Tomasz Ambroziak, Roland Jachimowski, Dariusz Pyza, Emilian Szczepański

Analysis of the traffic stream distribution in terms of identification of areas with the highest exhaust pollution

Transport is a sector that is said to be negatively affecting the environment. The continuous development of transport increases the negative impact on the environment and civilization. In the article authors present the parameters that were used to describe the size of harmful transport exhaust emissions, in particular by means of road transport and the factors affecting their size. The areas where the level of concentrations of air pollutants are exceeded in Poland were characterized and analysed. Also examples of the stream traffic distribution in the selected area of the transport network were presented.

Ilona Jacyna-Gołda, Żak Jolanta, Piotr Gołębiowski

Models of traffic flow distribution for various scenarios of the development of proecological transport system

The paper is a result of a research work concerning the development of an environmentally friendly transport system - Project EMITRANSYS. The publication contains the issues of shaping the transport system, where important factor due to the aspect of sustainable development is including the external costs in transport activity. This paper presents a mathematical model of the distribution of the traffic flow in the transport network. The paper presents selected aspects of the problem of multi-variant distribution of the traffic stream on the network transport for defined scenarios for the transport system development. Traffic distribution on the network has been made due to the criterion function − external cost connected with air pollution. The paper presents modal split of traffic ecological flow for chosen scenarios of the development domestic transport system.

Rafał Kucharski, Guido Gentile

Indirect observation of rerouting phenomena in traffic networks – case study of Warsaw bridges

In this paper we propose estimation procedure in which traffic flows resulting from rerouting model are matched with traffic flows observed during unexpected events. We show practical value of observing a entire cut-set of the transportation network and propose theoretical closed-form formulation of estimation problem for the rerouting model. We apply proposed framework on field-data from Warsaw bridges to observe rerouting phenomena. Most importantly we observed that: a) around 20% of affected traffic flow reroutes, b) rerouting flows are increasing in time, c) drivers show strategic capabilities, d) and maximize their

utility while rerouting. All of the which were hypothesized in Information Comply Model (Kucharski et. al., 2014) and are now supported with field observations.

Jerzy Merkisz, Marianna Jacyna, Agnieszka Merkisz-Guranowska, Jacek Pielecha

The parameters of passenger cars engine in terms of real drive emission test

This paper presents the preliminary concept research to develop the test used in the measurement of emissions in real traffic conditions for passenger vehicles. Work based on the lack of legal solutions for determining the environmental performance of light vehicles – as opposed to heavy-duty vehicles for which such regulations have specified. The elaboration is to compare the emission test used in clinical approval of passenger cars, while the synthesis of the results obtained under different conditions road tests. The intention is to develop a test for assessing the ecological vehicle in real traffic conditions, where restrictions will only drive type (gasoline engine, diesel engine, hybrid vehicle), which is consistent with the requirements of the certification tests. The result should be the foundation for the development of the test in terms of: the duration, to determine the operating conditions and vehicle and proposals for emission limit values.

Edward Michlowicz

Logistics waste utilization system in the steel plant

An important problem associated with the production of steel products is the need to ensure adequate protection of the environment. Throughout the technological foundry formed about 90 types of waste, while a significant number of them belongs to a group of hazardous waste. Resulting in the production system have a steel mill waste utility value to justify the economic and ecological use, not only in the steel sector but also in other sectors of the economy. There is a need to increase activities related to environmental waste management from manufacture of steel, particularly those whose development is one way of storage. The paper presents the concept of reverse logistics in the specific example of a steel mill a full production cycle and the overall costs generated within the waste management system of a full production cycle steel mill.

Tadeusz Niedziela

Automatic target recognition of complex internal structure

The paper presents methods of automatic target recognition from images with complex internal structure. Recognition methods proposed are based on the Fourier transform properties. These methods make it possible to bring the problem to Fourier transform, feature extraction and input image classification. Image data synthesis within diffraction plane significantly increases the probability of target detection.

Kamil Popiela, Mariusz Wasiak

Optimization of Unit Load formation taking into account the mass of packaging units

This article presents a mathematical formulation of the optimization problem of loading unit formation taking into account the mass of packaging units. Proposed model can be applied to optimize the arrangement of non-uniform cubical loading units in loading spaces. The model ensures possibility of defining various dimensions, masses, resistances of particular packaging units and their vertical axis rotation. Within the constraints of formulating optimization problem, taking into account masses and resistances ensures that all packaging units will rest on a pallet or on other packaging units, and the surface of contact between loading units guarantees stability of units arranged in subsequent layers. The mathematical model was verified. The paper provides an appropriate calculation example.