# CUMULATIVE INDEX

## *TRANSPORT and TELECOMMUNICATION, Volume 9, No 2, 2008 (Abstracts)*

**Alexander Krainyukov, Valery Kutev.** Results of Inverse Problem Solution for Radar Monitoring of Roadway Coverage, *Transport and Telecommunication*, Vol. 9, No 2, 2008, pp. 4–13.

This work has been focused on the development of approach to the inverse problem of subsurface radar sounding solution in frequency domain. We propose to use an Ultra Wide Band pulse radar combined with a line transmitter and receiver antennas.

Forward modelling is based on using of three-component mixing formula for estimation of soil electromagnetic properties in frequency domain, as well as on linear system response functions for the radar antenna system, and on the equations for wave propagation in a horizontally multi-layered medium representing the subsurface.

Model inversion, realized by numerically, uses results of forward modelling simulation in limited range of the soil electromagnetic properties changing. For realization of model inversion data the genetic algorithm of calculations has been chosen.

**Keywords:** radar, soil dielectric properties, radar monitoring, forward modelling, inverse modelling

**Eugene Kopytov, Vasilijs Demidovs, Natalia Petoukhova.** Application of Temporal Elements in the Railway Schedule Systems, *Transport and Telecommunication*, Vol. 9, No 2, 2008, pp. 14–23.

The paper deals with the issues of building a temporal database for the railway schedule. For the mathematical description of the railway schedule system, we suggest to use set theory and algebra of logics. We define the periodicity parameters and temporal elements and formulate the rules of their calculation. We also consider practical examples on defining the dates on which the set version of the train schedule becomes an actual subject.

**Keywords:** railway transportation, schedule, periodicity, temporal database, temporal element

**Gabriel Nowacki, Izabella Mitraszewska, Tomasz Kamiński.** The National Automatic Toll Collection System for the Republic of Poland, *Transport and Telecommunication*, Vol. 9, No 2, 2008, pp. 24–38.

The paper refers to some problems of worldwide applications in electronic toll collection systems for motorways and expressways. According to Directive 2004/52/EC, these systems should use one or more of the following technologies: satellite positioning, mobile communications using the GSM-GPRS standard (reference GSM TS 03.60/23.060) and 5, 8 GHz microwave technology. Authors have analysed the systems, which meet these requirements, especially the states as follows: The United States of America, Japan, Taiwan, Australia, Austria, Czech Republic, France, Norway and Germany. As a result of the analysis, it has turned out that only system using satellite positioning technology and mobile communications (GSM/GPRS) is the best toll solution of unique capabilities and this kind of technologically sophisticated system should be implemented in Poland. Author will present the initial structure of GSM/GPS based Toll Collection System for Poland. This type of system has many advantages. The first one is absence of the need for new road infrastructure (gantries); operators can keep using the existing infrastructure. System works without toll booths, extra lanes, speed restrictions or complex structures along toll roads. The second one is much greater flexibility in defining or changing payment by simply redefining the "virtual" toll areas. It means ability to adapt easily and quickly to changes in charge parameters (road classes, vehicle types, emission levels, times slots, etc.). The third advantage is the system's ability to support other value-added services on the same technology platform.

**Keywords:** Electronic Toll Collection (ECT), microwave technology, on-board unit (OBU)

**Vaira Gromule, Irina Yatskiv, Aleksandrs Medvedevs.** Investigation of Bus and Coach Service Quality on the Basis of Information System for Riga Coach Terminal, *Transport and Telecommunication*, Vol. 9, No 2, 2008, pp. 39–45.

The objective of the article is to analyse data about quality of bus and coach transportation in Latvia. Regional, intercity and international trips arriving in Riga Coach Terminal are examined. Determination and analysis of punctuality indices for different perators, on the different routes of buses, on day times and days of the week and for terminal as a whole may be a basis for a decision-making on quality improvement of passenger services. A solution of this task is an inalienable part of the quality system supported on a Coach Terminal and will serve as a basis for forming the passenger logistic hub on Riga Coach Terminal base.

**Keywords:** bus, information system, reliability, punctuality, descriptive characteristics, analysis

**Catherine Zhukovskaya.** A Simulation Model of Choosing an Air Flight by a Passenger, *Transport and Telecommunication*, Vol. 9, No 2, 2008, pp. 46–51.

The purpose of this research is as follows: creation of a passenger's behaviour model in choice of flight. For practical calculations the simulation approach has been used. Simulation has been carried out with MathCAD software.

**Keywords**: choice model, choice of flight, simulation approach