

RACE2050

RESPONSIBLE INNOVATION
AGENDA FOR
COMPETITIVE EUROPEAN
TRANSPORT INDUSTRIES UP
TO 2050

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COORDINATOR'S INTRODUCTION



Hans Dienel, TUB, coordinator

Dear Readers,
In September 2013 RACE2050 celebrated its first birthday. In the last months, during our reflective research on a "Responsible Innovation Agenda for Competitive European Transport Industries up to 2050", we have been collecting an ever growing number of transport scenarios. Easy access to the variety of scenarios is possible via the online scenario library of the center for strategy and scenario planning [1]. It offers downloads of 416 scenarios (future of energy 139 hits, travel 41 hits, transport 23 hits). This library contains only a portion of published scenarios. It is astonishing that a synopsis tool, such as we promised in RACE2050, which compares, classifies, assesses, and integrates these transport foresight activities,

has not been created earlier. A critical assessment of transport scenarios and their impact on decision making processes is overdue. We see a relationship between this lack of critical reflection and the lack of academic chairs in the area of futures research. Only with more serious reflection and comparisons can future research reach the next step in its scientific development. Of course, there are reflective activities out there: Two years ago, a Dutch team (Jan Anne Annema and Mig de Jong) published an assessment of the history of the transport scenarios ("Evaluating Dutch Transport Scenarios of the Past") [2]. Some months ago, the 100th birthday of the famous German futurologist Robert Jungk, was used for a critical reflection of horror scenarios. In a TV debate, a number of futures researchers discussed the question of whether apocalypse scenarios help to solve problems [3]. Our research offers a reflection on scenarios of the last 50 years, before we provide integrative scenarios for 2030 and 2050. You can have a look on first findings in our newsletters, visit our website regularly, start a discussion with us on impact assessment of scenarios and meet us at the conferences and workshops, which we

will announce on our website. We are looking forward to your responses!

We also have news about the consortium life: RACE2050 coordinators Massimo Moraglio and Hans Dienel exchanged roles in the leadership of the project: Massimo will be soon appointed as coordinator, while Hans-Liudger will be deputy coordinator.

On behalf of the RACE2050 team, Hans-Liudger Dienel and Massimo Moraglio.

1. www.scenarioplanning.eu
2. <http://tinyurl.com/RACE33>
3. <http://tinyurl.com/RACE34>



WWW.RACE2050.ORG

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"ALL OF THOSE CARS WERE ONCE JUST A DREAM IN SOMEBODY'S HEAD" - PETER GABRIEL

DEMAND-SIDE DRIVING FORCES INFLUENCING THE EU TRANSPORT INDUSTRY'S COMPETITIVENESS

MIGUEL SENAE SILVA, MANAGER AT VTM CONSULTORES, PORTUGAL
THIS ARTICLE IS BASED ON D5.1 – REPORT ON CURRENT DEMAND

An in-depth analysis of the Current Transport Demand and a Global Transport Outlook is presented in deliverable D5.1. This report builds on current and prospective information on people and freight mobility patterns and economic, demographic, energy, environmental and geopolitical issues to frame the "Driving Forces" that shape the future development of demand for transportation. Furthermore, it addresses the "Demand Challenges" that those changes will impose on transportation systems in 2030 and beyond. A snapshot for current demand for transportation worldwide was carried out together with a review of future requirements – based on existing foresight studies and scenarios – enabling the

identification of future competitive agendas. Global demand for transportation was assessed in terms of:

- Current passengers and trade freight flows;
- Modal choices and market shares;
- Driving forces and demand challenges entailing the future evolution of transportation;
- Geopolitical issues;
- Review of foresight studies on future demand of transportation systems.

A detailed modal split analysis was carried out for major world regions, and a high level quantification of current demand for transport services was carried out at a global and regional level. The modal split for freight and passengers varies significantly by region, being largely influenced by

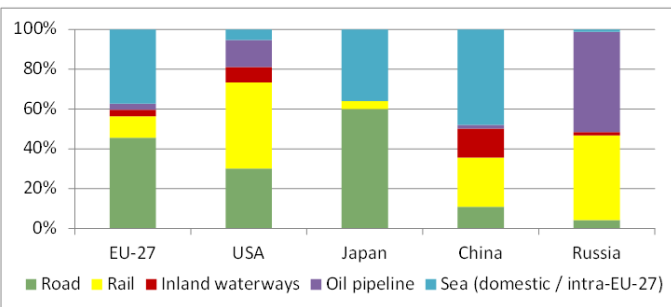
geography and economic factors.

In terms of global freight travel, roads are currently the most used mode (in volume terms) with 10,500 billion ton-kilometers (tkm), closely followed by seaborne transportation, (almost 9,750 billion tkm) and rail, with 97% of its 9,300 tkm produced in 7 regional networks alone: Russia, USA, China, India, Europe, Canada and Brazil. Aviation is responsible for just over 0.2 billion tkm (less than 1% of global transportation flows in volume) but, nonetheless, represents the most relevant share of international trade in value, with almost half of USA's and a third of European external trade being flown in/out. In passenger transport, private cars dominate the modal shares in developed countries, while rail and bus are relatively more important in developing countries, although as increasing wealth and disposable income spreads across emerging economies, motorization rates are climbing fast.

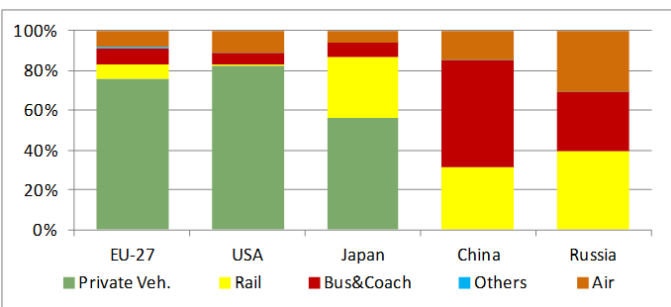


hours, migration and growing urbanization.

- Economic issues: GDP and GDP per capita progression and evolution in disposable income leading to increased and differentiated regional patterns of demand for passengers and freight transport; trade and globalization and developments in regional economies.
 - Energy consumption and resources.
 - Environment: Unprecedented pressures mankind is imposing on the natural environment and the transportation sector in particular.
 - Infrastructure as a lever for economic development and a driver for transport demand.
 - Tourism role in the global transportation arena.
 - Safety and Security issues in transportation.
- Geopolitical issues are addressed as they will certainly affect demand for transportation due to rapid industrialization of emerging economies, global competition for energy, raw



Freight modal split in 2009: Intercontinental Comparisons (all modes, tkm) (DGET-EC 2009)



Passenger modal split in 2010: Intercontinental Comparisons (all modes, pkm; several sources)

The "Driving Forces" and the key factors influencing transport demand evolution and the relationships between changes in these factors and expected repercussions on transport are analysed through:

- Demographics and society. The world population is expected to increase to around 9 billion by 2050, with expected changes in demographics and society, lifestyle and mobility behav-

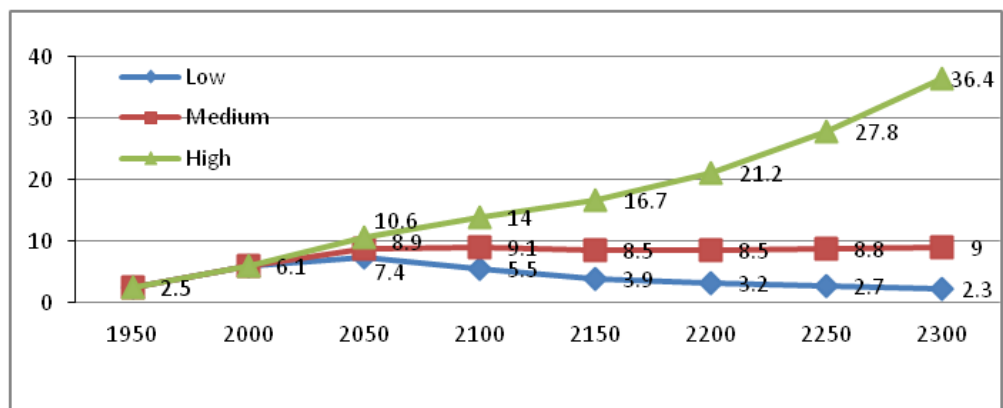
materials and natural resources, competing economic models, and divergent industrial and environmental regulations. This analysis identified the political and socioeconomic developments occurring in countries where the European transport industry has established its business presence in order to understand how these events may affect European industry products and services in the medium and long-term. The following topics were covered:

- Trade and international division of labour: trade barriers, global trade and global value chains and multilateral liberalization of trade.
- Business prospects in emerging nations: research capabilities and intellectual property protection; manufacturing competitiveness and unlocking emerging markets potential.

Demand challenges were analysed in detail, namely the effects that current trends will impose on future transportation systems, such as the ageing society, urbanization growth, increased congestion and infrastructural future needs, future energy challenges as dependency and scarcity, and tourism challenges and opportunities. Finally, several foresight visions of the future transportation demand for passengers and freight were addressed. The following table resumes the main findings on future expectations for transportation demand for current(!) modes of transport.

		2030	2050
Aviation	Pax	160 - 220	240 - 360
	Freight	237 - 253	-
Waterbourne	Pax	-	-
	Freight	146 - 188	227 - 370
Rail	Pax	-	219 - 286
	Freight	-	180 - 240
Road	Private Car	-	<i>More than Double</i>
	Bus&Coach	-	
	Freight	-	

Expected evolution of transport demand by mode by different sources (index 100 = 2010)



Global population development 1950-2000 and projections to 2300 (UN 2004)

	EU-27	USA	Japan	China	Russia	India	Brasil
Road network (paved) [x 1000 km]	5000	4400	968	3056	776	2433	202
Motorway network [x 1000 km]	68.2	94.3	7.6	65.1	30	70.9	9
Commercial freight vehicles [million]	34.1	11.0	6.2	13.7	5.4	6.4	8.7
Passenger Car Stock [million]	238.8	234	69.2	40.3	32.6	17.2	37.2
Private car [billion pkm]	4920	6826	712	46	-	-	-
Motorization [cars/1000p.]	477	763	542	30	228	15	195
Bus&Coach [billion pkm]	510.1	470.4	87	1502	147.7	582	27.4
Bus& Coach fleet [x1000]	819	846	227	1696	900	1532	723

Road Transport statistics

wherefore
how **what** whence whether
 where when **which** whom
who why
 whose
 whether

WHY BE BOTHERED BY THE “HISTORY OF THE FUTURE”?

DR. MASSIMO MORAGLIO, TECHNISCHE UNIVERSITÄT
BERLIN, GERMANY

THIS ARTICLE IS BASED ON D2.1 –REPORT ON TRANSPORT
FORESIGHT SINCE THE 1960S: STRATEGIC WARNINGS,
VISIONS AND OUTLINES

In recent decades futures studies gained a wider attention and more attentive tools were developed. However, even after many decades of experience, the assessment of the impact of foresight seems to remain a weak spot. We have too little understating on the magnitude of previous future-oriented research, both in terms of their “correctness” and in their ability to influence (and mobilize) policy-makers. One of the aims of RACE2050 was to understand the “history of the future”: how the future has been predicted in the past? What were the consequences? We do not consider such a survey ancillary. On the contrary, developing this kind of understanding is a central facet of RACE2050, because it reveals how Europeans have

We have identified three relevant moments for the European transport industry, in which the stakeholders claimed the sector was menaced by collapse: the “American Threat”, the “Japanese Threat” and the “Chinese Threat”



reacted once put under pressure by internal and external factors, as well as how the policy-makers were able (or not!) to deal with the challenges of their times. In recent times, we have identified three relevant moments for the European transport industry, in which the stakeholders claimed the sector was menaced by collapse, namely the “American Threat”, the “Japanese Threat” and the “Chinese Threat”.

Main lessons from the “American threat”

When Europe was alarmed by the perceived imminent US dominance centring on huge American economies of scale in the 1960s, it was able to cope with these fears by self-reorganizing through strong political will and new concepts of transnational cooperation. It seems that a warning “horror scenario” like Servant-Schreiber’s book “Le Défi Américain” (“The American Challenge”) contributed to strengthening the political will towards an already existing but stagnating European unification process and towards innovative and

competitive transport projects. To this end, top-down measures were taken, such as transnational collaboration, common policies and widening of the market, in order to achieve political and economic scale effects. From the American threat we could conclude that a threat can turn into opportunity and a weak sector (like the European aviation industry in the 1960s) can become highly competitive, once there is a careful analysis of current and future market demands. The notable examples of Airbus and Concorde can be understood as responses to the American threat, showing that a comprehensive approach of rationality and efficiency (Airbus) is more successful than prestigious political self-representation disguised as high technology (Concorde).

Main lessons from the Japanese threat

The analysis of the European reaction to the Japanese threat shows that again, Europe seems to need an external pressure to succeed in competition in the long term. Europe had to adopt



more flexibility towards traditional concepts of national business identities, and it had to abandon its political-ideological attitudes of ‘national champions’ and NIH (Not Invented Here) mentality. Japan’s efficiency and its pragmatic attitude forced Europe to shift from former economies of scale to economies of learning and cooperation. At first, the fear of Japan’s leadership split the European Community (by applying highly differing national import restrictions), but finally it prompted it to act in a more unified manner. Japan became a benchmark for Europe’s industrial future, particularly for the automotive sector. The British automobile sector showed that a weakened industry could recover by radically welcoming foreign investments and letting former competitors enter its own market. Actually, it seems that weakness can become a winning factor, or even the precondition for recovery, since the Japanese only invested in the weakest sectors in Europe and in peripheral areas with high unemployment. Following Japan’s lead, Europe learned to focus on growing markets abroad by establishing plants in North and Latin America and by effectively internationalizing the car industry. Learning from best practices and taking economic risks turned out to be a European success factor.

Main lessons from the Chinese threat

China’s tremendous growth brings into being both opportunities and uncertainties for Europe’s competitiveness. After twenty years of technology transfer, Chinese firms

are slowly entering the global market with their own brands. The European railway sector already feels seriously threatened. In contrast, the aviation and shipbuilding industries still feel rather safe since China is expected to focus on different niche markets in the medium-term. In-between is the automotive sector, which has so far benefited from high growth rates and rising demand for European (especially German) cars, but has already had to pay the price of the most long-lasting technology trans-

fer. The perceptions of the threat from China differ from sector to sector and even between firms, so generalization is difficult. The Chinese challenge is less defined culturally as "we against them" than the preceding American and Japanese threats. In the globalized world China can be seen as a threat or as an opportunity. More precisely, concerns about shortages of European high-skilled workforces might soon cause enforced relocations into other world regions. Fears of

insufficient financing for ever rising R&D expenditures raise doubts about the future position of the European aerospace sector. Decreasing demands in the domestic markets are causing major threats to the European transport equipment industries and their suppliers. The Chinese threat might evolve rather as an inner-European issue (workforce and financing deficits) than as a fear of being flooded with Chinese exports.

What next?

RACE2050 will elaborate and use these outcomes in order to better tune its next steps. The core idea emerging from the past negative scenarios for Europe is that the European transport industries are able to face challenges and to stay away from apparently unavoidable fates. Europeans did not succumb to the loop of self-fulfilling prophecies, but took action!

NEWS AND EVENTS

SELECTED EVENTS IN WHICH THE RACE2050 PROJECT AND SOME OF ITS FIRST RESULTS WERE PRESENTED

The second RACE2050 consortium meeting was held in Lisbon on 4-7 March 2013

The next consortium meeting will take place in Winterthur on 7-8 October 2013.

Workshop of the I-C-EU Project (Impact of transport infrastructure on international competitiveness of Europe), Leuven, Belgium, January 21st, 2013

Workshop "The future of the past: The Transportation Policies of the European Union (1958-2050)" Florence, Italy, May 10th, 2013

"Smart Transportation", Mini-conference of "Shiluvim", The Alumni Association of Tel-Aviv University Engineering Faculty, May 21st, 2013

Global Conference on Mobility Futures, Lancaster, UK, September 4th – 6th, 2013

11th Annual Conference The International Association for the History of Transport, Traffic and Mobility (T²M) Kouvola, Finland - St. Petersburg, Russia - September 25th – 28th, 2013

Tensions of Europe conference, Paris, September 19th – 21st, 2013



TRANSPORT EQUIPMENT AND SERVICES: CURRENT STRATEGIES AND FUTURE TRENDS

Dr. Massimo Moraglio, Technische Universität Berlin, Germany

This article is based on deliverable D4.1: Report on existing Equipment and Services Transport Strategies

Transport service industry

Although benefiting from growing volumes, the entire European transport service industry nevertheless presents poor financial results and difficult market conditions. Thus, there is a need for a radical new shape for the business (as proposed for the shipping industry), a different approach to customers' behaviour (as for private land mobility) and, more generally, an end-to-end offer. Environmental awareness has spread more and more, and is considered not a burden but a potential selling point; higher energy prices are strongly affecting the sectors' economic sustainability, thus pushing the need for energy saving strategies.

Transport manufacturing industry

Although truly internationalised, the transport manufacturing industry is usually close to the markets served, which has pushed many EU companies to open plants and assembly sites in emerging economies. Considering the role of those new markets, the leadership position of the European industry is challenged by new entrants, which enjoy a fast growing home market, lower technological gaps and lower final costs.

The automobile and the railway sectors are the most exposed to international competition, in which emerging economies' companies are playing a more relevant role. The high-tech segment and – for the car industry – the premium sub-market are less vulnerable to this trend. The aviation sector is still a duopoly dominated by Boe-

ing and Airbus, but four non-EU companies will be stepping into the market in the next years, thus giving a new configuration to the industry. The current studies and the industry stakeholders suggest focusing on top-end segments, R&D development and cutting edge technologies as winning strategies for the EU players.

While mature economies are saturated markets and seem to have experienced their peak in car ownership, emerging economies enjoyed, so far, skyrocketing growth, mainly fed by local plants. In this vein, the European car industry is witnessing a turning point in its history. The decline of its traditional market and, abroad, the growing pressure of 'local' producers create an immense stress on the EU OEMs and on their suppliers. As happened in the EU shipping industry, a shift towards the 'premium' segment, cutting-edge technologies, technical and non-technical innovations are often envisioned as the next stage for the EU car producers.

New trends

Globally, concerning integration, customisation and internationalisation the transport industry is facing three trends:

1. While outsourcing and delocalisation of the supply chain continue, some EU production clusters are showing a strong resilience, and they are truly competitive in the global market. This can lead to more internationalised production systems, in which some EU segments can offer first-class products with cutting-edge

technological innovations. Vertical and horizontal integration, alliance and joint ventures are expected to remain one way to face a more internationalised market.

2. The traditional borders among transport sub-sectors are crumbling, and more and more companies are developing new initiatives well beyond their core business. The race to offer end-to-end travel service is already open and many companies are stepping in. This is pushing, for instance, Deutsche Bahn to add car and bike-sharing to its portfolio, Daimler is involved in car pooling and car sharing, while Bombardier produces electric buses.

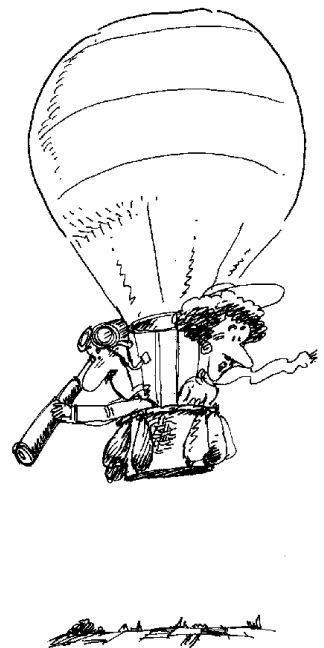
3. In mature economies motor-vehicle ownership is declining, especially among young generations. In such a new market landscape, the industries are already developing new offers to meet customers' requests. The ability to cope with this rising trend can be useful also in emerging (and urbanised) economies, where space, energy and pollution issues can lead to limited access to car ownership (as is currently the case in several Chinese cities).

Additional remarks

While traditional vertical and horizontal integration is still on the agenda of the transport industry, new forms of competition and integration have been detected. Globally, the transport demand overall will grow, and further international alliances (or consolidations) will be required in order to cope with the economies of scale and scope

requested by this new market outline. Still, relevant differences occur between mature and emerging economies: generally speaking, the latter are showing a growing demand for motorized mobility and vehicle ownership, while the former are declining markets.

As stated, transport companies (both manufacturing and services) are not just developing their core business, but are offering a wider range of services, implementing innovative forms of collaboration, and breaking the traditional boundaries among sub-sectors. Infrastructural constraints, environmental concerns and energy costs are (and, presumably, will be) the driving factors of this process. In mature economies, the younger generations display a greater interest in shared-economy, while new attitudes induce decreasing ownership of private vehicles. Time-budget and/or money-budget constraints are leading the new mobility behaviours, and forcing the industry to implement new partnerships, joint ventures and other forms of collaboration, which can match those changed demands. Altogether, the transport industry landscape keeps its traditional core business, but is quickly shifting to new concepts, from vehicle owner-



FRAMEWORK CONDITIONS FOR THE EUROPEAN TRANSPORT SECTOR

Andreas Christ, Zurich University of Applied Sciences, Institute of Sustainable Development, Switzerland

This Article is based on deliverable D6.1: Report on the synopsis on the current framework conditions

Deliverable D6.1 describes the framework conditions for the European transport sector including a broad context perspective. As the sector is diversified concerning specialisation, regionalisation and development intra-European differences need to be considered. Main aim is to identify the driving forces increasing competitiveness and to point out the main advantages and constraints for the competitiveness of the European transport sector giving an outlook on future challenges and opportunities.

The European transport market is innovative in technology development, offers a high number of jobs and significantly contributes to European GDP. In the last years the financial and economic crisis affected the transport industry in almost all areas. In maritime and rail transport competitors from other regions, especially from Asia, catch up.

Nevertheless, the European transport market in general is competitive as shown in numbers of business development, although there are several problems in a few areas. Numerous companies from all sectors are amongst the world leaders. Especially machinery, motor vehicles, aircraft, chemical products, pharmaceutical product and carbon/low carbon steel from European Union are considered excellent; products and services from Europe are still experiencing a high demand.

Competitiveness situation

In order to stay competitive in the future the European transport sector has to ensure exports and increase

presence in emerging markets. European companies still have technological advantages but new competitors challenge this position. Political measures are necessary to support access to emerging countries. European competitiveness is mainly based on technological advantage due to previous investments in R&D, efficient business organization and skilled labour force. As new competitors will try to take this position further investments in R&D are necessary as well as the critical observation of

To master the inner-industrial transformation while staying focused on the own strength and deriving unique selling points for future mobility will be the key issue to further develop competitiveness

and proactive adaption to regional market shifts and potential shifts of demand in terms of quality and prices. With rising income and affordability of mobility in general, cars and flight trips in emerging countries price level disparities may increase. Due to this transportation and mobility might get more cost sensitive for both, production and services.

The main challenges for the European transport industry will be to adapt successfully to this transformation. Crucial in this sense is whether European companies will be able and willing to realizing the transformation, understanding needs of new markets and to adapt to them. To master this inner-industrial transformation

while staying focused on the own strength and deriving unique selling points for future mobility will be the key issue to further develop competitiveness.

Sustainability situation

Sustainability aims to limit the use and consumption of resources and to avoid harm and danger towards society and environment.

In the EU the possibilities for sustainable transport can be seen as an opportunity to open new markets for products by stimulating R&D through environmentally based policies in transport. The acceptance of measures to reduce pollution in Europe is higher compared to other regions. Overall the European transport industry is one of the most innovative in energy efficiency and new technologies. Thus Europe could take the lead and thereby gain competitive advantages in the transformation process.

Challenges and Opportunities

The transport sector has to face changes coming up with new trends in mobility and transport demand causing a fundamental changes of the market such as global shift of demand, diversification of economic power and new perspectives on transport and mobility. This shift is not only resulting in decisions relevant to the market but also affecting culture, planning philosophy and values relevant for the transport sector. The European transport industry is based on a long history of solid based experience in technology, innovation, quality and high skilled labour force. This position is and will be challenged by the transformation of the market, claiming for a new way of thinking in transport as well as in developing and providing technologies and services. European transport industry could benefit from increas-



ing demand in emerging markets, particularly where there is already a strong position, which offers also the opportunity to meet essential requirements of the European home markets like efficiency improvement or sustainable transport. A challenge will be to meet the needs of emerging markets by inventing new solution and to compete with suppliers entering the market and changing the transport system with new technologies (e.g. ICT solutions) during the phase of transformation.

As strategies for the European transport industry several results derived from the analysis could serve as a first guideline for further investigation:

1. Optimizing the infrastructure and efficiency has to be addressed.
2. Knowhow has to be build and new solutions in the field of sustainable mobility have to be developed.
3. Thinking about transport in a broader perspective is needed, where mobility is an active movement combining different modes in a flexible and efficient way.
4. Change has to be embraced as transformation to create new ways in terms of products, services, business models, the way to operate and to be present in the market of mobility and transport.
5. The main opportunity for the European transport industry is the high level of quality, which is at the same time the greatest

INTERVIEW WITH PROF. CHRISTINE AHREND

PROF. AHREND HEADS THE CHAIR OF INTEGRATED TRANSPORT PLANNING AT THE TECHNISCHE UNIVERSITÄT BERLIN (TUB). SHE IS A MEMBER OF THE ADVISORY BOARD OF RACE2050.



You have much experience in futures studies in the transportation field, and you worked with the transportation industries. Can you tell us about this experience? How are futures studies regarded by the industries?

They regard it mainly as a strategic work for their companies, looking for long term strategies for their products. The departments are willing to use Futures methods for their strategies, but the top management prefers other approaches, as their decisions are more driven by economic factors. So the top management is willing to use futures studies to get the future direction, but their strategy is too much based on short economic effects. Personally I wished that they would use the long term view more intensively, but their view was more short-term-oriented than I expected. I think this is like the nature of the governance and politics of transport. It is not so "public" to think about 10 or 15 years into the future. I would like to see much more intense discussions about what is desirable in 10 or 15 years. For example, in a project about electro-mobility in which I was involved, the focus was about the next 15 years.

What were the main methods you used?

I used mostly the Scenario method. In addition, I did an intensive research on trends and factor analysis and I also used the method of impact matrix. But I enjoyed in particular working in company of artists and other creative people. Their work was used to share the view of the future by graphics, movies, etc. I like the basic analysis of

trends and changes with a view of 360 degrees, to aggregate all this knowledge step by step...

What about other methods, such as Delphi surveys?

In my research group at TU Berlin we don't use the Delphi method very much. For the long term transport planning we usually prefer scenarios. I like to combine the empirical work we do in the mobility research with the futures research, and to combine the knowledge of "the people in the street" with the academic knowledge. So an important focus of my research and of our group is to combine expert and non-expert knowledge.

Do the industries like the approaches that you described?

I think the answer is positive. They like it because it helps to effectively convey a short and clear message about the future. But sometimes I wasn't sure if this was the best idea, when the scenario was very complex.

In what way the transportation industry will be different in 2030 or 2050?

Let me focus on ground transportation. At the moment I'm a bit disappointed about it, so I don't have a strong vision... I wish that the industry uses modern technology to change the traffic system and to develop new mobility modes, new forms of organization of the traffic system. I am disappointed that the current focus is mainly on specific technologies and not enough on really innovative ideas for the whole system. They seem to stick to the current business models too much.

You expect something more revolutionary?

Yes, a little more revolutionary. They should use their power to more radically change the transport system. For example, the "just in time" transportation could be changed because it causes too much traffic. I think the society waits for changes in the industry and the industry waits to changes in society, so nobody really moves... New ideas are needed to better organize the production. We can use more the locations near the consumers for production, in order to decrease the freight transportation. It is desirable to reduce the global production system, and to use more the local and regional production. Also a change towards more intermodality is needed. This term is used much, but is hard to develop and implement. Products can be delivered in less time and less cost. For this something must be changed in the organizational structure.

What do you think will be the most important success factors for the competitiveness of the European transport industries in the future?

A hard question! I don't have a good answer. I think the power is in innovation, but by innovation I don't mean just to "modernize" something. A "leapfrogging" is needed, and I mean more a societal leapfrogging than a technology leapfrogging. The challenge is finding innovative ways how to modernize the system so that we reduce the pollution while reducing the costs and time of transportation. At the moment the industries are focused too much on how to sell their products –

which is understandable. But the result is that they are too "closed" in their thinking.

What do you mean by "societal leapfrogging"?

The term "leapfrogging" is normally used in the context of technology development. But I think that the most challenging aspect of innovation in the industry should be social responsibility. Of course the industries have to think about their profits, but they need to think more about how we can modernize the society. I think the industry in Germany can develop new business models and become a trendsetter for other countries for modernizing the transport system and for pushing the multimodality behavior. Currently it seems to me that they are "hiding" their competence and their innovation, and are not active enough.

What is the reason?

They are aware of the necessity to innovate. But they are not active as they should be. Perhaps they are too busy with looking for new markets. The car industry makes good profits outside Europe.

Can you mention a good example of current innovation?

There is an interesting example from sea cargo transport: A modern version of sailing technology was developed, with very efficient use of wind energy. By this they significantly reduced the fuel cost and pollution emissions. This is a commendable innovation.

Can you suggest an important wild card (low-probability high-impact future event) in the transportation field?

The car industry develops and implements entirely new and modern public transport concepts.

Can we observe some "weak signals" that could hint at the realisation of this development?

Not yet...

Interviewer: Aharon Hauptman, TAU.



RACE2050 WORK PLAN



RACE2050 foresight study aims to identify key success factors for sustainable growth of the European Transport industry and for policies which can increase its strength in a long perspective up to 2050.

Lessons from previous foresight studies and visions will help create an integrative foresight, which will enable the European transport industry maintain its leading position in world economy up to 2050. Key success factors will be

identified. Important drivers of change will be extracted by analyzing current policies, emerging technologies, energy and environment aspects, demand forces, geopolitical trends and other relevant domains.

"Wild Cards" analysis will provide additional important inputs.

General Morphological Analysis (GMA) will be used to integrate and assess a multitude of driving forces for alternative scenarios.

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KEY EXPECTED OUTCOMES OF RACE2050



- Novel scenarios for 2030 and 2050 on the competitiveness of the European transport industry.
- Recommendations for the necessary policies, including research policies, to reach the goals of desirable scenarios.
- Web-based interactive foresight synopsis tool, envisioned to create a long-term legacy for stakeholders.

