



## SUMMARY

The project *Strategy for planning, development and implementation of ITS on the roads of the Republic of Serbia in the function of road safety* (hereinafter referred to as the Strategy) has defined the following: the concept of intelligent transport systems (ITS), strategic grounds for the introduction of ITS in the Republic of Serbia, mission and vision and goals of ITS development on the roads in the Republic of Serbia, action plan for the establishment of ITS and the way of tracking the Strategy performance. European and other international experiences relating to the creation of strategic documents, standards and ITS development and implementation have been analyzed. Basic ITS sub-systems and subjects have also been defined, including the national ITS organization ITS Serbia and the proposal for the improvement of programs of academic institutions of the Republic of Serbia in the field of ITS.

The concept of the intelligent transport systems (ITS) represents a system of measures and technologies applied in the transport system uniting the informatics and telecommunication technology aiming at raising the level of road safety, more efficient traffic performance, with a smaller volume of congestions and a lower level of environmental pollution. In the world praxis, the synonym for intelligent transport systems is the term of the transport telematics. Since the implementation of ITS in the Republic of Serbia is at its beginning, it is necessary to decide on the implementation of a recognizable and internationally accepted term that should describe this field. The term that is more known and is market and user oriented is the term of intelligent transport systems. The important thing is that the acronym for intelligent transport systems in both Serbian and English languages is the same, so any confusion when using it has been avoided.

There are two ways in which to improve road safety through ITS – by using systems that have direct or indirect impact on safety. Examples of direct systems are: accident detection, warning systems (using variable message signs), offence detection, electronic permits, black boxes in vehicles, variable speed limits and intelligent adjustment of speed. Examples of indirect systems are those changing exposure to traffic or mode of transport, electronic fee collection systems, systems prioritizing public transport.

In the most general sense, ITS must ensure improvement of road safety levels by influencing the following:

- Reduction of traffic exposure and traffic risks;
- Reduction of risk of accidents and
- Reduction of consequences of accidents that already happened;

Within the project of the Strategy, the examples of best practices from all over the world have been also analyzed, particularly those relating to the planning, development and implementation of ITS. Special focus has been on ITS implementation in the EU countries and transition countries, since these are the examples relevant for ITS development in the Republic of Serbia. Experiences of the EU countries, strategic documents and standards and experiences from the



non-European countries, such as the USA, Canada, Japan and Australia have been also analyzed.

In order to define the mission and vision and goals of ITS development in the Republic of Serbia, the strategic grounds and legislation in force in the Republic of Serbia have also been subjected to analysis, accompanied by numbered ITS projects and a SWOT analysis made for that purpose.

The mission of ITS development is:

- To provide conditions for a safe, efficient, reliable and environmentally friendly road transport system through planning, development and integrated implementation of intelligent transportation systems;
- To raise awareness of the public, and in particular decision makers, about the benefits resulting from the implementation of intelligent transportation systems;
- To enable optimal integration of road transport into the transport system of the Republic of Serbia by implementing ITS;
- To enable faster integration of the transport network of the Republic of Serbia into the Trans-European transport network;
- To enable considerably larger volume of exchange of passengers, goods and information within and throughout the transport network of the Republic of Serbia;
- To enable Serbian corporate and scientific institutions to extend their competitiveness in the South-East of Europe and farther, in the field of research, development and implementation of ITS;
- To establish and provide the institutions and corporate societies of the Republic of Serbia with guidelines for the development and implementation of intelligent transportation systems, within the state road network;

The vision of ITS development:

- Design, usage and management of transport systems by means of intelligent transportation systems allow for any mode of traffic to reach any community in the country, in an adequate, safe, reliable and efficient way, at any time during the year;
- Decision makers in public and private sectors have accepted the fact that development and implementation of intelligent transportation systems is one of the fundamental measures for the achievement of goals set by the strategy of transport development;



The postulates and principles of the Strategy are the guiding lights for the definition of goals that should be achieved by the Strategy, including the fields to be defined that would remain actual even after the defined time frame of the Strategy has elapsed. The postulates and principles represent the basis for the coordination at all the levels of state subjects participating in planning, development and implementation of ITS. For other ITS subjects, these postulates should represent guidelines and orientation in which direction ITS development will go. Basic postulates to be fulfilled by ITS development and implementation in the Republic of Serbia include:

- Safety and security;
- Economics (effectiveness and efficiency);
- Mobility/availability;
- Protection of environment/energy efficiency and\
- Reliability and quality of services.

On the basis of development principles, the goals of the Strategy and activities by means of which these goals can be achieved have been defined. Activities are grouped by goals, although majority of activities contribute to the fulfillment of a larger number of goals.

The action plan for the establishment of the Strategy defines the strategic and legal bases for the performance of the Strategy, instruments for ITS implementation, activities and ITS services that should be implemented and a type project proposal form for the implementation of ITS applications.

Definition of goals and activities need constant tracking through relevant indicators showing the level of realization of activities. Since ITS development is a very propulsive branch, and the Republic of Serbia is at the very beginning of the process of implementation of ITS applications, there might be some big changes in the proposed technologies and procedures for the realization of certain activities. In case the EU integrations have been speeded up and a part of the primary road network re-categorized into the TEN network, and given new branches of industry and science, as well as the number of enterprises dealing with ITS development and applications in the Republic of Serbia and the establishment of an efficient mechanism for tracking of the transport strategy have experienced fast development, then it will be necessary to make the mid-term review of goals and activities of the Strategy.

Considering the national level, the mid-term review of the Strategy, accompanied by the proposal of measures, till the end of 2012, should be made by the Ministry in charge of traffic, and for the network of state roads – by the Public Enterprise “Roads of Serbia”. Thus the realization of the Strategy and the tracking of achieving its goals would have been analyzed, and if deemed necessary, the goals and activities of the Strategy re-defined.

The Strategy will be the basis for the establishment of the general (master) plan for development of intelligent transport systems that would have to precisely define the architecture of the system and the organizational structure of the national ITS.



The chapter under the title The Architecture of ITS of the Republic of Serbia brings the definition of the main ITS sub-systems, models of ITS architecture being most appropriate for the Republic of Serbia, subjects involved in ITS development and implementation, ITS functions and benefits resulting from the introduction of ITS. The architectures of the USA and Japan, as well as the European project FRAME and the ISO system architecture have been described. Following the best world practical solutions, a proposal for the system architecture in the Republic of Serbia has been made and described a few ITS applications that should be a part of ITS in the Republic of Serbia.

National ITS organizations have an important role in the promotion of research and implementation of ITS. In order to define the mission, vision and tasks of the national ITS organization, several European and other national ITS organizations world-wide have been subject to analysis. ITS Serbia has been proposed to be a non-profit making organization, gathering all the subjects involved in promotion, research, development and design of ITS, with the basic mission of raising awareness of decision makers and the public in Serbia of advantages resulting from the implementation of modern transport technologies. The goals to be fulfilled by ITS Serbia include:

- Creating a sustainable transport system in the Republic of Serbia, by promoting the use of ITS;
- Raising public awareness of benefits from the use of ITS;
- Promoting implementation of best practices from the countries with developed ITS applications;
- Monitoring the market of ITS goods and services;
- Connecting industry and science, networking of all stakeholders within the development and implementation of ITS applications;
- Cooperating with similar organizations, especially those related to the projects of mutual interest and of regional character (Corridors X and VII, CEETO, ...);
- Providing continual education in the field of ITS;

Having in mind the intensive development of ITS and their wide implementation, the leading researchers from the field of transport around the world encounter almost every day the challenges of the improvement and design of new ITS functions. As a result, there is an increase in number of required engineers, planners and designers possessing knowledge from this field, in order to satisfy the needs for human resources in such an extremely dynamically growing market, where, on the other hand, these human resources should represent a basis for the creation of the scientific base and development of ITS in the future. The Strategy has also defined the proposal for improving the program of academic institutions in the field of ITS in the Republic of Serbia. .