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**Inland Transport Instruments: Convention on the Contract
for the International Carriage of Goods by Road (CMR)-
Additional Protocol to the CMR concerning the
Electronic Consignment Note (eCMR)**

Additional Protocol to the CMR concerning the Electronic Consignment Note (eCMR)

**Operations of future eCMR system Comparison with services provided
by Pilot projects**

Submitted by the Secretariat

SC.1 will be invited to consider this comparison analysis prepared between the operational procedures stipulated in the eCMR protocol and the pilot projects performed so far.

I. Mandate and background

1. Article 5 of the eCMR protocol mentions “The parties interested in the performance of the contract of carriage shall agree on the procedures and their implementation in order to comply with the requirements of this Protocol and the Convention, in particular as regards:

- (a) The method for the issuance and the delivery of the electronic consignment note to the entitled party;
- (b) An assurance that the electronic consignment note retains its integrity;
- (c) The manner in which the party entitled to the rights arising out of the electronic consignment note is able to demonstrate that entitlement;
- (d) The way in which confirmation is given that delivery to the consignee has been effected;
- (e) The procedures for supplementing or amending the electronic consignment note; and
- (f) The procedures for the possible replacement of the electronic consignment note by a consignment note issued by different means.

2. At its eighty-first session in February 2019, the Inland Transport Committee (ITC) foresaw an increased interest in the international conventions with a digital theme administered by its working parties, including the Additional Protocol to the CMR concerning the electronic Consignment Note (e-CMR). Noting the number of accessions and ratifications to Convention on the Contract for the International Carriage of Goods by Road (CMR) and e-CMR, it encouraged the Working Party for Road Transport (SC.1) to increase its efforts to advocate and raise awareness of the benefits of being a contracting party to CMR, Protocol to CMR, and e-CMR.

3. ITC also expressed its support for SC.1 being the main platform for multilateral dialogue and the exchange of best/emerging practices by contracting parties implementing e-CMR, and requested SC.1, with the support of the secretariat, to prepare a paper detailing the research and other actions needed and/or recommended for the operationalization of e-CMR, to be tabled at a future ITC session.

4. The secretariat invited interested volunteers from SC.1 to form an informal group. Accordingly, an informal group of experts comprising of Slovenia, Latvia, Turkey, Russian Federation and Germany, the European Commission and IRU, was formed in October 2019 with Slovenia as chair.

5. This informal Group met several times and prepared a final report which is contained in ECE/TRANS/SC.1/2021/X. The informal group identified among other issues that “the pilots adopted different business and technological approaches reflects that the stakeholders involved in the different pilot projects to date have not discussed nor considered the possibility of coordinating their approach with others” as article 5 of the protocol stipulates. Furthermore, concluded that “the SC.1 secretariat may wish to consider appropriate future actions based on the content of group’s final report”.

6. The current document constitutes secretariat’s follow up on informal group’s conclusion and it should be read and considered in conjunction with document ECE/TRANS/SC.1/2021/1. The document summarizes all requirements listed in the eCMR protocol concerning the future operations of the electronic solution and provides a comparison of pilot projects services vis a vis those requirements as stipulated in the protocol.

II. Operational procedures stipulated by the eCMR protocol

7. The CMR Convention concerns the contract conditions, the contract document (consignment note), and the carrier’s liability limits in case of total or partial loss of the goods carried or in case of delay of delivery of the goods. The convention also defines the content of the consignment note (also known as CMR consignment note), which confirms the

contract of carriage. The eleven mandatory particulars forming the content of the consignment note are:

- (a) The date of the consignment note and the place at which it is made out;
- (b) The name and address of the sender;
- (c) The name and address of the carrier;
- (d) The place and the date of taking over of the goods and the place designated for delivery;
- (e) the name and address of the consignee;
- (f) The description in common use of the nature of the goods and the method of packing, and, in the case of dangerous goods, their generally recognized description;
- (g) The number of packages and their special marks and numbers;
- (h) The gross weight of the goods or their quantity otherwise expressed;
- (i) Charges relating to the carriage (carriage charges, supplementary charges, customs duties and other charges incurred from the making of the contract to the time of delivery);
- (j) The requisite instructions for Customs and other formalities; and
- (k) A statement that the carriage is subject, notwithstanding any clause to the contrary, to the provisions of the CMR Convention.

8. Moreover, there are seven optional particulars¹ to be written out if applicable. Among them is the value of the goods, which, if included, implies that damages are calculated in relation to the value indicated in the consignment note rather than in relation to the base and maximum values indicated by the Convention in article 23. Finally, parties may enter in the CMR consignment note any other particulars which they deem useful.

9. The consignment note is proof of the carriage contract between the sender and the carrier and is valid in a court of law. While the convention stipulates the particulars that must appear on a CMR consignment note, it does not specify the layout. In fact, there are many possible layouts, the most popular being the one developed by IRU.

10. At the time the CMR Convention came into effect, it was not envisaged that consignment notes could be done on any medium other than paper. Since, technology has evolved rapidly, and the use of electronic communications in international transport and trade has become widespread; increasingly so during the Covid-19 pandemic in 2020. Electronic communications have the scope to provide significant benefits in terms of speed of exchange of information, global access, and reusability of data.

11. The explanatory memorandum to eCMR sheds light on the objectives of eCMR. It states that “it is essential that in legally contractual relations the best conditions for the protection and security of documents are offered to operators” and lists the following three conditions:

- (a) the inalterability of the message, without the agreement of the parties, but also the possibility to change if there is agreement;
- (b) understanding and acceptance of the message by the consignee; and
- (c) identification of the parties and security of the authentication of their signatures.

12. These conditions are reflected in articles 3 (authentication of the electronic consignment note) and 4 (conditions for the establishment of the electronic consignment note) of e-CMR.

13. The key point of difference between the CMR Convention and eCMR is that while the CMR Convention requires a paper form with mandatory particulars and optional

¹ See article 6 paragraph 2 of CMR.

particulars (if applicable), eCMR requires also an agreement on the procedures for its operation and on the implementation of these procedures. That is:

- (a) The method for the issuance and the delivery of the electronic consignment note to the entitled party;
- (b) An assurance that the electronic consignment note retains its integrity;
- (c) The manner in which the party entitled to the rights arising out of the electronic consignment note is able to demonstrate that entitlement;
- (d) The way in which confirmation is given that delivery to the consignee has been effected;
- (e) The procedures for supplementing or amending the electronic consignment note; and
- (f) The procedures for the possible replacement of the electronic consignment note by a consignment note issued by different means.

14. In addition, several articles of the protocol refer directly or indirectly to different operational procedures of the eCMR. These operational procedures must be identified, described, analysed, and commonly agreed by all interested stakeholders. The following table summarizes these requirements with some initial explanations.

Table 1
List of operational procedures / concepts of eCMR

<i>Articles of the eCMR protocol</i>	<i>id</i>	<i>Operational procedure</i>	<i>Comments – Initial description</i>
Article 2	1	demand	Who initiates the electronic consignment note/ demand (consignor / carrier / both)? Who should have access to the system(s) and who should be authenticated? What about the successive / sub-contracting carriers?
	2	declaration	How the system(s) develops / produces the electronic consignment note, the data sets that are being included based on the convention (mandatory / optional); What the output should be? A QR code, a pdf file, electronic messages, others)?
	3	instruction	How and when the consignor can provide several instructions to the carrier(s)? Do they have the possibility to change/ amend their instructions to the carrier / successive / sub-contracting carriers during the trip? How the carriers will be informed?
	4	request	The same questions as above apply for the different requests.
	5	reservation	The same questions as above apply for the different reservations that any of the partners can make. For instance, the consignee, the receiver of the goods. Will the consignee / receiver have access to the system? Will the system authenticate him/her to ensure that he/she is the one that should receive the goods? This also applies for the proof of delivery. The Carrier also can make reservations on the declarations provided by the consignor / sender regarding for instance

<i>Articles of the eCMR protocol</i>	<i>id</i>	<i>Operational procedure</i>	<i>Comments – Initial description</i>
			the number of packages etc. It is important to know that according to the Convention (Article 8), the sender is not bound by the reservations unless he has expressly agreed to them.
	6	other communication relating to the performance of a contact of carriage	The same applies for any other communications regarding the performance of the contract among the 3 stakeholders + successive / sub-contracting carriers. It should be noted that Successive carriers are parties to the same and unique contract of carriage. Sub-contracted carriers are not parties to the same contract of carriage. There are consequently several contracts: a contract of carriage between the principal and the contracted carrier and a contract of sub-carriage between the contracted carrier and the sub-contracted carrier. Possibly, a new consignment note must be drawn up for each sub-contracted carrier, in which the subcontracting carrier is entered as the sender. The sub-contracted carrier is liable only to the initial carrier, whilst the latter is liable to the sender and the consignee for acts and omissions on the part of other parties he may use for the transport operation (including the sub-contracted carriers). These processes should be reflected in the electronic consignment note in order to ensure application of the Convention.
Article 3	7	Authentication of the electronic consignment note	The authentication is one of the most important issues in the digital applications equally important with the integrity of the data. The protocol refers to electronic signatures but also to other means. Experience from the digitalization of other UN Conventions (eTIR) saw that the lack of harmonization / international agreement on electronic signatures prevented its use as a commonly agreed method accepted by all contracting parties. A commonly agreed and feasible way must be identified for eCMR system.
	8	particulars contained in the electronic consignment note shall be accessible to any party entitled thereto	Access to the data from all stakeholders , not only the three that are involved in the contract of carriage but all others that are using this contract for several purposes (courts, customs, police, banks, insurance etc) is of critical importance for the continuation of success of the CMR convention. How this access is being granted to the different stakeholders? Integrity of data is key in order for these stakeholders to trust first the system(s) and then to request access.

<i>Articles of the eCMR protocol</i>	<i>id</i>	<i>Operational procedure</i>	<i>Comments – Initial description</i>
Article 4	9	electronic consignment note shall contain the same particulars as the consignment note referred to in the Convention	This has to be ensured. What about the optional ones?
	10	The procedure used to issue the electronic consignment note shall ensure the integrity of the particulars contained therein from the time when it was first generated in its final form	This is relevant to point 2 and strictly connected with point 11 below. How the system ensures the integrity of data and the inalterability of the message? How the system creates trust to all stakeholders involved.
	11	The particulars contained in the electronic consignment note may be supplemented or amended in the cases authorized by the Convention (<i>The procedure used for supplementing or amending the electronic consignment note shall make it possible to detect as such any supplement or amendment to the electronic consignment note and shall preserve the particulars originally contained therein</i>)	Following the previous point, who has the right to change/ amend the electronic consignment note, when and how? How all other stakeholders will be informed about these changes? Do their confirmation / agreement is needed in order to do so? If yes, how is this going to be achieved while en route? How and where all this amendments history regarding the eCMR will be recorded and stored ensuring their integrity and access by interesting stakeholders (courts)?
Article 5	12	The method for the issuance and the delivery of the electronic consignment note to the entitled party;	This relates to points 1 and 2
	13	An assurance that the electronic consignment note retains its integrity;	This relates to points 7, 10 and 11. Integrity of data creates trust to the system(s). How can be achieved? What are the rules / procedures that have to be established in order to make eCMR a trustful tool for all stakeholders?

<i>Articles of the eCMR protocol</i>	<i>id</i>	<i>Operational procedure</i>	<i>Comments – Initial description</i>
	14	The manner in which the party entitled to the rights arising out of the electronic consignment note is able to demonstrate that entitlement;	CMR convention is about the consignment note but maybe most importantly is about the liability connected and its limitations. How the system ensures that the party entitled to the rights arising out of the electronic consignment note is able to demonstrate that entitlement?
	15	The way in which confirmation is given that delivery to the consignee has been effected;	<p>The proof of delivery is not an easy task. It is not about the technology. It is about the authentication of the receiver, his/her access to the system(s) and the way(s) that he/she will prove that received the goods - that he/she will prove that did not receive the goods - that he/she will prove that partially received the goods - that he/she will prove that received the goods damaged and make a reservation - that he/she will prove that received the goods with damages in the packaging without knowing if the goods are damaged so she/he has to make a reservation - that he/she will prove that received the goods but without the carrier having followed the instructions / requests creating financial losses – or other problems making again a reservation etc.</p> <p>For instance, If the proof of delivery is being performed through a device (mobile phone ?) that a driver carries having installed a mob application of the eCMR system(s) has to be ensured that the driver will not have access to this data / be able to change these reservations and these data / reservations will be automatically uploaded in the eCMR system(s) ensuring integrity of data, storage of data and automatic dissemination of the information to all stakeholders.</p>
	16	The procedures for supplementing or amending the electronic consignment note;	This relates to point 11
	17	The procedures for the possible replacement of the electronic consignment note by a consignment note issued by different means	This point refers either to the fallback procedure and /or to different options existing in one system for producing the electronic consignment note (messages, QR code etc). In general, in the digital world and while travelling by truck internationally different options should exist to ensure continuity since technological interruptions might happen. The fallback procedure should be very carefully designed to avoid, if possible, having again documents printed in parallel with the electronic consignment notes.

<i>Articles of the eCMR protocol</i>	<i>id</i>	<i>Operational procedure</i>	<i>Comments – Initial description</i>
Article 6	18	The carrier shall hand over to the sender, at the latter's request, a receipt for the goods and all information necessary for identifying the shipment and for access to the electronic consignment note to which this Protocol refers	Access to the information from all stakeholders therefore authentication of all stakeholders.
	19	The documents referred to in Article 6, paragraph 2 (g) and Article 11 of the Convention may be furnished by the sender to the carrier in the form of an electronic communication if the documents exist in this form and if the parties have agreed to procedures enabling a link to be established between these documents and the electronic consignment note to which this Protocol refers in a manner that assures their integrity	CMR Consignment note is being accompanied by several other documents (<i>CMR Convention / Article 11 - For the purposes of the Customs or other formalities which have to be completed before delivery of the goods, the sender shall attach the necessary documents to the consignment note or place them at the disposal of the carrier and shall furnish him with all the information which he requires</i>). It is recognized that having the CMR consignment note electronic and then all other accompanying documents in paper eliminates the advantages of the eCMR especially those that have to do with time reduction, paperless environment, covid 19 free operations etc. On the other hand, it would be difficult if not impossible to have all documents electronic. It would facilitate though if the eCMR system(s) has the ability to attach electronic documents (pdf) therefore the sender can always scan and attach the accompanying documents.
Operational issues	20	Hosting 24/7/365	International transport should be further facilitated through the eCMR system. Therefore, access to the system(s) by all stakeholders 24 hours per day, 7 days per week and 365 days per year.
	21	Security / Storage of data / Access to the data	Integrity of data creates trust. Security, secured access and ensuring of inalterability of messages / data are in the heart of such a trustful system. The existing of mirroring servers even in different geographic locations following all international standards set for protection of data and personal data should be ensured and warranted.
	22	Maintenance / Upgrading	This point relates to point 22. An electronic tool such eCMR requires continues

<i>Articles of the eCMR protocol</i>	<i>id</i>	<i>Operational procedure</i>	<i>Comments – Initial description</i>
	23	Improvements to the system (s) / Decisions	improvements either on services provided, on operations agreed that require new upgrades of the system(s) etc. A mechanism should be set first to discuss and agree those new upgrades. Then another mechanism should be agreed that monitors the implementation of those agreed upgrades by the different system(s) providers. A tool needs continuous improvements. New technology developed might be enough for those improvements. Here, we are not referring to amendments to the protocol where SC.1 is the body where everything should be discussed. We are mainly referring to a technical body that will deal with the technical specifications of the systems where the different stakeholders interested in the system should meet, discuss and agree on those improvements and then monitor their implementation worldwide.

Source: eCMR protocol / SC1 Secretariat

III. Solutions on eCMR provided by private sector information technology (IT) companies

15. Various countries (contracting states as well as non-contracting states) and private sector entities have carried out e-CMR pilots at national, binational, and multinational scales. The focus of each pilot has been different, with some exploring the information exchange between business to business actors (“B2B”), while others have focused primarily on the information exchange between business to administration or business to government actors (“B2A”) and administration to administration or government to government actors (“A2A”). Since all pilots undertaken by the Governments are being analysed in the informal group’s report (ECE/TRANS/SC.1/2021/1) and since in most of these Governments initiated pilots information technology solutions are used from private sector companies the secretariat decided under this section to analyse only the solutions provided by the private sector IT companies.

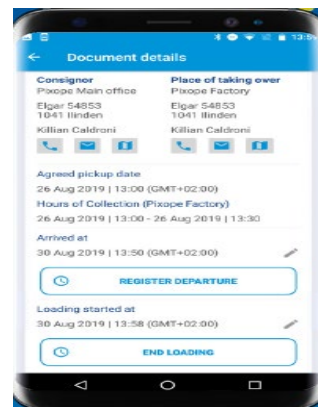
A. TransFollow

16. The approach of private sector is strictly business to business and refers mainly to the three partners described in the Convention without involvement of State authorities. They are also driver / carrier-focused rather than consignor / sender-focused.

17. The registration of the arrival and departure times in the TransFollow App is essential to optimise transport planning. The carrier must click on 'register arrival' when they arrive at the location of pick-up or delivery. Later, they must tap 'start loading/unloading' or 'end loading/unloading' to register the exact time and duration of the loading process. They must also tap on 'register departure' when they depart. The registered time slots are locked, and if they need to change something they can simply modify the registration by clicking on the image of a grey pencil.

18. To sign the freight document, the party must click on the 'Sign document'-button of the freight document to start signing. Parties can also select their preferred signing method: sign with a QR code, sign on Glass, or sign without agreement from the other party. Carriers can hand over their device to the sender at pick-up and consignee at delivery. The counterparty can fill in their name and e-mail and simply switch the system to their preferred language, which enables everyone to go through inspections and sign in their own language. Senders or consignees can check the shipment information in the summary. After validation, the counterparty signs on glass and the device can be returned to the carrier. Carrier can then approve the signing, which will make the freight document's status change from 'issued', to 'in transit', to 'delivered'. The signatures are added to the PDF.

19. Parties can change the details of the goods, if necessary, by tapping on their entered value. They can adjust the following details: the number of packages, their commercial value, their gross weight, their volume, and the number of loading places.



B. Collect + Go

20. Collect + Go easily connects to many systems, for they use a file transfer method through which it does not matter in which format the data is delivered. They provide data connections to ensure seamless integration into the client's processes.

21. Step 1: Data connection with Collect + Go

- (1) Via FTP (all formats) and through a "remap" service.
- (2) Via API (file format JSON) Signatures APIs available.

22. The Collect + Go platform connects very easily with all systems. When data is prepared from these systems with the cargo and/or journey data, they take care of any further processing.

23. Step 2: Set up of users in the portal:

Companies can set up users in their portal and invite other organisations. Every organisation has its own data environment. Users can see e-documents and sign them by means of a QR code or pin code.

24. The portal allows users to set up the e-CMR handling process: they can put together desired e-signing processes and invite supply chain parties. The e-CMR page provides insight into all current and completed assignments. In the dashboard users can immediately see where adjustments are needed in the handling.

25. Step 3: Application with carriers

- (1) Via the app (IOS / Apple / Google Play / Android)
- (2) On-board computer (Mercedes Benz / Bridgestone Webfleet / OEM TomTom / Trimble)

- (3) Full integration (Transics / TX Flex)
Collect + Go proposes the following options for e-signing:
- (1) PIN code
 - (2) QR code
 - (3) sender / recipient not present
 - (4) Sign on glass

26. The signing processes can be activated in the warehouse within half an hour.

C. Pionira

27. Pionira offers an accredited e-CMR service via the Xynaps platform. Pionira is a technical partner of the transport federation TLV (Transport en Logistiek Vlaanderen) and cooperates closely with OTM. Pionira has partnerships with the most commonly used systems (ERP, TMS, WMS and on-board computers) that enable them to integrate their operations to other systems.

D. Ubidata

28. Ubidata an accredited key provider of an e-CMR IT solution in Belgium. It provides a smartphone app but no other information is provided on how the operations of eCMR are functioning.

E. Vialtis

29. Developed in 1982, the company is dedicated to international transport companies across Europe and offers eCMR services. There is not much information provided in their website except for a video. It seems to follow the same logic as the other companies: Computer / Mobile connection, driver-focused.

F. Ospentos Oy

30. It was founded in Helsinki in 1986 and, although their main business regards air cargo throughout Finland, the Baltic States, Belorussia and Ukraine, the company was involved in the testing of e-CMR in August 2020 across the Baltic states and Poland.

G. Edge:ctp

31. It is a B2B order shipping system. It includes the generation of electronic consignment notes, among other digital documents.

IV. Comparison between the operational processes stipulated by eCMR protocol and the processes followed, and services provided in the different pilot projects

32. The following table performs a comparison between the possible future eCMR operational processes listed in table 1 with the processes followed and services provided in the different pilot projects initiated by Governments as well as the different IT solutions provided by different private sector companies.

Table 2

Processes listed in the eCMR protocol and processes followed by pilot projects initiated by the Countries

<i>PILOT PROJECTS</i>										
			DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
<i>Operational process of eCMR</i>										
Article 2	1	demand	the sender issues the electronic consignment note and hands over the goods to the carrier	NA, there is no confirmation on which party created the electronic consignment notes	Currently, the process of the electronic transport document starts by having an authorized party within the Benelux create the electronic consignment note in an approved software provider.	NA, but they used TransFollow	NA, but they used TransFollow	The sender	The sender	NA, but they used Collect + Go
	2	declaration	The electronic consignment notes were created by the parties in the software of the IT companies that participated in the project. The electronic	The IT service provider used was TransFollow. To ensure neutrality of approach, reports indicate that AEOLIX	An authorized party within the Benelux creates the electronic consignment note in an approved software provider. Approved	NA, but they used TransFollow	NA, but they used TransFollow	The application used, Transbook (Slovenian), saved the electronic consignment notes and created a QR code through	The application used, Transbook (Slovenian), saved the electronic consignment notes and created a QR code through	NA, but they used Collect + Go

PILOT PROJECTS

	DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
<i>Operational process of eCMR</i>	consignment note was uploaded to a national registry system. XML was the format preferred, but PDF, JPG and Excel were also used.	intended to ask all operational e-CMR service providers in Europe to provide their services to the AEOLIX toolkit and integrate their solution with that. (400 operations / 100 per corridor deployment).	software providers are Collect + Go (Belgian), TransFollow (Dutch), Pionira (Belgian), and Truckfly (French/Luxembourgish).			which the carrier could provide access to the documents to the authorities if necessary. Sender creates an electronic consignment note in a designated IT service provider upon collection of the goods by the carrier. The original electronic consignment note and any changes required new signatures from all of the parties that had signed the document until that point (for	which the carrier could provide access to the documents to the authorities if necessary. Sender creates an electronic consignment note in a designated IT service provider upon collection of the goods by the carrier. The original electronic consignment note and any changes required new signatures from all of the parties that had signed the document until that point (for	

PILOT PROJECTS

		DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
	<i>Operational process of eCMR</i>						authentication purposes). After receiving the goods, the consignee was required to confirm receipt and sign the electronic consignment note to confirm completion of the transaction.	authentication purposes). After receiving the goods, the consignee was required to confirm receipt and sign the electronic consignment note to confirm completion of the transaction.	
3	instruction	NA, but they used multiple IT companies.	TransFollow	Collect + Go, TransFollow, Pionira, and Truckfly;	TransFollow	TransFollow	Transbook	Transbook	Collect + Go
4	request	n/a	TransFollow	Collect + Go, TransFollow, Pionira, and Truckfly;	TransFollow	TransFollow	Transbook	Transbook	Collect + Go
5	reservation	Parties can update the electronic consignment note. It is possible to see	TransFollow	Collect + Go, TransFollow, Pionira, and Truckfly;	TransFollow	TransFollow	Transbook	Transbook	Collect + Go

PILOT PROJECTS

		DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
		the history of who created, viewed, or updated information in the e-CMR registries.							
	Operational process of eCMR								
6	other communication	NA, although during testing, information on virtual and real loads between partners participating was shared on Google Sheets. To speed up the exchange of information, information on the movement of goods was also shared by e-mail to project and technical managers in every country	TransFollow	Collect + Go, TransFollow, Pionira, and Truckfly	TransFollow	TransFollow	Transbook	Transbook	Collect + Go

PILOT PROJECTS

		DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project	
<i>Operational process of eCMR</i>										
Article 3	7	Authentication	NA, but feasibility study mentions that each country has their own technical solutions and state systems. It also says that to ensure technical interoperability for cross-border e-CMR solution, it is recommended to use technical standards on e-identification and authentication standards in accordance with eIDAS.	TransFollow	Collect + Go, TransFollow, Pionira, and Truckfly	TransFollow	TransFollow	Transbook (on-glass signature, outsourced)	Transbook (on-glass signature, outsourced)	Collect + Go
	8	Access to eCMR data	The stakeholders having access to the electronic consignment	TransFollow	Sender, carrier, and consignee have access to the electronic consignment	TransFollow	TransFollow	Parties have access to the electronic consignment note through	Parties have access to the electronic consignment note through	Collect + Go

PILOT PROJECTS

			DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
		<i>Operational process of eCMR</i>	notes in the transport process were sender, carrier, consignee, and authorities, which generally involved Tax, Customs, Road Administration, Police and Border Guard authorities in participating countries.		note. Authorities can have access to the database of the e-solution provider and the electronic consignment note is accepted by them if it complies with the conditions established for the pilot.			the Transbook platform. In terms of B2A information exchanges, authorities had temporary access to the electronic document through a QR code which the carrier showed at border and/or control checkpoints.	the Transbook platform. In terms of B2A information exchanges, authorities had temporary access to the electronic document through a QR code which the carrier showed at border and/or control checkpoints.	
Article 4	9	particulars of the eCMR	The electronic consignment note should be in conformity with the e-CMR Protocol	TransFollow	The electronic consignment note must be in conformity with the e-CMR Protocol	TransFollow	TransFollow	Transbook bears in mind e-CMR provisions on the particulars of the electronic consignment note	Transbook bears in mind e-CMR provisions on the particulars of the electronic consignment note	Collect + Go
	10	integrity of the particulars	The eCMR index registries system was created to	NA, but the AEOLIX platform is generally	Benelux regulates IT service providers and	TransFollow	TransFollow	Transbook outsourced the authentication services. The	Transbook outsourced the authentication services. The	Collect + Go

PILOT PROJECTS

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<i>Operational process of eCMR</i>	ensure the integrity of the electronic consignment notes. The system is focused on business to government (B2G) information exchange by using indexing service and the indexing number. The appointed government institutions and controlling institutions of the involved country will be able to see where the electronic consignment note is stored and receive	reported to be designed bearing the preservation of the security and integrity of the data in mind.	establishes provisions to preserve the information on electronic consignment notes. The pilot is based on decision M (2017) 12 of the Benelux Committee of Ministers. The decision establishes that IT solution providers are not required to be established in a Benelux country, whereas the author of the electronic consignment note is required to be established in			ePero service transaction consists of the following steps: - Capturing the signature from the sender representative (usually warehouseman in loading place) – first signatures triggers the beginning of the transaction on the ePero server - Capturing the signature from the carrier representative (driver of the vehicle) - Capturing the signature from the recipient	ePero service transaction consists of the following steps: - Capturing the signature from the sender representative (usually warehouseman in loading place) – first signatures triggers the beginning of the transaction on the ePero server - Capturing the signature from the carrier representative (driver of the vehicle) - Capturing the signature from the recipient	

PILOT PROJECTS

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<i>Operational process of eCMR</i>	agreed available data. The developed system is to ensure “high security, data immutability, transaction transparency and no single central point of control.”		the Benelux. Providers must immediately report each user created within their software that is using electronic consignment notes to the country that authorized the provider to participate in the pilot project.			representative (usually warehouseman in unloading place) - Creation of the pdf document after capturing of all signatures on the ePero server and saving of the document in the safe storage (availability to the all contracting parties).	representative (usually warehouseman in unloading place) - Creation of the pdf document after capturing of all signatures on the ePero server and saving of the document in the safe storage (availability to the all contracting parties).		
11	Supplement & amend the eCMR data	Sender, carrier, and consignee can update the electronic consignment note.	TransFollow service (driver with an electronic pen can change anytime the electronic consignment note data)	Collect + Go, TransFollow, Pionira, and Truckfly	TransFollow	TransFollow	Each supplement or amendment required recollecting the signatures collected until that point once again.	Each supplement or amendment required recollecting the signatures collected until that point once again.	Collect + Go

PILOT PROJECTS

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<i>Operational process of eCMR</i>										
Article 5	12	demonstration entitlement ;	n/a	In terms of controlling authorities, they were involved in the project, but reports do not detail the exact process through which they were involved, although text indicates their access to some eCMR information might have been through the AEOLIX platform	Collect + Go, TransFollow, Pionira, and Truckfly	The B2A aspect (controlling authorities, general validity) of the pilot is not confirmed. There is no available information on how/whether the authorities were involved in the project.	TransFollow	When companies decided to participate in the pilot, every company agreed with the Terms and Conditions of the Transbook software, which is an IT solution that bears in mind the compliance of art. 5 of e-CMR.	When companies decided to participate in the pilot, every company agreed with the Terms and Conditions of the Transbook software, which is an IT solution that bears in mind the compliance of art. 5 of e-CMR.	Collect + Go
	13	Proof of delivery;	n/a	TransFollow	Collect + Go, TransFollow, Pionira, and Truckfly;	TransFollow	TransFollow	Consignee was required to confirm receipt of goods in the Transbook platform	Consignee was required to confirm receipt of goods in the Transbook platform	Collect + Go

PILOT PROJECTS

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<i>Operational process of eCMR</i>										
	14	replacement of the eCMR by a consignment note issued by different means	n/a	n/a	Paper consignment notes could continue being used, although they were not required	TransFollow	TransFollow	NA, but paper versions were also used in the pilot because other countries required them.	NA, but paper versions were also used in the pilot because other countries required them.	Collect + Go
Article 6	15	receipt for the goods and all information necessary	NA, although with the ECMR all parties (senders, carriers, and consignees) have access to the ECMR through the IT service provider software.	n/a	n/a	TransFollow	TransFollow	Parties have access to the electronic consignment note and the information there through the Transbook platform	Parties have access to the electronic consignment note and the information there through the Transbook platform	Collect + Go
	16	Additional documents	n/a	n/a	Collect + Go, TransFollow, Pionira, and Truckfly;	TransFollow	TransFollow	n/a	n/a	Collect + Go
Operational issues	17	Hosting 24/7	Estonian IT service providers: Digi	TransFollow service	Collect + Go, TransFollow,	TransFollow	TransFollow	Transbook platform	Transbook platform	Collect + Go

PILOT PROJECTS

	DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
<i>Operational process of eCMR</i>	Logistikakeskus OÜ, Ospentos International OÜ, Qstep logiciel OÜ, Via 3L OÜ, and Mobicarnet OÜ. Latvian IT service providers: Puratos Latvia, SIAM and Multilog Freight SIA. Lithuanian IT service providers: Delamode Baltics UAB, Parnasas, UAB, and Rhenus Logistics, UAB Polish IT service providers: Trans.eu Group		Pionira, and Truckfly;			developed by Trinet.	developed by Trinet.	

PILOT PROJECTS

		DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
	<i>Operational process of eCMR</i>	S.A, Bunasta Sp. z o.o., Frosta Sp.zo.o, and 3Cargo Sp. z o.o. Sp. k. Developers of the project, e-CMR national registries system: Fitek EDI, UAB (LTU), Bunasta (LVA, LTU, POL), Intepia (EST), and PPL 33-35 (UKR).							
18	Security / Storage of data / Access to the data	e-CMR documents distributed index and search engine had to be a system where there is no central server, but at the same time allows sharing	AEOLIX will act as the enabler of this information transaction and will facilitate the access of the related entities to it. As with all data that will be handled in	Collect + Go, TransFollow, Pionira, and Truckfly;	TransFollow	TransFollow	The pilot included safe storage for the data and Transbook outsourced the authentication service to ePero (SETCCE).	The pilot included safe storage for the data and Transbook outsourced the authentication service to ePero (SETCCE).	Collect + Go

PILOT PROJECTS

		DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland	AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia	Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands	France and Spain	France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland	Slovenia	Slovenia and Turkey	e-CMR Tilburg (Netherlands) – Rzepin (Poland) e-Joint Corridor pilot project
	<i>Operational process of eCMR</i>	necessary data according to various roles and access rights.	AEOLIX, the ownership remains with the entities involved and not with the platform.						
19	Maintenance / Upgrading	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20	Improvements to the system (s) / Decisions	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 3

Processes listed in the eCMR protocol and processes followed by some private IT companies

Operational process of eCMR			Private IT companies					Ospentos Oy	Collect & Go
			Transfollow	AndSoft	Ubidata	Pionira	VIALTIS		
Article 2	1	demand	In the TransFollow platform, from what is gathered from the website, multiple parties seem to be able to create the consignment note.	n/a	n/a	n/a	From the website, it seems consignment notes can be created by any role	n/a	n/a
	2	declaration	All parties must be able to connect to TransFollow. TransFollow offers three options: Connect, Portal, and Drive. The TransFollow Connect API allows to instantly connect the TransFollow Datahub to the business' technical environment, enabling interoperability and data exchange between them, their partners and their customers and drive actionable insights from their transport operations.	n/a	n/a	Process to create the electronic consignment note Xynaps can handle different types of documents. The consignment note and identification form are most commonly used. Your administrator can choose which documents should be active in the company settings.	Process to create the electronic consignment note App provides steps to create ECMR. Information on the consignment note itself NA, but complies with e-CMR. Format NA.	n/a	Process to create the electronic consignment note Collect + Go easily connects to the business' system. With the file transfer method, it does not matter in which format the data is delivered. We also have the option of further processing the data for the business. With the API delivery we ensure seamless integration into the business process. Step 1: Data connection with Collect + Go 1) Via FTP (all formats) and through a "remap" service. 2) Via API (file format JSON.) Signatures APIs available. Step 2: Set up users in the portal In our portal the business can set up company users and invite other organisations. Every organisation has its

									<p>own data environment. The business can create users in the portal and see e-documents. The business can sign by means of a QR code or pin code.</p> <p>Step 3: Apply with carriers</p> <p>1) Via the app (IOS / Apple / Google Play / Android)</p> <p>2) On-board computer (Mercedes Benz / Bridgestone Webfleet / OEM TomTom / Trimble)</p> <p>3) Fully integrated (Transics / TX Flex)</p> <p>The portal allows the business to set up the e-CMR handling process. The business easily register users, put together desired e-signing processes, and invite supply chain parties. The e-CMR page provides insight into all current and completed assignments. In the dashboard the business can immediately see where adjustments are needed in the handling.</p> <p>Information on the consignment note itself</p> <p>NA.</p> <p>Format</p> <p>NA.</p>
3	instruction	TransFollow translates all the patented information into a set of TransFollow concepts. All parties agree to communicate company-relevant information in these terms to	n/a	n/a	n/a	n/a	n/a	n/a	n/a

		achieve successful data exchange.						
4	request	TransFollow includes a section in the eCMR for references - to review specific information mentioned on a consignment note, and a section for comments & attachments - to review observations and attached documents linked to a consignment note	n/a	n/a		n/a	n/a	n/a
5	reservation	All parties involved in a transport can share information about the digital consignment note. If one of them initiates a change, the others are informed. The changes are available for the connected systems of all parties. If the driver adds observations and attachments to the ECMR during the transport, it is indicated with an orange circle with an exclamation mark on the Documents overview screen. The event log presents the events indicating what, where and when happened. The event log on the e-CMR preview present all the reported modifications, all actions taken on the transport and by which party.	n/a	n/a	n/a	Users can report problems or issues	n/a	n/a
6	other communication	TransFollow Drive equips drivers with an application that allows for parties to receive real time insights from	n/a	n/a	n/a		n/a	With Collect + Go, packaging is easily registered. Each chain party receives a clear overview per location with the

			their ongoing transport operations. Businesses can dispatch missions and receive real time information from their fleet like vehicles tracking, alerts from major transport events and validated proof of deliveries						e-CMR. Signing the documents prevents discussion afterwards. Packaging overviews can be sent to the businessr ERP system on a daily basis
Article 3	7	Authentication	<p>Permanent company QR-code / Sign by company code</p> <p>TransFollow has enabled the possibility for counter parties (consignees and consignors) to sign for a freight document by presenting a permanent QR-code linked to the company. The user needs to go to the TransFollow Portal and indicate the information regarding 'the ID code to be scanned'. The counter party can show the QR code in any form (on a device, company id card or printed). The driver can 'Select Company code' during the signing process and scan the QR-code.</p> <p>Next, the carrier will see a message of approval of the correct QR-code and approve it. If the QR-code is not corresponding to the counterparty, the carrier will see a warning: "The counter party is not the place of taking over / delivery of the goods for the following freight document [FD number]".</p> <p>Signing with a QR-Code (TF Approval)</p>	n/a	n/a	<p>To sign a transport document , you as a consignor can scan the QR-code of the driver.</p> <ul style="list-style-type: none"> • Click the scan button in the bottom right corner of the app. • Next, scan the QR-code. • You will see all details of the document you are about to sign. • Make adjustments if necessary. • Tap the sign button to continue. • Verify your details. • Finally, tap sign to sign again to sign the document. <p>You can also sign documents using a signature code. This signature code is unique to your account. Beware that the QR-code is an equivalent of your autograph. When a driver arrives with digital transport documents. Just let them scan your signature code. By scanning this QR-code you have signed the document.</p>	n/a	n/a	<p>Legislation and regulations impose increasingly higher requirements on the transfer of goods. For example, it is important to be able to apply a secure signature that can be used to trace back who signed for transfer on behalf of the sending and receiving organisations.</p> <p>When the business work with Collect + Go, the business have the following options for e-signing:</p> <ol style="list-style-type: none"> 1) PIN code 2) QR code 3) sender / recipient not present 4) Sign on glass <p>Applying a secure signature (options 1 and 2) is easier than the business think. An additional advantage is that this way of signing is Covid Proof. The signing processes can be activated in the warehouse within half an hour</p>

		<p>With TransFollow Approval, every ECMR can only be viewed, managed, or signed by the users with accounts linked to this specific transport document. This allows all supply chain partners to easily identify if the person at the location has access to the consignment note in question and is therefore authorised to check and sign it. Sign-on-Glass</p> <p>Sign on Glass is a signing method where the counter party checks the information on the freight document and signs for pick-up or delivery. The driver then validates the information and signature. The signatures are presented on the PDF document of the ECMR.</p>			<p>The consignor can also start the signature process.</p> <ul style="list-style-type: none"> • They can go to the app and select the desired document. • Make adjustments, fill in missing data. • Next they will sign the document digitally and let the driver sign. • The driver can scan a QR-code, which virtually 'gives' them the document. • Or if the driver is already linked to the document, they can sign it on his device. • In that case a QR-code scan will not be necessary. <p>Double signature and print</p> <p>People can choose to print the transport documents for the driver, but the paper version of the consignor will not be printed and will be stored digitally. First both signatures are placed in the DigiCMR app. Next, using the platform or integrated system, you can print a paper version.</p>			
8	Access to eCMR data	<p>Particulars in the ECMR are accessible to the sender, carrier, and consignee. They have also added a new role: the client. The client is a company on behalf of which the transportation is organised.</p>	n/a	n/a	<p>NA specifically, but there is information on:</p> <p>User roles</p> <ul style="list-style-type: none"> • Administrator: The administrator role gives you admin rights. Without this role, you will never see the admin panel. 	Accessibility for "consumer, driver, supplier, sender, and computer	n/a	n/a

						<ul style="list-style-type: none"> • Driver: The driver role grants users the rights to view, edit and sign consignment notes on their mobile devices. This role should be applied to all drivers. • Dispatcher: The dispatcher role gives users the possibility to create, edit, ... digital documents on the web platform. • Network Manager: The network manager can create links between your company and other companies. 			
Article 4	9	particulars of the eCMR	The eCMR generally contains the same particulars as the CMR.	n/a	n/a	n/a	n/a	n/a	n/a
	10	integrity of the particulars	Only the parties involved (sender, carrier, and consignee) can edit the data, and they are all notified when there are changes.	n/a	n/a	n/a	n/a	n/a	n/a
	11	Supplement & amend the eCMR data	The status of a freight document shows the current phase in its so-called life cycle. It also determines if certain data can still be added or changed. The freight document status can change from draft to cancelled or issued. After issuing only a certain number of elements can still be changed. When goods are picked up by the carrier the status changes to transit. Before this moment	n/a	n/a	n/a	n/a	n/a	n/a

			the carrier also invites the consignor to sign for handing over the goods. At delivery, the carrier can invite the consignee to sign for reception of the goods. Then the status becomes delivered or delivered for inspection by the consignee						
Article 5	12	demonstrate entitlement;	A freight document itself also has a unique id that can be stored by the connecting systems for later reference. By signing the waybill – when transferring the goods - the two parties that sign, explicitly agree about the part of the freight document that is legally binding. Some elements like estimated times of arrival, references or supplement documents are not part of this scope	n/a	n/a	n/a	n/a	n/a	n/a
	13	Proof of delivery;	Consignee must confirm receipt of the goods in the TransFollow platform.	n/a	n/a	n/a	n/a	n/a	n/a
	14	replacement of the eCMR by a consignment note issued by different means	N/A	n/a	n/a	n/a	n/a	n/a	n/a
Article 6	15	receipt for the goods and all information necessary	The eCMR is available to the parties involved.	n/a	n/a	n/a	n/a	n/a	n/a

	16	Additional documents	TransFollow includes a section in the ECMR for comments & attachments - to review observations and attached documents linked to a consignment note	n/a	n/a	Upload Attachments You can add attachments to your consignment note by selecting a document and clicking "upload attachments". This might be handy to upload a plan for your driver, or customs documents.	n/a	n/a	n/a
Operational issues	17	Hosting 24/7	TransFollow offers services 24/7.	n/a	n/a	Pionira	n/a	n/a	n/a
	18	Security / Storage of data / Access to the data	When using TransFollow, each ECMR is only visible to the accounts that are linked to it, which means that no third party has access to the information stored on it. Also, TransFollow does not use any data provided by the users for commercial purposes	n/a	n/a	n/a	n/a	n/a	n/a
	19	Maintenance / Upgrading	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	20	Improvements to the system (s) / Decisions	n/a	n/a	n/a	n/a	n/a	n/a	n/a

V. Guidance by the Working Party

33. The Working Party is invited to consider the document and provide guidance on future steps regarding the development of a sustainable solution on eCMR.
