



Green corridor development of the Lyon-Madrid axis

EXECUTIVE SUMMARY

The results derived from this activity are expected to make a specific contribution to integrating the greening concept into corridor development planning. It takes into account all the components of the corridor concept, to accelerate their implementation through mature, realistic and validated implementation plans. This will also contribute to the development and successful implementation of rail freight corridors.

STUDY CONDUCTED BY :
Polytechnic University of Catalonia (2014)

The full document is accessible to the project's Stakeholders Interest Group on the CLYMA website: www.clyma.eu



DEVELOPMENT OF THE
**CONNECTION
LYON-MADRID**
ON THE MEDITERRANEAN
CORRIDOR

The concept of green transport corridors will reflect an integrated transport concept where short sea shipping, inland navigation, rail and road complement each other enabling the choice of environmentally friendly transport. Along these corridors, industry should be encouraged to rely on co-modality and on advanced technology in order to accommodate rising traffic volumes while promoting environmental sustainability and energy efficiency. Projects such as SuperGreen and EWCT II have made advances in defining the “green corridor”.

But the first step to advance in a greener corridor is to establish a standardized measurement system to identify the emissions and the sustainability of a service on the corridor. To allow the industry to choose among different transport services in terms of sustainability all these services should be environmentally measured using the same criteria. The elements to be considered in the sustainability measures should be specified (transport emissions, terminal emissions, infrastructure construction, infrastructure maintenance, etc.). These criteria are not defined on the TEN-T corridors structure and multiple calculation systems can be defined.

To avoid this problem and to make progress towards developing of green corridor it is necessary to standardize the sustainability measurement system on the corridor with a set of suitable KPI's and to propose some measures for the “green development” of the Lyon-Madrid axis. As part of the European project CLYMA, an analysis of the more appropriate indicators to monitor the greenness of the Lyon-Madrid corridor has been developed. The analysis performed was based on previous projects, a wide experts' consultation and the other tasks of the CLYMA project.

KPI's for a green corridor

69 factors were identified to assess the actions intended to make a freight transport corridor green. The factors identified are operational (21), regarding environmental and climate impact (11), regarding economic and social impact (22), and referred to infrastructures renewal or construction (15).

A set of indicators reflecting the general functioning of the corridor have been defined by taking into account the factors obtained and the indicators proposed by some previous projects. An overall of 16 indicators are proposed. A total of 9 indicators were previously proposed by SuperGreen project, 2 by EWTC II (2012) project and 5 are first proposed.

Block	Indicator
Operations	Direct costs of transport
	Frequency of service
	Safety measures
	Security measures
	Proportion of co-modal transport
	Quality of service in intermodal transport
	Reliability of service
	Transport time
Environment and climate impact	Alternative fuels filling stations
	CO2 emissions
	Engine standards
	SOx emissions
Economic and social impact	Activity of the areas served
	Impact on physical environment
	Total goods volumes
	Use of capacity



Actions for a green development of the Lyon-Madrid axis

Possible actions to foster the greenness have been categorized and priorities have been proposed.

The possible actions to foster the greenness of the corridor have been identified and categorized by taken into account: (1) the opinions and information obtained in the experts' consultation; (2) second interviews with some of the consulted experts, representing some of the stakeholders involved; (3) an analysis of the presentations and debates developed on the Stakeholders Summits of the CLYMA project; and (4) the results of other tasks of the project CLYMA.

The actions identified are presented in the table to the right:

Block	Actions
Functioning of the corridor	<ul style="list-style-type: none"> ▪ Actions on road traffic, as time restrictions, speed and rules for Heavy Goods Vehicles (HGV). ▪ Harmonization of regulations. ▪ Improve the management, interoperability and frequency of rail transport and the throughput of rail terminals. ▪ Promote good practices as eco-driving and using implementing planning systems. ▪ Separation of passenger and goods when possible or prioritization of goods in the rail traffic.
New technologies	<ul style="list-style-type: none"> ▪ Harmonization of ICT. ▪ Promotion of Intelligent Transportation Systems.
Physical infrastructure	<ul style="list-style-type: none"> ▪ Alternative fuels supplying. ▪ Electricity supplying for trucks and vessels in ports and trucks in parking areas. ▪ In relation to railway, electrification, extension of European gauge and harmonization of electric and signaling systems. ▪ Investments on inland waterway, maritime ports, rail, road or transshipment ports.
Political measures	<ul style="list-style-type: none"> ▪ Actions to facilitate the participation of the inhabitants of the areas affected on the planning and management of the corridor. ▪ Actions to promote the existence of a competitive market altogether with collaboration in the corridor. ▪ Define a roadmap for the corridor. ▪ Facilitate and encourage short sea shipping and inland waterway in the corridor.
Sustainability awareness	<ul style="list-style-type: none"> ▪ Analysis of the carbon footprint of the corridor. ▪ Facilitate comparison of freight alternatives in the corridor regarding pollution. ▪ Posting the pollution information of each carrier.
Whole transport system	<ul style="list-style-type: none"> ▪ Actions referred to security and safety, as education, norms that are more rigid and investments. ▪ Actions referred to the global planning of freight transport. ▪ Actions related to the assessment of social, economic and environmental aspects of the new projects. ▪ Implementation of CO2 labels. ▪ Tax policies to promote sustainable behaviors. ▪ Update regulations to allow greater train capacity by acting on load; speed; distance between trains, vehicle configuration; and train length.

Priorities proposed

Priorities are recommended as a result of the information and opinions obtained in the two rounds of experts' consultation and the other information available, as follows:

1

Encourage initiatives aiming to facilitate and promote co-modal and sustainable transport.

Actions and regulations that have a significant and visible impact on reducing emissions. Such as:

- Substitution of heavy fuel for liquefied gases and electricity from renewable sources in ports and marshalling yards.
- Implementation of charging stations of liquefied gases and electricity from renewable sources in all service areas for trucks and other motor vehicles.
- Implementation of regular high frequency railroad motorway services that link the main hubs of the corridor.
- Creation or improvement of rail links in ports and marshalling yards
- Expansion and promotion of regular short sea shipping services between the ports in the area of influence of the corridor.
- Implementation of a mandatory ELL (efficient loading label) in order to discourage the empty return trips of transportation vehicles.

2

Resolve outstanding issues of harmonization, frequency and reliability.

The enlargement of railway sidings in Spain to equal its length to those in France, allowing the circulation of larger trains and avoiding at the same time matching operations at the frontier between both countries.

3

Promote the use of advanced technologies

- Creation of a business incubator oriented to the use advanced technologies in the corridor.
- In particular, the development of applications oriented to reduce the waiting time of trucks in ports and marshalling yards, which would contribute significantly to the efficiency of the corridor and to reduction of emissions.
- Periodic calls for project funding of research and development on information, communications and energetic technologies in the corridor.

4

Improve planning processes

The planning processes had to ensure that all the interests involved are taken into account and that the necessary social consensus is obtained. To obtain this consensus and to ease the actions to be developed, all the stakeholders implied have to participate in the decision process and have to be fully taken into account.



Greening the corridor work plan

A guide on how to fulfil green requirements and characteristics in the future corridor development plans is provided. More specifically several recommendations are proposed for the future Mediterranean corridor development plan which must be aligned with the EU's "green objectives".

Based on a literature review on manuals and guides about planning and development of green corridors, plans and green corridor projects, especially European projects on green corridor, and the regulation of the European Commission, a conceptual framework is proposed in order to incorporate the green perspective, and to address the question of how do we plan, develop and manage a green freight corridor.

The framework describes the key steps that are part of a freight corridor planning and development plan. All of these steps affects sustainability and are used to integrate green considerations. They are presented below each of these:

1. Stakeholder identification and initial outreach
2. Establish vision, goals and objectives
3. Define performance criteria and data needs
4. Analysis. Identification of current and future problems, deficiencies and needs
5. Development and evaluation of alternatives, improvement strategies and projects
6. Development of an investment and financial analysis
7. Project development
8. Design of governance and management model
9. System monitoring

Moreover it is proposed a set of recommendations on how to incorporate environmental and sustainability concerns into each of the phases of the freight corridor development and operation.

Finally we analyzed the "Mediterranean Core Network Corridor Study. Final report" dated in December 2014 aiming to suggest how the document can be improved in order to assure a "green" development for the axis Lyon-Madrid.

Greening the corridor work plan recommendations

Identification of stakeholders

Following the general recommendations in CLYMA, communities should be involved since “successful consideration of environmental factors in corridor planning and project development will require significant public involvement and participation of environmental stakeholders”.

Establishment of vision, goals and objectives

Final Report for the Mediterranean Corridor (2014) identifies the following general objectives of the corridor:

- Economic efficiency
- Clean transport
- Cohesion-regional cooperation and trade

Recommended transportation sustainability goals

Sustainability	Definition
Safety	Provide a safe transportation system for users and the general public.
Basic accessibility	Provide a transportation system that offers accessibility that allows people to fulfil, at least, their basic needs.
Equity/equal mobility	Prove options that allow affordable and equitable transportation opportunities for all sections of society.
System efficiency	Ensure that the transportation system’s functionality and efficiency are maintained and enhanced.
Security	Ensure that the transportation system is secure from, ready for, and resilient to threats from all hazards.
Prosperity	Ensure that the transportation system’s development and operation support economic development and prosperity.
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Economic viability	Ensure the economic feasibility of transportation investments over time.
Ecosystems	Protect and enhance environmental and ecological systems while developing and operating transportation systems.
Waste generation	Reduce waste generated by transportation-related activities.
Resource consumption	Reduce the use of non-renewable resources and promote the use of renewable replacements.
Emissions and air quality	Reduce transportation-related emissions of air pollutants and greenhouse gases.



KPIs for the Lyon-Madrid green freight corridor proposed by CLYMA

Operational Objective	KPI
Removal of infrastructure bottlenecks and “filling” missing links	Number of identified bottlenecks
Upgrading of infrastructure quality level	Improved technical standards per transport mode
Efficient use of infrastructure	<ul style="list-style-type: none"> Freight and passenger flows Infrastructure utilisation rate
Optimal integration and improved interconnection of transport modes	<ul style="list-style-type: none"> Modal split Use of common traffic management systems Presence and use of intermodal terminals
Optimal interconnection of national transport networks	<ul style="list-style-type: none"> Border waiting time Use of common standards and procedures
Promotion of economically efficient and high-quality transport	<ul style="list-style-type: none"> Transport time Mean speed Frequency Freight security-availability of secured parking
Promotion of resource-efficient use of infrastructure	<ul style="list-style-type: none"> Pollutant emissions Availability of refueling infrastructure for alternative fuels
Reduction of congestion	Mean speed
Improvement of road safety	Safety (number of accidents or incidents)

Measures proposed in Final Report for the Mediterranean Corridor

Operational Objective	Measures
Promote resource-efficient use of infrastructure	<ul style="list-style-type: none"> Provision of refuelling infrastructure for alternative fuels Restrictions to highly polluting vehicles Protection of environmentally sensitive areas
Reduce congestion	<ul style="list-style-type: none"> Use of IT systems, such as dynamic route information panels Demand of management policies
Improve road safety	<ul style="list-style-type: none"> Development of forgiving infrastructure Implementation of EU Directives on Transport Safety

CLYMA project consists of the implementation of the corridor approach to a section of the **Mediterranean corridor**, concretely to the Western part of the corridor and specifically to the Lyon-Madrid Axis.

The project comprises of studies and actions on the organization and optimal implementation of the **TEN-T network**, taking into account long term perspectives, environmental aspects and associated needs, as well as studies that promote environmental sustainability, resource efficiency and low-carbon transport within an integrated transport concept. This should stimulate the deployment of the **Green Corridor concept**. The project also intends to develop a **managerial structure** for the intermodal corridor.



PROJECT OFFICE



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