

4 - LOGISTICS AND INTERMODALITY

4.1 - The Logistics dimension of Corridor V

4.1.1 Logistics on AlpenCorS: opportunities for a new industrialization

- At the end of our work, our findings and story line:
 - The West Europe manufacturing deindustrialization is in process since time, with no way of return;
 - The Far East, particularly China, and the Indian Ocean economies are the world geographic areas where most of the manufacturing industry will locate;
 - In the freight interchange with Europe, the logistics industry located along the Corridor V is taking benefit of a natural competitive advantage (versus a location on other major European Corridors) due to its proximity to the Mediterranean ports.
- ... the story line:
 - Delocalisation, unemployment and other related social problems faced in the Corridor V regions could be balanced (partially) by a parallel growth of the logistics industry;
 - However the growth of the logistics industry can't be led solely by the private sector (even if involving mega logistics operators with adequate financial capacity). The public sector has to be involved too with major tasks:
 - To facilitate a parallel land use turnaround (basically of areas left by the manufacturing industry) for the location of logistic districts (warehouses for quasi manufacturing, freight forwarder terminals for consolidation and deconsolidation of freights, multimodal terminals, etc.);
 - To provide road and rail accessibility to these "new manufacturing locations";
 - To improve Mediterranean sea ports and airports and their accessibility.
 - The logistics industry seems then to represent an impressive tool to rebalance costs and benefits versus the delocalisation of the manufacturing industry of the regions along Corridor V;
 - But, as said, the turnaround from manufacturing to logistics it's a task of two subjects: not only of the private but also of the public sector to provide road, rail, port and airport infrastructures and to facilitate, through an innovative legislation, the land use turnaround (constrained by too many fragmented decision makers).

4.1.2 Manufacturing Industry Outlook

- Completed the desk work ... faced field interviews to manufacturing and to logistics operators and to key logistics nodal points.

4.1.2.1 Changing Factors and Logistics Requirements

- The manufacturing industry in West Europe is facing tremendous changes able to radically modify its logistics requirements by now and to years 2010-2015.

4.1.2.1.1 Delocalisation of Production

- Delocalisation of production is by far the most

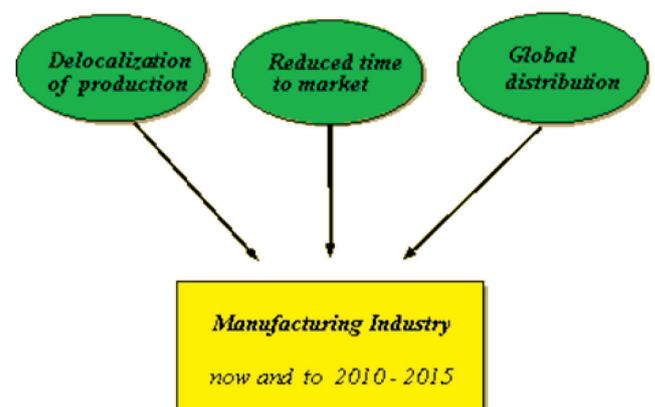
Figure 87. Logistics: Project Major Tasks



Source: IntiStudio's elaborations

boosting changing factor, involving not only large companies but also medium enterprises in all industrialized countries:

Figure 88. Major Changing Factors



Source: IntiStudio's elaborations

- World Foreign Direct Investments inflows increased from US\$ 200 billion in 1993 to US\$ 1,500 billion in 2000;

Table 20. Cumulative FDI Inflows 1999-2002 (billion US \$)

Cumulative FDI Inflows 1999-2002 (billion US\$)					
United States	758	Denmark	67	Israel	13
Belgium/Luxembourg	592	Italy	50	Russia	11
Germany	331	Switzerland	49	South Africa	11
United Kingdom	296	Argentina	39	Slovak Republic	8
France	191	Japan	37	Hungary	7
Netherlands	182	Australia	34	New Zealand	7
China	174	Poland	26	Turkey	6
Canada	140	Finland	26	Greece	3
Hong Kong	123	Czech Republic	25	Slovenia	3
Brazil	103	Korea	24	Lithuania	2
Spain	103	Austria	20	Estonia	2
Sweden	96	Chile	19	Iceland	1
Ireland	80	Portugal	18		
Mexico	67	Norway	17		

Source: IntiStudio on OECD data

- In 1999-2002, major destinations include large developed markets (USA, Germany, UK, France) as well as emerging countries (China, Hong Kong, Brazil, Mexico);
- In the AlpenCorS area:
 - Foreign manufacturing companies owned/participated by North Italian enterprises increased from 717 in 1988 to 2.200 in 2000 (+ 200%). Investments were mainly in East Europe and Far East;
 - In France, FDI outflows rose from US\$ 36 billion in 1990 to US\$ 177 billion in 2000 (+ 400%);
 - Slovenia, a net recipient of FDI, attracted during 1991-2000 US\$ 2,8 billion, mainly from Austria, Germany, France and Italy;
- For the future, the World Investment Report and international investment experts consider:
 - Delocalisation an irreversible process, continuing to grow as intense competition will persist, forcing companies to seek access to low-cost resources (particularly, labor);
 - China and India are the hot spots for FDI, followed by Thailand, Poland, Czech Republic, Mexico, Malaysia, Singapore and Republic of Korea.

4.1.2.1.2 Global Distribution

- Global distribution is... globalisation, geographic extension of inbound and outbound commercial relationships and internationalization of the supply chain.

- In the AlpenCorS area...:
 - Northern Italy:
 - Doubled annual exports during 1992-2003 (from € 84 billion to over € 185 billion), with a reduction of the EU share (from 62% to 54%) in favour of emerging markets (mainly East Europe and Far East);
 - Imports increased from € 82 billion to 176 billion, mainly from East Europe (+318%), Central Asia (+250%) and the Far East (+164%). Their cumulated share rose from 13% in 1992 to 20% in 2003;
 - France:
 - Exports grew from € 196 billion in 1994 to € 322 billion in 2002, principally to East Europe (+181%), Brazil (+165%), Turkey (+97%), China and USA (+50%);
 - Imports increased from € 192 billion to over € 320 billion, with East Europe and China increasing their relative importance. Today China is France's 8° foreign supplier;
 - Slovenia:
 - Exports increased by 52% during 1994-2002 (from US\$ 6,8 billion to US\$ 10,3 billion), with a rising relevance of East Europe and Balkans;
 - Imports grew at about the same rate (50%), in favor of some "traditional" partners (Italy and France) as well as of some "emerging" suppliers (particularly Spain, Poland, Hungary, Russia and China).

4.1.2.1.3 Reduced Time to Market

- Manufacturing companies are currently restructuring their supply chain due to globalisation of markets, proliferation of products with shorter lifecycles and to rising customer expectations;
- In restructuring their supply chain, companies pay increasing attention to time-to-market reduction, in order to be competitive and satisfy clients' needs:
 - Zara's time-to-market for new products (from design to delivery to stores) has been cut from several months to several weeks;
 - General Electric has reduced the lead-time (from order to delivery) of its electronics switches from 3 weeks to 3 days;
 - Motorola has reduced the lead-time of its "people-search" from 3 weeks to 2 hours.
- With a delivery time increasingly closer to production time, there is, in theory, no need for stocks ... in real time, dramatically less than before;
- And the need for manufacturing companies to avoid inefficiencies or interruptions in their supply chain has become more stringent... together with the pressure that they place upon transportation & logistic operators as "connecting subjects".

4.1.2.2 Where the Demand Goes

- Where the demand goes? ...East - West? North - South?
 - Whether the manufacturing industry of Western Europe is migrating towards the Far East regions to benefit of their booming and huge economies, these dominant changing factors are/will overcome the EU political issue of East-West integration;
 - ...and the available (scarce) financial resources will focus on the North - South improvements, despite the need to overcome rail and road bottlenecks in East - West relationships.

4.1.3 Logistics Industry Responses

- Faced field interviews to logistics operators and to key logistics nodal points.

4.1.3.1 Changing Factors and Logistics Responses

- Logistics, as a service, strictly follows the changing needs of manufacturing;
- The manufacturing is focusing on its core business, concentrating and outsourcing;
- Logistics is forced to keep the pace with concentration, growth of network and competition on the "one stop shopping" offer ... the growth of logistics mega operators.

4.1.3.1.1 Logistics Outsourcing

- The increasing complexity characterizing the manufacturing industry is progressively transferred to the

- Logistics outsourcing is expected to grow in scale and scope as restructuring of manufacturing and

Figure 90. Major Changing Factors

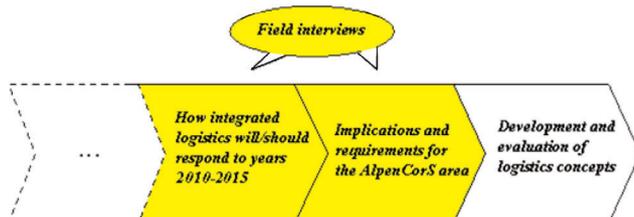


Source: IntiStudio's elaborations

distribution activities will force companies to concentrate on their core business and to seek improved performance in their logistics chains, using specialized operators.

- Today, logistics providers can look forward to increasing growth opportunities but, to be successful, they must provide more value-added services and become truly international, by strengthening their services worldwide.

Figure 89. Logistics: Project Major Tasks



Source: IntiStudio's elaborations

logistics operators, whose role is evolving from "simple" transportation suppliers to high value-added services providers who become partners in the supply chain management:

- Logistics is a growing industry ... during 1991-2000 the annual growth rate of Italian logistics sector was 5% compared to 1.7% of national GDP.

4.1.3.1.2 Growth of Logistics Mega Operators

- Such a pressure from the demand side implies an increasing level of concentration in the logistics industry, progressively controlled by mega-logistics providers that work to be the "one-stop-shop" for the manufacturing companies, through the enlargement of both services' range (road, rail, air, inter-modal transportation and quasi-manufacturing activities) and network
- The high number of M&A deals and partnership agreements confirms this trend:
- Typically, the logistics mega-operators limit as much as possible investments in real estate, in order to concentrate resources in the development of their core business (services & network) and to remain adequately flexible to capture new market opportunities.

4.1.3.2 Profile of the Logistics Industry Supply

- The logistics services supply is more and more structured as an industry with the major success factor

represented by the extension of geographic presence (network) tied to a demand growing global:

- ... and the infrastructure (the logistics platforms and their accessibility by rail, road...) is a key component of the service offered and key fidelization factor of a marketing strategy to be deployed by the regions willing to attract such an industry.
- Those AlpenCorS regions, unable to offer the required infrastructure to the logistics industry, remain and will necessarily remain transit areas ... charged by the economic and social costs of transportation, to

Table 22. Major partnership agreements during 2000-2001

Major partnership agreements during 2000-2001
- ABX & Blue Water
- Nexia & Dachser
- Schenker & Seino Transportation
- Italsempione, Dachser & Exel Logistique
- Géodis & France Télécom
- Schenker & Panalpina
- Stinnes & Deutsche Bahn
- Hays & Technologies
- TDG & Cap Gemini

Table 21. Major M&A operations during 2002-2003

Major M&A operations during 2002-2003	
Buyer	Acquired
Deutsche Post World Net (D)	DHL International Stock Express (F) Mayne Group Canada Inc (CA) R.P. Holding B.V. (NL) Danzas (CH)
Kuehne & Nagel (D)	OTC - Orient Transport Co (Egypt)
P&O (UK)	Branch of ProLogis (USA)
Wincanton Plc (UK)	P&O Trans European (UK)
Exel PLC (UK)	Power Logistics, Power Europe (USA)
Géodis (F)	Thales Freight & Logistics (F) ELIX (D)
Hays (F)	Groupeco (F)
Phoenix International Freight (USA)	Derwent Freight Services (UK)
Yellow Corporation (USA)	Roadway Corporation (USA)

Source: IntiStudio on ISFORT data

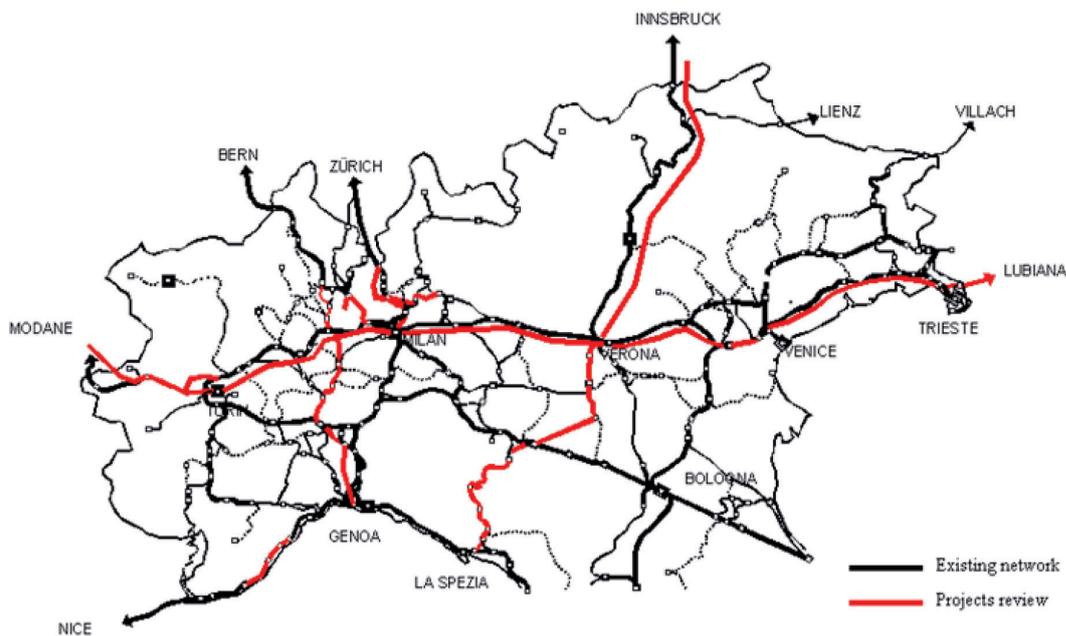
the benefit of other regions that such a needs will have satisfied.

4.1.4 Infrastructural Implications

- Consistently, with major factors of change impacting on the manufacturing and logistics industries: AlpenCorS, as the core area of Corridor V, needs infrastructures able to support and develop not only East-West relations but also accessibility to North-South (land, sea/ocean) relations, with efficient connections to inland terminals and seaports.

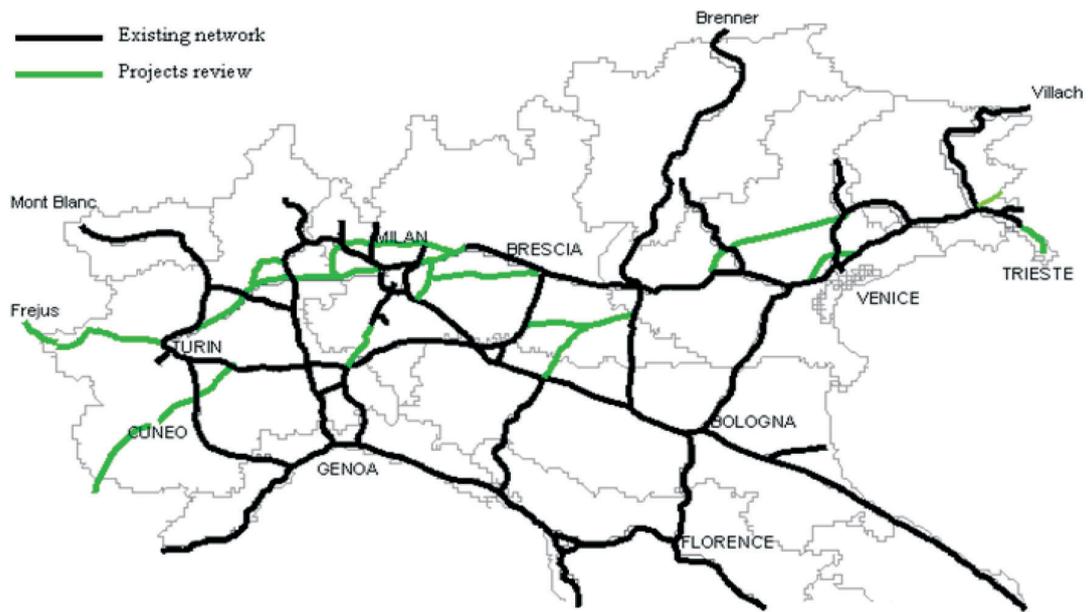
Source: IntiStudio on Federtrasporto data

Figure 91. Railway Network: Projects Review



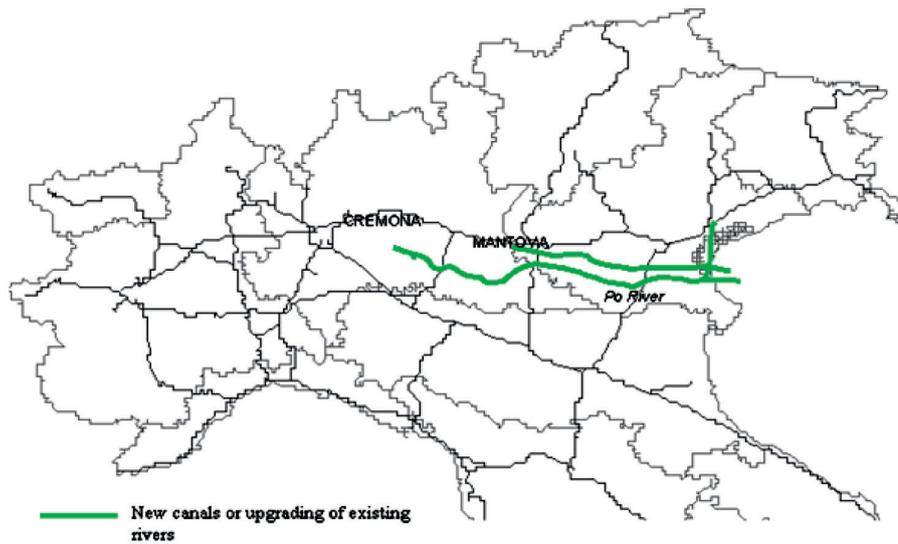
Source: IntiStudio on several sources

Figure 92. Highway Network: Projects Review



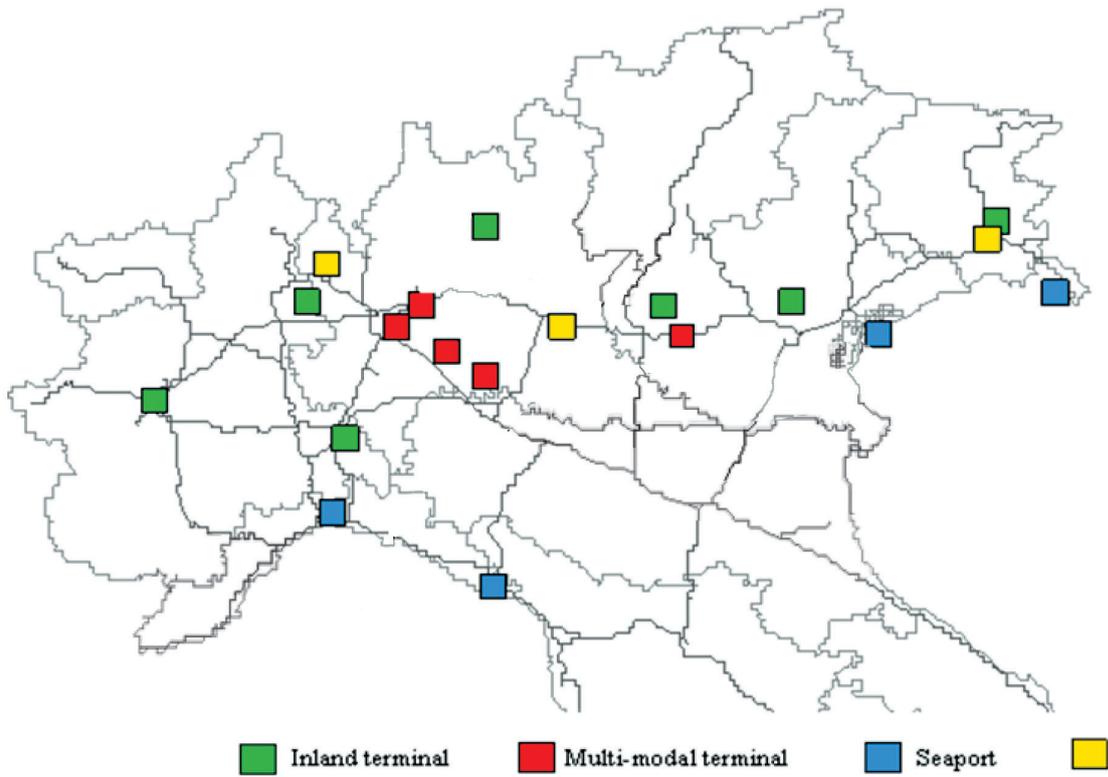
Source: IntiStudio on several sources

Figure 93. Waterway System: Projects Review



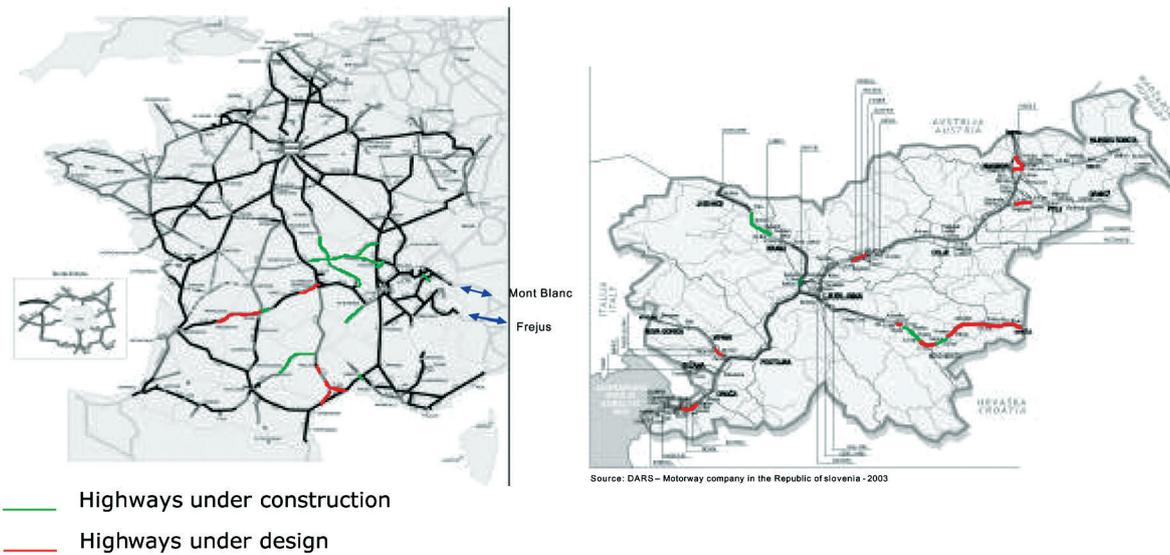
Source: IntiStudio on several sources

Figure 94. Terminals: New & Upgraded



Source: IntiStudio on several sources

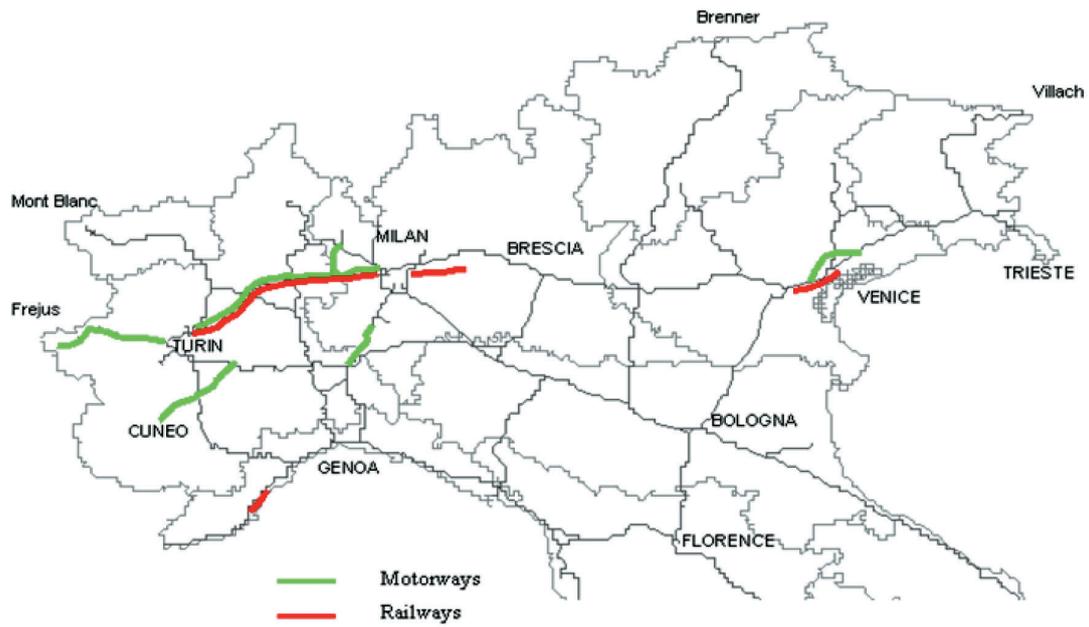
Figure 95. Boundary Regions: highway project review



Source: DARS – Motorway company in the Republic of Slovenia - 2003

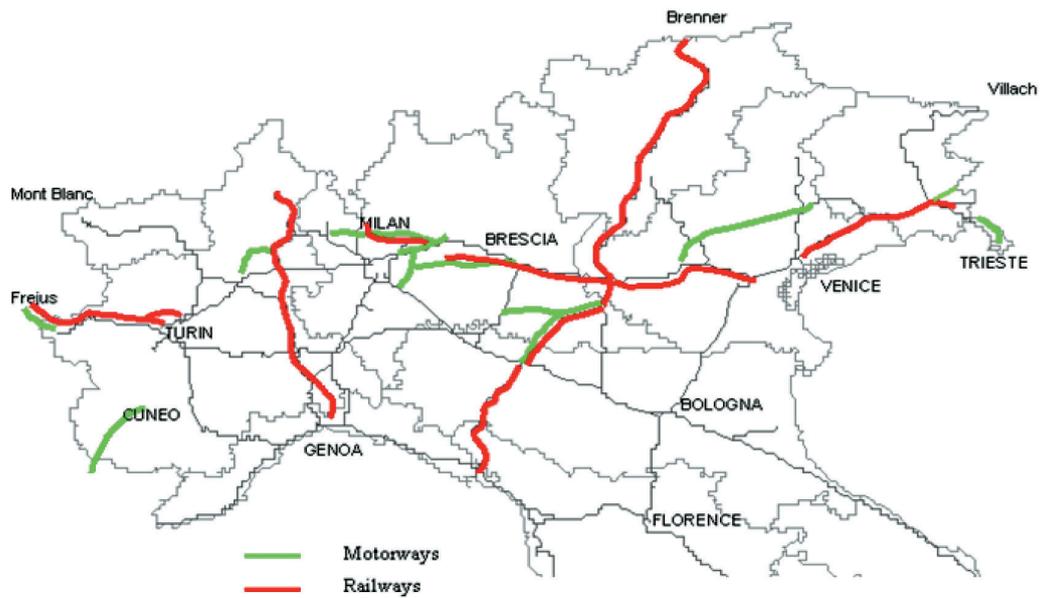
Source: IntiStudio on several sources

Figure 96. AlpenCorS : Short-Medium Term Scenario (<2010)



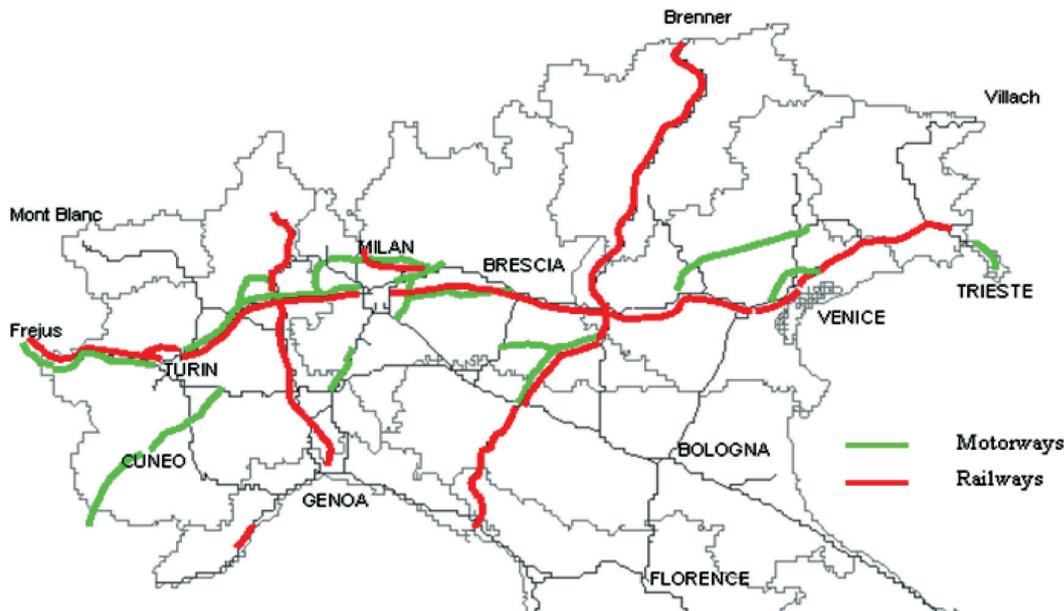
Source: IntiStudio on several sources

Figure 97. AlpenCorS : Long Term Scenario (>2015)



Source: IntiStudio on several sources

Figure 98. AlpenCorS : Global Scenario



Source: IntiStudio on several sources

4.1.4.1 Infrastructure’s Coherence in the AlpenCorS Area

- We have checked the infrastructure’s coherence in the AlpenCorS area trough the review of major projects for:
 - Rail
 - Highways
 - Water ways
 - Terminals (inland, seaport, airport)

4.1.4.1.1 Railway Network

- Major projects features:
 - High speed/high capacity line between Frejus Basis Tunnel and the Slovenian border (double track - 25kVAC - Interoperability standards) \pm 28.4 bn€;
 - Links to the northbound corridors and connections to Tyrrhenian ports (upgrading of existing routes) \pm 21.6 bn€;
 - By-pass of congested areas (Genoa, Mestre/Venice, Gronda Merici/Turin) \pm 2.6 bn€.

4.1.4.1.2 Highway Network

- Major projects features:
 - D. Solving the crossing of high density areas (new sections) \pm 7.9 bn€;
 - E. Increasing capacity on congested sections (third and fourth lane on existing sections) \pm 1.1 bn€;
 - F. New sections (with influence on the “AlpenCorS”) \pm 6.2 bn€.
- Is there coherence between the projected infrastructure in the AlpenCorS area and what the manufac-

turing and logistics industries are / will demand? Just partially!

4.1.4.2 Coherence exists mainly on the “spokes” (rail and highway connections)

- Rail is increasing network capacity on the major East-West and North-South links;
- Highway is overcoming bottlenecks, improving capacity on some congested links as well as around major metropolitan areas.

4.1.4.3 Lack of coherence for the “hubs” (terminals)

- Investments on terminals need to be improved where the demand is in place and will grow (i.e. in the Lombardy area);
- If AlpenCorS regions shouldn’t be just transit areas

Table 23. AlpenCorS: Planned Investments in the Italian Space

Transportation Mode	Billion of Euros	%
Railway	54.6	70.6
Road	20.3	26.3
Terminals	2.4	3.1
Waterway	marginal	marginal
TOTAL	77.3	100.0

Source: IntiStudio on several sources

but places where to locate logistics and “quasi manufacturing” activities as both the manufacturing and the logistics industries are asking for ...

- Attention and investments have to be focused on terminals (particularly, intermodal and logistics platforms).

4.1.4.4 Concluding

- Most of the infrastructure focusing on Italy (as core area of AlpenCorS regions) is planned... not financed;
- However, projects focus attention on links ... that's not enough;

- Delocalisation of production and global distribution enhance the role of logistics platforms, logistics district parks, multimodal terminals with high accessibility for freights;
- The AlpenCorS risk...
 - from present manufacturing area to just transit area... instead of a competitive region where to locate the growing logistics industry of Southern Europe.

Figure 99. Sibem: Its Location on the Map



Source: IntiStudio's elaborations

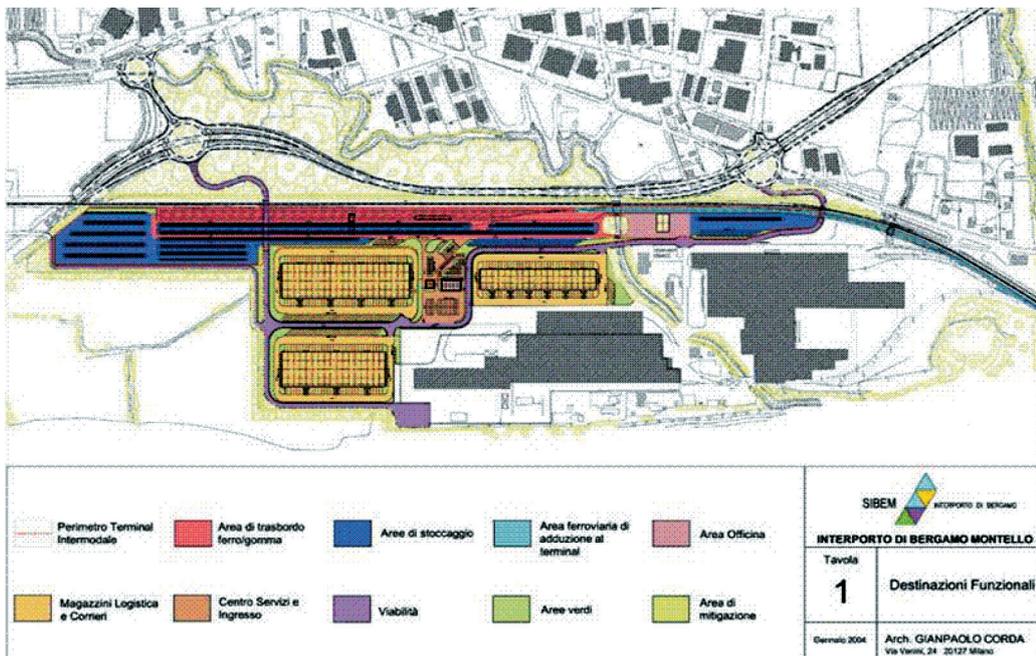
4.1.5 Land Use Constraints

- To take advantage of opportunities offered by the logistics industry, the AlpenCorS regions must face a parallel tough process of land use turnaround;
 - Closing of the obsolete manufacturing locations (due to the delocalisation) and opening of logistics platforms as the “new manufacturing locations”
- ...however, working not on “green field”, the task is really tough with many land barriers and political and social constraints.

4.1.5.1 A case history in the Lombardy region

- Lombardy, with the highest density of manufacturing industry in Italy, is still missing of logistics platforms joint to multimodal terminals since 1990, year of its logistics and transportation Master Plan ... and for Lacchiarella, a major infrastructure partially built, the Region has recently refunded the Central State for the received contributions due to

Figure 100. Sibem by Function (Intermodal and Logistics)



Source: IntiStudio's elaborations

the stop of the local decision makers (municipalities) to the construction of the multimodal terminal (as key infrastructure to support inside logistics activities and to relief the local territory from freight traffic congestion).

4.1.5.1.1 *The SIBEM case*

- Now, a new infrastructure it is at the eve of its opening: the Bergamo logistics and multimodal platform (SIBEM) ... but let's just outline the story;
- After 20 years, the first project was draft in 1984, the Lombardy Region was able to overcome local vetos introducing a new regional legislation (Conferenza di Servizi);
- The SIBEM project, recognized to be of "public interest", has been finally approved on October 2003.

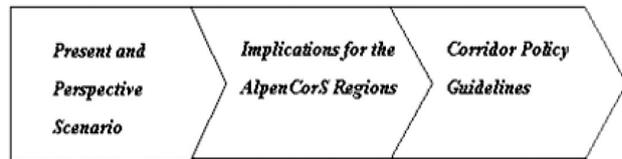
4.1.5.1.2 *Overcoming the Constraints*

- Not working on green field, and with the territorial turnaround as a must, the present fragmentation of decision makers requires:
 - The **government of the territory be consolidated from municipalities to an upper level** (i.e. Provinces and Regions), in order to face problems and opportunities at a territorial scale, large enough to balance the political, social and economic cost/benefits of any location of infrastructures for transportation and logistics;
 - To **implement an ad hoc legislation** (in the SIBEM case, the *Conferenza di Servizi*) to support and speed-up the territorial turnaround.

4.1.6 *AlpenCorS Logistics Master Plan: Summary and Results*

- **The Logistics System and its Dynamics.** With reference to the freight, the logistics has been conceived as a macro-system where the different elements of the service requested by the manufacturing industry (such as infrastructure, transportation, ICT, logistics know how, etc., as sub-systems) are interacting among them. Beginning from the present and perspective demand to years 2010-2015, IS has interpreted and gathered opinions (through interviews) on its implications for the logistics services offered, on the gaps to be closed, on the measures and policies to be implemented.
- **The Method of Approach.** At first, the logistics scenario has been built to years 2010-2015 through the identification and interpretation of the major changing factors affecting the demand and the offer of logistics. Then, the implications for the AlpenCorS regions has been drawn, as well as the

Figure 101. Logistics: The Method of Approach



Source: IntiStudio's elaborations

measures required to be competitive, as represented in the following figure

- **The results.** Consistently with the conceptual approach above represented, the scenario for the demand and for the offer has been built up, tested with the major logistics operators located in the AlpenCorS regions and drawn implications for their competitiveness. Bearing in mind the delocalisation processes in the manufacturing industry, focused mainly on the Indian and Pacific ocean areas (and to the derived relevant traffic flows addressed to the Tyrrhenian and Adriatic ports, offering to AlpenCorS a natural competitive advantage compared with other European corridors), it has been stressed the necessity for a system of logistics platforms, however in a land already deeply occupied. For these reasons, there is the need to implement norms to support that target (norms derived, as an example, from the Italian legislation for the so called "Legge Obiettivo") and for the provision of adequate financial resources to face investments, partly of them of public interest (the multimodal terminals). And through the way above outlined, measures and guidelines for their implementation have been identified and recommended. Among them: priority of attention to the recovery and conversion of dismissed industrial areas, as a consequence of the delocalisation processes on the way; activation of a sort of a territorial outplacement for the identification of areas and infrastructures useful for the logistics industry (where the accessibility via road and rail, first of all, represents a plus); start up of a sort of agency for the logistics (area by area) structured as an enterprise where the private interests (represented by the real estate companies) match with the ones of the subjects in charge for planning and the control of the territory (the local authorities), both of them as stockholders of that sort of agency.

4.2 - Intermodal transport

- A transport corridor, like the Alpen Corridor South could be seen as the ideal basis for setting up the

Table 24. Sources for Infrastructure's Coherence in the AlpenCorS Area

Institutions/Companies	Documents/Sources
CIPE - Comitato Interministeriale per la Programmazione Economica	<ul style="list-style-type: none"> • Delibera 121 del 2001 (Allegati 1, 2) • Delibera 92 del 2002 • Delibere 10, 22, 78, 79, 80, 113 del 2003 • Delibera 6 del 2004;
UNIONCAMERE LOMBARDIA - TRAIL	<ul style="list-style-type: none"> • Sistema informativo sulle infrastrutture di trasporto in Lombardia (Web Site: www.lom.camcom.it/trasporti/trail)
RFI - Rete Ferroviaria Italiana	<ul style="list-style-type: none"> • Contratto di Programma 2001-2005: Piano di Priorità degli Investimenti, edizione 2002
LTF - Lyon Turin Ferroviaire	<ul style="list-style-type: none"> • Web Site: www.ltf-sas.com
TRANSPADANA	<ul style="list-style-type: none"> • Web Site: ww.transpadana.org
MILANOMARE - MILANO TANGENZIALI SpA	<ul style="list-style-type: none"> • Progetti e servizi. Progetti e cantieri (Web Site: www.serravalle.it)
REGIONE VENETO	<ul style="list-style-type: none"> • Territorio e ambiente. Lavori Pubblici (Web Site: www.regione.veneto.it)
FONDAZIONE NORD EST	<ul style="list-style-type: none"> • "La ferrovia Trieste-Lubiana", 1 aprile 2004. Osservatorio Infrastrutture. (Web Site: www.fondazione Nordest.net)
TAV SpA	<ul style="list-style-type: none"> • Web Site: www.tav.it
AUTOSTRADIE PER L'ITALIA SpA	<ul style="list-style-type: none"> • Nuove opere (Web Site: www.autostrade.it)
FEDERPIEMONTE	<ul style="list-style-type: none"> • Settore Urbanistica e Territorio (Web Site: www.federpiemonte.org)
S.I.TO - Società Interporto di Torino	<ul style="list-style-type: none"> • Web Site: www.interporto.it/torino.
ANAS SpA	<ul style="list-style-type: none"> • Grandi Opere (Web Site: www.enteanas.it)
UNIONCAMERE PIEMONTE - TRAIL	<ul style="list-style-type: none"> • Web Site: www.trail.pie.camcom.it • Web Site: www.pie.camcom.it • "I progetti strategici della Legge Obiettivo" per AV Torino-Lione, cintura merci di Torino, AV/AC Milano-Torino e Milano-Genova, Valico dei Giovi, CIM Novara, Autostrada Asti-Cuneo (Web Site: regione.piemonte.it/trasporti/progetti)
REGIONE LOMBARDIA	<ul style="list-style-type: none"> • Direzione Regionale Infrastrutture e Mobilità. Aree tematiche: Merci e logistica; infrastrutture ferroviarie (Web Site: www.trasporti.regione.lombardia.it)
IL SOLE24ORE - EDILIZIA E TERRITORIO	<ul style="list-style-type: none"> • Edilizia e Territorio n. 15/2003 e settimanale del 11-25 agosto 2003

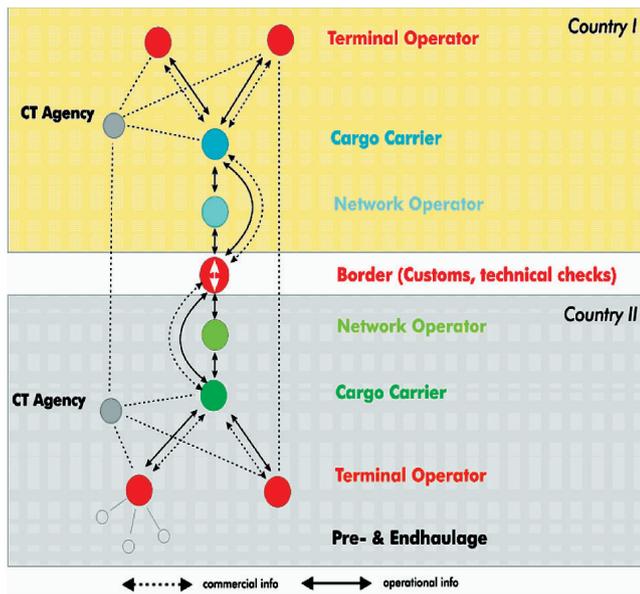
Source: IntiStudio's elaborations

- framework for a sustainable transport development.
- The development of a Corridor development strategy, reflecting the interests of all different stakeholders within this corridor region could be seen as a first step towards reaching the main objective for intermodality within AlpenCorS:
 - "Intermodal transport as a competitive (quality and monetary) alternative for the road transport of goods in the Alpen Corridor South Region"
 - The aim of AlpenCorS project is to identify the present regulative, administrative, technical, language

and spatial problems in the AlpenCorS Area leading to lack of intermodality, interoperability and interconnectivity in the interregional cross-border transport logistics.

- As its main objectives the project will attempt to find solutions for reducing these problems and for developing an interregional cross-border intermodal logistics concept.

Figure 102. Operating levels in international intermodal transport



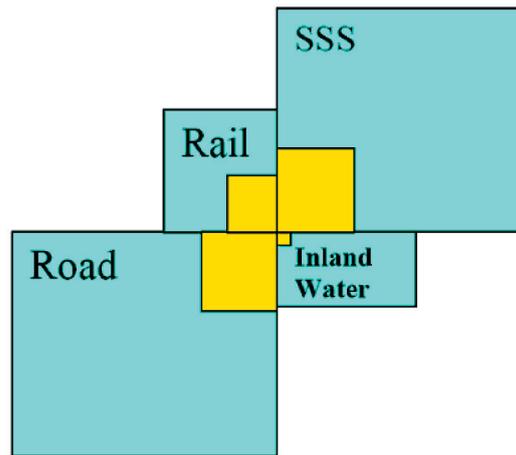
Source: Herry Consulting GmbH, 2004

4.2.1 Current status and global trends in intermodal transport

4.2.1.1 General Remarks

- In general, the role of intermodal transport has been growing significantly over the last years driven by a variety of factors such as environmental, safety, energy restrictions and others.
- Moreover, the need to provide a higher level of service to the customers of the transport industry poses new challenges to the operators or service providers, to further explore and exploit the use of different transport modes.
- Intermodal freight transport could be seen as an important prerequisite for sustainable freight transport within the Alpen Corridor South.
- The following figure shows the universal form of an exemplary intermodal border-crossing transport chain:
 - Within such an intermodal chain the load is hauled from the shipper to the consignee, usually the pre- and end-haulage is performed by truck and the main-haulage by a non-road mode (such as rail-haulage, inland waterways or short-sea-shipping);
 - Generally it is possible, that there are more than on modes used for main-haulage and also more than two terminals integrated in such an intermodal chain.

Figure 103. Relative size of the European market for intermodal transport



Source: Recordit, 1996

4.2.1.2 Current status

- Freight transport in EU – “now” (2001, in bn t-km):
 - Road: 1.395 (46%)
 - Rail: 242 (8%)
 - IWW: 125 (4%)

Table 25. International intermodal Transport volumes by source and destination

Origine	Destinaz.	TEU	% su totale UE	% Cumulata
D	I	830.158	20,36%	20,36%
A	D	496.474	12,18%	32,54%
B	I	441.546	10,83%	43,37%
A	H	250.291	6,14%	49,51%
I	NL	185.232	4,54%	54,05%
F	5	175.374	4,30%	58,36%
CH	D	173.594	4,26%	62,61%
CZ/SK	D	166.773	4,09%	66,70%
D	E	120.920	2,97%	69,67%
A	SI	108.976	2,67%	72,34%
DK	I	107.204	2,63%	74,97%
A	I	83.524	2,05%	77,02%
D	H	76.677	1,88%	78,90%
CH	I	73.289	1,80%	80,70%
B	CH	62.817	1,54%	82,24%
CH	NL	60.119	1,47%	83,72%
B	F	46.116	1,13%	84,85%
B	SI	45.182	1,11%	85,96%
D	DK	35.872	0,88%	86,84%
D	PL	35.844	0,88%	87,71%
Totale		3.575.982	87,71%	
Totale UE		4.076.827	100,00%	

Source: UIRR, EUROSTAT, 2004

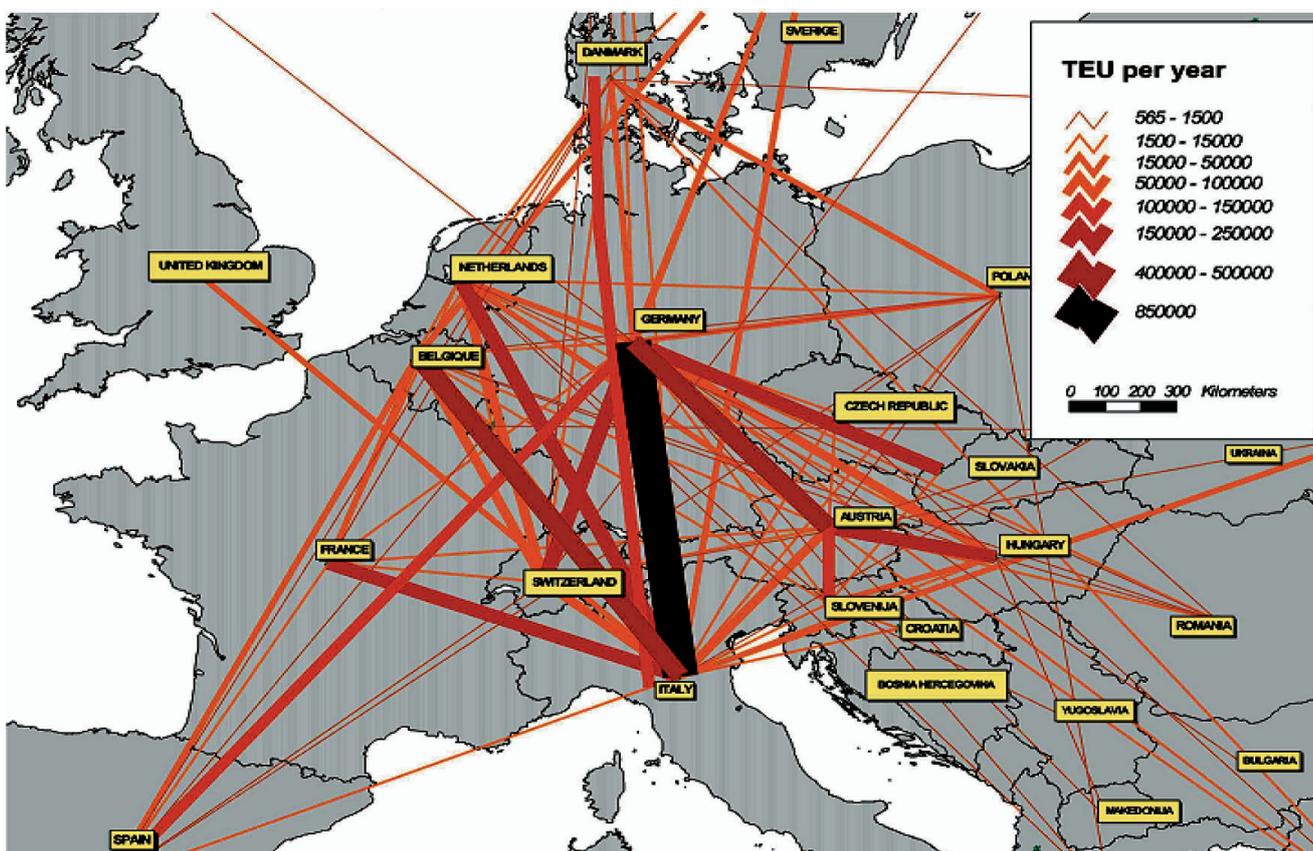
- SSS: 1.254 (42%)
- The main relations in intermodal transport are mainly North-South connections – especially from Italy to Germany (830.000 TEU per year, 20% of shipments in Europe), Italy and Belgium (440.000 TEU, 11% of European shipments) or Italy and the Netherlands (5% of shipments);
- Germany, Italy, Austria, Belgium and Switzerland are the main players in European intermodal transport by rail: Germany and Italy have each a share of about 25% on intermodal transport (accompanied & unaccompanied) by Rail – about 2 Mio. TEUs have been transhipped by origin or destination in these countries;
- Intermodal transport is concentrating on large flows across Europe – main N-S relations crossing the alps as Gotthard and Brenner;
- Demand for East-West intermodal transport is rather low because it is not competitive to other modes (e.g. due to rail infrastructure bottlenecks,...);
- Generally there is a steady growth in the number of shipments in the intermodal transport since the 1970s – from about 300.000 in 1970 to about 2.5 million shipments per year according the UIRR members;

Table 26. Global traffic volumes of Teus by country

Stato	TEU	% su totale UE	% Cumulata
D	2.028.858	25,3%	25,3%
I	2.003.029	25,0%	50,3%
A	987.893	12,3%	62,7%
B	648.391	8,1%	70,8%
CH	405.182	5,1%	75,8%
H	371.837	4,6%	80,5%
NL	316.599	4,0%	84,4%
F	276.660	3,5%	87,9%
DK	265.053	3,3%	91,2%
E	173.134	2,2%	93,3%
CZ/SK	170.175	2,1%	95,5%
SI	165.157	2,1%	97,5%
SI	116.349	1,5%	99,0%
PL	81.238	1,0%	100,0%
Totale UE	8.009.555	100,0%	

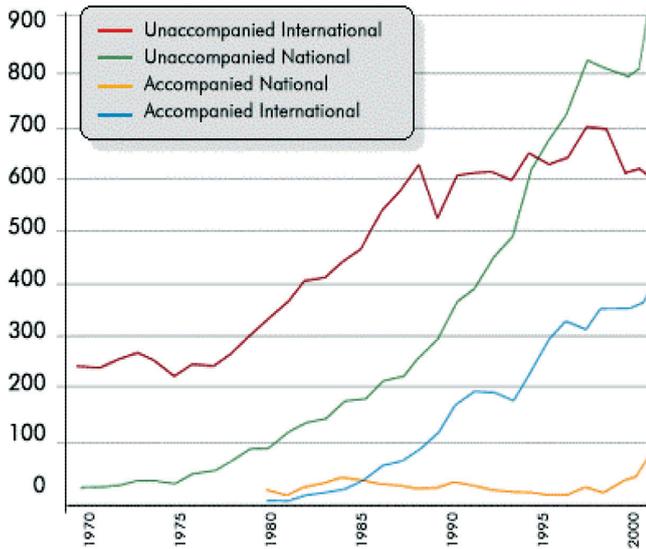
Source: UIRR, EUROSTAT, 2004

Figure 104. International Intermodal Rail Transport Flows (UIRR & ICF) in Europe in TEU/year



Source: Harry Consulting GmbH, 2004

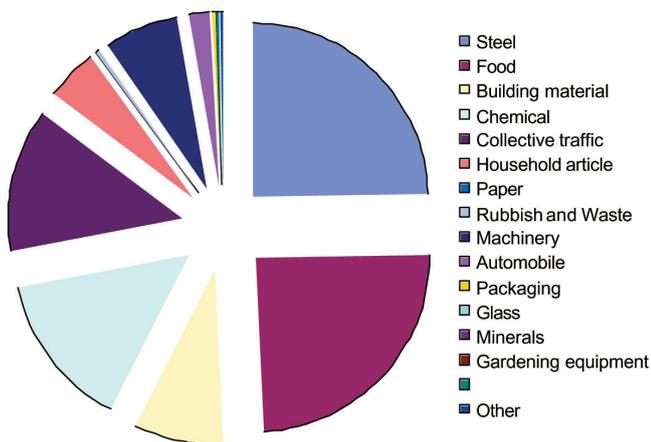
Figure 105. Intermodal transport growth between 1970 and 2000 (1,000 of Teus)



Source: UIRR, 2000

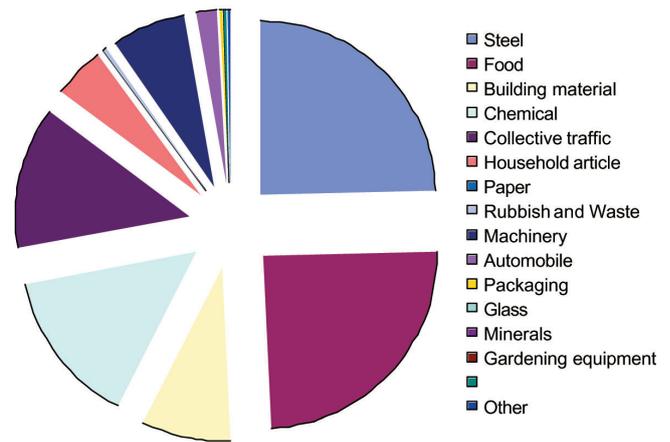
- It is remarkable that the unaccompanied international traffic is stagnating (including some ups and downs) since the late eighties – the development of the unaccompanied national traffic was increasing very quickly;
- Obviously accompanied intermodal transport is less important to unaccompanied – this is mainly caused by economical reasons like the use of the tractor somewhere else to increase productivity;
- Shipments related to the Alpine Corridor South (Corridor V) have a share of about 15% of the

Figure 106. Shares of goods per commodity group from Italian terminals to D, B, F, DK, UK



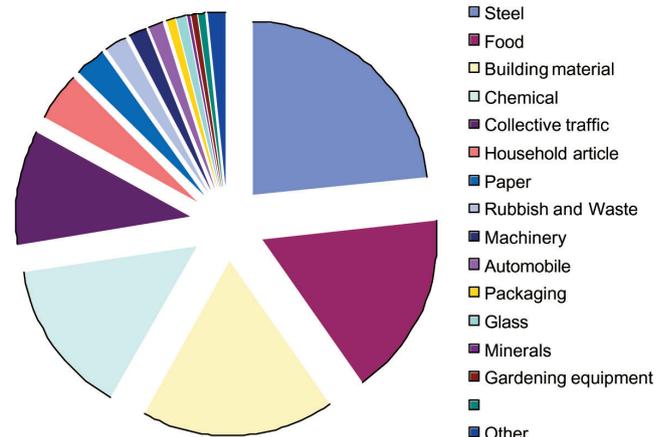
Source: CEMAT, 2003

Figure 107. Shares of goods per commodity group from Italian terminals to A, SL, H, PL



Source: CEMAT, 2003

Figure 108. Shares of goods per commodity group from Italian terminals to D, B, F, DK, UK, A, SL, H, PL



Source: CEMAT, 2003

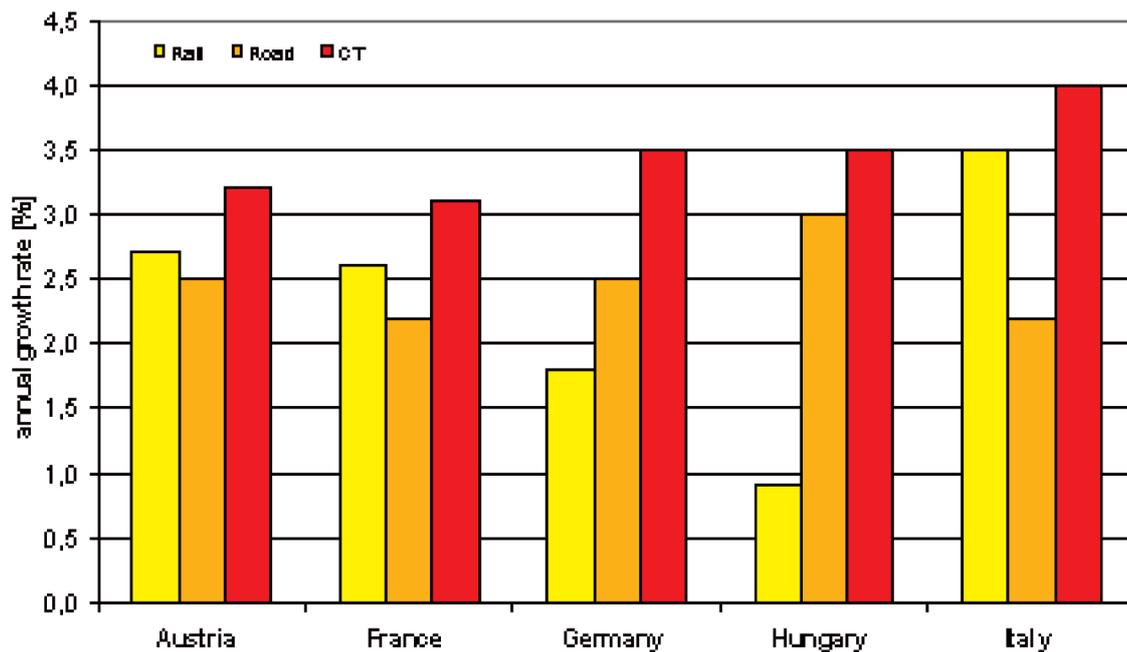
whole European rail related intermodal transport;

- Main relations are between Italy and France, Italy and Austria and the rolling-road between Austria and Hungary.

4.2.2 Trends and Future Development

- Main general aspects in the future of Intermodal transport:
 - Enhanced and stabilized quality of service (punctuality, consistency)
 - Customer-driven transit times
 - Supply of seamless trans-European intermodal services (esp. E<>W)

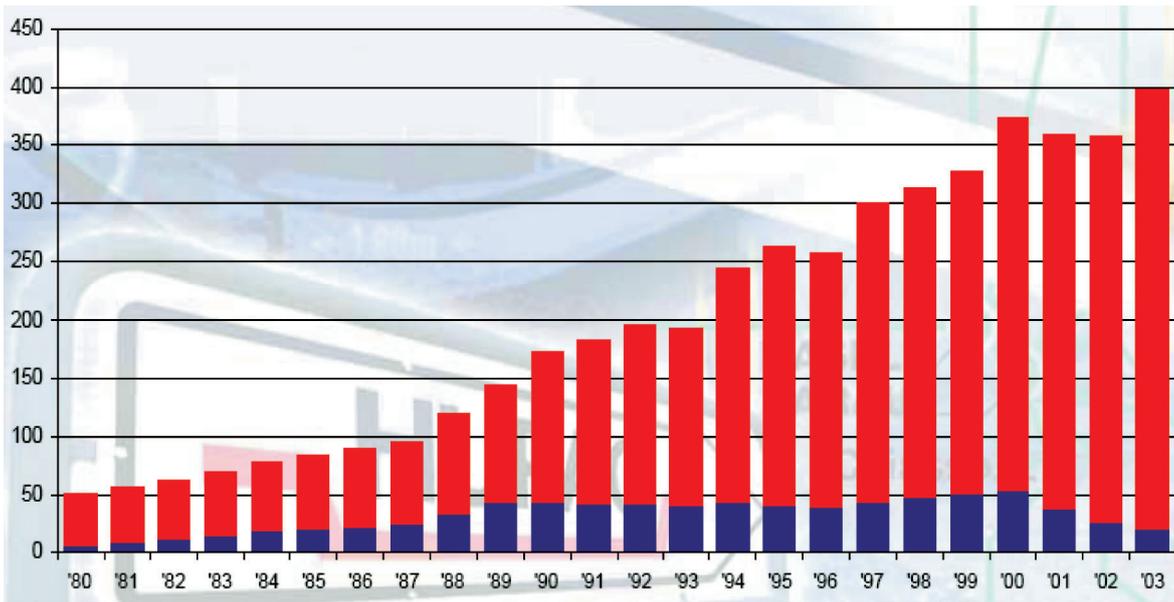
Figure 109. Prognosis of average annual growth of tonne-kms 2000/2015



Source: UIC-GTC, 2004

- Enhanced efficiency of rail transport owing to increased competition in the rail sector, and achievements like improved corridor co-operation and management, and interoperable technologies;
 - Road pricing is due to be implemented in the EU and induces a comparatively higher increase of road transport costs;
 - The enhanced effect of more than proportionate growth of intermodal volume will be reinforced by measures taken by transport administrations, which increasingly contain the "free rider" mentality in international road operations;
 - Increased size of technical controls;
 - Enforcement of "black box" registering truck drivers' driving periods;
 - Stronger penalties for breaking the law.
 - Parts of conventional rail freight volume will be shifted to intermodal services due to shippers requirements and efficiency;
 - EC and national states extend schemes of funding the start-up of CT services.
 - Intermodal transport in the AlpenCorS region:
 - The "concentration" of traffic flows:
 - Increasing transport volumes (at the same time: reduction of suppliers by manufacturers);
 - Increasing transport distances (caused by the use of more favourable labour conditions in different foreign countries);
 - Concentration of transport flows (especially from and to large hubs).
 - The "expansion" of globalisation:
 - Intensifying co-operation between all partners in a supply chain (freight integrators, terminal operators, rail operators etc.);
 - Concentration of service providers (creation of global companies, merges of key players, joint ventures etc.).
 - The importance of information:
 - Reinforced use of information and communication technologies;
 - for transport documents, information on transport precondition as well as information on the goods.
 - Tightening of transport preconditions:
 - "Just in time" & "Just in sequence" as a predefined opportunity for supply as a consequence of the minimizing costs for storing and warehousing;
 - Increase of larger stocks which on the one hand act like buffers, on the other hand saving transport costs.
 - Prognosis of Average annual growth rates of tonne-kms 2000/2015 [%]:
 - The rail growth rates are higher than the growth rate for road;
 - The CT growth rates are higher both than the growth rate for road and for rail.
- That means:
- Strong future development:
 - Current estimations forecast a speeding up development of corridor relevant intermodal transport until 2015: appr. 0,5 to 1 million transshipments per year: appr. + 150%.

Figure 110. Development of the CT of HUPAC



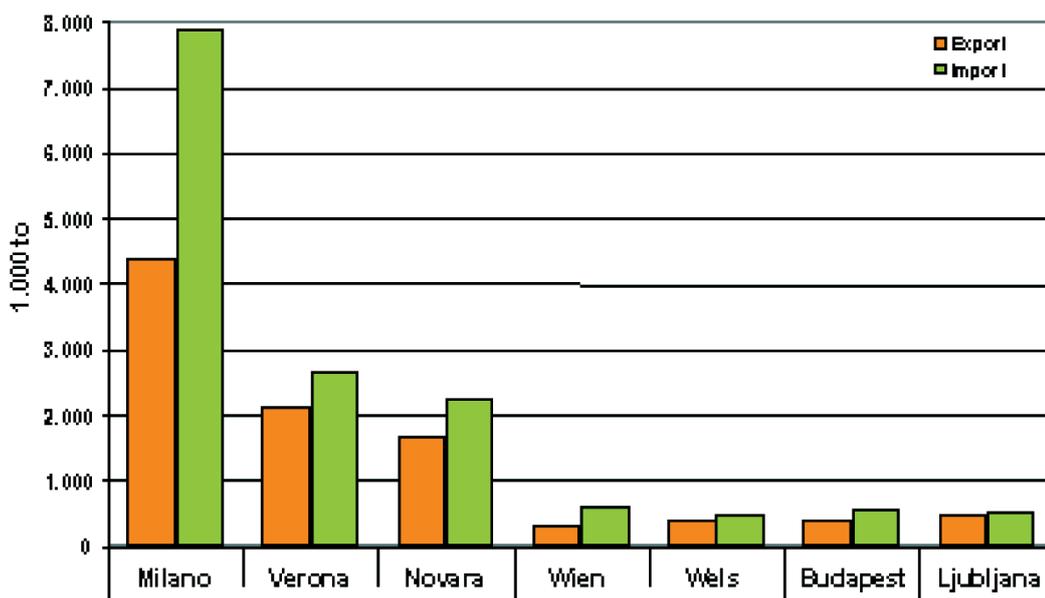
Source: HUPAC

4.2.3 Problems

- Asymmetric flows:
 - Traffic flows of selected terminals in the AlpenCorS region in 2002.
- Additional capacity in several terminals – especially in Northern Italy – is rather low and focussed on the N-S transport;
- High investment costs:
 - The crucial problem of the feasibility of (new-gen-

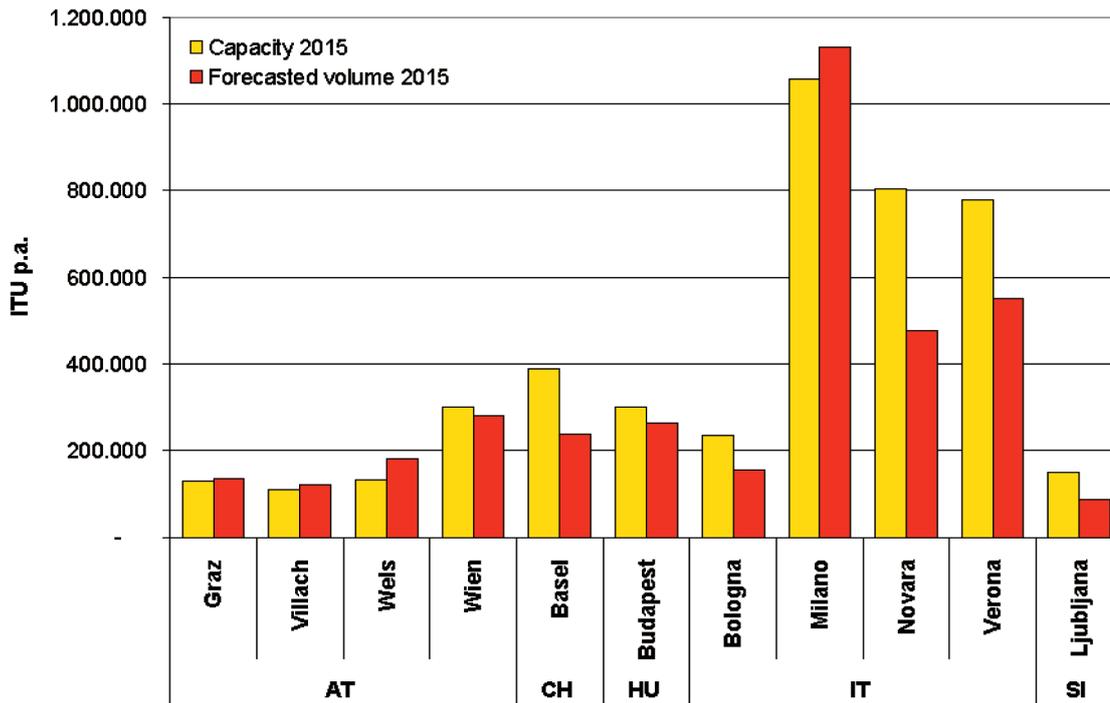
- eration) terminals is that high investment costs are located at the nodes (while most advantages occur in the network);
- Low cooperation between terminal and network operators;
- Lack of interoperability.

Figure 111. Traffic flows of selected terminal in the AlpenCorS region in 2002



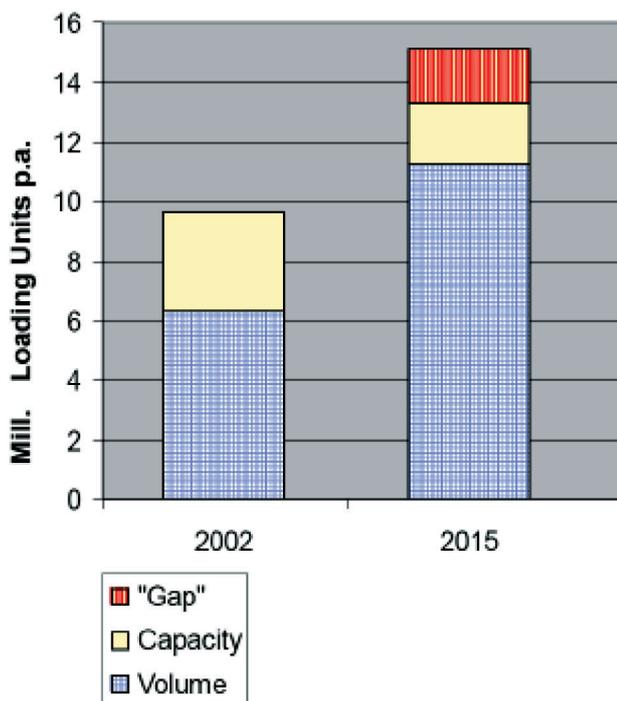
Source: UIC-GTC, 2004

Figure 114. Traffic volumes of selected terminals in the AlpenCorS region in 2002/2015



Source: UIC-GTC, 2004

Figure 115. Visualisation of the total capacity, volume and accumulated "gap" of 34 selected areas in 2002 and 2015:



Source: KombiConsult / Kessel + Partner 2004

4.2.4 Terminal investment schedules

- Austria:
 - Wien Freudenau Hafen CCT planned for 2006/07 (140.000 ITU p.a. road/rail);
 - Villach Süd CCT planned for 2006 (110.000 ITU p.a.);
 - Wien Inzersdorf planned for 2007/08 (160.000 ITU p.a.);
- Hungary:
 - Two older terminals have been replaced by new installation – BILK in full extension has a capacity of 300.000 ITU p.a.
- France:
 - Perpignan planned for 2007;
 - Plan for terminal development was set by the General Planning Office in 2003.
- Italy:
 - Bologna Freight village in 2008 (extended capacity 235 000 ITU p.a.);
 - Busto Arsizio II and III/Gallarate by HUPAC for 2005 (ext. cap. 400 000 ITU);
 - Verona Quarante Europa after 2004 (ext. cap. 380 000 ITU p.a.);
 - Novara CIM (250 000 ITU by 2006; ext. cap. planned 700 000 ITU p.a.);
 - Segrate/Milan from 2004 onwards (ext. cap. 200

- 000 ITU p.a.);
- Melzo/Milano after 2006;
- Isola della Scala/Verona after 2007;
- Bergamo/Montello planned;
- Lodi/Casalpusterlengo planned;
- Rivalta Scrivia planned;
- Padua planned;
- Cervignano planned.
- Slovenia:
 - Modernizing the Terminal of Ljubljana and the Port of Koper until 2006 (Installation of new Gantry Cranes).
- Switzerland:
 - Basel planned for 2007/08 (extended capacity 200.000 ITU p.a.);
 - Zurich planned for 2010/11.

4.2.5 Possible Solutions: - Concrete Terminal – Considerations: terminals in Italy

- General Situation:
 - The actual situation in the field of infrastructure in Italy is an enhancement of new warehouses and buildings. In Italy there exist enough gaping spaces for the construction of new buildings, which are not evenly spread, but rather built in congested area. One example of this situation is Milan, with a peculiar concentrations of Warehouses;
 - The infrastructure is splendidly constructed regarding nodes, freight village and stations. This leads to a high capacity that can be used now;
 - For an improvement of Intermodality it could be helpful, if the government uses public money;

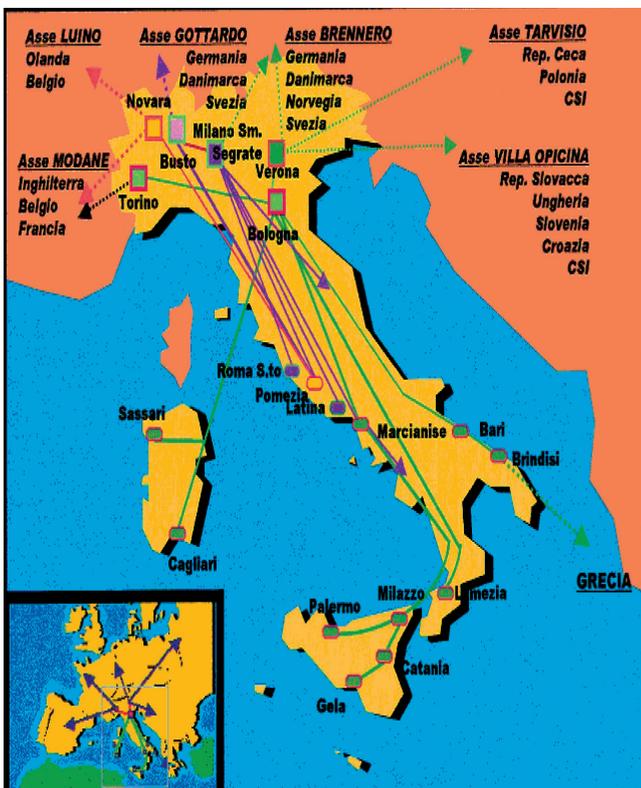
Table 27. General solutions for intermodal transport

Terminal level	Network level	Interoperability	Market conditions
Increase capacity of terminals	Concentration of intermodal rail transport on a limited number of international transport corridors	Consideration of intermodal transport in technical, operational and administrative procedures	Introduction of European-wide transport tariffs and pricing schemes
Relocation of urban terminals	Development of an intermodal network connecting sea and hinterland transport	Improved border procedures for intermodal transport	Consideration of external costs for fair prices
Restructuring of Terminals	Introduction of one-stop-shops for intermodal transport	Harmonization of loading units	Set rules to harmonise infrastructure charges
Better access to terminals	Improve connections between terminals and main network	ICT systems for intermodal transport	Introduction of European-wide allocation of slots for rail freight transport
Connect road network to major terminals in main rail corridors	Definition of alternative routes - route choice within AlpenCorS	Set safety standards	Criteria for investments in infrastructures
Harmonisation of opening hours	Restructuring railway networks	Harmonise technical standards across different modes	Marketing campaign for promoting intermodal transport
Privatisation of terminals	Give priority to freight on the rail network	Standards for data exchange between operators, terminals, customs	Knowledge portal for intermodal transport
Set standards for combined transshipment equipment	Harmonisation of voltage differences	Standards for loading units	Set up programme to improve market information
Implementation of new handling procedures	Liberalisation of Railway market	Standards for freight documentation	PPP models for intermodal terminals
Include terminals in TEN and Corridor concepts	Set standards for weight limits	Interoperable ICT for Tracking & Tracing	Overcome mental bottlenecks
Harmonisation of customs services			

Source: Harry Consulting GmbH, 2004

- The situation depends on the capacity of the organisations and the backbone of the transport organisations that work in this field;
- In fact of the political situation Italy lost traffic the last 2-3 years. This is a big social problem;
- In the last years the government of Italy focused on the South of Italy and reduced the financing in the North. The instability of the Politics in Italy changes the traffic. There were many projects, but there couldn't be realised much;
- In Italy the politics formulate the Mission for the Freight villages. This is the reason why the Mission is described more political;
- There has been an accelerated development of the South European Ports, particularly in Gioia Tauro and Genua, due to a better geographical position;
- The relocation of the companies to Asia changed the ratio of Export and Import in Italy. The percentage of Export decreased, due to a rising transportation from China and India to Italy.
- Problems:
 - In 2004 the intermodality in North Italy had a growing development, but it now get influenced of the higher costs of Italian Railways. As a consequence of the unforeseen expenses, operators react and change their behaviour, with a shifting of transportation from rail to road;
- There are some companies which promote their offers as logistic service. The real situation is that it's fashion to campaign with "logistic" and that this companies use only road with a low level of computer system. This problem occurs according to a low culture of the management and not on the possibilities;
- It's a critical moment of intermodality for Italy and the beginning of an increase of transportation in regions, which are better situated, can cause a problem for Italy;
- The general level of Italian Companies is not quite adequate to handle the new global situation, due to a low level of technology;
- It depends also from the politics of Italian transport. In the past the companies bought lots of trucks and this leads to more than 150.000 transportation companies with a high asset of trucks and a preference of transportation by road;
- The politics don't cooperate with the companies, which work in the field of Intermodality. In logistics the problem depends not from polical matters, but on the fact that there are few multinational companies of logistics to speak with. In Italy there is not a real situation of logistics companies.
- Solutions:
 - Some companies have recognised the importance of logistics and therefore influenced the development of management services, primarily for logistics;
 - It will be necessary to make a balance of the real costs of road transportation, to notice that the costs of intermodal traffic are competitive;
 - For the future it's important to achieve various goals. This includes the connection of a network to bring the operators closer together and the improvement of communication;
 - In the Alpen CorS-Region the challenge for the future is the efficient use of all railway connections, nods, intermodal terminals and a sufficient network to give the operators the best solutions for every need. The challenge is to make a good network that work in the South and in the North. It would be of great importance for all European Ports to work together;
 - The vision for intermodality and logistics in the AlpenCorS-Region is the real intermodal network. The trucks will be used only for small distances. For medium and longer distances the ship and the train are appropriate;
 - The future of the European Economy is to work more with the China-Asia Market. There are lot of phenomenal situations different from some years ago, but for a good logistic company it could be a situation of development;

Figure 116. Intermodal traffic axes in Italy



Source: Cemat

4.2.5.1 Novara CIM

- General Situation:
 - The Terminal Novara CIM is located near the motorway outside the centre and can be reached by road and rail;
 - Novara is a private terminal and it's a local company with about 600,000 square meters. Novara builds 7 lines for trains with 650 metres;
 - A second terminal is planned within the next 4 to 5 years with approximately 200.000 square meters. It should at least double the traffic;
 - The intermodal transport will increase in the near future, so the Terminal will invest in large transtrailer gantry cranes;
 - All goods which can be transported with the train arrive at the Terminal in Novara, except dangerous goods are not accepted;
 - The terminal handles approximately 120.000 ITU/year to the main destinations (Belgium, Great Britain, Germany and Netherlands);
 - Nearly 140 I/u were dispatched within Italy and about 600 I/u arrived from other Italian Terminals in the year 2003. In International Traffic about 56.000 I/u were send away and Italian Terminals achieved about 59.000 I/u from other Countries.
- Problems:
 - The main problem of Novara is the punctuality of the trains. Due to delays on starting, or delay caused of stops, weather or time, the trains do not arrive on time;
 - At Thursday, Friday and Saturday there is the main traffic. At this time the customers have problems to receive the lines. The customers want to organise it "Just in Time" and that leads to this bottleneck.
- Solutions:
 - It would be profitable for the terminal if the length

Figure 117. Novara Terminal



Source: Novara Freight village

Table 28. Intermodal Traffic in 2003

	National I/u	International I/u
Origin	141	56231
Destination	609	58867
I/u = loading unit		

Source: Cemat

of the trains and the loading weight would be improved;

- The Terminal should planned to organise the Terminal more efficiently. They could divide each storage in different areas of parking.

4.2.5.2 Verona Quadrante Europa

- General Situation:
 - The Terminal has a direct connection to the motorway (A4), the Railway (axis to Brenner, Milan, Venedig, and Bologna) and the airport V. Catullo;
 - The Terminal is operated by Cemat. In the past the arrival of the trains was inefficient. That's the reason why Cemat arranged a change of the railway company. Nowadays the transport are organised from RTC Locomotion;
 - The area of the industrial region is one of the largest in Italy. The Terminal handles the goods with semi trailers, swap bodies and containers on this intermodal node;
 - The Terminal Verona organises the main Intermodal Traffic via Brenner to Germany, Denmark, Norway and Sweden;
 - The Verona Terminal handles in Import about 108.000 I/u and in Export about 106.000 I/u. In the national Transport this Terminal received 665 I/u and send away nearly 760 I/u in the Intermodal Transport 2003.
- Problems:
 - Nowadays approximately 87% of the trains arrive on time, this was possible because Cemat made a contract with the railway companies to raise the quality of punctuality. Although the railway company doesn't dispose of elasticity;
 - The co-operation with Austria is inadequate due to regulations and technical problems on some routes;
 - Verona has problems with the space capacity. If the trains would arrive and leave on time, this problem could be solved. If the companies would recognise the importance of punctuality, the Terminal would be better organised and awareness would be created;

Figure 118. Freight handling in Verona Freight Village



Source: Verona Freight village

Table 29. Quadrante Europa: intermodal traffic in 2003 (l/u)

	National	International
Origin	665 l/u	107537 l/u
Destination	759 l/u	105598 l/u

l/u = loading unit

Fonte: CEMAT, 2003

- Various trains arrive early in the morning to reach the next terminal on time. This leads to capacity bottlenecks;
- Throughout the EU the localisation of the trains is bounded on the railway system. If the wagons get lost during the transport there is no possibility to identify the position;
- General there could be mentioned that Transport with normal swap-bodies drop and the special swap-bodies come into operation.
- Solutions:
 - Verona Quadrante Europa is a progressive innovative Terminal. On the average there could be said that there is a rise of transport beyond 10% / year. That's just one reason why the Terminal want to enlarge the Gateway;
 - In the near future the Terminal plan a transport connection to sea;
 - Cemat would like to have a transshipment point in Vienna to transport the goods to Eastern Countries. Nowadays it's not possible to organise with the Railway Company in Austria (ÖBB).

4.2.5.3 Busto Arsizio

- General Situation:
 - With the enlargement of the Terminal, they will start with two crane modules each on three tracks and a total of six gantry cranes;
 - In 2004 the shuttle connection between Basel and Busto Arsizio developed positively, due to new customers;
 - There were changes in the air at Busto Arsizio, according to the need for urgent planning of the future working needs of the terminal which, with operation of the expansion in the area, is to reach a considerable size;
 - The main destinations of the Terminals are Germany, Sweden, Switzerland, Denmark, Norway;
 - The area, facilities, relations and the transshipment will change in 2005.
- Problems:
 - The Terminal in Busto Arsizio has no more capacity. Today 34 trains/day are handled in this Terminal. That's the reason why Hupac now already expand the area;
 - In the beginning the strategy couldn't be realised,

Figure 119. Busto Arsizio Terminal



Source: Hupac, 2004

because of the problem on the route between Switzerland and Italy via Gotthard. This problem leads to a shifting of another route.

- Solutions:
 - The Terminals had problems with the capacity, this leads to a new concept. Since four years the customer receive an reduction for quick handling;
 - The customer get money back when companies handle the trains and trucks at night;
 - For the next ten years Hupac estimate, with a realisation of the strategy of only 20%. From 2007 till 2014 the beginning of the operation in

Table 30. Handling and equipments in all HUPAC terminals, in 2003 and 2004

	2003	2005
Area	108.800 m ²	242.800 m ²
Facilities	6 Gantry cranes 5 tracks with cranes (540-630 m) 5 tracks for transshipment 7 tracks for trains, which stay in the Terminal a longer time	11 Gantry cranes 11 tracks with cranes (540-760 m) 9 tracks for transshipment 15 tracks for trains, which stay in the Terminal a longer time
Relation	30 trains / day	46 trains / day
Transshipments / day	700 transmission 1000 UTI 20.000 net tonnes	1050 transmission 1530 UTI 30.000 net tonnes

Source: Hupac

Table 31. Traffic development of all Hupac Terminals in 2003 and 2004

	January - June 2004	January - June 2003
I/u = loading unit		
Unaccompanied transport transalpin	169.099	154.474
Unaccompanied transport non-transalpin	43.454	32.469
Total amount of unaccompanied transport	212.553	186.943
RoLa	12.625	9.860
Total amount	225.178	196.803

Source: Hupac

Lötschberg will help to achieve the strategy;

- Hupac is interested in traffic between Rotterdam and Austria.

4.2.5.4 Padua

- General Situation:
 - The primary objective of Padua Freight village is to provide an integrated, innovative and specific service, suited to companies needs;
 - Since the beginning of last year, Padua Freight village introduced a "Last-Mile" Concept and realised the idea with 15 carriers;
 - One important hub for Padua Freight village is the airport in Vienna, because of their attitudes and their tradition to work with East European Countries. Further Reasons are the attractive offers, extensive connections and geographical position of the Vienna Airport;
 - There was a decrease of the I.C.U. from 2001 till 2003. In 2003 the intermodal traffic had a total amount of 290.598 I.C.U. In 2004 the traffic results increased, but in this year there appears a decrease due to the development of costs. The influences of the costs depends from the railway policy;

- The trains leave the Terminal to reach various destinations in Italy and abroad to Rotterdam, Le Havre, Bremerhaven and Hamburg;
- In 2004 the Terminal handled the most goods with Containers to North Europe (25%). The other main destinations were Genoa and La Spezia with 23% each, followed with 16% which got transported to Leghorn. The other goods were carried to other

Figure 120. Padua Terminal

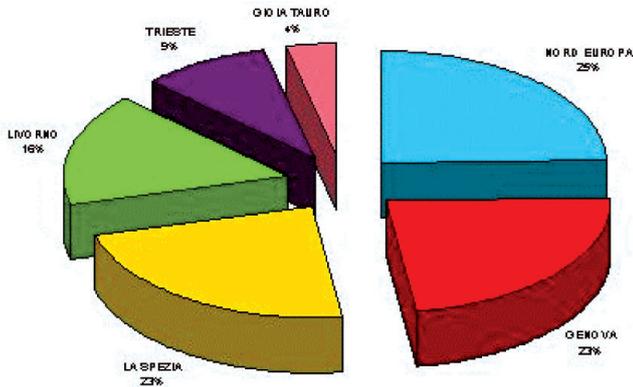
Source: Padua Freight village

Table 32. Intermodal Traffic from 2000 - 2004

I.C.U. = Intermodal Cargo Units	Intermodal traffic from 2000 - 2004				
	2000	2001	2002	2003	2004
Unaccompanied transport	321.618	319.720	302.532	290.598	310.234

Source: Padua Freight village

Figure 121. Padua Freight Village: intermodal traffic volumes by destination



Source: Padua Freight village

national destinations.

- Problems:
 - There are no real financial problems, but it depends on the aspect of rules, which have an impact of intermodality;
 - The statistic on the real costs of road transport aren't available, because lots of regulations are ignored and from the economic reason it's impossible to control.
- Solutions:
 - The management formulates a strategic plan, including Infrastructure, Terminal–Railway–Intermodal and Logistics Assets. With regard to Infrastructure, some points should be realised, like the accomplishment of the Investment Plan and the transfer of Know-how. The Objectives of the Terminal-Railway-Intermodal Asset based on the expansion of intermodal operation and the reinforcement of liberalisation;
 - For the Logistic asset, the Implementation of real estate management and the enlargement of operation is important;
 - A sufficient organisation of rail-road and sea-road intermodality is extremely important for the future;
 - In the future it would be helpful to find together a table of discussion for development;
 - The europe-wide infrastructure had experienced an expansion in the last years, so it would be necessary to link the separate parts together. Separate parts of infrastructure divide the traffic and this leads to a high

expense factor;

- For the future it's important to make a concentration of the strategic nodes.

4.2.6 Summary and Results

- The aim of AlpenCorS project - Intermodality & Logistics - is to identify the regulative, administrative, technical, language and spatial problems that are particularly severe nowadays and that lead to lack of intermodality, interoperability and interconnectivity in the interregional cross-border transport logistics.
- The method:
 - Based on the analysis of the current situation and the general trends of main areas' problems in intermodal transport, it was necessary for the further work to define the overall goal for intermodal transport within the Alpine Corridor South;
 - The mission has been embedded into a top-down balanced scorecard approach for defining objectives, measures and viable indicators for intermodality within the Alpen Corridor South;
 - By the help of a key informant survey (KIS) and a survey of interview with terminal and other operators, the empirical base has been created for analysis and solutions.
- Development:
 - Strong development of the intermodal transport in the EU;
 - Current estimations forecast a speeding up development of corridor relevant intermodal transport until 2015:
 - Approximately additional 0,5 to 1 million transshipments per year;
 - that means, approximately an increase of 150%.
- The problems are mainly:
 - The asymmetric flows;
 - The concentration of the intermodal transport on the North-South directions;
 - Lack of capacity both on the rail/road infrastructure;
 - The crucial problem of the feasibility of (new-generation) terminals is that high investment costs are located at the nodes (while most advantages occur in the network);
 - The low cooperation between terminal and network operators;
 - The lack of interoperability.
- Solutions:

- It would be necessary to formulate a strategic plan, including Infrastructure, Terminal-Railway-Intermodal and Logistics Assets;
- With regard to Infrastructure some points should be realised, like the accomplishment of the Investment Plan and the transfer of Know-how;
- The Objectives of the Terminal-Railway-Intermodal Asset based on the expansion of intermodal operation and the reinforcement of liberalisation;
- For the Logistic asset the Implementation of real estate management and the enlargement of operation is important;
- The proposed & possible solutions for intermodal transport in the AlpenCorS region are basically influence by some general studies and concepts concerning intermodal choice criteria and also by general problem areas or general bottlenecks in intermodal transport;
- There has been worked out solutions on different levels, that reflect the different levels of intervention in intermodal transport: terminal and network level, and concerning the interoperability and the market conditions.

4.2.6.1 Solutions on terminal level

- Solutions on terminal level mainly focus on investments on the main terminal but also on accompanying soft measures;
- Terminal operators will try to keep their traditional business going and to maintain their terminals, their core activity is transshipment. Terminal operators are often not interested in an optimisation approach for the whole network;
- If there is more than one terminal operator, like in the AlpenCorS area, competition between operators will lead to uneven prices for terminal services that will influence the terminal chosen by intermodal operators and haulers;
- This influence may blur the optimisation efforts for the whole network and lead to the other players choosing a terminal that is not part of the proposed optimisation model.

4.2.6.2 Solutions on network level

- Solutions at network level will mainly concentrate on a higher efficiency in rail operations. To achieve this goal, Railway companies should concentrate their investment on the main terminals and on main corridors, where a necessary concentration of intermodal freight flows is easier to achieve;
- From their business view they want to provide market oriented slots from the main terminals to the European mainland;
- The Terminals can make use of new concepts which will reduce the cost for the long-time. The "Last-Mile" Concept extends the range of services and the operators

can satisfy the consumer needs;

- The Development of an intermodal network connection with sea and the immediate vicinity would be of great importance and could be actualised in a short time horizon;
- The Introduction of one-stop-shops for intermodal transport and the improvement of the connections between the terminals and the main network will also have a high impact with a short realisation perspective;
- The harmonisation of voltage differences and the liberalisation of the Railway market has an high impact on economy, which should be set be the politics.

4.2.6.3 Solutions concerning interoperability (incl. ICT)

- Of high impact with a short realisation view can be seen the improvement of the border procedures for intermodal transport, the harmonisation of loading units and the implementation of ICT systems for intermodal transport;
- From the Terminal point of view their should be set standards for the data exchange between operators, terminals and their customers;
- The improvement of interoperability would be necessary to standardise the loading units and to harmonise the technical standards across different modes.

4.2.6.4 Solutions concerning market conditions

- The organisation of door-to-door freight transport by combining different modes of transport to build high quality, efficient and sustainable intermodal transport solutions is at the essence of the past and present efforts of the intermodal stakeholders;
- This reflects the need for integrating the intermodal chain and for approaching the intermodal transport as an autonomous transport mode. Intermodal operators have to fulfil an integrating role, that could be further expanded;
- An important prerequisite for this increased share of intermodal transport is based on present and future market conditions;
- The realisation of a fair market should consider the internalisation of the external costs and the integration of marketing campaigns for the promotion of the intermodal transport, which the organisation of programmes to improve the market information;
- Due to tax reasons the Private Public Partnerships Models can be a financial improvement for the intermodal terminals. Solutions concerning market conditions can also concentrate on the introduction of a European-wide allocation of slots for rail freight transport;
- Specific analysis have been conducted and solutions have been developed for a few main terminals.