

GAP ANALYSIS OF ROAD TRANSPORT STATISTICS OF UKRAINE

**Alla Novikova¹, Anatolii Redzyuk², Inna Shum³,
Olga Sabanska⁴, Tetyana Yashchenko⁵**

¹Doctor of Economics, Chief of Research Center Complex Transport Problems, State Road Transport Research Institute, Kyiv, Ukraine, E-mail: anovikova@insat.org.ua; ORCID: <https://orcid.org/0000-0002-7165-8673>

²Ph.D. (Technical Science), Professor, National Transport University, Kyiv, Ukraine, E-mail: aredzuk@meta.ua, ORCID: <https://orcid.org/0000-0001-5202-9508>

³Ph.D. (Economic Geography), Head of Consulting Department, Egis in Ukraine, Kyiv, Ukraine, E-mail: inna.shum-int@egis.fr; ORCID: <https://orcid.org/0000-0002-1278-9745>

⁴Head of European Integration Division, Association of International Road Carriers of Ukraine, Kyiv, Ukraine, E-mail: olga@asmap.org.ua; ORCID: <https://orcid.org/0000-0003-0593-5959>

⁵Head of Economics Division, State Road Transport Research Institute, Kyiv, Ukraine, e-mail: tyaschenko@insat.org.ua; ORCID: <https://orcid.org/0000-0003-3919-4968>

Abstract. Methodological approach to the implementation of statistical observations of the European Union regarding the activities of road transport are examined and a comparative analysis of the corresponding methodology of statistical observations in Ukraine is performed. Development of National Transport model needs big data. The purpose of the article is to bring the methodology of statistical observations of Ukraine to the Eurostat methodology and using database for development National transport model. The theoretical and methodological basis of the study are the basic provisions of the dialectical method of cognition, in particular induction and deduction. Various methods and techniques were used: statistical observation and grouping, analysis and synthesis, comparison, graphical, abstract-logical, systematic approach. Example is European transport policy information system development and implementation of data collection methodology for EU Transport Modelling. Sources of road transport statistics database in Ukraine are described in article.

Keywords: road transport, Eurostat, statistics, National transport model, statistical reporting, methodology, reporting forms, statistical observations, sample surveys.

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Introduction. In accordance with the Association Agreement between Ukraine and the EU (Article 355 and Annex XXIX), it is envisaged to bring the methodology of statistical observations of Ukraine to the methodology of Eurostat and regular reporting of Ukraine on key indicators.

Currently, the system of statistical observations on road transport in Ukraine has significant gaps. Road transport database is incomplete, many indicators and datasets are disaggregated, missing or unreliable. Most of Eurostat data are not collected in Ukrainian road transport statistics.

There are different factors of gaps in different databases. Some statistics are not kept such as the type of cargo, origin-destination matrixes for domestic freight transportation, number of passengers transported by cars. Another gap is due to changes in statistical observations, when statistical reporting forms were reduced or lost (for example, the Ministry of Internal Affairs of Ukraine has not reported on the register of vehicles fleet data since 2013). There are no data on interregional transport and economic connections in Ukraine, traffic intensity on roads, etc. There is no reliable statistics of the freight volumes on the road network.

The purpose of the article is to identify gaps in road transport statistics, to carry out a comparative analysis of the methodology of road transport statistics of Eurostat and Ukraine and to conduct a GAP analysis.

Literature review. Eurostat methodology of road transport statistics is set up in [1-8]. European transport policy information system development and implementation of data collection methodology for EU transport modelling is described in [9]. Concept and development plan on National transport model is presented in [10]. Results of Pan-European transport (TRANS-TOOL) model [11] and Great Britain transport model are described in [11-12].

Aims. The purpose of the article is to bring the methodology of statistical observations of Ukraine to the Eurostat methodology and using database for development National transport model.

Methods. The theoretical and methodological basis of the study are the basic provisions of the dialectical method of cognition, in particular induction and deduction. Various methods and techniques were used: statistical observation and grouping, analysis and synthesis, comparison, graphical. abstract-logical, systematic approach.

Results. The growth of the economy of any country is largely associated with the expansion of access for people and goods (via transport) to the main elements of the economic system. Analysis of the level of economic development, forecasting of the transport and economic relations is possible with statistical tools and methods.

Analysis of statistical information and research of publications based on the results of statistical observations in the field of road transport is the basis for:

- information support of public authorities and management of their macro- and microeconomic decisions, in particular related to freight and passenger transportation;

- creating access to opportunities such as sustainable transport and the ability to forecast traffic flows based on statistical observations, help to improve access to economic and social facilities, including access to job places, schools, medical institutions, goods, etc. in urban and rural areas;

- analysis of accessibility, in particular, in rural areas: the relationship between transport and food security; transport infrastructure (roads rehabilitation and construction) and transport services (accessibility of public transport);

- statistical analysis of the transport services quality and transport costs is important in evaluation and analysis of the economic growth prospects and transport companies competitiveness.

The research of volumes and routes of transportation provides an opportunity to conduct feasibility studies for the development of road network and obtaining loans from international financial organizations for construction and rehabilitation of roads.

The broadening of national transport policy from strategic infrastructure investments to infrastructure management with regard to efficiency, environmental, safety and regional equity objectives has led to a need for advanced and more policy sensitive tools of analysis. The increase of interregional and international mobility requires forecasting tools that go beyond the urban or regional level.

A powerful tool for analysis, forecasting and planning of investment projects is transport modeling – from urban models to the national transport model (NTM). The purpose of the NTM is to establish a tool which can be used to test and simulate the future major traffic flows of passengers and freight by modes and routes/links based on sets of assumptions with regard to economic, infrastructure and charging regimes. Additional objectives of the NTM are the following:

- to establish a planning framework and a tool at strategic level to forecast the future transportation demand expected in Ukraine based on the land use and socio-economic structure patterns;
- to demonstrate the effect of the proposed transportation projects at strategic level and to forecast multi-modal transportation demand in future horizons;
- to evaluate various alternative scenarios by multi-criteria;
- to generate information that will form basis for the financial assessments that can be carried out for the projects;
- to analyze potential operational, economic, environmental impacts of different transportation policies by using the identified data.

Modeling requires a lot of information, because the more detailed information makes model more reliable.

The European transport network model TRANS-TOOL is an integrated policy support tool for transport at the EU level. To create it, the European Commission initially funded research to provide a comparable information base ETIS (European Transport Information System). Transport statistics of each country were compared. Eurostat maintains an extensive information database, which is provided annually by each EU country. Requirements to road transport statistics are defined in a number of the EU regulations that have the force of law and envisage liability for failure to provide statistics or refusal to participate in surveys. National transport models are now available for every EU country.

In the field of road transport, there are the most gaps in statistical information because car owners, both bus and trucks, do not report on the route, traffic volumes, type of cargo. In addition, licensing of domestic freight transportation has been abolished in Ukraine, which makes impossible to determine the number of carriers, fleet of vehicles and other indicators.

With the slogans of deregulation in recent years in Ukraine, statistical reporting on road transport has been abolished or simplified as much as possible. Forms of statistical reporting on road transport are presented in the table 1 below.

At the same time, there is no control of the reliability and obligatory submission of statistical reports in Ukraine. Since approximately 90% of trucking companies own up to 10 cars, they are considered small businesses and pay a single tax. There are two systems of taxation in Ukraine: common taxation and single tax for small business, which is less than common taxation.

Table 1. Forms of state statistical reporting on road transport in Ukraine

№	Statistical reporting forms	№ and periodicity
1	Report on road transportation of goods by type of cargo, and passengers by type of service	№ 31- auto (quarterly)
2	Report on transportation of goods and passengers by road	№ 51 auto (monthly)
3	Report on vehicles operation	№ 2-tr (annual)
4	Survey for natural persons-entrepreneurs transporting freight on a commercial basis	№ 51-cargo (2 times a year)
5	Survey for natural persons-entrepreneurs transporting passengers on the route	№ 51 pass (2 times a year)

Source: systematized by the author on the basis of [13]

This does not stimulate submission of reliable statistical reports because actual revenues are often higher than those provided by the Tax Code for small businesses (for taxpayers under the simplified taxation system).

The State Statistics Service of Ukraine (Ukrstat) has not provided a database on the number of vehicles: it was received from the Ministry of Internal Affairs of Ukraine. But after cancellation of technical inspections of vehicles in 2013, the database was destroyed. Since 2018, the Ministry of Internal Affairs of Ukraine publishes information on vehicle registration on its website, which includes thousands of lines, but it is impossible to obtain information on vehicle fleet from it.

In 2017, the resolution of the Cabinet of Ministers of Ukraine on statistics of road accidents was amended. According to it, the Ministry of Internal Affairs stopped providing Ukrstat with a database on road accidents. Although on website of the Patrol Police of Ukraine information from 2017 on road accidents is presented quite fully.^{IV}

While statistical reporting in Ukraine is collapsing, Eurostat presents complete information on road transport activities: on the vehicle fleet (its structure by car brands, age, engine type, fuel type), the number of trucking companies, their employees, investments. In Ukrainian statistics, the number of employees and capital investment are generally taken into account in the context of land transport operations. Financial results of enterprises' activities are aggregated by type of economic activity "Transport, warehousing, postal and courier activities".

In addition, major part of road transportation is performed by industrial transport. As a result, there are two sets of statistics: monthly statistics is collected from road enterprises for which transport is the main activity, and annual statistics cover all industrial, agrarian and individual entrepreneurs, which has their own fleet.

There is no statistical reporting on traffic intensity on roads of Ukraine. At the initiative of the Government, traffic counters and cameras are being installed on road network.

On the contrary, the completeness of Eurostat statistics on road freight transport is quite impressive: by type of cargo, loading and unloading areas, transit, by car weight, number of axles, empty mileage. Similar statistics in Ukraine is not available.

This situation is aggravated by the fact that not all national road transport operators report to state statistics bodies or do not report fully. At the same time,

there is no liability in Ukraine for failure to submit statistical reports, in contrast to the EU, where penalties are provided for late submission or non-submission of statistical reports. Attempts by state institutions to introduce into the current legislation of Ukraine norms on liability of carriers for failure to provide statistical reporting failed under the slogan of business deregulation.

Instead, the business environment itself should be interested in the use of statistical surveys and other similar information on the sector activities, in order to identify possible gaps in the route network of public transport, regular traffic flows, information on average market costs of services, number of employees, capital investments in comparison with other types of activity, etc. Such data can help potential investors to find their competitive place in the market of transport services by analyzing the real situation in the industry with the help of statistical observation tools.

In the EU, passenger transport determines the volume of passenger traffic, the purpose of travel, which is not the case in Ukraine.

Information on freight transport is collected at the level of economic regions or small countries (NUTS 2), on passenger transport - at the level of cities, agglomerations (NUTS 3) (Fig. 1).

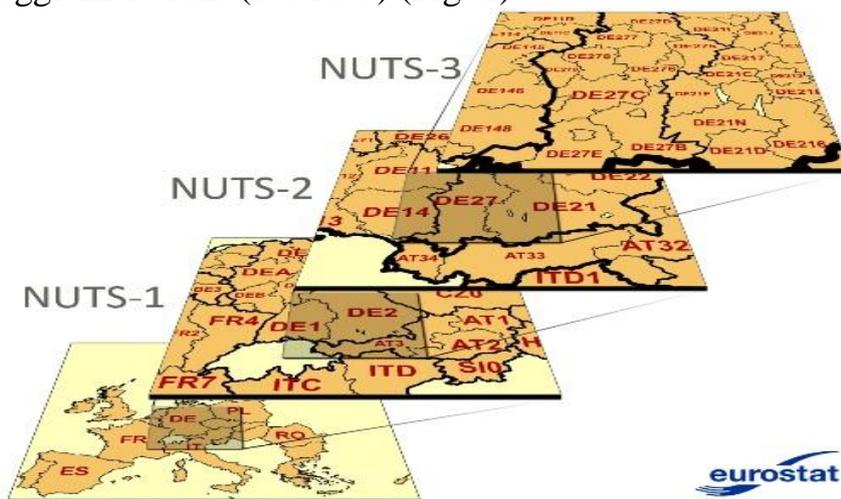


Figure 1. Territorial division of the EU according to the methodology of Eurostat

Except State Statistics Service data there are a lot of another sources of information. (Figure 2). Some data can be used from official sources and another data needs to be calculated thanks modeling.

Registers of bus routes are divided according the distance: Ministry of Infrastructure Ukraine (MIU) is responsible for Register of international and interregional bus routes; local authorities create cities and suburban bus routes registers.

Register of carriers is created by State Transport Inspection on the base of licenses. Database of international freight transportation provided by State Custom Service (including volume of export–import, its nomenclature, regions of destinations).

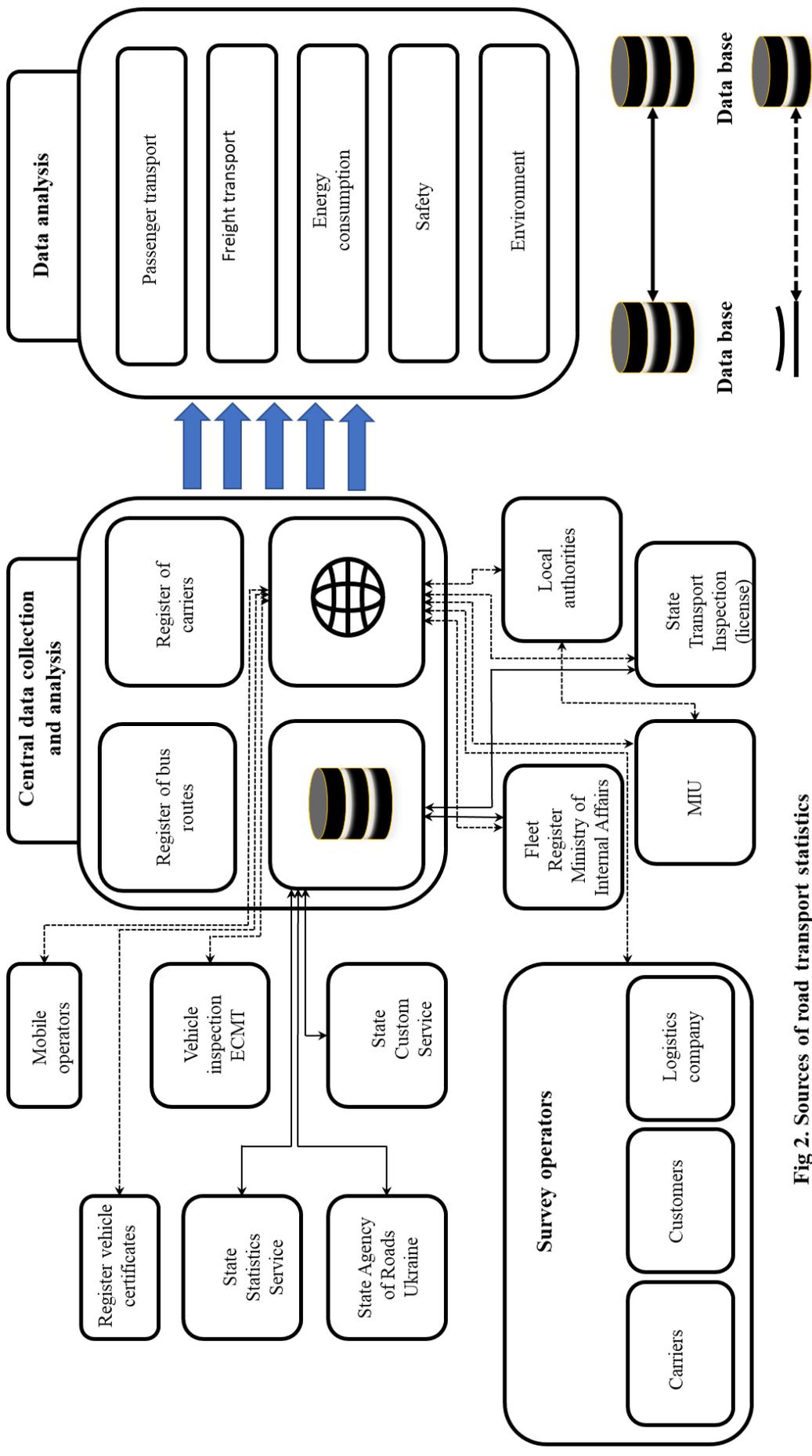


Fig 2. Sources of road transport statistics

Association of International Road Carriers own another database: international freight transportation: number of carriers, their freight vehicles fleet, routes, permits.

Ministry of Internal Affairs is responsible for vehicles fleet register. Additionally vehicles certification bodies can be used for new fleet data. Database about technical inspection of heavy vehicles that are used according European Conference of Ministers of Transport (ECMT) system of multilateral permits for international freight carriage.

State Agency of Roads conduct information about traffic on roads, type of vehicles and their weight.

Number of passenger trips can be presented by mobile operators but dividing between cars and buses needs special methodology and modelling.

Surveys are organized in order to receive database about aims of voyages, regions of destinations, loads and unloads cargo, type of goods and type of transport, distance class; type of movement (international, home, cabotage or transit) and so on.

In 2019, the first comprehensive survey campaign was carried out in Ukraine in the framework of the EU technical assistance project “Assistance to the Ukrainian authorities for establishment of national transport model and masterplan” led by Egis for the Ministry of Infrastructure of Ukraine. As part of the survey, interviews were conducted for all transport modes. Number of the country-wide interviews completed (including preference surveys): roadside interviews (cars, heavy vehicles) – about 46 thous., bus passenger interviews – 35 thous., boarding and alighting counts at bus stations – about 12 thous. at 46 locations, railway passenger interviews – 35.5 thous., air passenger interviews – about 5 thous., traffic counts at 70 points. The survey data were analyzed in the context of such characteristics as trip purposes, weekly dynamics, car availability – for public transport passengers, trip time and frequency, distribution among the places of interviewing. Interview campaign was also carried out with the actors involved in various domains in the transport sector, including public administrations, associations, private sector stakeholders, public companies. Road carriers, freight forwarders, stevedores in sea and river ports were interviewed on the volume and nomenclature of goods, transportation routes, etc.

Discussion. This practice is not developed in Ukraine yet, carriers refuse to answer questionnaires often, despite the guarantee of information confidentiality. Systematic roadside surveys should be conducted in cooperation with the Patrol Police, as employees of the Ministry of Internal Affairs of Ukraine and State Service for Transport Safety (Ukrtransbezpeka) have the authority to stop vehicles.

It is necessary to equip all roads with traffic counters, WIM and photo devices, and properly maintain their technical condition. In the EU countries, statistics on road traffic are collected several times a day.

Unfortunately there is no obligatory liability for failure or providing inaccurate statistical reporting of enterprises. It is necessary to improve the relevant control mechanism.

Conclusions. The main general conclusions are as follows:

1. Comparing the methodology of statistics of Eurostat and Ukraine in the field of road transport, in particular key indicators for statistical reporting, we can

conclude that national statistics represent key reporting indicators at 30% of the completeness and detail of similar Eurostat data.

2. In line with the implementation of the EU-Ukraine Association Agreement, it is important to align Ukrainian statistical methodology with the Eurostat one. It is necessary to legally approve obligations of Ukrstat, the Ministry of Infrastructure and the Ministry of Internal Affairs of Ukraine to organize statistical observations, including periodical surveys according to the Eurostat methodology.

3. The urgent issue is to establish the responsibility of carriers for failure to submit or submission of inaccurate statistical information or to introduce other effective levers (perhaps, conversely, stimulating and rewarding) in order to obtain more reliable statistical information which can be used for the road sector diagnosis, forecasting and planning.

4. It is necessary to change approaches to the implementation of certain statistical observations, in particular, regarding the allocation of financial indicators, labor movement indicators, investment performance indicators, etc. during the reporting on the type of economic activity "Land and pipeline transport", namely the implementation of statistical observations for "Road transport" section.

5. It is necessary to widely inform national operators about the legislative guarantee of information confidentiality, in accordance with the Law of Ukraine "On State Statistics", which will be provided by individual market operators in the framework of statistical surveys.

6. It is necessary to equip roads with traffic counters and camera devices, which are the elements of intelligent transport systems used for preventing traffic jams.

7. Ukrstat, the Ministry of Infrastructure, the Ministry of Internal Affairs of Ukraine, other executive bodies responsible for statistical and other reporting related to road transport of passengers and goods, should expand the list of statistical observations, as well as restore, update lost and missing forms of statistical reporting.

8. It is important to create a single electronic platform on the basis of Ukrstat facilities, accumulating all available road transport statistics from different authorities and covering information on carriers, routes, volumes and directions of transportation, operations, rolling stock, financial data, investment activity, border crossing, export-import operations, transit, foreign economic activity, road accidents, etc.

9. Legal regulation of the role, rights and responsibilities of government agencies related to statistics can significantly contribute to the establishment and maintenance of effective institutional mechanisms in these agencies, as well as mechanisms for their cooperation.

Author contributions. The authors contributed equally.

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