

FIT FOR

REICHT

Combined transport



RALF-CHARLEY SCHULTZE

CHAIRMAN UIRR





Sponsors of the Freight month



UIC Freight – competence centres

**LOAD
SAFETY**

**WAGON
UTILISATION**

**DANGEROUS
GOODS**

**TRAIN
OPERATION**

**COMBINED
TRANSPORT**

**DATA
EXCHANGE**

**CORRIDOR
DEVELOPMENT**

Program of Today

10.00 – 12.00 Morning Session

Welcome by UIRR & UIC

Presentation of the results of the Combined Transport Report 2022

Combined transport in challenging times and opportunities for the future

12.00 – 13.30 Lunch

13.30 – 14.15 Innovation in Combined Transport

Dassault presenting innovations @ customers

Q&A

14.15 – 14.40 Cargo Loading and securing in a CT context

Harmonisation of loading rules

Safety as experienced by CT actors

Legal framework of UIC loading guidelines

Terminal operator testimonial





ERIC LAMBERT CHAIRMAN UIC COMBINED TRANSPORT SPECIAL GROUP





COMBINED TRANSPORT REPORT 2022





COMBINED TRANSPORT REPORT 2022



Outline



- Methodological introduction
- Facts & Figures
- Spotlight analysis
 - Digit(al)isation
 - Cost chains
 - Weights and Dimensions

Methodological intro....



- Definition: multimodal – intermodal - combined

- Sources:



- Workshops and literature

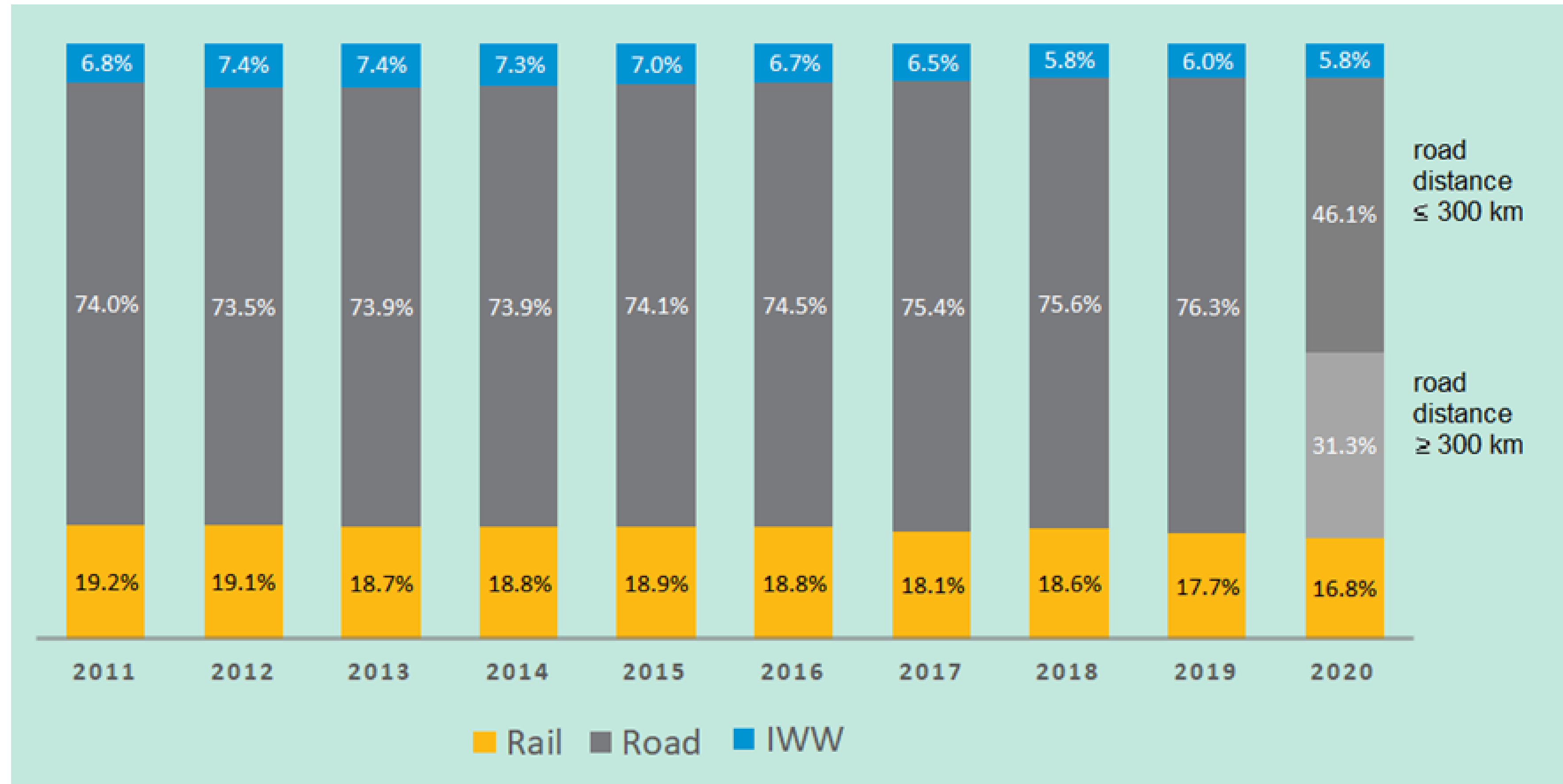
- New this year: CT via inland waterways



Facts & Figures: general



- Modal split of freight transport (% of tkm)



Facts & Figures: general

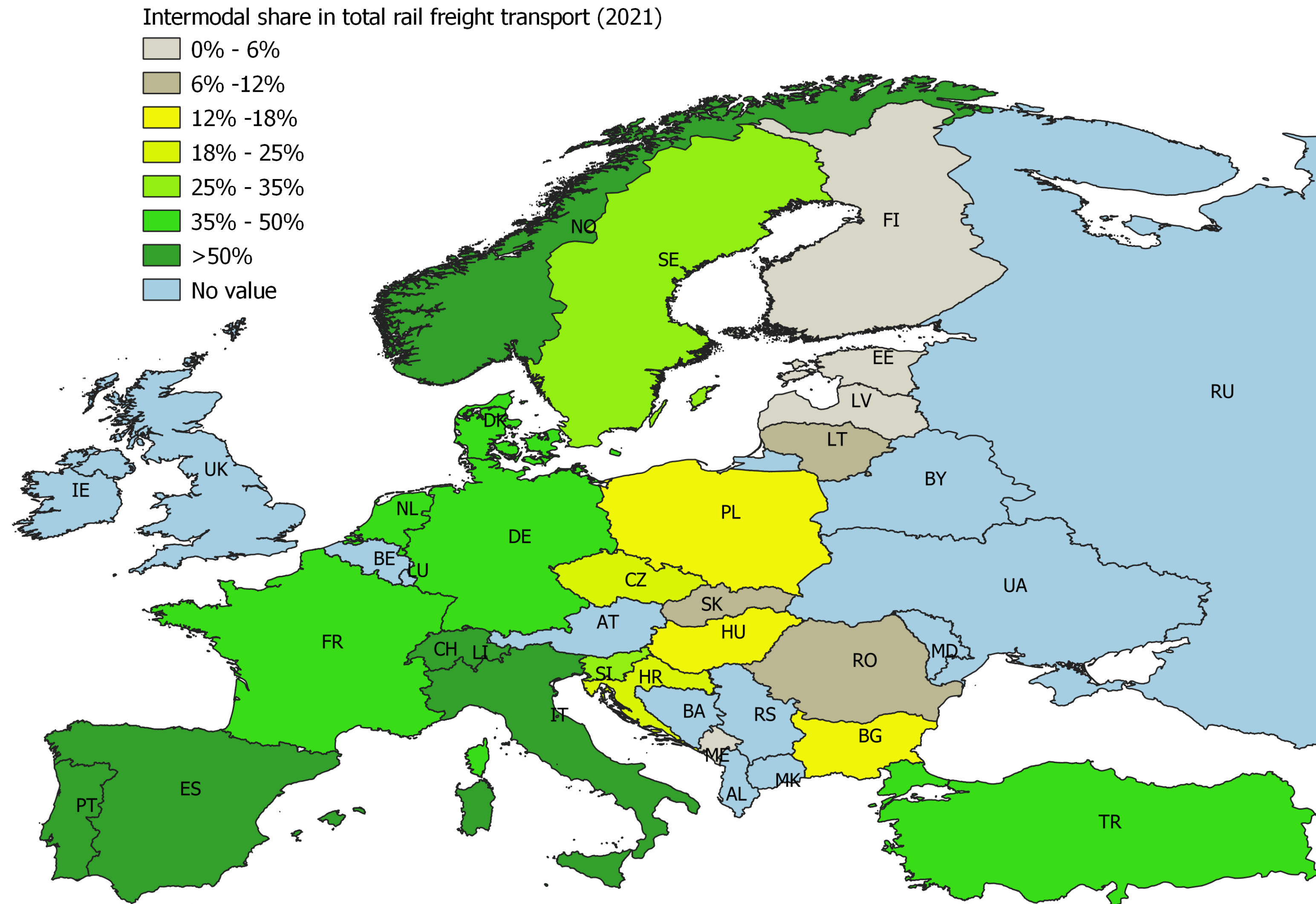


- Rail Freight vs Intermodal Rail Freight



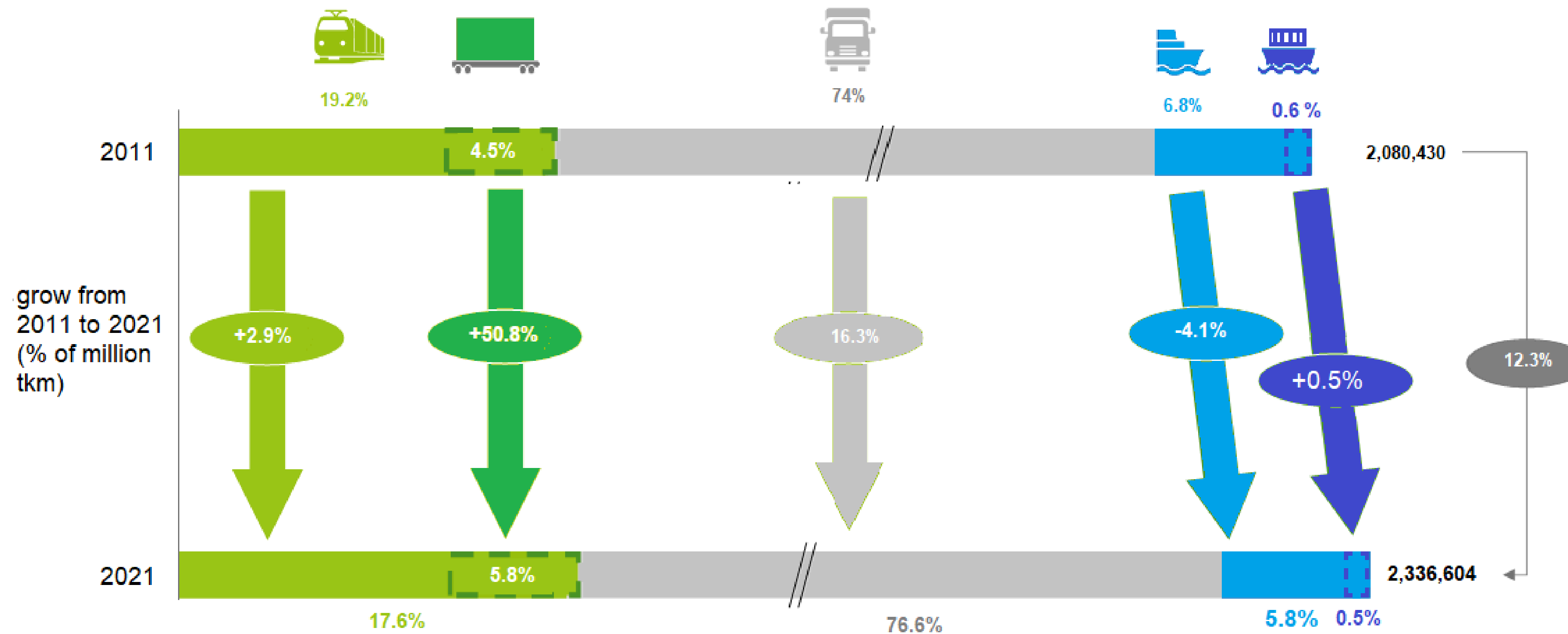
Facts & Figures: general

- Intermodal rail freight (% of total rail freight tkm)



Facts & Figures: general

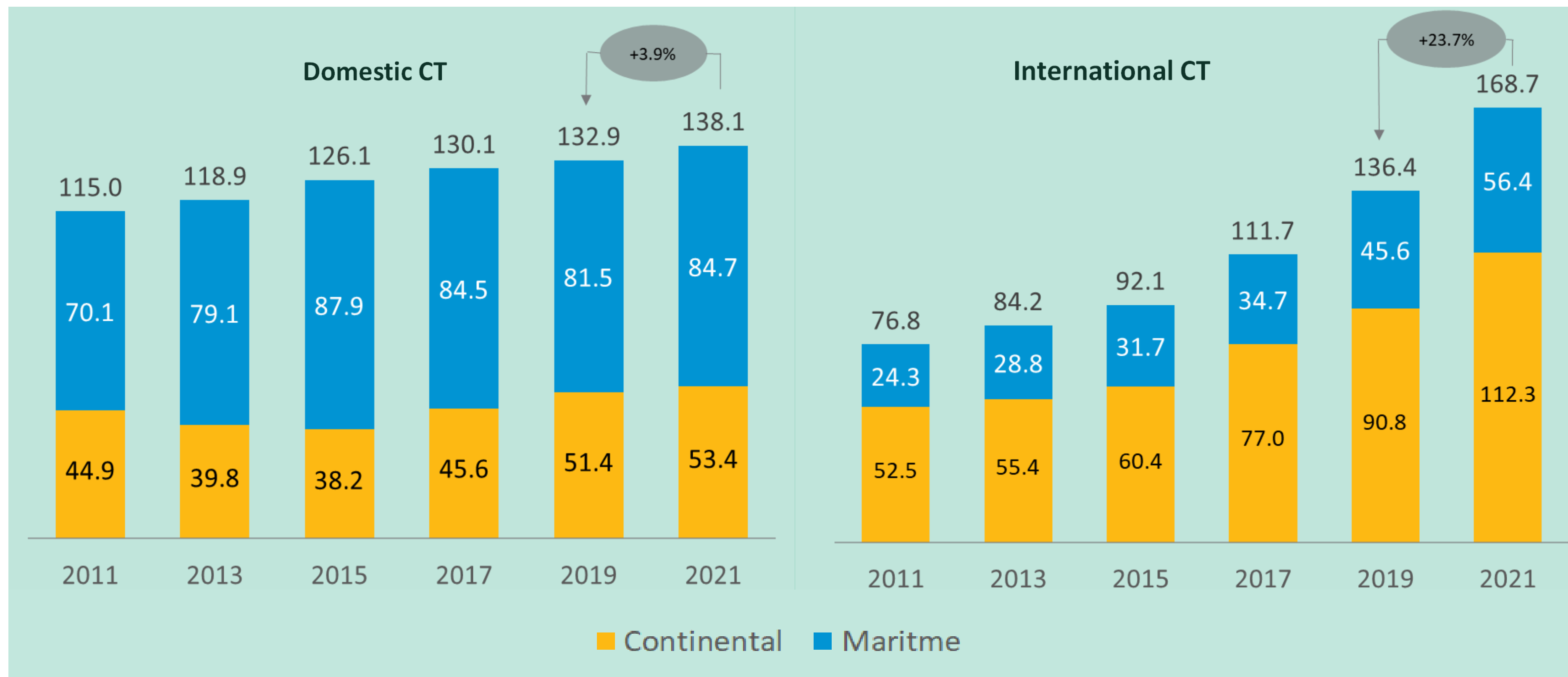
- Share of intermodal in total freight: 2011-2021



Facts & Figures: combined transport



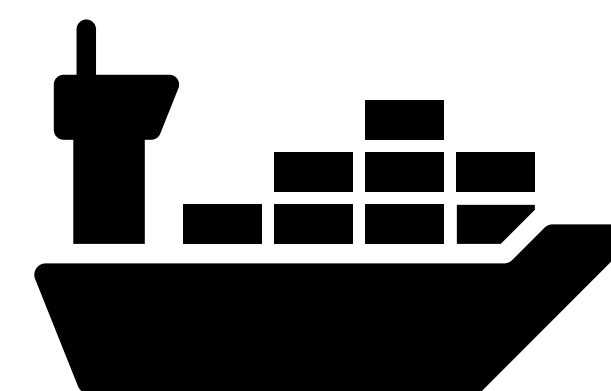
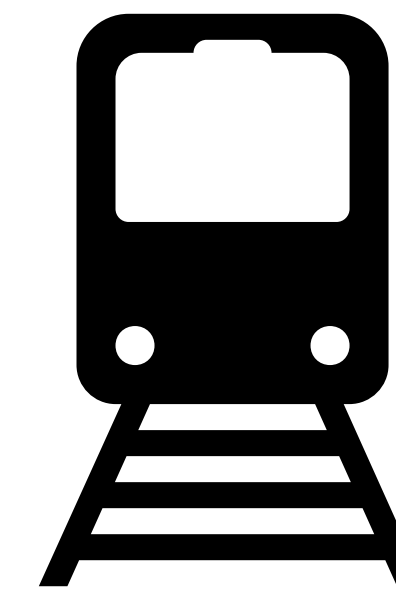
- Development of unaccompanied CT 2011-2021 (million tonnes) - markets



Facts & Figures: combined transport



Origin	Destination	Tonnes-kilometres (1000 tkm)
Germany	Italy	9067
Italy	Germany	7413
Belgium	Italy	3934
Italy	Belgium	3245
Netherlands	Italy	2542
Italy	Netherlands	2137
Luxembourg	France	1451
France	Italy	901
Germany	Netherlands	726
Netherlands	Germany	565

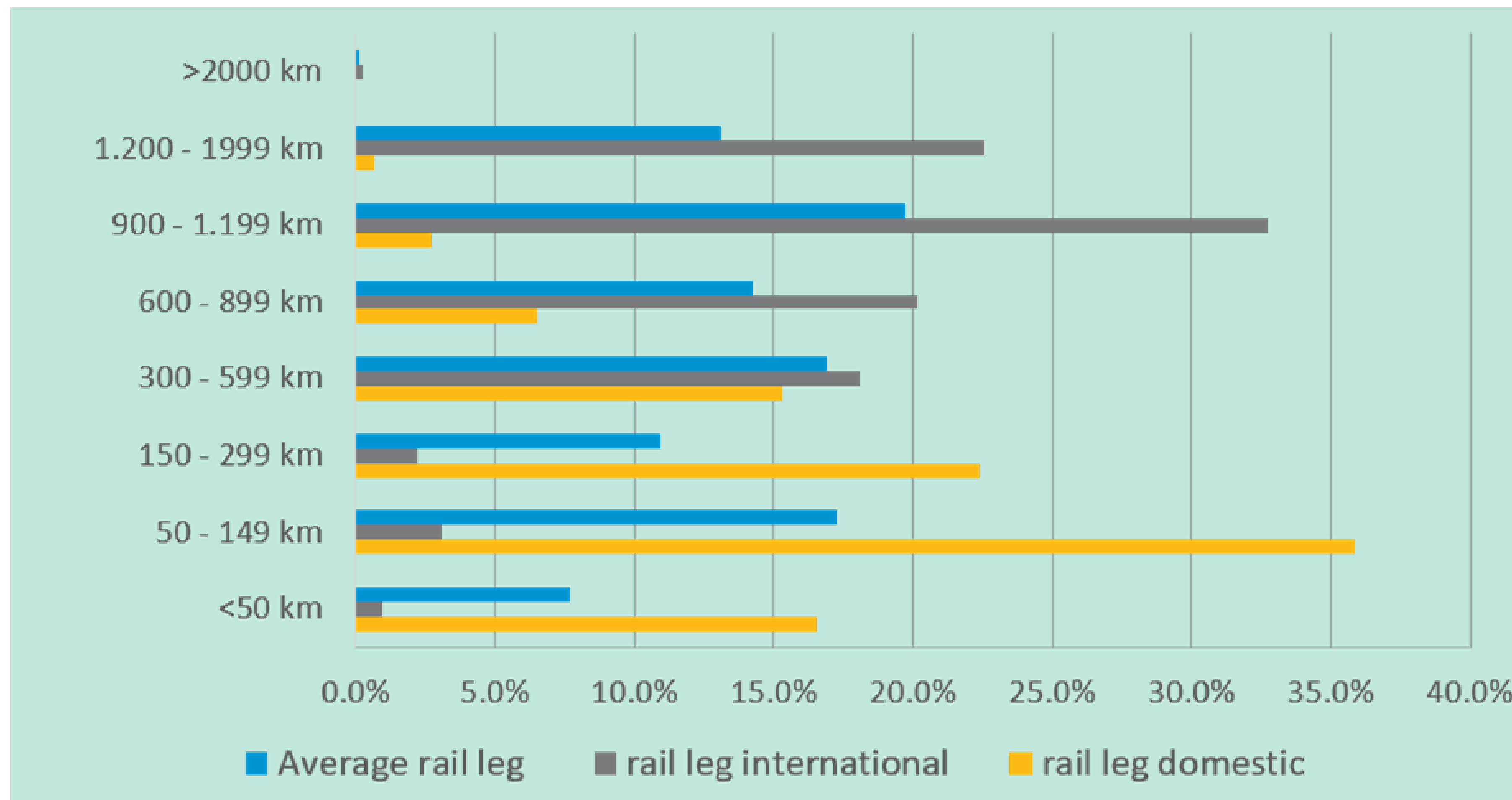


Origin	Destination	TEU-kilometres
Germany	Belgium	212 867
Netherlands	Germany	204 896
Germany	Netherlands	174 061
Belgium	Germany	105 819
Netherlands	Belgium	77 654
France	Belgium	39 158
Belgium	Netherlands	41 345
France	Netherlands	31 734
Netherlands	France	30 343
Netherlands	Switzerland	10 635

Facts & Figures: combined transport



- Distance of rail leg



SPOTLIGHT ANALYSIS

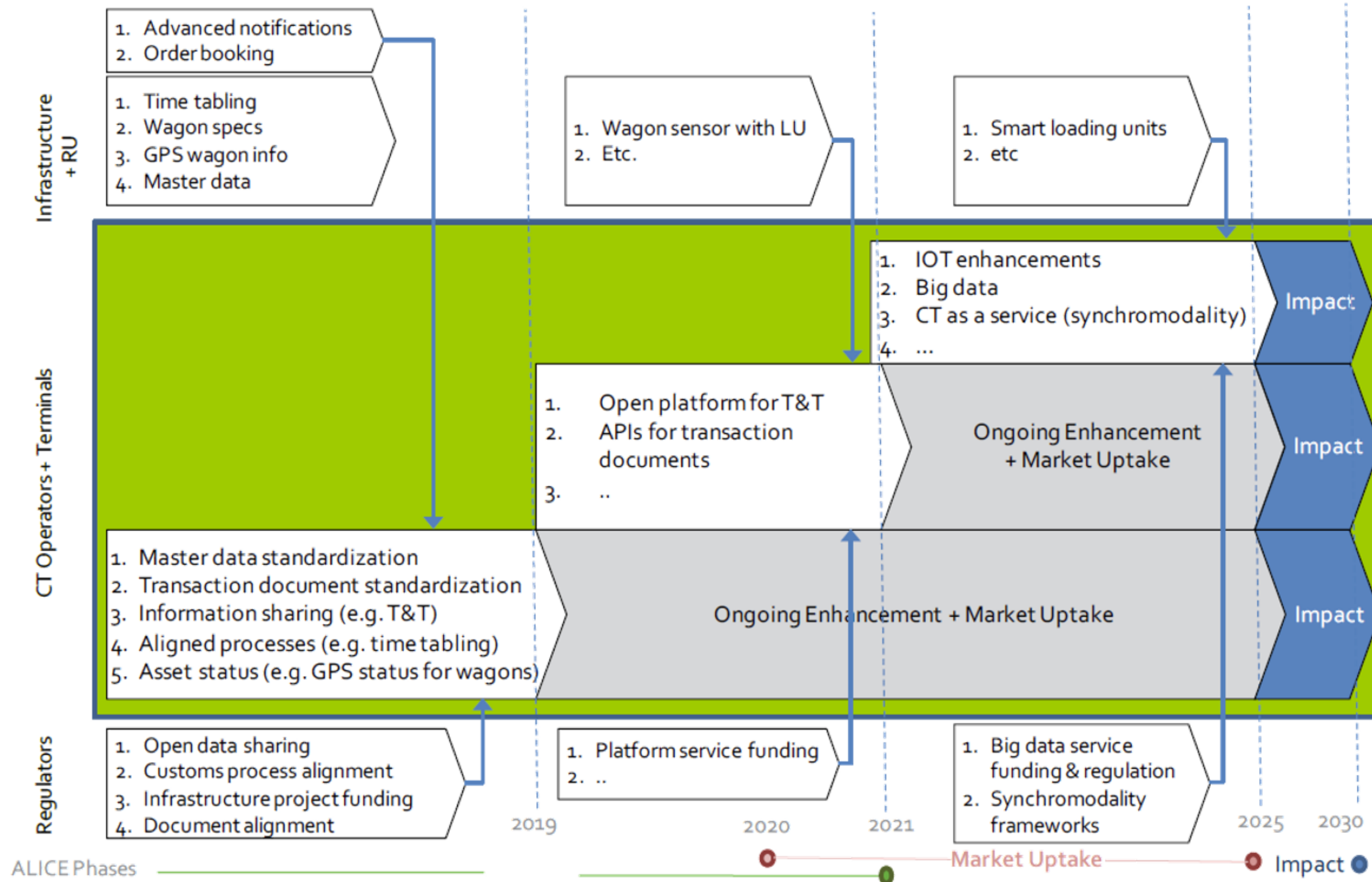
Digit(al)isation in combined transport

Digitalisation for combined transport



- Applications
 - Digital capacity management
 - Tracking & tracing
 - E-administration
 - Digital Automatic Coupling/Autonomous Train Operation
 - ...
- Challenges
 - Cybersecurity
 - Harmonised standards and databases
 - Digital transformation of all participants

Digitalisation for combined transport



SPOTLIGHT ANALYSIS

Cost Chain analysis

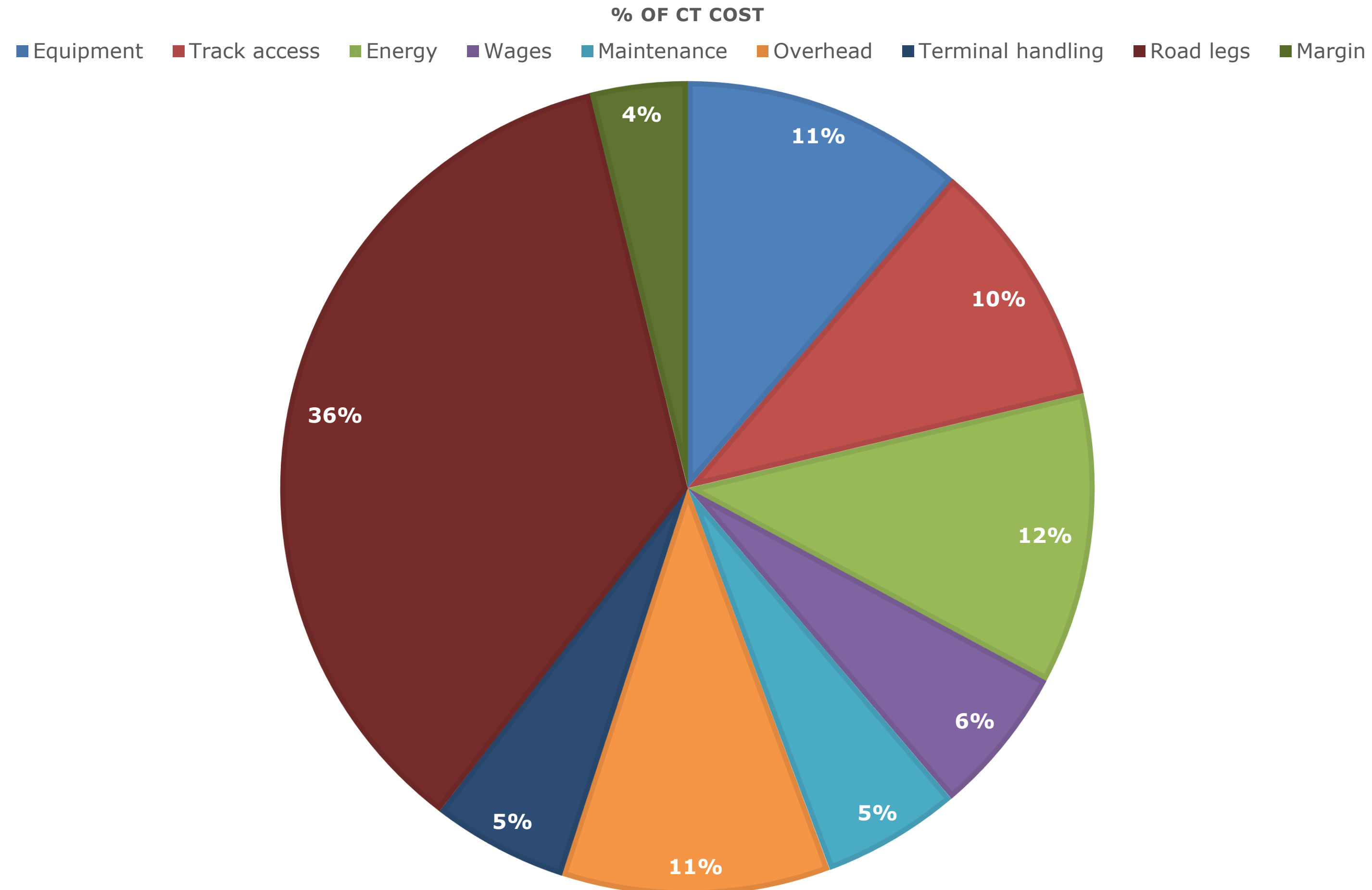
Cost components



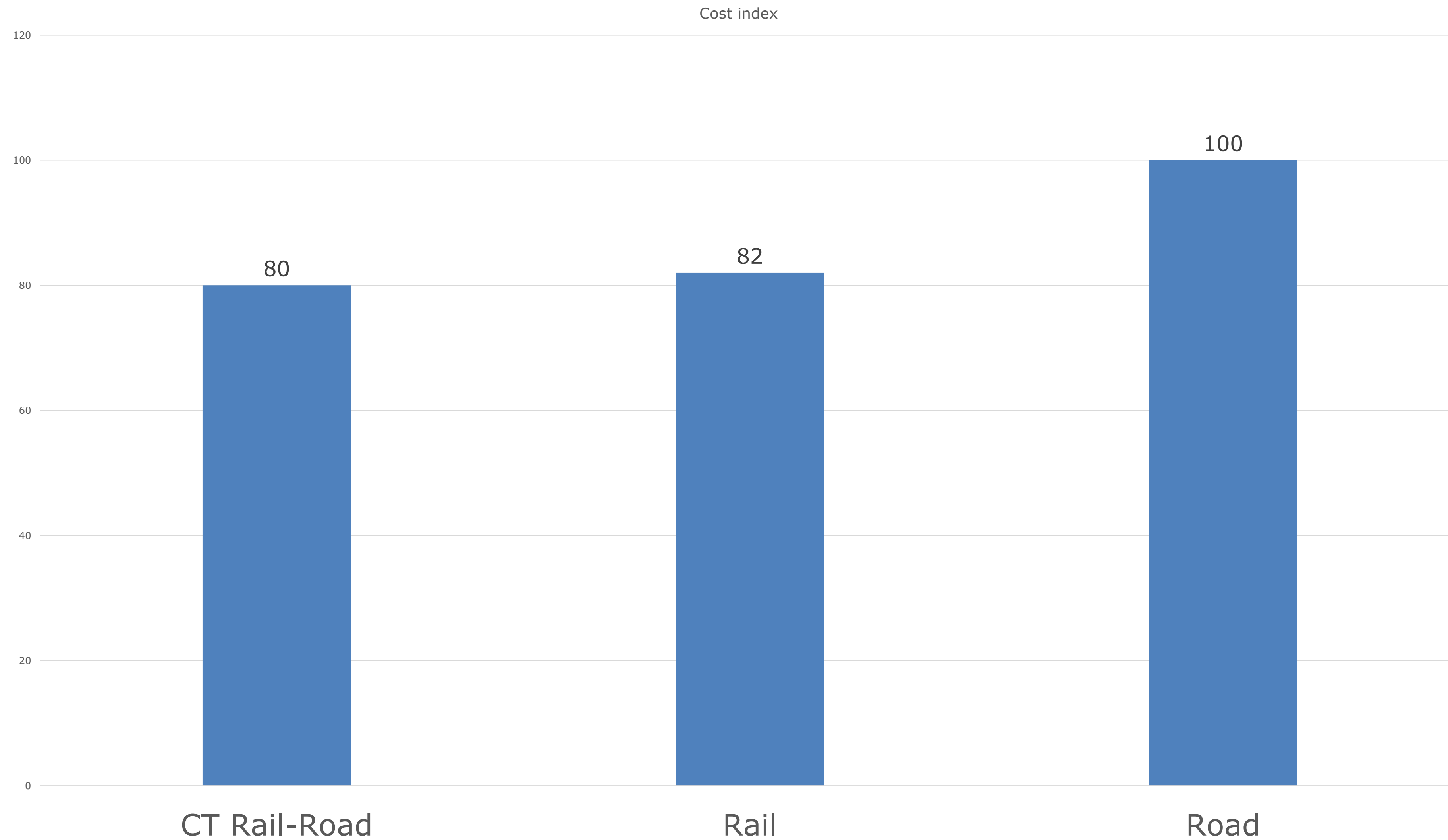
- Fixed costs
 - Equipment
 - Insurance
 - Overhead
- Variable costs
 - Energy
 - Infrastructure access
 - Terminal handling
- Semi-fixed costs
 - Wages
 - Maintenance

Corridor analysis

- Rail Freight Corridor 3 case: DE-IT



Corridor analysis



SPOTLIGHT ANALYSIS

Weights & Dimensions Directive

Review of Weights & Dimensions Directive



- Regulates Heavy Road Vehicles
- International transport limited to 16.5m/18.75m – 40 tonnes
- General exemption for intermodal at 42/44 tonnes
- National exemptions up to individual MS
 - General rule of 44 tonnes (e.g. FR, BE, IT) or higher
 - Longer Heavier Vehicles (25.25m, 60 tonnes) in SE, FI, NL and many countries with tests
 - Extended semi-trailers (+1.3m) in DE, IT

Impacts



- Improved fuel efficiency: 5-20% (rail: 60-90%)
- Infrastructure
 - Bridges
 - Pavements: higher axle loads
- Modal shift
 - Inconclusive evidence on reverse modal shift
 - Combined transport could be at risk, especially at shorter distances



THANK YOU!

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COMBINED TRANSPORT IN CHALLENGING TIMES AND OPPORTUNITIES FOR THE FUTURE

WITH THE SUPPORT OF



ermewa

Let's (re)invent
the railway together



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INNOVATION IN COMBINED TRANSPORT

INNOVATION @ ERMEWA



INNOVATION @ DASSAULT SYSTEMES

CARGO LOADING AND SECURING IN A COMBINED TRANSPORT CONTEXT



HARMONISATION OF LOADING RULES

Ralf-Charley Schultze



LEGAL FRAMEWORK OF UIC LOADING GUIDELINES

Eric Lambert

Current legislative framework

- **DIRECTIVE (EU) 2016/798 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 May 2016 on railway safety:**

- (7) The main actors in the Union rail system, infrastructure managers and railway undertakings should bear full responsibility for the safety of the system, each for their own part. Whenever appropriate, they should cooperate in implementing risk control measures.
- (8) Without prejudice to the responsibility of infrastructure managers and railway undertakings for developing and improving railway safety, the other actors, such as entities in charge of maintenance, manufacturers, carriers, consignors, consignees, fillers, unfillers, loaders, unloaders, maintenance suppliers, keepers, service providers and contracting entities, should not be precluded from assuming responsibility for their products, services and processes. Each actor in the Union rail system should be responsible, vis-à-vis the other actors, for complete and truthful communication of all relevant information to check whether vehicles are fit to run. This concerns, in particular, information on the status and history of a given vehicle, maintenance files, traceability of loading operations, and consignment notes.
- (9) Each railway undertaking, infrastructure manager and entity in charge of maintenance should ensure that its contractors and other parties implement risk control measures. To that end, each railway undertaking, infrastructure manager and entity in charge of maintenance should apply the methods for monitoring set out in the common safety methods ('CSMs'). Their contractors should apply this process through contractual arrangements. In view of the fact that such arrangements are an essential part of the safety management system of railway undertakings and infrastructure managers, railway undertakings and infrastructure managers should disclose their contractual arrangements on request of the European Union Agency for Railways ('the Agency') established by Regulation (EU) 2016/796 of the European Parliament and of the Council ⁽¹⁾ or the national safety authority in the context of supervision activities.

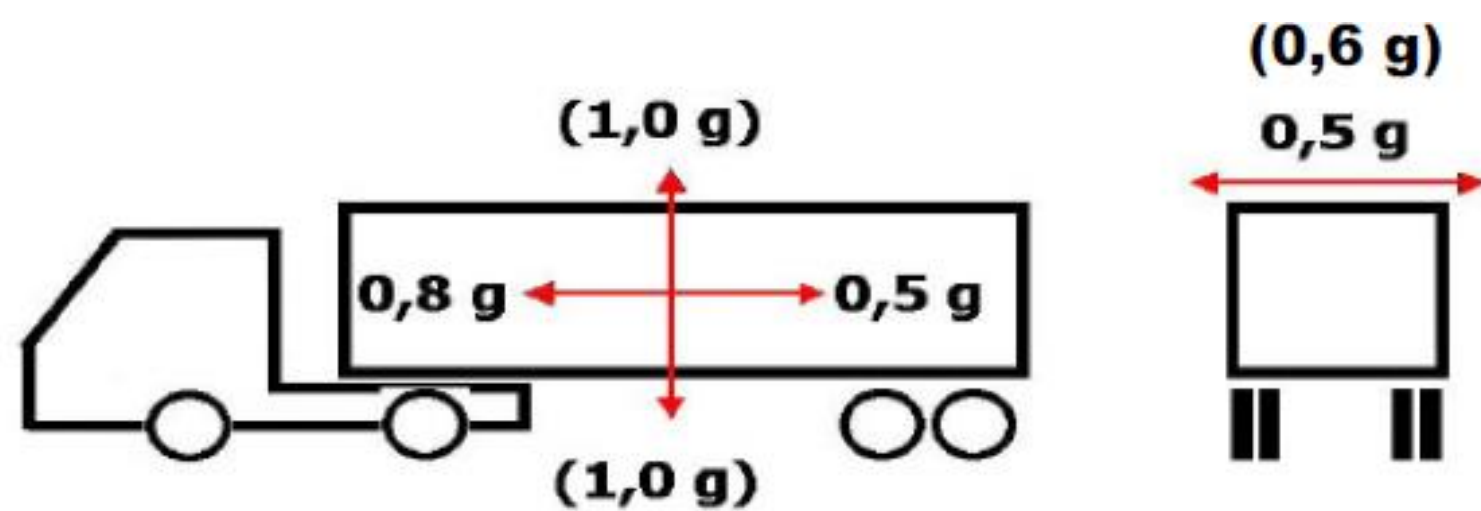
Ultimately, the RU is responsible for the safety of the transport

EN 12195-1, 2011

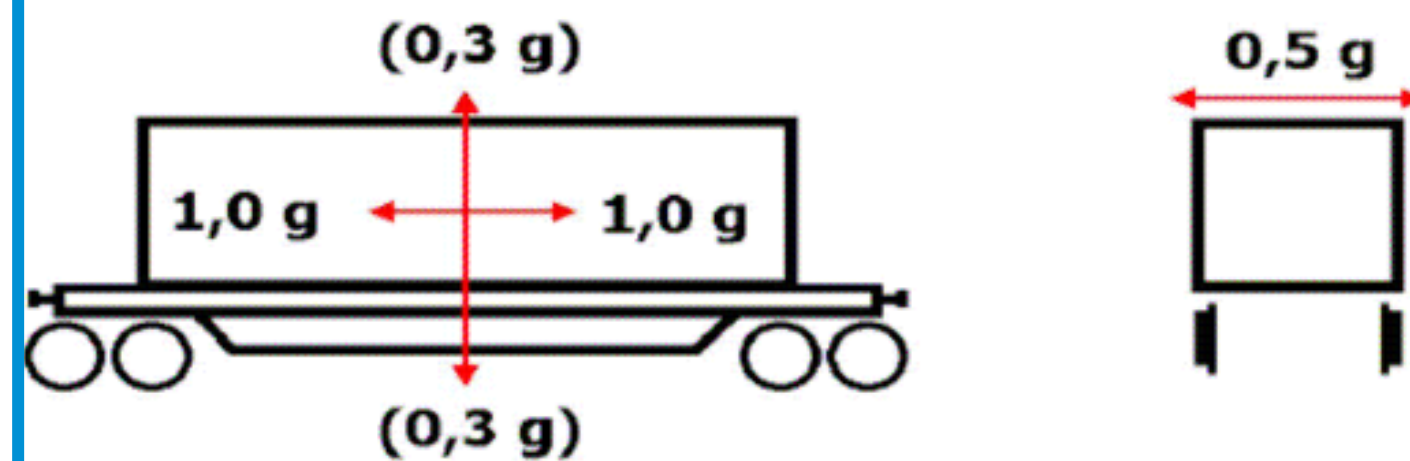
Load restraining on road vehicles - Safety - Part 1: Calculation of securing forces

This European Standard is applicable to the design of securing methods (blocking, lashing, and combinations) for securing of loads for surface transport by road vehicles or parts of them (lorries, trailers, containers and swap bodies), including their transport on vessels or by rail and/or combinations thereof. Hump shunting with acceleration over 1 g during railway transport is excluded, as it is not foreseen in combined transport. (Web lashings see EN 12195-2, lashing chains see EN 12195-3, lashing steel wire ropes see EN 12195-4). This European Standard does not apply for vehicles with a total weight equal to or lower than 3 500 kg.

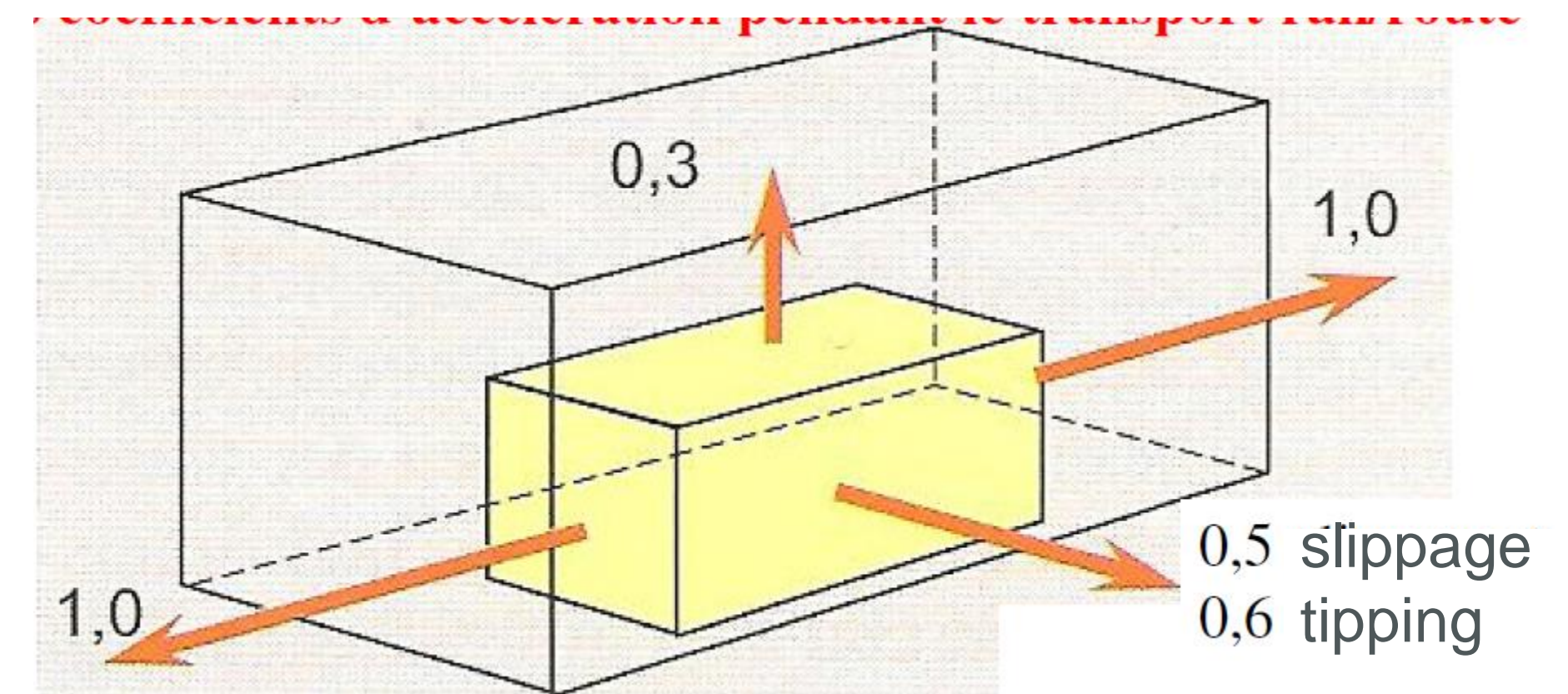
Road



Rail



CT



UIC Loading Guidelines

- The expert group is composed of loading advisors from UIC members who meet regularly to maintain the high quality of the document taking into account any market developments.
- The latest version is dated April 2022 and takes into account the recommendations made by the ERA JNS Procedure, which was set up after the Great Belt Bridge accident in January 2019.
- The guidelines are available free of charge on the UIC website, in the three official languages of the Association: English, French and German.
- <https://uic.org/freight-36/wagon-issues/loading-rules>

Safety is everyone's business, always and everywhere!



CARGO SECURITY – THE TERMINAL VIEW

CFL-Terminal



The CFL intermodal terminal

A comprehensive multidisciplinary infrastructure project for a sustainable freight transport

Eric LAMBERT

Senior Business Development Manager
M: +352 621 371 170 E: eric.lambert@cfl-mm.lu

CFL multimodal

One-stop shop offering multimodal services

•Key figures (2020)

- Staff: ca. 1140 FTE
- Turnover: ca. 260 Mio. EUR

•Core activities

•Logistics

- Door-to-door multimodal solutions
- Warehousing (temp-controlled, GDP)
- Customs agency

•Rail

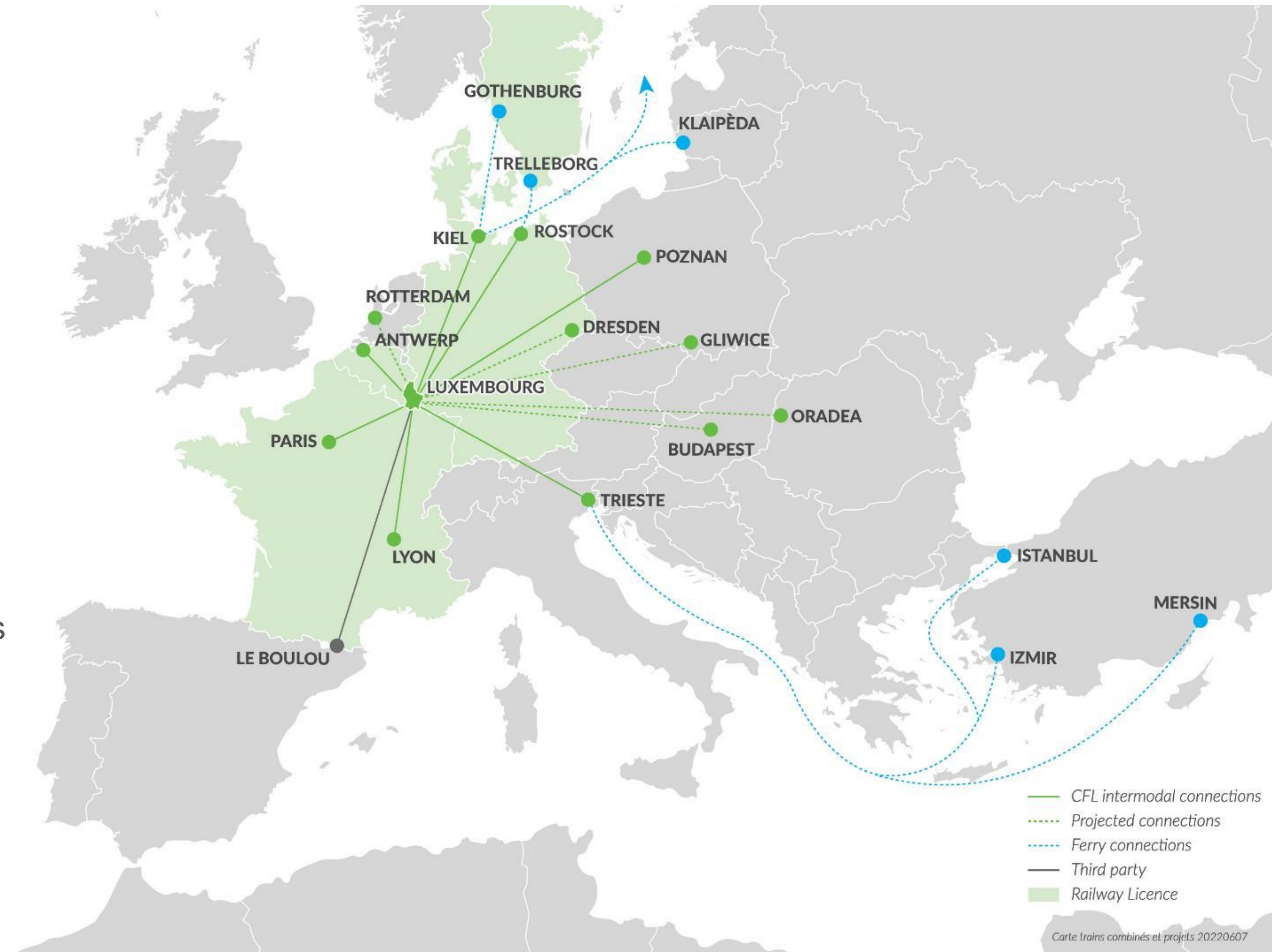
- Conventional (railway undertaking in 6 countries)
- Intermodal network

•Infrastructure in Luxembourg

- Terminal (vertical, horizontal, 600k TEU)
- International marshalling yard
- Wagon maintenance workshops
- Secured Truck Stop (gas, relax, parking)

•Certifications

- ISO, AEO, GDP, etc..



Eurohub Sud

Summer 2021



CFL multimodal

Terminal Services

- **Total surface**
33ha
- **Total handling capacity:**
600.000 units / year
- **# of tracks in terminal**
6 tracks of 700 m
- **Transshipment**
2 gantry cranes (4 tracks, 12 CT trains/d.). 3rd crane under prep.
2 reach stackers
2 horizontal tracks (16 Lohr trains /d)
- **Facilities**
container & semi-trailer Repair workshop on site
- **Storage**
840 ST parking places
Any type of goods and major ADR classes
- **Secured truck stop**
- **AEO certified**



Technical Inspection

Automated Gate IN/OUT

840 parking places for ST

Vertical loading area

Horizontal loading area

Marshalling yard

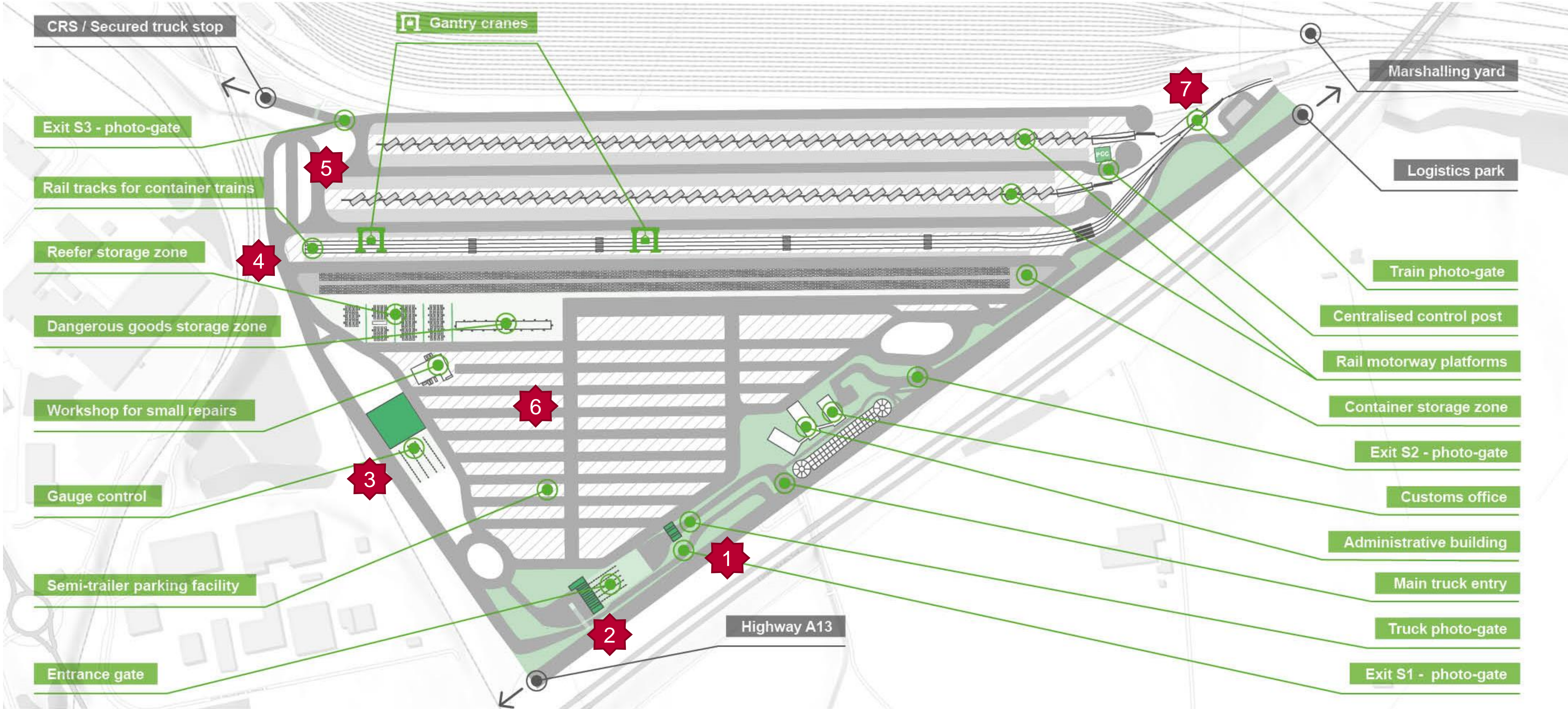
Warehouse

Secured Truck Stop

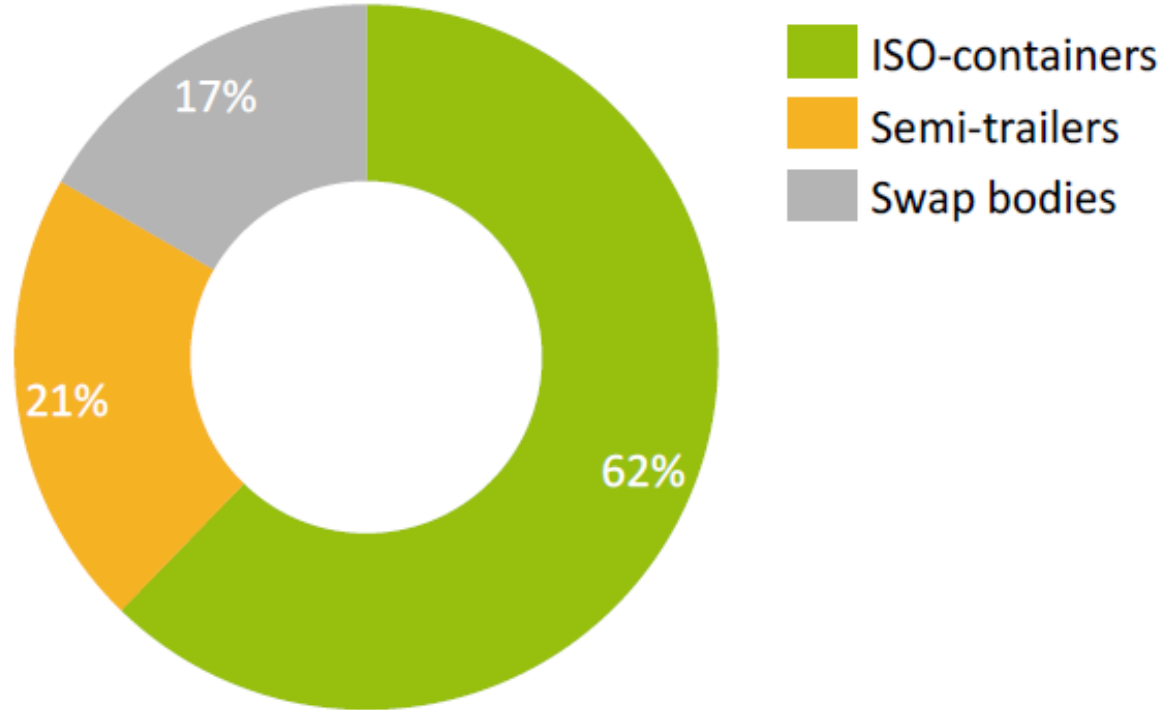
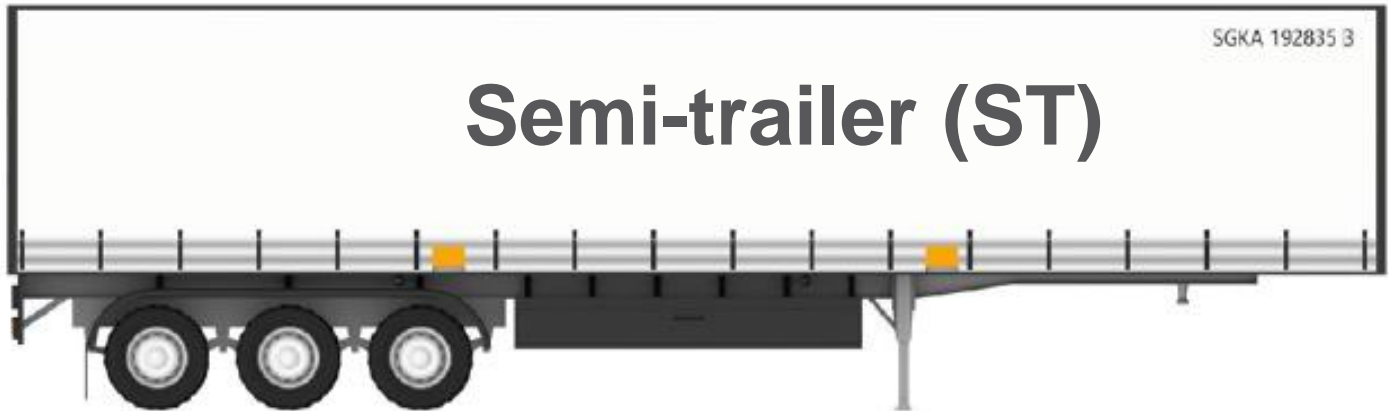
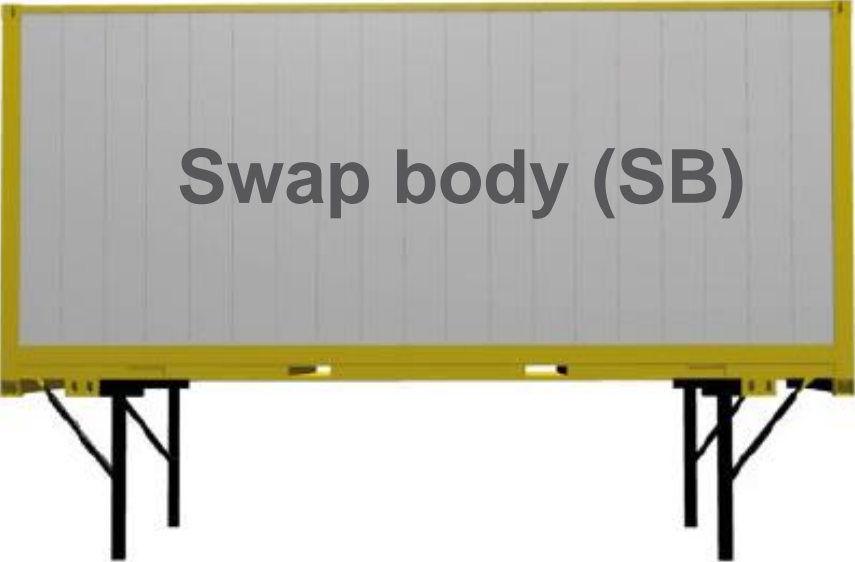
Repair Workshop

ADR Storage

The intermodal CFL terminal in Bettembourg-Dudelange



Typical craneable loading units and standard handling equipment



Structure of semi-trailer market in EU

Horizontal loading

All types of semi-trailers

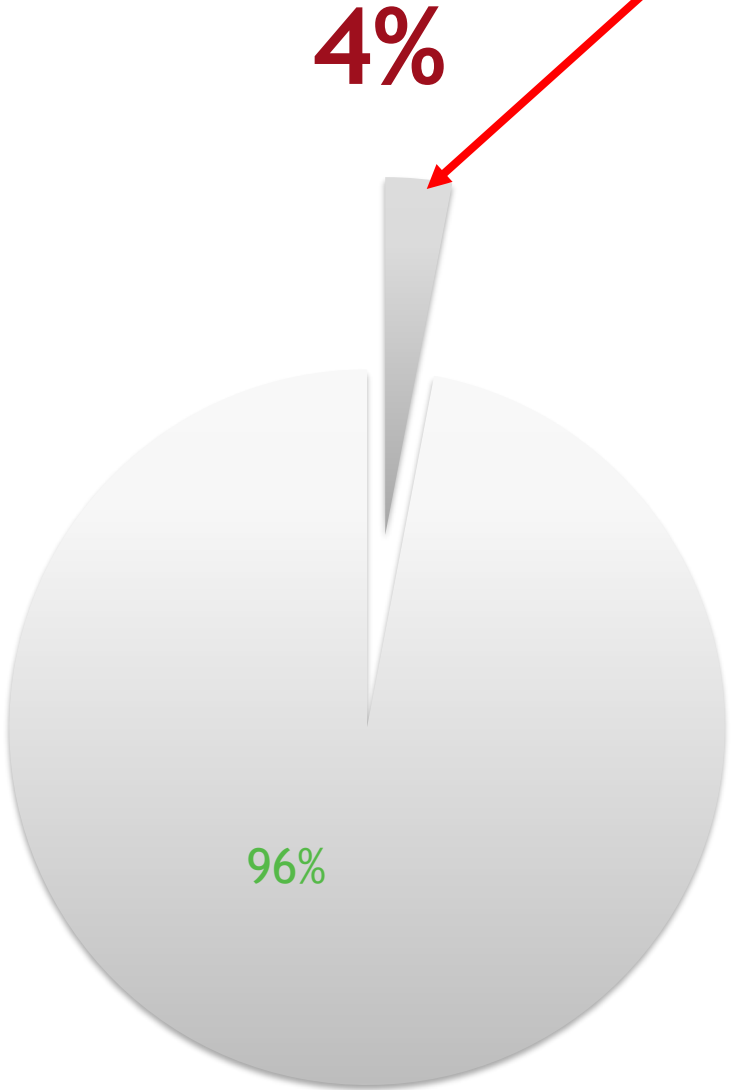


Standard semi-trailers
approximately **3 000 000 units in Europe**

(2018 Eurostat source)

Vertical loading

Only craneable semi-trailers



Craneable semi-trailers
Approximately 110 000 units in Europe

higher tara, less payload , shorter lifecycle

Modalohr vs. gantry cranes

Complementary solutions

GANTRY CRANE / REACH STACKER

Sequential transshipment

Not so easy

Need to truck ST to parking area

@3h to unload/load a 700m long train

12 CT trains / day

Needs 2 persons at the same time to handle ST

Have to stop operation during strong winds

Spreaders can damage the semitrailer

Designed for containers, not optimized for ST

Process

Scalability

Parking

Throughput

Capacity on similar surface

Resources

Constraints

Damages

Terminal

MODALOHR

Almost parallel transshipment

The terminal capacity can be adapted

Parking places along the rail track

1h to unload/load a 700m long train

16 trains / day

Needs **40%** less terminal personnel to handle a ST

Can be operated despite strong winds

No damages during transshipment

Designed for the semitrailer (efficiency)

Co-existence of vertical and horizontal transshipment

Let's get the best of each solution

- +85% of conventional (vertical) terminal capacities in Europe are in use. Facing additional volumes will be a challenge.
- Needed more efficient usage of conventional terminal capacities for dedicated ITUs.
- Vertical loading is well-optimized to handle containers (stackability, standardizing, automation).

Efficient use of conventional terminals for containers



- @95% of all registered semitrailers in Europe are non-craneable.
- Non-craneable semitrailer offers additional @500kg of payload vs craneable semitrailer.
- Wear of a non-craneable semitrailer is lower than a craneable one due to lifting process.

Not all ST can become craneable

Vertical handling





REMOTE OPERATION STATION





Modalohr technology

Modalohr technology

at a glance

MANUFACTURER

- Lohr Industrie, (Strasbourg)
- System existing in market since 2003; used by CFL terminals since 2007
- 6 terminals in FR, IT, PL and LU as well as 6 new projects in ES, PL & FR
- 450+ wagons
- Business Concept: offers technical solution and lets others operate, like CFL or SNCF

TRANSSHIPMENT

- Automated and emission-free technology
- Well-proven solution in all different, harsh environments
- No damages of the semitrailers
- Dedicated equipment in the terminal to (un)load horizontally with little manpower to operate the Lohr wagon:

WAGON

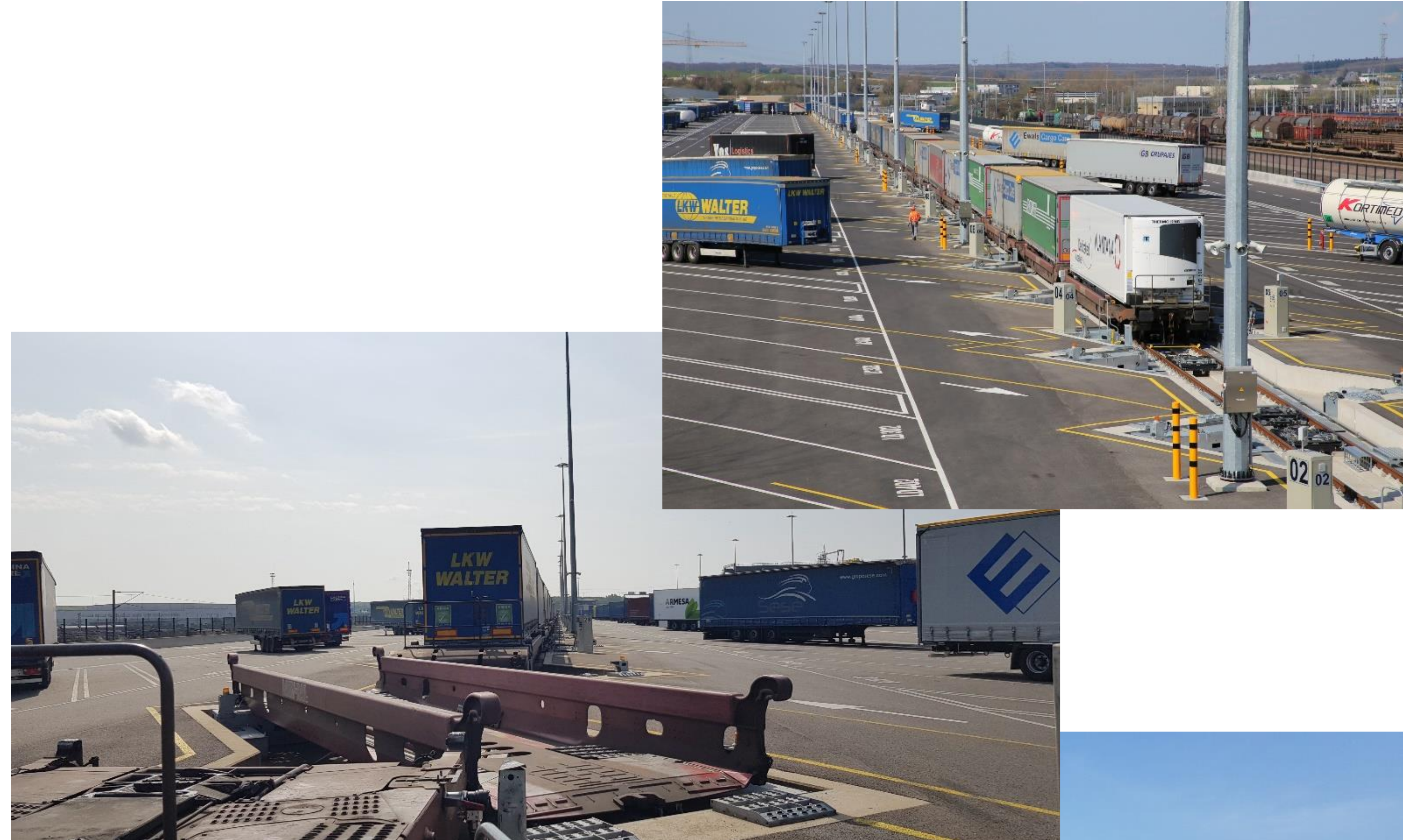
- Special low-floor, light, length-optimized double-pocket wagon to transport
 - non-accompanied,
 - non-craneable and craneable ST
 - other equipment like tractors or other vehicles
- Can be used with vertical loading in combination with gantry cranes / reach stackers
- Works under very strong cross winds (e.g South of France) up to 140km/h
- Can cross whole Europe without any loading gauge limitations, which is not the case with normal Pocket-wagons
- Authorized for 120km/h, TSI-WAG conform
- Sub-floor level height compared to Rail: 213mm
- Wagon tara per semitrailer: @22to
- Number of ST in
 - a 600m long train is 34 ST
 - a 750m long train is 44 ST



Horizontal solution for non-craneable semitrailers in LU

Modalohr technology

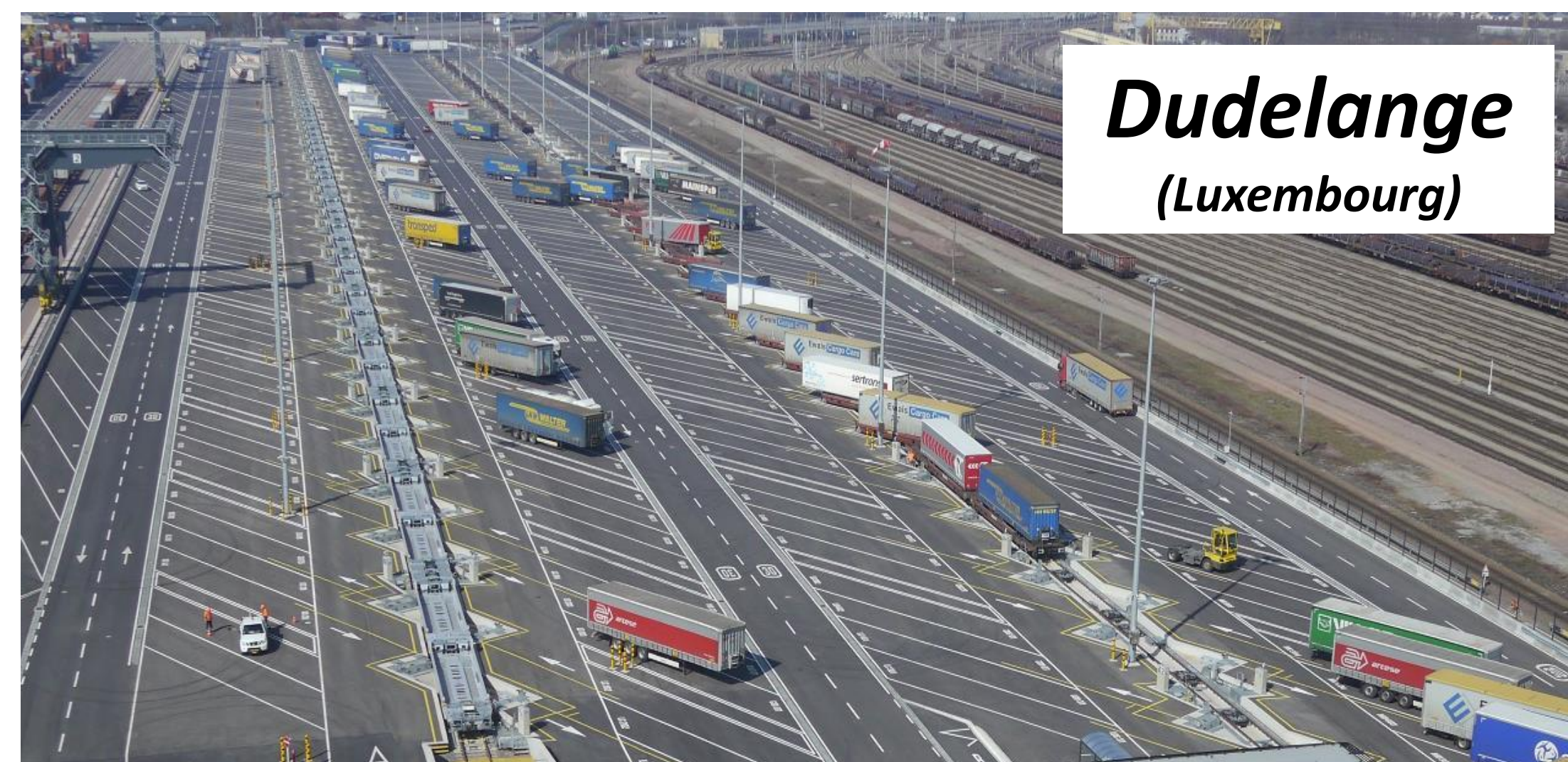
- CFL terminal is equipped with 2 tracks à 700m length
- Per track: up to 42 ST can be treated at once
- Mainly non-craneable semitrailers
- Technology used by CFL multimodal Group since 2007 on different connections:
 - PL Poznań (operated by CFL intermodal)
 - FR: Le Boulou (operated by LorryRail)
 - FR: Sète (operated by SNCF)
 - Soon ES: Barcelona



Existing MODALOHR terminals



Le Boulou
(France)



Dudelange
(Luxembourg)

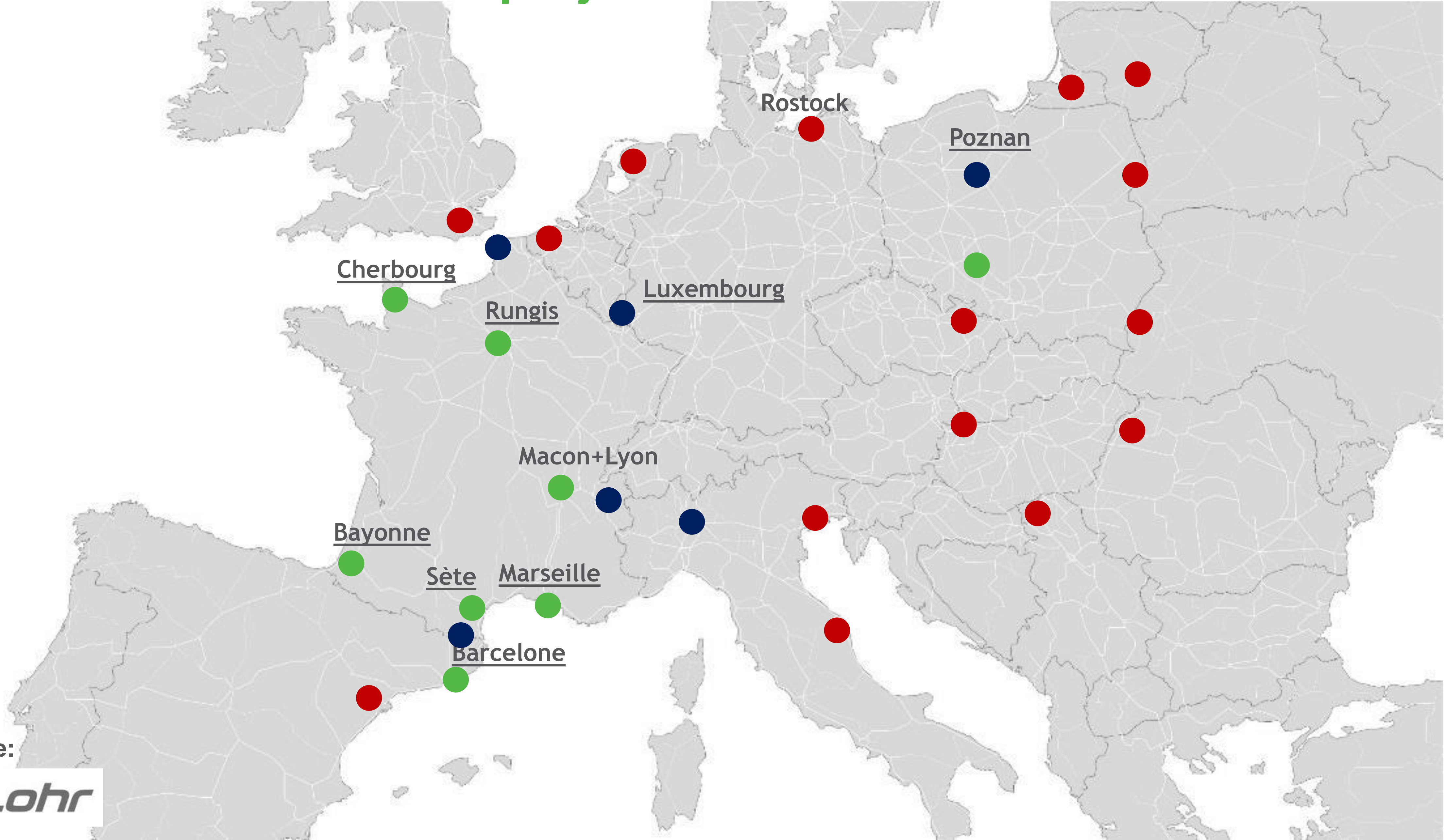


Port de Calais
(France)

Etc.



Modalohr Terminals in **projects** and in **discussion**



Source:





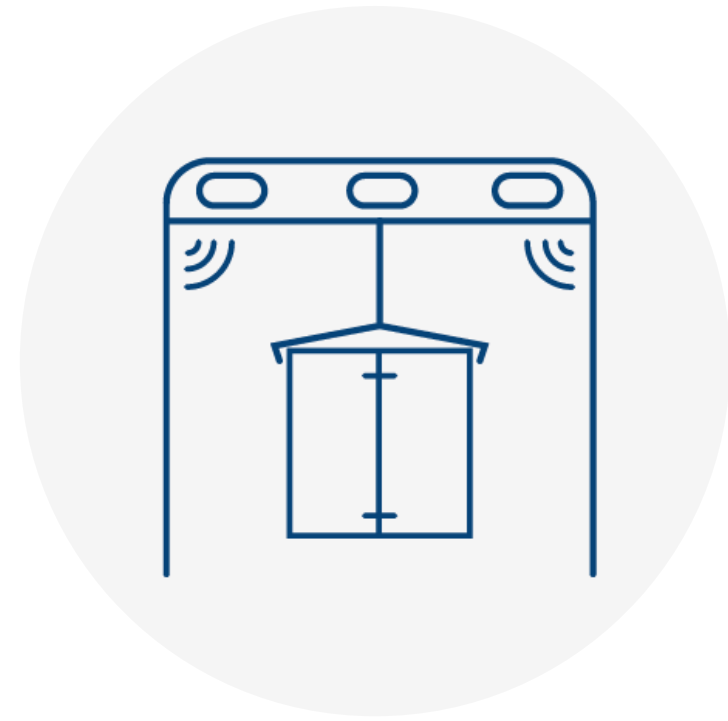
UNLOADING & LOADING of a 750m train

<https://www.youtube.com/watch?v=oReyJ3hMucc>

Automation solutions & services for inland terminals



Gate automation



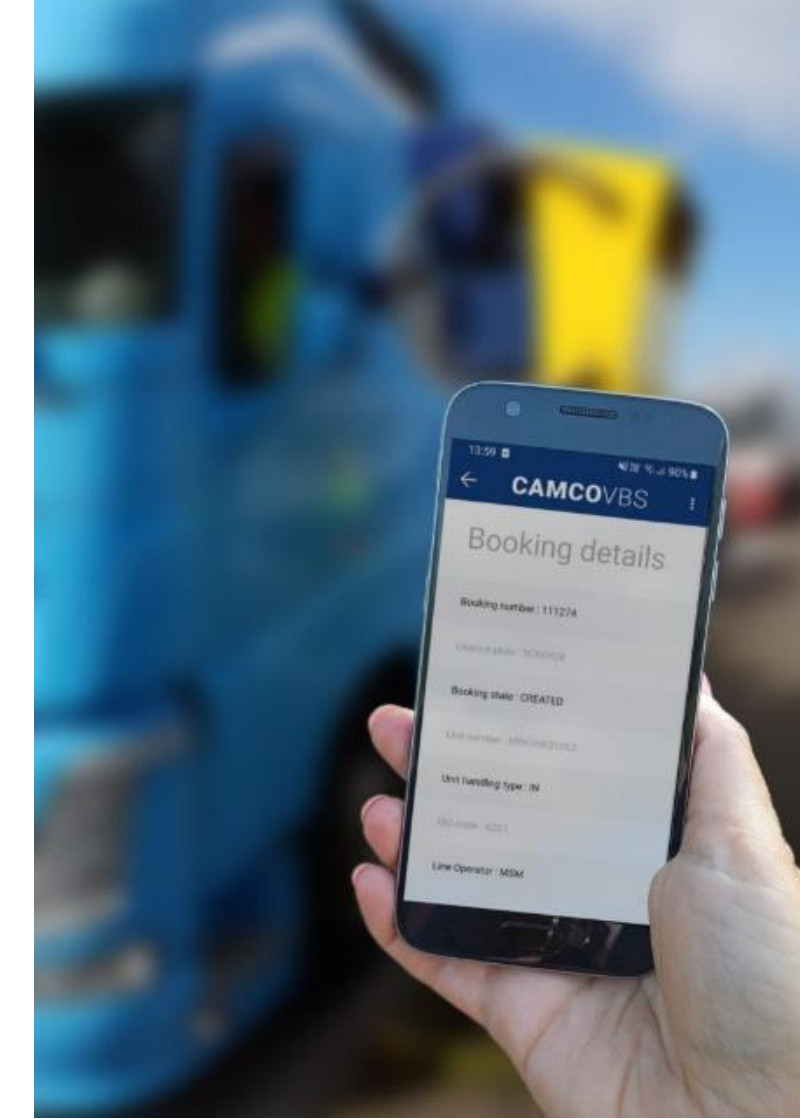
Crane OCR



Rail OCR



Vehicle Booking System



What is Optical Character Recognition (OCR)

- Identification of an **object**, here a **series of numbers or a unique pattern** of visually distinct elements on a cargo loading unit using electronic optical capturing devices
- Passive process which requires visibility from some imaging device to the target.
- Next, in a secondary process, specialized software interrogates the bits and bytes of the captured digital image to locate and **extract** pre-determined **patterns** within.
- When completed, the recognized patterns are assembled, and an attempt is made to uniquely identify the object or objects within the image



What is Optical Character Recognition (OCR)

- OCR is widely used for the identification of equipment markings
 - i.e. written text of truck license plates,
 - container number stencils, etc.
- Also used to record the condition of the equipment itself.
- Key benefits of OCR
 - provides a reliable method of identification,
 - No need for any tag or device to the asset.





Line-scan camera images truck & container

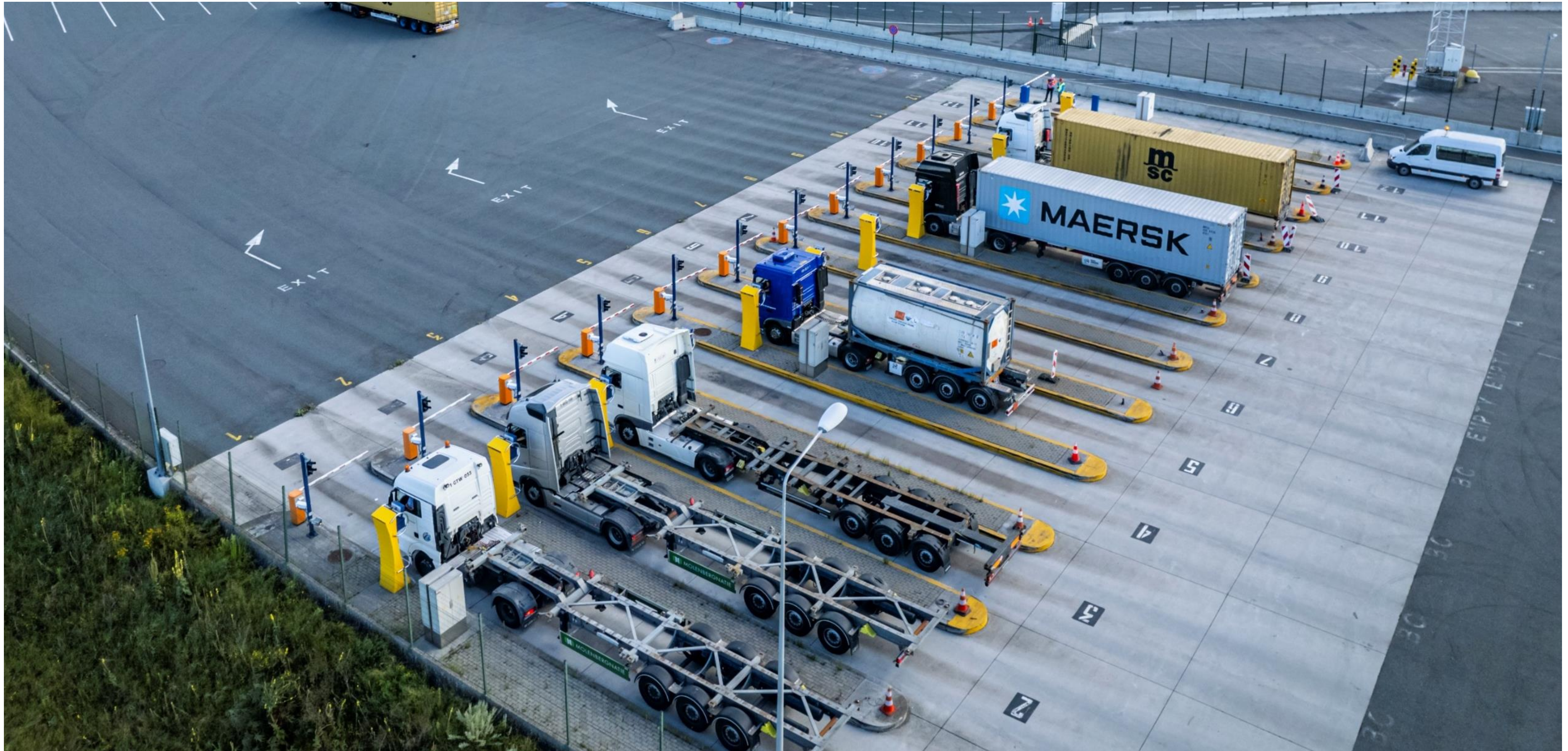


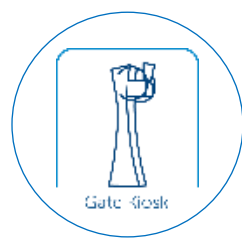
Benefits of Optical Character Recognition implementation (OCR)

- **Asset visibility:** identification and tracking of assets such as trucks, containers and trains within a port or across multiple supply chain nodes.
- **Operational control:** providing real-time visibility of an asset and its location to enable process automation and control.
- **Safety:** ensuring the safety of personnel and equipment, typically within a facility environment.
- **Security:** providing manless access control at perimeters and validation of asset ID to eliminate the human element so common in theft, pilferage and other criminal activities.



Truck Automated Gates



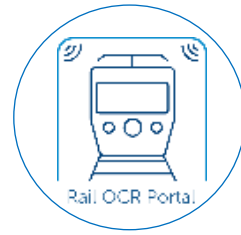


Gate kiosks



Rail Operations





Automated train inventory with Rail OCR

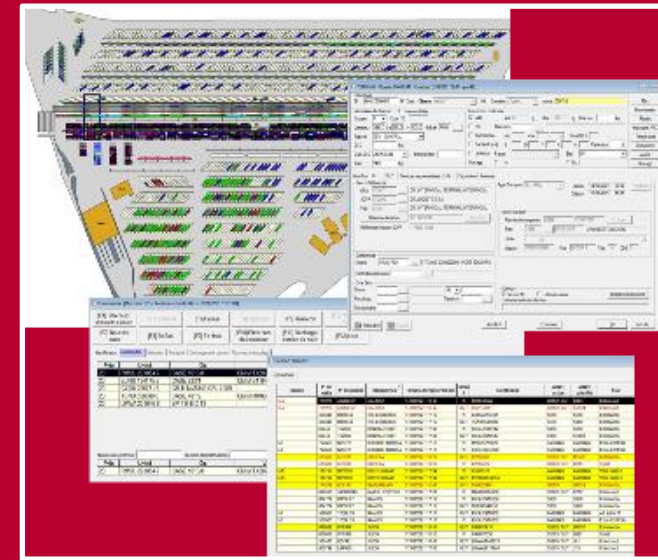


- Compare cargo information provided by departure terminal
- Faster train loading & unloading
- Improve train turnaround time
- Train Gate Operator application
- Supports live shunting if combined with railcar RFID technology

Cutting edge Terminal Management System

Main IT structure

File management
 Customer data Mgmt
 LU data Mgmt
 Technical Master data Mgmt
 Invoicing
 ...



Terminal
 Operating
 System

Visualization of the whole terminal
 Ressource Order Mgmt

- Cranes, ReachStacker
- Shunting
- Terminal engines

Active Trailer Mgmt on site



OCR at
 all Gates
 (in/out)

Automated recognition of:

- ISO & ILU-Codes
- License Plates
- ADR labels
- Sealing presence

...



OCR
 Train Gate

Automated recognition of:

- Wagon number
 - ILU codes
 - ISO codes
- Wagon sequence

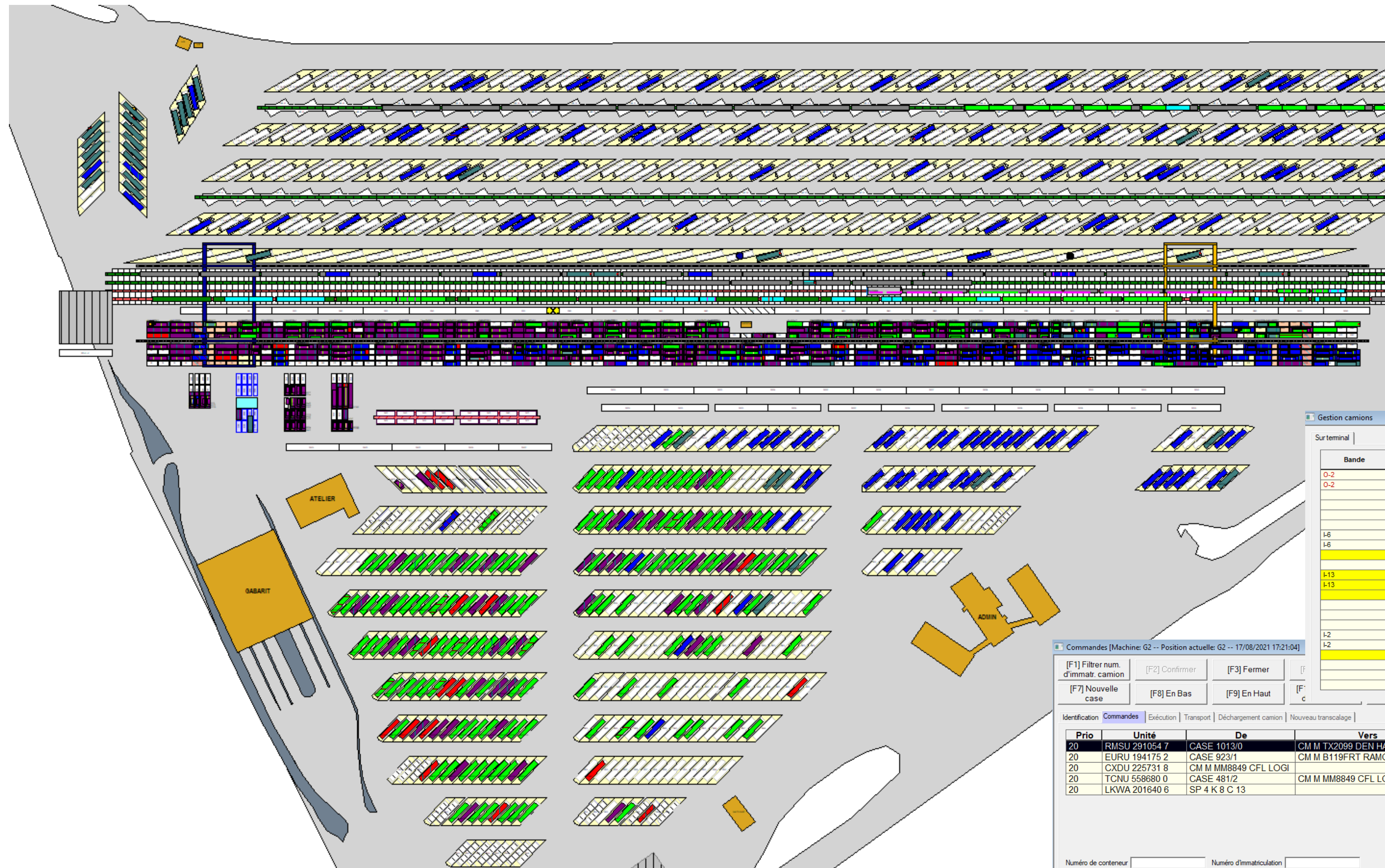
...



Gate
 Operating
 System

- Multilingual
- Driver data acquisition
- Order reference
- OCR and Order data matching
- Self check-in/out

IT System – Terminal Operating System (TOS)



TERMINAL - Dossier 0000IEMT - Création 12/08/2021 18:11 - par FRL

Concernant: Ct MMLK3000011 Conf. Classe IMPORT IM Domaine CFLMM Actuel C307 /0

Informations techniques: Non modifiable

Groupes: P Code ISO Description conteneur: Vide Net 0 kg Brut 7490 kg Brut max kg

Longueur 1360,0 La 259,0E H 400,0C Gabarit P400 RID Marchand: Température Min Max Humidité %

Type ct GEN - GENERAL Supplomb (cm) G D T A H Partie term: Limitation Raison: Blocage In Out

Date CSC UNKNOWN Date de fabr. Tare 7490 kg

Workflow: IN OUT Services supplémentaires Info Facturation Annexes

Tiers / Références: OPA CFLINT CFL INTERMODAL - TERMINAL INTERMODAL SOPA CFLLOG CFL LOGISTICS S.A. Pool CFLINT CFL INTERMODAL - TERMINAL INTERMODAL

Référence livraison CFL2049224 Référence livraison SOPA 17080015332

Continentale: Origine FRLIO-PEH 87 72320 0308200000 - PORT EDOUARD Destination prévue: Over Sea: Navire: Port chargé: Transnav: Port déchargé:

Type Transport: RL - RAIL Arrivée: 14/08/2021 04:04 Annulation: Création: 12/08/2021 18:11

Arrivée du train: Plan de déchargement 41956 13/08/2021 Train 41956 13/08/2021 LYON-BETTEMBOURG Route: Wagon 378249920349 Voie SPOOR 1 Tête 19 CDS 2

Assistant Correction OK Annuler

Gestion camions

Sur terminal

Bande	N° de visite	N° de plaque	Transporteur	Temps enregistrement	In/Out	Conteneur	Arrêt actuel	Arrêt planifié	État
O-2	751976	AG30ESP	CALSINA	17/08/2021 16:42	IN	R2455BCW	CHECK OUT	B813	Check-out
O-2	751976	AG30ESP	CALSINA	17/08/2021 16:42	OUT	R5615BDH	CHECK OUT	KD124	Check-out
	424846	MM8849	CFL LOGISTICS	17/08/2021 17:12	IN	CXDU2257318	S560	S560	Commande
	424846	MM8849	CFL LOGISTICS	17/08/2021 17:12	OUT	TCNU5586800	S560	S480	Commande
	69449	TX2099	DEN HARTOGH	17/08/2021 17:00	IN	RMSU2910742	S360	S360	Commande
	69449	TX2099	DEN HARTOGH	17/08/2021 17:00	OUT	RMSU2910547	S360	S1000	Commande
L-6	792859	NJ8373	DI EGIDIO INTERNA	17/08/2021 17:17	IN	MEDU5236877	PARKING	PARKING	Extra Controle
L-6	792859	NJ8373	DI EGIDIO INTERNA	17/08/2021 17:17	IN	UACU3934338	PARKING	PARKING	Extra Controle
	533662	LPC208	GRTEKA	17/08/2021 16:29	OUT	PZ2826WE	CHECK OUT	MD433	Commande
	533662	LPC208	GRTEKA	17/08/2021 16:29	IN	PZ385V5	CHECK OUT	B205	Traté
L-13	119799	MV8691	HEISTERKAMP	17/08/2021 17:04	IN	CSH3378	PARKING	PARKING	Vers Gate in
L-13	119799	MV8691	HEISTERKAMP	17/08/2021 17:04	OUT	EWAK0054359	PARKING	PARKING	Vers Gate in
	176214	KEE743	KATRANGAS	17/08/2021 16:41	OUT	HROB2142	LD318	LD318	Commande
	698318	34BMD248	MARS LOGISTICS	17/08/2021 17:08	IN	MARE0014930	CHECK OUT	B702	Check-out
	874774	B119FRT	RAMOS	17/08/2021 17:12	IN	RMSU2910188	S360	S360	Commande
	874774	B119FRT	RAMOS	17/08/2021 17:12	OUT	EURU1941752	S360	S920	Commande
L-2	529965	I258LGS	RAMOS	17/08/2021 17:17	OUT	RMSU2910085	PARKING	PARKING	Att autre Ct
L-2	529965	I258LGS	RAMOS	17/08/2021 17:17	IN	RMSU2910362	PARKING	PARKING	Extra Controle
	606062	KFC970	XLION	17/08/2021 16:58	OUT	HROM7410	CHECK OUT	LD332	Commande
	606062	KFC970	XLION	17/08/2021 16:58	IN	HROM7638	CHECK OUT	B821	Traté
	557485	KGF421	XLION	17/08/2021 16:56	OUT	LKWA2046870	CHECK OUT	J01	Check-out
	438749	LAP469	XLION	17/08/2021 17:00	OUT	LKWA2017948	CHECK OUT	J19	Check-out

Commandes [Machine: G2 -- Position actuelle: G2 -- 17/08/2021 17:21:04]

[F1] Filtrer num. d'immatr. camion [F2] Confirmer [F3] Fermer [F7] Nouvelle case [F8] En Bas [F9] En Haut

Identification Commandes Exécution Transport Déchargement camion Nouveau transcalage

Prio	Unité	De	Vers	L	H	Vide	Brut	ISO	Provenance	Destination	Planifié
20	RMSU 291054 7	CASE 1013/0	CM M TX2099 DEN HARTOGH	20'	8'6"		32070	22T6			
20	EURU 194175 2	CASE 923/1	CM M B119FRT RAMOS	20'	8'6"		2500	22T6			
20	CXDU 225731 8	CM M MM8849 CFL LOGI		20'	8'6"		2200	22G1	S560		
20	TCNU 558680 0	CASE 481/2	CM M MM8849 CFL LOGISTICS	40'	9'6"		3900	45G1			
20	LKWA 201840 6	SP 4 K 8 C 13		1360	400		34570		37824992117	LYON TERMI	

Numéro de conteneur Numéro d'immatriculation Nouveau transcalage

Prio	Unité	De	Vers	L	H	Vide	Brut	ISO	Provenance	Destination	Planifié
20	RMSU 291054 7	CASE 1013/0	CM M TX2099 DEN HART	20'	8'6"		32070	22T6			



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