

National background report on Transport for Serbia

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March 2009**

1. Purpose of the national background report and summary of the consultation process

The objective of this report is to provide an overview of the transport research environment in the Republic of Serbia (hereinafter: Serbia), with a SWOT analysis of the transport research capacities and identification of transport research priorities for Serbia in the period 2008-2012, based on a consultation process with transport experts.

This report is intended to contribute to shaping the future European Union (EU) – West Balkans (WB) research cooperation, through relevant European Commission (EC) initiatives, policies and funding programmes, in the way that meets the interests and actual needs of transport stakeholders in the region.

In order to identify research priorities in the field of transport and to aid in putting this report together in an impartial manner, a consultation process took place in January and February 2009. The questionnaires were sent to project managers of all the ongoing transport research projects (23 projects) funded by the Ministry of Science and Technological Development of the Republic of Serbia. The responses have been received from 12 experts.

Based largely on the outcomes of the consultation process, this report identifies a set of seven research priorities for Serbia in the field of transport for 2008-2012 period, in line with the proclaimed objective of the **wbc-inco.net** project, which is to identify RTD potentials and priorities for take-up in FP7 and other European research programmes and funding schemes, as well as to enhance participation of researchers from the region in European projects.

2. The Transport S&T system in Serbia

2.1. The policy framework

2.1.1 The overall Transport policy framework

In 2008 the Government adopted the *Strategy of development of rail, road, water, air and intermodal transport in the Republic of Serbia for 2008-2015 period*. (Official Gazette of the Republic of Serbia No. 004/08, 13 January 2008) The directions for future transport sector development in the Strategy are based on principles of safety, intermodality, application of new technologies, complementary use of different transport modes and rational use of available capacities and resources in Serbia. Basic goal of Serbia's transport strategy is to reach the compatibility with the EU's transport system, while ensuring as low as possible adverse environmental impacts of such development.

Seven general objectives (goals) of the Strategy have been defined:

1. Integrating Serbian transport network into the TEN-T.
2. Efficient use of comparative advantages of each transport mode.
3. Rising the quality of transport services, by increasing efficiency, better organization of transport operations from economics, safety and environmental perspective and application of target-oriented planning and managing of traffic flows.
4. Increasing the level of safety and security of the transport system.
5. Strengthening and gradual liberalisation of transport market.
6. Reducing adverse environmental impacts of transport.
7. Establishing stable financing of transport system's development.

2.1.2 The elements of Transport research policy making

The work on a new *National strategy for science and technological development* is underway, and is scheduled to be completed by the end of June 2009. It is expected to define the principal directions (priorities) of Serbia's development in the S&T field.

While Serbian Ministry of Science and Technological Development (MSTD) provides funding (research grants) for a certain number of research projects in transport, there are no explicit target research areas/themes in the field of transport as such (i.e. no areas/themes predefined by the MTSD). Rather, the MSTD typically announces call for applications for research grants in the field of transport, and then makes the evaluation and eventually selection of research projects proposed by various research institutions (groups) based on reviews of qualified (external) reviewers.

In 2008, the total financial support to R&D activities by the MSTD amounted to EUR1.73 million, which represents about 0.006% of Serbia's GDP in that year.

2.2 Overview of Transport research activities

2.2.1 Transport research projects

There are presently 23 ongoing research projects in transport funded through the MSTD's latest completed call for proposals (*Research programme in the field technological development for the 2008-2011 period*, Area: Transport). These projects are led by six different research institutions:

- Faculty of Transport and Traffic Engineering, University of Belgrade (14 projects)
- Faculty of Technical Sciences, University of Novi Sad (4)
- Institute "Mihajlo Pupin", Belgrade (2)
- Institute "Kirilo Savić", Belgrade (1)
- Faculty of Mechanical Engineering, University of Belgrade (1)
- Faculty of Mechanical Engineering, University of Kragujevac (1)

The MSTD presently also finances three projects in the programme *Energy efficiency in transport*.

Apart from the projects funded by the MSTD, there are also nine projects in the EC Framework Programmes 6 and 7 in which Serbian research institutions are taking part: four project in FP6-Area: *Sustainable development, surface transport* and five projects in FP7-Area: *Transport (including Aeronautics)*, with aggregate EC contribution amounting to EUR 618,465.00.

For more details concerning the involvement of Serbian research institutions in European transport research projects, please refer to Annex IV.

2.2.2 Key competencies in Transport research field

Of the 23 ongoing research projects in transport funded by the MSTD (*Research programme in the field technological development for the 2008-2011 period*, Area: Transport), 10 relate road traffic (addressing various applications of intelligent transport system, safety aspects, environmental impacts, energy efficiency, level of service considerations), four projects are devoted to rail traffic (safety, energy efficiency, technological development and environmental considerations). Further on, there are three projects relating water transport (fleet efficiency, port processes optimisation, and

strategic considerations), as well as two projects concerning air transport (methods for evaluation of development scenarios from various perspectives, and emissions and noise mitigation), two projects in logistics (supply chain management), and finally two projects relating postal services (risk management and strategic considerations).

For the full list of MSTD-funded ongoing R&D projects in the field of transport, please refer to Annex III.

Collaboration on transport research projects between research institutions and commercial enterprises seems insufficient, in terms of lacking initiative for research in transport from transport stakeholders, as well as with regard to poor transfer of research findings (results) into (operational) practice. More recently, there have been certain initiatives to bring together the industry and research institutions, such as the programme coordinated by the Belgrade Chamber of Commerce, but with no concrete results for the time being.

2.2.3 Transport research infrastructure

On a national level, transport RTD contributions are supported first and foremost by the Ministry of Science and Technological Development. Except for providing research grants for transport RTD projects, the MSTD also supports and finances the KOBSON service (Consortium of Serbian libraries for joint supplies, <http://nainfo.nbs.bg.ac.yu/Kobson/page/>) – providing research institutions with a free access to e-versions of relevant scientific journals and scientific information in general.

Main research performers in the S&T field of transport in Serbia include:

- University of Belgrade:
 - Faculty of Transport and Traffic Engineering
 - Faculty of Mechanical Engineering
 - Faculty of Civil Engineering
- University of Novi Sad – Faculty of Technical Sciences
- University of Kragujevac – Faculty of Mechanical Engineering
- University of Niš – Faculty of Mechanical Engineering
- Institute “Mihajlo Pupin”, Belgrade
- Institute “Kirilo Savic”, Belgrade
- Institute of Physics, Belgrade
- Institute “Vinča”, Belgrade
- CIP Traffic Institute, Belgrade
- Innovation Centre, Faculty of Mechanical Engineering, University of Belgrade

- Military Technical Institute, Belgrade
- Utva Aircraft Industry, Pančevo
- Zastava Automobiles, Kragujevac
- PE “Serbian Railways”
- PE “Roads of Serbia”

For the full list of transport research performers in Serbia, including their postal and web addresses, please refer to Annex II.

2.3 Key drivers of Transport research

2.3.1 Main Transport sector trends in Serbia

Transport market in Serbia has not yet been liberalised, and is still largely dominated (monopoly or quasi-monopoly) by state-owned operators (especially in rail and air transport) and infrastructure providers. Transport infrastructure is for the most part provided by fully state-owned public enterprises (tolled motorways, railways, airports, air services navigation,...).

According to official statistics, the contribution of *Transport, storage and communications* (TSC) sector to Serbia’s GDP is considerable, and has been rising steadily between 2004 and 2006, with some stagnation seen in 2007. This category of services contributed by 12.8% to Serbia’s GDP in 2007 (compared to 9.2% in 2004, and 12.9% in 2006).

In 2007 the TSC sector employed more than 109,000 personnel in nearly 6,500 enterprises, and has received foreign direct investment of about EUR 500 million. In the same year the export of TSC services brought US\$ 833 million, 60% of which came from export to EU member-states, with further 30% share of export to European non-EU countries.

2.3.2 Main socio-economic challenges in Serbia

This section (2.3.2) is composed from excerpts from the World Bank’s *Country Brief 2008*, available from:

http://www.worldbank.org.yu/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/SERBIA_EXTN/0,,contentMDK:20630647~menuPK:300911~pagePK:141137~piPK:141127~theSitePK:300904,00.html

Serbia is a middle-income country with great potential for fast economic development, as the country is endowed with natural and mineral resources and fertile and arable agricultural land. Serbia is also well positioned for development of a transportation hub,

given its strategic location at the crossroads of major road and rail routes in South-eastern Europe. Most economic activity is concentrated in services (about 65 percent of GDP), industry (24 percent), and agriculture (11 percent).

After the turmoil of the 1990s, Serbia has made significant progress with a wide ranging program of democratic and economic reforms which started in 2001. Macroeconomic stability has been restored which provided basis for fast growth of the economy, and incomes have risen strongly. GDP per capita, estimated at \$2,100 in 2002, has reached \$5,400 in 2007. During the same time period, poverty has fallen from 14 percent of the population to about 6.6 percent (according to last year's *Living Standards Measurement Survey*).

Recent economic developments

During the 1990s, Serbia was exposed to wars and economic sanctions. The political changes since 2000 have laid the foundation for making a clean break with the past decade of economic decline. They have done so by creating the basis for economic and social reforms as well as for the increased donor support.

Strong economic progress has been achieved since 2001, particularly in expanding private sector participation in the economy. Macroeconomic stability, achieved swiftly in the first years of transition, has been broadly maintained. During the first seven years of transition the economy grew on average 5.6 percent per annum, peaking in 2004 with 9.4 percent GDP growth, one of the highest growth rates among transition economies. In 2007, growth remained strong at estimated 7.5 percent. There have also been major improvements in the business environment that saw Serbia ranked as the top reformer globally in *Doing Business 2006* report, for reforms carried out in 2004-2005. Still, further reforms to strengthen the environment for sustained private sector led growth, including continued structural reforms and privatization, will be vital to ensure that living standards continue to converge with those in Europe.

However, despite Serbia 's strong growth performance, significant **challenges** remain. External weaknesses are apparent in double-digit and expanding current account deficit. Despite significant decline of the public debt, external debt remains about 60 percent of GDP as private external liabilities continue to grow quickly. Although policy action and fiscal restraint will be required to address external weaknesses, Serbia 's reserves position is currently very comfortable as a result of strong private sector inflows including foreign direct investments (FDI). FDI averaged 7.2 percent of GDP over the last 5 years, resulting in Serbia being among the top countries in Europe and Central Asia with respect to attracting such investment. FDI was especially strong in 2006, as a result of several large privatization deals, including the sale of a mobile telephone operator.

At over 40 percent of GDP, public expenditures remain high. While a fiscal adjustment occurred between 2003 and 2005, with expenditures falling from almost 44 percent of GDP to just over 40 percent, those gains have been reversed with recent wage rises and spending pressures as a result of election promises in run-up to the series of

parliamentary elections, and a deficit has again emerged. Fiscal loosening has also created inflationary pressures and pushed the annual average inflation rate close to 7 percent. Rising inflation in Serbia has been also the result of the global increase in oil and food prices.

Unemployment, poverty, and poor inclusion of the vulnerable remain concerns in Serbia . During the past decade, a long period of instability, international isolation, and economic turmoil adversely affected living standards of the vast majority of the population. The country's poor economic performance over that period led to a decrease in real earnings and was accompanied by deterioration in social protection and health services. As a result, poverty rose sharply in the 1990s. Although currently around 6.6 percent of the population falls below the poverty line (according to *Living Standard Measurement Survey*), one third of the country's people are barely above the poverty line and remain in danger of slipping into poverty if any adverse economic developments occur. The unemployment rate (as per internationally comparable Labour Force Survey) is still high at 14 percent of the labour force despite the significant decline from a year ago. Unemployment is affecting young people and minority groups in particular.

Challenges ahead

- Harmonizing the fragmented political scene. Despite major improvements, the fragmented political scene hinders the development of a more stable political environment.
- Accelerating EU integration. The Stabilization and Association Agreement with the European Union has been signed, but is still not effective.
- Maintaining macroeconomic stability. Due to fiscal deficit and high current account deficit, macroeconomic stability remains vulnerable, particularly to external shocks.
- Improving governance and building effective state institutions. Building effective state institutions to improve governance and transparency, and implementing comprehensive legal and judicial reform are essential to improve government performance, increase foreign investment, and ensure sustainable growth..
- Improving the well being of the most vulnerable and building human capacity. The political sustainability of the reform effort will depend to a large extent on the government's success in shielding the vulnerable and building human capital. Improving social protection mechanisms and boosting the quality and efficiency of health services and educational system are the key challenges. Particular efforts will also be required to alleviate poverty among minority groups, rural poor, and in depressed regions formerly home to large industrial and mining industries..
- Addressing environmental problems and mitigating disaster risks. Significant environmental issues associated with the legacies from heavy mining and

industrial industries will need to be addressed and managed. Also, recent floods, droughts, and fires have highlighted the need for effective regional disaster preparedness and response capabilities. These issues are also thrown into focus by the increasing need for climate change mitigation and adaptation measures.

3. Integration of Serbia in the European Research Area in the field of Transport

3.1. Thessaloniki Agenda for the Western Balkans: Moving towards European integration

At the European Summit in Thessalonica held on 21 June 2003, the European Union offered **European Partnership to the Western Balkans countries** as one of the key instruments of the EU pre-accession strategy for the potential EU membership candidates. The EU Council of Ministers adopted the Decision on the principles, priorities and conditions contained in the European Partnership with Serbia-Montenegro including Kosovo, in compliance with the UN Security Council Resolution 1244 of 10 June 1999.

The Partnership lists short- (12-24 months) and mid-term (3-4 years) priorities for the preparations for further integration in the EU. This mechanism shall exclusively determine relations between the EU and Serbia until the Stabilisation and Association Agreement has been signed.

One of the most important facts regarding European Partnership is that the financial assistance is conditioned by the implementation of the priorities (Annex to the document, Article 5). In other words, the document shall exclusively arrange relations between the EU and our country all the way through to the signing of in the Stabilisation and Association Agreement-it is a new framework for defining relations between the EU and the Western Balkans. Financial assistance is also conditioned by the progress achieved in meeting the Copenhagen criteria, although these are the criteria set to be met for the membership, not for the association.

On the publication of this document, Serbian Government adopted Information on European Partnership and the need to adopt the Action Plan in order to meet the priorities set in the European Partnership.

[Source: The EU Integration Office of the Government of Serbia,
<http://www.seio.sr.gov.yu/code/navigate.asp?Id=67>]

3.2. The Stabilisation and Association Agreement between EU and Serbia

On 9 September 2008, National Assembly of the Republic of Serbia ratified the Stabilisation and Association Agreement (SAA) and Interim Trade Agreement. This formally marked the end of the process initiated on 10 October 2005, when negotiations for conclusion of this agreement were started between the Republic of Serbia on one side and the European Communities and their member states on another. SAA and Interim Agreement were initiated on 7 November 2007, and they were signed on 29 April 2008. SAA will enter into force after its ratification by the EU Council of Ministers and the

European Parliament and after it is ratified by all signatories i.e. Member States of the EU. The Interim Agreement will enter into force after it is ratified by the EU Council of Ministers and the European Parliament.

[<http://www.seio.sr.gov.yu/code/navigate.asp?Id=106#744>]

3.3. European Union's Framework Programmes for research and technological development

Serbia is an associated country to the EU's Framework Programmes for research and technological development, making all legal entities established in Serbia eligible for funding on the same footing as legal entities from the Member States.

[ftp://ftp.cordis.europa.eu/pub/fp7/docs/third_country_agreements_en.pdf]

4. SWOT analysis of the Transport research capacity in Serbia

4.1 Strengths

- Transport recognized among national priorities.
- Institutional support for RTD in transport, first of all by the Ministry of Science and Technological Development.
- Presence in EU research programmes.

4.2 Weaknesses

- Transport research in general lagging behind European/international trends (in terms of topics, methods, etc.).
- Lack of specific (target, predefined by the MSTD) transport research themes – no clear transport research strategy as such. No clear focus on areas that might provide most benefits for the transport system, economy and society as a whole.
- Insufficient and typically untimely communication on transport R&D funding opportunities.
- Insufficient support (incentives) for young researchers – lack of funding and of longer-term positions in research institutions. Leakage of former/potential researchers to commercial sector.
- Joint research: research institutions/transport stakeholders (industry) – insufficient communication, cooperation and transfer of research findings. Transport research lacks initiative from the (national) transport industry.
- Lack of communication on EU policies. Research community does not always keep pace with EU transport policies.
- Lack of project management skills (particularly in preparation of proposals for EU-funded research programmes).

4.3 Opportunities

- New *National strategy for science and technological development* (work underway) – transport research possibly among priorities.

- Presence in EU research programmes. Serbia is an affiliated country for EU's framework R&D programmes. Access to EU research funds.
- EU accession process – alignment of transport research policies with the EU's, expected to provide more funding opportunities.
- Expected liberalisation of transport market. In a liberalised setting, transport stakeholders will be incentivized to improve their performance (efficiency), so as to be(come) more competitive. Such a change might well lead to increased cooperation with research institutions (and greater spending on R&D by industry stakeholders).

4.4 Threats

- Research infrastructure. Lack of institutional support (first of all funding) for acquisition of latest (state-of-the-art) technologies – ICT, simulators, equipment for laboratory experiments (testing) etc.; Technical equipment increasingly lagging behind recent developments.
- Brain drain. Loss of transport research staff to both commercial sector in Serbia and to foreign commercial enterprises and research institutions, jeopardizing the prospects of transport research in Serbia.
- Economic crisis – endangered RTD funding.

5. Transport research priorities for Serbia

Today's Central/South East European (CSEE) countries have for a long period of their history been the part of the Hapsburg or/and Ottoman Empires, six of them later constituting former Yugoslavia, such legacy resulting in strong relations still existing between most of them (e.g. ethnic relations, complementary economies, consumers' habits – inertia, such as in tourism, etc.). The globalising nature of the modern economy, on the other side, also calls for a greater degree of integration between states, removing barriers to a more rapid and more intensive flow of people and goods. As legal obstacles are increasingly (but not yet to a sufficient degree) being removed with EU integration processes (past and planned), it is getting more obvious that a transport system might pose a bottleneck which could slow down possible quicker integration of this, still highly fragmented region, and the likely benefits this process is expected to bring along.

Integration of Serbia, on three levels: "regionally" (with other WB countries), into the wider CSEE sub-system and into the EU is emerging as a development of crucial importance for all sides. This integration should ideally (realistically) be achieved through a medium- to long-term adaptation of Serbian (and other WB countries') transport system in terms of its technical/technological, operational, economic, social, environmental, and institutional aspects in order to become sufficiently compatible with that of the neighbouring regions and eventually with the EU's TEN-T.

In that respect, all transport modes should be considered: road, rail, water and air transport. Their current state ought to be analysed, existing and prospective gaps identified, scenarios developed for the future development of infrastructure and services for narrowing these gaps, followed by an evaluation of feasibility of particular scenarios from social perspective. Finally, the measures for implementation of the feasible scenarios are to be synthesised in the format of the policy packages (consisting of measures) for each mode and for the system as a whole.

5.1 Transport Research priorities on the basis of the country's readiness

The existing surface transport infrastructure in the region is characterised by a rather modest network of highways and non-existence of high-speed rail, and as such it does not seem to provide satisfactory links between the constituting countries. Furthermore, this part of Europe has been experiencing faster than average GDP growth in recent years, the trend which is forecast to continue, with a consequent strong increase in mobility expected.

One of the obvious R&D priorities therefore seems to be: to investigate possibilities for developing a sustainable integrated transport system for the Balkan's region on the one hand, and for linking (integrating) it to the CSEE transport system and to the TEN-T on the other, through an "optimal" combination of different transport modes (the concept of optimodality), which would provide effective and efficient transport services to its users

through modal competition and complementarity. In this context, the “sustainable transport system” should simultaneously embrace technical/technological, operational, economic, social, environmental, and institutional performance.

In line with the above written, R&D priorities in the field of transport could be classified in two broad categories: network-related and vehicle-related priorities. Each of those is now detailed in turn.

5.1.1 Priority 1: Transport network-related R&D activities

This class of activities should pave the way for an effective inclusion (integration) of Serbian transport network into wider (regional and European) transport network, enabling an efficient and less environmentally harmful flow of passengers and goods (freight), not only for “terminal” traffic (where origin and/or destination are in Serbia/other WB countries) but also for transit traffic, bearing in mind the strong traffic flows traversing the WB region.

Research in the field of transport should focus primarily on matters of intermodality, interoperability and interconnectivity of both passenger and freight transport on pan-European corridors VII and X, as well as on lower-rank transport links (regional, national, etc.). More specifically, research efforts should head towards the development of:

- P1.1. Optimal combinations of different modes (optimodality), aiming at efficient and seamless transport chains (especially for transit). Different combinations of modes may be investigated in WB environment: e.g. rail/road or air/rail/road in case of passenger transport; rail/ road or water/rail/road for freight transport;
- P1.2. Intelligent transport systems, encompassing all transport modes: rail, road, water and air transport;
- P1.3. Supply chain management including terminal processes;
- P1.4. Charging schemes for use of transport infrastructure.

5.1.2 Priority 2: Vehicle/vessel-related R&D activities

This class of activities focuses on potentials to improve the efficiency (in more dimensions: technical, economics, energy, environmental impact etc.) of transport in Serbia and WB region in terms of research, testing and/or design of vehicles/vessels that would contribute to such development. More specifically, the following research themes are proposed:

- P2.1. Development of small aircraft;
- P2.2. Development of river and river-sea ships;

P2.3. Experimental testing including technical and navigational characteristics and propulsion of loaded ships and pushed convoys, to increase the efficiency of river traffic.

5.2 Transport Research priorities on the basis of future potential

Due to specificities of the transport field, there are no foreseeable future research priorities different from the present ones, described in Section 5.1.

Annex I. Classification of the Transport research fields

N/a.

Annex II. List of Transport R&D institutions

	Name	Postal address	Website
1.	Mathematical Institute, Serbian Academy of Sciences and Arts	Kneza Mihaila 36, 11000 Belgrade	www.mi.sanu.ac.rs
2.	Institute "Mihajlo Pupin"	Volgina 15, 11000 Belgrade	www.imp.bg.ac.rs
3.	Institute "Kirilo Savić"	Vojvode Stepe 51, 11000 Belgrade	www.iks.rs
4.	University of Belgrade – Faculty of Mechanical Engineering	Kraljice Marije 16, 11000 Belgrade	www.mas.bg.ac.rs
5.	University of Kragujevac – Faculty of Mechanical Engineering	Sestre Janjić 6, 34000 Kragujevac	www.mfkg.kg.ac.rs
6.	University of Belgrade – Faculty of Transport and Traffic Engineering	Vojvode Stepe 305, 11000 Belgrade	www.sf.bg.ac.rs
7.	University of Novi Sad – Faculty of Technical Sciences	Trg Dositeja Obradovića 6, 21000 Novi Sad	www.ftn.ns.ac.rs
8.	Innovation Centre, Faculty of Mechanical Engineering, University of Belgrade	Kraljice Marije 16, 11000 Belgrade	www.inovacionicentar.rs
9.	University of Belgrade – Faculty of Civil Engineering	Bulevar Kralja Aleksandra 73/I, 11000 Belgrade	www.grf.bg.ac.yu
10.	CIP Traffic Institute	Nemanjina 6, 11000 Belgrade	www.sicip.co.yu
11.	Institute of Physics	Pregrevica 118, Zemun, 11080 Belgrade	www.phy.bg.ac.yu
12.	University of Niš – Faculty of Mechanical Engineering	Aleksandra Medvedeva 14, 18000 Niš	www.masfak.ni.ac.rs
13.	Institute "Vinča"	P.O. Box 522, 11001 Belgrade	www.vin.bg.ac.yu
14.	Military Technical Institute	Ratka Resanovića 1, 11030 Belgrade	www.vti.mod.gov.rs
15.	PE "Serbian Railways"	Nemanjina 6, 11000 Belgrade	www.zeleznicesrbije.com
16.	PE "Roads of Serbia"	Bulevar Kralja Aleksandra 282, 11000 Belgrade	www.putevi-srbije.rs
17.	UTVA Aircraft Industry	Pančevo	www.utvaaviation.co.rs
18.	Zastava Automobiles	Trg topolivca 4, 34000 Kragujevac	http://zastava-automobili.com

Note: The list assembled by the MSTD.

Annex III. Ongoing MSTD-funded research projects in the Transport research field

1. Integrated information-management system for traffic regulation on roads and motorways
(Project led by Institute „Mihajlo Pupin“)
2. Intelligent transport systems as a means of alleviating urban traffic congestion
(University of Belgrade – Faculty of Transport and Traffic Engineering)
3. Universal toll system enabling tolling in motion
(Institute „Mihajlo Pupin“)
4. Application of the results of experimental investigations in defining new analytical methods to determine transport effects of pushed convoys on Danube navigable network
(University of Belgrade – Faculty of Transport and Traffic Engineering)
5. Development and application of optimization methods in shaping the supply chains in Serbian car-manufacturing industry
(University of Novi Sad – Faculty of Technical Sciences)
6. Programme to reduce the harmful gaseous emissions and noise in the air transport system of Serbia
(University of Belgrade – Faculty of Transport and Traffic Engineering)
7. Re-engineering business processes and risk management in the provision of postal services
(University of Belgrade – Faculty of Transport and Traffic Engineering)
8. Application of intelligent transport system technology on Serbia’s road network
(University of Novi Sad – Faculty of Technical Sciences)
9. Diagnosis, identification and monitoring of propagation of rail-track failures aiming to improve safety and harmonize the methodology with European standards
(Institute „Kirilo Savić“)
10. Developing the method to assess safety based on vehicle condition
(University of Belgrade – Faculty of Mechanical Engineering)
11. Danube – European Corridor VII and Serbia’s sea-access strategy by connecting to the Black Sea, the Caspian Sea and the Mediterranean region ports, as seen from the perspective of the impact of the river-sea transport development on Serbia’s economy
(University of Novi Sad – Faculty of Technical Sciences)

12. Methods to determine dynamic characteristics of motor vehicles in the function of traffic safety
(University of Kragujevac - Faculty of Mechanical Engineering)
13. Contemporary methods of capacity- and level-of-service analysis on road sections
(University of Belgrade – Faculty of Transport and Traffic Engineering)
14. A model of sustainability of universal postal service through the development of postal technology, development of informatics society and regional development of the Republic of Serbia
(University of Novi Sad – Faculty of Technical Sciences)
15. Optimizing logistic processes of secondary distribution of oil derivatives
(University of Belgrade – Faculty of Transport and Traffic Engineering)
16. Methodologies and models to increase the capacity of the freight reception and delivery system in IWW ports: Case study Pančevo port
(University of Belgrade – Faculty of Transport and Traffic Engineering)
17. An investigation into and development of new methods for optimal use of adhesive capabilities of towing vehicles
(University of Belgrade – Faculty of Transport and Traffic Engineering)
18. Modelling transport needs in function of mobility requests and cities' energy efficiency
(University of Belgrade – Faculty of Transport and Traffic Engineering)
19. A project of technical development of the PE “Serbian Railways” in the market restructuring and opening conditions
(University of Belgrade – Faculty of Transport and Traffic Engineering)
20. Methods for evaluation of development scenarios of the air transport system in Serbia (airlines, airports, ATC) – safety, efficiency, economic and environmental aspects
(University of Belgrade – Faculty of Transport and Traffic Engineering)
21. Development of the family of hybrid-propulsion buses
(University of Belgrade – Faculty of Transport and Traffic Engineering)
22. Investigating the effects of rail modernization on the creation of modern integrated transport system of the Republic of Serbia and on the efficient environmental protection
(University of Belgrade – Faculty of Transport and Traffic Engineering)
23. Development of the fleet management system to reduce the carbon-dioxide emissions
(University of Belgrade – Faculty of Transport and Traffic Engineering)

24. Development and application of a system for monitoring the energy efficiency of road transport fleet

(University of Belgrade – Faculty of Transport and Traffic Engineering)

25. Development of application of optimal technologies of combined transport, in the function of improvement of energy efficiency in transport, as a logistic support to increased competitiveness of Serbia's economy

(University of Novi Sad – Faculty of Technical Sciences)

26. Development and application of an optimal controlling system for tracking of transport energy efficiency

(University of Novi Sad – Faculty of Technical Sciences)

Annex IV. Involvement of Serbian researchers in European Transport research projects

In the FP7 programme, theme: *Transport (including Aeronautics)* there are five projects in which Serbian research institutions are involved, namely:

- *RIS Services for Improving the Integration of Inland Waterway Transports into Intermodal Chains (RISING)* – wherein Republic of Serbia’s Directorate for Inland Waterways is the member of the consortium undertaking the project,
- *Transport EU-Western Balkan Network for Training, Support and Promotion of Cooperation in FP7 research activities (TransBonus)* – wherein University of Kragujevac – Faculty of Mechanical Engineering in Kraljevo is the member of the consortium undertaking the project,
- *Public Transportation - Accessibility for All (PubTrans4all)* - wherein University of Belgrade – Faculty of Mechanical Engineering is the member of the consortium undertaking the project,
- *Supporting research on climate-friendly transport (REACT)* – the project wherein University of Belgrade – Faculty of Transport and Traffic Engineering is the member of the consortium undertaking the project, and
- *Support for realising new Member and Associate States’ potentials in transport research (TransNEW)* wherein University of Belgrade – Faculty of Mechanical Engineering is the member of the consortium undertaking the project.

Annex V. Principal results of recent Transport research projects in Serbia

Papers published in journals from the SCI list (journals belonging to transport-related categories).

Category/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
TRANSPORTATION								1	1	2
TRANSPORTATION SCIENCE & TECHNOLOGY	2	2	1	2	2		1	1	9	20
TOTAL	2	2	1	2	2		1	2	10	22