METROCARGO ®

An innovative system for intermodal freight transport

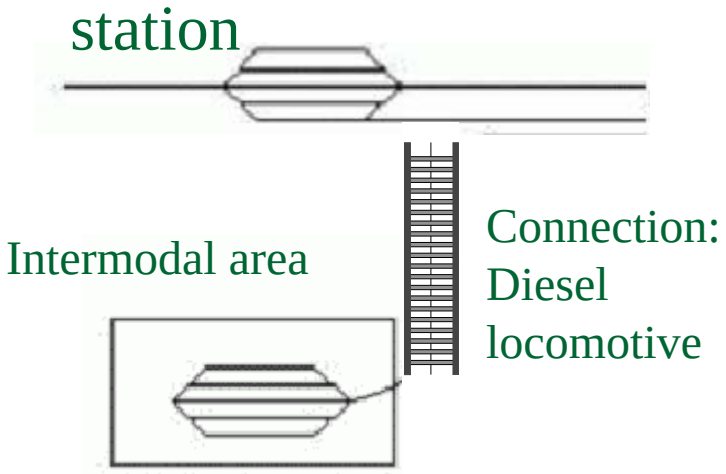
What is METROCARGO®

The MetroCargo® system is a smart Electro-mechanic system that allows charging and discharging containers from a train in only a few minutes.

A key feature of the Metrocargo® system is its adaptability to any kind of train and container type WITH NO NEED OF MODIFICATIONS TO THE WAGONS NOR THE CONTAINERS. Optical recognition technology allows the system to “read” a train composition as it enters the station and even the identifiers of each single container (no need of special RFID or barcoding).

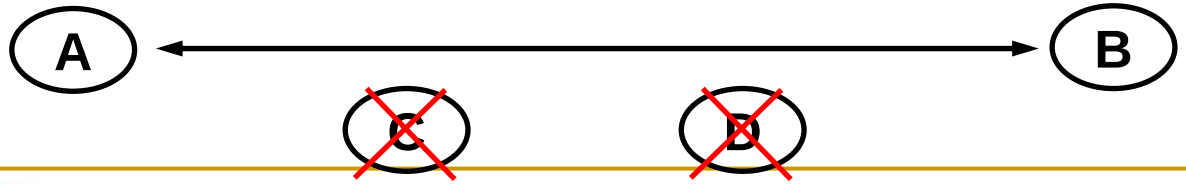
Traditional intermodal terminal

Traditional Handling time :
10 – 12 hours per train



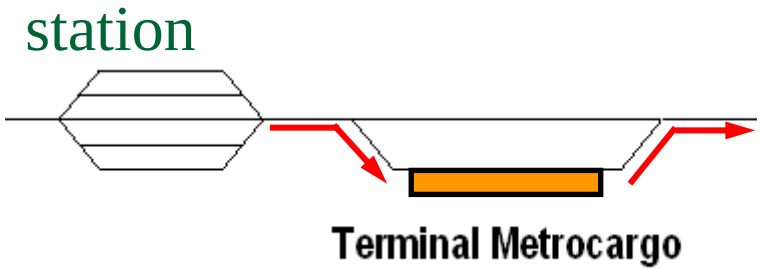
Today intermodal terminals are off-line. Trains must be shunted away from the electrified track using diesel locomotives, pulled to a loading yard, loaded, and brought back to the regular track by diesel traction. This operation usually takes 10–12 hours, with significant shunting costs (up to 70/100 euro per unit)

This situation doesn't allow to do intermediate stops in intermodal terminals because of costs and time involved



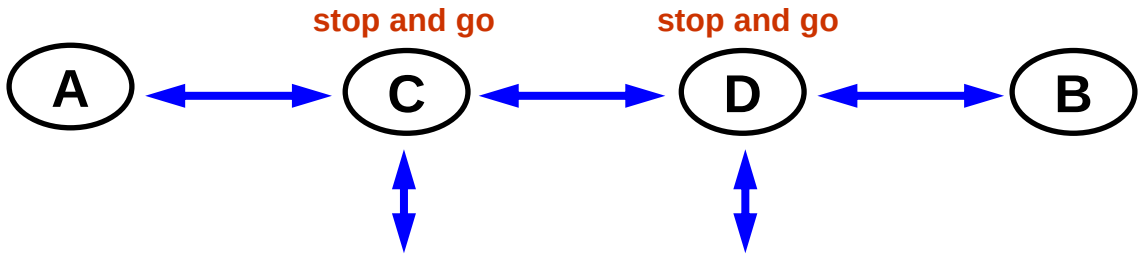
Metrocargo in network

Metrocargo Handling time:
60 minutes per train

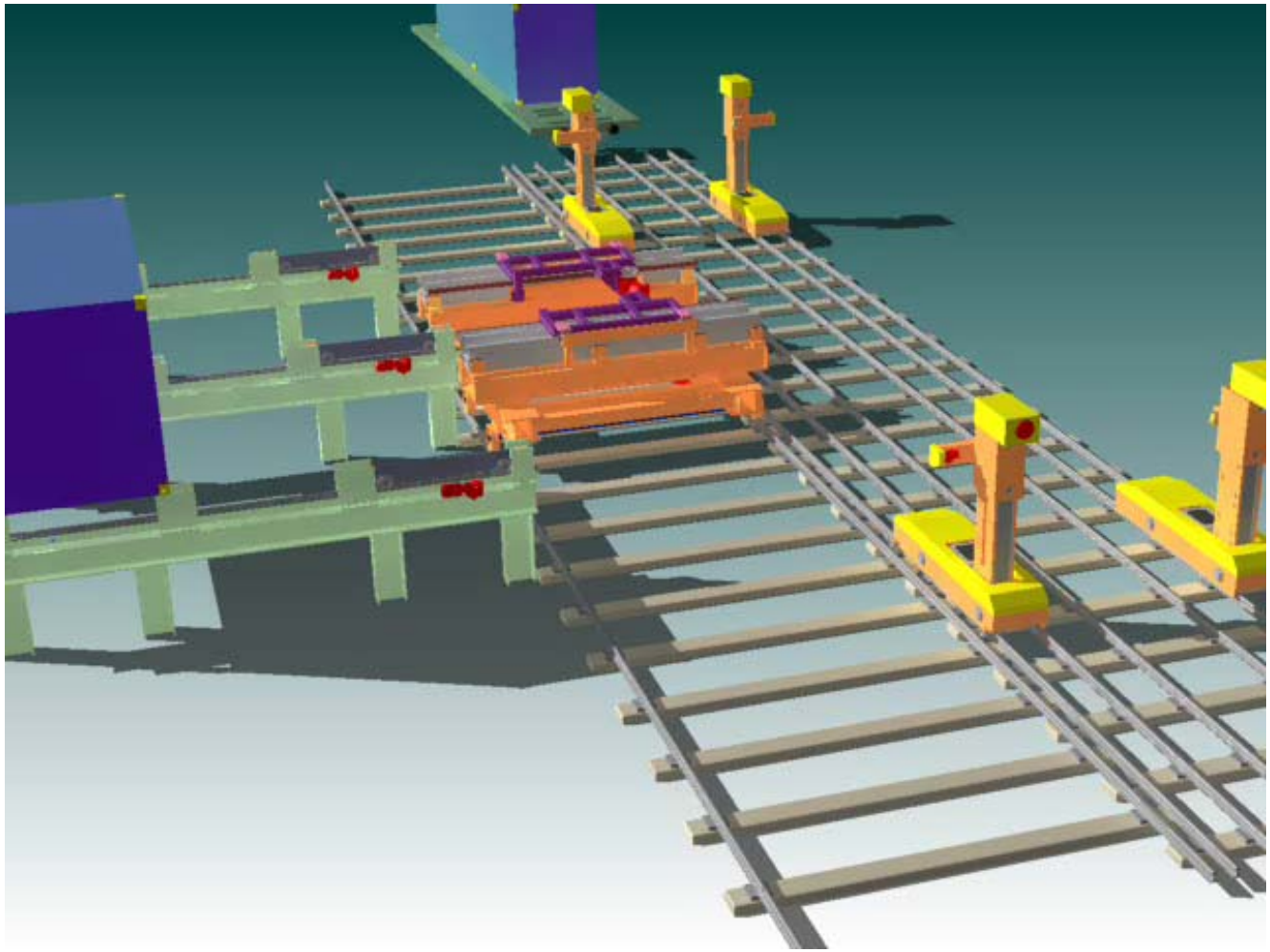


With Metrocargo® the loading unloading activity takes about 60 minutes. The trains remain under the electrical track and automatic handling permits the safety movements of containers.

Metrocargo allows to do intermediate stops with a great reduction of costs and times!



Metrocargo principle



The contribution of VIT

In 2007 the mechanical design had been completed, but devices and SW were lacking for:

- **precise and rapid detection of the corner fitting where the container was to be pinned**
- **verifying that the containers on an oncoming train were as foreseen in the load plan**
- **making sure no person enter the automated loading area**
- **predicting the effect of errors and perturbations on the overall performance of the system**

The contribution of VIT

Metrocargo promoters applied for an EC-funded research project under the 7th Framework programme to obtain research support.

The VIT research project was developed to provide the required complements to the Metrocargo technology. The project fulfilled its goals and gave the SME participants the needed know-how and prototypes.

The contribution of VIT

The results of the VIT project were incorporated in a full scale section of a Metrocargo plant that was developed for demonstration outside VIT and installed in the port area of Vado Ligure, Italy. The plant, complemented by the devices and prototypes developed within VIT, succeeded in becoming fully operational.

The impact of VIT on Metrocargo was decisive, as it provided the functions it lacked and made it fully operable, though further engineering and refining will be necessary.

Metrocargo Plant

The system has 3 main components:

- 4 Lifting Towers (2 per side on track)

- 2 independent transfer cars

- Sorting Platforms

Metrocargo Plant

Four towers allow to lift/to let down containers on wagons. Towers work inserting a pin in the side slot of the corner fitting of containers.

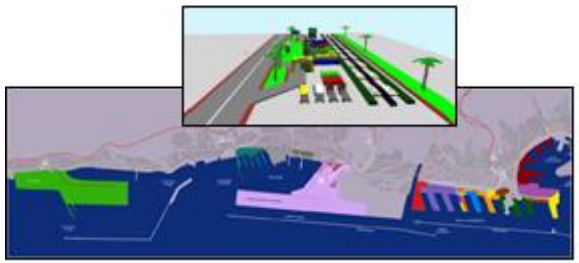
Two independent transfer cars insert a bridge between wagons and container and then move horizontaly container on sorting platform.

Sorting Platforms have motors that allow to move container unload/reload on trucks.

Metrocargo applications

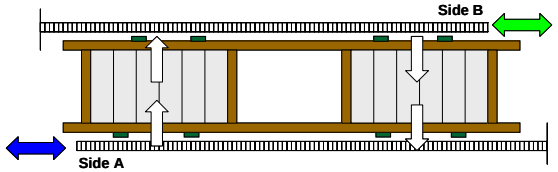
Network

Port-Inland Connections



City Logistics

Transfer Between Different Gauges



Start-up of the Metrocargo italian network : Tirrenic line

- **Starting Scenario**
  - 8 lines with 20 trains /day
  - 7 input /output terminals
  - 4 Metrocargo transit terminals
  - 20 trains per day

- **Results**
  - 700 ITU / day
  - Average loading/unloading time in Terminal: 30 min.
  - Max total transport time: 24 hrs
  - Max waiting time in terminal: 8 hrs
  - Average loading of trains: 70%

Scenario 1

Start-up of the Metrocargo italian network : Tirrenic line
Economic / financial results

- 150.000 UTI/year moved;
- Start-up with 15 Mil €
  on 30 Mil € of total investments
- ROE: 5%
- Operative CASH FLOW : positive at the 3° ye
- Turnover 150 Mil €/year

Metrocargo network in Italy – final layout

Indicators are :

- 50.000 further trains per year on the rail network;
- 1.500/2.000 new qualified jobs on the territory;
- 5 - 8% transport cost reduction;
- 300 million euro of investments.

Metrocargo® solution for APM TERMINALS in Vado Ligure

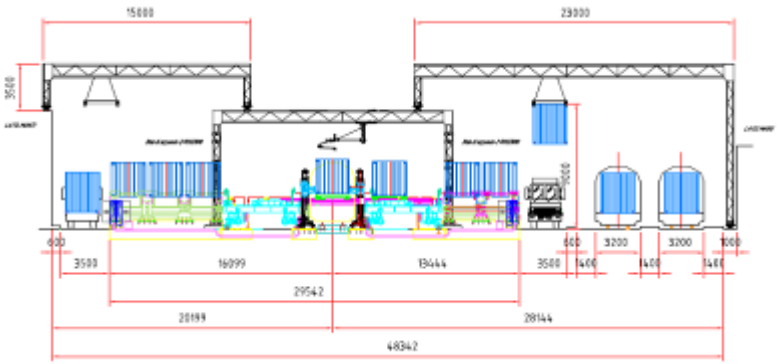
APM TERMINALS

Metrocargo® terminal features

- used surface	21.400 m²
- Max width	45 m
- max train length	458 m
- max capability per train	66 teu
- storage capacity	192 teu per side
- number of Metrocargo© transfer systems	6/8 per side
- n° RTG	2 per side

Maximum Metrocargo® terminal performance

-time load/unload train:	**40 min (pair)**
-operative days	350
-trains/day:	**20 (pair)**
-trains/year:	7.000 (pair)
-loading factor	80%
-teu/day:	1.056
-teu/year:	**793.200**

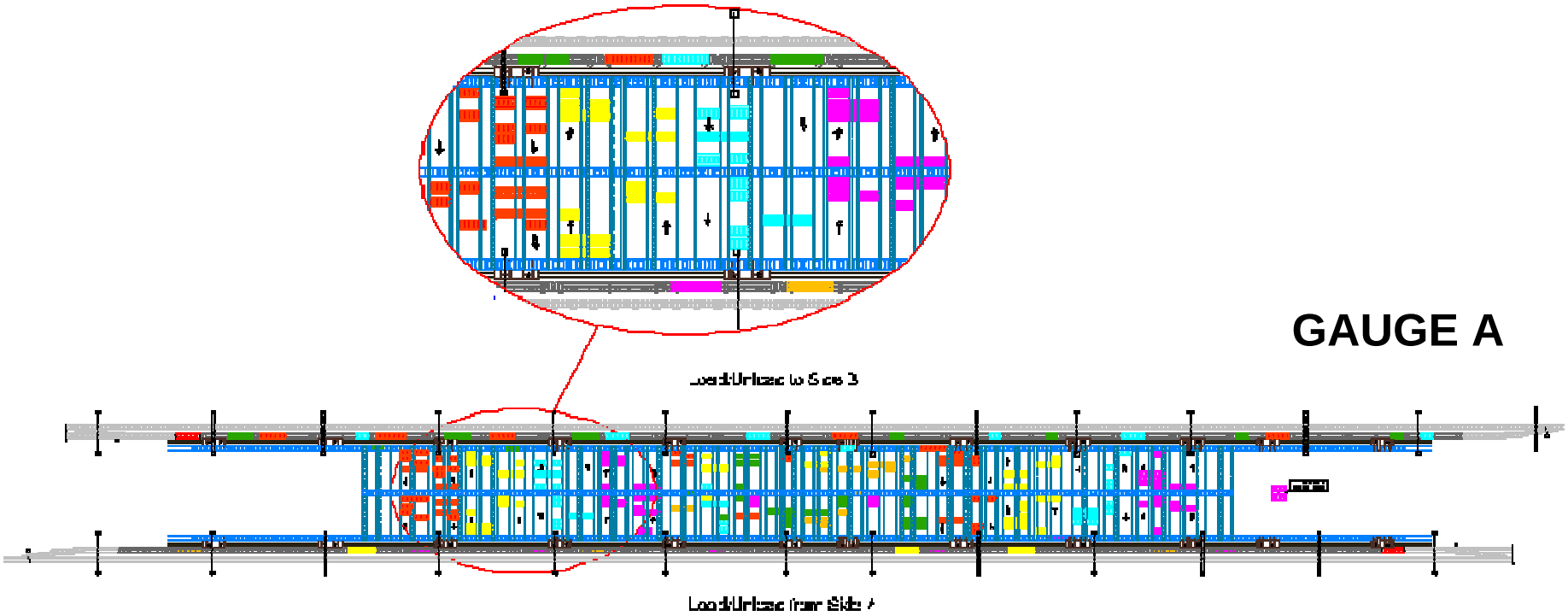


i.log INIZIATIVE LOGISTICHE S.R.L.

metrocargo

Example different gauges

Metrocargo can be used between different railway gauges.

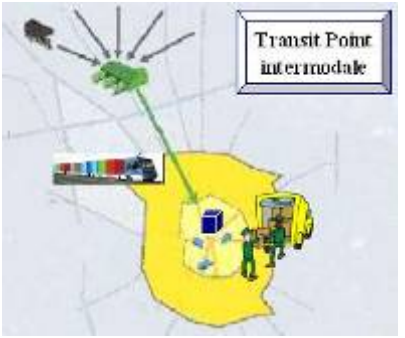


GAUGE A

GAUGE B

Metrocargo City

Only 12 m



The innovative concept permits:

- to pickup goods outside the city and set up them into swap bodies
- to use railroads to enter directly inside the center of the cities
- to load swap bodies, without cargo breach, directly on the vehicles
- to delivery goods inside the cities with low pollution impact and traffic
- to transport outside the cities goods and garbage

I.Log with FINMECCANICA are developing a new system for Milan city based on Metrocargo technology.

FINMECCANICA

i.log INIZIATIVE LOGISTICHE S.R.L.

metrocargo

Thank you for your attention