

**BELARUSIAN STATE UNIVERSITY OF TRANSPORT
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ
УНИВЕРСИТЕТ ТРАНСПОРТА**

Bukavnyova Nadezhda Igorevna. *Electronic seals as a tool of digitalization of customs transit*

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At the present stage of the world economy development, the sphere of foreign trade is on the verge of full entry into the digital environment. The goods movement through the customs border by any mode of transport is connected with the performance of various customs operations, including customs control and customs operations for the release of goods. Customs authorities worldwide seek to create favorable conditions for business development and interregional cooperation by automating customs operations and implementing the latest innovations in the field of information technologies aimed at accelerating the movement of goods, the customs control requirements being observed.

For the Republic of Belarus, raising the level of competitiveness and increasing foreign trade is a key task. The favorable geographical and geopolitical location of the country makes its transit potential one of the priority development areas. According to the results of the World Bank's research "Logistics Performance Index", in the conditions of tough competition Belarus has recently lost its position in the international market of transit and logistics services (table).

Table – The position of the Republic of Belarus in the countries ranking on the Logistics Performance Index (LPI)

Year	Customs	Infrastructure	International shipments	Logistic competence	Tracking& Tracing	Timeliness	Total score (rank)
2007	2,67	2,62	2,12	2,12	2,71	3,00	2,53 (74)
2018	2,35	2,44	2,31	2,64	2,54	3,18	2,57 (103)

Footnote – Source: Own elaboration with the LPI (2007 – 2018) data [⁵⁷].

At the same time, it should be noted that the improvement of the integral logistics efficiency indicator of the Republic of Belarus, due to the growth in the international shipments, logistic competence and timeliness scores, is observed over the analyzed period. The reason for the rapid drop in the ranking is the fact that other countries of the world develop their transit potential faster, using the available opportunities more effectively, what leads a high level of competition.

In our opinion, in order to develop transit system in Belarus and increase effectiveness of the customs procedure of customs transit, it is necessary to ensure: *the transparency* - data should be available to all participants of the logistics chain simultaneously (to subjects of foreign economic activity and customs authorities); *the compatibility* - sharing data and resources requires the development of a compatible software and common work standards; *the mobility* - accelerating of processing, transferring, storing data, increasing the capacity to respond quickly to any changes and work in real time, because goods delivery failure often occurs due to delays of the information supply to all participants in the chain, data lose their relevance, management decisions becoming ineffective.

Electronic seals (hereinafter referred to as E-Seals) provide all three aspects mentioned above and are one of the main tools for digitization and automation of the customs procedure of customs transit. They ensure smooth border crossing, acceleration of the customs operations with cargo, the security of delivery.

Unlike traditional lead/plastic seals, E-Seals guarantee automatic remote control with the determination of the geolocation of vehicles in international traffic in real time. A special digital chip is installed in the padlock, which is almost impossible to crack. At the same time, a mobile workplace (hereinafter referred to as MWP) is created, allowing to read the

⁵⁷ The Logistics Performance Index and Its Indicators 2007 – 2018 [Electronic source] : [official site] / The World Bank – Washington, 2019. – Access mode : www.worldbank.org – Access date : 04.03.2019.

identification number of the cargo and to control other parameters necessary to ensure transportation. For this purpose, an accelerometer and a temperature meter are embedded into the MWP.

The main advantages of E-Seals are: battery charge retention for about 45 days at air temperatures from minus 45 to plus 70 degrees Celsius; a navigation module that receives signals GLONASS, GPS, BeiDou, Galileo, EGNOS; a built-in memory card for information storage; ability to track the route and conditions of transportation of goods online (subjects of foreign economic activity and customs authorities); possibility to create the function of automatic payment of customs duties and taxes by the shipper; providing the organization of rapid response teams.

Based on the analysis of the experiment carried out in Taiwan, for 7 months of implementing E-Seals in the port of Kaohsiung, 4200 containers passed through the port gate at a speed of 20-70 km/h. Data accuracy was 97,4%⁵⁸.

In the Eurasian Economic Union (hereinafter referred to as - the EAEU), active work on developing a unified transit system using E-Seals is in progress. Temporary experiments on the implementation of electronic seals were conducted in Russia and Kazakhstan in 2018. They showed that the use of E-Seals actually speeds up the transportation process, as well as simplifies the monitoring of vehicles and enhances safety. For example, according to experts of The Telecommunications, Information and Banking technologies Congress, the use of electronic navigation seals on railway transport reduces the transit time on the China-EU route from 10 to 5 days. The first experiment on using the E-Seals was started in the Republic of Belarus on March 13, 2019. It took place at five major checkpoints located on the Belarusian-Polish, Lithuanian, Latvian and Ukrainian parts of the border: «Bruzgi-2» and «Kamenny Log» checkpoints of the Grodno regional customs, «Bigosovo-1» checkpoint in Vitebsk

⁵⁸ Automatic identification system used in the terminal operation and electronic seals: materials of the international conference INTMOD2009, Saint-Petersburg, 27–28 jan. 2010 г. / VIT Technical Research Centre; edited by A. Perumal. – SPB., 2010. – P. 1–18.

region, «Kozlovichi» checkpoint in Brest region and «Novaya Guta» checkpoint of the Gomel customs⁵⁹.

It is extremely important for the customs authorities to achieve simple and rapid information exchange with subjects of foreign economic activity, for example, about the condition of the vehicle, quantity of goods, time of arrival of the vehicle to the customs authority, time spent on customs control, etc. Moreover, the use of the E-Seals while applying the customs procedure of customs transit, will be an alternative to the customs escort of goods, its replacement by electronic. Also for the customs authorities, as law enforcement agents, the introduction of the E-Seals is a necessary stage for the transition to paperless control technologies and customs operations, and the use of spot-checks based on the risk analysis and management system.

While performing transit procedures, subjects of foreign economic activity face typical problems such as goods delivery failure, high logistics costs and an insufficient level of information and logistics services in the field of tracking and controlling transport conditions. Electronic sealing allows tracking the delivery of goods in real-time, monitoring even the smallest deviations of the vehicle from the route. Also it's possible to receive notifications about a particular phenomenon affecting the timing and route of delivery. The use of the E-Seals allows calculating the delivery time as accurately as possible, keeping a record and evaluating all actions and movement of the vehicle, which makes a further change in the delivery time almost impossible with the exception of emergencies. Such time accuracy is very important for the subjects of foreign economic activity. Introducing E-Seals makes it possible to transfer logistic processes to outsourcing even for small enterprises.

Electronic sealing has a positive effect on transportation safety. Customs authorities and subjects of foreign economic activity have the ability to track any changes occurring with the cargo or vehicles online. For example, the person concerned may

⁵⁹ Electronic monitoring of customs transit system is being implemented in Belarus [Electronic source] / Belarus News, BELTA – Minsk, 2019. – Access mode : <https://belta.by> – Access date : 14.03.2019.

monitor air humidity or the temperature regime inside the vehicle on which the transportation is carried out. The E-Seals can provide automatic call for rapid response teams (call for law enforcement agencies) to prevent situations with the opening of vehicles (robbery) or route deviation (shadow transit schemes). The scheme of digitization of the customs procedure of customs transit with the implementation of the E-Seals is shown in the figure.

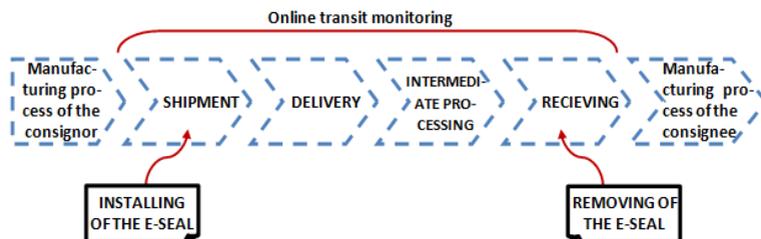


Figure – **The scheme of digitization of the customs procedure of customs transit**

Footnote – Source: Own elaboration.

However, it should be understood that electronic means of identification are more expensive than mechanical ones, they are reusable and losses will occur only in the early stages of innovation implementation. Therefore, in our opinion, it is advisable to provide transport organizations and foreign economic activity participants with an opportunity to receive subsidies and discounts for the purchase of expensive technical equipment within the framework of state programs to support small and medium-scale businesses. This will ensure the transition to full-fledged electronic document flow in the field of transit shipments. At the moment, this is a key factor in increasing the transit attractiveness of the country. Moreover, it is possible to establish production of the E-Seals in our country, which will reduce the cost of the identification means and expand export opportunities, since there is a high demand for such identification tools in many countries worldwide. There is also a real possibility of opening holdings or joint ventures with leaders in the manufacture of

electronic seals from Russia (for example, the Compass Company and the Group of Companies «Strazh»).

Thus, for the Republic of Belarus, the necessary conditions for the transit potential development are maximum transparency of transportation and the possibility of a virtual vision of the cargo operations for the entire delivery process. The use of the E-Seals contributes to the achievement of these goals. They not only solve the tasks, but also contribute to the safe transportation of goods from the consignor to the consignee, making it possible to transfer many logistics processes to outsourcing and ensuring the legal movement of goods without opening throughout the route.

**Букавнёва Надежда Игоревна. *Электронные
навигационные пломбы как инструмент цифровизации
транзита***

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На современном этапе развития мировой экономики сфера внешнеторговой деятельности находится на пороге полного вступления в цифровую среду. Перемещение товаров через таможенную границу любым видом транспорта связано с выполнением различных таможенных операций, включая осуществление таможенного контроля и таможенных операций по выпуску товаров. Таможенные органы всех стран стремятся к созданию благоприятных условий для развития бизнеса и межрегионального сотрудничества путем автоматизации процессов совершения таможенных операций и внедрения новейших разработок в сфере информационных технологий, направленных на ускорение перемещения товаров при соблюдении требований таможенного контроля.

Для Республики Беларусь повышение уровня конкурентоспособности и наращивание объемов внешней торговли является ключевой задачей. Выгодное