KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY

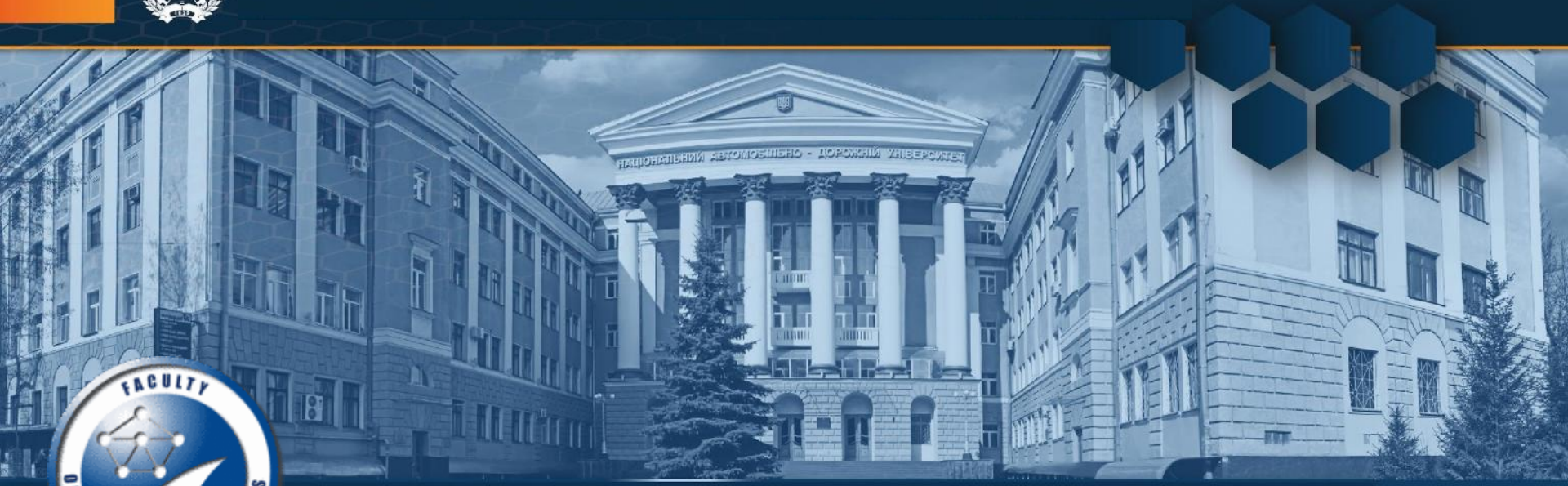


FACULTY OF TRANSPORT SYSTEMS

Research and innovative solutions for sustainable Transport Systems

Education • Research • Innovation • Partnership with Communities and Business

KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY



Research Areas of the Department of Transport Technologies in the field of "Sustainable Development of Integrated Transport Technologies"

Head of Department – PhD in Engineering, Associate Professor Oleksii Pavlenko

https://fts.khadi.kharkov.ua/

Email: ktt@khadi.kharkov.ua

Development and Enhancement of the Resilience of Agricultural Product Supply Chains

The development and enhancement of the resilience of agricultural product supply chains is highly relevant due to the growing volatility of the market environment and destabilizing factors affecting the agricultural sector. Ensuring the reliability, continuity, and adaptability of these chains improves food supply efficiency and strengthens the competitiveness of agricultural producers.



Stakeholders in this type of research include:

agribusiness enterprises
logistics operators (3PL, 4PL)
agricultural traders
local self-government authorities

Expected results of work on enhancing the resilience of agricultural product supply chains include:

a map of flows, bottlenecks, and risks in the supply chain;
analysis of alternative routes and delivery technologies;
a scenario-based response plan for key risks (customs delays, transport shortages, terminal constraints);
a model of key node operations: elevator, terminal, railway station, port, and customs crossing

Improvement of Freight Transport Organization and Planning

Effective organization of freight transport within and between cities requires scientifically grounded route planning and rational use of vehicles. This can be achieved most effectively through transport models that make it possible to identify rational routes and optimize freight operations.



Stakeholders in this type of research include:

local self-government authorities
transport enterprises and carriers
industrial and trade enterprises
warehouses and distribution centers

Expected results include:

development of computer models for freight transport planning in urban and intercity transport systems
reduction of total transport costs through route optimization and improvement of transport process organization
improvement of transport service quality and resilience of transport operations

Organization of Public Passenger Transport Operations

Effective organization of public transport operations requires coordination of the key elements of the transport process. This is most effectively ensured by defining contractual relations, providing routes with the required documentation, and coordinating timetables. This approach makes it possible to create a convenient, predictable, and attractive public transport system.

Stakeholders in this type of research include:

local self-government authorities
transport enterprises and carriers
public organizations
public transport users



Expected results include:

provision of the required documentation for route operations
definition and regulation of contractual relations between the contracting authority and transport operators
development of tariff-setting methodology and compensation calculation methods
formation of effective tools for transport system control and management

Development of Multimodal / Combined Transport in International Transport Corridors

The strategic development of multimodal / combined freight and passenger transport within international transport corridors is an important factor in improving the efficiency of logistics systems, the quality of transport services, and Ukraine's integration into the European TEN-T transport network. Strategy development and the integration of multimodal solutions will help ensure resilience, safety, and increased capacity of international transport corridors under the conditions of the green transition.

Stakeholders in this type of research include:

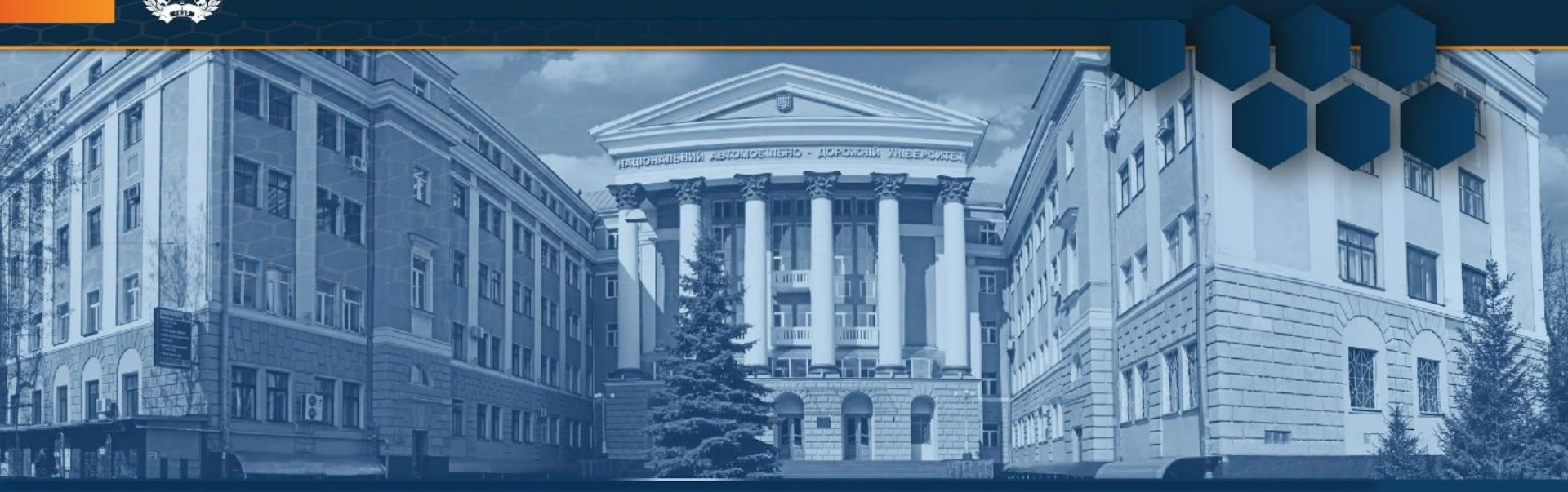
local self-government authorities
transport enterprises and carriers
intermodal transport operators
transport hubs and distribution centers



Expected results include:

formation of a cooperation-based interaction strategy for participants in multimodal supply chains
development of models for synchronizing business processes in multimodal containerized freight supply chains
development of models for organizing "seamless multimodal mobility" in freight and passenger transport within international transport corridors

KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY



Research Areas of the Department of Transport Systems and Logistics in the Field of "Innovative Technologies for the Development of Integrated Transport Systems"

Head of Department – PhD in Engineering, Associate Professor Yevhen Liubyi

https://fts.khadi.kharkov.ua/

Email: tsl@khadi.kharkov.ua

Improvement and Development Planning of Urban Public Transport Route Networks

Urban public transport route networks require periodic review and adjustment to ensure the best possible alignment with current transport demand. This can be achieved most effectively through the use of computer-based transport models.

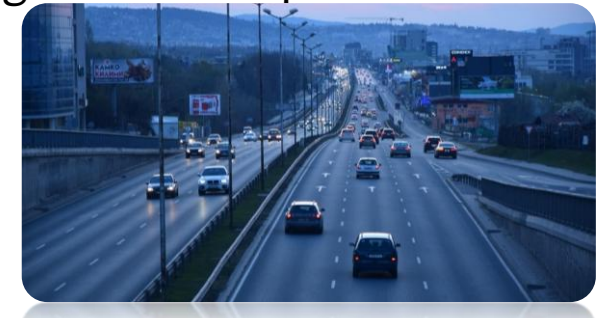
Stakeholders in this type of research include:
Ukrainian municipalities;
transport enterprises and carriers;
public transport passengers;
businesses (city-forming, service, and other enterprises)



Expected results of planning changes in route networks include:
a computer-based transport model of the city;
improved quality of passenger transport services;
increased efficiency in the use of rolling stock (buses, trolleybuses, trams);
rationalization of the number of vehicles operating on routes.

Surveys of Passenger Flows, Traffic Flow Intensity and Composition

Traffic and passenger flows are among the most in-demand data for assessing the performance of transport systems and planning their development.



Stakeholders in passenger and traffic flow surveys include:
city and regional councils, amalgamated territorial communities, government institutions and organizations;
carrier enterprises operating public transport routes;
drivers of private cars and trucks, and public transport passengers.

Expected results of passenger and traffic flow surveys include:
passenger flow intensity;
traffic flow intensity and composition;
dynamics of flow changes by hour of the day;
passenger transport volumes;
level of transport demand

Development of Sustainable Urban Mobility Plans

A Sustainable Urban Mobility Plan (SUMP) is a strategic document designed to meet the mobility needs of people and businesses in cities and their surrounding areas in order to improve quality of life. It builds on existing planning practices and takes into account the principles of integration, participation, and evaluation.

Stakeholders include:

city authorities; ► business;
users of all transport modes and their communities;
public organizations; ► educational institutions;
other enterprises, institutions, and organizations affected by the transport system and generating travel needs.



Expected results of SUMP development include:

strategic and operational measures to improve transport systems;
improved quality of transport services for the population;
access to loans and grants for transport development;
increased sustainability of transport modes and the transport system;
improved quality of life;
planning and monitoring tools.

Development of Traffic Signal Coordination Plans

Traffic signal coordination plans are designed to synchronize signal operations in order to reduce delays for road users, decrease the number of stops at intersections, increase travel speed, and reduce travel time.

Stakeholders in the development of coordination plans include
city authorities;
traffic management centers;
drivers of private cars;
other road users;
urban residents



Expected results of traffic signal coordination include:
formation of a "green wave" on urban arterial roads (allowing passage through several consecutive intersections on green signals);
reduction of traffic congestion and exhaust emissions;
reduction of traffic delays and the number of stops along the route;
increased capacity of urban arterial roads;
improved road traffic comfort

KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY



Research Areas of the Department of Traffic Management and Road Safety in the Field of "Ensuring the Efficiency and Safety of Urban Road Network Operation under Martial Law"

Head of Department – Doctor of Engineering Sciences, Professor Ivan Nahliuk

https://fts.khadi.kharkov.ua/

Email: oibdrkhadi@ukr.net

Improvement of the Operation of the Urban Road Network in Large Cities

In recent years, due to the evacuation of people, enterprises, and organizations from combat zones, the population of certain cities and regions of Ukraine has increased. This has led to more complicated traffic conditions and increased road safety risks.

proposed areas

Modeling the operation of urban road networks under increasing traffic load and population growth



Development of measures to improve urban transport networks and increase their operational efficiency under new conditions

Development of Traffic Management Schemes for Settlements in Areas of Potential Hostilities

Under martial law, transport systems of cities and settlements located near combat zones face additional loads and risks. They must support wartime logistics needs and enable the evacuation of people and material assets.

proposed areas

- Modeling the operation of urban road networks under special conditions using PTV VISSIM software
- Development of evacuation routes for people and material assets of critical enterprises and organizations
- Analysis of transport node capacity and development of traffic management schemes for emergency situations caused by military actions





Improvement of Road Design and Construction Standards

Current standards for the design and construction of urban road infrastructure were developed for peacetime conditions and are not aimed at ensuring the efficient and safe operation of the transport network under martial law.

proposed areas

Revision and improvement of current standards for the design and construction of streets and roads in settlements in the following areas:
- **meeting civil safety needs;**
- **ensuring the protection and functioning of critical infrastructure facilities;**
- **enabling the implementation of evacuation plans for people and material assets;**
- **meeting the logistics needs of the Armed Forces of Ukraine, etc.**





Розташування танку Т-84 на поперечному профілі магістральної вулиці загальноміського значення (ДБН В.2.3-5:2018)

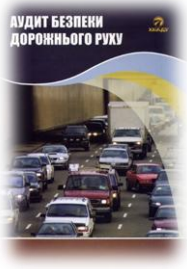
Ensuring Road Safety under Martial Law

Under martial law in Ukraine, road safety indicators have deteriorated, including an increase in the relative severity of road traffic crashes. In 2024, the number of road traffic fatalities was twice the number of civilian deaths caused by hostilities (according to ACLED).

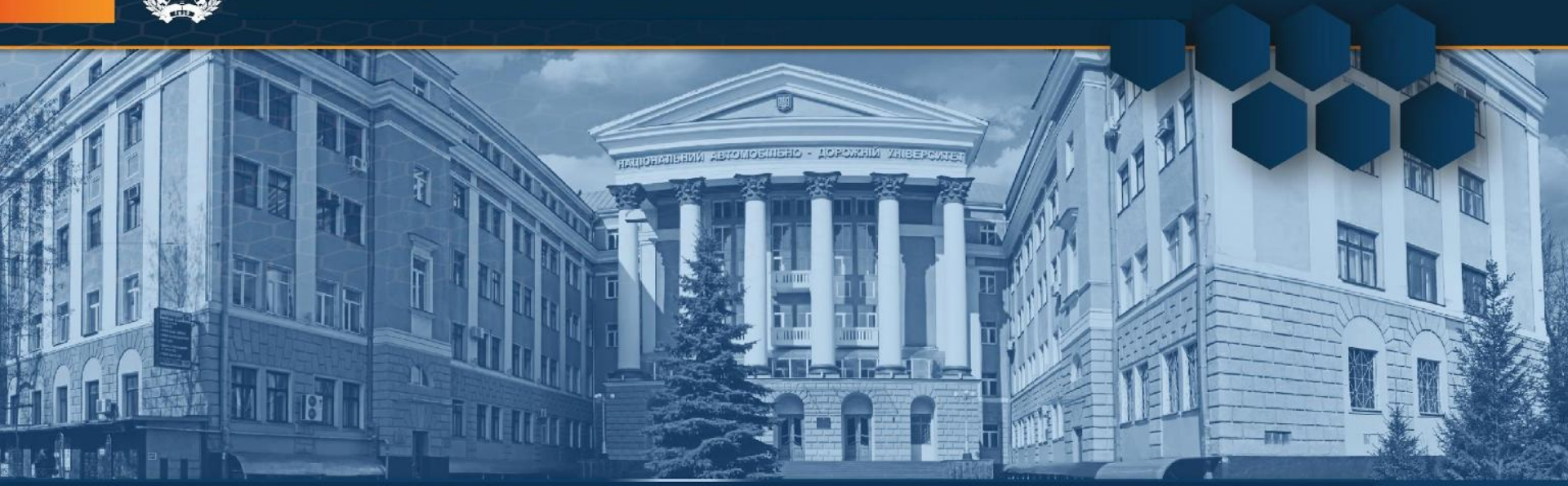
proposed areas



- **Identification and analysis of specific road traffic hazard factors under martial law**
- **Development of road safety measures and reduction of road crash risks under martial law**
- **Conducting road safety audits on highways and urban road networks**



KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY



WE INVITE YOU TO COOPERATE!

Scientific research and innovation development
Consulting and transport audit
Specialist training and staff professional development
Establishment of laboratories and training centers

https://fts.khadi.kharkov.ua/

Email: dekanat.fts@gmail.com