*living*RAIL

Living in a Sustainable World Focused on Electrified Rail

Vision 2050 for a Positive State of Rail and Spatial Patterns

Vision 2050 for a Positive State of Rail and Spatial Patterns

Preliminaries

1. The LivingRAIL project

This document was produced by the research project LivingRAIL which is co-funded by the 7th RTD research programme of the European Commission. The Core objective of the LivingRAIL project is to develop a Vision for the future of the rail sector in Europe in 2050 supported by a roadmap of measures and policy actions to achieve the white paper targets of a 50% mode share of the railways in key passenger and freight markets by 2050. Detailed information on the project can be retrieved at: www.livingrail.eu.

2. Methodology

In this document we describe the results of a broad visioning process by which we want to describe how Europe should look like by the mid of the century such that electrified rail and public transport cater half of medium distance passenger trips and medium to long distance freight trips. By a backcasting process the LivingRAIL Vision 2050 also develops the story lines how to arrive there from today's situation.

Mobility styles and logistics processes emerge from a multitude of framework conditions. These starts by the lifestyles of peoples and the habits of companies and depends on the prevailing urban and regional settings, on mobility systems available and of course on the attractiveness and services offered by the railways. These incredients are all part of the LivingRAIL Vision 2050. Accordingly, it is extremely broad going far beyond the sole description of transport market trends. The LivingRAIL Vision 2050 further builds on a set of framework conditions and transport sector targets set out by LivingRAIL Deliverable 2.3.

This Vision sets the target point for the LivingRAIL Railmap 2050 - a roadmap drafting the pathway towards the achievement of the mode share targets formulated in the EC White Paper 2011. Generally a vision describes an idealized desirable future of a specific system that is substantially different from the status quo. For policy maker and civil society communities, shared visions are increasingly recognized as highly relevant for initiating transition processes and achieving social changes.

3. Justifications

Why rail? The primary goal of forward-looking planning of our social environment shall be to preserve sufficient resources for future generations without compromising the present. These resources include economic strength, environmental quality and social justice, i.e. the three commonly listed pillars of sustainable development. It is here where collective transport modes need to be developed and used as high quality and low impact alternatives:

Alternative scenarios. Of course, technological development is not limited to the rail sector. Autonomous cars with emission-free electric or fuel cell propulsion may well compromise the railways' environmental and social advantage. Given the current developments in electric and hydrogen vehicles and the announcement of first commercial roll-outs of self-driving cars makes this development a real threat for commercial transport. A further threat for the railways is a persistent regime of financial constraints and austerity in Europe. The greatest threat of all, however, is probably the lacking commitment of policy of various levels as well as of the railways themselves to modal shift and customer orientation goals. The LivingRAIL project underlines a positive scenario whilst acknowledging these threats and pitfalls on the way.

The 2050 Vision

The 2050 vision developed by the LivingRAIL team with the help of external experts from the transport sectors, from academia and public administration expresses a wishful future rather than an expected trend scenario. The Vision 2050 sets the changes which we believe need to take place in order to give the realisation of the White Paper mode shift targets set out by the Commission in 2011 a chance to become true.

As the targets are radical by demanding for a three to five fold increase of passenger and freight volumes by rail, the necessary changes in railway supply, policy, spatial structures and user preferences are alike. Accordingly, we do in no way believe the situation described in our 2050 Vision and on the way to then will happen automatically. Strong drivers and action on a variety of activity fields is needed; these measures will be described in later stages of the LivingRAIL project.

In this document we elaborate the main vision statements and the underlying storylines by four themes and 13 sub-themes from the 2050 perspective. While the detailed roll-out of the vision in this document goes from the prevailing situation in 2015 over short- and medium- to long-term developments, this summary concentrates on the 2050 vision statements.

1. The overall vision statement

In 2050 Europe will have reached the mode share targets envisaged by the EC Transport White Paper 2011 in regional, long-distance passenger and freight transport.

In 2050, the majority of regional and long-distance passenger trips and medium to long distance freight movements are done by rail, mainly on electrified networks. For high density areas the share of rail travel approaches 60% and even more in large agglomerations, while low density and peripheral regions which still have more car dependence have achieved a 40% market share for the railways.

Arriving at this balanced societal state has neither emerged as a matter of course, nor has it been easy to achieve. Thanks to multiple societal drivers with changing lifestyles and more responsible user behaviour, better spatial and urban policies, optimised rail and public transport services, better rail technology, an active promotion, an economic, social and cultural environment in Europe has emerged favouring the use of rail.

2. Values and Lifestyles

In 2050 people put much more value on healthy and sustainable lifestyles than today.

Green and healthy lifestyles: In 2050, a high level of environmental awareness and sustainable behaviour, but also personal health and well-being, are inseparable parts of peoples' lifestyles. Sustainability awareness influences the behaviour of citizens, firms and institutions: e.g. in lifestyle and consumption patterns, business and production models, national accounts, financing, and supply chain management.

Change of status symbols: In 2050, the status function of the private car of the 20th century as given way to a pragmatic use of transport means according to needs and availability. Thus in high density regions, the car has clearly lost its dominant popularity, while in low density regions, the car is still an important part in every day mobility when there are few alternatives available. In general, a trend towards using and sharing cars instead of owning them as well as from exclusively using cars to combining transport means has taken place.

Commuter and business travel: In 2050, flexibility of school, work and public service times as well as ICT technologies and measures (such as commuter rooms, mobile workplaces, telephone and video conferences) are used to reduce the need for travel, to avoid traffic peaks and enjoy daily life without having to travel so much. With regard to business trips, a shift from plane to rail and a trend towards using communication technologies if possible have taken place. However, face-to-face social contacts still remain important for business.

3. Spatial and Urban Policies

All cities and regions are developed strictly according to integrated sustainable planning principles.

Compact and liveable settlements: 2050 is characterised by fully integrated spatial and urban planning practices all over the Union. Most people live in compact towns,

cities or city neighbourhoods. All day-to-day travel necessities can be performed by walking and cycling. Public transport stops provide the possibility for easy commuting or other trips by tram, metro and light rail. Cities across Europe have kept and cultivated or re-discovered their local identity. Efficient rail services all across Europe support a polycentric European network of cities and towns, making development more resilient and diversified.

Accessible regions: In 2050 regional and national transport investment plans are rail-based. The mainly travel-time-focussed pseudo-objective benefit cost assessment schemes of the past are now replaced by much broader decision guidelines, taking into account factors such as the development potential of the society, health, happiness or poverty reduction. For that purpose, a general strategic framework vision developed jointly by the European Member States serves as a guideline.

Open and connected Europe: Railway markets in Europe are now open to multiple levels of competition. This has injected a spirit of customer and market orientation inside the traditional formerly state owned and now partly privatised national rail companies. Passengers and goods forwarders have gained from this development by more attractive products and services and by better price structures. Co-ordinated trans-European investment plans have formed a network of co-operating passenger and freight gateways connecting Europe to neighbouring countries and overseas

4. Mobility Services

The majority of people and firms all over Europe have easy access to high quality, affordable and secure passenger and rail freight services.

Customer orientation and affordability: Highly customer-oriented railways value user satisfaction over operational efficiency and cost savings. Both aspects of company decision making are relevant, but in contrast to the process oriented public enterprises of half a century ago, railways have managed to find a good balance of operational efficiency to keep prices low, and improved customer services.

Passenger multimodality: Rail and major public transport stations are multi-functional hubs for fully inte-

grated mobility systems and are regional centres of economic, social and cultural urban life.

Intermodal freight: Integrated logistics providers organise the entire transport chain flexibly at low costs. The developments described have led to a market structure where multi-modal service entities organize highly reliable and cost-efficient trans-European logistics chains for all industry sectors.

Europe has completed a high quality and dense rail network connecting all cities and regions and the European rail industry is a global leader in innovative and user-oriented system solutions.

Automation and train control: By 2050 organising rail paths through Europe is as easy as booking flight slots from one airport to another and nearly as flexible as planning a car, bus or truck journey. Thanks to a fully implemented and jointly improved ETCS Level 3+ train paths can be added, altered or removed almost in real time on large parts of the European network, in particular on all main corridors connecting major agglomerations. On these corridors, track capacity has tripled thanks to flexible, automated control and routing systems.

Capacity and speed – infrastructure and rolling stock: There has been a 2 to 4-fold expansion in rail system capacity for both passenger and freight. A well maintained and high quality electrified European rail network allows fast and reliable operations to all major and medium sized destinations across the continent. Once in cities, dense urban and regional networks allow efficient onward travel. Public transport systems are fully integrated on all levels (local, regional, urban and long distance) for ticketing, information, interchanges between modes at stations.

Timetables and rail services: All large and medium sized cities across Europe are connected by reliable, very frequent, high quality services. Although the expansion of high speed networks and services as the railways' "premium product" has been supported, the focus is put on cost efficient EC/IC services connecting regions and agglomerations. In summary, the rail system is now set up so that there is a cost-effective and attractive service for low cost, business and premium market segments.

Emerging Priorities for Action

While re-emphasising the basic and necessary ingredients on railway futures advocated since long, the LivingRAIL vision strongly points on business and cultural frameworks. This broad view leads to a number of core policy recommendations in order to achieve the massive mode shift envisaged by the EC White Paper by 2050.

1. *Be aware of alternative futures*. Rail needs to address these by incorporating the new technologies as quickly as possible in its own system and by getting more cost efficient without compromising on customer orientation.

2. *Place users in the core of decision processes*. Without developing the mindset of customers, company managers, policy-makers and at last of railway staff, no substantial increase in rail mode share will happen.

3. *Immediate action is needed*. These actions need to happen quickly and decisively in order to have a sufficiently large effect in the decades ahead.

4. *Interventions need to be consistent*. Stakeholders and decision-makers need to co-operate and that steps taken towards more sustainability in transport need to be consistent in order not to risk achieving given sustainability goals.

5. *Re-think business and policy cultures*. Implementing the radical changes in railway investments, operations and customer care as well as in policy-making, regional and urban planning requires 21st century business and policy-making mentalities.

6. *Respect the limits of the railways*. But the flexibility of the system and its accessibility in sparsely populated areas are limited. Rail providers thus need to co-operate with other modes or integrate these into their core business models.

7. *Consider Europe's multiple faces*. The different economic and cultural conditions prevailing in Europe need to be taken seriously when setting development goals and when drafting action programmes.

The LivingRAIL Vision 2050 adds to other publications as it tries to tell separate but related story lines for different regions in Europe. In order not to complicate these stories we restrict to two stereotypical types of regions or *focus areas*: high density well-off regions in the European centre and low density areas with less per capita income at the European periphery. The expected development of the LivingRAIL vision over time and by type of region is explained in detail in the main part of this Special Report.

Partners

Fraunhofer Institute for Systems
and Innovation Research ISI, Germany

Allianz pro Schiene e. V., Germany

TRT Trasporti e Territorio, Italy

University of Birmingham, UK

MCRIT, Spain

Rail Technology Cluster Austria

SIEMENS AG, Germany

Savez za željeznicu. Croatia