

RITS-Net

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RITS-net

Regions for Intelligent Transport Solutions



European Union

European Regional Development Fund

Short presentation of the region

Administrative data:

RITS-Net Target region: Pleven Municipality, Pleven District, Northwestern planning region

➤ **Pleven District:**

- 11 municipalities and 269 752 inhabitants.

➤ **Pleven Municipality:**

- 812, 98 km²;
- 25 settlements (2 towns and 23 villages);
- 131 152 inhabitants.

➤ **The town of Pleven** - regional and municipal administrative, economic, transport, cultural, educational, health and tourist center

- 85, 09 km²
- 106 954 inhabitants



Transport challenges

In the Region, the citizens of Pleven and the transport system for urban mobility face the severest pressure of the dynamic transport development, the increasing necessity of it and especially its negative influence over the environment and the life quality.

The main problems of the urban mobility in the city of Pleven can be summarized as follows:

- Increasing number of private vehicles;
- Insufficient transport infrastructure and urban electrical transport network;
- The use of public transport is low (21,4%);
- Physically and technologically outdated public fleet;
- Poor organization of the public traffic and lack of coordination between the main users of the road network;
- Disturbing low level of road safety and security, especially for the vulnerable road users;
- Increased release of harmful emissions into the environment and excessive noise pollution;
- Insufficient pedestrian and cycling infrastructure;
- Low level of ITS in the transport services;
- Understated quality of public transport services.

Following the outlined above problems, the main challenge in front of the urban mobility in Pleven is the lack of an integrated policy and plan of urban mobility with focus on increasing the use of public transport.

Transport Priority Measures

The Municipality of Pleven has a plan developed on the sustainable urban transport, but it weakly concerns the participation of ITS. Therefore within the project RITS-Net were developed standardized questionnaires. After the "priority-risk" analysis carried out of the results of the questionnaires, came to the fore ITS tools which are of high priority for the Region. They have key functions for the traffic and the transport, whose development and maintenance are of the highest strategic importance for the community in Pleven. Evaluations on their deployment and full integration in the transport system of Pleven categorize them with high priority and they can be summarized as follows:

1. ITS instruments of high priority and low risk. Generally they are related to the following:

- Emergency and accidents management services
- ITS for traffic and mobility management
- Parking and automatic payments
- User information
- Public transport management

2. ITS instruments of high priority and high risk: Most of these ITS instruments belong to the topic on user information and are mainly related to the improvement of information services on the public transport of the passengers like by dynamic user information, smart bus stops and a platform for multimodal travels.

Following the overall and comprehensive analysis, there were outlined the following main ITS priorities for the development of sustainable transport in the city of Pleven:

- Public transport management and automatic payments
- Traffic management
- User information
- Management of parking and automatic payments
- Emergencies management and accidents

Main ITS applications in Use

On the territory of the city of Pleven are partly implemented:



- **Video surveillance system** – a peripheral network of high-tech digital cameras is built on four key intersections in the city. Points for overall video surveillance are created. They are connected by wireless telecommunication connection to the operations center, located in the building of Municipality of Pleven. At one of the busiest intersections, the system is equipped with terminal devices for recognizing the license plates of the vehicles, enabling the surveillance and the collection of traffic data, vehicles tracking, shooting incidents and violators of the traffic rules.



- **SMS payment for parking** – It is used the system TERACOMM MPS SMS, implemented in the city of Pleven for charging and control of parking in the "Blue Zone" - May 7th, 2013 with a contractor: Tera Communications SA for Bulgaria. The system has three main features: self-charging per one-hour stay in the "Blue zone", parking control and administration. The technological solution provides an integrated communication environment between drivers, public parking operator (Call-center, controllers and unit for repatriation), SMS-centers of mobile operators and payment systems between all of the operators. Payment shall be made by the drivers through sending SMS with predefined content to a single number without a code for all of the mobile operators.

Main ITS applications in Use

In the city of Pleven are already in operation 40 new trolleybuses Skoda 26Tr Solaris as there is a trend gradually trolley fleet to reach 90 trolleybuses. They are equipped with AVL system, information system, video surveillance, visual and voice notification about the stops in the vehicles.

Mobile device with 3G environment, mounted on the dashboards of the trolleys drivers, will maintain a real time connection to the central dispatch system, tracking the implementation of the schedules of trolleys, the route set down and possible delays in time. The new solution also allowed through embedded in the tablet NFC technology to be identified in real time who is the driver of each vehicle which is in motion.

Furthermore each client of "Trolley Transport" Ltd. - Pleven, can in real time make reference on his/her smart phone and to be informed about the current schedule of trolleys. The pilot project provides the opportunity each passenger to use unlimited and free Wi-Fi. The service is funded by the Municipality of Pleven.



ITS for future implementation

Defined key objectives and main instruments determine the strategic field of action for the full use of ITS technologies in the local transport system. The Action Plan proposes to implement the following set of ITS measures for the realization of basic ITS instruments which in maximum to support local actions taken for technological innovation:

1. Measures for public transport management and automatic payments

- E-ticketing system in MUPT in Pleven
- Automatic counting of the passengers in MUPT in Pleven.

2. Measures for traffic management and mobility

- Extension of ITS for traffic management in Pleven
- Extension of the system for video surveillance of the traffic in Pleven
- Monitoring of the air quality and noise pollutions
- Intelligent pedestrians walkways

3. Measures for providing user information

- Extension of the net of the intelligent stops of the public urban transport
- Platform for planning of multimodal travels

4. Measure for parking and automatic payments management

- Integrated electronic system for parking management

5. Measures for emergency and accidents management

- Unified system for security during the public travels
- Priority of the traffic lights for the emergency and accidents vehicles

Feasibility Study on the implementation and integration of electronic ticketing system for the passengers in the model for sustainable urban public transportation of the city of Pleven

The city of Pleven does not have any experience in using electronic ticketing systems. Currently used ticketing system in the city is conventional one, with conductors and it uses paper transport documents. However, in Pleven 40 new trolleybuses have been delivered and it has been initiated a project for a Management System which includes AVL system, visual and vocal notification on the territory of the bus stops and in the vehicles and building a Control center. The system will allow better control over the movement of public transport vehicles and it will provide prerequisites for the implementation of a unified electronic ticketing system in the city of Pleven

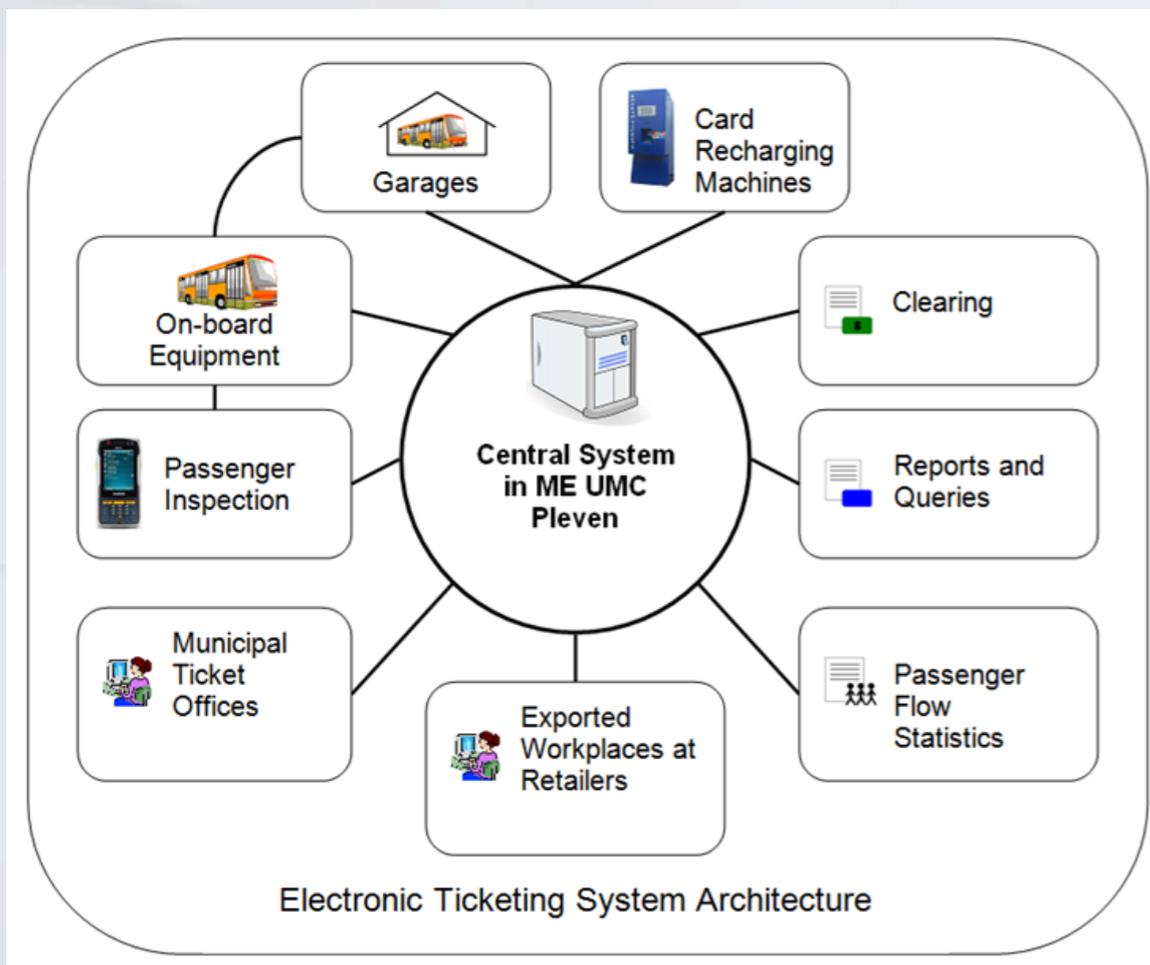
Feasibility study on the implementation and integration of e-ticketing system for passengers in the model for sustainable urban transport in the city of Pleven was realized with the financial support of project RITS-Net through the organizational collaboration between Association "Euroregion Pleven Olt" and Consulting company "Antima" Ltd., Sofia. It offers an intelligent solution to achieve an effective and sustainable improvement of the service "planning, chagrining and travel by urban public transport in the city of Pleven" by introducing a new - Electronic ticketing system.

The electronic system proposed is based on the electronic card Mifare®Classic. The system has a centralized structure and major subsystems and elements that interact with each other in real time and best meet the European standards for ITS in terms of systems for automated charging (AFC/Automated Fare Collection systems).

Proposal for System

The Electronic ticketing system proposed by us maintains:

- Centralized design with a unified database
- Centralized financial income
- Clearing system for distributing the income
- Introducing flexible timetables and promotional fares
- Using of unified electronic documents
- System for “check-in check-out” or “check-in” fare collection
- Using coded with a bar code paper tickets
- Line transfer of passengers without additional payment



- Receiving statistical data about the processes of purchase and validation of transportation documents registered by the respective technological devices
- Creating new opportunities for traffic optimization in the city of Pleven

The informational exchange between the on-board equipment and the Central system is implemented in two ways:

- ON-LINE: the information exchange is accomplished through a UMTS or GPRS while vehicle is in motion
- OFF-LINE: the information exchange is accomplished through a Wi-Fi and after that through UMTS or GPRS at certain points in the depots.

Transport documents

According to the proposed vision in the System the main transport documents are the contactless electronic cards which are charged with a "value" or a "prepaid period". Validators located in the transportation vehicles check the validity of the electronic cards and the validity of "prepaid period". If a charging for a luggage or a travel is necessary, then from the charged "value" on the card is taken such a value equal to the price of the desired transportation service. The electronic cards are available at the workplaces for issue, recharging and selling in municipal offices, workplaces in retailers and optionally at card recharging machines.

It is also proposed the use of coded bar code paper tickets for a single trip, which are sold only by vehicle drivers at unattractive prices.



Specification and financial assessment of the system elements

The proposal is that in all 90 vehicles of the public transport in Pleven it should be installed onboard computers with built GPS and GPRS and 2 Validators per vehicle. We envisage a delivery of 10 device sets for inspection of passengers, installation of 3 workplaces for issuing, personalization, sale and recharge of electronic traveling documents and 30 workplaces for recharging of electronic traveling documents. We envisage also technical equipment for data transfer of 2 depots and equipment – hardware, database and software for the Central system and 6 workplaces aimed for the back office. We consider the delivery and indoor mounting of 15 card recharging machines as an option.

The investment costs estimated by us may be between € 1,022,279 including VAT and € 1,712,707 including VAT. We recommend the variant where investment costs are reduced to € 1,057,915 including VAT.

The time horizon for implementation of electronic ticketing system is the period between 2016 and 2019.

Estimated results: Increased use of the urban transport > reduce of the individual travels by personal car > reduction of the traffic > improvement of the air quality and noise pollution.

Lessons Learnt

For Association "Euroregion Pleven Olt", RITS-Net partnership and the methodology contributed to obtaining basic picture on ITS and capacity development to promote their use and planning the actions for deployment in the region:

RITS-Net = ITS

Three most important lessons:

❖ The deployment of the ITS potential for achieving sustainability of the local transport policy requires the involvement of all of the stakeholders for coordinated and harmonized actions. A key factor for success is the agreement on common problems and understanding the ways that ITS offer to overcome them in the highest degree :

- The creation of Regional Working Group, as a platform to promote the ITS deployment in the region is a key lesson on the need for the organization of the stakeholders. The Working group agreed on the need for a study of the possibilities for the implementation of E-Ticketing system in urban public transport - operational necessity of the highest priority.

❖ Sharing experience and good practices for the development of individual ITS to fully integrated systems based on the interoperability and open standards is a practical lesson to encourage the development of action plan for a phased or full ITS deployment based on the transfer of good practices.

The examples for this are:

- Video-surveillance system for safety public transport in Craiova, Romania;
- Pedestrian Light Guard System (PLGS) - Intelligent light pedestrian crossing, Bulgaria.

❖ The preparation of good practices from the regions for the participation in thematic RITS-Net Workshops created the conditions for establishing new partnerships. An important lesson is they to be stored and further developed, because they can bring capacity and ideas for future development or multiplication of their experience in the region.

Thank you for your attention!

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