

TRANSPORT DOCUMENT IN ROAD FREIGHT TRANSPORT – PAPER VERSUS ELECTRONIC CONSIGNMENT NOTE CMR

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Abstract

The contract of carriage in road freight transport is regulated by the Convention on the Contract of Carriage in Road Freight Transport (CMR Convention). This Convention provides for a single accompanying document - the CMR consignment note. It is one of the most important documents in road freight transport. Since the adoption of the Convention, this paper document has accompanied the goods throughout the transport. Given that time goes on and everything is being modernized, digitized is no different in the case of a consignment note. In 2008, an Additional Protocol was adopted, which allows the use of an electronic consignment note instead of a paper consignment note. The aim of this paper is to analyze the most important document in road freight transport in its paper and electronic form. Another aim is to compare the paper and electronic consignment note, to explain the advantages of its introduction and also to explain why it is not widely used in modern times. The introduction to the article describes the benefits of adopting the CMR Convention. In the following chapters, the consignment note in paper and electronic form is described in more detail, their significance, and their course of use. The article also presents the main advantages of introducing an electronic consignment note and the reasons why the electronic consignment note is not used as much as paper consignment note.

Keywords: road freight transport; CMR Convention; CMR consignment note; e-CMR

1. Introduction

Road transport is an essential element of a modern supply chain. It connects production, distribution and consumption across geographical areas to provide services and brings together all stakeholders in the supply chain at local, national, regional and global levels [15]. Road transport also plays a crucial role in developing countries and regions, which lack alternative transport systems, such as rail infrastructure or inland waterways [6, 11]. In this context, it is often the only available way for landlocked developing countries to access regional and global markets and participate in cross-border trade [24, 25]. Due to differences in legislation between countries in relation to the contract of carriage, the CMR Convention was negotiated at the level of the United Nations Economic Commission for Europe and signed in Geneva in 1956 [2, 5]. The CMR Convention applies to any contract for

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the carriage of consignments for consideration by a road vehicle, provided that the place of acceptance of the consignment and the intended place of delivery, as specified in the contract, are in two different States, at least one of which is a Contracting State to the CMR Convention regardless of the domicile and nationality of the parties [21, 23]. The countries that are members of the CMR Convention are shown in Figure 1 below, and currently, 58 countries have accepted the CMR Convention [4].



Fig. 1. Member States of the CMR Convention [4]

Countries that have accepted the CMR have received certain benefits and limitations. They are briefly listed in Table 1 below.

Tab. 1. Benefits and limitations of carriers resulting from the CMR Convention [9]

Benefits	Limitations
Fair competition carriers	Presumption of liability of the carrier – strict liability
Lower international road transport costs, including insurance costs	Liability for his agents and servants
Harmonization of contractual and liability conditions	Limited compensation
Facilitation and harmonisation of claims and recovery procedures	Liability of the carrier for partial or total loss, which arises between the taking over and delivery of the goods
Standardisations of transport documents – CMR consignment note	Liability of the carrier for damage, which arises between the taking over and delivery of the goods

Benefits	Limitations
CMR consignment note facilitates commercial transparency	Liability of the carrier for delay, which arises between the taking over and delivery of the goods
Identification of Parties to the transport contract and main transport conditions	Carrier's liability relieved in certain cases if proof that loss or damage attributed to a special risk. But the claimant may prove the contrary: reversal of the burden of proof
Facilitations of controls by the contractual partners and by the Authorities	No limit or no exclusion of liability if wilful misconduct by the carrier
Simplifies claims handling and reduces number of Court cases	No limit or no exclusion of liability if default equivalent to wilful misconduct
Simplifies claims handling: Clear procedures and deadlines to respect	

One of the advantages of adopting the convention is a uniform transport document – a CMR paper consignment note [26]. According to the European Commission, road freight transport is expected to increase by 57% between 2010 and 2050, which will have a strong impact on the environment [17]. For this reason too, a mobility package has been adopted, covering legislative initiatives in the field of safe, clean and connected mobility. One of the packages is focused on digitization. Goods companies, drivers and consignees use a paper CMR consignment note to provide information on the goods dispatched and the parties involved in the shipment. In February 2008, an Additional Protocol to the CMR Convention was adopted to allow the use of the electronic consignment note (e-CMR) [19, 20]. So far, only a part of the EU Member States has implemented this protocol, and the European Commission represents an opportunity to further encourage all EU Member States to ratify the Additional Protocol, use the e-CMR and at least save the environment in this way [1]. The aim of this article is to introduce the reader to the most important document in road transport, which is the already mentioned CMR consignment note in paper and electronic form. Furthermore, we want to compare the paper and electronic consignment note, explain the advantages of its introduction and also explain why the electronic consignment note is not so much preferred at present.

2. Paper consignment note

The Convention on the Contract for the International Carriage of Goods by Road uniformly regulates the accompanying documentation of transported consignments, the principles of the carrier's liability and the procedure for claiming damages [18, 22]. The Convention does not regulate international road transport, but only the requirements related to the contract of carriage in international road haulage, while they are mandatory for carriage if at least one state is a member of the CMR Convention. It describes the most important document in the international transport of goods, and that is the CMR consignment note [5, 11].

The CMR consignment note is usually issued by the carrier at the place of loading, the consignor or the consignee. The consignor may be the company that physically loads the

goods or even an entity located elsewhere that only orders the loading. A consignment note is a document relating to the carriage of goods by road. It declares the contract of carriage and contains instructions given to the carrier [12]. Nevertheless, the absence, irregularity or loss of the consignment note shall not affect the existence or validity of the contract of carriage, which shall continue to apply the provisions of this Convention [2, 5]. The CMR Convention does not require any special form of contract of carriage, but it is necessary to issue a consignment note, which serves as a confirmation of receipt of the goods and as proof of the contract of carriage [12].

2.1. Format and content of the consignment note

Although the CMR Convention does not require any specific consignment note format, the International Road Union (IRU) has developed a consignment note format taking into account the requirements of the CMR Convention set out in Article 5 [22]. The consignment note format is shown in Figure 2 below.

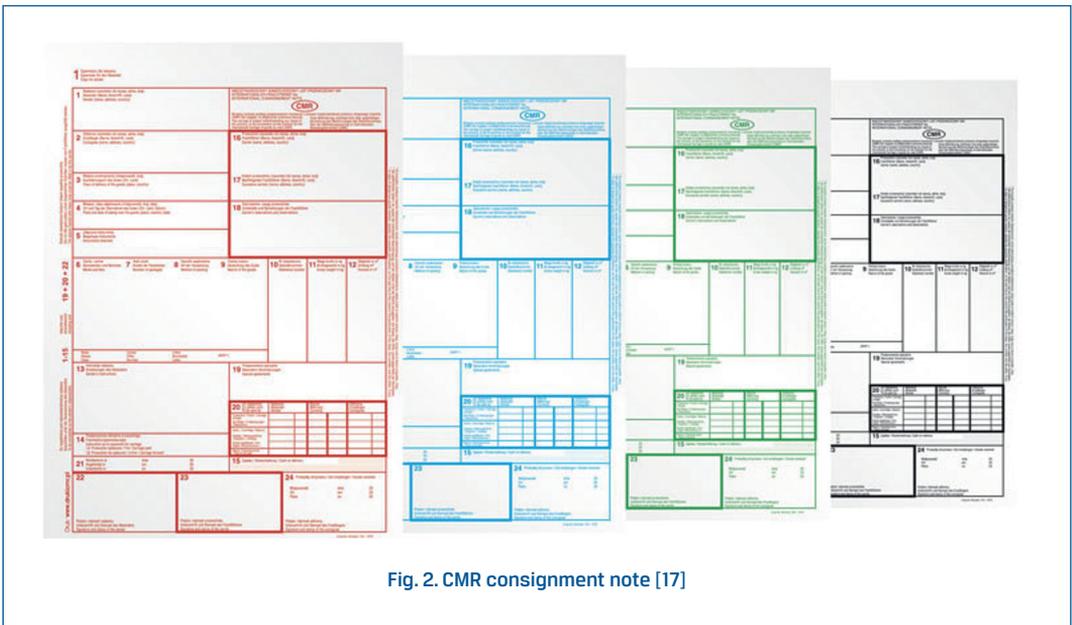


Fig. 2. CMR consignment note [17]

The consignment note is issued in three original copies, which are signed by the consignor and the carrier. The first red copy is addressed to the consignor and is proof to the consignor that the goods have been handed over to the carrier for carriage. The second blue copy is intended for the consignee to know how much goods to take over from the carrier. The third green copy is addressed to the carrier, it is also a document confirming that the goods have been handed over to the consignee. The consignment note may also contain more than three copies. In this case, the fourth and fifth copies may, if necessary, be submitted to the bank, the insurance company, the customs office, etc. [18].

The matters which must be stated in the consignment note are set out in Article 6. In all cases, the following information must be recorded in the consignment note:

- the date of the consignment note and the place where it is issued;
- the name and address of the consignor;
- the name and address of the carrier;
- the place and date of receipt of the goods and the place designated for delivery;
- the name and address of the consignee;
- a description of the nature of the goods and the method of packaging, in normal use, and, in the case of dangerous goods, their generally accepted description;
- the number of packages and their special marks and numbers;
- the gross mass of the goods or their quantity otherwise expressed;
- transport charges (transport costs, additional charges, duties and other charges incurred between the conclusion of the contract and delivery);
- the necessary instructions for customs and other formalities;
- statement that the shipment is subject to the provisions of this Convention, notwithstanding the provisions to the contrary [29].

The consignment note is required to include a statement that the transport is subject to the provisions of the CMR Convention. If the consignment note does not contain this declaration, the carrier will be liable to the person entitled for all expenses, losses and damages arising from this omission. The consignment note is not a transferable document or a document of ownership [29].

If the carrier does not have the appropriate means to examine the accuracy of the particulars of the number of pieces and their marks and numbers, this fact must be entered in the consignment note in the form of reservations, together with the reasons therefor. These reservations are valid and binding on the consignor only if he has expressly acknowledged them in the consignment note. This means that the reservations are listed on all copies of the CMR consignment note and are signed by the consignor. Therefore, the carrier should state his reservation on the first copy of the consignment note before handing it over to the consignor. Box 18 of the CMR consignment note is intended for reservations. It is also possible to state in the consignment note the price of the consignment or the special interest in delivery. Box 20 is used to record this information, but this fact must be agreed, as the completion of this box affects the carrier's liability for carriage [22].

2.2. Functions of the consignment note

The CMR consignment note performs the following functions:

- information – it contains all relevant information on the preparation for each of the parties directly involved (consignor, consignee, carrier) and indirectly involved parties (control authorities), such as information on the place of departure and destination, specifications of the goods, etc.;
- instructional – detailed information contained in the individual parts of the CMR

consignment note (destination, customs clearance, order number, invoice, etc.) form instructions for the carrier / driver regarding the necessary activities;

- identification – the information contained in the consignment note can be used to identify the goods at the place of customs clearance (MRN) or at the place of destination (order number, invoice, contract, etc.);
- evidentiary – serves as proof of receipt and delivery of the consignment specified in the consignment note [10].

3. Electronic consignment note

The popularization of Internet access has enabled the development of IT tools and contributed to the fourth industrial revolution characterized by the digitization of production and services. Although the digitization of transport documentation has become a reality in competing transport sectors (electronic consignment note in rail transport, SeaWaybill in maritime transport), the CMR consignment note was issued only in paper form, despite the needs of supply chain participants [13, 26]. Later, the development of information technology enabled the start of work on the electronic consignment note (e-CMR) [3]. The legal basis for starting work on the e-CMR electronic consignment note was the Additional Protocol to the CMR Convention on the Electronic Consignment Note of 20 February 2008. Following ratification by Lithuania, Latvia, Switzerland, Finland and Bulgaria, this Additional Protocol entered into force on 5 June 2011[1]. The countries that have adopted this protocol are shown in Figure 3 below.



Fig. 3. Member countries of the Additional Protocol [1]

According to the protocol, the CMR international consignment note can be issued in electronic form in accordance with security regulations and is the equivalent of a paper document and has the same legal force. In order for e-CMR to be considered a full-fledged transport documentation, it is necessary to have a reliable electronic signature (the requirements for an electronic signature are the same as the requirements of the Electronic Signature Act). It should also be possible to provide the same information in a consignment note issued in electronic form as in a traditional paper document. The electronic consignment note procedure should ensure the integrity and consistency of the data between the parties [8]. Transport companies may only use accredited software vendors for e-CMR. There are currently four accredited suppliers: Collect + Go, Transfollow, Pionira and Truckfly.

The first e-CMR transmission took place on 19 January 2017 between the Spanish city of Huelva and the French city of Perpignan. The transport was organized by the IRU in cooperation with the Spanish Association for International Transport (ASTIC) and the French National Road Transport Federation (Fédération Nationale des Transports Routiers - FNTR). The subject of the transport was oranges and they were transported over a distance of 1.300 km. The TransFollow application was used to handle the first transport using the e-CMR. During the transport, a Lenovo tablet and a Samsung J3 phone were used to confirm the system's functionality on Android-based devices [9]. The implementation of the first transport using e-CMR went smoothly, which showed that this form of transport documentation is simple and functional. Later, implementation tests for the use of e-CMR began in the Benelux countries - Belgium, the Netherlands and Luxembourg.

Given that the CMR consignment note, which is traditionally in paper form, represents a set of rights and obligations - a legal status - for the companies involved in each journey, it is very important that the software used for these new services is legally compliant with the CMR Convention, which remains an international regulatory framework for them [27]. The IRU works closely together and recommends using Transfollow for e-CMR [17].

3.1. Use of the electronic consignment note – Transfollow

In order to use the TransFollow platform, each party (sender, carrier and recipient) must be connected to the TransFollow system. The procedure for using e-CMR is as follows: Initially, you need to download the free TransFollow application or application package, then install it and register an account. The sender prepares the e-CMR by filling in the fields in the application or the TransFollow program. For larger users who need to create more e-CMRs per day, TransFollow provides a key API (public application programming interface) to integrate its existing system into the TransFollow platform. It allows them to use their own software system to create an e-CMR, which will later be transferred to the TransFollow platform. The system assigns a number to the created e-CMR (e.g. NL333609). If the recipient has a TransFollow account, he will receive a notification from the TransFollow platform about his installed application (via e-mail notification) that the consignment is ready for transport. The carrier receives the consignment note information in its traffic management system or in the TransFollow application and plans the transport. When the carrier receives the consignment note and confirms it, the shipper will be notified on his computer or mobile device that the carrier is ready to pick up the consignment. The carrier collects the

shipment from the sender. After loading, the carrier marks the receipt of the shipment using a standardized and secure TransFollow protocol with a unique code. The sender will receive a digital copy. The carrier transports the goods to the consignee. The recipient will be notified of his application via the TransFollow platform or the management system that the consignment is being transported. The shipment is delivered to the recipient, who registers for collection and can add notes and photos about the condition of the goods. There are three ways to deliver the goods (QR code, signature on the display or without a signature). The sender is informed of the delivery in real time. The carrier no longer has to send the signed consignment note in printed form to the consignor. Depending on the nature of any comments, the sender may take action against the customer. The transaction is then completed, and a certified digital copy of the consignment note can be viewed and downloaded [28].

The possibility of multiple copies is also duly respected. TransFollow can create a PDF document that contains the contents of an electronic shipment record and looks very similar to the classic CMR paper consignment note that most users are familiar with. In the case of a roadside check, the driver may present the e-CMR on the screen of his smartphone or tablet without a hard copy or may provide the QR code of the electronic consignment note [7].

3.2. Comparison of paper and electronic consignment note

The paper and electronic CMR consignment note meets all the requirements set out in the CMR Convention. The key difference between them is that the e-CMR connects all parties involved in the supply chain through a digital platform and is electronically updated by each of the parties at each stage. One of the main advantages of implementing e-CMR is a significant reduction in costs. Currently, the CMR consignment note is printed in at least 4 copies, other costs are related to its sending and archiving. In addition, issuing a letter is time consuming and often requires the shipper to deliver the document directly to the driver [26, 28]. In terms of the administrative efficiency that can be achieved with digital CMR, significant savings can be made across the sector, as shown in Tables 2 and 3 below.

Tab. 2. Costs and time associated with the paper consignment note [7]

Item	Activity	Time (min)	Cost (€)
Issue	Printing	1	0.31
	Distribution	3	0.93
Use	Signing	5	1.54
	Retrieval (1%)	0.15	0.05
Filing	Status update	3	0.93
	Archive	3	0.93
	Sent POD	5	1.54
Total			6.23

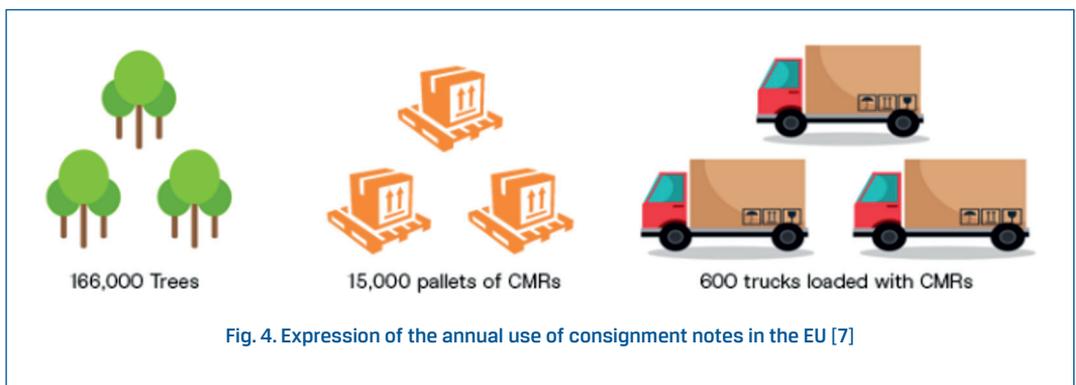
Tab. 3. Costs and time associated with the electronic consignment note [7]

Item	Activity	Time (min)	Cost (€)
Issue	Printing	0	0.00
	Distribution	0.5	0.15
Use	Signing	5	1.54
	Retrieval (1%)	0	0.00
Filing	Status update	0	0.00
	Archive	0	0.00
	Sent POD	0	0.00
Total			1.69

When used e-CMR, the carrier can save an average of € 4.54 on one consignment note and up to 14.65 minutes in terms of time.

Other benefits include:

Environment – One of the many benefits is a direct reduction in the use of paper, which has a significant impact on the environment. In the EU alone, approximately 377,000,000 million CMR consignment notes are used annually for cross-border transport [7]. The following Figure 4 shows the annual equivalents of used paper for CMR consignment note.



Health and safety – As we are all currently witnessing a pandemic, there are also strong arguments about the health and safety of workers. E-CMR eliminates the need for paper to pass from one person to another as it passes through the supply chain, reducing the risk of contamination where the virus may be present for a significant period of time [30].

Better visibility and efficiency – The digital nature of e-CMR allows stakeholders to track shipments in real time as they move through the supply chain. Upon completion of the shipment, the completed CMR is immediately available to all parties, allowing companies to begin invoicing processes for goods received. The fact that there is no need to wait for the driver to return with a CMR paper consignment note can speed up the invoicing

process by weeks, which will help companies improve their financial situation in the company. Damage to the goods can be reported in real time. Attaching photos to a document within the platform can help reduce the time it takes to resolve disputes and help speed up any claims [4, 16].

In addition, the implementation of e-CMR brings benefits to the logistics environment in the form of:

- integration with customs systems enabling the current customs status of the goods transported to be checked and reported in real time;
- cooperation with other industrial services, such as fleet management, services;
- enhancing road safety through automatic emergency calls for lorries;
- increasing the overall efficiency of transport, which will be reflected in greater economic competitiveness of the transport industry and the countries which are signatories to the Additional Protocol to the CMR Convention.

4. Discussion

You may be wondering why, given the clear benefits that e-CMR can provide to companies, it is less widely used. One of the main reasons why this is the case is that some countries that have ratified the CMR Convention have not yet ratified the Additional Protocol to the CMR Convention. Acceptance is not automatic. International transport within the e-CMR is allowed between two signatory countries only if it does not cross the borders of the non-signatory country. The road carrier cannot therefore cross such a country only with the e-CMR and must also have a paper consignment note in the vehicle. In such a case, it is not cost-effective to use the e-CMR, because the driver still has to issue a paper CMR consignment note and it is also not efficient in terms of time. One of the major countries that has not yet acceded to the Additional Protocol is Germany, which, due to its geographical location and the importance of export policy, is considered to be a significant missing link in the supply chain throughout Europe. At present, the CMR Convention has been accepted by 58 countries around the world and the Additional Protocol by only 29 countries. At present, it is not possible to carry out a transport using e-CMR from Eastern Europe to Western Europe, because apart from Germany, this addition has not yet been accepted by Austria, which is a neighbouring country. Countries that significantly affect the use of e-CMR are shown in Figure 3. Michael Bünning (CEO of BLG Automotive Logistics) believes that the main reason for hindering the wider adoption of e-CMR is that some EU Member States do not recognize the importance of the whole issue. "We spoke to the political parties in Germany and their answer was simple, that they did not feel enough pressure from industry," he confirms. "But this is completely wrong." The industry really needs this technical improvement to make it more efficient. Gesine Meissner (German MEP and member of the Committee on Transport and Tourism) also understands the situation in Germany in that the authorities do not realize how important electronic freight documents are for the ongoing adaptation of the road freight sector to an increasingly digital world. "Maybe the industry needs to put more pressure on the German authorities because," he says. "I admit that the introduction of such documents is a complex matter that would require investment and reorganization of all actors involved in the logistics chain - but it needs to be done."

Renée Reijers (Communications Adviser at the Dutch Transport and Logistics Association) points out that the reason for the slow growth of member states is that "Organizations make money by selling CMR paper documents and right now they have to build a new business case on e-CMR. They are working on it, but in the meantime, they are not calling for the rapid implementation of e-CMR in their Member States" [14].

Another secondary reason is that some companies are hesitant with this technology, even though the paper format is less efficient overall, many companies optimized their own ERP systems to manage paper CMR and until e-CMR is accepted more widely, they do not plan another step towards its electronic version.

Another reason is the system's distrust of ensuring the privacy and confidentiality of potentially sensitive commercial data. It is therefore necessary to ensure that the parties using the system are trustworthy and can be verified. Transport documents currently require signatures to authenticate certain transactions (for example, the receipt of goods for transport) and electronic systems must provide a way to fulfil this important role. The electronic authentication method must meet at least the following criteria:

- it must be a unique link to the signatory;
- it must be able to identify the signatory;
- it must be created by means that can be maintained at any time under the sole control of the signatory;
- it must be linked to the authenticated data in such a way that any subsequent change to the data can be identified [1].

It should be noted that there are many proven technical solutions that meet the above criteria and are widely used in critical systems such as banking and e-commerce. The legal framework for the acceptance of electronic signatures has therefore existed for many years [1999/93/EC], [2003/511/EC]. The problem, then, is not in security, but rather in the belief of the industry, which has been using paper signatures for many years, that electronic signatures are in fact more secure and reliable than their physical counterparts, and that they are legally valid forms of authentication. Given this mistrust, it is also worth noting that at least one of the accredited suppliers of this system (Transfollow) holds the certificate ISO 27001. ISO 27001 is an international standard issued by an International Standards Organization and describes how information security can be managed [28].

The limited use of electronic consignment notes for freight transport is an obstacle to the further development of logistics services throughout the EU. The European Commission is aware that the lack of availability and use of e-CMR across the EU limits the further development of the e-Freight initiative and has a spill-over effect on other initiatives such as e-Customs [16]. It must be said at the end of the discussion, the European Parliament and the European Council agreed on 27 November 2019 and adopted the mandatory use of electronic consignment notes. The electronic consignment note should be mandatory from 2026, which should mean that the digital transmission of consignment notes in Europe between companies, governments and customs administrations is one step closer. In the last two years, up to 9 countries have adopted the Additional Protocol, representing almost a third of the Member States.

5. Conclusions

The CMR paper consignment note is an official document and proof of the contract between the customer and the carrier. It provides a paper trail of logistical movement and is usually the only document that truck drivers have in relation to the cargo they are carrying. An electronic consignment note which complies with the provisions of the Additional Protocol shall be considered equivalent to the consignment note provided for in the Convention, that is to say, it shall have the same probative value and effectiveness as the paper consignment note. However, the electronic consignment note must be verified by the contracting parties to the contract of carriage by means of a reliable electronic signature which ensures the connection with the electronic consignment note. With e-CMR, carriers are able to electronically enter, store and exchange logistics data in the logistics chain in real time. Timely recording and exchange of logistical data means that users receive information about the goods transported immediately, so that any subsequent actions, such as initiating legal proceedings, invoicing or even accident response procedures, are faster and at a lower cost. The transition to a digital solution also reduces the environmental impact of global trade, uses less paper and provides data to optimize the logistics chain. It minimizes the risk of human error and can adopt multilingual platforms for seamless international application. Despite all the benefits that this electronic consignment note provides, there are currently few companies that actually use it. One of the most important reasons why it is not so widely used is that Germany, due to its location, is not a Member State of the Additional Protocol. Given that the European Parliament and the European Council have made the digital consignment note mandatory from 2026, it would be appropriate to monitor the further development of this situation. Furthermore, it would be possible to examine whether it is possible to use the electronic form of the consignment note also in the fight against illegal activities.

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7. Nomenclature

EU European Union

IRU International Road Union

IT Information technology

MRN Movement Reference Number

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