

Destination: Sustainable Mobility

Thirteen European Companies Working on Future Rail Vision

SPIDER PLUS is a research and development project co-funded by the European Union in the scope of the Seventh Framework Programme. The project aims at developing a passenger and freight mobility vision for 2050 encompassing seamless transportation where electrified rail has a central role.

It is about time to act. In the years to come the decision makers, be they politicians or industry leaders, have to prepare the way to respond to future mobility needs in sustainable ways. This must be the

only way to proceed for giving a better future to our children. The current trend has led to an increasing number of people using individual vehicles for the citizens' mobility and trucks for goods movement. Despite new limitations, the overall emissions are steadily increasing. The prospective damages and costs to society are still undervalued.

Hence, the European Commission published two keywords within the White Paper that are essential for the prospective transport policy: sustainable mobility. That means a



What does SPIDER PLUS stand for?

Sustainable Plan for Integrated Development through the European Rail network – Projecting Logistics and mobility for Urban Spatial design evolution

PROJECT KEY FACTS

- Budget: 4,1 million €
- EU contribution: 3 million €
- Duration: 12/2012 – 5/2015
- Coordination: HaCon
- Consortium: 13 European research and industrial companies from seven countries
- Project goals:
 - » Developing a vision for sustainable mobility in 2050
 - » Elaboration of measures to support a modal shift to rail according to the EU White Paper



www.spiderplus-project.eu



Overview of the SPIDER PLUS project approach

massive shift of traffic to rail. In the long-term, more than 50% rail market share are the set goal for both rail passenger and rail freight transport. This is considered a very demanding goal while it is not clear yet how to achieve this objective.

The SPIDER PLUS consortium faces this challenge. 13 European companies and institutions provide cross-modal expertise. Leading industrial players like Siemens or EADS participate as well as market newcomers such as NTV, European universities and research companies to set the course for the project goal: sustainable mobility.

Current Project Status

Overview of the future mobility elaboration progresses

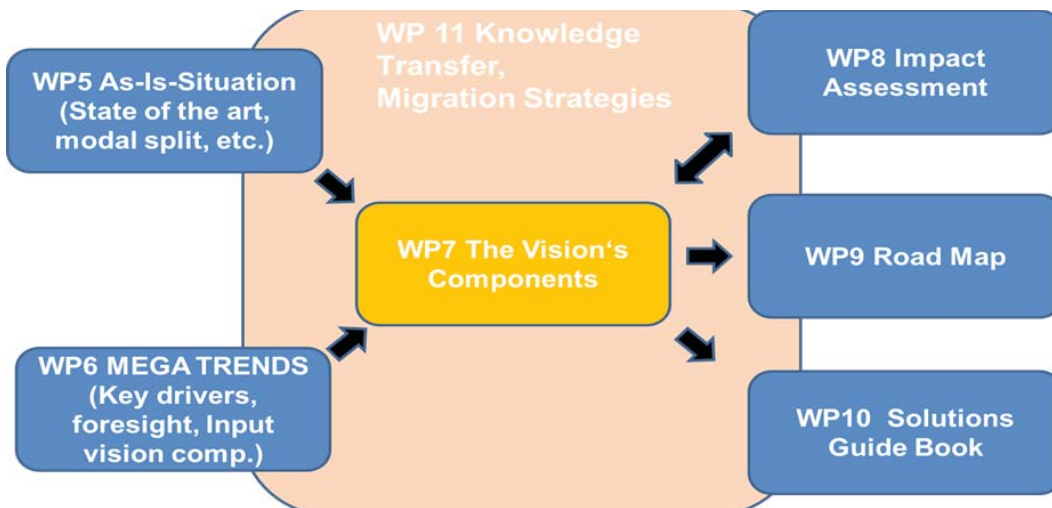
The aim of the SPIDER PLUS project is to set the basis for a future efficient, attractive and environmentally friendly railway

transport modes. Safety, security and transport efficiency improved significantly. The demand for mobility increased more than the available

countries have very negative effects on the rail sector besides a significant infrastructure reduction (e.g. number of terminals/marshalling yards). As a consequence the number of employees dropped, leading to other societal challenges as well. Nevertheless the experiences of other countries show that after hard times it is possible to get back to a successful rail transport system, when the open market requirements can be met by appropriate developments.

Some major example results are:

- › The overall demand for logistic services will continue to rise significantly; intensive measures are necessary.
- › Reliability and resource efficiency are the key criteria for the competitiveness of rail freight services. This can only be significantly improved by a new generation of IT technologies.
- › The rail infrastructure capacity is a limiting factor.
- › The demand in High Speed Rail market is supply or infrastructure driven.
- › Service costs, transit time, comforts, seamless connections, available information constitute drivers for modal choice.
- › Comfortable co-modal solutions are the key to success.
- › Rail freight transport needs a completely new industrialised business model on identified axes, with improved freight villages and transfer operations.



Interaction between the work packages

with a pivotal role in the intermodal transport chains of passenger and freight providing its benefits to the transportation system as a whole. The consortium works jointly in each work package due to the cross-disciplinary conception of the project.

The „As Is Situation“

The current situation of the sector was elaborated in order to develop visions for the future of European mobility. This evaluation was done from both offer and demand perspectives. A gap analysis was performed by analysing the transport market “AS-IS” situation with its relevant market segments, taking into account the envisaged market development. Deciding factors associated with user’s requirements such as costs and quality in “door-to-door” transport chains or journeys have been taken into account.

In the last couple of years the European mobility has made progresses in many sectors of traditional

capacity. Statistics have shown that the rail performance is insufficient if compared to the overall mobility. However, the differences between rail passenger and freight transport can be summarised as follows:

Rail passenger transport has shown positive trends with references to urban and high-speed services. Nevertheless high-speed rail represents only one per cent of the total European rail passenger kilometres (pkm). The result is an enormous growing potential where adequate service offerings are available.

Rail freight transport shows disappointing results in all segments due to poor performances, lack of industrialisation and high costs. The new member states and accession countries experience the rail market share declining drastically after the divestiture of the formerly state owned and steered rail system and the parallel opening of the road market. The short term structural changes of the transport system in these

Mega Trends

Evolving from the “As Is Situation”, the identification of “Drivers of Change” is the next step of the SPIDER PLUS project. The drivers are factors capable of shaping the 2050 vision of a society mostly served by electrified rail. Therefore, societal trends and developments have a major impact on future mobility demands. Attitudes, values, behaviours, life styles as well as goals and expectations have to be determined for both business and customers.

Though, a picture encompassing societal factors only is too short-sighted. “Drivers of change” that influence the external environment and the rail industry have to be considered as well. Two categories have been set:

- ▶ Internal drivers (environment, competition, stakeholders, regulations, etc.)
- ▶ External drivers (energy, economy, resources, technology, politics, etc.)

A study with combined forecasting and back casting techniques has been designed and executed to ensure an accurate evaluation concerning cross impacts and consequences of internal and external drivers. The results have been subsequently judged and evaluated.

By 2050, almost everything in today’s world will have been transformed including the challenges we face and the solutions we invent to address them. The rail transportation system will have to undergo a profound transformation over the next 40 years if it is to play its potentially crucial role in creating sustainable wealth and prosperity in Europe.

What can be expected how transportation will look like in 2050, when the drivers remain unchanged? The 2050 scenario shows some possible changes compared to today’s situation (see box).

Scenario 2050

The connected traveller benefits from seamless multi-modal transport, using a virtual travel companion that is aware of the traveller’s preferences and the real time context. New mobility routines and behavioural changes have led to more flexible and service oriented ways to provide individual mobility and varying lifestyles. Smart hubs in the cities’ periphery are responsible for the distribution of in- and outbound logistics and transport.

Electric technology has replaced combustion engines. The spatial pressure is high: About two-thirds of the population is living in urban areas. In this urbanised environment, public transport is the main mean of transport. Multi-modal travelling is easy due to a wider range of available transport modalities. In addition, there has been a massive decline in the ownership of individual transportation. The line between the real and the virtual world has blurred.

Vision’s Components

In addition to fostering the growing markets of recent years such as high-speed, Air-Rail and Combined Transport through advanced technology and IT systems, the goal of the vision components is also to evaluate the demand on reactivating hidden potentials and developing new concepts. One example is to build new or restore existing tracks and improve connections between valuable logistics areas and big urban centres, in order to develop an eco-friendly urban logistics mostly based on electric vehicles for the last-mile delivery. A better integration of transport planning and space planning plays a greater role in the future.

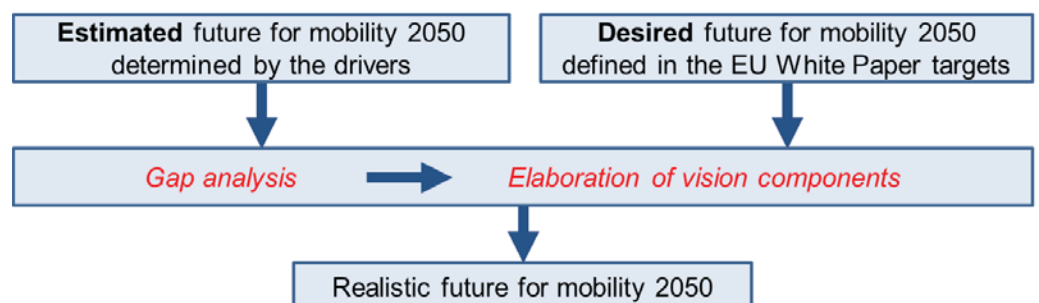
This is only one example for vision components which are currently being elaborated by the consortium. The next step is to present the key results a selection of external experts in a dedicated workshop. For more detailed information please have a look on the back page.

OUTLOOK:

Impact Assessment & Road Map

The implementation of visions is naturally accompanied by impacts. The assessment of impacts delivers evaluations and validations concerning the solutions in the different dimensions that have been elaborated during the previous WPs. Long lasting measures which are capable of producing effects will be assessed at two time horizons: the intermediate step 2030 and finally 2050.

The work package’s final result, a comprehensive assessment of the SPIDER PLUS solutions functions as a basis leading to the development of the road map. In the end measures will be derived from the vision components dictating the content of the road map. The sequence of the measures and the latest estimated point of realisation will be documented.



Elaboration of realistic future mobility 2050

Upcoming Events/Workshops

In order to elaborate the results of work packages, meetings with selected experts are a crucial part of the development process. In March and April, three meetings are scheduled to work on and discuss the results of WP7.

In general, feedbacks from external experts are important for evaluations and possible modifications of developed solutions. Therefore, railway undertakings representatives, worldwide operating concerns, universities and infrastructure managing companies are invited to assess progresses within the project.

On **March 10** an internal managing meeting takes place in Madrid. The current status of the upcoming tasks, internal reviews and quality checks will be discussed. Besides, the preparations for the expert meeting the next day will be made.

On **March 11**; First meeting with external experts regarding task 1

“Electrified high speed rail society” and task 2 “European rail freight corridors’ role” | Madrid

ERA (European Railway Agency) and the ADIF (Administrador de Infraestructuras Ferroviarias) are represented during the expert meeting on March 11. Topics are the future of high-speed passenger transportation and European rail freight corridors’ role within rail freight services.

On **April 15**, 9:00 – 19:00; Transport Research Arena: During the Transport Research Arena (TRA) in Paris SPIDER PLUS poster presentation takes place | Paris, CNIT (Level C, panel 81)

On **April 16**, the second meeting with external experts regarding task 3 “Local transportation and role of rail”, task 4 “Urban/regional planning evolution and its impact” and task 5 “Industrial production and associated business processes” | Paris, CNITthird

Network of Expertise

Based on best practices already showing solutions for the future the project consortium, supported by a network of over 60 experts, develops specific recommendations and measures to be implemented in the coming years and decades by the rail sector and by the policy makers. Two expert networks have been established in order to include the largest possible range of expertise and ideas: one composed by leading transport academy experts who contribute with the newest findings and ideas, the other one composed by railway industry specialists bringing in the latest business news and experiences regarding the feasibility of the identified developments.

For further SPIDER PLUS project information please contact:

- › **Franco Castagnetti**
(franco.castagnetti@newopera.org)
- › **Marcel Muchow**
(marcel.muchow@hacon.de)

Or visit the project website:
www.spiderplus-project.eu



Panorama photo of the SPIDER PLUS back casting workshop in Hanover

Project partners:



Coordinated by:



HaCon Ingenieurgesellschaft mbH
Lister Strasse 15
D-30163 Hannover
Phone: +49-511-33699-0
Fax: +49-511-33699-99
Website: www.spiderplus-project.eu
www.hacon.de



Co-funded by the
European Union