

I.Log proposes **Metrocargo**  
A new solution for intermodal shipment



PRESENTATION TO THE  
DELEGATION OF RUSSIAN  
ENTREPRENEURS

*Fabio Tarantino*

*Milano, 30 September 2008*

I.Log was established in 2004 to promote and develop innovative logistic initiatives, engineering and software development.

The partners are managers and consultants and have a wide transport and logistic experience.

I.log has a particular know-how in the road and rail transport, and in the design of logistic infrastructure.

## I.Log activities

- ILOG collaborates with national and international Universities and Research Centres, is a partner of several R&D projects funded by Regions, by FILSE (Financial Enterprise of Liguria for the Economic Development) and by the Liguria Scientific and Technologic Park;
- ILOG is the coordinator of the VIT-VISION FOR INNOVATIVE TRANSPORT Research project, partly funded by the EC. VIT is aimed at developing essential components of the Metrocargo technology:
  - Vision system for detecting and centering the container corner fitting
  - Reading the composition of incoming train (container sequence and ownership codes)
  - Safety and security of the work area
  - Data control



# International Award of Communications 2007

I.Log has received the award “Premio Internazionale delle Comunicazioni 2007” dedicated to the freight transport assigned by International Institute of Communications.



*“I.Log has been awarded for its R&D activity about the innovative intermodal system called Metrocargo.”*

## What is METROCARGO



- Metrocargo is an operative method that makes it possible to innovate the actual operativeness of the intermodal transport without the modification of the trucks and the containers
- METROCARGO technology allows to create a logistic system able to put in a network the existing intermodal infrastructures to activate the large potential synergies of the sector
- It's a logistic concept based on the speed and the safety of the activities for the goods and the operators
- Moreover it's a technical solution to load / unload the trains in a fast and economic way.



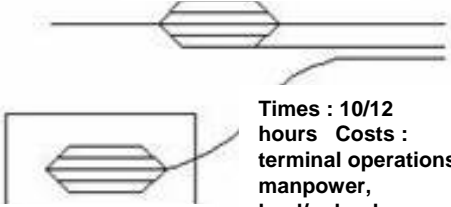
## Metrocargo targets



- To supply a logistic infrastructure both efficient and competitive to the transport operators;
- To put in a network the existing terminals and logistic platforms;
- To move big goods traffic volumes from the road to the rail;
- To use each mean of conveyance in the best way;
- To simplify the rail transport using shuttle trains with a prefixed itinerary;
- To reduce the environmental pollution;
- To reduce the total costs of logistics improving the overall competitiveness.


# What is a METROCARGO terminal

**Actual situation station**

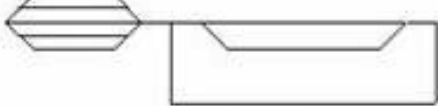


Times : 10/12 hours  
Costs : terminal operations, manpower, load/unload

Intemodal point

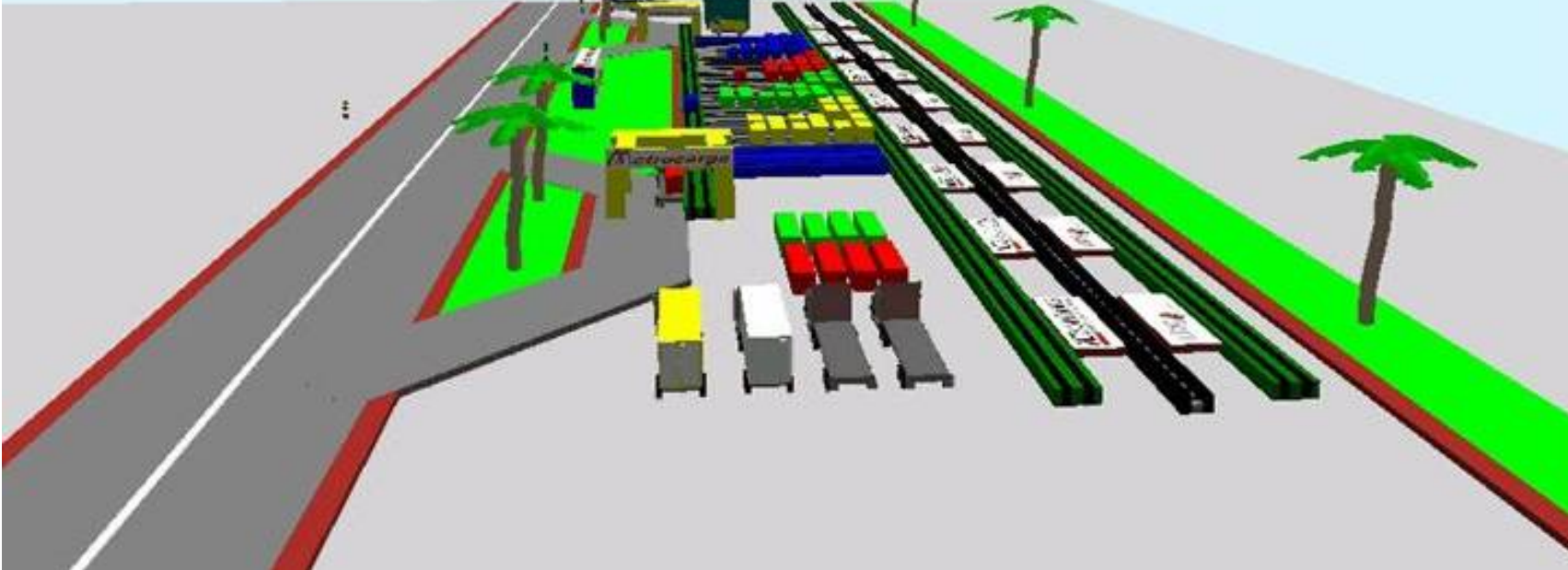


**METROCARGO solution station**



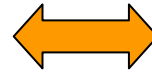
**Terminal Metrocarga**

Times : 40 minutes  
Costs : automated load/unload

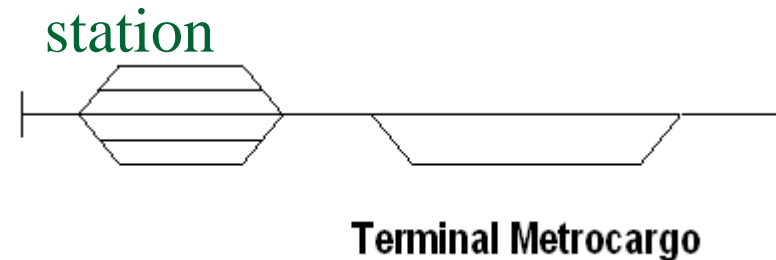
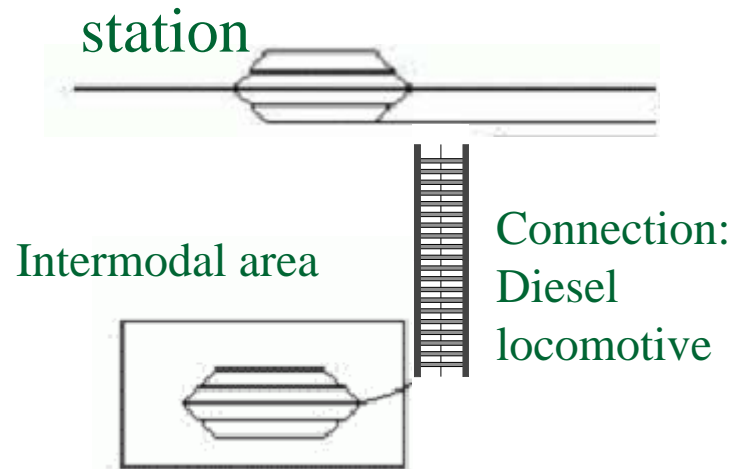


## Traditional against Metrocargo

Traditional Handling time :  
10 – 12 hours per train



Metrocargo Handling time:  
30 minutes per train



In traditional solutions 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)

With Metrocargo the loading unloading activity takes about **30 minutes**. The trains remain under the electrical track. Automatic handling permits the safety movements of containers.



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## Metrocargo opportunities :

For a region :

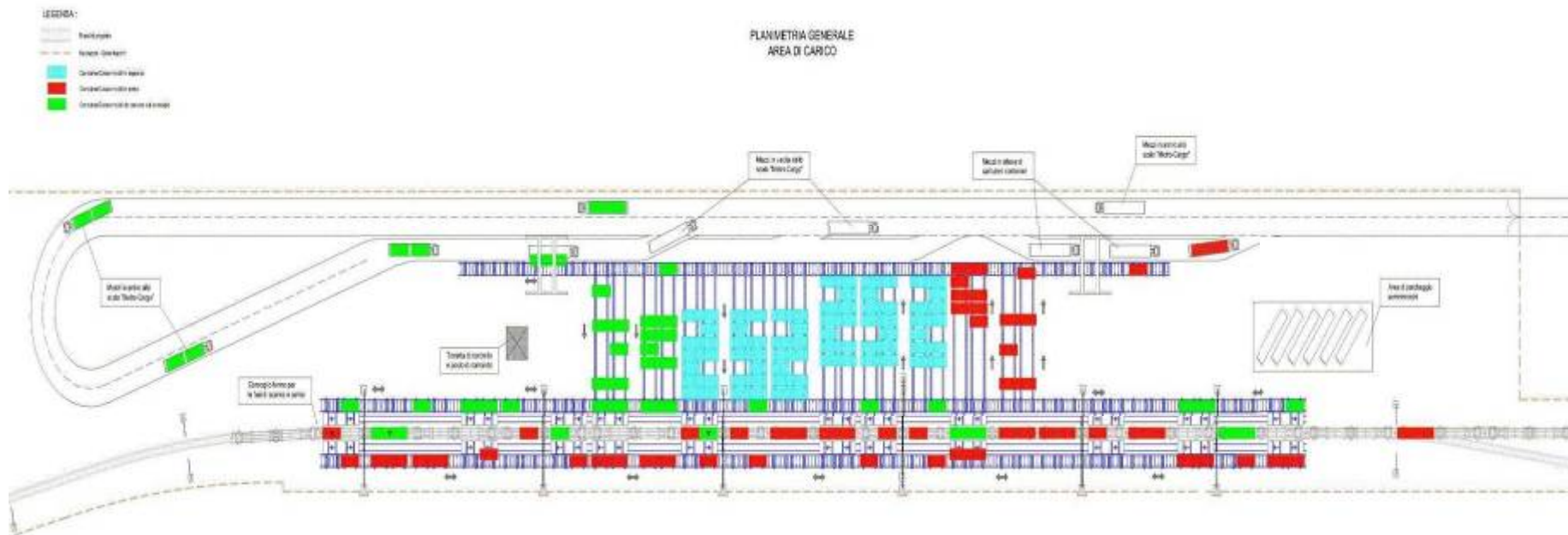
- to become a point around which to have “favourable” conditions for a higher competitiveness of productive, commercial and service settlements;
- It is non-invasive and allows to get back marginal areas;
- Increases the value of low traffic stretches of line.

For the existing intermodal centres :

- the possibility to offer network services even for single load units;
- the reduction of the working costs eliminating the rail work costs;
- reduction of the returns time;
- handling of many trains per day with only a working track;
- transport services toward many destinations with a limited UTI number.

# Investments

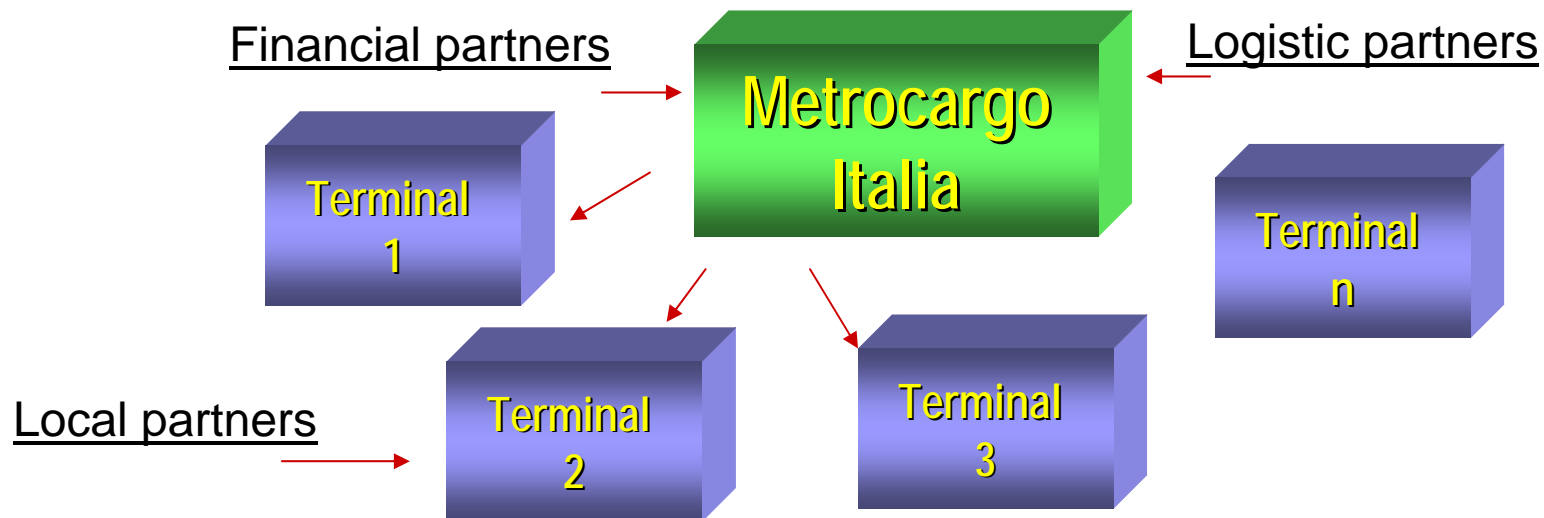
- A single terminal requires: 5 to 15 M€ according to size
- Terminals have a modular structure and a gradual expanding, parallel to the flow increases, is possible.
- Terminals can be located in dismissed railroad areas
- All types of existing railway cars and load units can be used



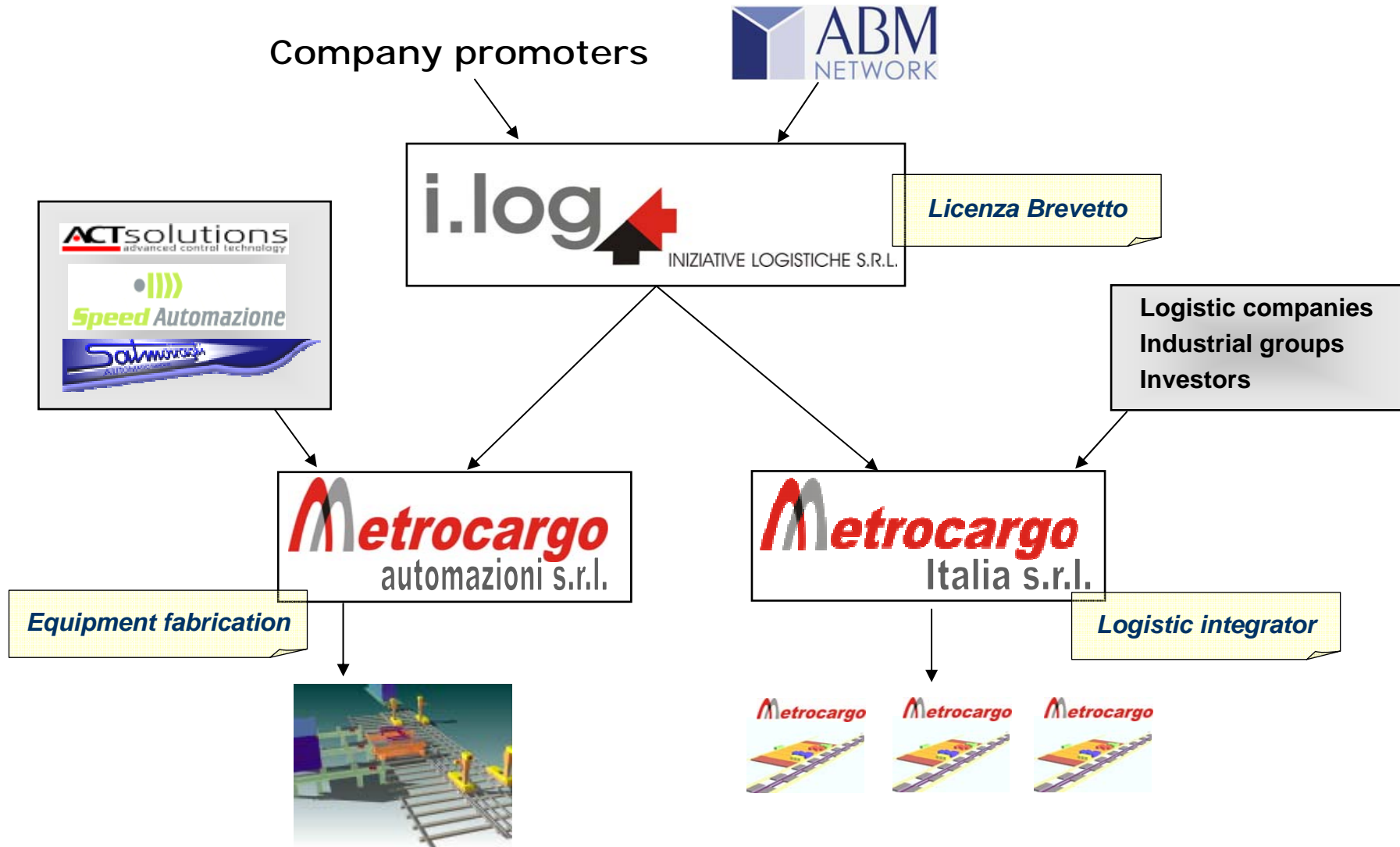
## Network – corporate scheme

The initiative joins more companies and organizations. For the Italian market:

- Metrocargo Italia is the coordinator of the whole network.
- Metrocargo is going to be participated by financial partners and can be also participated by strategic logistic partners.
- Each terminal will be a company with local partners (public and private).
- Metrocargo will have a participation in each single terminal.
- Additional companies support the terminal building, network running & services.



# The corporate structure

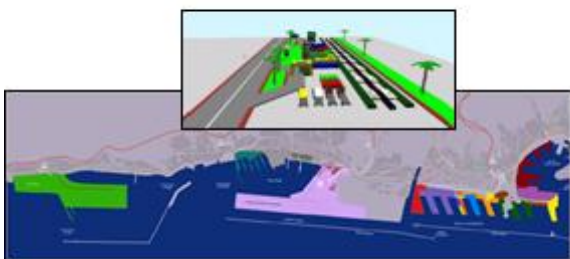


# Metrocargo additional applications

Network



Port-Dry Port Connection



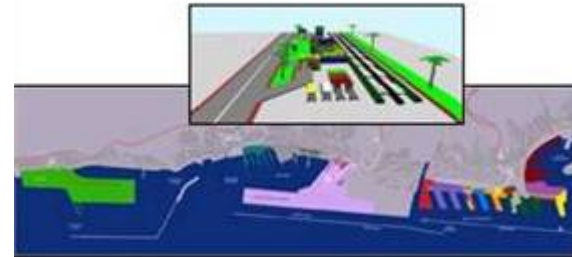
City Logistics



Short Sea Shipping



## Port-Dry Port connection

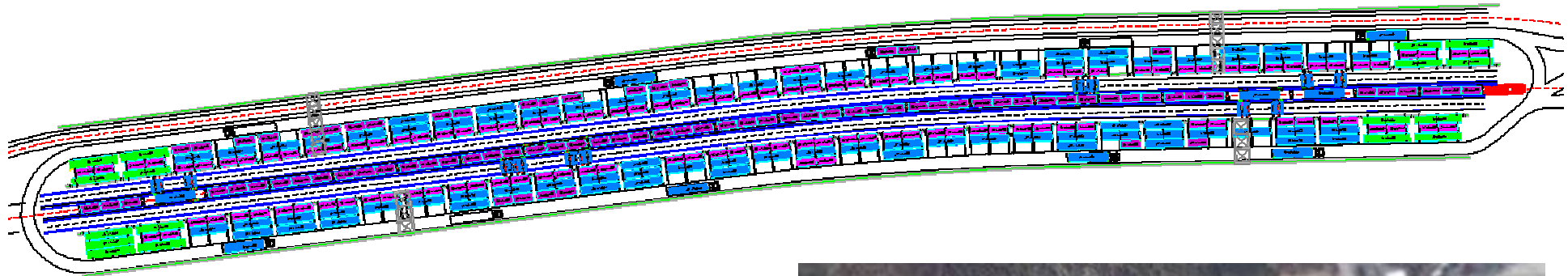


Ports requirements:

- high speed translation of load units
- greater use of the railroad
- cost reduction for handling and shunting
- reduced loading time

# Metrocargo® solution in Vado Ligure port – the MAERSK platform

## The plan



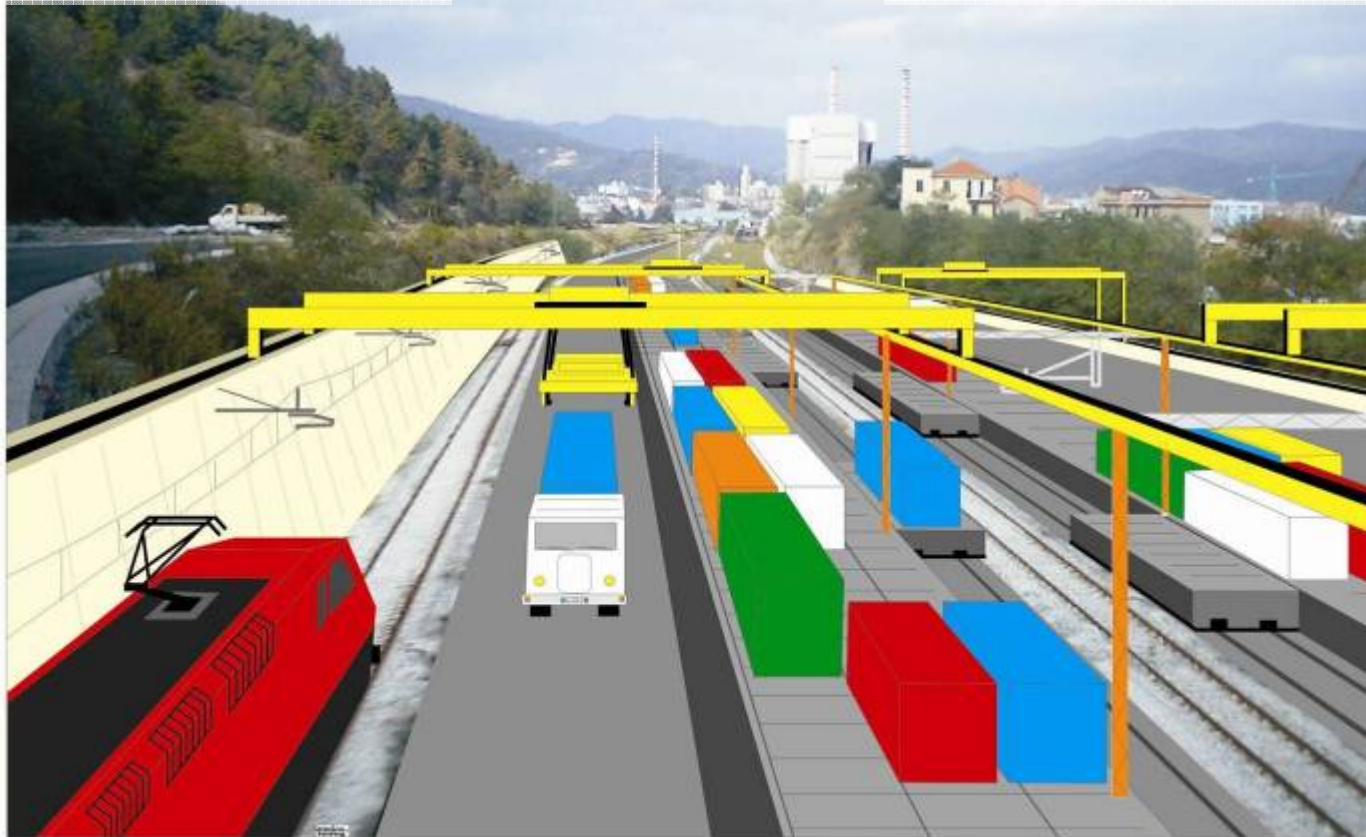
Used area	21400 m <sup>2</sup>
Max width	48 m
Max train length	458 m
Storage capacity	66 TEU



## Metrocargo® railway solution in Vado Ligure

Metrocargo® system will optimize the use of the area.

The one existing rail track will be used, just building a bypass line.

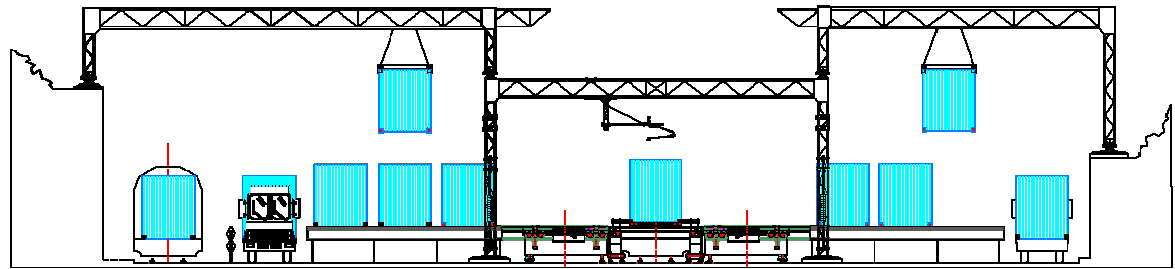




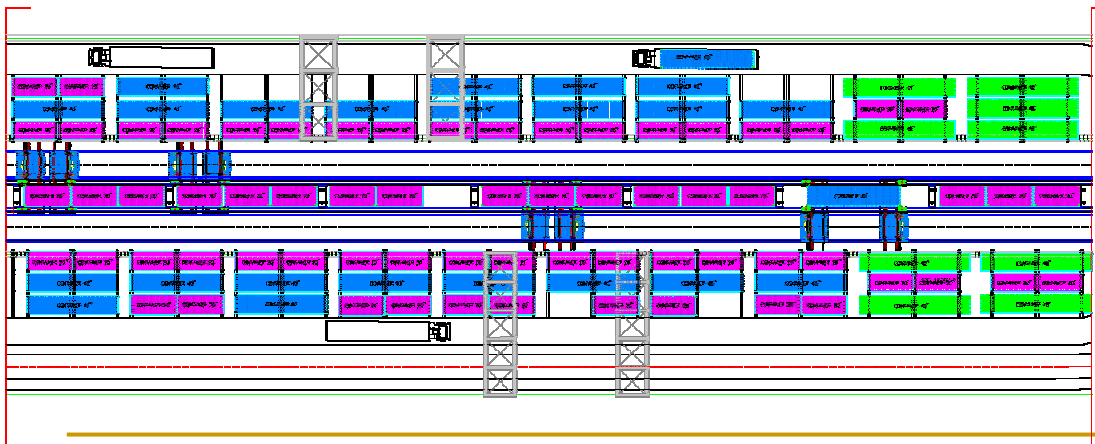
## Metrocargo® in Vado Ligure: operating features

Metrocargo® system allows four operations at the same time:

- unload from trucks
- load on wagons
- unload from wagons
- load on trucks



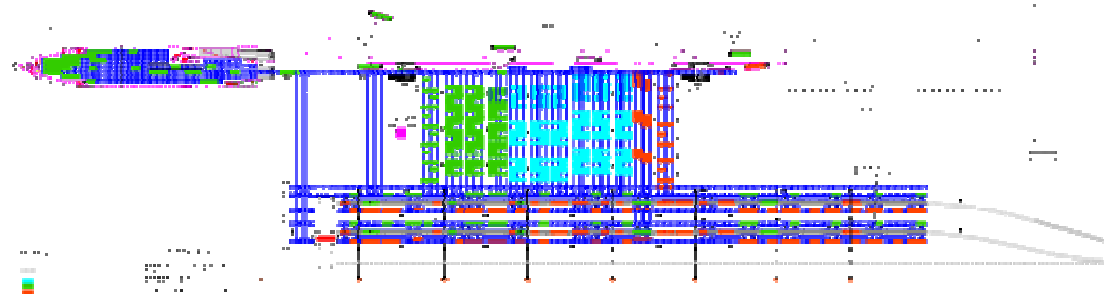
Instead the operations happened at the same time on different places.



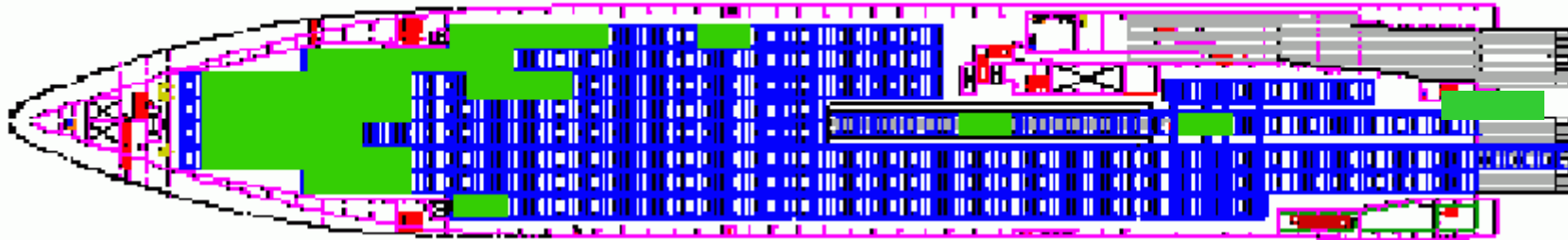
Metrocargo® system aims to storage 6 trains per time, 3 trains for each side ready to load/unload.

# Short Sea Shipping

The hold become an automatic warehouse



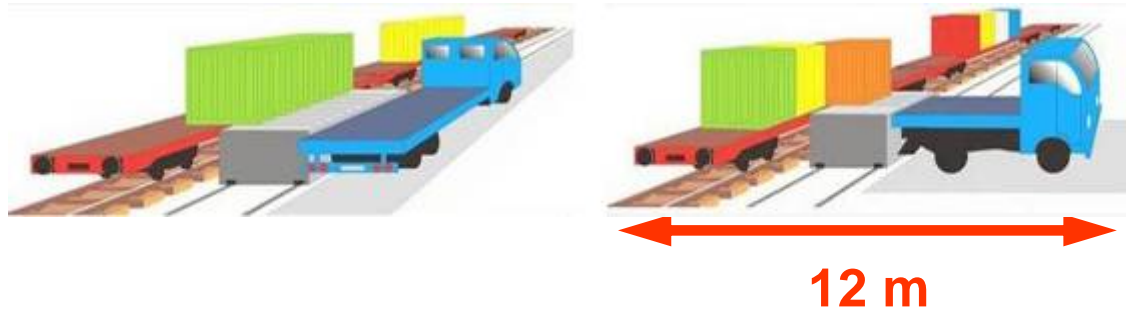
- Shipping



- Railway naval freight

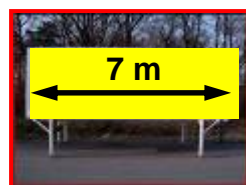


# Metrocargo City

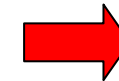
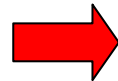


The innovative concept permits:

- 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



20 foot



## Advantages of Metrocargo City

- General economic saving
- Removal of trucks entering the city
- Optimised distributive paths starting inside the delivery area
- Load discontinuity is avoided the with a public/private Transit Point
- Pollution and traffic congestion reduction

 **Low management costs!**

**The train can transport containers during the night and the track becomes a warehouse!**

## Reverse logistic with Metrocargo City

In this case too it is used a low emission road vehicle “at the best” only in the city centre and the train takes care of the “economic” transport outside the city.

The city road network is used only in the phase of the rubbish collection and the railway is used for the transport to the dumping ground.

- The same load units used for the distribution may be used for the transport outside the city of clean materials (plastic, paper and cardboard) collected along the path.



- Adapting other containers it's possible to utilize intermodality to transport rubbish and glass outside the city.

Rome example  
(Ama-Ecolog-Serfer)



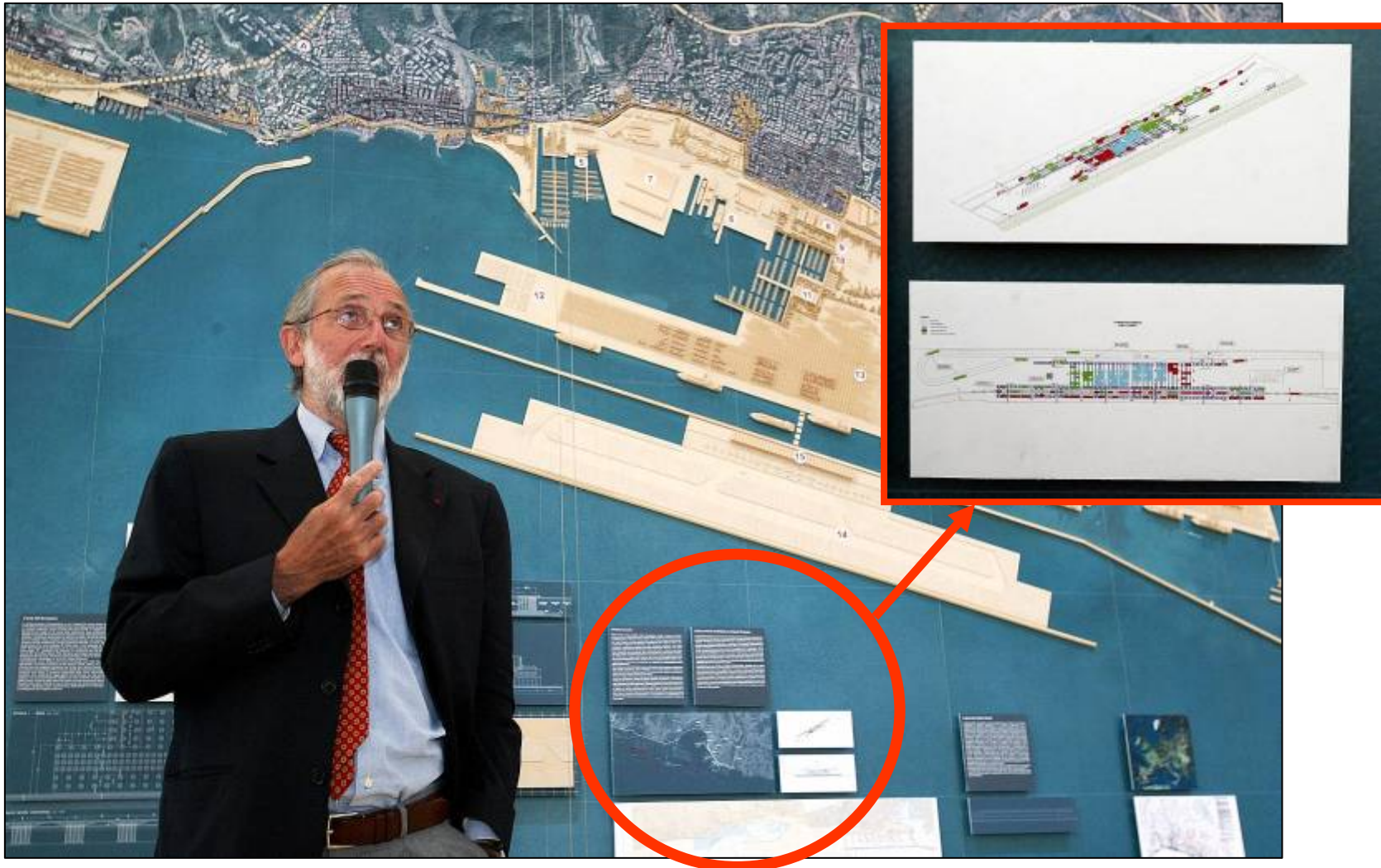
## First prototype

- Automatic transfer shuttle prototype (full scale) with Laboratorio di meccanica generale e di meccanica delle vibrazioni della Facoltà di Ingegneria di Genova, and other partners

**UNIVERSITÀ DEGLI STUDI  
DI GENOVA  
FACOLTÀ DI INGEGNERIA**



# Metrocargo in Arch.Renzo Piano's Genoa waterfront



# VIT Project



## SEVENTH FRAMEWORK PROGRAMME

*VIT*

*Vision for Innovative Transport*

**Project partly funded by the EC**

Grant agreement no. 222199

SP4-Capacities - Research for SMEs

[www.vitproject.eu](http://www.vitproject.eu)

*VIT*  
*Vision for Innovative Transport*



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# VIT Project

**The project structure is that a number of small enterprises (SMEs) form a Consortium with researchers (RTD performers) to do development and research work for an industrial project.**

**The EC grants funds to the SME's to pay for the research work.**

**Following is the list of SMEs and RTD performers in the VIT project**

# VIT consortium



## ■ SMEs



- I.LOG (IT) *project coordinator*



- Molinari Rail AG (CH)

- WITT (DE)

- Systems Navigator (NL)



VIT prj partly funded by EC  
[www.metrocargo.it](http://www.metrocargo.it)

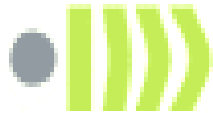


# VIT consortium



## ■ RTD performers

- DISI - Università degli Studi di Genova (IT) -- *RTD coordinator*



- Speed Poland

**SAT**

Simulations- und Automations-Technologie AG

- SAT (DE)

**imavis**

- Imavis srl(IT)



- Dundee University (UK)



INNOVATIVE LOGISTICHE S.R.L.


VIT prj partly funded by EC  
[www.metrocargo.it](http://www.metrocargo.it)



# VIT Project

- European Community has partly financed the research project VIT VISION FOR INNOVATIVE TRANSPORT.

The VIT project (Vision for Innovative Transport) is about the development of **computer vision technologies** to achieve full automation of the innovative Metrocargo system for intermodal shipment of containers and swap bodies.

Proposal Submission Form		
	EUROPEAN COMMISSION 7th Framework Programme on Research, Technological Development and Demonstration	Research for the benefit of SMEs <i>Research for SMEs</i>
		<b>A1:</b> Content
Proposal Number	<input type="text" value="000000"/>	Proposal Acronym <input type="text" value="VIT"/>
General Information		
Proposal Title	<input type="text" value="Vision for Innovative Transport"/>	
Duration in months	<input type="text" value="18"/>	Call identifier <input type="text" value="FP7-SME-2007-1"/>
Sector code(s) most relevant to your topic		
Sector code 1	<input type="text" value="Transport"/>	
Sector code 2	<input type="text" value="Information and Communication Technologies"/>	
Free keywords (industrial application)	<input type="text" value="intermodality, rail transport, container handling, swap body, video-surveillance, safety systems, automation"/>	
Free Keywords (S&T)	<input type="text" value="computer vision, 3D reconstruction, motion analysis, statistical learning, dynamic event recognition, process simulation and automation, OCR"/>	
Abstract (max. 2000 char.)		
<p>The VIT project (Vision for Innovative Transport) is about the development of computer vision technologies for an innovative system for intermodal shipment of containers and swap bodies across Metrocargo. This system will equip a network of terminals distributed at the tertiary connected by suburban freight lines. Containers will be transferred from one train to another (as for passenger traffic). Loading will be done horizontally under the electric feeding line, without shunting the train to a load yard with diesel traction. The time required to load a train will be about 40 minutes instead of the current 8-12 hours. It is foreseen that 10-15% of current long distance road traffic can be transferred to rail with comparable delivery time and lower transport costs. The modules developed within VIT will be integrated in Metrocargo. Computer vision is the key technology enabling the design and implementation of comprehensive and modular covering automation, safety and security. A high degree of automation guarantees the processing speed that makes the loading system practically viable and economically sound. In addition VIT will ensure human safety when human presence is detected in dangerous areas and records of the infrastructure. The scientific and technological objectives are the study, design and development of (i) a robust and redundant vision system for precise positioning of the lifting units for automatic load/unload, (ii) vision functionalities to check the correctness of train loading, (iii) an innovative prototype of a low cost 2D visual module to issue the train composition, (iv) a video-surveillance system to monitor off-board zones, (v) a system security infrastructure to detect and solve possible system failures. These goals will be reached through a balanced effort involving contributors from both the participating OMCs and the VIT technology plus industrial partners and their SMEs who represent and technological solutions related to the activity.</p>		
Similar proposals or signed contracts?		
a) Has this proposal (or a very similar one) been previously submitted to a call for proposals of the 7th EU RTD Framework Programme?	<input type="text" value="no"/>	
IF YES	-	
- please give the call identifier	<input type="text"/>	
- please give the proposal or contract number (if known)	<input type="text"/>	
b) Is this proposal (or a very similar one) currently being submitted to another call under FP7?	<input type="text" value="no"/>	
IF YES please give the call identifier	<input type="text"/>	

## VIT Project

- Aims of the EC-funded research project VIT are the study, design and development of:
  - a robust and redundant vision system for precise positioning of the lifting units for automatic load/unload
  - vision functionalities to check the correctness of train loading
  - an innovative prototype of a low-cost 2D visual module to scan the train composition
  - a video-surveillance system to monitor automatic operation areas where personnel should not enter
  - a system security infrastructure to detect possible system failures.

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## VIT Project

- Work has started on the first of June 2008 and is progressing rapidly. Significant progress has already been made on the most crucial component, the vision system that must identify the side slot of the container corner fittings and guide the lifting columns so they can lift the container.
- ILOG, through its controlled company Metrocargo Automazioni, is constructing a full scale mechanical prototype of a Metrocargo plant, with all significant components except the vision system for identifying the corner fitting. Mechanical tests will be performed manually until the vision system is developed within the VIT project.
- The mechanical prototype will be made available to the VIT project for development and testing

# Finmeccanica Group

- I.Log is a partner of FINMECCANICA for 2 Italian projects.  
The first project uses Metrocargo technologies in Ports.  
The second project uses Metrocargo technologies in City Logistics.



# Metrocargo testing

- The Port Authority of Savona has chosen to finance and test Metrocargo.
- The system will be the railway terminal of the new multipurpose platform in Vado Ligure that will be operated by APM Terminals of the Maersk Group

## Metrocargo, via libera alla sperimentazione

Via libera del comitato portuale alla sperimentazione del progetto Metrocargo. È stato un sì unanime quello espresso nella riunione di questa mattina per valutare attraverso un prototipo industriale la valenza del sistema innovativo che consente di spostare consistenti volumi di merci, di ridurre l'inquinamento ambientale mediante un minore utilizzo delle infrastrutture viarie e di far diminuire il costo complessivo della logistica consentendo un miglioramento dell'efficienza complessiva. L'annuncio dell'avvio della sperimentazione è stato dato ieri dal presidente Rino Canavese che ha spiegato l'utilità del nuovo servizio per container basato sul rapido trasferimento in orizzontale dei contenitori nell'ottica della costruzione della piattaforma multipurpose a Vado Ligure. "Il prototipo- ha detto Rino Canavese all'assemblea- sarà pronto per la metà di luglio. Lo sperimenteremo per verificarne il funzionamento in rapporto con l'esigenza che si verrà a creare a Vado con il nuovo terminal contenitori". Il progetto si basa su un terminal dotato di un sistema di caricamento orizzontale dei container sui vagoni ferroviari. Ogni contenitore viene appoggiato su uno speciale pallet, che scorre su un percorso con rulli motorizzati, che lo portano a bordo. In questo modo, il carico e lo scarico non necessitano di gru e risultano, quindi, più rapidi e sono controllati numericamente. Approvato dal comitato anche il bilancio consuntivo 2007 chiuso con un utile di tre milioni e 299mila euro e un avanzo di amministrazione di tredici milioni di euro. Come è stato sottolineato nella relazione dei



revisori dei conti, buono il contenimento attuato dall'amministrazione portuale savonese nel settore delle spese correnti, altrettanto coerente l'impegno negli investimenti. Ed è stata anche luce verde per la sottoscrizione del protocollo di intesa, alla firma il 5 maggio prossimo a Genova, tra le Ferrovie Spa, le Regioni Piemonte e Liguria, le Province di Alessandria e Savona, il Comune di Genova, la Fondazione Siala e le due Autorità portuali di Savona e Genova, oltre a Confindustria ligure e piemontese, per la realizzazione e la gestione dell'hub di Alessandria. In cambio il presidente Canavese ha chiesto e ottenuto l'impegno di Trenitalia la possibilità di ottenere il declassamento della linea ferroviaria da nazionale a portuale nel tratto fra Parco Doria e il porto per avere maggiore flessibilità nei servizi di trasferimento e manovra.

(23 aprile)



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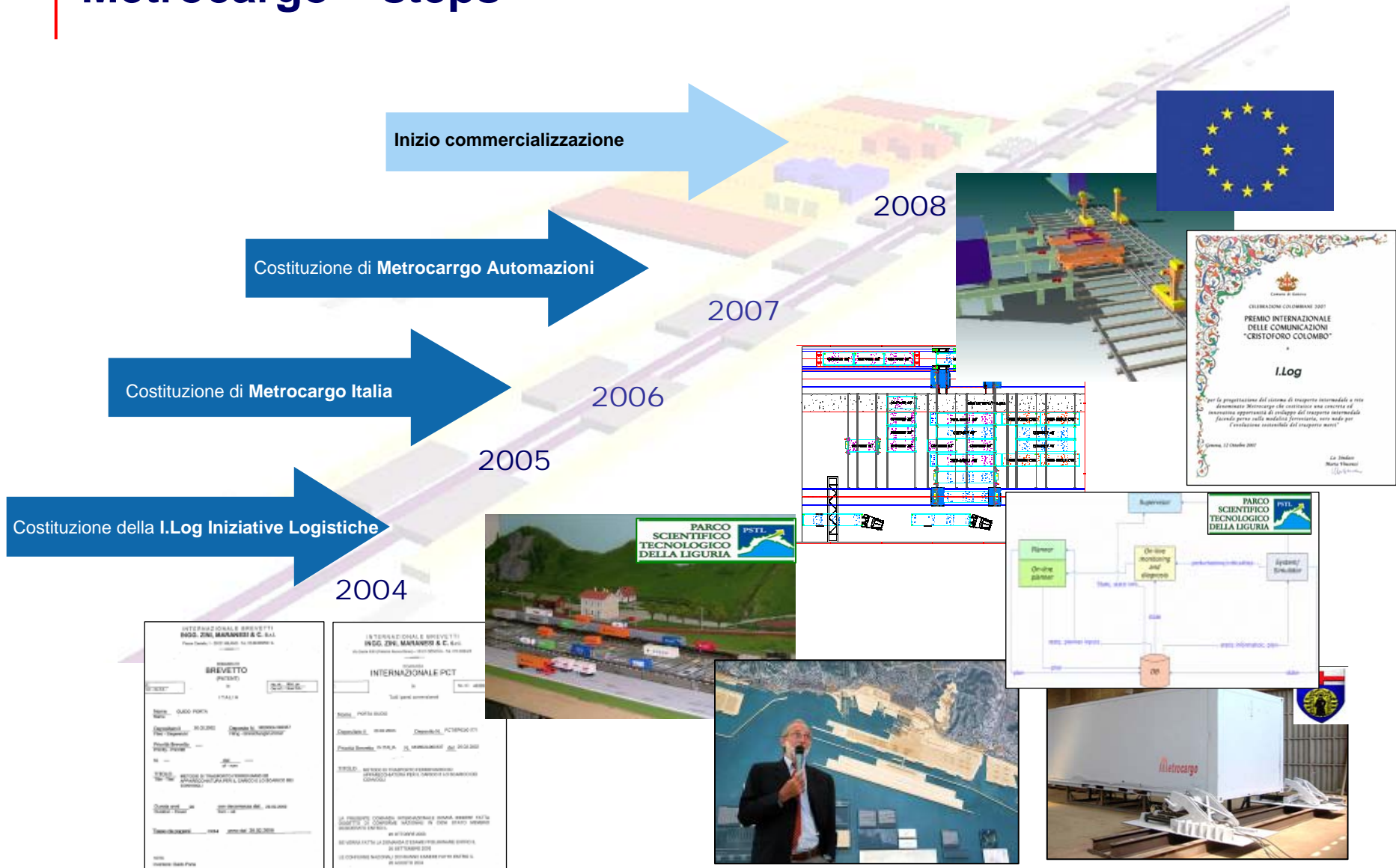
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## Metrocargo testing

- Testing will begin in July 2009.



# Metrocargo – steps



# Press Review

## Metrocarga a caccia di finanziamenti

INTERMEDIALITÀ. Progetto di sistema integrato

Il sistema di trasporto integrato Metrocarga, che prevede la connessione ferroviaria con il sistema stradale, è stato presentato in una conferenza stampa a Genova. Il progetto è stato presentato da un consorzio di imprese che include i maggiori operatori del settore. Il sistema è stato progettato per migliorare l'efficienza del trasporto merci e ridurre i costi. Il progetto è stato presentato da un consorzio di imprese che include i maggiori operatori del settore. Il sistema è stato progettato per migliorare l'efficienza del trasporto merci e ridurre i costi.

## Train unloading made simple

Two new intermodal systems may hold the key to improving road to rail connections writes Anzica Gireano

Il sistema di trasporto integrato Metrocarga, che prevede la connessione ferroviaria con il sistema stradale, è stato presentato in una conferenza stampa a Genova. Il progetto è stato presentato da un consorzio di imprese che include i maggiori operatori del settore. Il sistema è stato progettato per migliorare l'efficienza del trasporto merci e ridurre i costi.

## Il merci con le fermate

Container e casse mobili vengono caricati con un sistema orizzontale

FERROVIE. Presentato il progetto MetroCargo: vuol riportare sui binari il 5% del via strada

Il sistema di trasporto integrato Metrocarga, che prevede la connessione ferroviaria con il sistema stradale, è stato presentato in una conferenza stampa a Genova. Il progetto è stato presentato da un consorzio di imprese che include i maggiori operatori del settore. Il sistema è stato progettato per migliorare l'efficienza del trasporto merci e ridurre i costi.

## Metrocarga al debutto

Prime applicazioni nel retroporto di Albcro e nel terminal di Valdo

Il sistema sarà alla base di una rete di terminal automatizzati che si propone di rendere più efficiente, più veloce e meno costoso il trasporto delle merci attraverso il treno

Il sistema di trasporto integrato Metrocarga, che prevede la connessione ferroviaria con il sistema stradale, è stato presentato in una conferenza stampa a Genova. Il progetto è stato presentato da un consorzio di imprese che include i maggiori operatori del settore. Il sistema è stato progettato per migliorare l'efficienza del trasporto merci e ridurre i costi.

## UN METODO D'AVANGUARDIA PER DISTRIBUIRE LE MERCI

Metrocarga, il magazzino automatico

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## Metrocarga: un sistema per l'handling da ferro a gomma

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## Metrocarga on the horizon

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## Conclusions

- The project intends to become a new operating reality in the logistic field that, respecting the accounts equilibrium, will reach a relevant position in the italian intermodal transport and, in the medium term, will position itself among the most representative realities of the european logistic



producing a competitive advantage for Italy and the italian enterprises.

## ***Thank you for your attention***

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*Milano, 30 september 2008*