

Destination: Sustainable Mobility

Thirteen European companies working on a vision for future rail

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. Within the "White Paper on Transport" the European Commission published two keywords that are essential for the prospective transport policy: sustainable mobility. That means a 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 de-

manding 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.

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

All project activities have been allocated to work packages. The content-related work packages include the assessment of the „As-is situation“ (WP5) and „Drivers of Change“ influencing the future mobility (WP6). Both work packages act as input for the components of the

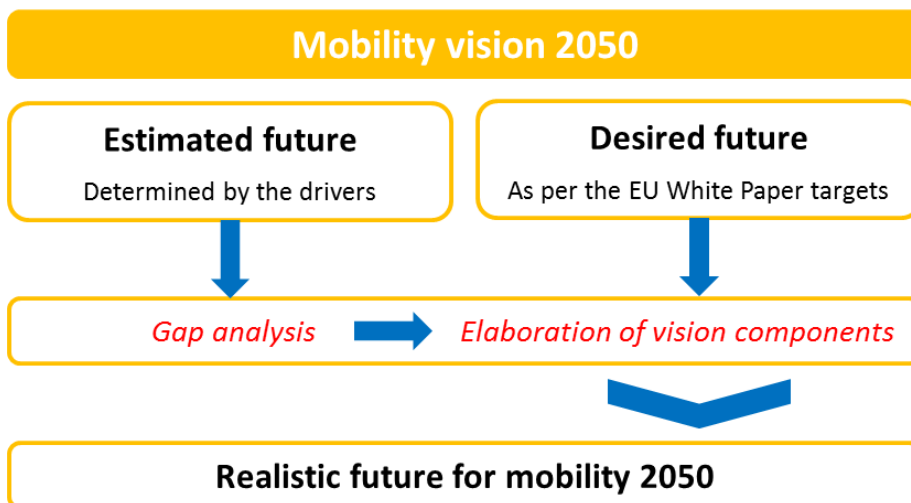
PROJECT KEY FACTS

- › 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



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vision (WP7). The impact assessment (WP8) allows delivering evaluations and validations concerning the solutions that have been elaborated during the previous work packages. Based on these results, a „Road Map“ (WP9) and a „Solutions Guide Book“ (WP10) are to be developed. With the finalisation of WP5 and WP6 in the end of 2013 the basis for the development of the vision 2050 (WP7) has been set. Now, it is time to gather the vision’s elements, identify suitable co-modal solutions and measure their impacts on the future (WP8). Afterwards, the development of the detailed Road Map until 2050 with the necessary implementation steps takes place (WP9). The project results will be summarised in a Solutions Guide Book (WP10).



Elaboration of the realistic future for mobility 2050

Current Project Status

Overview of the future mobility elaboration progresses

The vision's components (WP7)

Objective

The main objective of work package (WP) 7 was to develop and elaborate a SPIDER PLUS 2050 vision for a rail based European society and to assess and to roughly verify the feasibility and achievability of the vision.

The vision is a set of ideas that describes the future state of the transport market. It highlights the preferred future with a society overwhelmingly served by electrified rail and is the framework for strategic planning.

Approach

The vision has been carried out with a common approach in five different components which have been integrated at the end to provide a complete picture of the 2050 transport market.

Results

An *electrified high speed rail society* is accomplished through an unified European rail system which regains technological and industrial leadership. New technologies for trains and infrastructures enable faster and more comfortable services. Innovative ICT organises intra-/intermodal communication and reduces maintenance efforts. The network accessibility is secured by upgraded and op-

timized stations acting as integrating nodes. The liberalised high speed rail (HSR) is more accessible through co-modality and the interoperability between European countries creating a single market and reducing barriers to usage.

For *European rail freight transport* the highlight elements revolve around an efficient multilevel network which allows services and interconnections with hierarchical level in order to support industrialised services. The vision involves optimised nodes, intercontinental trade, seamless door-to-door transport, cross-border interoperability, true European industry standards, efficient capacity management, collaborative business models, new rolling stock generations, innovative ICT and comprehensive rail services.

The *local transportation* is divided into passenger and freight transport to overcome capacity and priority problems. Long and medium distance multi- and intermodal rail freight services are fully integrated with urban freight logistics services. The bundling in logistics hubs allows the necessary volumes to choose rail as competitive alternative against road freight transport. New automated underground freight transport systems, cargo tram and cargo metro can complement rail services in

urban areas. The vision also faces improved cooperation and rail-favoured planning / regulations. Urban passenger transportation has been constantly improved along the high demand axes with high capacity and high frequency metro / tram networks and further integrated service offers (bus network, e-bike, e-car sharing). Interchanges are performed centrally in local mobility hubs which integrate high speed rail services with the local network. Access, payment and navigation in public transportation happens seam- and contactless and is supported through augmented reality.

The SPIDER PLUS vision elaborates also on the role of *urban and regional planning*. Urban planning provides central locations with optimal functioning for new mobility as well as new logistics hubs. The vision comprises increasing the quality of public spaces by integrating infrastructure, creating liveable open spaces, guaranteeing walking and cycling links throughout the city, limiting private vehicle trips inside the city as well as offering a functional and comfortable public transport network based on rail for high volume connections becoming the main ways of moving around the city. The *industrialisation of rail freight service production* in 2050 is support-

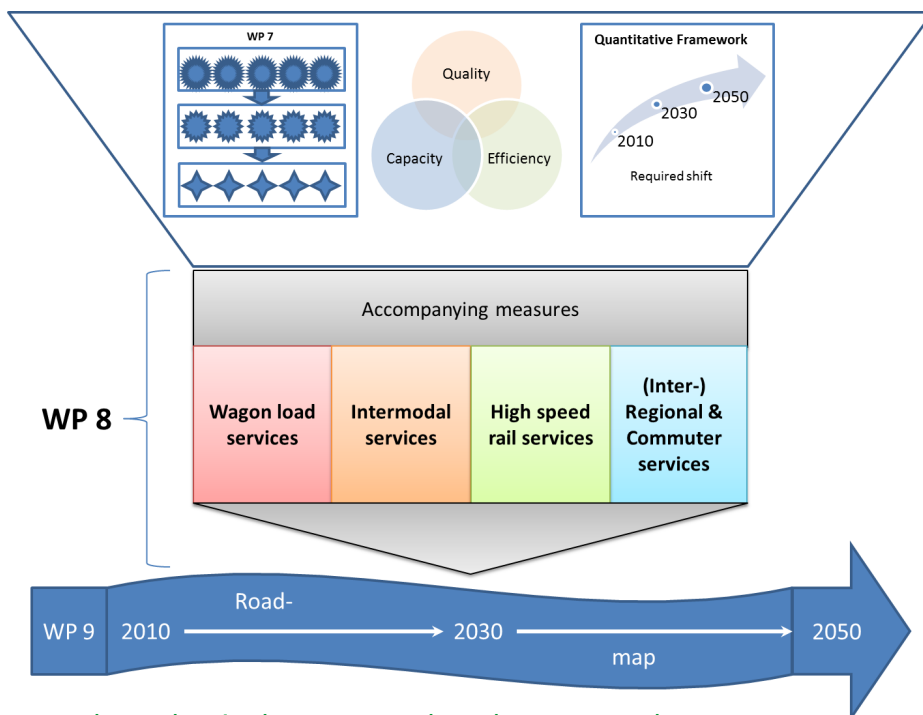
WP 7: The vision's components				
Task 7.1	Task 7.2	Task 7.3	Task 7.4	Task 7.5
The electrified high speed rail society	European rail freight corridor's role	Local transportation and the role of rail	Urban/ regional planning	Industrial production and business processes

The structure of work package 7

ted by modern hub concepts. Hubs close to traffic attraction zones are used as consolidation / differentiation points to realize economies of scale and fully benefit the rail production systems. Network establishment and cooperation among hubs are a fact all-over Europe. The service industrialisation is favoured by the general transport evolution above asset based business models as well as a low cost society. The overall vision is technically, socially, financially and politically achievable if recognised and shared.

Impact assessment (WP8)

At the current stage of the project (WP 8) the SPIDER PLUS consortium identifies suitable co-modal solutions out of the various vision elements elaborated in WP7. This selection process took place in the light of the general requirements as they are: Quality, capacity and efficiency. The third mainstay of WP8 takes the overall quantitative framework into account. Aimed at a European society overwhelmingly served by rail, the identified solutions have to fulfill two tasks. The first one is to enable the railway system to cope with the increased traffic due to the enormous shift to rail. The second task is to make railway traffic more attractive and competitive in order to let this shift to rail happen. WP 8 classifies the co modal solutions according to the respective railway production concept. This assigns wagon load services and in-



Interdependencies between work package 7, 8 and 9

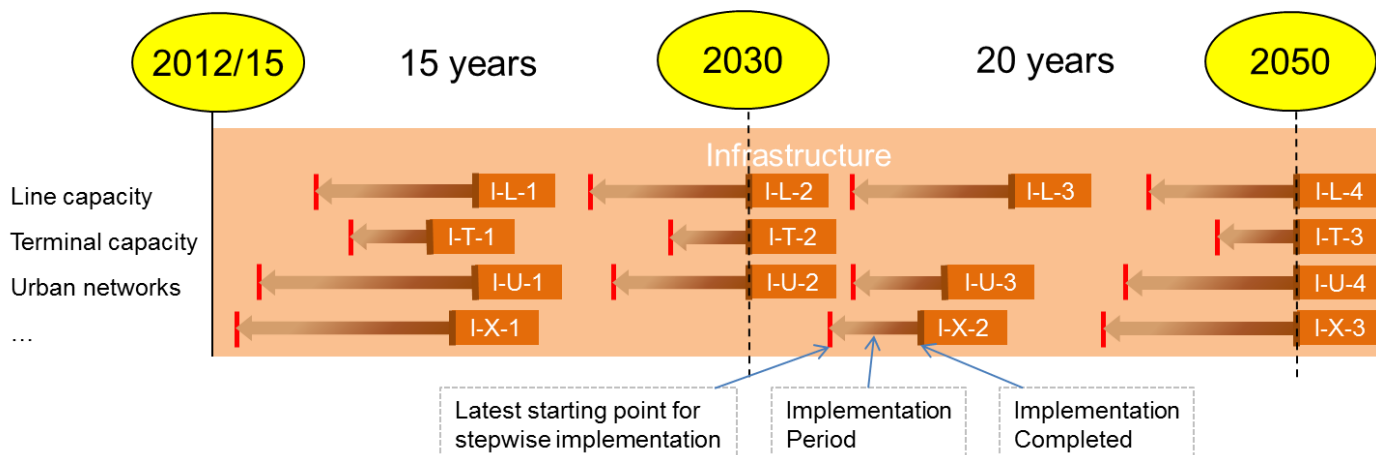
termodal services to freight as well as high speed rail services and (inter-) regional & commuter services to passenger transportation. Within these categories, the measurements and innovations are clustered into: Infrastructure, management & operations and technology.

In addition, accompanying measures like the market environment, general policy frameworks and infrastructure actions are taken into account. Accompanying measures cover actions and innovations concerning the market environment and general framework as well as general actions on the infrastructure. Co-modal solutions are evaluated with regard to their impact. For several measures and innovations, a cost

benefit analysis is performed in order to obtain detailed information on the return on investment. Based on the effective actions and innovations linked with their specific impacts the SPIDER PLUS Road Map will be developed.

Road Map (WP9)

The Road Map brings together two sides: Possible transport volumes based on the required shift (SPIDER PLUS vision 2050) and the actions that will enable rail to make the vision come true. Several measures have to be coordinated, required pre-conditions have to be met and the general framework has to be adjusted. Therefore, the tasks within work package 9 deal with infrastructure



Example of how the SPIDER PLUS Road Map could look like

Upcoming events and workshops

and technology measures, as well as business models and cost funding schemes. The successful integration of national systems into a European grid and the implementation of co-modality in a user-friendly environment complete the desired development until 2050. Temporal aspects are taken into account in order to put the before elaborated actions into a consistent action plan. Different implementation periods lead to fixed times for the latest starting point for a stepwise implementation. The time horizon is divided into two periods. The first one concerns the years until 2030. This intermediate step gives orientation and also the possibility to start adequate corrective actions if needed. The achievements until 2030 will be a crucial indication for the fulfilment of the whole SPIDER PLUS vision. The second period targets the years between 2030 and 2050.

Subsequent to the SPIDER PLUS Road Map a "Solutions Guide Book" (WP10) will be provided containing the results and recommendations in a summarized form.

Network of expertise

Two expert networks have been established in order to include the largest possible range of expertise and ideas in the development of specific recommendations and measures to be implemented in the coming years and decades by the rail sector and by the policy makers. 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. Altogether more than 60 experts have signed a letter of support and will be invited to specific validation workshops.

Upcoming events

- ▶ Milan // October 2014
In October the next workshop with external experts will take place. Discussed topics will be possible actions and measures to fulfil the SPIDER PLUS mobility vision 2050.
- ▶ Duisburg // November 2014
The SPIDER PLUS project will participate to the European Freight & Logistics Leaders Forum in Duisburg in November.
- ▶ Frankfurt // December 2014
In December a workshop with external experts for WP9 will be hold in Frankfurt. The mobility 2050 Road Map will be the central topic.

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Panorama photo of the SPIDER PLUS backcasting workshop in Hanover

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