USAGE OF TELEMATICS SYSTEMS IN PUBLIC TRANSPORT

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Summary: The long term objective in the field of urban mobility is an effort to prioritize public transport before individual transport. One option to fulfill this goal is to increase the attractiveness of public transport from the perspective of their users - passengers. Existing passengers can keep improving service quality in public transport. Means of improving quality in public transport are now telematics systems, which offer passengers a range of services.

Key words: Telematics systems, Public Transport, Urban Mobility

INTRODUCTION

Transport Research Centre (CDV) for financial support Technology Agency of the CR is an investigator of the project - Telematics systems in the public transport. The project is designed jointly by the company APEX, CHAPS, Technical University of Ostrava - Institute of Transport, SILMOS and KORDIS. The aim of the project is the development of telematics systems in relation to increasing the attractiveness and efficiency of public transport.

1. PREVIOUS SOLUTIONS

The development of telematics systems in public transport is very heterogeneous. In integrated systems of individual cities use different autonomous systems that operate by different carriers, organizers or administrators of an integrated transport system.

The appropriate level of typing equipment can prevent the uncoordinated spread of systems. The greatest emphasis should be placed on the mutual compatibility of systems. Telematics in public transport has been several times in the past dealt with in the research project of the Ministry of Transport. It is therefore to describe already existing systems but a more sophisticated look for new solutions based on the already available knowledge and operating systems.

Nowadays, traffic telematics holds a very important role. In the near future its importance will increase even more. The greatest importance will be telematics systems currently in the sustainable development of transport. The Czech Republic is its strategic location, an important transport line in centre of Europe. The competitiveness of Czech Republic in many sectors is directly dependent on the density and quality of road infrastructure and quality of related services for efficient transport of goods and people.

These services that increase the efficiency of transport providing in a large extent telematics systems. Considering the fact that funds for construction and modernization of

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existing road infrastructure are limited today thanks to the ending support from EU structural funds it appears the path of development through telematics systems as the most logical option.

2. DESCRIPTION OF THE SOLUTION OF INDIVIDUAL SUBSYSTEMS

2.1 Preference in public transport

The aim is to analyze the preference of public transport in the Czech Republic and the EU. Attention will be paid to individual integrated transport systems, carriers and organizers of public transport. After the analysis is the comparison of individual subjects in relation to the preference of public transport. Will the proposed unified approach and system architecture to implement these systems into practice. Design of these systems should take into account the financial requirements according to the introduction of technology. The proposal will be given to those technologies which would not be interference with the existing infrastructure.

The next procedure we consider a system preference options in smaller towns where preferences were not addressed. The result will be a proposal preference for smaller towns, including a feasibility study and design of financial analysis the proposed solution was available. Examples of solution preference of public transport are shown in Figure 1 and Figure 4 (TIC- traffic information centre).

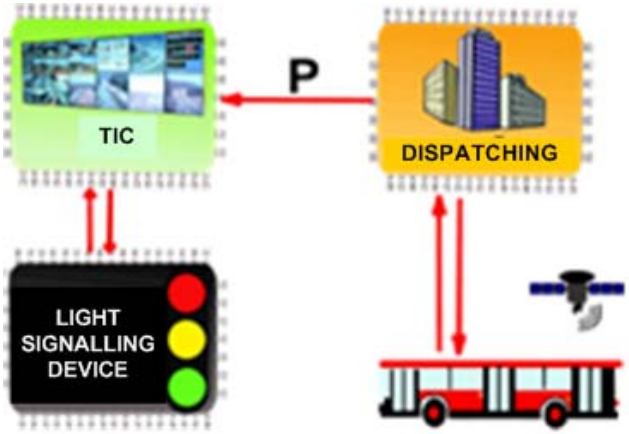

Fig. 1 – Option 1- Centralized system of preference of public transport

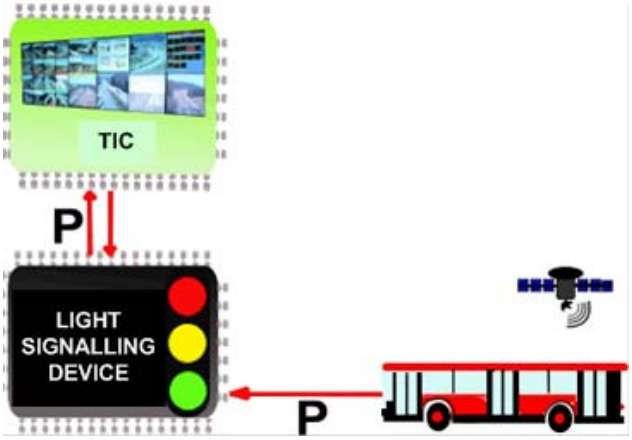

Fig. 2 – Option 2A- Local system of preferences of public transport to receive information

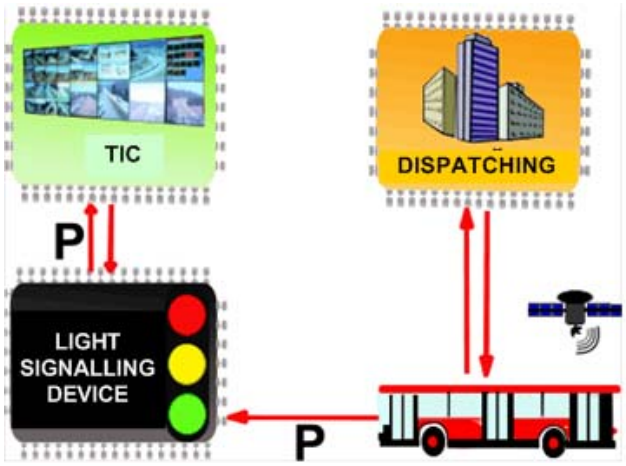

Fig. 3 – Option 2B- Local system of preferences of public transport - full use of dispatching

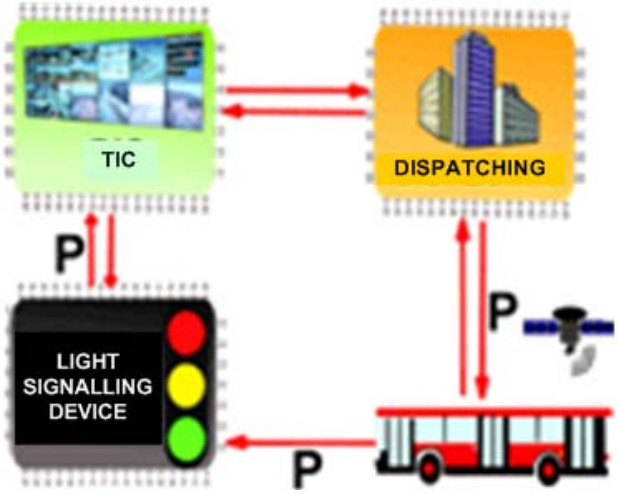

Fig. 4 – Option 2C - Local system of preferences of public transport - communication between entities

2.2 Identification of fixed objects in public transport

Prerequisite for model and simulation of critical situations in traffic is the existence of dynamic data to inform about the processes that take place in transport. The aim of this stage is to develop a methodology for locating fixed points. We need to analyze how effectively can use this data. Part of it will also create a database of fixed points located in the selected city.

This will create a feasibility study which will also contain information on the proposal for possible legislative support of localization of objects. This step will prevent the investigation procedures and techniques used in the targeting of fixed objects for some integrated transport systems and operators.

Set of static information in combination with dynamic information (vehicle detection) enable the creation of an extensive information system. This information can then be used for modelling and simulating situations with which we can more effectively manage traffic (vehicle preferences) and prevent crisis situations (congestion). Important parts of the information system are upgrades and maintenance of these data.

In terms of localization is meant locating the exact position in space using GPS. These data are of great benefit to all stakeholders and can be used in many ways. One option is to use these data for modelling traffic situations that may occur in transport.

An important aspect of development in this area is to update the localized points in traffic when changing their position. It will be necessary to support the legislation in this area, which will be binding for the stakeholders. Database localized points has a large secondary benefit. These data can also be used within an already solved preference of public transport or tariff system optimization.

The proposed solution will be in direct relation to the prCEN ISO TS 28701- Road traffic and transport telematics - Public transport- Identification of fixed objects in public transport. This document (prCEN/TS 28701) has been prepared by Technical Committee CEN/TC 278 Road transport and traffic telematics. This document defines a model and principles for the main stationary objects related to the accessibility of public transport (e.g. stops, stop area, railway station, transfer nodes, inputs etc.).

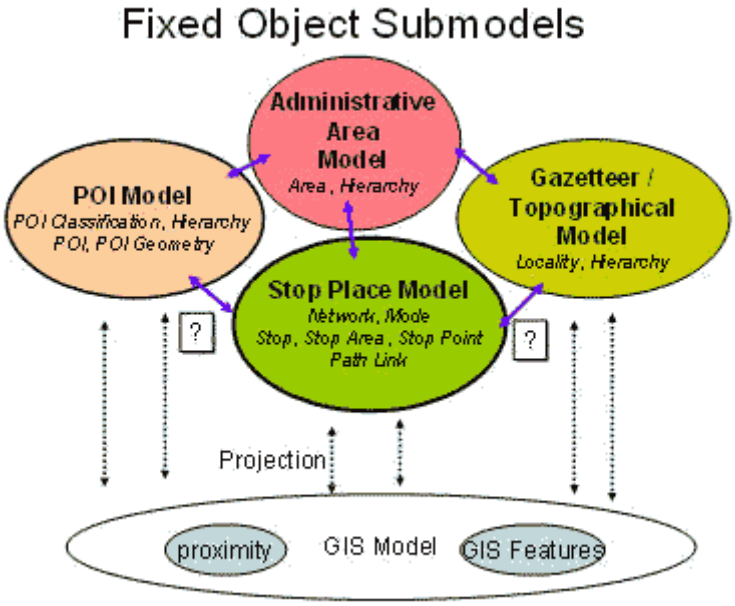

Fig. 5 – Fixed Object Submodels (2)

2.3 Modern methods of check-in in public transport

This stage involves an analysis of passenger check-in technology, analysis check-in systems implementation and evaluation of the suitability of the selected technologies in the framework of integrated transport systems. Individual designs of modern technological solutions will be based on trends in this field exist and these trends will subsequently develop.

Methodology will be designed for the client system and for its operators. Methodology for the client will include the award of tenders, evaluation of the best system on the basis of the results of questionnaires to passengers, socio-economic impact of the selected system. Methodology for the operator will include an evaluation of the effectiveness of the solution in the form of a questionnaire survey with the results found quality of system.

2.4 Data protection in public transport

Threat analysis will be processed in the handling of confidential information across all systems in public transport (anonymisation of data, protection of electronic purses, etc.) Subsequently, will be the proposed ways to prevent these threats, whether using technical measures or systemic changes.

The proposed solution will comply with the applicable legislation of the CR and the EU:

- Law on Personal Data Protection 101/2001 Coll.,
- Convention for the Protection of Individuals with Regard to Automatic Processing of Personal Data CETS No.108.

Generally, it may be data protection issues to structure the following main areas:

- Ensuring privacy,
- Ensuring confidentiality ,
- Ensuring the integrity,
- Ensuring access to services,
- Limit the possibility of abuse ,
- Identification of problems
- Ensuring safety,
- Ensuring the credibility of the system.

3. POSSIBILITIES USAGE OF TELEMATICS SYSTEMS IN PUBLIC TRANSPORT VEHICLES

The figure 6 shows the telematics systems equipment of public transport vehicle. Equipment can be in two variants - on the basic level of standard and optional levels. It depending on the requirements of the customer service and supply carriers.

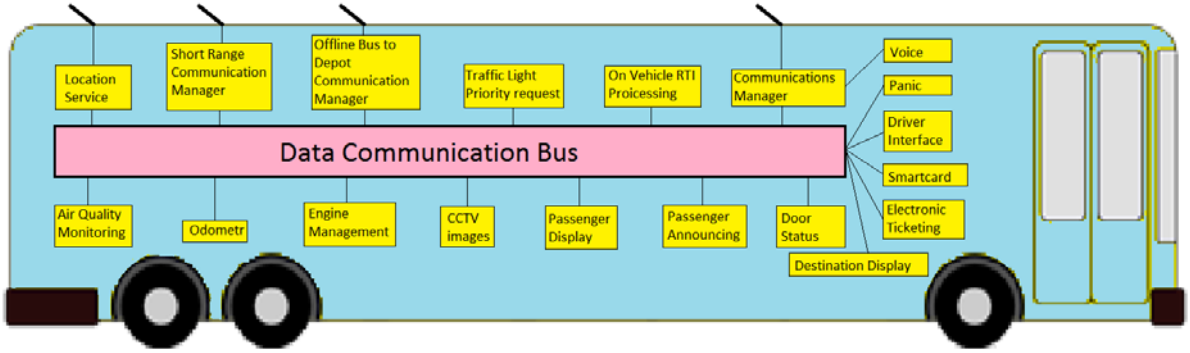

Fig. 6 – Telematics systems equipment of public transport vehicle

CONCLUSION

Telematics systems are a tool to facilitate improved services for passengers while providing a greater awareness and safety. The project - Telematics systems in the public transport is designed first year and the results of pilot testing will then be published. It is expected that the results of the project will enhance current systems for innovative solutions and that the proposed methodology and feasibility studies to facilitate their eventual implementation.

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