approach and a conscious attitude of each road user will make roads safer and save people's lives and health.

FREIGHT TRANSPORTATION AND ITS IMPLEMENTATION IN THE EU AND THE USA

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The modern global economy depends on the efficiency of logistics for transporting various types of cargo. Despite their shared goal – ensuring the fast and safe movement of goods – the European Union and the United States have different approaches to this sector. The EU places a strong emphasis on environmental sustainability, size limits, and the protection of drivers' rights. The U.S. focuses on maximizing capacity, large-scale truck-trailer combinations, and the flexibility of the domestic market.

The purpose of this article is to examine and compare freight transport systems in the United States and the European Union, as well as to analyze their technical and regulatory development in this sector.

An analysis of the scientific literature and regulatory framework, as well as articles, and a comparison of key aspects of the EU and U.S. approaches to the logistics system in freight transport.

The European Union

The Single Market and Environmental Sustainability

Logistics in the EU is based on the principles of liberalization (the free movement of goods) and strict compliance with environmental standards.

1. The Basics of the Free Movement of Goods

The free movement of goods is the cornerstone of the EU's internal market and the first of the Union's four fundamental freedoms. The basic principle is that a product that has been legally manufactured and sold in one EU country automatically gains the right to be sold in all other member states.

2. The Role of the Customs Union and the Removal of Barriers

By 1968, member states had completely abolished internal tariffs, allowing traders to export goods without additional duties. In addition to internal benefits, the Customs Union established a common policy regarding goods from third countries ***[1]***

Regulation of Working Hours

The EU has very strict rules regarding drivers' working and rest periods. The use of digital tachographs is mandatory to ensure that drivers do not exceed the permitted driving limits. ***[3]***

Daily Rest Period - The standard daily rest period must last at least 11 hours. It may be divided into two parts: the first must be at least 3 consecutive hours, and the second at least 9 hours. A reduced rest period (9 to 11 hours) is permitted, but no more than three times between weekly rest periods. It is important that the new daily rest period be taken within 24 hours of the end of the previous rest period. In the case of shared driving (a crew of two drivers), each driver must rest for at least 9 hours within a 30-hour window. ***[2]***

Environmental Standards (Euro)

The EU is a leader in the implementation of emissions standards. Many cities have “green zones” where older trucks are prohibited or restricted from entering.

The Essence and Evolution of the Standard - Euro VII is the most recent phase of emissions regulation in the European Union, continuing a process that began back in 1992. The main difference of the new standard lies in its comprehensive approach: the EU aims to reduce the overall negative impact of transportation on the environment, focusing not only on exhaust emissions but also on sources of pollution that were previously overlooked.

1. Implementation Schedule

The transition to the new requirements will take place in phases, giving automakers time to adapt their technology:

November 2026: The standard becomes mandatory for new passenger car and light commercial vehicle models.

November 2027: The requirements apply to absolutely all new passenger cars and trucks sold on the market.

2028: Compliance with Euro VII becomes mandatory for all buses, trucks, and trailers.

2. Key technological innovations

The most significant change in Euro VII is the expansion of the list of pollutants. For the first time, legislation regulates particulate matter emissions resulting from tire and brake system wear, which are critical for urban air quality. Additionally, the standard sets significantly stricter limits on ammonia (NH_3) emissions, strengthening environmental protection and public health. ***[4]***

Dimensions

1. Basic Dimensions and Maneuverability Standards

Standard limits apply to most trucks: the maximum height is 4 meters, and the maximum width is 2.55 meters. An exception is made for refrigerated trucks, which may be up to 2.60 meters wide provided the insulation walls are sufficiently thick. A single vehicle without a trailer or a trailer on its own must not exceed 12 meters in length. To ensure safe driving, the “turning circle” rule applies: when maneuvering, the vehicle must fit within a circle with a radius ranging from 5.30 meters (inner) to 12.50 meters (outer).

2. Parameters of Road Trains and Tractors

When combining vehicles, strict restrictions on length and internal proportions apply:

Vehicle with a trailer: the total length must not exceed 18.75 meters. In this case, the total length of the cargo areas is limited to 15.65 meters, and the distance between the tractor’s rear axle and the trailer’s front axle must be at least 3 meters.

Tractor with a semi-trailer: the total length is limited to 16.50 meters. The maximum length of the semi-trailer itself is 13.60 meters, and the distance from the coupling pin to the rear must not exceed 12 meters.

National Specifics and Exceptions

A number of countries have introduced their own regulations for domestic transport that differ from the pan-European standards. For example, in Sweden, Finland, the Netherlands, and Flanders, the use of long road trains (LZV) up to 25.25 meters in

length is permitted. The Netherlands also allows significant lengths for circus and self-propelled special equipment (up to 22–24 meters). Within the Benelux region, the limit for 45-foot containers is set at 17.30 meters, while Hungary and Romania have slightly stricter limits – up to 18.35 meters. Additionally, rules regarding cargo protruding beyond the vehicle vary by country. ***[5]***

United States of America

Length and weight

Much longer truck combinations are permitted in the United States. On many highways, you can find "long-haul trucks" (LCVs) – tractors pulling two or even three trailers.

In the United States, there is a single formula for determining the permissible weight of vehicles, which limits the maximum gross weight to 80,000 pounds (approximately 36 tons). In addition to the total weight, axle loads are strictly regulated: the limit for a single axle is 20,000 pounds (9 tons), and for a dual axle, 34,000 pounds (15.4 tons). ***[6]***

Some states implement their own additional restrictions and strict penalty systems, which vary significantly depending on the jurisdiction:

· Virginia: Uses a progressive scale where the rate increases from 1 cent to 20 cents per pound of overload.

· New York: The penalty system is based on both axle load violations (from $100 to $2,450) and gross vehicle weight violations.

· California: Combines administrative and criminal liability.

The interstate highway system was specifically designed to allow heavy vehicles to travel between states without stopping in city centers.

Key Features and Trends:

Modernization (2025–2026): A $1.2 trillion investment plan is in place to repair infrastructure, including the renovation of 600,000 bridges, a significant portion of which are considered deficient. ***[8]***

Electrification: Roadmaps are being developed for the transition to eco-friendly freight transport, including networks of charging stations for trucks by 2040. ***[9]***

Logistics hubs: Integrated transport corridors combining different modes of transport (multimodal transport) are being actively developed. ***[7]***

Electronic Logging Devices (ELD)

These are the equivalent of European tachographs, which have only recently become mandatory. Hours of Service (HOS) rules in the U.S. are somewhat more flexible than in the EU, but enforcement is just as strict. The Federal Motor Carrier Safety Administration (FMCSA) requires the use of electronic logging devices (ELDs) to track drivers' hours of service (HOS). Registry Update: FMCSA is actively removing non-compliant ELD devices from the official list of approved devices. Carriers are given 60 days to replace devices if they have been removed from the registry to avoid fines and suspension from work. ***[10]***

Medical Devices (FDA): Manufacturers of medical devices that import products into the U.S. are required to register their business and products with the Food and Drug Administration (FDA). Electronic Reporting: Manufacturers of radiation-emitting devices (e.g., MRI machines, lasers) must submit electronic product safety reports. ***[11]***

CONCLUSION A comparative analysis revealed differences between leading logistics models:

The European Union bases its transport policy on environmental and social regulations. This is evidenced by limits on the dimensions of road trains, the use of digital tachographs to monitor drivers' 11-hour rest periods, and the implementation of the Euro VII standard.

The United States focuses on maximizing capacity. The U.S. allows the operation of significantly longer trucks with weight restrictions, where weight control is delegated to the states with the application of strict fines. Working-hour monitoring via ELD devices is more flexible, and the environmental focus is shifting toward large-scale infrastructure electrification.

Thus, the EU model exemplifies strict socio-environmental control, whereas the U.S. model demonstrates greater commercial flexibility and a focus on the scale of transportation.

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ROAD SAFETY IN UKRAINE AND EUROPE IN 2025–2026

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Introduction Road safety remains one of the most important social and transportation problems in the modern world. Every year, millions of people are injured or killed in traffic accidents. Although many European countries have significantly improved their road infrastructure and traffic safety systems during the last decades, road accidents continue to cause enormous human and economic losses. The problem is especially serious in Ukraine, where the level of road fatalities remains much higher than in most European countries.

According to European statistics, around 19,800 people were killed on EU roads in 2024, while approximately 100,000 people suffer serious injuries every year. Despite the fact that EU roads are considered among the safest in the world, the European Union continues introducing new safety measures and technologies in order to achieve its long-term “Vision Zero” strategy, whose goal is to reduce road deaths to zero by 2050.

In Ukraine, the situation is even more alarming. In 2025, 3,249 people died in traffic accidents, which exceeded the number of civilians killed by Russian attacks during the same period. Since 1991, approximately 190,000 people have lost their lives on Ukrainian roads. Every year, about 30,000 people are injured in road accidents