An afternoon with Combined Transport:

# The technical challenges of Combined Transport


***Eric Feyen***, *Technical & Project Officer*
*Antwerp, Combinant Terminal, 4 September 2012*

# Combined Transport – The products

| Unaccompanied CT | Accompanied CT |
| --- | --- |
|  |  |
| Transhipment of the loading unit (swap body, container, semi-trailer) | Forwarding by train of the complete truck (including its driver) |
| *87% of UIRR traffic (2011)* | *13% of UIRR traffic (2011)* |

## CHALLENGE 1

**Everything transported with conventional trucks should also be conveyed with Combined Transport**

# Challenge 1. **Wide variety of loading units: ISO-Containers**

## **ISO containers** (reference: ISO 668)

**Worldwide use in maritime transport**

General Purpose Container

Tank Container


High-Cube Container


Open-Top Container


Refrigerated Container

Stackable and cranable by the top
Standard width: 2,44m
Standardised lengths: 20ft (6.10m), 30ft (9.15m), 40ft (12.20m) and 45ft (13.716m)

# Challenge 1. **Wide variety of loading units: Swap-Bodies**

## **Swap bodies and Non-ISO containers**

**(reference: EN 284, 452, 1432, 12406, 12410, 13853, 14993)**

**European continental transport**


Swap-Body Class A with tarpaulin


Swap-Body Class A with fixed structure


Tank Swap Body / Container


Swap-Body Class C with tarpaulin

Cranable by the top or bottom (if fitted or not with upper corner fittings)
Standardised lengths of class A swap-bodies: 12.50m or 13.60m
Standardised lengths of class C swap-bodies: 7.15m, 7.45m or 7.82m

# Challenge 1. **Wide variety of loading units: Semi-Trailers**

## **Cranable Semi-Trailers** (with reinforced grapple zones)

**(reference: UIC leaflet 596-5)**

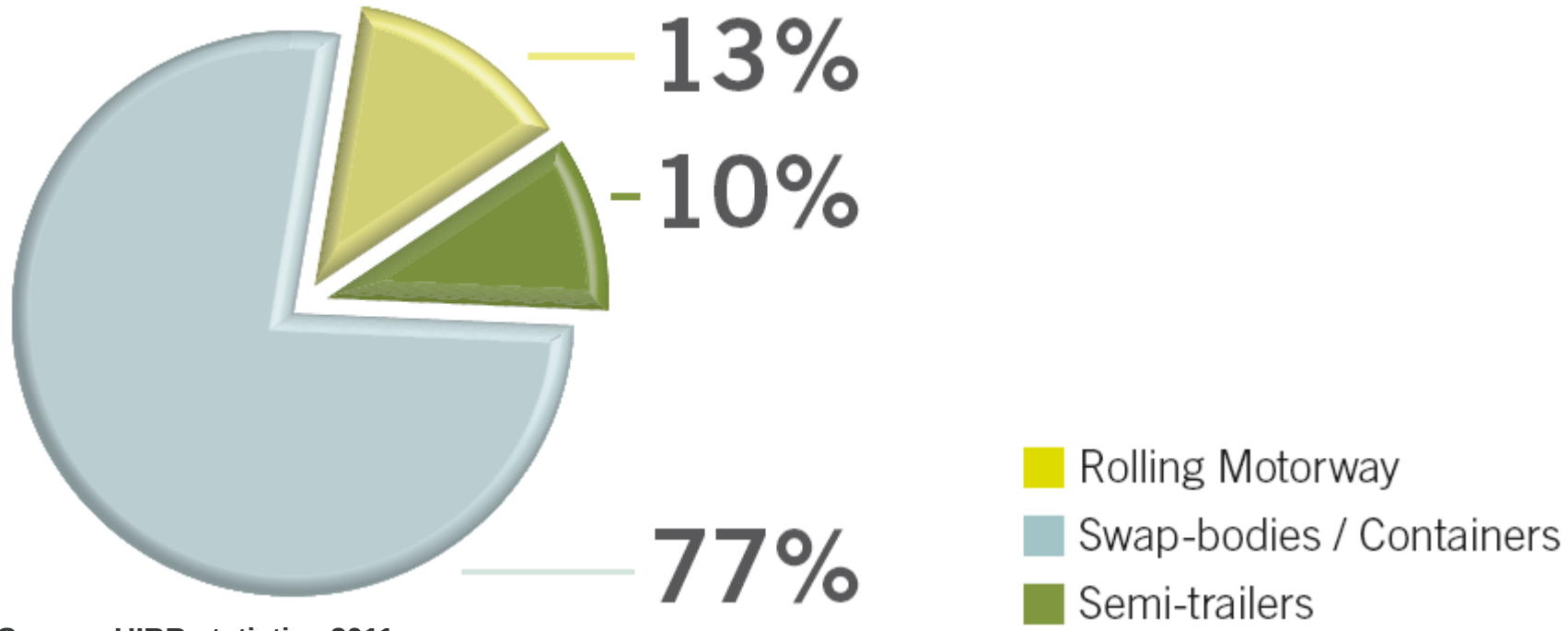

Standard semi-trailer with length of 13,60m
(width of 2,55m or 2,60m – height of 4,00m )


MEGA semi-trailer with length of 13,60m
(height of 4,00m)

## **Conventional Semi-Trailers** (with no modifications to the frame)

ISU technology for transporting semi-trailers
up to 4 m and 2,60 m

# Swap-Bodies in European Combined Transport




**Source: UIRR statistics 2011**

Majority of shipments (77%) used swap-bodies and different types of ISO and non-ISO containers.

# Why the Swap-Body? **- More flexibility (1)**


1. Road hauliers are using swap-bodies for unimodal road forwarding as well.
2. Thanks to the folding legs, the swap-body can be deposited/collected at the warehouse/parking facilities (loading bays) built out for use by trucks/trailers.
3. No transhipment equipment is needed to load/offload from trucks.

# Why the Swap-Body? **- More flexibility (2)**

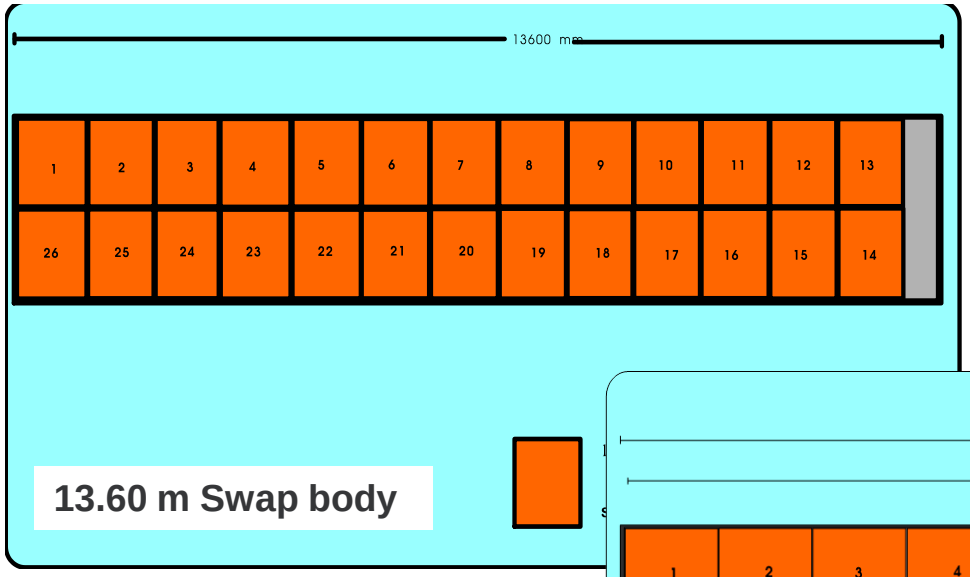
Flexible: adapted to the specific cargo to be shipped or logistics requirements (with loading possibilities from every direction)

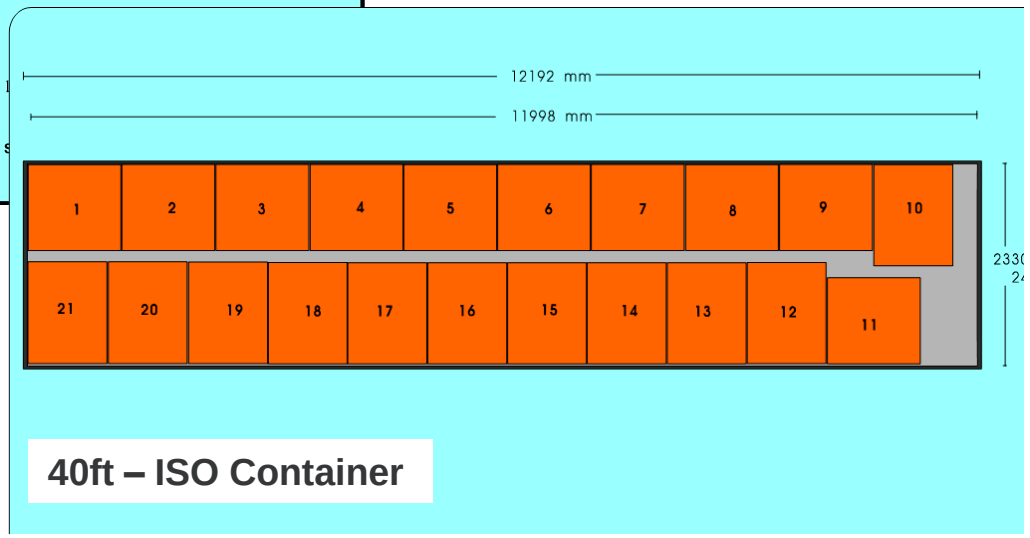

This type of SB is used for easy loading from the sides.


This type of SB is designed for loading steel coils from the top.

# Why the Swap-Body? **- More capacity**

20% more euro-pallet capacity: the width and length when scaled to the maximum allowed road dimensions in Europe.

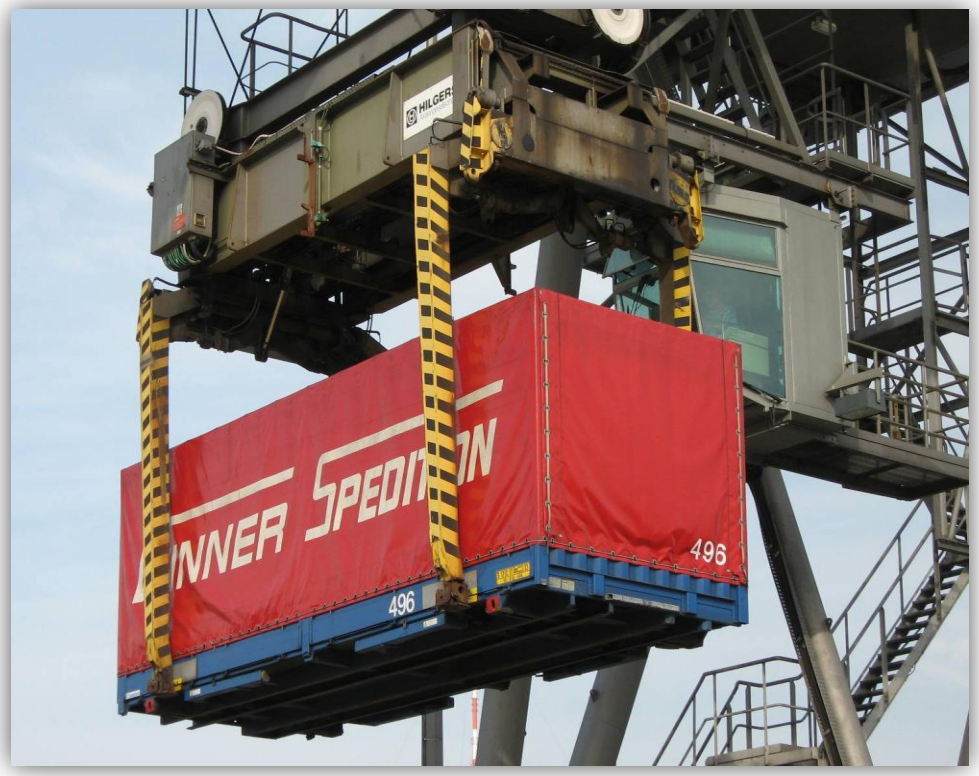



Due to greater length and width, the 13.60m European swap body has a higher pallet capacity than the 40' ISO and can contain **26 instead of 21 pallets**.

# Why the Swap-Body? **- More payload**

The design of the swap-body is optimized to a minimum tare weight to (thereby) maximise loading capacity.




Minimum tare weight through lighter construction: 2.5t for a 7.45m and 4.9t for a 13.60m

**=> around 5% more payload**

# Challenge 1. **Loading units: Conclusions**

- The success of road transport is due to its flexibility in offering solutions adapted to the specific customer needs – **Combined Transport must learn and offer the same**.
- One size of truck/trailer does not fit all – **similar variety (and more) is available in loading units**.
- Combined Transport today is capable of offering the **same possibilities as on road**.
- European swap-bodies offer flexible solutions and are the most used intermodal loading units in continental transport

## CHALLENGE 2

**Interoperable standards for transferring the loading units to the wagons**

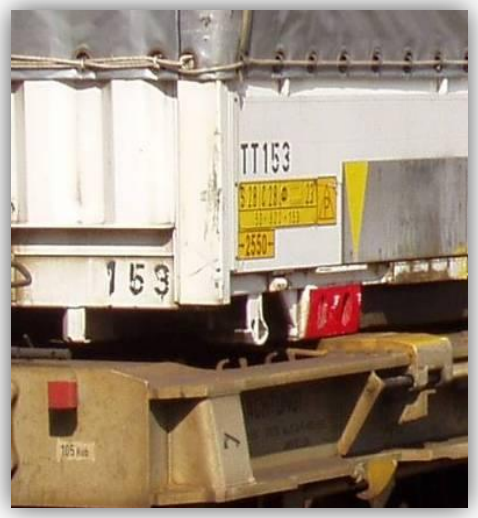
# Challenge 2. **Need for interoperable standards**

Standardisation of basic parameters allow a compromise between flexibility and harmonisation in order to obtain high productivity of the intermodal system

Container top corner fitting


Common elements: grapple arms fitting into handling devices

Wagon with pins at several positions




Swap-body with bottom corner fittings on wagon

## CHALLENGE 3

**Design of the right wagons allowing the transportation of all kind of loading units**

# Challenge 3. **Wagon types**

## Standard flat wagons for ISO and NON ISO Containers / Swap Bodies


4-axle container wagon

6-axle articulated wagon (Loading possibilities:
2 x 40’ or 4 x 20’)

## (Multipurpose) wagons for Cranable Semi-Trailers


6-axle double-pocket wagon (Loading possibilities:
2 x 13.6m semi-trailer or 4 x 7.82m)

# Challenge 3. **Wagon types**

*Total number of wagons used exclusively for unaccompanied CT services (by wagon types in service in 2007)*

| Category | Type of wagon | # of Wagon | TEU/ Wagon | # of TEU | Share [%] | Price in Euro |
|---|---|---|---|---|---|---|
| (a) | 60-feet 4-axle | 28.000 | 3 | 84.000 | 50,3 | 72.500 |
| (b) | 80-/90-feet 6-axle | 5.300 | 4 | 21.200 | 13,2 | 105.000 |
| | 104-feet 6-axle | 3.300 | 4 | 13.200 | 8,2 | |
| (c) | 4-axle pocket | 1.500 | 2 | 3.000 | 1,9 | |
| | 6-axle double pocket | 1.700 | 4 | 6.800 | 4,2 | 145.000 |
| (d) | 2-axle | 7.800 | 2 | 15.600 | 9,7 | |
| | other 4-axle | 6.500 | 2 | 13.000 | 8,1 | |
| | low-floor | 1.900 | 2 | 3.800 | 2,4 | |
| **Total** | | **56.000** | **Ø 2,9** | **160.600** | **100,0** | |

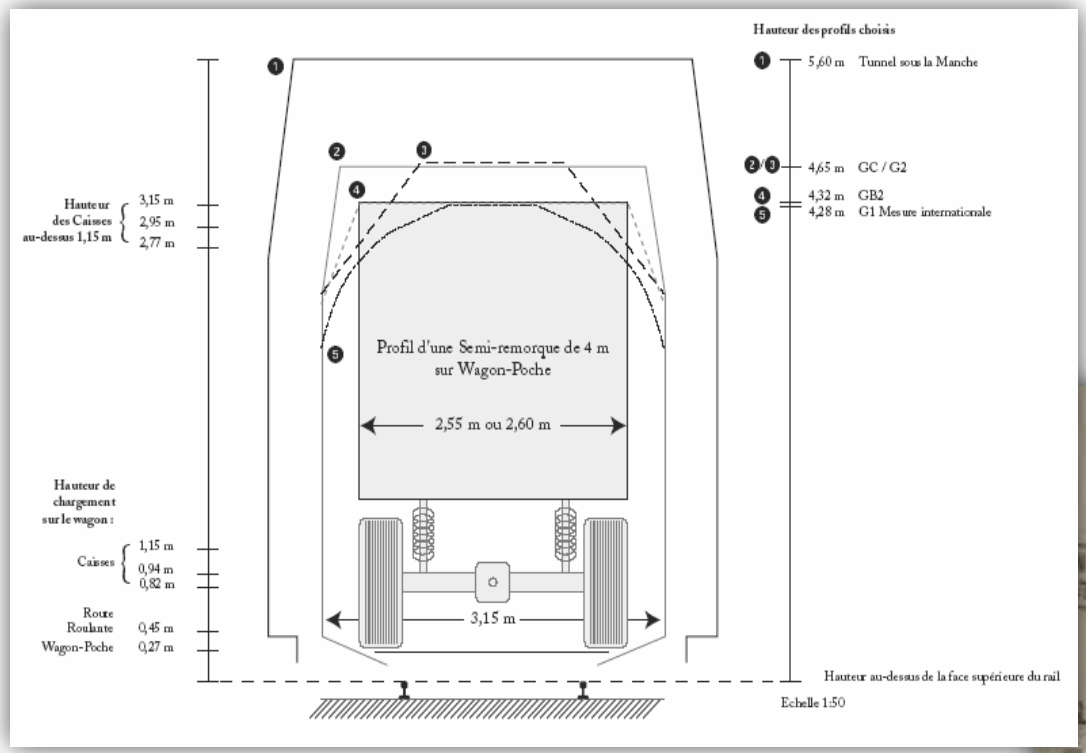
*Source: KombiConsult research and estimates*

# CHALLENGE 4

## Running CT trains on the European rail infrastructure

# Challenge 4. **Rail Loading Gauge (1)**

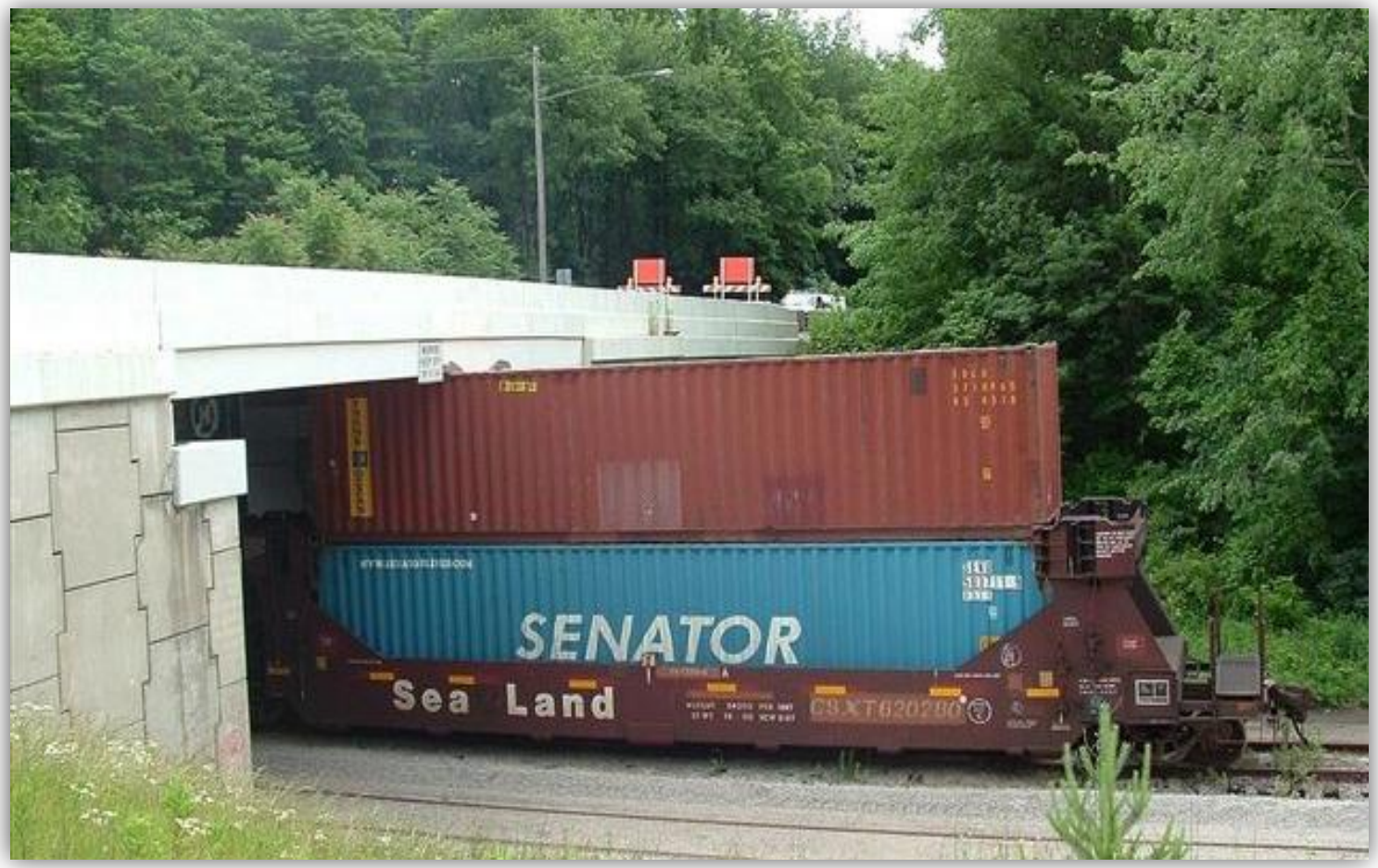
Problem: restricted loading gauge of railway lines (problematic in particular for semi-trailers)




**=> costly to enlarge the entire infrastructure (tunnels, bridges) or to build low-platform wagons**

# Challenge 4. **Rail Loading Gauge (2)**

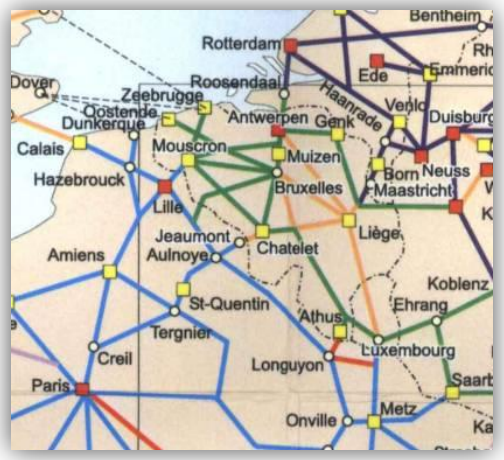
Prevention of accidents like this one in the USA



# Challenge 4. **Rail Loading Gauge (3)**

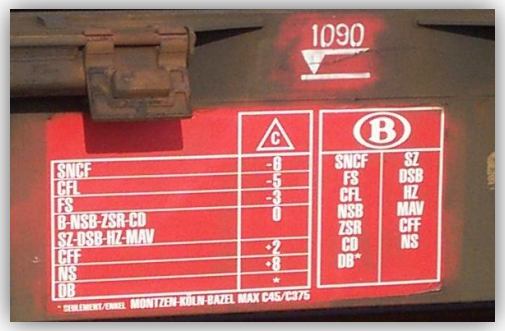
- Combined Transport with loading units, or road vehicles on railway wagons, exceeds the G1 UIC loading gauge (it ideally requires the larger GC gauge), hence **railway lines must be codified to determine the accurate gauge for CT.**

- Alongside the **codification regime for railway lines**, a **system of codification of loading units and wagons has been established** to enable a smooth flow of CT trains.



Codification of lines

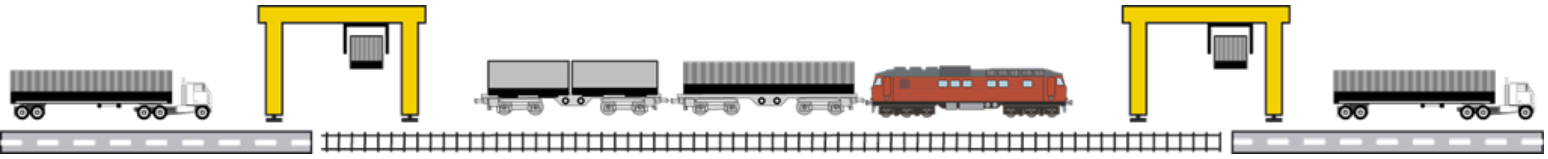
Codification of loading units



Codification of wagons

# THANK YOU FOR YOUR ATTENTION

Administrator of the ILU -Code



**Eric Feyen - UIRR scrl**
efeyen@uirr.com
+32 2 548 78 95