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ORGANISATIONAL AND ECONOMIC MECHANISM FOR IMPROVING TRANSPORT SUPPORT OF INDUSTRIAL ENTERPRISES IN UZBEKISTAN: CONTRACTUAL KPIs, DIGITAL MONITORING AND SCENARIO-BASED ASSESSMENT

Ruzmetova Mukhabbat Samandarovna

Lecturer and Researcher at the Department of «Management, marketing and tourism»,Tashkent State Transport University.

mail:ruzmetovamuxabbat@tstu.uz https://orcid.org/0009-0007-5192-4544

***Ruzmetova Mukhabbat Samandarovna**, PhD candidate, Tashkent State Transport University*

Abstract. The article substantiates an organisational and economic mechanism for improving the transport support of industrial enterprises in Uzbekistan. The mechanism combines contractual KPIs for logistics services, digital cargo monitoring, rational outsourcing, industrial and logistics hubs, a transport support passport of the enterprise and a modernisation roadmap. A scenario forecast for 2026–2030 shows that under the realistic scenario freight turnover reaches 104.7 billion tonne-km, transport and logistics costs fall by 10% and the integral efficiency index rises from 0.55 to 0.72. A model calculation for an enterprise with annual logistics costs of 100 billion soums gives a net effect of 5.83 billion soums, an ROI of 116.6% and a payback period of 0.46 years.

Keywords: transport support, organisational and economic mechanism, contractual KPIs, digital monitoring, outsourcing, scenario forecast, ROI, Uzbekistan.

Ilm fan taraqqiyotida raqamli iqtisodiyot va zamonaviy ta'limning o'rni hamda rivojlanish omillari

Introduction

Relevance of the topic. As President Shavkat Mirziyoyev has noted, transport and logistics are the "circulatory system" of the economy [1]. The tasks set for the coming years are ambitious: bringing exports to USD 40 billion in 2026, raising the share of finished and semi-finished goods in exports above 55% and increasing value added in industry from USD 36.5 billion to at least USD 60 billion within five years [2]. Resolution No. PP-28 of 27 January 2025 requires cutting transport costs by 10–15%, doubling international freight and tripling the capacity of logistics centres by 2030 [3].

At the enterprise level, however, these goals face persistent problems. Transport is planned after the production programme, carriers are chosen by the lowest tariff, responsibility for delays is blurred and cargo is monitored after the fact. Small businesses account for 77.4% of freight turnover [4], which makes the market flexible but fragmented and complicates the standardisation of service quality. International organisations also point to shortages of multimodal infrastructure and warehouse capacity in the region [5; 6]. Without an organisational and economic mechanism that links contracts, data, infrastructure and financing, national infrastructure projects will not translate into lower costs and higher reliability for industrial enterprises. This determines the relevance of the study.

The aim of the article is to substantiate an organisational and economic mechanism for improving transport support of industrial enterprises and to assess its expected economic effect under alternative scenarios.

Structure of the mechanism

The proposed mechanism consists of five interrelated blocks: contractual, financial, operational, digital, and control and evaluation. It moves the enterprise from fragmented accounting and post-factum control to a closed cycle of planning, execution, monitoring and correction.

The **contractual block** replaces selection by the lowest tariff with selection by full cost, reliability and digital maturity of the operator. Its core is a set of contractual KPIs with penalties and bonuses (Table 1). The **operational block** introduces a single calendar for procurement, production, warehousing and shipment, together with route and batch optimisation and cooperation with sector hubs. The **digital block** provides online cargo tracking, electronic requests and documents, and analysis of deviations. The **financial block** relies on public-private partnership, cluster co-financing and investment selection based on the total economic effect. The **control block** includes an annual audit, the integral efficiency index and an operator rating.

Outsourcing is applied selectively. Strategic planning and control of key indicators always remain with the enterprise. Operational transport, warehousing and documentation can be transferred to an operator when volumes are variable, products are standard and the operator is digitally integrated [7; 8].

Table 1. Contractual KPIs for transport and logistics services

Group	Indicator	Economic content	Use in the contract
Time	Compliance with the planned delivery date	Reliability of the production schedule	Fixed as a quality indicator
Time	Average deviation from planned time	Predictability of transport	Basis for penalties and bonuses
Cost	Deviation of actual cost from contract cost	Tariff and operational discipline	Assessment of the service provider
Resource	Vehicle load factor	Use of capacity	Planning of consolidated shipments

Group	Indicator	Economic content	Use in the contract
Quality	Share of deliveries without damage	Safety of material flow	Criterion for admitting an operator
Information	Share of operations with digital confirmation	Transparency and traceability	Enterprise monitoring system
Risk	Availability of a backup route	Ability to keep supply during disruption	Condition for handling critical cargo

Source: developed by the author.

Scenario forecast to 2030

The expected results were assessed using three scenarios. The inertial scenario assumes fragmented modernisation and 3.0% average annual growth in freight turnover. The realistic scenario assumes consistent introduction of contractual KPIs, digital monitoring, route optimisation and logistics centres, with 4.5% growth. The optimistic scenario assumes accelerated integration of organisational, digital and infrastructure solutions, with 6.0% growth. Freight turnover is extrapolated from the 2025 level of 84.0 billion tonne-km; cost, time, reliability and inventory indicators are expressed as indices (2025 = 100).

Table 2. Scenario parameters of transport support of industry by 2030

Indicator by 2030	Inertial	Realistic	Optimistic
Average annual growth of freight turnover	3.0%	4.5%	6.0%
Freight turnover, billion tonne-km	97.4	104.7	112.4
Transport and logistics cost index (2025 = 100)	95.0	90.0	85.0

Indicator by 2030	Inertial	Realistic	Optimistic
Average delivery time index (2025 = 100)	96.0	92.0	85.0
On-time delivery index (2025 = 100)	105.0	110.0	115.0
Safety stock index (2025 = 100)	96.0	93.0	88.0
Digital monitoring coverage, % of operations	30.0	60.0	80.0
Integral efficiency index	0.60	0.72	0.82

Source: author's calculations based on 2020–2025 data and the targets of Resolution No. PP-28.

Only the optimistic scenario fully reaches the PP-28 target of a 15% reduction in transport costs, while the realistic scenario reaches its lower bound of 10%. The forecast is not a point prediction: if actual indicators deviate from the realistic path by more than 5%, the timing, resources and set of measures should be revised.

Economic effect of the mechanism

The total economic effect is calculated as the sum of savings in transport costs, release of working capital from inventories, reduction of downtime losses and reduction of penalties and quality losses, minus modernisation costs:

$$E_{total} = E_{tr} + E_{inv} + E_{dt} + E_{pen} - C_{mod}$$

The model enterprise has annual transport and logistics costs of 100.0 billion soums, safety and excess stocks of 40.0 billion soums, an annual cost of capital of 18.0%, downtime losses of 12.0 billion soums and penalties and quality losses of 5.0 billion soums. Modernisation costs are 2.5, 5.0 and 8.0 billion soums for the three scenarios. The inventory effect equals the reduction in stocks multiplied by the cost of capital.

Table 3. Economic effect, ROI and payback of the mechanism (billion soums)

Scenario	Transport savings	Inventory effect	Downtime reduction	Penalties and losses	Gross effect	Modernisation costs	Net effect	ROI, %	Payback, years
Inertial	3.00	0.14	0.60	0.20	3.94	2.50	1.44	57.8	0.63
Realistic	8.00	0.43	1.80	0.60	10.83	5.00	5.83	116.6	0.46
Optimistic	13.00	0.72	3.00	1.00	17.72	8.00	9.72	121.5	0.45

Source: author's calculations.

In all three scenarios, the mechanism pays back within one year. Direct transport savings provide 73–76% of the gross effect, but downtime reduction adds a further 15–17%. This confirms that the effect of transport modernisation goes beyond tariffs and is realised through the reliability of production schedules.

Conclusion

1. Improving transport support of industrial enterprises requires an organisational and economic mechanism rather than isolated purchases of vehicles or software. The proposed mechanism unites contractual, financial, operational, digital and control blocks into a closed management cycle.

2. Contractual KPIs shift the choice of operator from the lowest tariff to full cost, reliability, cargo safety, digital confirmation and backup routes.

3. Under the realistic scenario, by 2030 freight turnover reaches 104.7 billion tonne-km, logistics costs fall by 10%, on-time delivery improves by 10% and the integral efficiency index rises to 0.72.

4. For a model enterprise with 100 billion soums of annual logistics costs, the net effect ranges from 1.44 to 9.72 billion soums, with ROI of 57.8–121.5% and payback of 0.45–0.63 years.

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