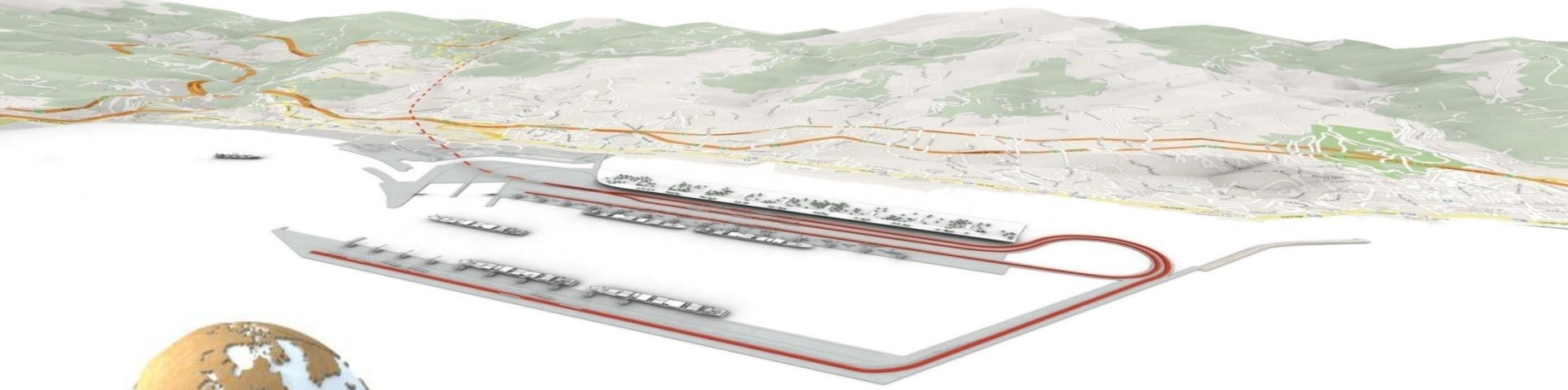


The Mediterranean gateway for the Silk Road: can Genova be the one?

Lugano, May 2018

Bruno Musso / Fabiola Mascardi

The dimensional jump of sea trafic and the new ports' characteristics and needs

Big oceanic ships demand to the ports:

High capacity and speed in handling: ports need today a loading/unloading speed of up to 8000 TEU per day against today's 2000 TEU per day of the best Mediterranean terminal, PSA. This speed is needed to ensure the handling of the big oceanic ships in and out in 5 days, as happens in the northern ports.

As a consequence:

Shangai/Genoa **today 40 days:** 20 navigation + 20 in port

Shangai/Rotterdam **today 30 days:** 25 navigation + 5 in port

Shangai/Genoa **tomorrow 25 days:** 20 navigation + 5 in port

This would mean for transport to Switzerland from China via Genova vs Rotterdam:

A)With norden Europe like handling time: Sea freight **-18%;**Total transit time **-17%;**

B) with present handling time: Sea freight **+10%;** transit time **+25%**

Alphaline has estimated the present extracost in **+500$** per TEU

The dimensional jump of sea trafic and the new ports' characteristics and needs

High port efficiency needs the ship to be loaded/unloaded only in 2-3 ports, each handling around **14000 TEU in/out.**

Frequency of lines departures: nowadays in the Northern EU ports, the trend is to evolve **from one arrival** of an oceanic ship line per week **to three times a week,** but there are already programs for daily departures.

This **high traffic concentration** has one important **consequence:** handling either 8000 TEU/day x 250 days or 14000 TEU per line three times a week will produce

with one only berth for one only line 2 Millions TEU per year

This correspond more or less to the whole capacity of the port of Genoa today.

As a consequence of this traffic concentration tendence only **3 only International groups** (2M, The Alliance and Ocean Alliance) cover already today about **90% of oceanic traffic**.

The dimensional jump of sea trafic: the ports' characteristics and needs

At least 3-4 berths for big oceanic ships: this brings the port capacity need per year to around **10 million TEU** (8 for oceanic traffic and 2 for mediterranean smaller transport, as today in Genoa) corresponding to:

Space for port handling: **500 hectares** (200 h. in Genoa today)

Nearby space for industrial activity: **3000 hectares**

Capacity of outflow: around **800 trains or 30.000 trailers**/day (against the nowadays 30 trains and 5000 trailers for Genoa)

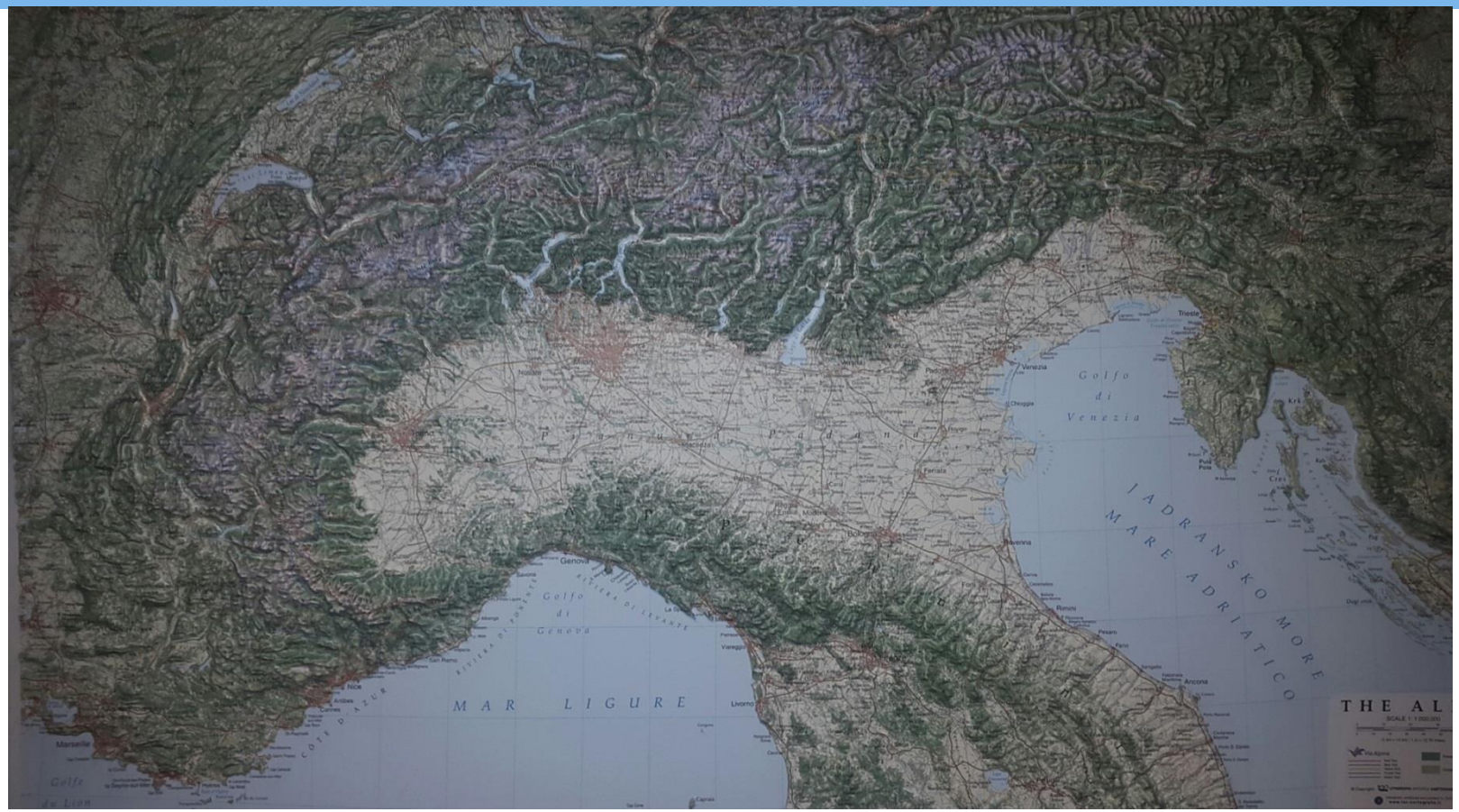
The 10-12 million TEU reference market: Pianura Padana, Switzerland and South Germany

Around the Mediterranean sea the **only market** with 8-10 million TEU which can justify lines with big oceanic ships is the one represented by Northern Italy, Switzerland and South Germany.

Nowadays just the Pianura Padana traffic of 8,5 million TEU is served as follows:

Alto Tirreno	5,0 million TEU	4 ports
Alto Adriatico	1,5 million TEU	4 ports
Nord Europa	2,0 million TEU	3-4 ports

The 10 million TEU reference market: Pianura Padana, Switzerland and South Germany



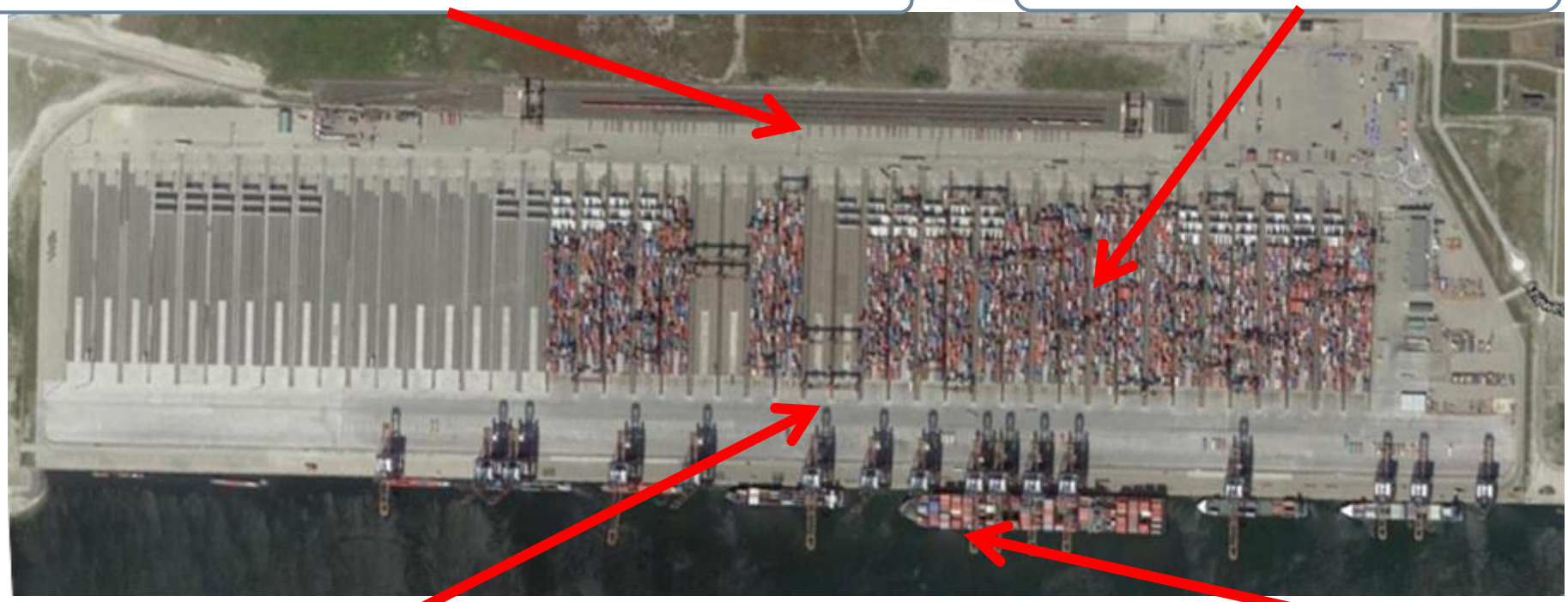
The **only possibility** to serve this market is to efficiently work on **putting together the deep water** of the Tirrenian sea and the **big space** for dry port and industrial usage available just over the Apennini mountains, in Pianura Padana.

How does a modern northern EU port work

Four specific organizational phases in port handling are needed:

Zone for loading/unloading trains and trailers

Zone for container deposit



Automatic Mechanism of TEU transport

Zone for ship load/unload

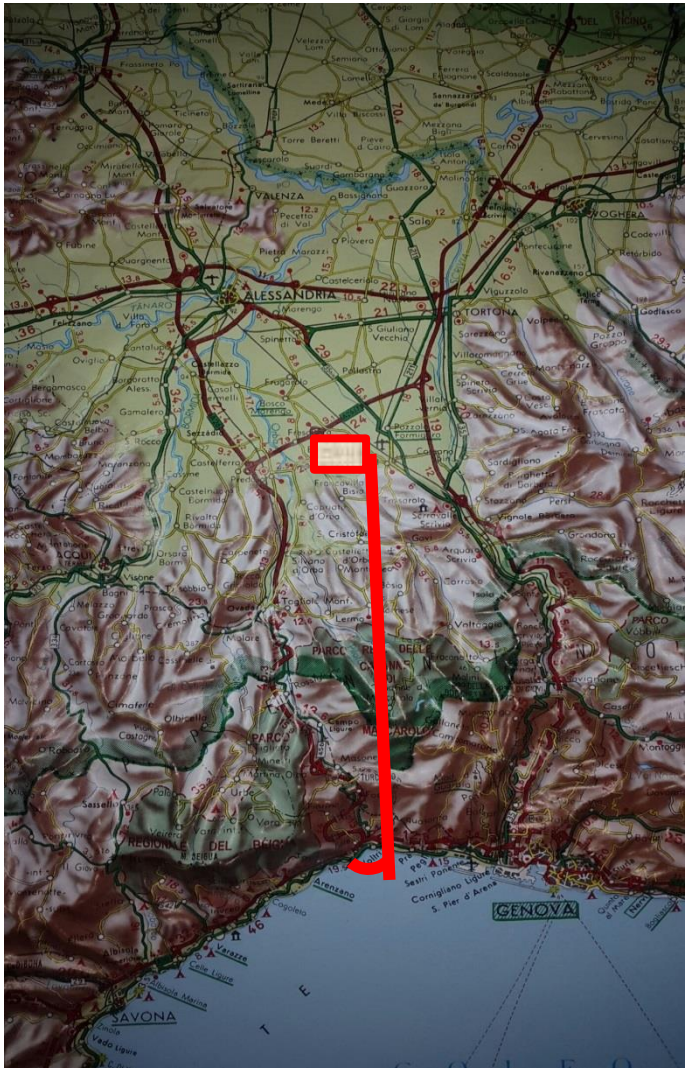
Can this same very efficient system be built in Genoa with its reduced port space?

A solution does exist : Bi-level Rail Underground for Containers Operation BRUCO

The Projet **BRUCO** (Bi-level Rail Underpass for Containers Operations) studied by the SiTI (Compagnia di S. Paolo and Politecnico University of Torino) with a group of genovese port operators implies:

A) a dedicated tunnel long 38 km
B) an automated rail system linking
C) the Genoa Pra existing port and
D) the dry port to be built in the Novi Ligure area.

During the building of the tunnel and the works to enlarge the dam up to 100m the PSA terminal could continue to work normally.



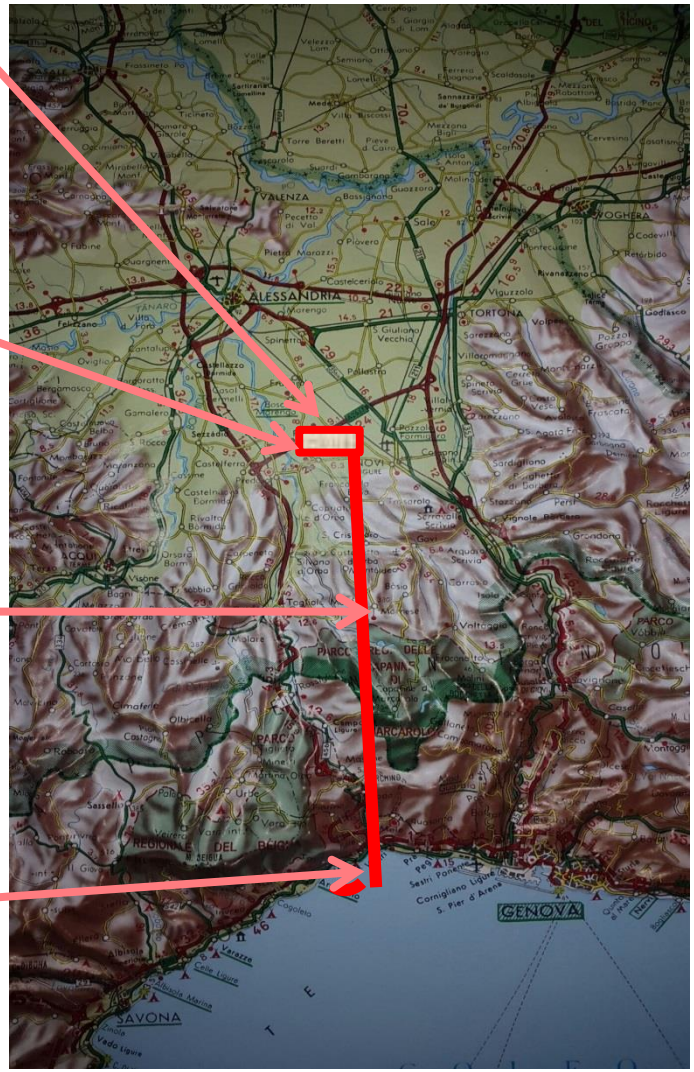
The solution: BRUCO in Genoa's port

Zone for loading/unloading trains and trailers

Dry port area in Novi L. – Basaluzzo: there are 900 hectares available for port and industrial operators (1.500 x 6.000 m.)

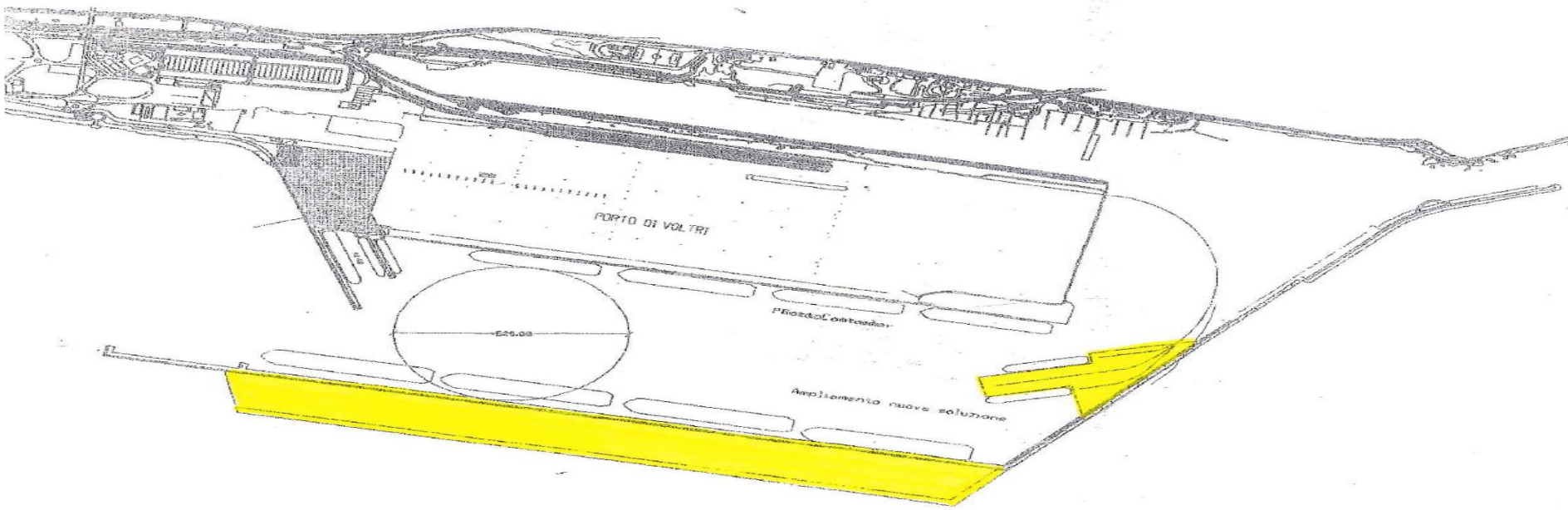
Rail dedicated tunnel 38 km long, with a completely automated mechanism for transporting 32 TEU/hour

Port of Genoa Prà/Voltri Ship handling facilities



BRUCO: Infrastructural works to be realized in the port of Genoa Pra (in yellow)

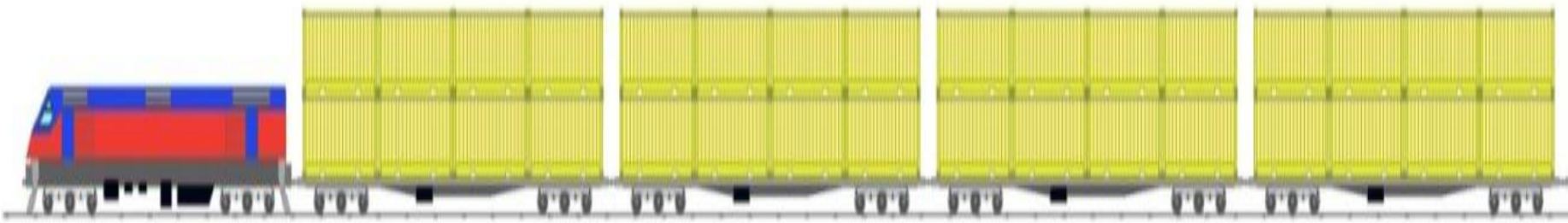
The **existing dam** must be **enlarged** towards the sea in order to become a new quay where the containers can be loaded/unloaded from the ship on and from the automated rail transportation system. The dam, 1600 m. long, has already a **draft of 20 m,** while the evolution area draft is 25 m.



Oceanic Berth: **1.600 m could allow 3-4 berths** with a potential of 6-7 million TEU traffic

Mediterranean berth: 2 smaller berths with a potentiality of 0,5-1 million TEU

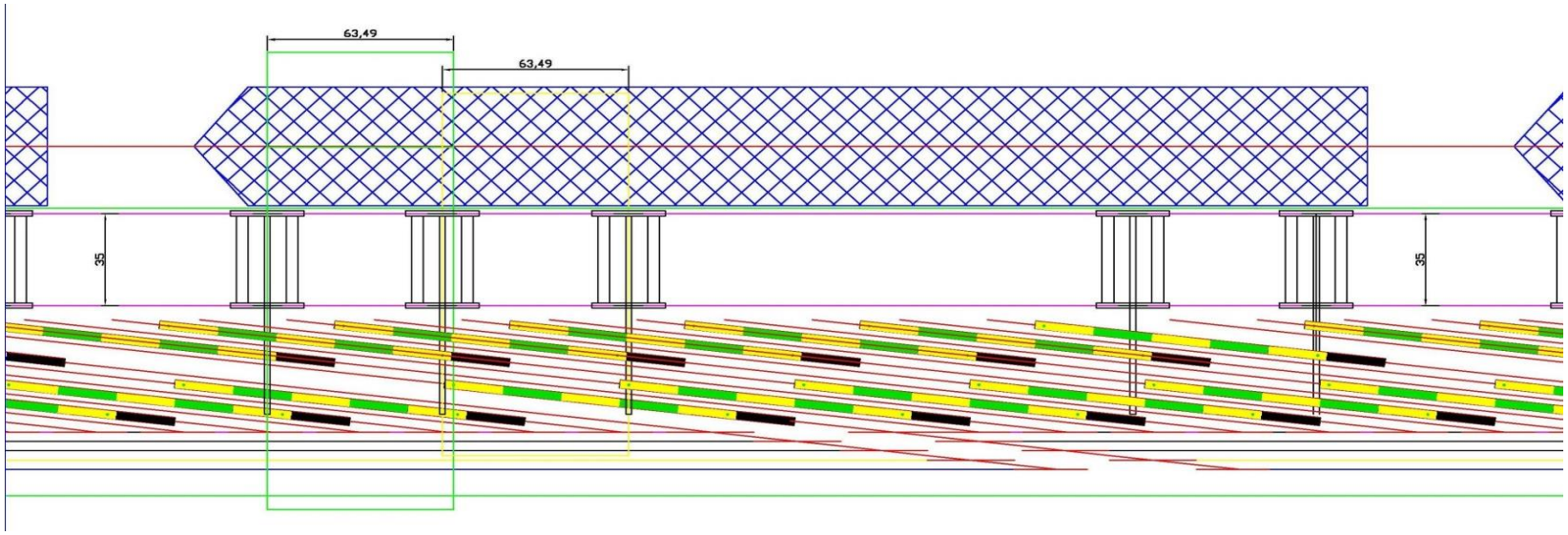
BRUCO: Authomated System to link the wet and dry port



- Special dedicated electric doubledeck rail system
- Speed around 40km/h
- To be loaded with 32 containers per shuttle
- Estimated journey time: around 1 h
- Potential transportation load: 10 million TEU/ year

BRUCO: Automatic system for loading/unloading the ship on the quay

The especially studied **automatic system for loading/unloading the ship directly on the rail navette**, and to **move the navette** along the 1600m long quay and within the tunnel, is meant to allow loading around 40 navette per hour distributed between 4 berths of 400 meters each, each equipped with 5 tower cranes.



Fonte: SiTI

BRUCO: can it be financed with private capital?

Estimated common infrastructure investment:

about **2 billion** Euro

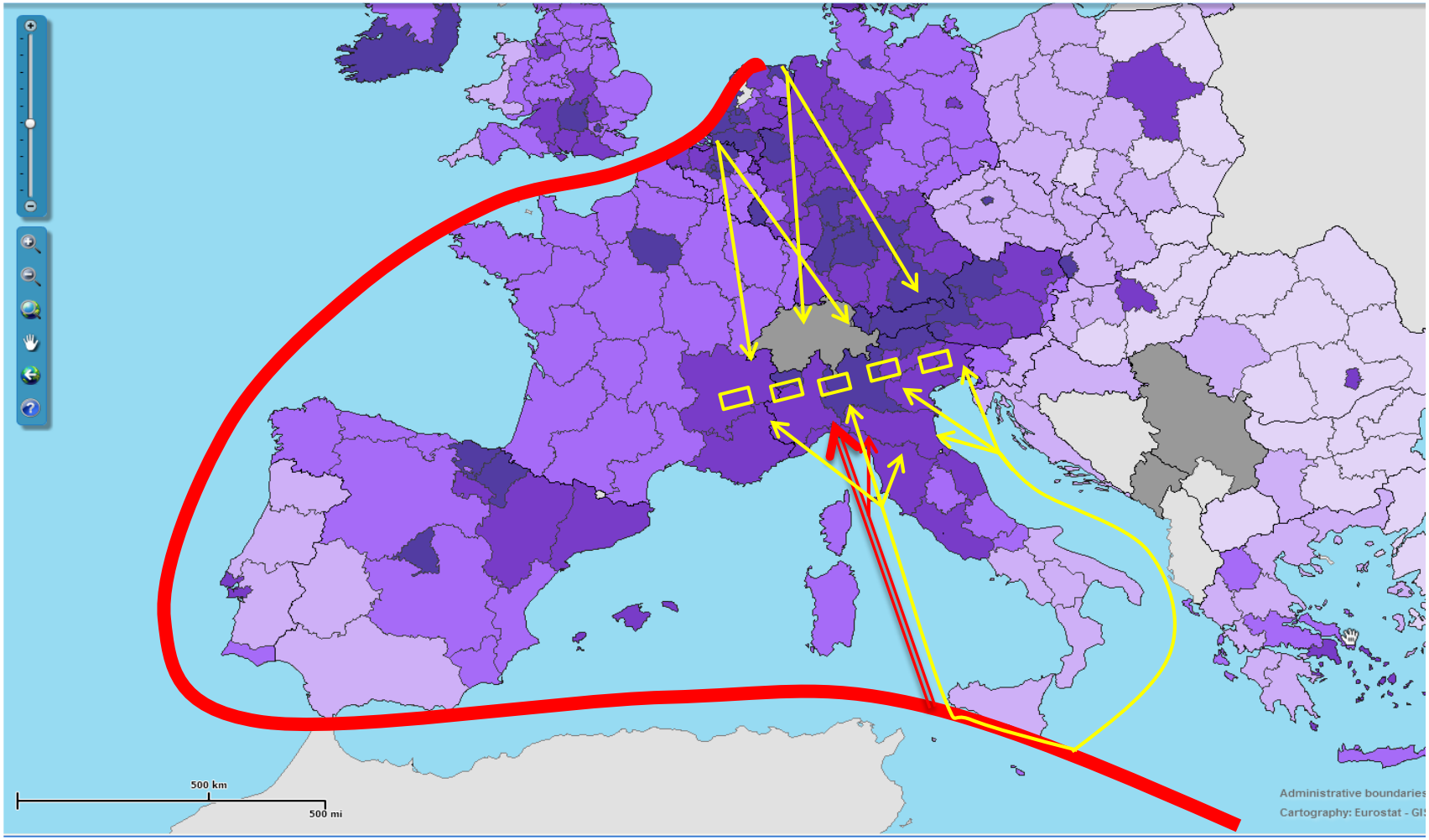
How to cover these?

Using the rail navette could ensure a **saving of around 60€** per container for the mountain stretch transportation with respect to the existing situation.

Calculating a **toll of 50 Euro per container** to be payed to use the new infrastructure would give an income of 200 million already at 4 million TEU/year transported, well under the infrastructure capacity.

This would ensure an interest on the capital invested of 10% per year, which renders the project interesting for private investors.

The silk road does not stop in the Mediterranean sea without BRUCO



The silk road has a gateway in the Mediterranean area: Genoa with BRUCO