deployment of forces along the entire frontline without wasting unnecessary time. Logistics ensures strategic communication between military units, enabling the timely assessment of each unit's needs and facilitating resource exchanges when necessary. It's worth noting that besides military logistics, civilian logistics is also

extremely important. Evacuating people from frontline areas, providing essential supplies to those in need, and establishing communication with occupied territories all require skilled organization and management.

### The difficulties that Ukraine faces in organizing logistics

1. Insufficient transport capacity. To transport goods or people, a large number of vehicles of all types are required, ranging from buses to specialized trailers for machinery. Due to poor technical condition of the transport or combat losses, the quantity of transport necessary for transportation significantly decreases, and replenishing losses takes time since factories not redirected to military production are unable to produce the required amount of equipment within the necessary timeframe.

2. Lack of additional logistic routes. When planning troop supply, the most convenient and shortest delivery routes are chosen. Over time, these routes become major logistic arteries through which a significant portion of all military transports to various parts of the front are conducted. Naturally, the enemy attempts to disrupt these supply chains, thereby creating a shortage of necessary components and gaining an advantage on the front lines. The absence of additional routes means the inability to quickly resume supplies when the main arteries are damaged. Additionally, the capture of a supply route could result in the loss of communication with a particular object on the front if that road was the sole supply chain for the object.

3. Poor road conditions. Roads on the front lines typically consist of sections worn down by vehicles. Creating improved infrastructure in frontline territories is not cost-effective due to financial constraints and the constant shifting of the front line in one direction or another. For this reason, vehicles with increased off-road capabilities are used for delivery, but due to the aforementioned reasons, there is often a shortage of such vehicles, making frontline supply operations more challenging.

4. Threat of fire and capture of logistic arteries. Important roads are always under fire control to block enemy supply lines. If a road is situated in open terrain and has significant strategic importance, the enemy will strive to seize or establish fire

control over it. Transporting goods along such roads becomes dangerous or even impossible. This issue often affects residents of frontline cities. Despite international law, Russia fires upon convoys carrying humanitarian aid, putting many people in need of assistance on the brink of survival.

5. Customs issues. A large amount of equipment and aid comes from various countries around the world. This volume of goods must undergo border and customs controls, which takes time. Another pressing issue is the blockade of checkpoints, which is a critical problem in full-scale war conditions. Polish protesters have already inflicted and continue to inflict irreparable damage to the Ukrainian economy by blocking transportation and delaying deliveries.[4]

#### Ways to solve logistic problems

1. Strengthening the defense of key transportation arteries. As mentioned, the enemy attempts to seize or establish fire control over important supply routes. Without proper defense, these roads may become unsafe for use. To prevent this, it is necessary to strengthen the defense of crucial supply routes. This can be achieved by increasing the number of checkpoints. Improving air defense in these areas is also crucial. Both sides of the conflict use drones and missiles as their primary means of destruction, so creating mobile air defense groups will help protect a large area at low cost. The Ukrainian Armed Forces continue to actively create such groups, which also helps defend Ukrainian cities from terrorist attacks by Russia.

2. Creating additional logistic routes. As I mentioned earlier, relying on just one supply chain is not efficient, as damage or loss of control over that particular area can have severe and irreversible consequences. Having additional supply routes significantly increases the chances of maintaining control over frontline objectives in emergency situations, as the entire volume of supplies can be redirected through another route at any moment. It also hinders the enemy's ability to disrupt supply chains, as with multiple delivery options, it becomes challenging to predict which route will be used at any given time.

3. Manufacturing or procuring means for rapid supply restoration. Bridges and railway tracks are primary targets for disruption in supply blockades, and repairing

them takes time. While repairing railway tracks typically remains the only option, special equipment such as pontoon bridges and mobile bridges can be used for rapid restoration of bridges. Such equipment also enables the creation of supply routes where they were initially absent, which can be extremely useful, for example, during river crossings.

4. Addressing border issues. Currently, Ukraine is experiencing serious problems due to the blockade of its borders with Poland. Protesters in that country are dissatisfied with the current policies of the European Union towards Ukraine and have decided to block the border, which has become a pressing issue. One solution could be to establish separate checkpoints specifically for military and humanitarian aid, designate customs terminals as critical infrastructure, and negotiate agreements to neutralize borders, which would significantly increase the volume of product deliveries.

And of course, we must not forget about inflicting damage on enemy logistics. Ukraine does not have such vast resources, so systematic destruction of supply routes of the Russian army is a priority goal for subsequent liberation of temporarily occupied territories. On October 8, 2022, the Crimean Bridge, the main artery connecting the temporarily occupied peninsula with the mainland of Russia, was blown up[1]. A second similar incident occurred on May 17, 2023[2]. Additionally, Ukraine actively obstructs the construction of a land highway between Donbas and Crimea.[3] To carry out such operations, we need long-range weapons such as ATACMS, Taurus, and Storm Shadow/SCALP missiles (the latter are already actively used by the armed forces for strikes deep into occupied Crimea), as well as modern combat aircraft such as the F-16, on which our pilots are already undergoing training.

In conclusion, it can be said that logistics plays a pivotal role in military conflicts. This field faces numerous challenges, but it also offers many solutions. The method and speed of resolution ultimately depend on us.

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## **DEVELOPMENT OF ELECTRIC VEHICLES: HOW DOES THE GROWING POPULARITY OF ELECTRIC VEHICLES AFFECT THE TRANSPORTATION SYSTEM AND LOGISTICS?**

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The world of the automotive industry has recently undergone important changes related to the growing demand for environmentally friendly transport and the development of technology. Electric cars are becoming a real symbol of innovation in the modern automotive world.

Electric vehicles are vehicles that run exclusively on electricity, obtained from batteries or other sources of electrical energy. This technology represents an environmentally friendly and sustainable way of moving, which is already becoming an important choice for many car owners and car manufacturers.[1]

Today, electric vehicles are becoming more and more popular and the growth has a significant impact on the transportation system and logistics as follows:

- Impact on the transport system:
  - o Reduction of greenhouse gas emissions: Electric cars do not produce harmful gases, which makes them an environmentally cleaner mode of transport. This can help reduce air pollution and combat climate change. According to the International Clean Transportation Council, switching to electric vehicles could reduce greenhouse gas emissions from transportation by 60% by 2030;
  - o Increased energy security: Electric vehicles are not dependent on fossil fuels, which can help countries reduce their dependence on oil and gas imports. This can lead to greater energy independence and security;