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Milena Bieniek

Service level in model of inventory location with stochastic demand

In this paper we consider the influence of the safety factor on the decision of the inventory location. This decision is done based on the model which centralizes or decentralizes the safety stock. In this model we have to choose between the location of the inventory in the regional warehouses or the location in the central warehouse. The decision is made due to the minimizing the holding costs and the supply costs of the safety stock from the central warehouse to the customer. The main assumption is that the customers have the stochastic demands on the inventory items. Moreover, the customers' demands have the known distribution with the known parameters. The complex analysis of the influences of possible probabilistic demands' distributions on the safety factors is conducted. The numerical computations for the safety factors used in the facility location model are also presented. In numerical examples we take into considerations the demands' distributions the most often used in practice like the normal, the Poisson, the Gamma and the exponential distribution. Some graphs for the safety factors of these distributions are also drawn. Moreover for the mentioned demands' distributions the model of the safety stock location depends on the specific factors. Among other things these factors are the mean and the variance of the demand, the number of the regional warehouses, the assumed service level, and some cost factors like the holding costs and the transportation costs. Some graphs which illustrated the dependence of the model elements on some listed before parameters are presented and their influence on the location decision is studied also.

Marianna Jacyna, Mariusz Wasiak, Konrad Lewczuk, Michał Kłodawski

Simulation model of transport system of Poland as a tool for developing sustainable transport

Paper presents features of simulation model of proecological transport system on the example of Poland. Model allows computational experimentation and inference on transport modal split and emission of pollution in national transport system. Particular elements of the model are characterized: transport networks for different modes, stock of vehicles, demand model for passenger and freight transport, and mechanism of material and passenger flows distribution into a network. Characteristics describing infrastructure, vehicles, and harmful compounds of exhaust gases are given. Model is implemented in PTV VISUM. Road and rail vehicles for passenger and freight transport are characterized and divided into groups according to types. The demand for transport services and emission of exhaust gases components are reflected in model of proecological transport system of Poland. The last part of paper presents exemplary results of research on estimating emission from transport activities.

Ewa Kardas-Cinal

Selected problems in railway vehicle dynamics related to running safety

The paper includes a short review of selected problems in railway vehicle-track system dynamics which are related to the running safety. Different criteria used in assessment of the running safety are presented according to the standards which are in force in Europe and other countries. Investigations of relevant dynamic phenomena, including the mechanism of railway vehicle derailment, and the resulting modifications of the running safety criteria are also discussed.

Agnieszka Merkisz-Guranowska, Jacek Pielecha

Passenger cars and heavy duty vehicles exhaust emissions under real driving condition

In the assumptions regarding to the transport policy both at the level of country and Europe there is the concept of sustainable development of transport. Warsaw University of Technology in cooperation with Poznan University of Technology performs research work concerning the shaping of environmentally friendly transport system – Project EMITRANSYS. In this project, one of the conditions is to reduce exhaust emissions by means of transport. The paper presents the reasons for the testing of the exhaust emissions under Real Driving Emissions testing (RDE). Research potential of Institute of Combustion Engines and Transport at Poznan University of Technology in the area of road testing of passenger and heavy-duty vehicles has been presented in the paper. Example test results have been shown in the aspect of the emission-related classification of vehicles.

Vladimir Selin, Fedor Larichkin, Valentina Novoseltceva

Economic development of the Russian arctic space by upgrading transport and logistics sector

The article characterizes the growing interest of the Arctic states and the world community to the development of the vast natural resources in the harsh environment of the Arctic, including the development of programs and the strategy, the importance of international cooperation, harmonization of legal framework of economic activities in the macro-region. The essential modernization and development of transport and logistics complex in the effective development of the Arctic zone is substantiated. A conceptual model for creating the modern transport and logistics complex applicable to Murmansk transport hub, the largest in the Russian Arctic, has been developed.

Emilian Szczepański, Ilona Jacyna-Gołda, Jakub Murawski

Genetic algorithms based approach for transshipment HUB location in urban areas

Points of distribution, sales or service are important elements of the supply chain. These are the final elements which are responsible for proper functioning of the whole cargo distribution process. Proper location of these points in the transport network is essential to ensure the effectiveness and reliability of the supply chain. The location of these points is very important also from the consumers point of view. In this paper developed method of points location was present on the example of urban transport network. The developed approach is based on the Vehicle Routing Problem in the multistage distribution systems. The proposed method uses a genetic algorithm. Article also presents a mathematical model of delivery cost as a criterion function. The article presents an example calculations which illustrating the operation of the developed method.

Andrzej Wolfenburg

New version of the BBS method and its usage for determining and scheduling vehicle routes

The work presents a method of the vehicle routing and scheduling using the modified Branch and Bound Simulation method for vehicles simultaneously carrying loads from multiple orders. Limitations concerning vehicle loads and time windows in pickup and delivery points are taken into consideration. The developed algorithm appoints the shortest, the fastest and the cheapest routes with a certain known accuracy. A modification of the BBS method is described A sample of result using Google API is shown.