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Papers submitted for publishing in both Proceedings and Book of Abstracts were reviewed and accepted by the referees from the Congress International Programme Committee.

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The duty of the Editor was to select keynote, invited and other papers. The duty of the Technical Editor was to technically align all papers with the Guidelines as close as possible. The duty of the Publisher was to edit these Publications and to prepare them for printing.

JUMV expresses the most sincere appreciation to all authors for their effort to contribute to this publication.
ANALYSIS OF ENERGY EFFICIENCY AND COSTS OF SERVICE OF FULLY ELECTRIC BUSES IN BELGRADE PUBLIC TRANSPORT

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ABSTRACT

Information concerning development, including current projects, and present state of European market of fully electric buses is presented in this paper. Special attention was paid to test trial results from the energy efficiency point of view of an electric bus compared to the trolleybus and the diesel engine bus carried out along a given public transport line in the city of Belgrade. The obtained results serve for identifying the cost of spared energy, or fuel cost at annual level for all three of the above mentioned transportation subsystems. The research showed that energy cost in the case of full electric bus is lower than that realized with the trolleybus or the bus with diesel engine.

ENERGY-EFFICIENT DRIVING IN URBAN ENVIRONMENT BASED ON ADAPTIVE STOP&GO CRUISE CONTROL AND ITS IMPACT ON TRAFFIC FLOW AND EMISSION

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ABSTRACT

Energy-efficient driving followed by reduced exhaust emission and footprint, presents an attractive research field especially in the past decade. One way to obtain energy-efficient driving is to enhance the traffic flow and reduce the traffic congestion. Regarding this fact, serious steps have been taken in the Intelligent Transportation Systems (ITS) domain. All these efforts are pointed towards achieving lower driver workload, enhanced traffic flow, reduced congestion, fuel consumption and emission and improved safety. As a result, Several Advanced Driver Assistance Systems (ADAS) have been developed during this period and even introduced on the market. For an example, a Full Range Adaptive Cruise Control (ACC) is a system that integrates a conventional ACC system (for higher speeds) and Stop&Go system (for lower speeds) and leads towards enhanced traffic flow and safety.

Most of the papers in the subject field treat highway traffic. Despite those, the research presented in this paper is focused on urban traffic environment. The main characteristic of vehicles movement in urban traffic is intensive acceleration and deceleration, mainly because of no consistent traffic flow produced by the traffic lights. As a result the movement gets wavy effect, especially through urban intersections where this effect is intensified due to increased driver inattention, workload, weather and several side activities like SMS, CD and radio change, site seeing etc. In these conditions, intensive acceleration and deceleration lead towards increased fuel consumption and emission, decreased road capacity and flow, decreased driver concentration, and eventually decreased safety. This problem imposes the meaning of energy efficient driving in urban environment in a form of harmonized vehicle start and flow through intersections without unnecessary acceleration and deceleration. In order to obtain qualitative measures regarding the energy saving, the impact on the traffic flow, travel time, speed and exhaust emission, a virtual model of harmonized traffic stream is built in Matlab. The results from several simulations are compared with real traffic stream. The comparison shows that the harmonized traffic stream as a model of energy-efficient driving has significant positive influence on the fuel consumption and exhaust emission, and on urban traffic flow.

KEYWORDS: Adaptive Stop&Go Cruise Control system, virtual model, energy-efficient driving, harmonized traffic stream, real traffic stream, traffic flow, fuel consumption, emission.
THEORY OF NETWORK RELATED RESEARCH OF VEHICLES DYNAMICS IN URBAN ENVIRONMENT

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ABSTRACT

Transport and vehicles have great impact on peoples’ life every day. Continuous increase in traffic on the roads is leading to serious issues with congestion, safety and impact on the environment. This is especially emphasized in urban areas. Networks theory has been and is very interesting approach studying of vehicle dynamics in urban areas which can help addressing number of said issues. This research has also added regional dimension which could help development and introducing ITS in similar environment. In this, early stage of research, the initial results showed that the approach of presenting road infrastructure as network (graph) in vehicle simulations proves to be good and opens opportunities for deeper research.

KEYWORDS: network, vehicle dynamics, simulation model, ITS.
ECO-DRIVING TRAINING POTENTIAL IN REAL-WORLD OPERATION OF A HEAVY GOODS VEHICLE FLEET IN SERBIA

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ABSTRACT

The importance of commercial vehicle drivers’ eco-driving training is recognised by national authorities, vehicle owners and vehicle manufacturers. Vehicle manufacturers offer eco-driving training both to secure the client’s loyalty and raise their confidence in training courses and new technology. Potential eco-driving benefits were estimated at around 10% fuel savings for a vehicle fleet of 22 vehicles. After careful analysis of supplied data for representative vehicles, realistic potential of eco-driving training in real-world HGV operation were estimated. Recommendations regarding eco-driving performance indicators and data used and analysed for further assessment of driver training efficiency are given.

KEY WORDS: HGV operation, eco-driving performance indicators
QUALITATIVE SERVICE: A WAY TO RELIABLE AND SAFE MOTOR TRANSPORT

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ABSTRACT

The article describes the developed methodology for process improvement in the system of firm services, implemented in the form of decision support system. Searching for an optimal solution is performed using the developed simulation models. The model parameters are selected based on the analysis of statistical information about the failures, the specific and age structure of park of serviced fleet, data on the mileage and operating conditions. The modular system allows to expand if needed the range of tasks at a conclusion to the market of the trucks of a new model range. The adequacy of the proposed methods is confirmed by the verification and validation of the developed models. The article provides an example of change processes in the system of firm technical servicing at the market of compressed gas vehicle.

KEYWORDS: operational reliability of the truck, firm service system, decision support system, failure statistics, natural gas vehicles
METHODOLOGY OF MAINTENANCE MANAGEMENT WITH THE OBJECTIVE OF ENERGY EFFICIENT AND RATIONAL VEHICLE FLEET OPERATION

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ABSTRACT

The influence of vehicle fleet maintenance management on efficient and rational realisation of the given transport volume was researched in this paper. In order to lower total costs of transport and maintenance for the given transport volume, it is necessary that fleet managers manage the vehicle maintenance process more efficiently. For the evaluation of maintenance management efficiency, the methodology for integrated maintenance management was developed. The developed methodology was implemented in the company with its own vehicle fleet. Achieved improvements in the observed company contributed to total transport and maintenance costs’ reduction, which allowed the given transport volume realisation in an energy efficient and rational way.