



Czech ITS 2020 vision

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ABSTRACT

Transport telematics (ITS - Intelligent Transport Systems) deals with application of information and communication technologies with the aim of enhancing traffic performance, economies, efficiency, safety, ecology and comfort of transport. ITS basic functions applicable to all modes of transport include a.o. traffic control and management, intelligent vehicles, electronic fee collection, management of rescue systems, management of public mass transportation, route planning, provisioning of traffic information, fleet management and logistics of freight transport. Developing the tradition of science, research and the existing industrial basis, the Czech transport telematics sector is one of those most advanced in Europe. Nevertheless, the present scope of ITS implementation in the Czech Republic is relatively low, and the social climate and regulatory environment related to ITS aren't at a sufficient high level either. Therefore, the Association for Transport Telematics (SDT, ITS&S) is coming up with an initiative called ITS 2020 Vision, trying to formulate crucial directions of development and implementation of transport telematics in the Czech Republic until 2020, identify the main obstacles to the development and propose the methods of how to remove them.

KEYWORDS: Development of transport telematics in the Czech Republic until 2020

1. Introduction

Transport telematics (ITS - Intelligent Transport Systems) deals with application of information and communication technologies with the aim of enhancing traffic performance, economies, efficiency, safety, ecology and comfort of transport. ITS basic functions applicable to all modes of transport include a.o. traffic control and management, intelligent vehicles, electronic fee collection, management of rescue systems, management of public mass transportation, route planning, provisioning of traffic information, fleet management and logistics of freight transport. Developing the tradition of science, research and the existing industrial basis, the Czech transport telematics sector is one of those most advanced in Europe. Nevertheless, the present scope of ITS implementation in the Czech Republic is relatively low, and the social climate and regulatory environment related to ITS aren't at a sufficient high level either. Therefore,

the Association for Transport Telematics (SDT, ITS&S) is coming up with an initiative called ITS 2020 Vision, trying to formulate crucial directions of development and implementation of transport telematics in the Czech Republic until 2020, identify the main obstacles to the development and propose the methods of how to remove them.

2. ITS potential

The significance of transport telematics for the Czech economy will rise. Competitiveness of our country, with traditional industrial production and strategic position in the centre of the European continent, will directly depend on throughput of transport systems, especially road and rail infrastructure, and quality of related services enabling efficient and economical freight and passenger transport. In the near future, the Czech Republic will, however, face significant cuts in funding and impossibility to carry on

increasing the traffic network density. ITS technologies and services will thus become the main tool for sustainable development of transport systems, enabling more intensive use of transport infrastructure, fair imposition of fees for its use, incorporation (internalization) of social (external) costs of transport, enhancement of safety and reduction of environmental impacts.

3. Conditions for ITS development

3.1 Need for a long-term strategy

Efficient implementation of ITS in the Czech Republic requires the existence of a long-term strategy, which must be an integral part of the Transport Policy of the Czech Republic. This is the only way of how to achieve the maximum return on investment in the new transport-telematics infrastructure. The present state is unfortunately such that there is no such strategy. ITS&S will therefore instigate the elaboration of the Strategy of ITS Development in 2010 – 2020 for all modes of transport and will use efforts towards adoption of this strategy by the Government of the Czech Republic.

3.2 Standardisation and certification

At the moment, the ITS sector in the Czech Republic is undergoing a process of adoption of CEN and ISO standards. A topical problem is however how to implement these standards into practice within the framework of the undertaken projects. For this purpose, the ITS&S demands that the tender documentation for all public contracts executed both at the state level and at the regional level should contain the requirement for adherence to specific valid norms and standards. In connection with ITS development, it is also turning out that what is needed to guarantee the features, interfaces and interoperability of telematic services are complete new norms and standards. The ITS&S therefore supports establishment of a new departmental coordination activity for introduction of new standards.

The EU Directive on implementation of ITS in road transport will require also the performance of certification of ITS systems and services. The ITS&S therefore supports the establishment of independent institutions responsible for certification of ITS systems and services. This will ensure a high standard of telematic systems, competitiveness of Czech suppliers, compliance with the requirements of the EU Directive and harmonisation with the systems of the other Member States. With the aim of ensuring a high

professional and technical level of designing and delivering telematic systems, the ITS&S will strive for establishment of the institute of an authorised person in the sector of transport telematics.

3.3 Public procurement

The present approach to public procurement in the Czech Republic is unsatisfactory in the ITS sector. In many cases, the delivery of ITS technologies and services is an integral part of construction work. It results in combination of two totally different pieces of work: the technologically advanced delivery of ITS with a high value added forms only a fraction of the whole investment and becomes a secondary part of the work in which the construction part prevails. This leads to undervaluation of the ITS importance, unjustified pressure on prices of ITS deliveries and occurrence of opportunities for business speculations of higher suppliers. The ITS&S will therefore strive for separation of deliveries of ITS technologies from deliveries of the construction work itself and for definition of the basic rules for price and quality of the technical part of the tender documentation.

4. Scenario of ITS development

4.1 Road transport

A high proportion of transport of passengers and freight runs over the network of roads. Besides enhancing efficiency of infrastructure use, telematic applications also have a positive impact on reduction of externalities (enhancement of traffic fluency and safety, reduction of travel times, reduction of fuel consumption and air pollution). The ITS&S therefore supports systematic and purpose deployment of ITS especially in the following fields:

- development of systems for traffic data collection and traffic data provisioning to drivers with the emphasize on the capacity of such systems to provide relevant and up-to-date data,
- development of systems for “line” traffic management in vulnerable sections of cities rings and access roads (expressways),
- development of cooperative on-board systems for on-line sharing of important information among drivers/vehicles and intelligent infrastructure,
- implementation of electronic fee (payments) collection systems as a tool for fair imposition of toll on road network for the purpose of collection of financial funds or for traffic regulation and traffic “calming” down.

The ITS&S demands that the particular development of individual systems should comply with the approved (and yet non-existing) strategy of ITS development in the Czech Republic, see Section 3.1 above.

4.2 Road toll

The road infrastructure in the Czech Republic traditionally financed from taxes. In the last years, the massive development of motorway network is financed also from EU Funds and from privatisation yields; another source of finance is starting to be also the EFC system (expected income in 2007 – 2016 is 3,2 billions EUR, total operational and investment cost shall be 0,7 billion EUR, investment cost has already been paid by end of 2010).. So through ITS, it is possible to provide efficient and fair collection of toll on road infrastructure, taking into account the scope of use of roads and motorways by particular users. Further development of toll collection system of the Czech Republic must be in the first place cost-effective and must support the objectives of the transport policy of the Czech Republic and the EU.

4.3 City transport

The transport in cities must be perceived as a comprehensive system integrating individual road transport by motor vehicles, mass road transport and transport by non-motor vehicles. The ITS&S places a big emphasis on development of telematic applications leading to creation of a comprehensive well-working city system, not as an isolated solution, but with links to roads systems behind the city borders.

What is by the ITS&S regarded as a priority is creation of efficient traffic-information systems of cities, integrated in the municipal/regional traffic centre (systems of collection of traffic and meteorological information, video-surveillance, tunnels control systems, provision of information to drivers with variable traffic signs, etc.). Application of such comprehensive telematic city systems will be pushed through by the ITS&S not only in big cities but also in all towns with current traffic problems. What is also important is the connection of city centres with regional and national traffic-information centres.

For traffic regulation and calming, the ITS&S's priority will be to develop systems for traffic safety, especially systems warning the drivers of speeding in dangerous places, automated records of red light running, especially in dangerous places with a high rate of traffic accidents and in proximity of schools. Systems recommended with the aim of traffic regulation in city centres and cores of cities will enable effective regulation of unsolicited (and non wanted) road transport and reduction of traffic jams

and air pollution. Discussion will be led about regulation systems based on tolled entries or tolled stays of vehicles in tolled areas with an efficient parking policy focused not only on regulation of surface parking, but also controlled and systematic development of mass underground garages with efficient systems of automated navigation of vehicles to the parking lot by variable traffic signs.

4.4 Economy of city toll collection systems

As mentioned above, city toll collection systems are intended especially for city traffic regulation. Although a precondition for existence of a city toll collection system is the cost efficiency (costs lower than revenues), the main aim is the motivation to use the ecological city public mass transportation. By introduction of a fee for entry into the city centre, the costs of car use then incorporate also the social costs of noise, pollution or consequences of accidents - so the costs not included in market prices of vehicles or fuels. Revenues from city toll collection systems can then be invested in development of public mass city transportation.

4.5 Public transport

Public transportation is a pillar of passenger transport and together with development of infrastructure, ITS applications and use of rail transport capacities represents the main potential of optimisation. Within the framework of a transport system, the public transportation has to play a more important role than the mode of transport only for those who for financial or other reasons have no other choice. A topical task is to achieve a higher attractiveness from the viewpoint of public transportation users - passengers, a.o. through telematic tools, providing on-line availability of information about connecting lines, comfortable purchase and validation of tickets in vehicles. An attractive public transportation must also mean a network system covering the whole area and interconnecting all modes of transport not only in terms of a system of connecting lines, but also in terms of fare collection and acceptance of travel documents (tickets) all over the Czech Republic. Although the latest ITS technologies enable to carry out the concept of the "interoperable electronic ticket", the national interoperability has not been provided yet. The main problem is now the adoption of regulatory measures, which would demand the national interoperability over already implemented regional electronic ticketing systems, system of the Czech Rail company and the system of the capital city of Prague. The ITS&S therefore proposes to create conditions for implementation and operation of a united national centre for interoperability and clearing in public transportation.

4.6 Traffic safety, economy and ecology

The maximum possible safety of transport must become the priority of the whole society. According to successful implementation of regulatory, preventive, repressive and technical measures, it is easily possible to assess and compare the social and economic maturity of European countries. For many years, intelligent transport systems have already enabling to implement the systems of automated emergency calls (E-Call), monitoring of dangerous freights, weighing trucks in motion or the system of monitoring of transported animals life conditions quality. The main obstacle to the development is again the nonexistence of regulatory measures - adopted at the EU level for provision of international interoperability - which would define and enforce the practical implementation of these systems. The ITS&S will therefore strive, within the framework of intensive communication with representatives of state administration, for progress at elaboration of regulatory measures ordering ITS introduction for enhancement of traffic safety.

A topic of its own is the issue of use of transport telematics for reduction of impact of traffic on environment. The environment is directly influenced by traffic especially by car engines emissions, generation of CO₂, dust particles and noise. Intelligent transport systems, like in the field of safety, can significantly contribute to reduction of environmental impacts (traffic calming, shorter travel times, lower fuel consumption). The main problem is however the methodology and calculation of social costs / savings associated with environmental impact of traffic/ implementation of ITS. The ITS&S warns in this connection against rash use of often published untrustworthy data with reference to a "guarantees source" from the EU. At present, the Czech Republic does not have any comprehensive trustworthy data available, which poses a limitation for implementation of transport-telematics solutions financed from public funds (as it is difficult to prove the return on investment). The ITS&S will therefore instigate a comprehensive R+D project to be undertaken in this field.

4.7 Railway transport

Application of information and communication technologies in railway transport has a historical tradition given by high demands on traffic safety. Therefore, the implemented standardization of processes, procedures and certification in railway transport will be a practical guide for how to undertake similar processes in road transport.

ITS&S supports state ownership of the "rail-way" infrastructure and equal access to provision of services on the railways. The railway administrator must be the owner and coordinator of use of railway infrastructure - accessible to a wide range of carriers. The present state of ITS makes this access possible. However, development of security systems on the railway in the Czech Republic will have to be coordinated with current European trends in united management of railway transport (systems ERTMS/ETCS, GSM-R).

Implementation of ITS in railway transport will lead to enhancement of safety and speed of trains. ITS implementation on regional tracks in the surrounding areas outside borders of big cities will make the integration of railway transport with urban transport more efficient. Extension of interoperable security systems from railway corridors to other railway tracks in the Czech Republic will enable the use of railway by new local and foreign carriers. ITS&S also proposes to finalise the solution of railway traffic management from two centres in the Czech Republic: from Píerov and from Prague.

4.8 Space technologies

Space technologies, especially global navigation systems, enable to carry out a lot of advanced telematic services. The ITS&S therefore supports the EC ambitions at construction of an own independent space infrastructure -EGNOS and Galileo systems - and welcomes EU decision to situate the seat of Galileo supervisory authority in Prague. Czech Republic is a member of European Space Agency. A higher precision, integrity, continuity or availability of the satellite navigation signal of GPS and/or Galileo will enable to extend the ITS applications, using the information about position of vehicles, persons or freight, to new sectors such as air traffic control or signalisation in rail transport. ITS&S will strive within the framework of the Czech initiative Galileo User Forum together with Ministry of Transport of the CZ to push through the Czech industry, science and research as a European initiator of development of applications based on Galileo and GNSS systems.

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