

Modernization of the East-West International Transport Corridor and Increasing Azerbaijan's Transit-Logistics Potential

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Abstract

The article analyzes the development prospects of the East-West International Transport Corridor in modern conditions, directions for modernizing its infrastructure, and Azerbaijan's strategic position in the international transit-logistics system. The study extensively examines the corridor's role in accelerating connections between Europe and Asia, the application of multimodal transport systems, the development of digital logistics technologies, and infrastructure solutions based on green energy.

The article specifically assesses Azerbaijan's transit potential, the significance of the Baku–Tbilisi–Kars railway line, the activities of the Alat International Sea Port, and the development opportunities of Ganja city as a logistics center. Simultaneously, it analyzes the optimization of cargo flow, automated management systems, smart transport technologies, and the impact of applying alternative energy sources on transport efficiency.

The research concludes that the modernization of the East-West corridor has crucial strategic importance for strengthening regional economic integration, expanding international trade, and increasing Azerbaijan's transit revenues.

Keywords: East-West transport corridor, multimodal transport, logistics, transit potential, Ganja city, international freight transport, digital logistics, green energy, infrastructure, smart transport systems.

1. Introduction

In the context of the modern global economy, international transport corridors have become one of the fundamental elements of world trade and logistics systems. The intensive increase in freight transport, especially between Europe and Asia, has necessitated the development of new and more efficient transit routes. In this regard, the East-West International Transport Corridor acts as an important strategic international logistics platform.

The East-West corridor is a crucial transport artery connecting China, Central Asia, the Caspian region, Azerbaijan, Georgia, and Turkey with European markets. The corridor holds special importance for reducing the duration of international freight transport, optimizing logistics costs, and expanding trade relations. In recent years, the significance of this route has grown further due to geopolitical and economic changes.

With its favorable geographical position, Azerbaijan is considered one of the main transit centers in the East-West transport system. Within the framework of its transit-logistics strategy, significant investments have been directed towards the development of railway, highway, port infrastructure, and logistics centers. The Baku–Tbilisi–Kars (BTK) railway line and the Alat International Sea Trade Port play particularly important roles in expanding the region's freight capacity.

Furthermore, Ganja city stands out as an important logistics and industrial center located on the East-West corridor. The city's road and railway infrastructure creates favorable conditions for international freight transport.

Currently, one of the main problems facing the East-West corridor is that the existing infrastructure cannot fully accommodate the growing cargo flow. Therefore, modernizing the corridor, implementing digital management systems, developing multimodal transport, and expanding the use of alternative energy sources are considered pressing issues.

2. History and Development Dynamics of the East-West Corridor

The formation of the East-West International Transport Corridor began in the late 20th century within the framework of the European Union's TRACECA (Transport Corridor Europe-Caucasus-Asia) program. The Multilateral Agreement signed in Brussels in 1993 formed the legal basis for this route. However, the corridor's real potential opened up after the commissioning of the Baku-Tbilisi-Kars (BTK) railway line in 2017.

The BTK line is 826 km long and has a cargo transport potential of 6.5 million tons per year. Through expansion works, this figure has been increased to 5 million tons. In 2024, record volumes of cargo were transported via BTK: 2,915 TEU from China to Turkey, 912 TEU from Turkmenistan, and 747 TEU from Uzbekistan. At the same time, the total number of containers transported from the direction of China reached 27,000 TEU, which represents a 25-fold increase compared to the same period last year.

In 2024, the total volume of cargo transported through the transport corridors passing through Azerbaijan was 33 million 258 thousand tons, and the freight turnover was 13 billion 198.3 million ton-km. Compared to the previous year, this represents an increase of 1.4% and 2.5% respectively. Transit cargo accounted for 56.6% (18.84 million tons) of the transported cargo.

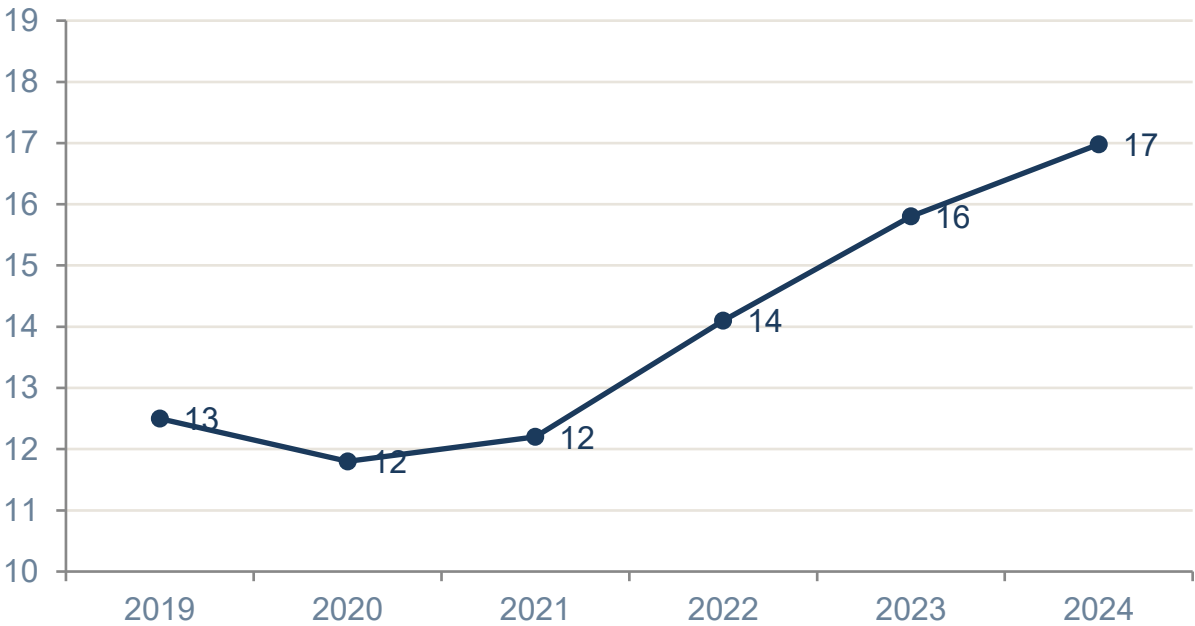


Figure 1 shows that cargo flow on the East-West corridor reached 16.98 million tons in 2024 from 12.5 million tons in 2019. The total increase during this period was 35.8%. The fastest growth was observed in 2021 (+11.9%) and 2023 (+12.1%). The temporary decrease in 2020 (-5.6%) is related to the global COVID-19 pandemic and its impact on international trade volumes.

Figure 2. Dynamics of annual growth in Azerbaijan's transit revenues (2020–2024)

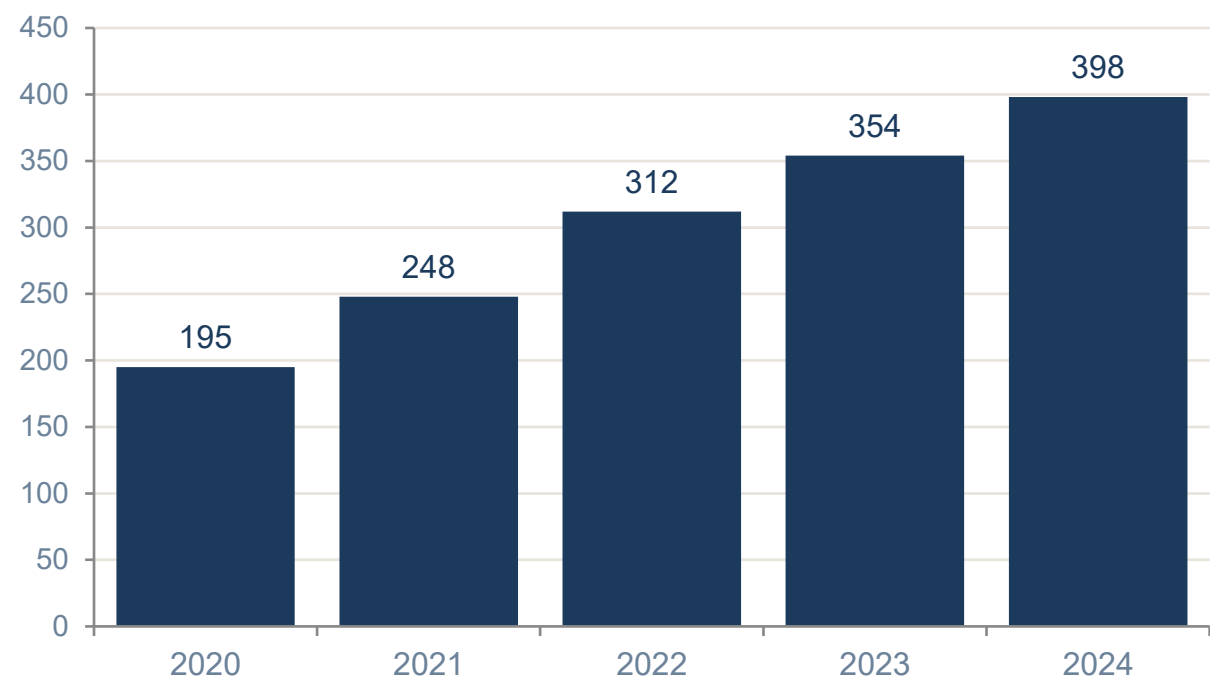


Figure 2 reflects the dynamics of Azerbaijan's transit revenues. Transit revenues, which were 195 million manat in 2020, reached 398 million manat in 2024, indicating a total increase of 104.1%. This growth dynamics confirms the strong development of the country's transit potential and the increasing volume of international freight transport.

Figure 3. Cargo transport structure by corridors passing through Azerbaijan in 2024

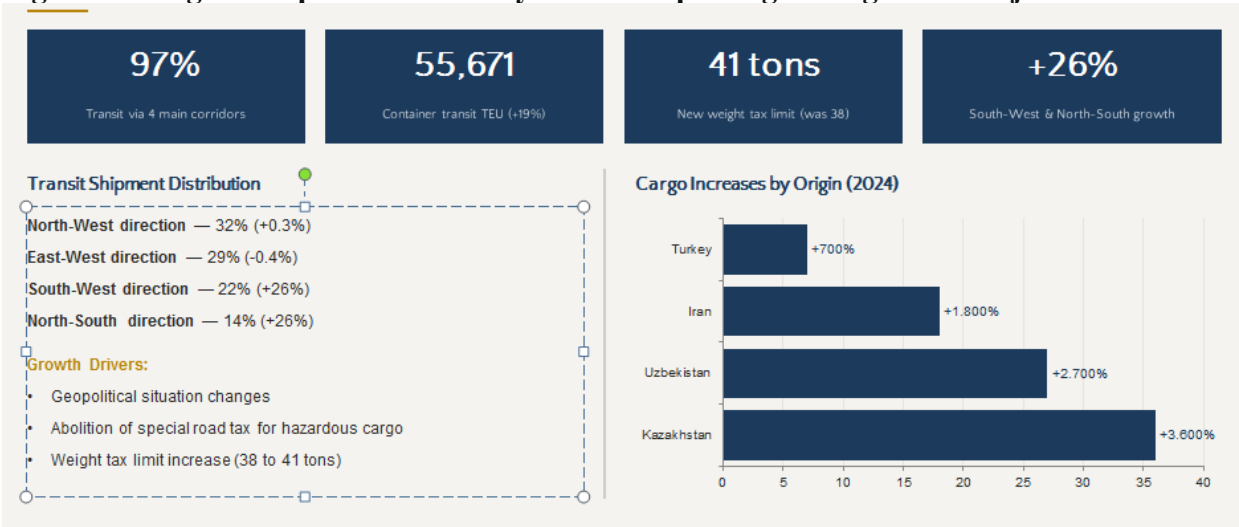


Figure 3 depicts the cargo transport structure by four main corridors passing through Azerbaijan in 2024. The East-West corridor accounts for 51.1% of total cargo transport (16.98 million tons), North-South 29.8% (9.90 million tons), North-West 18.0% (5.98 million tons), and South-West

1.2% (0.39 million tons). This structure clearly demonstrates the dominant position of the East-West corridor in Azerbaijan's transit system.

3. Azerbaijan's Transit-Logistics Strategy

Azerbaijan's favorable geostrategic position and modern transport-logistics infrastructure significantly contribute to the country becoming one of the main transit hubs in the region. Providing multimodal transport through the Baku Port located on the western coast of the Caspian Sea further strengthens this role.

In 2024, 97% of transit shipments took place via four main corridors:

- North-West direction — 32% (0.3% increase)
- East-West direction — 29% (0.4% decrease)
- South-West direction — 22% (26% increase)
- North-South direction — 14% (26% increase)

In 2024, the number of transit container shipments was 55,671 TEU, which represents a 19% increase compared to 2023 (46,909 TEU in 2023). The main reasons for the increase in transit shipments are the geopolitical situation, the abolition of the special road tax for hazardous cargo, and the increase in the weight tax limit for freight trucks from 38 tons to 41 tons, which has made the route more attractive.

In 2024, transit cargo passing through Azerbaijan showed sharper increases from Uzbekistan (+27%), Kazakhstan (+36%), Iran (+18%), and Turkey (+7%).

Table 1. Comparative analysis of international transport corridors

Indicator	East-West	North-South	TRACECA	Middle Corridor
Total length	~8,500 km	~7,200 km	~10,000 km	~11,000 km
Annual cargo (2024)	16.98M tons	9.90M tons	~25M tons	~15M tons
Avg. transport time	12-15 days	18-22 days	20-25 days	10-12 days
Transport cost	~\$0.045	~\$0.052	~\$0.048	~\$0.038
Multimodal	Rail+Road+Sea	Rail+Road	Rail+Road+Sea	Rail+Sea
Digitalization	Medium-High	Medium	Medium	High
Transit countries	AZ, GE, TR	AZ, IR, RU	KZ, AZ, GE	KZ, AZ, TR

Table 1 shows the comparison of the East-West corridor with other international transport corridors. The East-West corridor has a competitive position with an average transport time of 12-15 days and a cost of ~\$0.045 USD/ton-km. It has a shorter route compared to TRACECA and lower costs compared to the Middle Corridor.

4. The Role of Ganja City in the Cargo Transport System

Ganja city is one of the important logistics and industrial centers located on the East-West corridor. The city's road and railway infrastructure creates favorable conditions for international freight transport. Ganja Logistics Center has an annual cargo handling capacity of 5 million tons, with an actual cargo volume of 2.1 million tons in 2024.

Developing Ganja as a logistics hub forms important prospects for optimizing cargo flow across the region and improving the quality of transport services. The city has strategic advantages due to its proximity to the Baku–Tbilisi–Kars railway line and its location at the intersection of highways.

To further increase the logistics potential of Ganja city, the following measures should be taken:

- Construction of new logistics terminals in the city;
- Modernization of railway infrastructure;
- Expansion and repair of highways;
- Implementation of digital management systems;
- Creation of logistics facilities based on green energy.

• **Table 2. Cargo handling capacities of Azerbaijan's main logistics centers (2024)**

Logistics Center	Capacity	Actual 2024	Strategic Role
Baku Int'l Sea Port	15M tons	8.5M tons	Main Caspian port
Alat Int'l Sea Port	25M tons	3.2M tons	BTK starting point
Ganja Center	5M tons	2.1M tons	Western region hub
Baku Trade Port	10M tons	6.8M tons	TRACECA main port
Sumgayit Port	3M tons	1.4M tons	Industrial export

- Table 2 shows the cargo handling capacities of Azerbaijan's main logistics centers. The Baku International Sea Trade Port, with an annual capacity of 15 million tons, is the main port of the Caspian region. The Alat International Sea Port has a potential of 25 million tons and plays a strategic role as the starting point of the BTK. The Ganja Logistics Center acts as the logistics hub of the western region.

5. Road and Rail Transport on the Corridor

In 2024, of the cargo transported via transport corridors, 46.0% or 15,277.6 thousand tons were transported by rail, 30.3% or 10,090.0 thousand tons by road, and 23.7% or 7,890.4 thousand tons by sea.

In 2024, rail transit saw a 6% increase (7,039 thousand tons, an increase of 373 thousand tons).

Road transit saw an 11% increase (7,206 thousand tons, an increase of 686 thousand tons).

Total freight volume on the Baku–Tbilisi–Kars railway line for 2017-2022 was 1,347,585 tons.

In 2022, 432,284 tons of cargo were transported. As a result of expansion, the annual cargo capacity of the railway line is being increased from one million tons to five million tons.

In 2024, record cargo was transported via BTK. 2,915 TEU were transported from China to Turkey, 912 TEU from Turkmenistan, and 747 TEU from Uzbekistan. The total number of containers transported from the direction of China was 27,000 TEU, which is 25 times more than the same period last year.

6. Application of Modern Logistics Technologies

In modernization, special emphasis should be placed on using solar and wind energy as primary sources for powering the corridor's infrastructure. Solar and wind energy have significant potential for creating a sustainable and independent energy base. Using these sources will reduce dependence on traditional sources and minimize the carbon footprint, which will have a positive impact on the environment.

Intelligent Transport Systems (ITS) will play a key role in monitoring and managing traffic, which will significantly reduce the number of accidents and facilitate the work of operators. The implementation of automated and electrified machinery will ease human labor and increase safety in production.

Within the framework of applying digital logistics technologies, the expansion of e-TIR, e-CMR, and "Single Window" mechanisms serves to accelerate customs procedures and reduce logistics costs.

Table 3. Economic efficiency indicators of multimodal transport

Indicator	Rail Only	Road Only	Rail+Sea	Rail+Road
Transport time	18-22 days	14-16 days	12-15 days	11-13 days
Cost (\$/ton-km)	~\$0.0525	~\$0.0655	~\$0.0455	~\$0.0485
CO2 (kg/ton-km)	0.018	0.062	0.012	0.015
Damage rate	0.8%	1.2%	0.5%	0.7%
Customs time	48 hours	36 hours	24 hours	30 hours
Efficiency Index	72/100	65/100	88/100	82/100

Table 3 reflects the economic efficiency indicators of multimodal transport. Multimodal (rail + sea) transport has the most optimal indicators: 12-15 days transport time, ~\$0.045 USD/ton-km cost, 0.012 kg/ton-km carbon emissions, and an efficiency index of 88 points. This...

7. Problems and Development Prospects

Main problems facing the East-West corridor:

1. **Infrastructure limitations:** The existing infrastructure cannot fully accommodate the growing cargo flow. Although the capacity of the BTK line has been increased to 5 million tons, demand is expected to grow further.

2. **Border-crossing procedures:** Long duration of customs procedures. On average, customs procedures take 24-48 hours, which is not an advantage compared to competitive routes.
3. **Digital integration:** Incomplete compatibility of digital systems between countries. Standardization of electronic data interchange systems has not yet been fully implemented.
4. **Energy supply:** Dependence on traditional energy sources. The level of green energy supply for logistics infrastructure is low.

In 2024, a "Joint Declaration on the Establishment of Strategic Partnership" was signed between Azerbaijan and the People's Republic of China. This document envisages deepening cooperation in the transport-logistics sector. Azerbaijan also coordinates transport policy among member countries by participating in the Trans-Caspian International Transport Route (TITR) International Association.

8. Ways to Increase Efficiency

Measures should be taken in the following directions to increase the efficiency of the East-West corridor:

1. **Creation of a modern logistics center in Ganja city** – for optimizing cargo flow across the region and creating new jobs.
2. **Expansion of the implementation of digital cargo tracking systems** – application of e-TIR, e-CMR, and the "Single Window" mechanism along the entire corridor.
3. **Modernization of railway and road infrastructure** – expansion of the BTK line, repair and expansion of highways.
4. **Establishment of logistics terminals based on green energy** – construction of logistics facilities using solar and wind energy.
5. **Strengthening international cooperation on multimodal transport** – deepening cooperation within TRACECA and TITR.
6. **Digitalization and simplification of customs procedures** – reducing border-crossing time from 24 hours to 12 hours.

Conclusion

The analyses conducted show that the East-West International Transport Corridor further strengthens Azerbaijan's strategic position in the international logistics system. In 2024, 16.98 million tons of cargo were transported on the corridor, which represents a 35.8% increase compared to 2019.

The modernization of the corridor is of great importance for accelerating freight transport, increasing transit revenues (398 million manat in 2024), and expanding regional economic integration. Azerbaijan's transit revenues increased by 104.1% during 2020-2024, which confirms the country's dynamic development in this field.

The application of digital logistics technologies, development of multimodal transport, and use of green energy-based transport solutions can ensure the long-term sustainable development of the corridor. Multimodal (rail + sea) transport is the most optimal option with an efficiency index of 88 points.

At the same time, developing Ganja city as a logistics center will enable more efficient use of Azerbaijan's transit potential. The city's annual cargo handling capacity of 5 million tons can be increased to 8-10 million tons through expansion of existing infrastructure.

The East-West corridor is a path towards improving people's lives, strengthening international cooperation, and creating sustainable infrastructure. All available technologies should be used to turn this corridor into a symbol of progress and human care.

Practical Proposals

1. Creation of a modern logistics center in Ganja city;
2. Expansion of the implementation of digital cargo tracking systems;
3. Modernization of railway and road infrastructure;
4. Establishment of green energy-based logistics terminals;
5. Strengthening international cooperation on multimodal transport;
6. Digitalization and simplification of customs procedures.

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