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*Odessa National Academy  
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**Information Technology, Automation and Robotics**

**Proceedings**

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## **ORGANIZATION OF INTERNATIONAL CARGO DELIVERY IN A DIGITAL ECONOMY**

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**Abstract.** *The study of the domestic market of international transportation was conducted in three steps. Firstly, the state and trends of the international transport services market in Ukraine were analyzed. Secondly, the competitive situation in the Ukrainian market of international cargo delivery was assessed. Thirdly, digital solutions in the organization of international cargo deliveries were characterized, which are already implemented at the macro level, taking into account global trends. Scientific work suggests the ways to develop the transport portal of electronic services; recommends the introduction of an electronic consignment note as a mandatory prerequisite for the digitalization of international cargoes delivery.*

*In order to stimulate the transport business to switch to digital technologies, it is necessary to introduce centralized online platforms at the macro level. To this end, Ukraine has taken the first step and launched a transport portal for electronic services, which combines electronic services in all areas of the transport industry into one smart system.*

*However, the transport business is mostly conservative, so it is necessary to conduct a strong explanatory and educational work among potential users of this system. To this end, the study clearly identified the main benefits and effects for users of the transport portal in terms of individual functions, in particular, the expected effects of obtaining through the transport portal permits for international transport, permits for oversized transport.*

*The study focused on the analysis of the strategic role of transport exchanges as an online platform for information exchange in the supply chain of transport services to world markets. The characteristics of the main transport exchanges presented on the market of Ukraine and the main IT-solutions that transport exchanges offer to their users are presented.*

**Keywords:** *international delivery, digital economy, electronic commodity-transport invoice, transport portal, effect, transport exchange*

### **I. INTRODUCTION**

The relevance of the study of digital economy problems and related concepts is determined by the following facts. Firstly, the share of industries relying on digital technologies is constantly growing. There are processes of digital technologies penetration into other spheres of human life, in particular, into the international trade and the organization of international deliveries on the digital technologies basis, which radically change their technological structure. Some activities have already been completely transformed under the influence of digital technologies. It is expected that e-commerce will soon dominate at the household level, and approaches

to the trade organization itself will change greatly as well. The study of the socio-economic consequences of such changes is of serious scientific interest.

Urgency of the research is due to the fact that the main task of the system of international freight delivery by road in a digital economy requires a clear definition of strategic directions for the transformation of traditional approaches to the organization of international freight delivery and the introduction of a fundamentally new model of competitiveness.

So, the goal of the work is to develop theoretical and methodological justification of the strategic directions of digitalization of the process of organizing the international delivery of goods.

The main tasks, the solution of which is necessary to achieve the goal of the study are:

- to analyse condition and tendencies of development of the international transport services market in Ukraine;
- to assess the competitive situation of the international cargo delivery organization in the Ukrainian market;
- to propose an improvement of the international cargoes delivery organization through the development of the transport portal of electronic services;
- to recommend the introduction of an electronic consignment note as a mandatory prerequisite for the digitization of international cargoes delivery.

The scientific novelty of the work lies in the theoretical and methodological justification of the peculiarities of the organization of international delivery of goods in a digital economy, in particular, received further development:

- the concept of introduction of the electronic consignment note, in particular, the offered stage of practical realization of this concept is offered;
- directions of improvement of international freight transportation due to the proposal of “using Uber’s principles” of freight transportation, divergence (diversity) of IT-products in the transport sphere and creation of "transport IT-platforms".

## **II. LITERATURE ANALYSIS**

The problems of organizing the international delivery of goods have been the subject of research by many scholars. In particular, the works of A.S. Galkin [11], A. Gorbenko [2], K.G. Kozina [8], O.O. Karpenko [5-6], V.P. Levada, Y.A. Davidich, S.V. Smerichevskaya [10, 12], and others are devoted to the organization of international transportation. Peculiarities of the formation of the digital economy are actively considered by many other authors, in particular S.M, Veretyuk [1], V.G. Voronkova, T.P, Romanenko, V.V. Pilinsky [1], and others. But, unfortunately, there is still too little research on the organization of international cargo delivery in a digital economy.

## **III. OBJECT, SUBJECT, AND METHODS OF RESEARCH**

The object of the study is the system of organization of international cargo deliveries in Ukraine.

The subject of the study is conceptual and methodological bases of the organization of the international delivery of cargoes in the conditions of digital economy.

Methodology and methodological foundations of the study based on the basis of a comprehensive and systematic approach, using general scientific and economic research methods, in particular: methods of scientific logic, grouping, comparison and generalization, methods of tabular and graphical analysis, methods of structural-factor and economic-mathematical analysis, project forecasting method.

#### IV. RESULTS

##### 4.1 Analysis of the condition and tendencies of development of the international transport services market in Ukraine

In accordance with the State Statistics Committee of Ukraine, the number of employees in the field of transport services remained almost at the level of 2010, although it decreased by 6.3% compared to the previous two years (Fig. 4.1). It should be noted that the number of people working in the transport sector is growing in the crisis years for Ukraine after Russia's aggression.

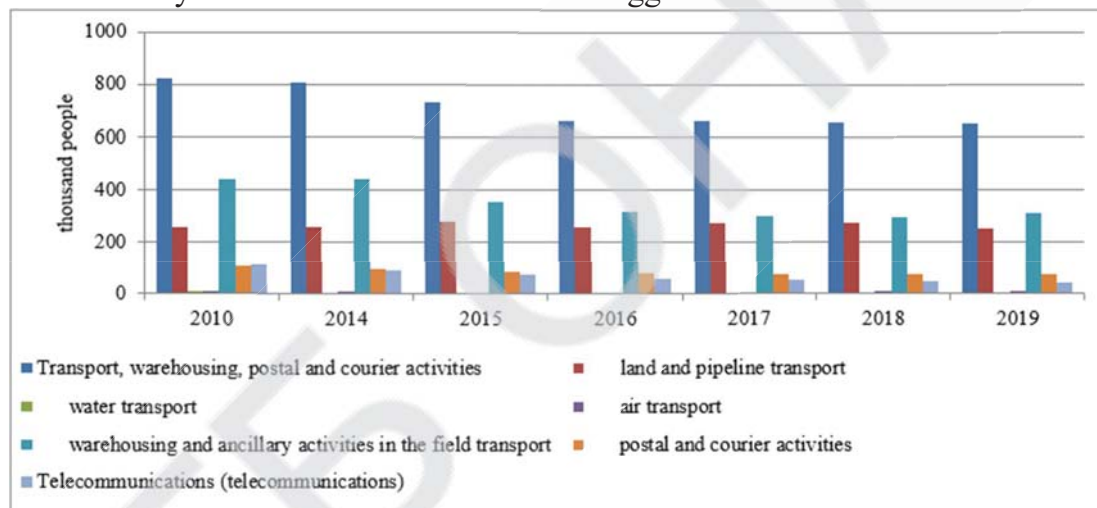


Fig. 4.1.1. Dynamics of the average number of full-time employees of enterprises by type of economic activity "Transport, warehousing, postal and courier activities", thousand people. Source: based on [13]

The total volume of transport services exports in Ukraine amounted to 5851423.3 thousand dollars USA, and imports - 1464807.2 thousand US dollars in 2018.

In 2019, compared to 2018, there was a slight decrease in exports of transport services (by 0.2%), while the volume of imports of transport services increased by 20.8%. Compared to 2010, transport services exports decreased by 25.3%, while imports, on the contrary, increased by 24.3% (Fig. 4.1.2).

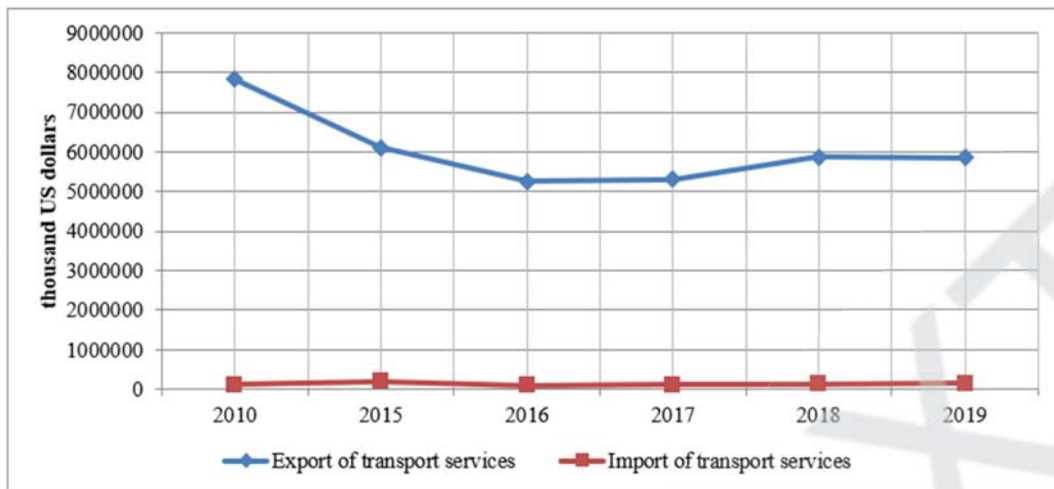


Fig. 4.1.2. Dynamics of exports and imports of transport services in Ukraine, thousand US dollars. Source: compiled by author based on [13]

According to the State Statistics Committee of Ukraine, in the structure of export-import operations, despite the decrease in TS exports, a larger share in the overall structure of export-import TSs belongs to export supplies (80%), which is definitely a positive factor. (Fig.4.1.3).

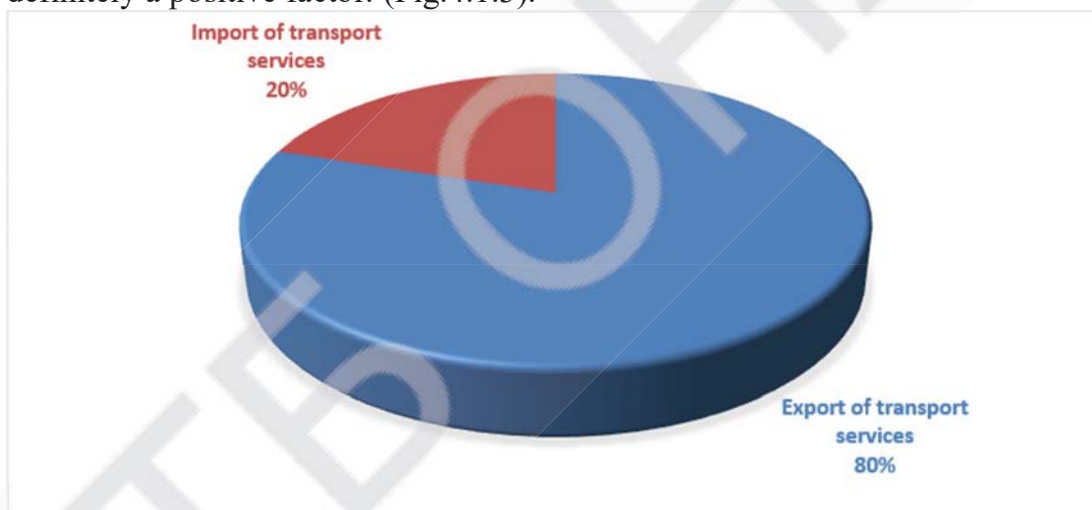


Figure 4.1.3. - Structure of export-import transport services of Ukraine with the countries of the world for 2019. Source: compiled personally based on [13]

The main factors that hinder or slow down the development of competencies for the digitization of business models in the transport and logistics industry, according to surveys of managers of transport and logistics companies conducted by PwC (respondents could choose three answers), are (Fig.4.1.4):

- significant needs for financial investments, 38%;
- unresolved issues related to data security and confidentiality, 38%;
- lack of a clear program for the development of digitalization and support / initiative from senior management, 33%;
- staff shortage, 26%;
- slow spread of basic infrastructure technologies, 23%;

- business partners do not have the opportunity to participate in the joint development of digital solutions, 22%;
- lack of clear understanding of the economic benefits of investing in digitalization, 21%;
- lack of digital standards, norms and certification, 17%;
- concerns about the loss of control over the company's intellectual property, 15%.



Fig. 4.1.4. Factors that hinder or slow down the development of competencies for digitization of business models in the transport and logistics industry. Source: compiled by author based on [14]

The potential of new technologies for logistics is huge, but now companies in the industry are in no hurry to implement it despite of they also help increase flexibility and scalability, standardize and harmonize processes throughout the organization.

#### **4.2. Assessment of the competitive situation of the international cargo delivery organization in the Ukrainian market**

There are many companies on the Ukrainian market that provide international cargo delivery services. The nature and range of their activities are very different. These are powerful international transport and logistics companies (DHL, Kuehne + Nagel), and domestic transport and logistics companies ("Delivery", "Zammler", "Ecole Ukraine"), many ordinary freight forwarding companies and specialized delivery services. Let's try to find out what is the difference and what are the competitive advantages of delivery services that are represented in Ukraine and offer, including services for international delivery of goods.

The study was conducted on the basis of a questionnaire survey of online stores that constantly use different delivery services. The questionnaire, in particular, included questions aimed at finding out which delivery services are used by online stores and to what extent. Delivery services were rated on a ten-point scale. As a result, 120 owners of online stores told about their experience of cooperation with delivery services. In addition, the study assessed the capabilities of services and compared the price of their services.

As was expected, the most popular was the delivery service Nova Poshta. It is used by 97% of respondents, which is almost three times higher than the result of its closest competitor - Ukrposhta (33%). The least popular were Zruchna (3%) and Delfast (0.8%) (Fig. 4.2.1) [15].

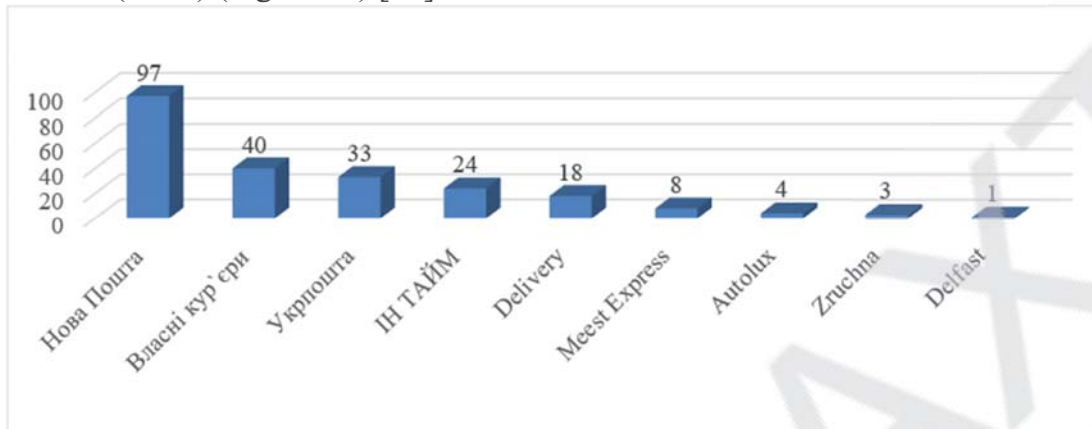


Fig. 2.11. The level of popularity of delivery services in Ukraine among consumers of online stores. Source: based on [15]

In the table 4.2.1 presents the main results of research that highlight the competitive advantages and weaknesses of each of the companies.

Table 4.2.1

**The results of surveys of consumers of online stores on the quality of evaluation of services of various delivery services**

Company	Number of respondents	Strengths	Weak sides
Nova Poshta	62	-fast delivery (33 answers); -wide network of branches (22 answers); -convenient automation and integration with various services (9 answers) -Fulfillment service	-high cost of services (28 answers)
Ukrposhta	43	-low price (17 answers)	-slow delivery (15 answers); -poor service (9 answers); -inconvenient online office (2 replies)

Intime	23	-low prices (8 answers); -Fulfillment service	-inconvenient location of offices (10 answers); -sloppy cargo delivery (5 replies)
Delivery	9	-one of the lowest prices on the market (3 answers)	-not enough offices (4 answers); -periodic problems with cargo delivery (2 answers)
Autolux	8	-relatively low prices (2 answers)	-small number of offices (6 answers);
Meest Express	7	-relatively low prices (1 answer)	-insufficient number of offices (3 answers); -poor service (3 answers)

Source: based on [15]

### 4.3. Improving the organization of international cargo delivery through the development of a transport portal for electronic services

The following services can be obtained on the transport portal of electronic services [16] today:

- Booking permits for international transportation.

Previously, nearly 800,000 permits were manually ordered and issued annually.

At the same time there were problems which are easily solved through introduction of a transport portal (fig. 4.3.1):

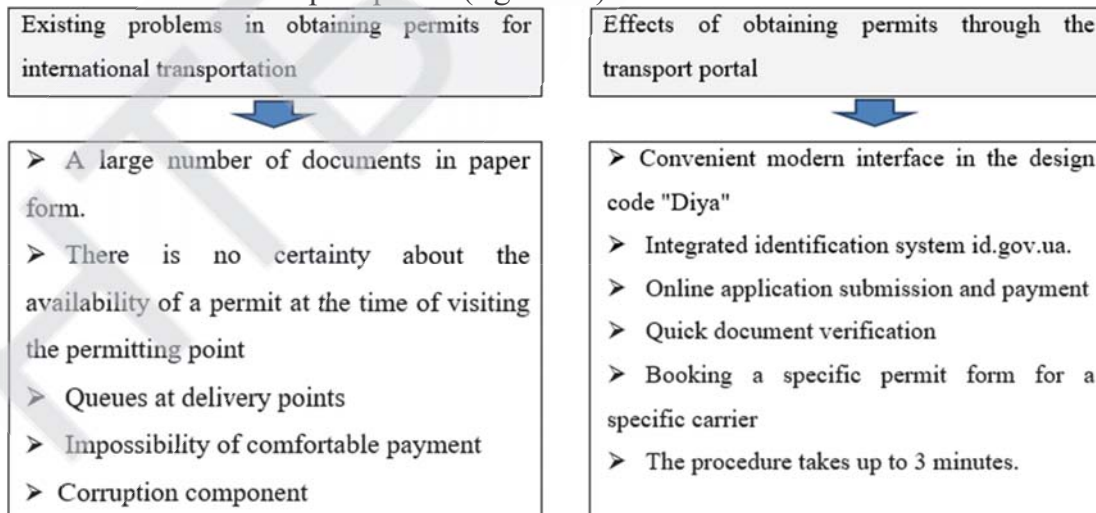


Fig. 4.3.1. Expected effects from the implementation of the system of obtaining permits for international transport through the transport portal. Source: compiled by author based on [16]

- Online post-control at customs.

The portal, which exchanges data with customs, provides an opportunity to actually track intruders who try to forge permits or violate the order of their use. Each registered permit can be traced from the moment of its reservation or printing to the border crossing and return to the permit issuing point.

- Permits for oversized transportation. The effects of this service are presented in Fig.4.3.2.

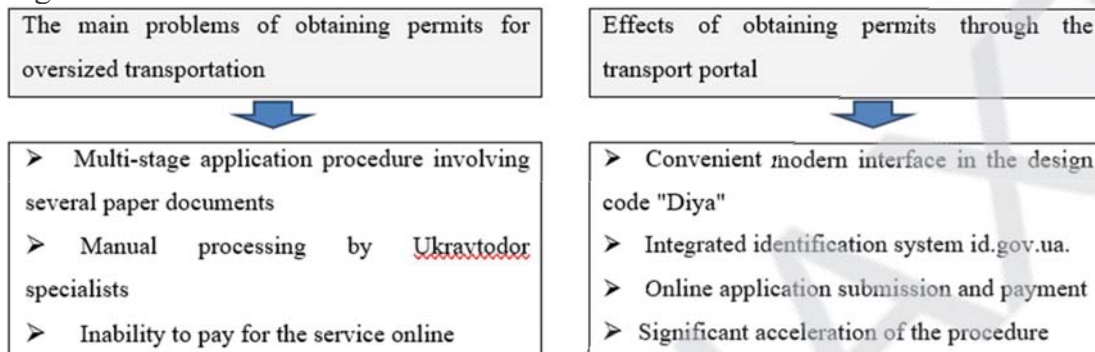


Fig. 4.3.2. Expected effects from the implementation of the system of obtaining permits for oversized transportation through the transport portal. Source: compiled by author based on [16]

- The introduction of E-protocols

It simplifies the accounting and prompt processing of protocol acts issued by Ukrtransbezpeka inspectors. This allows inspectors to promptly, directly from the scene of the accident, to transmit to the Ukrtransbezpeky control department information about violators, which further contributes to the efficiency of handling road accidents.

- Video surveillance in Permitting Points

It allows for public control and increases the transparency of the permitting process. Today there are such video surveillance points in Kovel, Holoby, Lviv, Vinnytsia, Khmelnytsky, Boryspil, Korosten. In the near future it is planned to introduce this service in 7 more important points.

- An e-consignment note, an electronic document certifying the rights to carry out cargo transportation.

E-consignment note is a legally significant document intended for all participants in the transport process, accounting for goods on the way of their movement, payments for transportation of goods and accounting for work performed. Currently, a pilot project has been implemented, a central database of e-consignment notes has been built, and data from commercial document management systems that serve carriers are entered into it [16].

#### **4.4. Introduction of electronic consignment note as a mandatory prerequisite for digitalization of international cargo delivery**

The electronic consignment note is an important step towards the digitalization of transport services. Among the post-Soviet countries, Georgia and Belarus already have a positive experience of implementing e- consignment note. For example, in

Belarus, the turnover of electronic consignment note reaches 120 million units per year, and the potential savings from abandoning the paper counterpart is 600 million euros.

The consignment note is a single and obligatory document for all participants of the transport process, which confirms the fact of transportation and delivery of goods, payments for transportation of goods and accounting of work performed.

To understand the scale of the "paper" problem, some figures can be given.

Approximately 500 million invoices and their copies are printed in Ukraine every year. This is more than 120 full 20-ton trucks with 1 million packs of A4 paper, each of which costs an average of 70-80 UAH. Add to this the cost of sending the original by paper invoice - it is still about 20-40 UAH and lost time, not to mention the printing and work of the responsible person. It turns out more than UAH 1 billion of business expenses annually on paper invoices, which are ultimately paid by each of us, paying for the purchased goods.

To solve this problem, the paper invoice should be replaced by an electronic one. That is why the key goal of solving this problem at the macro level should be considered the full digitalization of transport services while ensuring the transition to the highest quality service.

The pilot project on e- consignment note is planned to be implemented in 2 stages; at the 1st stage to introduce e- consignment note for general groups of goods. At the 2nd stage - to digitize consignment note for excisable groups of goods. At the third stage - to introduce the international format of e-CMR electronic consignment note for international freight. On the fourth - to standardize e- consignment note and e-CMR.

The first results of the introduction of e- consignment note indicate a significant reduction in the time for document administration - up to 1-3 days (including transportation time), while with paper consignment note the process sometimes took 21 days. Regarding savings (by courier delivery), the average cost decreased by 5-30 times. The transition to e- consignment note is a prerequisite for the creation of the transport and logistics sector of additional added value and new jobs, which in turn will contribute to the development of all sectors of the economy without exception.

## **V. CONCLUSIONS**

The main factors that hinder or slow down the development of competencies for the digitization of business models in the transport and logistics industry, according to surveys of managers of transport and logistics companies are significant needs for financial investments, unresolved issues related to data security and confidentiality, lack of a clear program for the development of digitalization and support / initiative from senior management. The potential of new technologies for logistics is huge, but now companies in the industry are in no hurry to implement it.

There are many companies on the Ukrainian market that provide international cargo delivery services. The nature and range of their activities are very different. Despite the fact that the market is a competition of two major players - Nova Poshta

and Ukrposhta, alternative services have enough opportunities for development. The market is large and competitive, so large players cannot cover all service segments. Due to this, even new companies appear. For example, the Justin delivery service recently opened. She will work on the bases of Fozzy Group and Autolux.

The priority areas of transport policy in Ukraine today are the development of multimodality of transport and digital transport corridors. To achieve these goals, the Ministry of Infrastructure of Ukraine creates modern electronic services in all areas of the transport sector. However, to stimulate business to switch to digital technologies, it is necessary to introduce centralized online platforms at the macro level. The introduction of electronic services is not just the transfer of old public services online. This is the optimization of services taking into account the urgent market needs and convenience for consumers and users. In addition, in the future all state electronic services will be provided in a single interface.

The following services can be obtained on the transport portal of electronic services today: booking permits for international transportation, post-control at customs, obtaining permits for oversized transportation, transition of Ukrtransbezpeky inspectors to a new format - e-protocol, video surveillance in permitting cities, international consignment note.

It is important to understand that the transition to e- consignment note will create digital transport corridors in the future and will promote the development of multimodal transport in the Europe-Asia-Europe connection, renewal of Ukraine's status as a transit state, construction of a bridge between East and West, Ukraine and investment in infrastructure. The transition to e- consignment note is a prerequisite for the creation of the transport and logistics sector of additional added value and new jobs, which in turn will contribute to the development of all sectors of the economy without exception.

The full-fledged translation of consignment notes into electronic form will have a significant impact on both the freight market and the economy as a whole. Expected results from the implementation of e-consignment note are the following: simplification of interaction between transportation participants, acceleration of business processes of cargoes delivery and inspection of carriers, provides the possibility of accounting for road freight in a single system, which will increase revenue, ensures the coherence of the work of different departments through a single access to all registers that regulate the process of road freight, provides up-to-date information from the necessary registers in real-time.

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