



REPUBLIC OF ESTONIA
TRANSPORT ADMINISTRATION

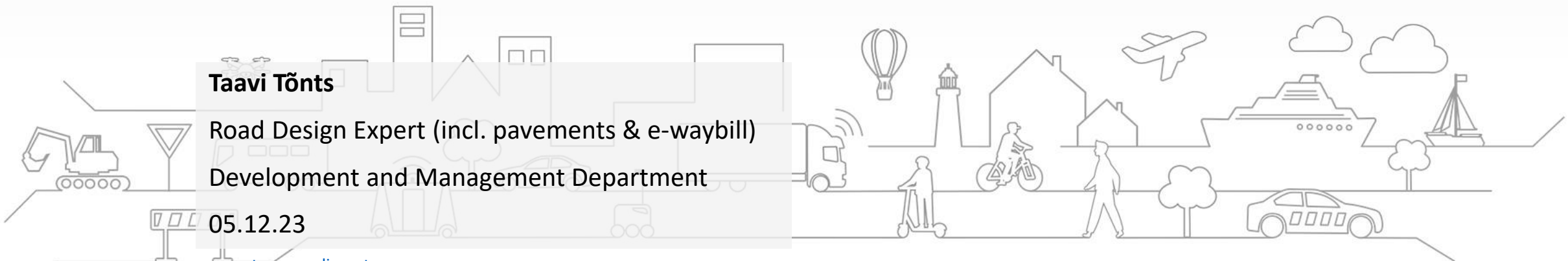
Intelligent Access, e-waybills and eFTI Developments in Estonia

Taavi Tõnts

Road Design Expert (incl. pavements & e-waybill)
Development and Management Department

05.12.23

www.transpordiamet.ee



Intelligent Access, e-waybills and eFTI (eCMR) developments

Service providers can provide many services together: freight, vehicle and road access control info – **to ensure compliance with the applicable rules** (i.e. for abnormal load/freight transport).

Different waybill types in Estonia

1) CMR paper

eCMR/eFTI national index registry (the prototype is in the development phase)

Freight info

2) Internal state paper waybill

e-waybill national index registry (since 2020 pilots in ETA's building contracts)

Freight info+
IAP

3) Abnormal HV permit/waybill, based on:
IA on the VELUB: GNSS for the 52t on the Smart Road map + min 7 axles; double tires; Euro 5;
+OBW & e-waybill in the future for the 60t & min 8 axles; 20,75m; double tires; Euro 6

Freight info+
IAP

- **eFTI** regulation **2020/1056/EC** is dealing only with the electronic **freight** transport information.
- Directive amending Council Directive **96/53/EC final draft**: Member States may implement **Intelligent Access Policy (IAP)** schemes within their territories to regulate, monitor and ease the access by heavy-duty vehicles to specific roads or areas.
 - For the purposes of this Article, an '**intelligent access policy**' shall mean a technical and functional framework to manage heavy-duty vehicle **access to the road network**, through the use of **telematics**, to ensure compliance with the applicable rules on **weights and dimensions**.



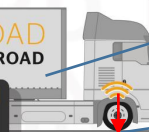
EC2019/1213 Standardisation request OBW

THE OBWS
ON BOARD WEIGHING SYSTEM
This solution uses sensors, for example in axles, to measure load distribution - before vehicles hit the road. Fleet managers and drivers can access all data via special apps in the cabin and office. The OBWS helps you create optimum capacity, new opportunities and greater efficiency.

BENEFITS OF
ON BOARD WEIGHING
Regulatory Compliance
Efficient Loading
Predictive Maintenance



KNOW YOUR LOAD
BEFORE THE ROAD



DIRECTIVE (EU) 2015/719
demands more frequent weighing of commercial vehicles.
(Source: European Union)

MORE THAN 435 **VEHICLES ON BOARD**
across Europe determine the weight of trucks on the road.
(Source: WIM)

eFTI 2020/1056/EC

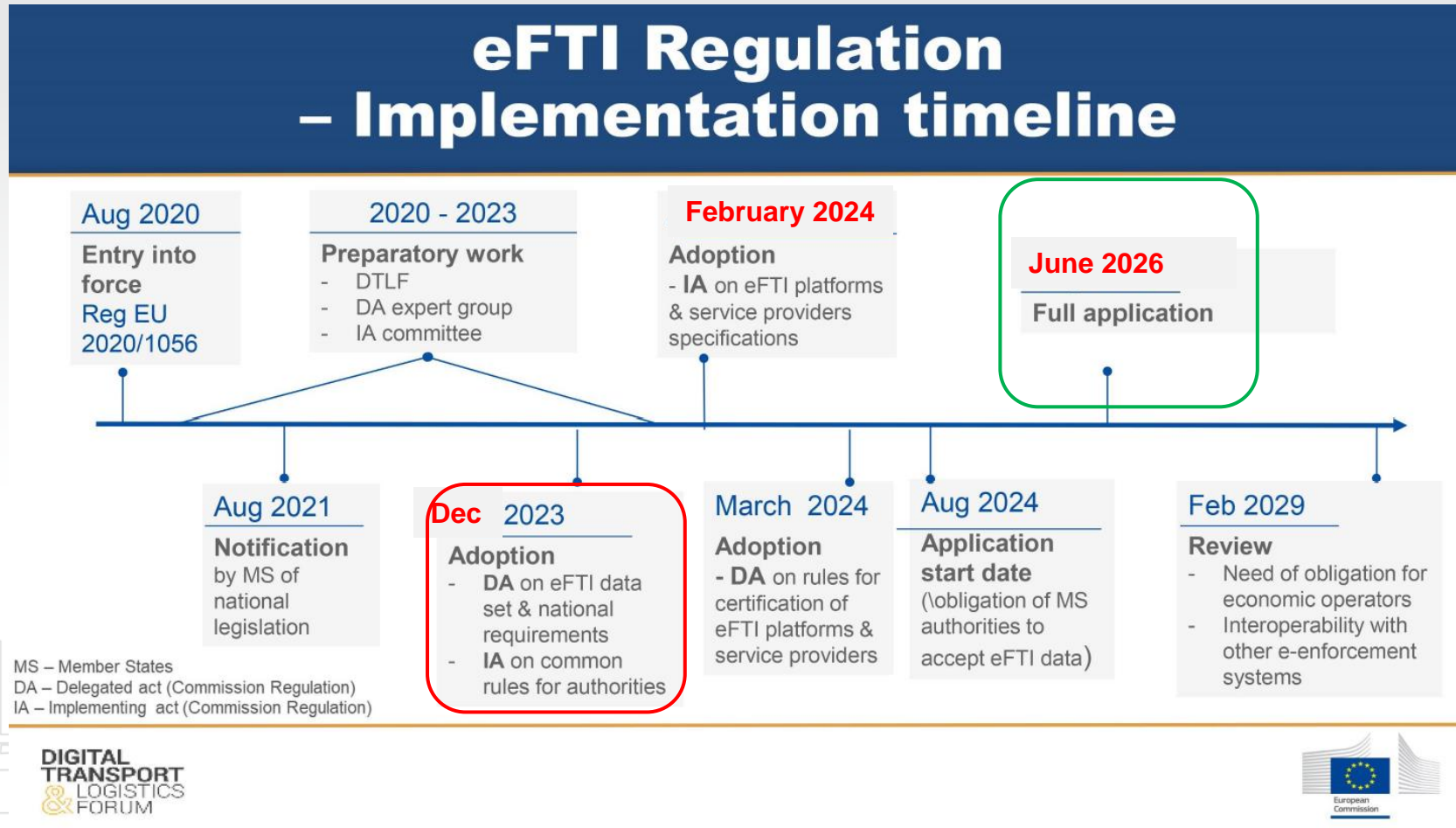
IAP 96/53/EC draft

1. eFTI developments



EU eFTI (electronic Freight Transport Information) regulation

In June 2026 EU authorities must accept the electronic freight data (**red** - changes in 2023)



eFTI 4 EU project

*"eFTI4EU is setting out to be a **pioneering project** in implementing the eFTI regulation. Our partners are devoted to helping the European transportation industry embrace digitalisation" said Eva Killar*



- Duration: 36 months
- Applied budget: 28.3 million euros

Coordinator

Eva Killar

Email: eva.killar@klimaministerium.ee

Co-Coordinator

Ulrika Hurt

Email: ulrika@digilogistics.eu

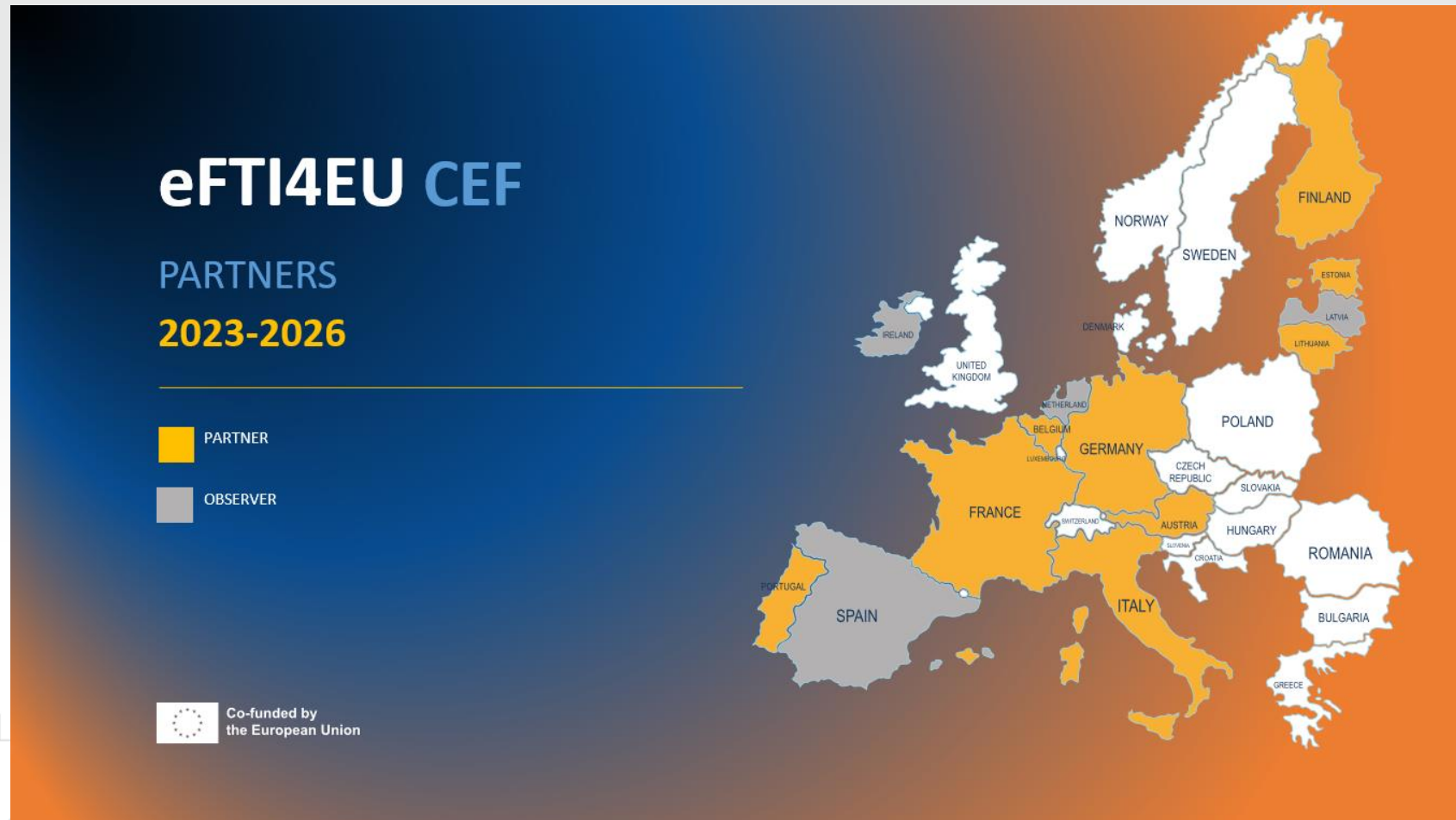
General Contact

Project e-mail

Email: info@efti4eu.eu






eFTI 4 EU project partners



eFTI Technical Implementation Specifications

Annex 4 – Detailed Message Structure_Draft (deadline: Feb 2024)

eFTI Technical Implementation Specifications Annex 4 – Detailed Message Structure

	Circle SpA Piazza Borgo Pila 40, A/46, 16129 Genoa, Italy www.circletouch.eu
	Digilogistika Keskus OÜ Teaduspargi 6/1, Tallinn, Estonia www.dlk.ee
Contract No.	MOVE/D1/SER/2022-331/SI2.882058 (MOVE/2022/OP/0009)
Author(s)	Antonio Molinari, Frank Janssens, Ulrika Hurt
Client	DG MOVE 
Document Type	Technical Specifications



Prepared for:



European Commission

Doc. Name: eFTI TIS Annex 4 – Detailed message structure
Doc. ID: eFTI2-TS05

4 Message Data Definition

4.1 Contact Information

Attribute	Type	Required	Notes and Description	Example
Email	String	Mandatory	Email (RFC 5322)	dipps172.00r0@pecp.s.poliziadistato.it
streetName	String	Mandatory	Street name	Via San Vitale
buildingNumber	String	Mandatory	Building number	15
city	String	Mandatory	City	ROMA
additionalLine	String	Optional	Additional information to identify the address	Palazzo C
postalCode	String	Mandatory	Postal code	00184

4.2 Competent Authority

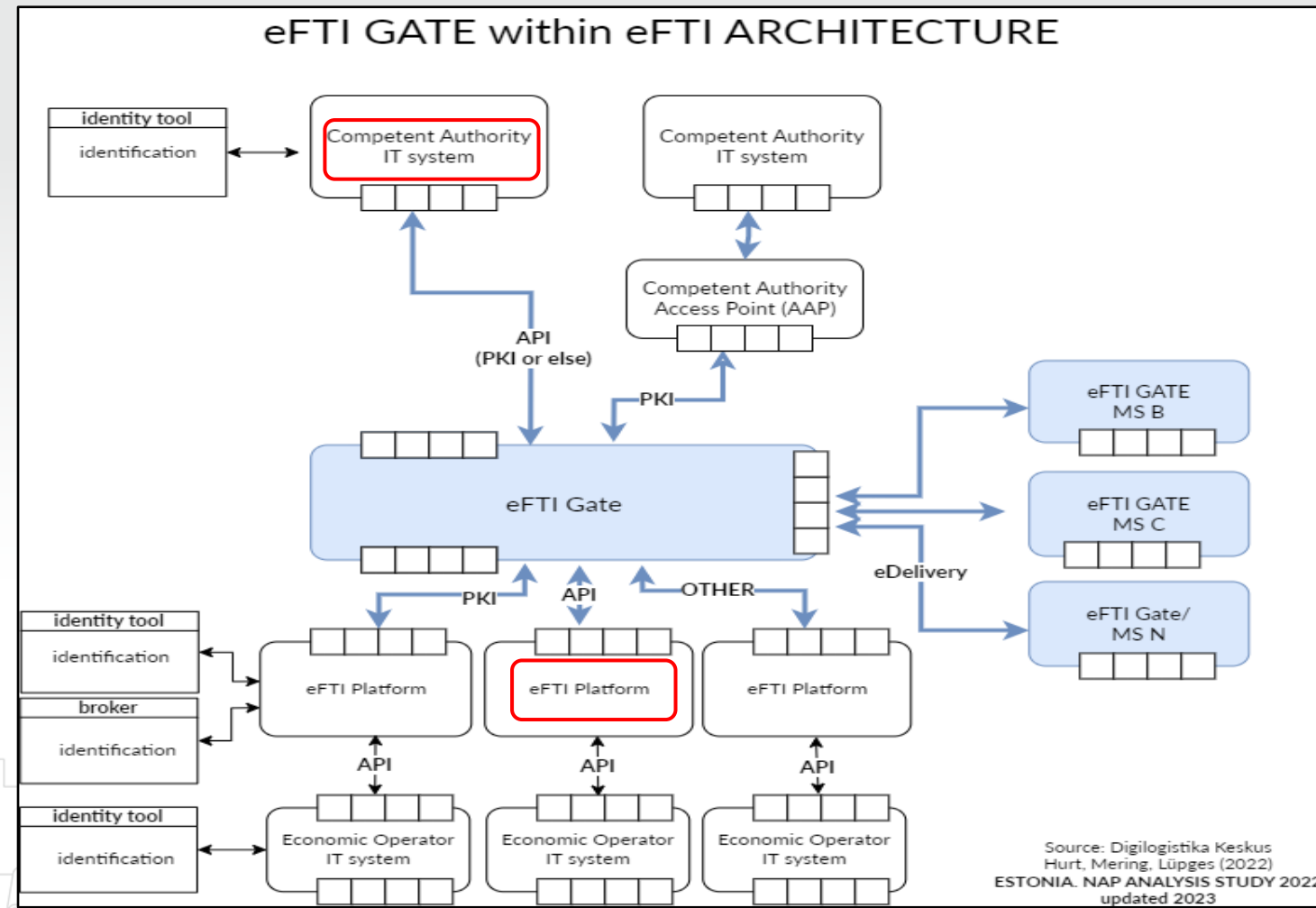
Attribute	Type	Required	Notes and Description	Example
country	String	Mandatory	ISO 3166-1 alpha-2	IT
legalContact	Contact Information	Mandatory	Contact information for the legal office of the CA	
workingContact	Contact Information	Mandatory	Contact information for the working office of the CA	
isEmergencyService	Boolean	Mandatory	Indicate if the competent authority is an emergency service (for example fire fighters)	False
name	String	Mandatory	Name for the Competent Authority	Questura Roma
nationalUniqueIdentifier	String	Mandatory	For instance, VAT number	vatID:IT80202230589

4.3 Transport Mode

This class is represented by an enumerator.

Value	Notes and Description
ROAD	Indicates that the transport is performed by road
RAILWAY	Indicates that the transport is performed by train
AIR	Indicates that the transport is performed by air
WATERWAY	Indicates that the transport is performed by inland waterways

Estonian eFTI Gate (was: NAP) Analyses Study 2022



Estonian legislation for certifying the contract of carriage

Road Transport Act § 29 (3) In the case of paid carriage of goods, the driver must carry a document in a format which can be reproduced in writing, certifying the conclusion of the contract of carriage (hereinafter referred to as *the **transport document***) and which is prepared by the consignor or freight forwarder of the cargo.

[RT I, 22.03.2022, 2 - from force. 01.04.2022]

(4) The transport document referred to in subsection (3) of this section must contain **at least the following information**:

- 1) the name and address of the consignor of the cargo;
- 2) the name and address of an Estonian or foreign carrier;
- 3) the name and address of the consignee of the cargo;
- 4) the place and date of loading;
- 5) the place where the cargo is unloaded;
- 6) the common name of the cargo;
- 7) the gross mass of the load or, where it is not possible to determine the gross mass of the load, the quantity of ~ the load in other units of measurement.

(5) When using an **electronic transport document**, the following data shall be added to the data specified in subsection (4) of this section:

- 1) **the first name, surname and personal identification code** or, in the absence thereof, the date of birth of the driver performing carriage of goods at the Estonian carrier;
- 2) **registration numbers of the car and its trailer.**



About 95/46/EC (General Data Protection Regulation) GDPR

Info is needed to conduct the Business



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS



DIGILOGISTIKA KESKUS
DIGITAL LOGISTICS
CENTER OF EXCELLENCE



Rahastatud Euroopa Liit
NextGenerationEU



Eesti
Arengu Keskus

The eIDAS regulation⁴⁸ and the amendment proposal thereof⁴⁹ are concerned with the implementation in the extent to which is concerned with identification and authorisation of persons, digital signature, digital stamps of economic operators.

The **GDPR**⁵⁰ on the protection of natural persons in the processing of personal data can be applied to a certain extent and must be taken into consideration. Although the details of a driver are not personal data **but business information**, for example. On the other hand, it should be highlighted that the Estonian Road Transport Act (the wording which entered into force on 1 April 2022) requires specifying the name of the driver and, in the case of a contract with an Estonian haulier, the personal identification code or date of birth on the freight document.

A considerable number of pieces of legislation related to data management are currently being drawn up due to the **proposal for the Data Governance Act**⁵¹.



Data handling and its security is very important

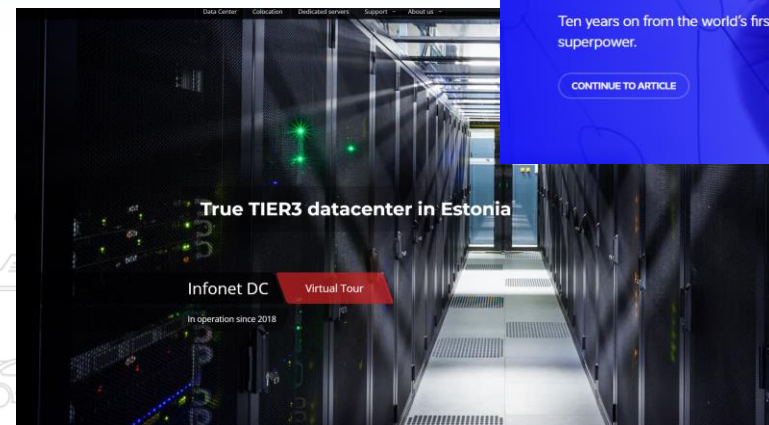


e-Residency ID card –
*everyone in the World
can apply it.*



Ten years on from the world's first cyber war, Estonia has become a global cyber security superpower.

CONTINUE TO ARTICLE



2. e-waybills developments



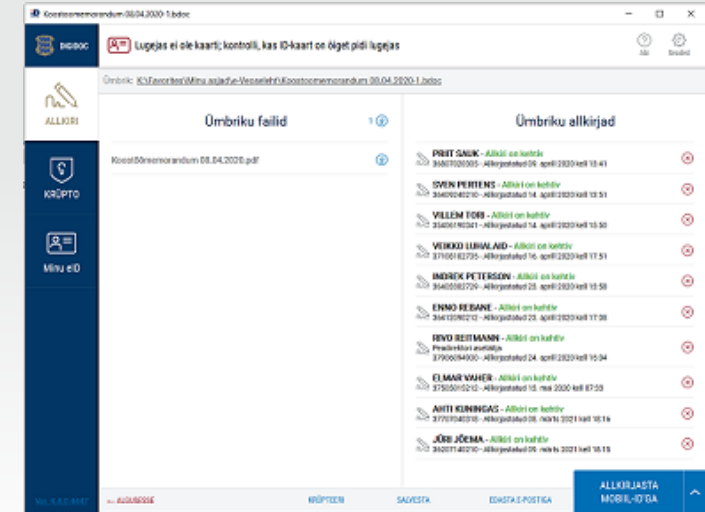
Bulk material e-waybill memorandum goals:

- 1) Making supply chains more transparent in road construction;
- 2) One time data entry;
- 3) Increase road safety;
- 4) Reduce truck overweight.

Bulk material e-waybill memorandum was signed
in 2020 by 8 Estonian state stakeholders, at the moment there are **10**.

In 2024, an e-way bill will be mandatory for transport of construction bulk materials in procurements by the Transport Administration (together with GNSS).

Automatic mass information (static weights or OBW etc., will be later in version 2.0).



2023 pilots' min requirements

(Appendix in the Building contracts - for the service providers)

Annex 16

Minimum requirements for documenting e-waybill work

- 1) All ~~consignment notes~~ consignment notes for bulk materials (sand, gravel, rubble, materials with bituminous binders, etc.) and the summary tables compiled on the basis thereof (e-waybills) must be drawn up in an electronic data exchange platform.
- 2) The data exchange platform is an information and communication technology-based solution for the processing of electronic freight transport information through which data exchange takes place between the economic operators concerned, as well as between the economic operator concerned and the competent authority, in a machine-readable form.
- 3) The system must function in such a way that in the absence / interruption of the Internet connection, the entered e-waybill remains on hold and is automatically transmitted when the Internet connection is restored, together with the date and time of entry (digitempel).
- 4) By way of exception, in the event of a proven lack of internet connection or problems with the software, the consignment note may be filled in on a paper sheet and the e-waybill must be completed retrospectively no later than 1 working day after the shipment has taken place.
- 5) The data that is reflected in the e-waybill must be contained to a minimum (recurring items can be pre-filled):
 - a) Place, name, address; coordinates; **time**, date, year of loading;
 - b) **Carrier: company name, address and registry code**, name and telephone number and personal identification code of the driver, time of commencement of the trip, date, year;
 - c) Place of unloading: **name and address, coordinates**, time of arrival at destination, date, year, calculated and kilometres driven;
 - d) **Consignor of the cargo: name** and telephone number **of the representative, company name, address, registry code**;
 - e) Lorry: vehicle registration number, trailer registration number, unladen mass of the vehicle and trailer, maximum permissible mass of the vehicle and trailer, number of axles of the combination of vehicles;
 - f) Consignee of the cargo: company's name, **address** and registry code;
 - g) Approval: name, time, date, year;
 - h) The common name of the cargo (name of the material sent), quantity, weight;
 - i) Gross mass of cargo (quantity);
 - j) If there is an object: start and end date, year;
- 6) If the transport company uses a subcontractor, then the data of the subcontractor must also be filled in in the carrier's data on the consignment note: **company name, address and registry code, name** and phone number of the driver and personal identification code.
- 7) The data exchange platform must enable the authorisation of various viewing rights for the Customer and the Engineer, the generation of waybills, the addition of additional documentation. Additional documentation certifying the origin of the material (declaration, product certificates in agreement with the Engineer or the Customer) must be attached after each load (may be linked to the original document) and submitted to the Engineer for inspection and confirmation no later than the next working day.
- 8) It must be possible to create separate construction objects with the necessary data in the system and the system must enter information about them on the e-waybill.
- 9) The data exchange platform shall enable GNSS location-based tracking with each load.

- 10) The Carrier must have a smart device with a GNSS device and it must be activated during the entire transport (the Customer has the right to deduct up to 0.1% of the Contract Value for non-compliant e-waybills). The equipment or the antenna of the equipment must be in a position visible to the satellites throughout the journey.
- 11) It must be possible to create a separate object(s) in the data exchange platform, incl. the data described above must be reflected next to the specific object. The information arising from the truck and/or trailer number must be generated automatically from the traffic register database (through entering the registration plate, via the API of the Estonian Transport Administration, for which a contract must be concluded in advance), which must reach the e-waybill in the electronic environment. If the truck has a 48/52t special cargo permit, its presence/number and period of validity must be entered in the "notes" box.
- 12) An e-waybill must also be created for shipments that take place from intermediate warehouses to the object (except for intermediate warehouses directly on site, the requirement for an e-waybill from intermediate warehouse to object applies if public roads are used). A note must be made on the e-waybill as to whether the material is from a quarry or material to be transported from an intermediate warehouse.
- 13) It must be possible to export all e-waybills and the data on them from the user interface to a table in CSV or XLSX format for more detailed analysis. It must be possible to select the composition of the data to be exported.
- 14) The Customer must have the right to monitor and store in the system the GNSS log files of the delivery of material within the framework of his contract (to make sure that the place of origin and destination of the load corresponds to the declarations and the object).
- 15) It must not be possible to delete the e-waybill.
- 16) The e-waybill may be changed, but the data on the changes must be retained on the consignment note (for example, when crossed out).
- 17) It must be possible to reject the e-waybill if the load is not accepted. It must be possible to include a reason for the rejection and the driver must be able to choose a new destination for the rejected load. Both the original destination and the changed destination must remain displayed on the consignment note.
- 18) The free storage of the e-waybill and its availability to all parties must be guaranteed by the service provider for 7 years after the completion of the consignment note (§ 12 (1) of the Accounting Act).
- 19) It must be possible to identify the confirmation of three parties on the e-waybill (confirmation of the consignor, carrier, receiver, incl. there may be several receivers).
- 20) The time limit for the approval of the consignee approver is 24 hours and he must be able to confirm several consignment notes at once (the so-called mass fastening option).
- 21) The Contractor must make a summary of the experience of using the e-waybill and, if necessary, present it at the customer's meeting or at the road maintenance forum at the end of the season. In the summary (2-4 pages), it is necessary to highlight the pros and cons as separate subsections and make proposals for the development of ease of use of the e-waybill, etc. The preparation of a written summary is part of the reception of the object.
- 22) The contractor must take into account that random check-weighings are carried out on the site in order to compare the actual weight with the declared weight for the purpose of statistical overview and e-waybill development work. Control weighing shall be carried out up to the 10th time. The weighing shall be carried out by the Contracting entity without prior notice.
- 23) If necessary, the contractor must attend the meetings of the e-waybill working group of the Estonian Infrastructure Construction Association and submit their own overviews of the experience and development proposals of the e-waybill, etc.

For piloting: vers. 2.0:

24) The following must be interfaced with the e-waybill data exchange platform: weighing machine (must have valid verification) and/or loader weighing device (must be valid) and/or on-board weight (OBW) information from the on-board computer of the combination of vehicles. Weight data must be recorded on the e-waybill.

25) The system must calculate the actual mass of the load (unladen mass of the combination of vehicles + mass of the load) and must issue a warning if the maximum weight allowed by law for this combination of vehicles is exceeded above the permissible limit (the contractual limit is not displayed by the Customer - it remains in reserve).

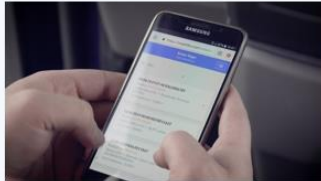
26) The data exchange platform of the e-waybill shall contain a separate indication of the weight interface in order to make them distinguishable and automatically read together in the xls table.

2nd version of the e-waybill (with weight interface) additional conditions for the pilot.

Road construction process as example by Wayiller.com

Waybiller Road construction process as example

A bill of lading is created in the loader



The truck driver completes e-waybill (confirms delivery)



The truck driver accepts the e-waybill and starts the transport



The site manager confirms the assortment and quantity of the delivered material (confirms the loading list)

- E-waybill is entered in assortment and quantity(t)
- The consignment note is linked to the place of departure and the car number
- The same information goes to the quarry's owner's information system
- When transporting asphalt, the plant has created the waybills on the basis of weight data, and the truck driver is taking it over



- When the driver selects the car number and the starting point, the open e-waybills are displayed to him in the Waybiller
- It is the driver's responsibility to start and end the journey (loading list)
- Eesti Killustik no longer issues paper delivery notes !!!



- The site manager has a real-time overview of the transported materials, carriers, weights and comments on e-waybill.
- It takes less than 1 minute to create a report.
- Construction supervision and Road Administration have the same overview (possible also for Police, Tax Authority).



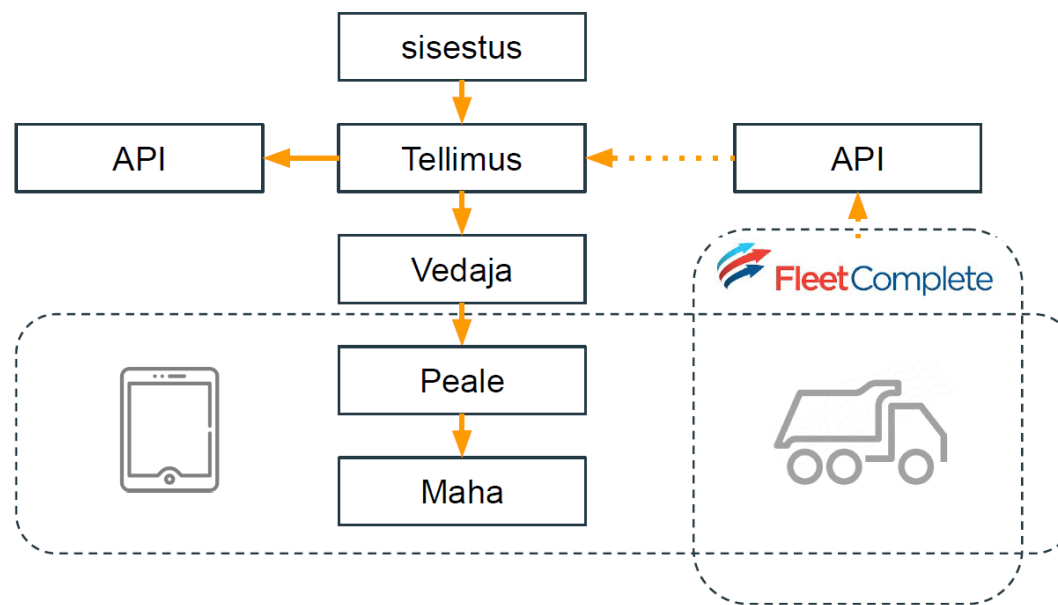
Internal state e-waybill process as example by Planlog.ee

IA data (OBW) possibilities via the API from FleetComplete.com



Siseriiklik e-veoseleht

- 2 projekti
- FleetComplete
- Teekond
- Tegevuspunkt
- Kaalu andmed



Crushed stone transport example by Cargoson.com

Booking DA26433 (Müügiarve 123456789)

Print

App Actions

Edit

Use as a template

Tanel Vaarmann - DEMO OÜ (Demo OÜ)

FCA Tallinn · ROADFREIGHT Booked

Collection

Ülemiste keskus

Suur-Sõjamäe 4, 11415 Tallinn (EE)

Jaan Tamm · +372 555 666 · jaan@example.com

Date06-09-2023

Estimated collection date: 07-09-2023

Schedule loading

Tail lift

Notify by phone

Delivery

Demo OÜ

Roheluse tee 1, 75516 Roobuka (EE)

Tanel Vaarmann · +372 53006149 · tanel@cargoson.com

Date06-09-2023

Estimated delivery date: 08-09-2023

Schedule loading

Tail lift

Notify by phone

Return doc.

30 KM

Killustik

1 LOAD

23500.0 kg

84.864 m³

1360x240x260 cm

13.6 LDM

Confirmed

Collected

Delivered

Completed

Project X

Hange Y

Info for the carrier

Killustik tuleb vahelaost

Registration plate

848TFP

Discussion

Carriers

Services

CO₂e

Collection / Delivery

ProShip

ProShip Demo *

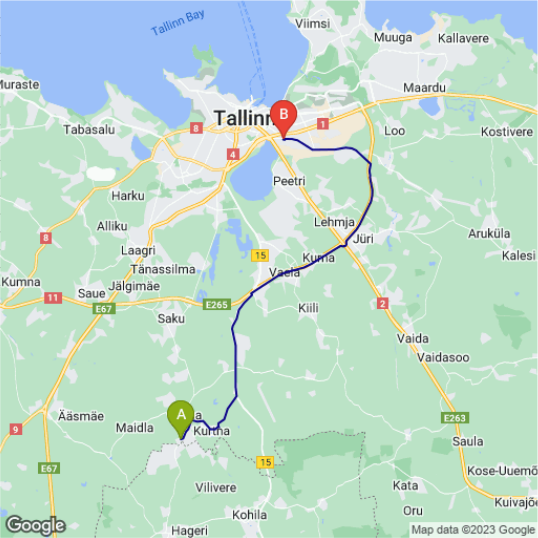
Economy

Greener Choice

49,53 kg

Summary of 848TFP 🚚👤 (848TFP) history from: 06.09.2023 00:00 to: 06.09.2023 09:07

Distance	38.00 km
Driving time	44m
Idling time	00m
Working time (idling + driving)	44m
Work duration (first engine on - last engine off)	55m
Fuel tank level at start	
Fuel tank level at end	
Fuel added	0.0 l
Fuel lost	0.0 l
Fuel usage Total	0.00 l (Driving: 2.70 l, Other: -2.70 l)
Driver(s)	Roberto Kivi
Fuel usage per distance in working time (idling + driving)	0.00 l/100km
Fuel usage per hour in working time (idling + driving)	0.00 l/h
Idling fuel usage	0.00 l
Driving fuel usage average	7.11 l/100km
Engine burned fuel by CanBus	2.7 l
Engine mileage by CanBus	7.11 l/100km




* Fuel data takes up to 8 hours to calculate, therefore the fuel data for the last 8 hours may be volatile.

3. Intelligent Access (IA) developments




CEDR Technical Report


Intelligent Access (IA): current NRA practices (in the VELUB system we have piloted 52t IA)



Conférence Européenne
des Directeurs des Routes
Conference of European
Directors of Roads

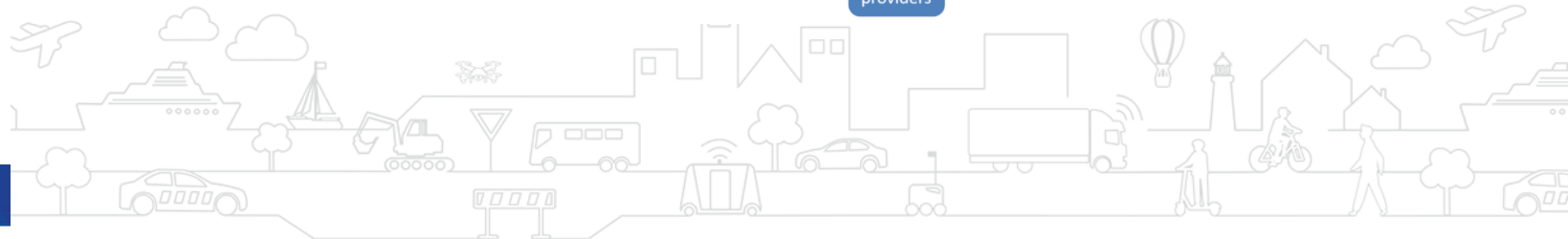
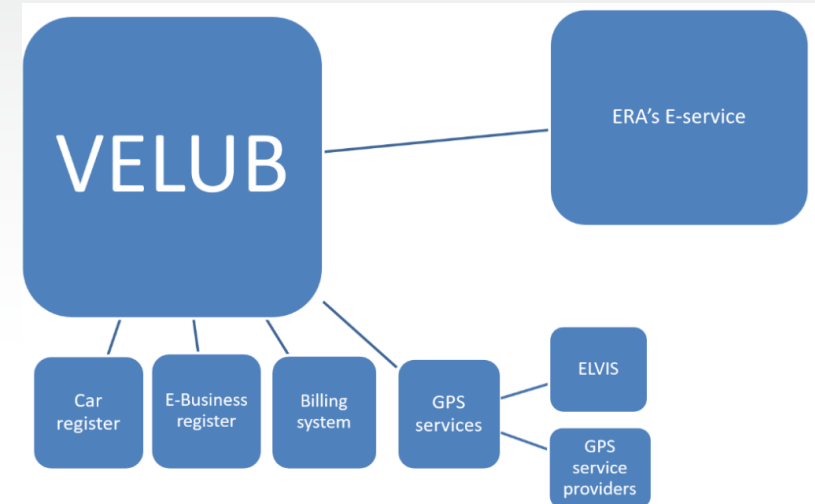
CEDR Technical Report 2022-01





Intelligent Access (IA): current NRA practices
CEDR Working Group Road Freight Transport

June 2022



The VELUB special permit legislation

Local authorities can mark the roads in the VELUB



Riigi Teataja

Lühine otsing seaduste ja üleriigiliste määruste terviktekstide pealkirjadest

Sisesta akti nimi, märksõna või ametlik lühend

OTSI

Täpne otsingLigutusStatistikaViitedEelnõudKohtuteaveÕigusuudisedAbiEnglishMinu RT

Teksti suurus: A A A

MeeldetuletusedLaadi allaTrükiRSSAbiinfo

ÕigusaktMenetlusteave

Väljaandja: Majandus- ja taristuminister

Akti liik: määrus

Teksti liik: terviktekst

Redaktsiooni jõustumise kp: 01.12.2022

Redaktsiooni kehtivuse lõpp: Hetkel kehtiv

Avaldamismärge: RT I, 01.06.2022, 3

Vali redaktsioon:

Eelmine

Hetkel kehtiv

Võrdle redaktsioone

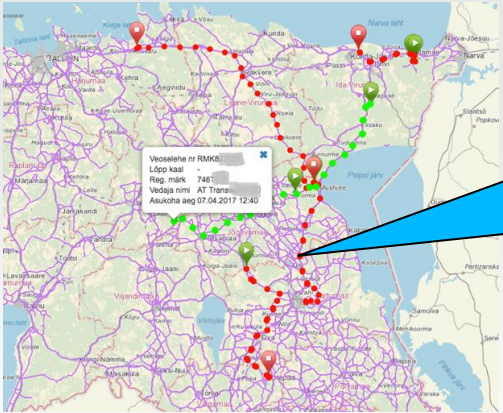
Vaata digitemplit

Eriveo tingimused ning eriveo teostamise ja erilubade väljaandmise kord ning tee omanikule tekitatud kulutuste hüvitamise, eriloa menetlustasu ja eritasu määrad

Vastu võetud 04.09.2015 nr 114
RT I, 09.09.2015, 2
jõustumine 12.09.2015

Muudetud järgmiste aktidega (näita)

Määrus kehtestatakse liiklusseaduse § 34¹ lõike 7 ja § 73 lõike 11 alusel.



Violet corridors are suitable for 52t trucks. At the moment, the police is manually checking whether it is in the right corridor.

Tabel 2. Eriveo tasu autorongi lubatud tegeliku massi ületamise eest määruse § 4 lõikes 2 nimetatud eriveol pikaajalise loaga (eurodes)

Period	Perioditasu ühe autorongi ja ühe teemaniku kohta.	
	State roads, EUR	Municipal roads, EUR each of 79 municipals
1 week	100	10
1 month	200	30
3 months	300	50
6 months	400	80
12 months	500	100

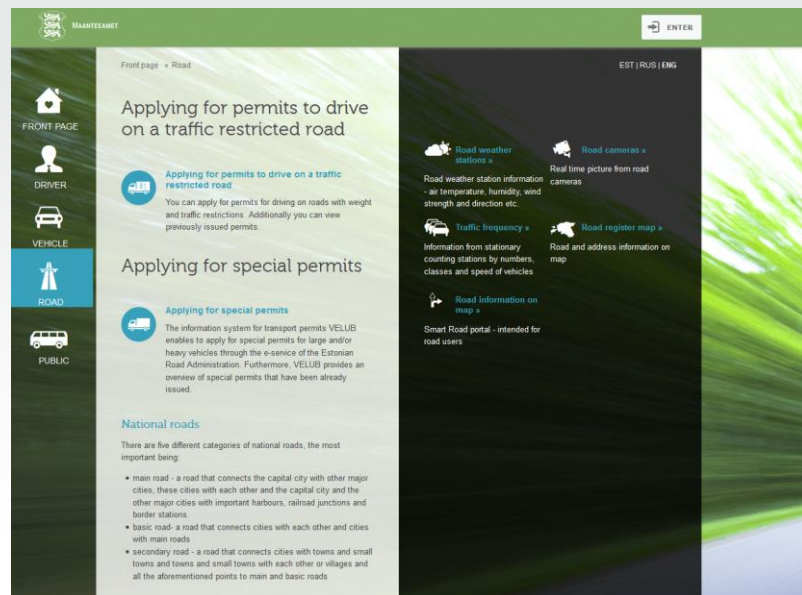
§ 1. Määruse reguleerimisala ja rakendamine

1. peatükk Üldsätted

Special permit applying in the VELUB

ID code is needed for the local users.

VELUB contact: marko.jurimaa@transpordiamet.ee



The screenshot shows the 'Application for special transport permit' form. The left sidebar contains navigation links: FRONT, DRIVER, VEHICLE, ROAD (highlighted), and PUBLIC. The main content area has a heading 'Application for special transport permit' and a progress bar. The form includes sections for 'Permit type' (Regular permit, Quick permit), 'Applying for a permit' (For short-term, For long-term), 'Details of cargo' (Application for laden/unladen journey, Type of cargo), 'Explanation note', 'Application for free permit', 'Intended transport time' (From: 20.09.2019, To: 22.09.2019), 'Applicant' (Code: 47101010033, Name/Designation: MARI-LIIS MÄNNIK, Address: Harju maakond, Tallinn, Lasnamäe linnaosa, Maarja tn 25-75, E-mail: inga.rutto@finestmedia.ee, Telephone: 485455), 'Carrier' (Estonian carrier, Foreign carrier), 'Language of the permit' (Estonian, English), and 'Sending the permit' (By e-mail to the applicant's e-mail address). A blue callout box points to the 'Code' field with the text 'Sample ID code'. The bottom of the form has 'SAVE AND CONTINUE' and 'CANCEL' buttons.

For the better mass control EU develops OBW systems.

Estonian map of the 52t abnormal transport GNSS 3-year data.

It is possible to make OBW load maps also in the future.

NB! OBW is very important to develop further in Europe for the IAP & to protect the aging infra.

CEDR
Conférence Européenne
des Directeurs des Routes
Conference of European
Directors of Roads

EC2019/1213 Standardisation request OBW

THE OBWS
ON BOARD WEIGHING SYSTEM

This solution uses sensors, for example in axles, to measure load distribution - before vehicles hit the road. Fleet managers and drivers can access all data via special apps in the cabin and office. The OBWS helps you create optimum capacity, new opportunities and greater efficiency.

BENEFITS OF
ON BOARD WEIGHING

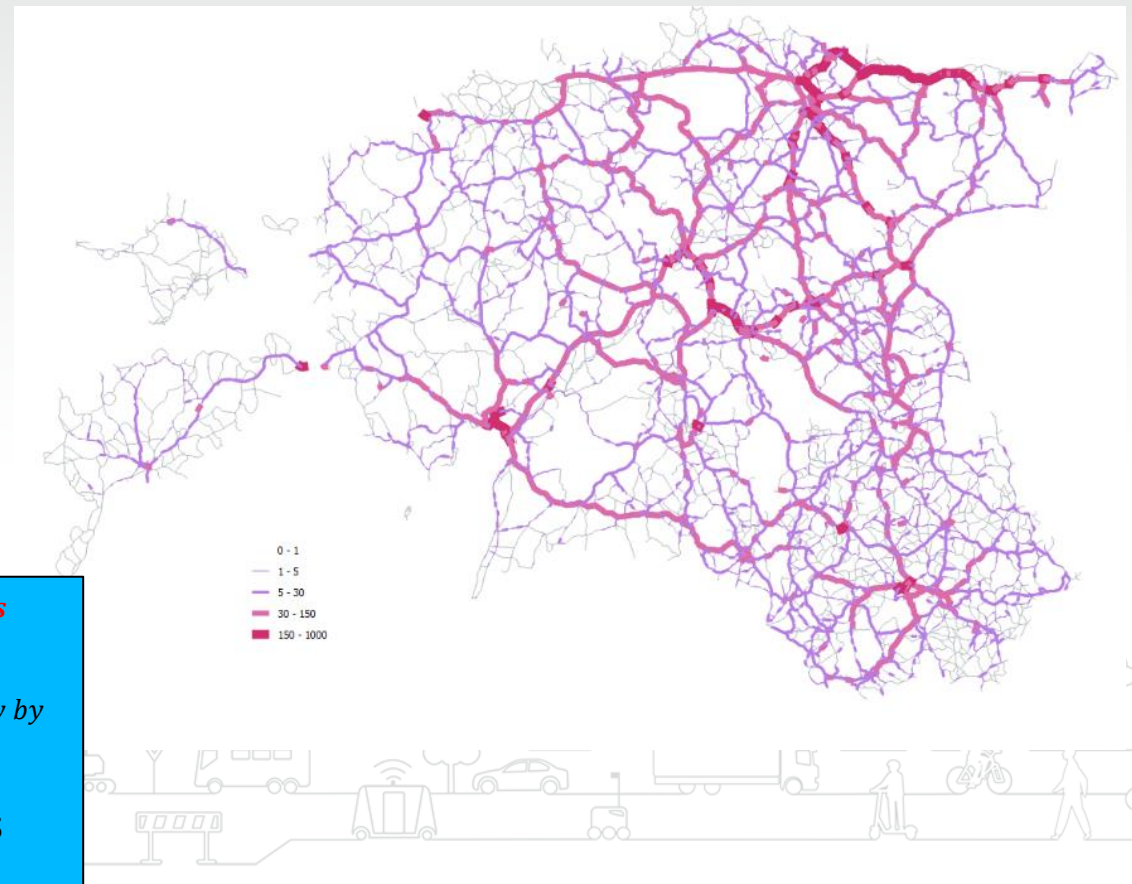
- Regulatory Compliance
- Efficient Loading
- Predictive Maintenance

ON BOARD WEIGHING SYSTEM

KNOW YOUR LOAD BEFORE THE ROAD

DIRECTIVE (EU) 2015/719
demands more frequent weighing of commercial vehicles.
(source: European Union)

16th June 2021 CEDR WG Road Freight Transport



Details can be found in papers HVTT15 and HVTT16

OBW test report is [here](#).

HVTT16: HV Intelligent Access & e-waybills development in Estonia

HV INTELLIGENT ACCESS and E-WAYBILLS DEVELOPMENT IN ESTONIA



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Abstract

The research objective is more effective and greener road freight transport with HV's, without damaging aging road infra below. One of the best solutions in 21. century is to use all kinds of digital data (temperature; GNSS; OBW etc.) and maps, to control the logistics in the most optimum way, depending on the used vehicle's load type (IA). It's a very cost-effective system. Since the HVTT15 paper, much work has been done in Estonia in the logistics digitalization area which has been described shortly below. By the end of 2021 will be analysed, if different cloud-based logistic infosystems can be developed together in a small Estonia.

Keywords: Intelligent Access; Estonian VELUB System Development; Estonian Smart Road; OBW Automated Mass Control Integration; Reducing Infra Construction Stresses; More Efficient and Greener Transport; CEDR Road Freight Transport (RFT) workgroup; Estonian eCMR & e-waybill development; EU eFTI regulation.

Sõiduk	Andmeallikas	Teljekoormus, t							Sõiduki tegelik mass koormus-kaalud, t	OBW Sõiduki tegelik mass pardakaal, t	Tolerants, %
		Axle 1 Telg 1	Telg 2	Telg 3	Telg 4	Telg 5	Telg 6	Telg 7			
Scania 04	Koormuskaalud	8.75	8.10	7.75	6.15	8.35	6.70	6.75	52.55		
	Pardakaal OBW	7.80	7.70	7.60	7.30	7.50	7.17	7.53		52.60	0.10
Volvo 02	Koormuskaalud	7.60	9.15	9.30	7.40	8.15	7.35	7.40	56.35		
	Pardakaal	7.50	8.70	8.50	8.00	8.60	7.30	7.40		56.00	-0.62
Volvo 04	Koormuskaalud	7.80	9.05	8.85	6.80	8.25	7.20	7.25	55.20		
	Pardakaal	7.40	8.90	9.20	6.40	8.20	7.30	7.20		54.60	-1.09
Scania 05	Koormuskaalud	7.70	9.30	9.05	6.85	5.55	8.05	8.00	54.50		
	Pardakaal	6.80	8.60	8.90	7.60	7.40	7.27	7.37		53.93	-1.04
Volvo 02	Koormuskaalud	8.25	9.55	8.60	7.35	9.00	6.75	6.85	56.35		
	Pardakaal	7.80	10.10	8.80	7.40	9.10	6.70	6.80		56.70	0.62

Figure 9 – The results of the vehicles control weightings

For this test purpose, five trucks were selected, connected /22/, and monitored through the fleet management platform provided by FleetComplete. Necessary additional hardware and software developments were done to allow to read the weighting data by telematics devices from vehicles CAN bus using FMS interface and display the data through web interface (Figure 10& 11). For verification purposes, weighing of fully loaded HGV vehicles was carried out with portable scales.

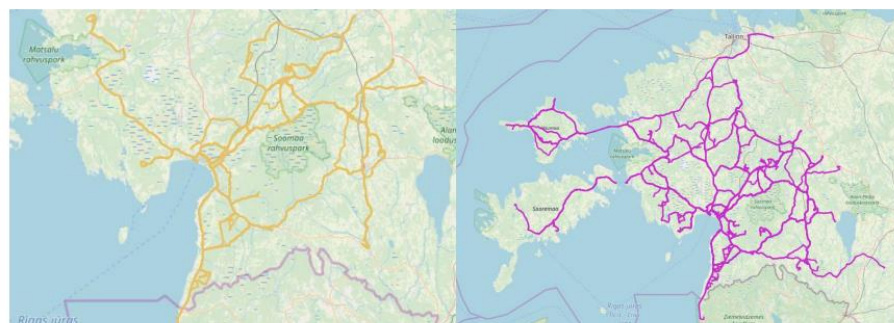


Figure 10 – HV „Volvo 02 timber truck 4+“ moving paths 10.09.2019 – 21.10.2019 (left) & 21.10.2019 – 15.01.2020.

THANK YOU & hope to see you at TRA 2024!

