

Title: The sustainability of the road transport research agenda in European.

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Abstract

The Transport Research Arena (TRA) held their first conference in Göteborg Sweden in June of 2006 with the theme of: Greener, Safer, and Smarter Road Transport for Europe. The overall aim of the conference was to develop a viable platform for European transport research in relation to the European Research Arena (ERA) and the Seventh Framework Program (FP7) thereby contributing to a sustainable, safer and more efficient road transport system in Europe. This paper will present an evaluation of how well the European research agenda can capture the breadth of research necessary to attain the goal of a sustainable road transport system in Europe. The focus is on how the research frameworks of the organizing agencies (ERTRAC, CEDR and the EC) and a selection of the TRA conference papers and presentations define and apply sustainable development and sustainability, what issues are prioritized, and what areas are missing. The overall research question is: Can the European research agenda create the know-how and expertise necessary to attain a sustainable road transport system in Europe? Taken as a whole, the growing trend in European transport research focuses on a somewhat one-dimensional approach to framing both the problems and solutions of road transport. All of the solutions to transport related problems such as safety, congestion and environmental degradation were framed in terms of technological or systems modeling approaches such as intelligent vehicles, more efficient design and production, cleaner fuels, and more proficient management, logistics, and operations. The topics that were absent included the role of policy and implementation, decision-making and planning, and individual behavioral related dimensions. There is thus a need to establish a more balanced agenda for transport research that better mirrors the policy direction that the EU has taken especially with regard to both the mid-term review of 2001 Transport White Paper and to the Sustainable Development Strategy II, where a diversity of approaches which better grasp the complexity of transport related problems make up the majority of prioritized research programs and projects.

Introduction: Road transport research in Europe

Transport Research Arena (TRA) held their first conference in Göteborg Sweden in June of 2006 with the theme of: *Greener, safer, smarter road transport for Europe*. This conference was organized by three important European organizations: ERTRAC (European Road Transport Research Advisory Commission), CEDR (Conference of the European Director of Roads), and the European Commission. The overall aim of the conference was to create a viable platform for European transport research in relation to the European Research Area (ERA) and the Seventh Framework Program (FP7). The TRA conference was loosely modeled after the well established TRB (Transport Research Board) conference that is held yearly in the US. The organizers of TRA wanted to establish a complementary counterpart in Europe. This was to be achieved through bringing together and coordinating European transport stakeholders, including national, regional and private research around a common strategic agenda, with the goal of creating a sustainable, safer and more efficient road transport system in Europe. The aim of this paper is to see if the goal of TRA has been

achieved by presenting an evaluation of how well the European road transport research agenda captures the breadth of research necessary to putting the EU at the forefront of the knowledge needed to attain a sustainable road transport system in Europe.

There is no need here to reiterate the long list of problems that are a result of a dependence on the automobile and trucks for the transportation of people and goods within Europe and around the world. It is, however, important to remind ourselves that the complex problems associated with road transport cannot be solved without a broad spectrum of strategies and research perspectives. The transport sector is traditionally home to politicians, civil servants, planners, and administrators who are predominantly educated within technical and applied fields, such as engineering, urban development and transport planning. What this means in practice is that much of the work done within the sector has been influenced by educational paradigms and worldviews that focus on instrumental problem formulations and solutions such as technical and systems modeling approaches. As Thomas Kuhn so eloquently pointed out in 1962, professionals and academics are educated within certain paradigms that teach them how to, not only solve problems, but how to frame them in ways that can be solved using their specific methods and perspectives (Kuhn 1962).

There is also a great deal of road transport research that is being carried out from other perspectives such as within the social sciences, where the impact and interactions of individuals with their social structures is in focus.¹ Psychologists, cultural geographers, human ecologists, sociologists, ethnologists, transport planners, architects, and political scientists, to name but a few, contribute an entirely different approach to formulating and analyzing both the problems and the solutions for the transport sector (Black and Nijkamp 2002; Freund and Martin 1993; Frändberg 1998; Frändberg and Vilhelmson 2002; Marsh and Collet 1996; Polk 1998, 2003, 2004; Hagman 2002, 2003; Steg, L., Gifford, R. 2004; Steg, L., Vlek, C and Slotegraaf, G. 2001; Tengström 1991, 1995; Thynell 2003; Whitelegg 1993, 1997).² Such approaches include research on transport policy, decision-making and planning, implementation processes, and factors that influence mode choice and transport behavior (Jakobsson, C., Fujii, S., Gärling, T. 2000, 2002; Loukopoulos, P., Gärling, T., Vilhelmson, B. 2004; Poortinga, W., Steg, L., Vlek, C. 2004; Vilhelmson 1999). A growing body of research also focuses on how discourse, power and rationality shape change within the sector giving valuable insight into why certain strategies and decisions gain precedence over others (Flyvbjerg 1998; Hansen 2002a, 2002b; Polk 2005; Tengström 1999). As can be seen from this brief overview, there is a plurality of perspectives and theoretical orientations that are represented in transport research, from systems modeling and technical research to more social science approaches. Each contributes a necessary link in the chain towards the knowledge base that is needed to reach a sustainable transport system for Europe.

This paper will focus on how well the diversity of research that is proposed by key actors on the EU level, with a focus on the 2006 TRA conference organizers and participants, integrates the vast array of research that is needed for attaining more sustainable road transport solutions. This will be achieved by way of an evaluation of the research frameworks of the TRA conference organizers and the conference itself. For comparative purposes, four main research areas have been identified as covering the broad array of research targets that are deemed mandatory for achieving this end. These include: land use and infrastructure,

¹ See, for example, the on-going Swedish program on sustainable transport: TransportMistra. For more information see their webpage at Transportmistra.org.

² The references given are but a few examples of European and American transport researchers in the social sciences, and focus predominantly on European and Scandinavian examples.

behavioral changes, policy and implementation, and technological development. A broad research agenda including the natural, technical and social sciences is the only adequate way to promote the changes that are necessary in each of these key research areas. A focus will be on how sustainable development and sustainability have been integrated into the research frameworks and agendas that are currently being promoted in the EU. This will include an analysis of the content of the definition of these terms as well as the level of analysis that is applied.

The use of sustainable development and sustainability in the road transport research arena

The recent integration of *sustainable development* and *sustainability* in the transport sector brings the paradigmatic underpinnings of the sector even more in focus by clearly demarcating how sustainable development is defined and applied. Since the current goal of the European road transport research agenda is to attain a *sustainable* transport system, it is important to discuss what this has meant and currently means within the road transport research discourse. As is well documented, sustainable development is a concept that has gained a cross sector prominence since its reformulation in the Brundtland report in 1987, with a clear emphasis on the role of economic growth for reaching social and environmental goals (Jacob 1996, Kain 2003, WCED 1987). It has had a great impact specifically in the transport sector due to the important role that transport and mobility play in economic growth, social issues and development especially on a global level, and to the large amount of carbon dioxide that is produced and is projected to be produced within the sector in the near future and (EU 2001). However, sustainable development, sometimes framed simply in terms of different *sustainability* goals, is most often used as an ambiguous, vague and all encompassing concept. The most well cited definition is 'development that meets the needs of the present without endangering the needs of future generations' (WCED 1987: 43). Social, economic and environmental dimensions are almost always included as key cornerstones to attaining sustainable development.

Given such a definition, it is easy to see that sustainable development is a very socially correct and desirable concept. It is a goal that everyone supports and, more importantly, pays lip service to resulting in a rhetoric that is more often than not empty of any real content and meaning. One way that this can be explained is that the interaction or relationship between the three main dimensions are almost always missing, thus promoting a win-win proposition instead of an analysis about the complexity of relationships both positive and negative between economic growth, social equity and environmental protection (Jacobs 1996, WCED 1987). Economic growth has also been seen as an unproblematic panacea for all types of social and environmental problems, with no regard to the fact that increasing consumption, be it mobility or goods, almost always entails some sort of resource use and degradation. Because of this rhetorical use, sustainable development can often do more harm than good by obfuscating the real life conflicts and priorities that have to be made in planning and policy making. One way of explaining this rather paradoxical result is that sustainable development encompasses a number of intrinsically different types of goals and values that can be operationalized in seemingly contradictory ways. One way that this can be better understood is to take a closer look at how sustainable development is used in practice.

There are two umbrella definitions regarding the content of the definition that will be used here. The first is referred to as a *broad* definition of sustainable development, as mentioned above, following the precedence set down in Brundtland, and sees sustainable development as including social, economic and environmental dimensions where all are given more or less

equal weight (Peirce 1994, Tengström 1999). The second, or *narrow*, definition puts the environmental limitations as the limits within which social and economic goals must be reached, thereby setting up a concrete link between the different parts. The premise of the second definition is that there can be no long term social and economic sustainability without the preservation of natural resources. Sustainable development can also be framed by distinguishing between three levels of analysis: the ethical, the strategic and the operational (Jacob 1996). The first includes the core values and ideals which can be formulated in terms of ethical principles such as intergenerational equity, participatory decision-making and human-nature interdependence (ibid). The second or strategic level applies these core values in development and research contexts as strategies or goals while the third focuses on sustainable development on an operational level, on how it can be concretely formulated in specific types of indicators (ibid). On the ethical level, development can only be economically and socially sustained for future generations if it does not degrade its resource base as is mirrored in the narrow definition (Kain 2003).³ Short-term economic growth at the expense of global equity and the resource needs of future generations is, from an ethical definition, not sustainable development. However, sustainable development is seldom evoked on its ethical content; it is most often used to support or promote short-term economic growth and competitiveness on the strategic and operational levels as is seen in Agenda 21 and in new Sustainable Development Strategy II in the EU (EU 2006). Being aware of how these different definitions or levels of analysis thus has a profound impact on how sustainable development is applied resulting in a great deal of concrete power in shaping the type of research that is seen as being worthy of funding and support. These definitions and levels of analysis will form the basis of the following analysis.

Method

The methods used in the following analysis are predominantly qualitative text analysis though a few quantitative approaches have also been applied when analyzing the TRA conference. The conference homepage, program, proceedings, abstracts and full papers, as well as participatory observation of the plenary and parallel sessions make up the core material for the analysis of TRA. The research agendas of the organizing groups have been analyzed regarding the definition of sustainability, the level of analysis, the breadth and focus of the research frameworks and strategies, and how well the strategies/platforms mirror the different research approaches that are applicable. A number of key documents have been selected by each of the agencies to represent their current position. These are outlined in the respective sections.

The organizers of the 2006 Transport Research Arena: ERTRAC, CEDR and the EC

As noted by way of introduction, the TRA conference was organized by three actors in the European transport research area.⁴ All of these organizations have research agendas of their own following the goals of the different political bodies and authorities that they are affiliated with or represent. A key question in evaluating the research agenda for European road transport is how the separate organizations that are active in the sector formulate their own strategies and frameworks for research, and how well these frameworks were represented in

³ While Jacob makes a clear distinction between the use of sustainable development and sustainability, Kain 2003 applies Jacob's framework to sustainable development on all three levels, instead of differentiating between a sustainability ethic and sustainable development as a strategic and applied concept. I follow Kain's modification in this paper.

the TRA conference. The research agendas of the respective participating organizations will be briefly summarized and analyzed in the following.

The research framework of the European Road Transport Advisory Council (ERTRAC)

The European Road Transport Advisory Council (ERTRAC) was established in 2002 to bring together and coordinate high level stakeholders in the transport sector. The initial aim of the council was to develop a common vision for research in the sector and to map out the specific research needs of the different stakeholder groups (ERTRAC 2006). In 2004 ERTRAC published a report on a common vision for the sector (ERTRAC 2004). In April 2006, after a series of workshops and reviews, they formulated a research framework for 2007-2015. Both this vision and the research framework will form the basis of the following analysis.

The ERTRAC vision was formulated in June of 2004. *Sustainable* is most often used to refer to the sustainable economic growth of the EU. Economic competitiveness is seen as the major focus of the vision (ERTRAC 2004: 3). Sustainable development is defined in the following way:

The Strategic Research Agenda follows the principles of sustainable development considering with equal importance the societal, environmental, and economic elements. It aims to contribute to the development of new technologies which should provide: improved quality of life of European society (e.g. better mobility, safety, security), environmental improvements (e.g. reduced greenhouse gases, emissions, noise, better use of resources, recycling) economic improvements (e.g. increased competitiveness, employment, and growth). (ERTRAC 2004:12).

The definition of sustainability that is given in the ERTRAC research framework covers the classic key areas that are most often cited in discussions of sustainable development. It, however, emphasizes the development of new technologies to attain the social, environmental and economic goals that are outlined. Overall, in the ERTRAC vision, sustainability and sustainable development are applied as operational terms or goals, and not as a normative or ethical positionings. They are also loosely used as strategic terms, but more rhetorically than concretely. Thus the normative standpoints that sustainable development encompasses are missing from the strategic and operational levels since the goals were never formulated outside of a specific, limited application. Overall, the *sustainability* (read long term viability) of economic growth and competitiveness is the main emphasis in the ERTRAC vision.

The ERTRAC Research Framework was developed after a series of “intensive workshops and reviews encompassing the entire road transport sector and including hundreds of actors, large and small and many small and medium sized enterprises” (ERTRAC 2006:3). This framework is made up of four main research areas (1. Mobility, Transport and Infrastructure, 2. Safety, 3. Environment and Energy, 4. Design and Production) which were divided up into a number of key areas with sub-themes (ERTRAC 2006). As seen in the vision, a majority if the key areas and sub-themes are technical or systems related. The most important topics, and the most prevalent key areas, deal with technical solutions for freight and passenger transport. Land use and infrastructure is also an important topic, but also focuses on technical solutions such as more efficient logistics, improved road surfaces and different types of smart networks. Only one key area, out of 27, social trends and behavior, did not emphasize a technical approach. There were no mention of the role of policy and implementation in the research framework.

In summary, the research topics and key areas that are emphasized in the ERTRAC research framework stem from a very specific approach within road transport research, namely one that falls within the technical and instrumental problem solving paradigm. Sustainable development and sustainability are used in a similar fashion as was seen in the vision, as an adjective that describes an operative goal with a clear emphasis on technical developments that can lead to economic growth and competitiveness. This seems to be the main forum for sustainable development, namely as a way of increasing employment, GDP, and taking a place on the international market for road transport related products (ibid:17). The research framework ends with 5 recommendations for the EU seventh framework program, reiterating an emphasis on economic competitiveness, through research priorities that frame the solutions to road transport problems in terms of technical, logistic and systems modeling approaches (ibid. 17-19).

The Strategic Plan of the Conference of European Directors of Roads (CEDR)

The Conference for European Directors of Roads was started in 2003 and as a follow-up organization of representatives of national road administrations that grew out of two already existing organizations, the Western European Road Directors (WERD) and Deputy European Road Directors (CEDR). The mission of CEDR is to contribute to the development of a sustainable road system, to create a network of personal contacts, to provide a common platform for defining and solving problems, to coordinate with other EU activities and international bodies, and to disseminate the results of this collaboration to all of the member states (CEDR 2005:5). CEDR published a Strategic Plan 2005-2009 in May of 2005 which will form the basis of the following analysis.

An important mandate for the chair of CEDR was to define and formulate the problems of European road transport, thereby shaping a platform upon which solutions as well as future problems could be developed, recommended and identified for the member states (ibid, 9). The governing board decided that three thematic domains will form the core of CEDR's activities: Management, Construction and Operation. The mapping out of the specific problems of road transport that need to be addressed in the thematic domains was carried out in 2004 through a survey of CEDR priorities by representatives of the member states themselves. The priorities identified in this survey form the basis of the strategic plan for 2005-2009. All of the member states approved this strategy.

In the CEDR document, sustainable development is clearly defined at the beginning of the document on the strategic level of analysis as including social, economic and environmental aspects (CEDR 2005:5). There are no allusions or mention of sustainable development as an ethical or normative approach. Despite this prominent beginning, the topics that are prioritized show little balance between the social, economic and environmental aspects of the thematic domains (Management, Construction and Operation). As was seen in the ERTRAC research framework brochure, CEDR also emphasizes the operational level in its technical and logistical framing of the problems surrounding road transport. Since CEDR represents the national road administrations of the member states this can be seen to simply mirror the expertise, goals and orientation of these agencies. However, the first topic of the mission of the CEDR is to "contribute to future developments of road traffic and networks as part of an integrated transport system under the social, economic, and environmental aspects of sustainability" (ibid, 5). Given the focus on a broad definition of sustainability, it is interesting that the subsequent priorities of the thematic domains do not balance out these different key areas nor make any attempt to relate the different dimensions to one another. Again, this result

can be explained through the analytical distinctions between the ethical and operational levels of applications. Sustainable development is more prominent than in the ERTRAC document, both with regard to the definition and its placement as a part of the mission of CEDR, but this auspicious beginning does not inundate the following tasks that are specified for the different thematic domains working groups.

The great need for integrating sustainable development into policy development and management while noted in the priorities of CEDR's thematic domains are absent or unspecified in the tasks that will form the core of the activities until 2009, which instead prioritize tasks such as public/private partnerships, road pricing, financial procurement, and cost management for long term investments. Sustainable mobility for the future is listed as a task as well, but beyond stating the need for the creation of an efficient infrastructure to meet future mobility needs, no other means of attaining this goal are specified. The less specified tasks will be much harder to implement and attain, both because they have not been operationalized in any concrete fashion, and due to the fact that they much more complex and difficult to accomplish.

Overall, the mission of CEDR is formulated to capture the complexity of both sustainability and the need to establish a solid platform for collaboration, knowledge sharing and research development between the represented stakeholders in the member states. Unfortunately, this mission is not adequately covered in the tasks that are prioritized in the thematic domains, thus weakening a strong overall initial consensus of the group. The priorities of the thematic domains are also broad and well formulated, especially with regard to management, but this approach is not mirrored in the actual tasks that are specified for the working groups. Once again it is clear that the application of sustainable development has been limited to the operational level encompassing only an instrumental, technical and logistic approach to the problems that are being faced in the sector.

EU research in road transport: The European Commission

The great amount of work that has been done within the EU regarding transport-related issues is clearly outside of the scope of this paper. However, in June of 2006 a Mid/term review of the EC's 2001 Transport White Paper was published (EU 2001). The parts of this review that deal specifically with road transport as well as a recently published 2006 EC brochure on road transport research were selected to represent two examples of the current position within the EC on road transport research.

The Mid-term review of the 2001 Transport White Paper (MR) is an assessment of current and future needs of transport policy in the EU (EC 2006a). A number of studies and consultations were made to make this evaluation and are summarized and annexed in the review. The review focuses on the problem definition, the definition of objectives, and the development of different policy options. While there is a great deal of attention given to the internal transport market in Europe, Sustainable Development is noted as a key goal, especially in relation to environmental problems. The most important topic taken up under the problem definition is the importance of the transport sector for the EU economy, both in terms of GDP, growth, tourism, internal and international markets and establishing the EU as a competitive producer of transport-related innovations. CO₂ emissions, congestion and safety including terrorist attacks and geopolitical tensions are listed as the new problems, many of which clearly stem from a dependence on road based modes.

A number of key issues were identified in the 2001 White paper which included congestion, the environment and health. In 2005, four future objectives were added. The first addresses the need for a strong internal market supported through the efficient movement of people and goods, through protecting the environment and people, through increasing the efficiency and sustainability of the sector with an emphasis on innovation, and through connecting the Union internationally (ibid). Sustainable development is not noted as an explicit part of the future objectives, but it is implicated with a balance of emphasis on the three cornerstones of sustainable development, namely on economic, social and environmental dimensions. However, even with this broad emphasis, the transport sector is predominantly seen as an instrument for economic growth through the achievement of a well functioning internal trans-European market through economic and resource efficiency (ibid). There is no mention made of the potential conflicts between minimizing either the environmental impacts of transport or how the per capita consumption levels in Europe would play out globally, especially with reference to greenhouse gas emissions. The development of economic and resource efficiency, two key objectives of the Lisbon strategy, are also emphasized as a core goal of transport policy.

The EC Mid-term review of the 2001 White Paper makes a clear attempt to address the broad implications that a sustainable transport system have on future trends in Europe. Social as well as environmental impacts are integrated into most of the problem formulations and objectives. However, as was seen previously, there is no broader normative or ethical awareness of the consequences of levels of consumption in Europe and how this will affect future generations and the world. Sustainable development, while not referred to explicitly in the objectives, is included as a strategic goal by the emphasis on economic, social and environmental dimensions. The problems and solutions to road transport are framed in a number of different ways, with predominance on economic and technical approaches, but also including environmental and behavioral components, at least implicitly with an emphasis on health, congestion, accessibility and social dimensions. Overall the EC documents analyzed do make an attempt at grasping the breadth and complexity of the transport sector that has been lacking in the ERTAC and CEDR agendas. However, it must also be noted that this review does not present any specific tasks or priorities for a research agenda, which is what has been criticized in the other documents. To see what is being prioritized more concretely, a 2006 EC brochure presenting road transport research was also analyzed (EC 2006b).

In preparation for the TRA, the European Commission had a brochure made up which presents a cross section of the research that is being funded under the current framework program. It includes 35 projects divided into 8 thematic areas, which were city logistics, safety, design and production, road infrastructure, hydrogen and fuel cells, hybrids, alternative fuels, and noise reduction (ibid). ERTRAC is cited as a key resource in coordinating both researchers and research platforms for the seventh framework program. As with the other documents analyzed in this paper, the EC brochure limits its use of sustainability to describing economic goals for Europe. The creation of jobs and economic competitiveness within road transport design and production are the topics that are emphasized. Of the 35 projects, which are presented in the brochure, only 1 cannot be characterized as dealing purely with technical or modeling aspects. All of the other 34 described by the EC in preparation for TRA deal with the development of new vehicles, fuels, materials, road systems and construction, logistic systems, data base collection, and/or modeling (ibid). The majority deals with the development of new technologies, materials, or systems. Sustainable development is more or less absent from the 2006 EC brochure on road transport research. Sustainability as a concept

is used sparingly in the introduction and in a few of the projects to refer to something that can be maintained over an undefined time period, though this is not explicitly integrated into the projects.

High level technological solutions, as outlined in the EC brochure, will not be applicable to an international market that cannot afford such solutions such as those developing in India and China, the leading nations where research of this type is most greatly needed. Nor will such solutions be applicable to the new member states where low budget solutions are currently needed to serve the most basic of transport needs for their populations. All of the research that was selected to profile the road transport research that is currently being funded is geared to extremely specialized, expensive, highly technical solutions like new hybrid technologies, hydrogen cars, intelligent materials for road construction, new 3-wheeled vehicles, etc. Once again, as priorities go from being strategic to operational, the variety of paradigms for formulating both the problems and solutions to road transport narrow to the same approach that has been seen in all of the organizing groups thus far, namely highly technological, dealing with material construction or a systems modeling approach.

The Transport Research Arena Europe 2006

As mentioned by way of introduction, TRA held their first conference in June Of 2006 with the goal of establishing a strong platform for road transport research in the EU. The conference attracted a total of 1,000 participants, of which 363 presented papers. Among the presenters, 146 were academic researchers, 123 represented private organizations such as consultants and business interests, and 104 were from a governmental agency. The conference was held over three days, with six main thematic session topics which included: the Growing European Research Arena; Mobility of People, Transport of Goods; Safety and Security; Energy, Environment and Resources; Design and Production, and Integrated Approaches.

The 3 plenary sessions, including the introductory and final ones, were made up representatives from the conference organizers (ERTRAC, CEDR, EC), representatives of the Swedish Road Administration, the local organizing group, Swedish and European Ministers, the car industry, the Transportation Research Board (TRB), and various representatives from different EU consulting firms, programs and research organizations such as POLIS, ECTRI and FEHRL. All of the plenary topics dealt with how the future of road could lead to a sustainable society, specifically including economic growth and global competitiveness. One plenary session dealt specifically with ERTAC's mission for 2020.

Overall, most of the speakers in the plenary sessions presented a broad analysis of the problems that are faced in the road transport sector, citing the classic tripartite sustainable development goals and the need for a *holistic* approach. However, when more specific research projects or strategies were presented, this broad, holistic vision was narrowed to dealing with developing different types of technical solutions within the social, economic and environmental dimensions. For example, in the opening session a representative from ERTRAC, presented a talk dealing with win-win scenarios for road transport systems. He started his talk by noting that the transport sector is not sustainable due to the great increase in road use that is expected in the EU both with regard to the increasing needs of personal travel and increasing amount of goods that is expected to be transported by road. In his talk, a sustainable road system is one where the three components, society, ecology, and economy, are combined and must be adequately dealt with. *Society* he uses to refer to safety and access related issues. *Ecology* refers to energy use and pollution. *Economy* encompasses a road

system that is efficient and competitive. This tripartite approach results in a number of needs or conditions. These include the following characteristics that must be dealt with: complex problems; multi-stakeholders; the need for a broad forum and holistic view; the need for open- transparent processes; the need for consensus; and a viable EU research agenda. As has already been covered in the section on ERTRAC, this broad perspective while admirable for its breadth, is not visible in the research agenda that is currently being promoted.

Similar trends were seen in the different parallel sessions where a minority of the participants presented research that was not framed within a technological or systems modeling framework. Of the 5 strategic sessions, all emphasized a technical approach to problem formulation and solutions. Of the 40 parallel sessions, 30 dealt with technical (both IT and construction topics) and systems modeling approaches; 3 dealt with social trends, planning and behavior; and the remaining 7 with research or topics dealing with increasing economic growth and competitiveness. A majority of the sessions framed the solutions to problems such as safety, congestion and environmental degradation in terms of intelligent vehicles and intelligent transport systems that could relieve congestion, increase safety, encourage modal shifts to cleaner forms of transportation, and improve the efficiency of goods transportation. A majority of the parallel sessions thus approached sustainable development or sustainability from the operational level of analysis that emphasized a narrow approach to problem solving within the sector.

As can be seen from this brief summary of the sessions, the TRA conference shows a well established trend in European transport research in a technical and systems modeling approach to framing both the problems and solutions of road transport. The overall impression of the conference was one of a naive technological optimism and economic myopia. Overall, when sustainable development is used at the TRA conference, it is defined loosely as a road system that is economically viable, environmentally sound, and socially acceptable. There was little or no mention or discussion of the ethical positioning that sustainable development represents through reference to the greenhouse effect, global equity, intergenerational resource needs, the role of global warming and the impact that the transport sector has and will continue to have on trends that impact such issues. China and India were also notably absent from the discussion, though global trends towards motorization in the most highly populated countries in the world will drastically change the face of global CO₂ emissions and put more pressures on Europe to find more viable alternatives.

The need for a new agenda for transport research in Europe

There is a well established trend in European transport research that oversimplifies and reduces the complexity of attaining sustainable development in the road transport to a well known box of technological fixes including smarter cars and networks for safety and congestion problems, cleaner and more efficient fuels and engines for reducing environmental degradation and health problems, and smart infrastructure for increasing competitiveness and efficiency. This analysis of the TRA conference and organizers confirm that, despite the emphasis given to sustainable development in the EU's Sustainable Development Strategy II, there is still a narrow focus of research in the transport sector. An instrumental approach to problem framing and solving is taking precedence over more interdisciplinary and broader research agendas thus limiting the research that is being developed and funded in the EU. The contours of the discourse surrounding how sustainability is dealt with in the sector mirror the underlying values or priorities of the involved agencies. Economic growth and competitiveness and the role of transport in supporting such growth are not questioned, nor is

the dominant role of the private car and trucks. Sustainability is defined in the classic win-win sense, where the tripartite economic, environmental and social dimensions are duly noted. However, these three dimensions are not sufficiently integrated into the research agenda that is being supported by the EU in agencies such as ERTRAC and CEDR. The win-win interpretation does not adequately address the reality of the problems that are being faced and will be faced in the sector. Given the transport trends in Europe - especially regarding the projected 38% increase in freight by the year 2020, and the fact that many cities are having difficulties dealing with the environmental and social consequences of current transport use - this approach is more than problematic, it presents a false picture of the current situation. Prioritizing research and development that uses short sighted technological fixes will cripple Europe as a leader in transport solutions for the world, as well as not adequately serve the needs of the new member states, where expensive solutions are not a viable alternative. Given that the current administration in the US does not even acknowledge global warming as a problem, the EU has a clear role to play with regard to international development, especially for setting precedence for developing sustainable and affordable mobility options for the fast motorizing countries in the developing world.

As this paper exemplifies, the way concepts are used and defined is important because definitions set up priorities, validate and give legitimacy to a certain way of approaching and solving problems. Combining the openness and interpretability of sustainable development, and the already well established orientation of the transport sector has resulted in a specific interpretation of the concept that is narrow and limited to just one possible orientation, albeit a very important one. The way a problem is defined is essential to identifying the types of research initiatives and approaches that are seen as being most valid. Given the myriad of research orientations that are possible within the transport sector, giving more legitimacy to one represents an act of power. The individuals or organizations that are in a position to identify and define the research priorities of the entire EU, such as ERTRAC itself proposes to do, are in a position to validate certain types of research, thereby excluding others. It is vital to ask what is excluded, because the results of such a process of exclusion are tantamount to the future of R & D in Europe. Certain types of research programs and projects will receive funding while others will not. Certain types of research will be carried out and implemented while others will not. The result is in a body of research results that solves certain types of problems in a certain way, excluding other types of problem formulations and solutions.

This paper has tried to identify the contours of the current research agenda by focusing on how sustainable development has been used, as well as on what is missing from the proposed research agendas, and what has been relegated to non-importance. Three main reasons were found which explain why sustainable development has not had the impact it could have in the transport sector. For the first, the ethical level of analysis while present as an overarching goal is completely lacking on the strategic and operational levels. Second, there is no integration between social, economic and environmental dimensions on the strategic level, and where there is, the economy is seen as a panacea to all development problems. The narrow definition positioning environmental limits as the contours of sustainable development is for all practical purposes lacking, despite the fact that the sector has a great impact on global resource use and pollution. Third, only one perspective has any real precedence or support on the operational level and that can be summed up by technological fixes and more efficient systems. The question that needs to be asked is if such an integration of sustainable development in the transport sector is adequate to making the road transport system in Europe sustainable. This paper suggests that it is not.

The strength of sustainable development as a tool for change lies in the far-reaching nature of its normative and ethical standpoint regarding the resource preservation necessary for intergenerational equity. Thus sustainable development is used because it stands for values that everyone accepts on an ethical level, but these values vanish or are watered down on the strategic and operational levels by the different stakeholders that use the term. This, however, does not need to be the case for the future. With a broadening of the core areas for research, strategic and operational indicators can also be developed from other core research topics from within a broader range of theoretical and methodological approaches. This could include more research on policy and implementation, decision-making and city planning, transport behavior, and citizen participation, to name but a few important topics. In this way, the technical and instrumental perspectives can be balanced and strengthened by a broader more interdisciplinary approach to problem solving. Any limitation of the EU research agenda is problematic because focusing on applied and technical solutions cannot, alone, mirror or solve the problems that are currently being faced within the transport sector. Given the far-reaching and complex nature of the social, economic and environmental problems connected to road transport, a broad, interdisciplinary research agenda is clearly the only adequate response to the problems that are currently being faced.

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