



Master Plan of the Northern Italy Waterway System

Abstract and Executive Summary



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¹ Tourist inland navigation of Veneto – Padano Waterway System– Cap.1.1.2.1

² Sea motorways network: synergies with waterways system – Cap. 1.2.1.1

³ European Waterways System– Cap. 1.2.2

⁴ Veneto: regional planning and programming– Cap.1.4.3.6

⁵ Veneto environmental network – Cap. 1.5.4.1

⁶ Projects files

⁷ Transport capacity of Northern Italy Waterway System– Cap. 1.3.7

⁸ Participation to Multicriteria analysis (MCA)

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ABSTRACT

Background

The Master Plan aims to provide a framework for the implementation of the global project for the development of the Northern Italy inland waterways (from Venice Sea Port to Cremona Inland Port) with a mid-term perspective.

The Master Plan considers not only the planning of infrastructural interventions to overcome bottlenecks and adaptation to class V of the waterway, but also a logistic analysis of the whole supply chain, including the multimodal nodes and the waterway as part of a trans European axis interchanging with railways (PF1 and PP6) and MoS (PP21) in the Adriatic Sea, as well as its connection to the rail/road Berlin/Palermo axis.

The Master Plan considers fluviomaritime navigation issues, short sea shipping, fleet development programmes and River information Services development. The need for a comprehensive plan has been raised by the local and regional ports and the waterway authorities that have subscribed to the agreement for Coordination for the functional development of the Northern Italy and Northern Adriatic inland Waterway System.

Objective

The overall objective of the Master Plan is to create an instrument able to define a strategy for the inland navigation development for the next decades, modifiable and adaptable to the necessities implemented by the stakeholders in the waterway management.

The strategy aims at making the inland waterways of Northern Italy more attractive as a logistics and transport infrastructure. This ambition is pursued by the improvement of the overall planning and the coordination of operational activities and investment roadmaps, by joining all existing local plans and projects in a unique framework. The farthest objective is to extend the reach of the Northern Italy Waterway System to the Adriatic Sea, enhancing a new corridor up to Greece and further to the Black Sea, which represents one of the main Northern Italy export area in the Mediterranean Sea.

Result

The output is a strategic Action Plan including:

- the analysis of surveys results and identification of current bottlenecks (not only infrastructural, but also possible legal, regulatory, environmental, commercial or operational ones);
- the strategy including mid-long term objectives;
- the methodology;
- the Action Plan including: (i) a list of priority projects, synthetically described in factsheets; (ii) a list of pilot projects, described in detail, including feasibility study, timetable, financial perspective; (iii) a monitoring plan.

The Master Plan, based on desktop studies and on on-field research, has been constantly shared with stakeholders and investors; it results into a scenarios definition and into a set of recommendations for actions.

EXECUTIVE SUMMARY

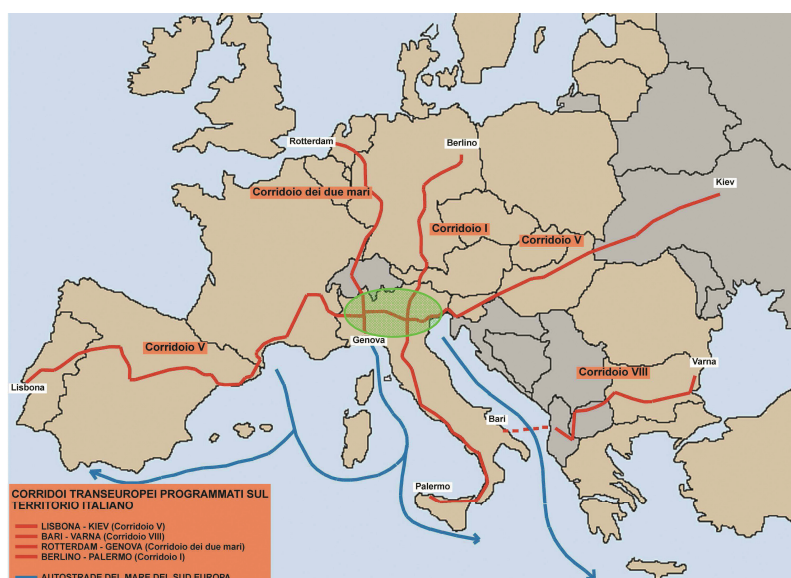
Introduction

Due to the increasing external costs derived from the great use of road transport, it is fundamental to promote a modal shift to more **sustainable transport modes** like rail and inland **waterways** for a competitive and sustainable development of the economic activities, in accordance with European transport policies, in particular with the TEN-T and the NAIADES programme.

The waterway and the ports in particular constitute a **real alternative**, because they allow to implement intermodal connections not only between water, rail and road, but also directly between rail and road as intermodal terminals.

The **Northern Italy and Northern Adriatic Sea Waterway System** represents an interesting chance of a possible connection between the industrial activities of one of the most developed region in Europe, **Po Valley, and the Sea**, with an east–west relation, through a continuous dialogue between the Northern Italy Waterway System ports on the west, and the north Adriatic overseas ports on the east.

Figure 1 Localization of the Northern Italy and Northern Adriatic Sea Waterway System among the EU corridors



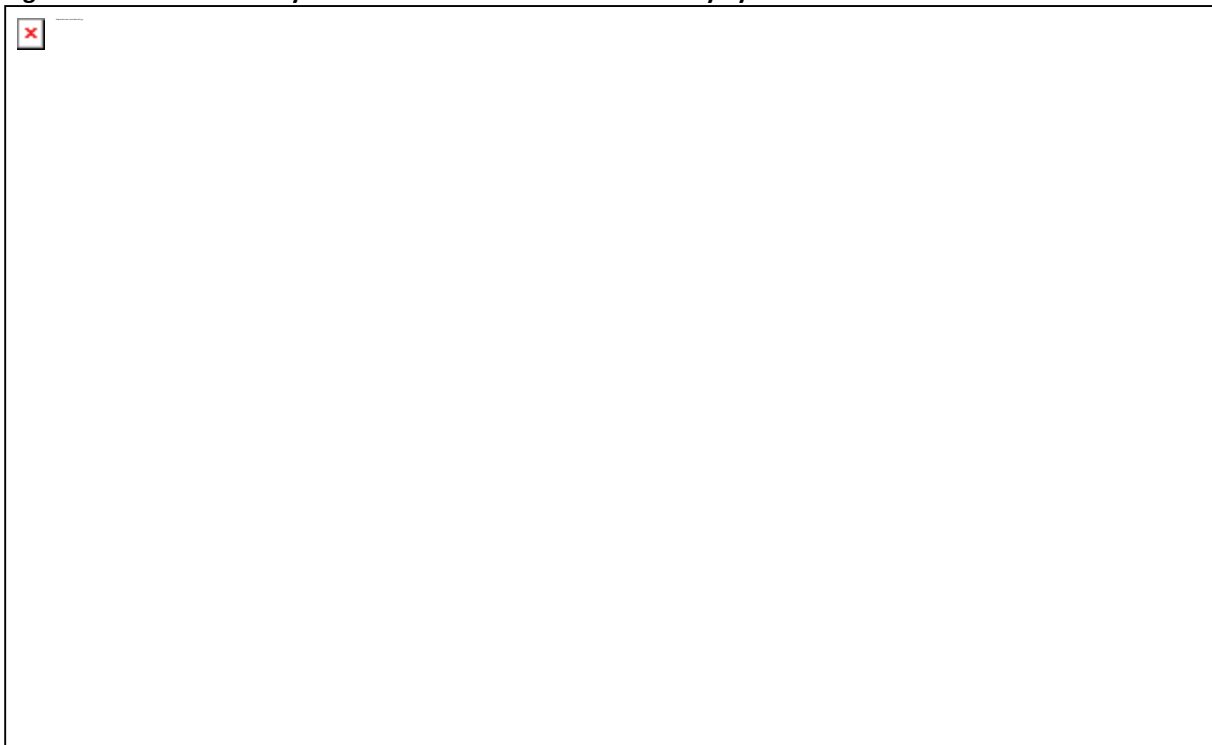
Source: ARNI, 2010

The System is composed from west to east by:

- the Inland Ports of Cremona, Mantova, Rovigo, Boretto and Porto Nogaro (and other public and private docks lying along the waterways);
- the Po river and the Mantova – Adriatic Sea Canal, the two main waterways connecting the sea and the Po valley in synergy, with an east-west relation, where the inland ports are located;
- the Venice lagoon, the Po – Brondolo canal and the Idrovia Ferrarese, linking the main waterways to the sea ports with a north – south relation;
- the north Adriatic sea ports, such as Ravenna, Chioggia, Venice, Monfalcone and Trieste.



Figure 2 The Northern Italy and Northern Adriatic Sea Waterway System in detail



Source: Province of Mantua, 2011

Coordination for the functional development of the Northern Italy and Northern Adriatic inland Waterway System

The Coordination for the functional development of the Northern Italy and Northern Adriatic inland Waterway System, gathering all the **stakeholders** involved in the administration of the waterway system, was established in 2008 in order to ensure a **coordinated governance** of the waterway activities. The Coordination is composed by:

- the inland and sea Ports of Cremona, Emilia Centrale, Mantova Port System, Torretta Veneta, Rovigo, Chioggia, Venice and Porto Nogaro, represented by the public administrations involved such as the Provinces of Cremona, Mantova, Verona, Reggio Emilia and Rovigo, and Port Authorities (Venice and Chioggia);
- the agencies involved in the administration of the waterways: AIPO (Region Lombardy and Emilia – Romagna) and Sistemi Territoriali Spa (Veneto Region);
- the promotional entities and associations for the development of inland navigation and of the industrial activities inside the area interested by the waterways: Consvipo, UNII, SCIP;
- RAM Spa (Rete Autostrade Mediterranee - MoS), to develop the relationship between sea and inland waterway transport.

Furthermore, several public entities are invited as working group observers:

- regional entities: Lombardy, Emilia Romagna, Veneto, Friuli Venezia-Giulia and Piemonte;
- Ministries of Transport: Italy, Slovenia and Croatia;
- sea Ports of Ravenna, Monfalcone, Trieste, Rijeka, Koper, Zara.

The aim of the Coordination is the cooperation to define a **common strategy** in the development of all the aspects concerning **inland navigation**. The Coordination aims at defining a common infrastructural plan, at

improving the waterways, at setting new transshipment facilities and at integrating the system with the sea navigation. Moreover it points at defining and promoting new technical solutions in order to foster the development of both inland and sea-river fleet, able to minimize the environmental impact and to set proposals able to address the decisions at national level to achieve a more advantageous legal framework.

Master Plan of the Northern Italy Waterway System

Within this framework, the Coordination for the functional development of the Northern Italy and Northern Adriatic inland Waterway System wants to create and make available an instrument able to define a strategy for the inland navigation development for the next decades, modifiable and adaptable to the requirements implemented by the stakeholders in the waterway management.

The instrument should not be focused only on the infrastructures, like the traditional public planning documents. On the contrary it should also include all the relevant aspects of inland navigation, like technology R&D, legal framework and reforms, infrastructural development, marketing, governance, etc. The “Master Plan of the Northern Italy Waterway System” was set to meet all these requirements, and to be the Coordination **dynamic instrument** for the functional development of the Northern Italy and Northern Adriatic inland waterway system.

Objectives of the Master Plan of the Northern Italy Waterway System

The overall objective of the Master Plan is to define a global strategy in order to:

- make the Northern Italy inland waterways more attractive as a logistics and transport infrastructure improving accessibility and competitiveness of the surrounding areas;
- enhance the efficiency of the logistics and freight transport chain;
- improve the overall planning and coordination of the operational activities;
- join all existing local plans and projects in a unique framework;
- extend the reach of the Northern Italy Waterway System to the Adriatic Sea by joining it with the Short Sea Shipping system, thereby to enhance a new corridor from Cremona (the Western part of the Italian river system) up to Greece and further to the Black Sea, one of the main export area of North Italy in the Mediterranean Sea.

Master Plan Structure

As already mentioned, the Master Plan aims to be a common baseline for the definition of the development strategy of the waterway system, a framework analysis and a program of dynamic actions.

For this purpose, the Master Plan has been structured into three parts. Two are flexible describing the context and the proposed Action Plan, which must be constantly updated and shared by the group, and one is more rigid, containing a methodological part that should represent the basis for the work of the whole coordination group and for the common strategy.

The three parts are the following:

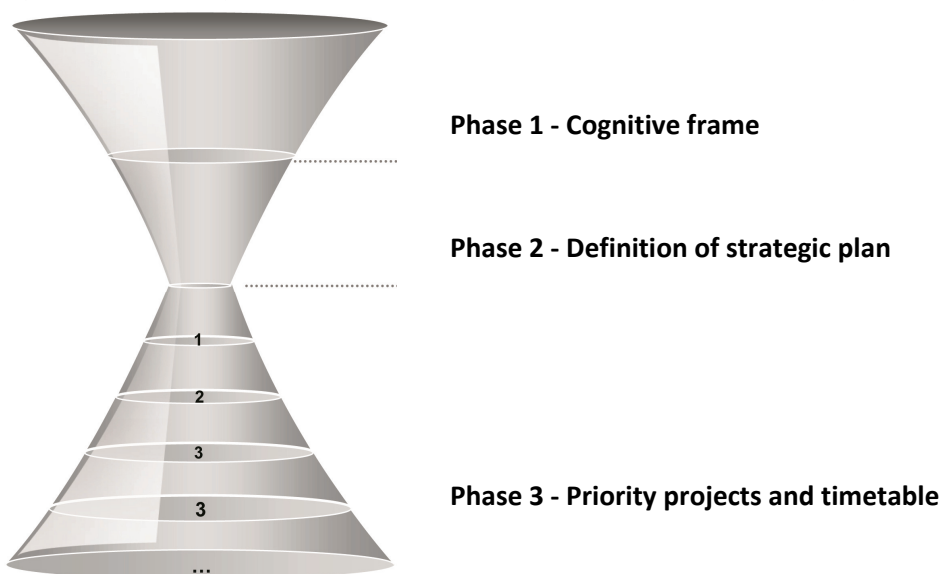
1) **Analysis and Framework:** in this phase the participants to the Coordination for the functional development of the Northern Italy and Northern Adriatic inland waterway system worked together in thematic groups to collect all the available details concerned with: infrastructures, socio-economic-environment aspects, law and administrative innovation, pilot projects. The data were analyzed and inserted into a SWOT analysis. The result is the analysis and description of the general framework in which the System is situated and is operating.

2) **Strategic Plan:** in this second phase the strategic medium-long term objectives for the inland navigation, deriving from the first phase analysis are listed.

3) **Action Plan:** in this third phase the definition of priority strategic projects, definition of a monitoring plan for their future implementation and timescale, set also through public consultation with stakeholders, are available. The Action Plan includes: (i) a list of priority projects, synthetically described in factsheets; (ii) a list of pilot projects, described more in detail, including feasibility study, timetable, financial perspective; (iii) a monitoring plan.

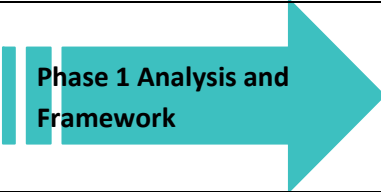
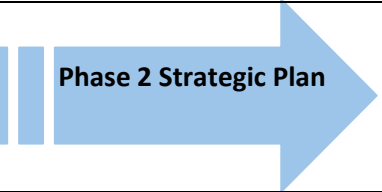
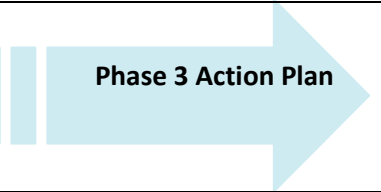
The three analytic phases are represented in the following figure: main points that have supported the definition of the objectives and the definition of strategic plan realized in a several specific projects, have been identified with a SWOT analysis, from many information received in the cognitive frame.

Figure 3 Methodological articulation of Master Plan of Northern Waterway System



Source: ALOT s.c.a.r.l., 2011

Each of these three phases is divided in another three working steps, as in the following figures.

 Phase 1 Analysis and Framework	 Phase 2 Strategic Plan	 Phase 3 Action Plan
<ul style="list-style-type: none"> 1.1 <i>Inland waterway system</i> 1.2 <i>Territorial and economic aspects</i> 1.3 <i>Infrastructural aspects</i> 1.4 <i>Competences, legislation and governance instruments of the network</i> 1.5 <i>Environmental aspects</i> 1.6 <i>Traffic flow data analysis</i> 1.7 <i>First analysis of logistics potentiality of the inland waterway system</i> 1.8 <i>Global SWOT analysis of the state of the art</i> 	<ul style="list-style-type: none"> 2.1 <i>Methodological approach to the definition of the plan strategy</i> 2.2 <i>General objectives for the inland navigation of UE 2006-2013 program</i> 2.3 <i>Action lines, strategic objectives and strategic actions for the Northern Italy waterway sistem</i> 2.4 <i>Methodology of priority projects definition</i> 2.5 <i>Methodology of priority projects evaluation (MCA)</i> 	<ul style="list-style-type: none"> 3.1 <i>Results of the interviews to actors and local business companies through the questionnaires, for the priority projects definition</i> 3.2 <i>List and description of priority projects</i> 3.3 <i>Result of multicriteria analysis</i> 3.4 <i>In-depth file of the projects to be realized</i>

Contents of the Master Plan

Phase 1: Analysis and Framework

The framework, in addition to the Master Plan aim definition, namely the commercial shipping in Northern Italy compared to the general theme that can also have tourism relevance, defines the territorial and economic framework, regulatory framework, competences and also an environmental planning instruments that manage the system. There is also a detailed description of the linear and punctual infrastructures that constitute the system, illustrating the so-called "bottlenecks" and there is a classification of the projects along the network.

The representation of the offer is accompanied by an analysis of existing and potential freight traffic data along the waterway system and an analysis of the attitude of the waterway transportation manufacturing districts in the Northern Italy area, considering the potential traffic that the system could be able to support.

For each of the issues examined, an array of strengths, weaknesses, opportunities and threats was prepared (SWOT analysis). At the end of Phase 1 an overall SWOT matrix was produced, which summarizes all the issues and provides a brief reading of the actual state of the Northern Italy Waterway System, allowing, in the next step, to set the development of the strategic plan.

Northern Italy Waterway System

Before setting a frame of Northern Italy Waterway System, a discernment between its commercial and tourism characteristic is introduced, providing some essential elements of tourism navigation.

A brief historical overview of the system development and the results of the main national and European studies in relation to commercial and tourism inland navigation are related in particular. Afterwards, a description of tourism inland navigation is reported.

Territorial and economic aspects

The waterway system navigable for commercial purposes is geographically located in the center of the most developed European areas. The macro area of Northern Italy is analyzed in detail, highlighting its importance at economic-productive level, its localization dynamics and mobility importance, as a potential hub, and as an intersection and conjunction among trans European corridors that pass through Italian territory and the network reference for the freight crossing the Alpine Space.

In particular the position and the trend west-east of the waterway system are strategic for the Northern Italy market (Milan is 50 km far away from Cremona, the furthest port in the system) favoring the Po Valley economic and industrial development, reaching the mouth of the Adriatic Sea.

The favorable location of the waterway system, however, must take into account the competitiveness and the geographical development of the highway system which is well-branched in the territory and the scattered distribution of business and logistic companies in Northern Italy, which does not promote inland waterway freight transport.

This section ends with an elaboration on the hydrographical basins in which the system is located.

Infrastructural aspects

The chapter addresses the fundamental issue of the representation of the network and the nodes of the Northern Italy Waterway System through the creation of an updated and shared database on the infrastructures, with particular emphasis on critical aspects and on expected developments.



The analysis covers the network segments, the artificial canals and the river Po, the navigation locks and the ports along the waterway network. Analysis highlights a good infrastructure network, with some parts of the network in Va class CEMT and major inland ports provided with facilities connection to roads and rails and equipped with port facilities that make them competitive in the context of logistic platforms in Northern Italy.

However, several critical issues remain: the main ones concern the lack of infrastructure for the direct transshipment between sea and inland navigation vessels, the lack of water levels regulation along the rivers, with the risk of inability to navigation for some periods, and the presence of some major bottlenecks (first of all, localization of parts in class IV reduce the efficiency of the parts in class V).

There are also management problems, such as the lack of coordination between the existing navigation infrastructure (particularly in relation to the locks), the lack of traffic data sharing and of the network conditions data in real-time and of a series of ports functional specialization.

Another important reported point is the failed realization of priority projects (river regimentation to the mouth of the Adriatic sea, and completion of the Milan-Cremona canal), in addition to the dispersion of limited financial resources in non-priority infrastructure projects.

To test the capacity of the network, an evaluation of the canals and rivers capacity has been applied, considering the ports' capacity as infinite. This evaluation provided a theoretical current data on the entire waterway system of about 79,200 tons/day and of 252,000 and tons/day in the future scenario, with all the project interventions completed.

These data are in annual terms of 29 million tons of freight a year for the present situation and of about 92 million tons in terms of future capacity.

Considering the maximum capacity of the ports, the current figure is 2.3 million tons per year, while in the future it is estimated in 7.9 million tons/year.

The chapter ends with a review of the fleet used in the inland waterway system.

Competences, legislation and governance instruments of the waterway network

This chapter deals with the regulatory framework, the competences and planning instruments to better analyze the waterway system in Northern Italy.

A general lack of strategic vision of the waterway system came out from this evaluation, both at the legislative, administrative and planning level, especially with regard to infrastructure interventions.

The competences are often divided in the various parts of the waterway system and do not interact among them, the regulations are not uniformed and an overall plan of development lacks. One of the main problems concerns the competences and the management of the operations in inland waterway system, where the lack of integration is even more serious.

Environmental aspects

The considerable benefits of more energy efficient vehicles for navigation and the resulting lower rates of greenhouse gases emission and lower noise exposure, are the main reasons of the renewed interest that EU policies currently reserve to navigation, as an alternative to road and railway transport.

In this regard, the environmental benefits are discussed and key policies and programs on water and navigation are addressed (Marco Polo, Naiades, etc.). There are also given some good environmental practices in international cooperation projects (Danube and Rhine) with regard to inland navigation.

Despite the good environmental performance in relation to other modalities of freight transport, the analysis has duly considered also the effects of the inland freight transportation on the environment.



Therefore some suggestions for evaluation of the transport externalities are provided, pointing out that the evaluation of transport and/or infrastructural projects with the quantification of environmental damages and externalities has several problems linked mainly to the methodological uncertainty and variability of the evaluation intervals. The calculation of the value of € 4.76/tons of externalities saved with the modal shift from road to inland navigation is reported as the example in a future scenario of implementation of all projects in Northern Italy Waterway System. The chapter ends with an analysis of the environmental framework of the waterway system in Northern Italy, from which the fragmentation of competences on waterway system between public and public private actors comes out again.

Freight flow data analysis

In this chapter the freight flow data of the waterway system are analyzed, to identify the operational status of the ports and the trade trend over the past three years. First of all a methodology for data collection is presented, given the lack of a uniform system of data collection and processing, which prevents the clear and unambiguous understanding of the trend of trade development.

In the second place the river and road traffic data are shown to identify the trends of freight flows transiting through the waterway system and within the inland ports network. The chapter ends with an analysis of potential traffic scenarios that can affect the system once the current criticalities are solved.

From the analysis carried out on the current system of data managing, an almost total lack of automation and of a common exchange platform traffic data sharing and network conditions in real time has to be reported. As far as traffic data are considered, it is reported that goods are almost all in entrance towards inland ports with their high concentration. The trend of waterway traffic (2007-2010) is lowering more than the road transport, because the river transport is the most severely exposed to the economic variables and the structural crisis concerns in particular sectors historically associated with waterway system (chemical and mining).

Because of the possibility to use the European (Project Marco Polo II, budget dedicated to IWT), national, regional and provincial contributions, it would be convenient to create an automated common data collection and management. Other possibilities to be mentioned are the optimization of the so-called "return loads", maritime integration to the North Adriatic port system, based on the model of the Northern Range ports and new technologies (ship model "fluviomar") through appropriate collaboration policies, and opening of the market to new railway operators.

The trend of transported goods in inland waterway system is in decline and in 2010, although with a sign of recovery, the data of about 386.000 tons is more than halved compared to the situation in 2007 (about 774.000 tons). However it should be noted that the negative trend is also valid in a broader perspective, since the level of increased traffic volumes is recorded in 2001 (906.000 tons or so, without the figure of Rovigo, not available).

An estimation method of traffic was applied to test the network ability, and it provided a potential traffic of current and future system. A cap on the potential as well as on the present demand for river transport in Northern Italy, and with the implementation of soft interventions achievable in the short term, can be considered, as written above, equal to 5% of trade above quantified (41.5 million tons). That is about 2.2 million tons per year.

A cap on the potential demand referring to the future with a more extensive waterway system and with the upgrade of existing infrastructure, can therefore be estimated in 10% of the total transport, that is about 6.4 million tons. From this figure it is possible to estimate savings in terms of externalities of about 30.5 million per year, assuming that the traffic shifts completely from road to inland waterway transport.



First analysis of logistics attitude towards waterway system

This chapter examines the attitude of the industrial districts of Northern Italy to transport goods through the waterway system, in order to identify the main market features which the waterway system refers to. A similar study was addressed at individual companies, with the use of direct survey through questionnaire. From the analysis carried out it appears that the presence of equipped inland ports and particular product types benefit the tendency towards the waterway transportation.

The production areas potentially suitable for inland waterways transport are steel industry characterized by steel scrap and steel coils arriving from the seaports, the food industry mainly characterized by feed and grain, and directed largely to the farms of the Po valley, the furniture district of Eastern Lombardy, characterized by hazardous materials such as methanol, and urea transport and energy sector compatible with the type of ships sailing in the waterway system.

Gasoline potential (about 200.000 tons) and the furniture district potential, towards North Africa and the Middle East and the transport of oversize/ overweight cargo, directed towards the Middle and Far East have to be detected for exports by waterway.

From the data collected it is clear that the choice of inland waterway transportation concerns mainly the imports of raw materials and half-processed materials from Eastern Europe, Middle and Far East, while it remains marginal in terms of exports (finished products to Western Europe). This leads to a lack of balance on the east-west direction affected by inland waterway, with the problem of empty return.

However, in recent years, the growing development of the Middle East and North Africa countries, has led to increasingly offset flows from east to west, and therefore to inland waterway transport, because the products for these Northern Italy markets have to reach the ports of Northern Adriatic.

From the interviews it appears that the breaking load generated with the arrival in port and additional road transport to destination do not represent a limitation to businesses companies interviewed, due to the immediate vicinity they could easily constitute a shuttle service (in some cases even automated), which overcomes the last mile costs.

This element raises attention to the need of planning an easy-industrial complex localization along the waterways, to facilitate door to door transport based on the North European model. Furthermore other elements were highlighted such as the need to have a fluvio-maritime fleet capable of sailing in the Adriatic sea, also with adverse weather conditions and the need to develop existing fleet, which currently lacks the capacity of transport necessary to meet the potential demand.

Phase 2: Strategic Plan

As anticipated, the Phase 2 of the Master Plan intends to provide a methodological frame of reference. The results of the cognitive framework of demand and supply of inland waterway navigation system have been summarized in a SWOT matrix. Possible intervention strategies identified as possible areas of strategic Action Plan are firstly grouped by intervention strategies that help to focus the main areas of intervention.

Each strategic macro theme contains a list of action lines (typically represented by action verbs such as create, start, build, develop, etc.) and they represent what should be done to achieve the strategy. There is therefore the Action Plan. Each line of intervention is matched to a priority project, a subset of projects ordered through the multicriteria analysis method.



Methodological approach to define the strategy of the Master Plan

The first part of Phase 2 deals with the Master Plan structure, defines the three phases of its structure and the underlying methodology. In particular, after the illustration of the Master Plan structure, the focus moves to the definition of objectives and actions resulting from the elaboration of Phase 1, using the results of the SWOT analysis effectively.

General objectives for inland navigation of the EU Programme 2006-2013

The strategic objectives of the Master Plan are then placed in relation to the objectives set by the European Union for the inland waterways of the EU Programme 2006-2013, to ensure/check consistency.

Lines of intervention, strategic objectives and strategic actions for the waterway system of the Northern Italy

Starting from the objective, lines of action have been defined:

- marketing;
- services;
- governance;
- training and regulation;
- infrastructures;
- information & communication technology;
- environment, safety at work and social benefits.

These lines of intervention group a series of objectives, which strategic actions are related to, with the aim to achieve the same objectives.

In this way a grid is built with the frame represented synthetically as basis for the definition of specific actions that should be started to overcome the criticalities raised and to take advantage of the strengths highlighted in Phase 1.

Methodology for priority projects definition

In order to give substance to the methodological approach used, some specific projects considered prior have been associated to each strategic action. These are the projects that could boost the implementation of the strategic action of reference, and to attain the strategic goal to which it relates.

The selection of these projects came out from the collaboration of ALOT s.c.a r.l. team with international and national experts who joined ALOT s.c.a r.l. in the analysis of system critical issues and needs, bringing their own technical expertise and the ones from geographical area of their interest. In this analysis participated also the waterway system stakeholders, in particular from the Coordination, consulted in relation to their subjects and able to suggest solutions borrowed from the areas of their managerial competence and from the territory they represent.

The information were collected and structured with interviews to different subjects mentioned above.

A standard structure has been adopted for the description of the project, which although hardly adaptable at the same time to the various intervention aspects, was necessary in order to later perform a MCA analysis for the objective assessment of the various projects on the basis of common criteria.

Firstly, each project was included in a clear hierarchy, assigned to strategic action of reference, and consequently assigned to a strategic objective and to a line of action that has been identified.

Afterwards, for each project following aspects have been indicated:

- objective;
- state of the project;
- operational status;
- project cost;
- financial situation;
- realization times;
- description.

Assessment methodology for the priority projects

The last part of Phase 2 covers the methodology chosen for the selection of projects on which the action Master Plan will be developed (in the next phase of the Master Plan) that is the multi-criteria analysis, which takes into account a number of different criteria, not always monetized and therefore not always comparable with a cost-benefit analysis.

Compared to Cost-Benefit, the MCA analysis differs in the intent to identify the degree of "desirability" of an intervention based on its effects and independently of the costs of its implementation, leaving the cost-effectiveness evaluations to previous analysis (thus operating as a filter against a number of alternative projects) or subsequent (made in this case to select desirable projects based on their feasibility).

In this case, the analysis is carried out in two successive steps:

- Feasibility study: the aim is to select projects based on a comparison (qualitative one, although based on quantitative data for many of the projects) between construction costs and benefits to the achievement of the main objective of the Master Plan (i.e. the increase in waterway traffic) in terms of increase in supply and demand;
- Multi-Criteria Analysis (MCA) aims to outline a ranking of desirability of each of the projects previously selected for the system in a qualitative manner.

It is important to stress that this procedure is performed separately for two categories of projects, in order to make the assessment more easily comparable:

- 1) infrastructural projects;
- 2) "soft" projects (organizational, regulatory, marketing, etc.).

The assessment is structured on a consistent selection criteria for each of the two different groups.

Phase 3: Action Plan

It is the final phase of the project, which starting from strategy, defines a logical and graded order of projects based on cost / benefit / eligibility, throughout multi-criteria evaluation of a selected group.

The list of priority projects provides on one hand an initial guide for the actors involved in choosing the most effective measures feasible, and on the other one, it proposes a hierarchical ordering of projects which public and private entities could have the opportunity to implement and then manage in the future.

A battery of indicators (of results and trends) that support the monitoring activities is also assigned to each project.

The monitoring and reporting system contains the approach proposed by the system of 'scorecards', a term borrowed from the boards used in baseball and basketball, in addition to the mere score. In both sports the score is in fact the result of the combination of a large number of events and variables essential for a correct interpretation of the expected final result, their careful and constant analysis.



Similarly, the creation and measurement of effectiveness of the Action Plan will be verified according to a set of trend indicators and results that help monitoring of the implementation degree of the proposed strategy.

Interviews results through questionnaires to local businesses and stakeholders to define priority projects

The highest importance was given to the number of bodies involved in the administration and development of the waterway system, since they could represent the many different aspects and peculiarities of the area of reference, useful for the implementation of the Master Plan. For this purpose a series of interviews involving the stakeholders of the system were carried out and the results are reported in this chapter. With regard to project proposed in the Master Plan, those involved have unanimously stressed the need to act primarily on the legislation, recognized as an aspect currently extremely unfavorable, and whose adjustment could be made at no cost and very quickly.

The most important change suggested in the regulatory frame, is the equation of navigation along the coast to the inland navigation, thus avoiding the need to use sea tugs in addition to or instead pushers supplied, and bypassing also the problem of maritime piloting.

Another shared need is the removal of requirements afflicting the river vessels arriving in seaports (eg piloting, mooring, CO2 tax, etc.), which favor road transport operators/ competitors.

The first requirement emerged regarding the infrastructures, is the justification of investments with benefits resulting from these, in particular in terms of externalities saving.

The need to extend the network and penetrate into the economic sector of Northern Italy and the need to construct a hybrid terminal near the coast (Porto Levante), capable to receive the river vessels directly for transshipment with a small coaster and arrive to inland ports quickly, have been emphasized in terms of infrastructure investment.

Another interesting element is the development of synergies between waterway and railway, and therefore the ability of direct transshipment to allow an easier connection between railway and seaports, through the waterway.

The need for coordination, including also private sector, has been raised forcefully, with regard to governance. The aim is both to avoid localism, cutting down the efforts of individual institutions in an overall framework and bringing benefits to the system as a whole, and especially, to provide potential investors with a single interface for information and guidance on opportunities and partnership arrangements.

The system of incentives such as promotion of savings generated in terms of externalities, to encourage the navigation and bridge the gap between inland navigation and road transport is another element to be considered.

Private sector suggests also their partnership in the modernization of the fleet, which could be able to compete with road transport after technological improvements. The fleet renewal, besides the construction of a balanced system of incentives, should also involve operators already active in other geographical areas in Europe.

Only already established individuals have the possibility to install a modern and numerous fleet in short-term, even without incentives.

Finally, the need to use new technologies, creating an Internet website aimed at matching the demand and supply of water transport, and focused on demonstrating the environmental benefits related to inland navigation has been raised, in terms of marketing.

On the same side the opportunities related to export have been emphasized, in particular by a large transport companies in South-East Asia, which might be interested in placing hub to collect goods for export right along the waterway.

List and description of priority projects

At the end of the analysis and interviews, 93 priority projects are listed. Each project is connected to the fact sheet, which shows the main features described in step 2.

Results of multicriteria analysis

In agreement with what is shown in the last section of Phase 2 of the Master Plan, the multi-criteria analysis (MCA) is intended to define an indicative ranking of projects according to:

- a) their economic feasibility in relation to the contribution they bring (for the offer improvement and demand enlargement) to the traffic development;
- b) their responsiveness to the specific objectives of the Master Plan.

The first of these points is considered through the Step A of multi-criteria analysis, consisting of a feasibility qualitative assessment, while the second is considered through the Step B, consisting of a true MCA performed on selected projects based on the first step.

A pair of values was associated to each project expressing:

- 1) the contribution to the traffic development (a value from 0 to 100);
- 2) economic cost (a value from 0 to 100).

The quantification of the first value was carried out by the working group through a qualitative assessment, while the second one was based on an estimate of the construction cost of each project.

The comparison between the values (1) and (2) ranks each project in a diagram, which also presents information on the eligibility of each project divided as follows:

- not funded and for which no funding are expected in a short time period (0%);
- already funded or able to be funded immediately (100%);
- projects for which partial funding can be activated (for some expected or with deferred timing) (50% or other intermediate values).

In accordance with the methodology presented in Phase 2, the projects selected in the first step (in particular those with positive eligibility or evaluation of costs / benefits greater than 1) are divided into two categories: "hard" (infrastructure projects) and "soft" (other projects) and subjected to an MCA in order to establish an interventions prioritization. The result of this step is illustrated in following two tables, in which the score of the MCA presented for each project is normalized, with 100 equal to the score of the "best" project.

Among the selected projects: Venice offshore platform, the connection to Milan (Milan-Cremona Canal), the regulation of the river Po, the adjustment of the River Po from Mantua to Cremona, incentives to navigation, the calculation of externalities, regulatory reform, the locks automation.



In-depth factsheet on projects to be undertaken

An exhaustive factsheet was completed for each of these projects. Each one contains the fields representing the information normally required in a call for proposal in order to show the most concrete and significant elements:

- name of the project;
- line of intervention;
- strategic objectives;
- strategic action;
- bottlenecks;
- expected results;
- project costs;
- funding modality;
- state of the project;
- project duration ;
- start of the project;
- location of the project;
- work plan and description of the activities;
- territorial impact.

Participation to Trade Shows and Events

As explained above, the elaboration of the Master Plan was based on a continuous consultation and dialogue with the most important actors of the waterway system. Here follows a list of the main events during which the Master Plan progress was presented and requests and suggestions were collected and discussed. The method used includes round tables, interviews and questionnaires to stakeholders and decision makers.

1. "Presentation of the Master Plan of Northern Italy Waterway System", Mantua (Italy), 29th July, 2010;
2. "Mantua Open Port", Mantua (Italy), 15th October, 2010;
3. "Improving inland waterway transport of Dangerous Goods Transportation", Rovigo (Italy), 26th Novembre 2010;
4. Presentation of new basin ", Mantua (Italy), 14th Marc, 2011;
5. "Made in Steel", Brescia (Italy), 23rd March, 2011;
6. "Potentiality, development and promotion of the logistic network of inland navigation of Northern Italy. Complementarity of touristic and freight navigation in inland waterway ", Castelmasa (Italy), 25th March 2011;
7. "Opening of Valdaro intermodal area", Mantua (Italy), 2nd April, 2011;
8. "Transport Logistic 2011", Monaco (Germany), 12th May, 2011;
9. "Multimodal Transport approach in Northern Italy", Mantua (Italy), 31st May 2011 - 1st June , 2011;
10. "The promotion of Veneto Padano Inland Waterway System Within the context of logistic competences of the Open ENLoCC network ", Mantua (Italy), 21st June 2011 – 22nd June, 2011;
11. "The Masterplan of Northern Italy Waterway System and North Adriatic: proposal for an overall efficiency of inland waterways ", Parma (Italy), 19th July, 2011;
12. "Visit to Laakdal", Antwerp (Belgium) 6th September 2011 – 8th September, 2011;
13. "Workshop- a comparison of strategic Masterplans of European Waterway Systems and examples of free stream navigation ", Brussels (Belgium), 19th Octobe, 2011 - 20th October 2011;
14. "Waterway System: functional aspects, developing perspectives", Nogaro (Italy), 26th October, 2011;
15. "NINA-NET Final Meeting & Open Workshop, Rovigo (Italy), 11th November, 2011;
16. The promotion of inland waterways and their impact on logistics and industrial system of the North ", Rovigo (Italy), November 18th, 2011;
17. Studies for the improvement of the infrastructure of waterway system in Northern Italy. Final project of the free course of the river Po, "Parma (Italy), 2nd December, 2011.



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