

Vamp uP

Vado Multimodal Platform Intermodal
Connection Optimization and Upgrading



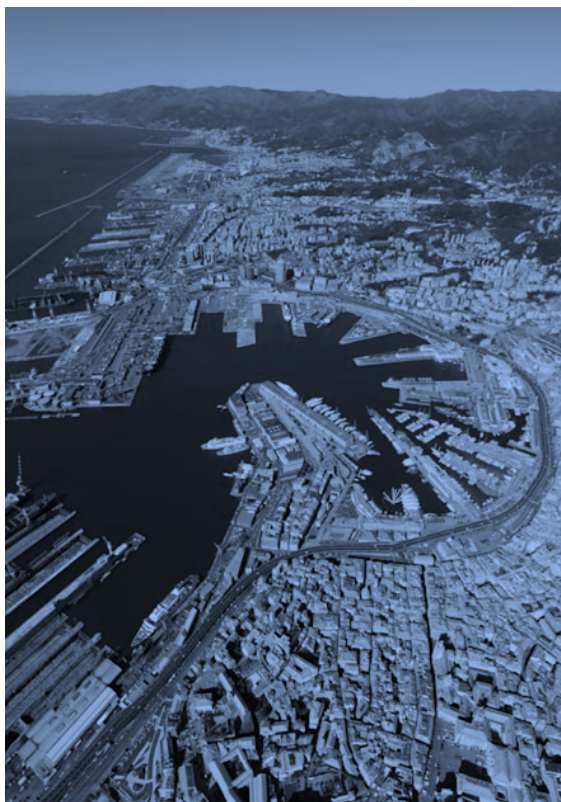
The role of intermodal transport for a sustainable supply chain

Oliviero Baccelli

in collaboration with Francesco Barontini and Lorenzo Angioi

29 October 2020





*Intermodality, Digitisation and Green Technology:
the European pathway of the Ports of Genoa.
Vamp Up & E-Bridge EU Projects*

The role of intermodal transport for a sustainable supply chain

- The growing relevance of an efficient and sustainable transport network for Northern Italy
- How to encourage sustainable transport policies
- The importance of the completion of TEN-T Corridors
- The role of intermodal railway transport for a sustainable supply chain
- The role of intermodal railway transport for an efficient supply chain
- Policy recommendations



The fundamental role of an efficient infrastructure transport network for minimizing the economic and environmental costs of international trades for the Italian economy, especially for the Northern part of it, is highlighted by clear trends of EU territorial indicators.

The increasing economic relevance of the participation at global value chains requires to give priority to enablers of efficient cargo flows

Export value of commodities on GDP

The part of the GDP related to the export for the Italian system is grown-up from 22,7% (2007) to 26,3% (2018). This value rises to 33,8% in the Northern regions (**7,5% plus than national average**)

Territorial Framework	2007	2012	2017	2018
Italia	22,7	24,2	26,1	26,3
Nord Italia	29,8	30,9	33,2	33,8
Veneto	34,3	34,8	37,9	38,9
Piemonte	28,9	32,1	36,1	35,1
Lombardia	30,6	31,0	31,5	32,6

Degree of commercial openness of the manufacturing sector

The degree of commercial openness of manufacture sector (i.e. participation to the global value chain) is in continuous increase regarding to the GDP, with record values in the North of Italia (**10,3 points plus than national average**)

Territorial Framework	2010	2017	2018
Italia	27,1	31,9	32,4
Nord Italia	36,1	41,9	42,7
Veneto	39,5	45,7	47,0
Piemonte	34,8	43,9	42,8
Lombardia	38,8	42,9	44,4

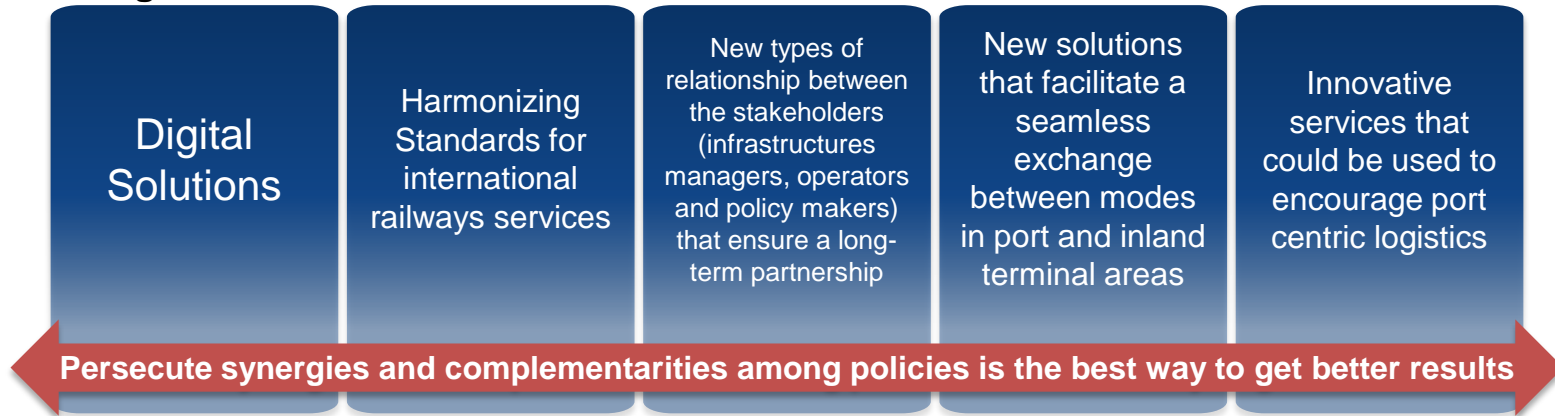




Specific multi-level types of policies are required by different needs coming from three different typologies of demand of freight mobility:

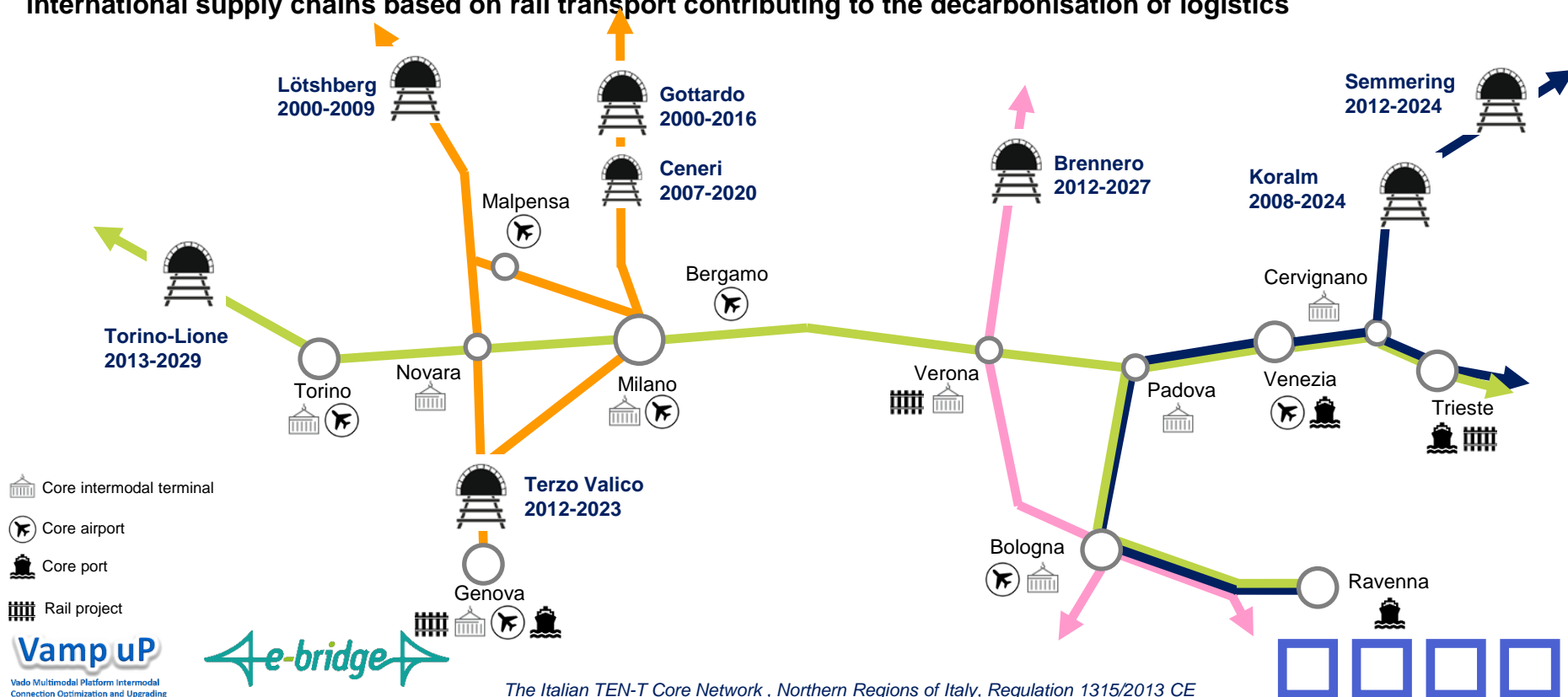
- **Intra-regional**
- **Interregional**
- **Cross border**

The three categories require different sustainable transport policies, that have to consider the peculiarities of the specific context (e.g captive vs competitive flows). The potential **enablers of efficient cargo flows** are:





Efficient rail connections going beyond local and national borders are crucial for European ports. The completion of TEN-T Corridors will generate a strong multimodal network on selected routes, increasing the efficiency of the international supply chains based on rail transport contributing to the decarbonisation of logistics



The case of an **efficient intermodal** services from Voltri terminal to a terminal in Bergamo area (740 meter long train with 21 wagons)- **2024 Scenario**
Important environmental benefits: 68,42 Euro per Intermodal Unit (40 feet container)= -53% total cost of externalities

Euro-cent per ITU*km	Road transport	Intermodal railway transport from Voltri	Differences
Accident (Euro-cent)	6.107,00	643,62	5.463,38
Air pollution (Euro-cent)	1.511,73	695,15	816,58
Climate change (Euro-cent)	1.425,60	194,40	1.231,20
Noise (Euro -cent)	2.639,00	3.562,76	- 923,76
Congestion (Euro -cent)	662,20	90,30	571,90
Well to tank (Euro-cent)	550,00	867,52	- 317,52
Total cost of externalities per ITU (Euro)	128,96	60,54	68,42

Door to door road service: 220 km

Door to door transport based on an intermodal railways service: 220 km by rail + 30 km by road

Specific Co2 emissions per transport mode – in EU



Source: European Environmental Agency, 2017

The case of **non efficient intermodal** services from Voltri terminal to a terminal in Bergamo area (550 meter long train with 16 wagons)- **2020 Scenario**
Still Important environmental benefits: 54,83 Euro per Intermodal Unit (40 feet container)= **- 43% total cost of externalities**

Euro-cent per ITU*km	Road transport	Intermodal railway transport from Voltri	Differences
Accident (Euro-cent)	6.107,00	699,44	5.407,56
Air pollution (Euro-cent)	1.511,73	697,70	814,03
Climate change (Euro-cent)	1.425,60	194,40	1.231,20
Noise (Euro -cent)	2.639,00	4.615,19	- 1.976,19
Congestion (Euro -cent)	662,20	90,30	571,90
Well to tank (Euro-cent)	550,00	1.115,19	- 565,19
Total cost of externalities per ITU (Euro)	128,96	74,12	54,83

Door to door road service: 220 km

Door to door transport based on an intermodal railways service: 220 km by rail + 30 km by road

Specific Co2 emissions per transport mode – in EU



Source: European Environmental Agency, 2017



The case of an efficient intermodal railways services from Voltri terminal to a terminal in Bergamo area (740 meter long train with 21 wagons). **2024 Scenario**

Limited financial benefits: 18 Euro per Intermodal Transport Unit (e.g. 40 feet container)

Door to door components	Euro per service
Railways cost (including infrastructure and electricity costs)	2.970
Wagons rent	1.260
Terminal lift costs	2.688
Port and terminal maneuvers	700
Pre o Post Haulage (IN o OUT)	3.150
Total cost of door to door intermodal service	10.768
Total cost of door to door service for single ITU in a case of efficient railways system with 42 ITU	256

Door to door road service: 220 km
Intermodal door to door service: 220 km by rail + 30 km by road

In case of short distances economies of scale are important in order to justify the organization of a more complex system and reduced flexibility of door-to-door services based on intermodal railways services compared to road services

Total Road transport cost (220 km and port terminal lift) per ITU	274
--	------------

Fonte: Elaborazioni PTSCLAS





The case of **non efficient intermodal railways services** from Voltri terminal to a terminal in Bergamo area (550 meter long train with 16 wagons)- **2020 Scenario**

Non existing financial benefits: -16 Euro per Intermodal Transport Unit (e.g. 40 feet container)

Door to door components	Euro per service
Railways cost (including infrastructure and electricity costs)	2.970
Wagons rent	960
Terminal lift costs	2.048
Port and terminal maneuvers	900
Pre o Post Haulage (IN o OUT)	2.400
Total cost of door to door intermodal service	9.278
Total cost of door to door service for single ITU in a case of inefficient railways system with 32 ITU and not efficient cost of maneuver in the port area	290

Total Road transport cost (220 km and port terminal lift) per ITU	274
--	------------

Door to door road service: 220 km
Intermodal door to door service: 220 km by rail + 30 km by road

Important opportunities for decarbonizing logistics require efficient railways infrastructure in order to have long train (5 more wagons make the financial difference) and efficient cost of maneuvers

Fonte: Elaborazioni PTSCLAS





In this context, the **European Union is pushing for increasing the efficiency of intermodal transport services based on rail transport and the Vamp-Up project** demonstrates the attention of the EU for this topic.

The management of a bridging period between a non-efficient and an efficient railways system needs some specific **tools to fulfil Port Authorities' role as a community manager**. Policy tools should **reduce cost difference between business as usual solutions and green solutions** in order to achieve the long term goals of decarbonizing logistics and decrease the costs of shipments through economies of scale and specialization.

A specific framework for state aids dedicate to support railways system could reach two specific goals:

- **In short term**, offer a more resilient system, contribute to the de-carbonization of logistic processes related to the port system and enhance the infrastructural investments already done.
- **In medium term** stimulating players to anticipate investments in locomotives, wagons and company culture, minimizing the risks of postponing the important growing opportunities for intermodal railways services **in long term**.



PTSCLAS Contacts



- **OLIVIERO BACCELLI**

Director of Master in Economics and Management of Transport,
Logistics and Infrastructures, Bocconi University Milan and Vice
President and Senior Advisor PTSCLAS - o.bacelli@ptsclas.com

- **FRANCESCO BARONTINI**

Senior Consultant PTSCLAS – f.barontini@ptsclas.com

WWW.PORTSOFGENOA.COM

