

**POLISH ACADEMY OF SCIENCES  
COMMITTEE OF TRANSPORT**

---

**ARCHIVES**  
**OF** **QUARTERLY**  
**TRANSPORT**

---

**ARCHIWUM TRANSPORTU**

ISSN 0866-9546

**volume 32**  
**issue 4**  
**Warsaw 2014**

Detailed instructions for authors and contacts to editors can be found on journal's webpage:  
[www.archivesoftransport.com](http://www.archivesoftransport.com)

The Archive of Transport is indexed by the Polish Ministry of Science and Higher Education (6 points).

All articles are peer-reviewed by two external reviewers. Reviewers list is published once each year in the last issue of the journal and also on journal's webpage.

Copyright © 2014 by Polish Academy of Sciences.

All rights reserved. No part of this publication may be modified, reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from publisher.

Printed by PAN Warszawska Drukarnia Naukowa, 00-656 Warszawa, ul. Śniadeckich 8.

Circulation 200 copies.

# ***THE ARCHIVES OF TRANSPORT***

## ***Editor-in-Chief***

Marianna Jacyna,  
*Warsaw University of Technology, Poland;*

## ***Editorial Committee***

Andrzej Chojnacki,  
*Military University of Technology,  
Poland;*  
Agnieszka Merkisz-Guranowska,  
*Poznan University of Technology,  
Poland;*

Andrzej Szarata,  
*Cracow University of Technology,  
Poland;*  
Adam Weintrit,  
*Gdynia Maritime University,  
Poland;*

## ***Editorial Advisory Board***

### **Chairman**

Marian Tracz,  
*Cracow University of Technology, Poland;*

### **Deputy Chairman**

Jerzy Kisilowski,  
*University of Technology and Humanities, Poland;*

### **Membres**

Salvatore Cafiso,  
*University of Catania, Italy;*  
Jan Celko,  
*University of Zilina, Slovakia;*  
Csaba Koren,  
*Széchenyi István University of Applied Sciences,  
Hungary;*  
Bogusław Liberadzki,  
*Warsaw School of Economics, Poland;*

Raffaele Mauro,  
*University of Trento, Italy;*  
Larry Rillett,  
*University of Nebraska, USA;*  
Efim N. Rozenberg,  
*Moscow Institute of Railway Engineering (MIIT),  
Russia;*  
Kumares Sinha,  
*Purdue University, USA;*

### ***Statistical Editor***

Tomasz Ambroziak,  
*Warsaw University of Technology, Poland;*  
Jolanta Żak,  
*Warsaw University of Technology, Poland;*

### ***Editorial Secretary***

Konrad Lewczuk,  
*Warsaw University of Technology, Poland;*

### ***Linguistic Editor***

Joseph Woodburn,  
*University of Bristol, United Kingdom;*

### ***Ghostwriting Firewall***

Emilian Szczepański,  
*Warsaw University of Technology, Poland;*

## ***Associate Editors (Subject Editors)***

### **Transport Engineering**

Andrzej Chudzikiewicz,  
*Warsaw University of Technology, Poland;*  
Radim Lenort,  
*VŠB-Technical University of Ostrava, Czech Republic;*

### **Transport Infrastructure and Management**

Gebhard Hafer,  
*University of Applied Sciences in Berlin, Germany;*  
Edward Michłowicz,  
*AGH University of Science and Technology, Poland;*

### **Optimization and Algorithmic in Transport**

Tadeusz Nowicki,  
*Military University of Technology, Poland;*  
Askoldas Podviezko,  
*Vilnius Gediminas Technical University, Lithuanian;*

### **Logistics Engineering**

Goran Dukic,  
*University of Zagreb, Croatia;*  
Tomasz Nowakowski,  
*Wrocław University of Technology, Poland;*

### **Railway Transport**

Yury V. Diomin,  
*Kyiv University of Transport Economy & Technologies, Ukraine;*  
Andrzej Lewiński,  
*University of Technology and Humanities, Poland;*

### **Road Transport**

Dusan Malindzak,  
*Technical University of Košice, Slovakia;*  
Juan Carlos Villa,  
*Texas A&M Transportation Institute, USA;*

### **Air Transport**

Jerzy Manerowski,  
*Warsaw University of Technology, Poland;*  
Jozsef Rohacs,  
*Budapest University of Technology and Economics, Hungary;*

### **Maritime Transport**

Zbigniew Burciu,  
*Gdynia Maritime University, Poland;*  
LU Huaqing,  
*Zhejiang Ocean University, China;*

### **Ecology of Transport**

Jerzy Merkisz,  
*Poznan University of Technology, Poland;*  
Vitalii Naumov,  
*Kharkov National Automobile and Highway University, Ukraine;*

### **Telematics in Transport**

Vladimir Hahanov,  
*Kharkov National University of Radioelectronics, Ukraine;*  
Miroslaw Siergiejczyk,  
*Warsaw University of Technology, Poland;*

### **Transport Safety**

Geza Tarnai,  
*Budapest University of Technology and Economics Hungary;*  
George P. Sakellariopoulos,  
*Aristotle University of Thessaloniki, Greece;*

### **Mobility in Transport**

Włodzimierz Choromański,  
*Warsaw University of Technology, Poland;*  
Burford J. Furman,  
*San Jose State University, USA;*

## ***Editorial Committee Contact:***

### ***THE ARCHIVES OF TRANSPORT***

Faculty of Transport, Warsaw University of Technology  
Koszykowa 75, 00-662 Warsaw  
Poland

E-mail: [archivessecretary@wt.pw.edu.pl](mailto:archivessecretary@wt.pw.edu.pl)

Phone: +48 22 234-58-55

# Contents

<u>Tomasz Ambroziak, Roland Jachimowski, Dariusz Pyza,</u> <u>Emilian Szczepański</u> Analysis of the traffic stream distribution in terms of identification of areas with the highest exhaust pollution.....	7
<u>Iłona Jacyna-Gołda, Żak Jolanta, Piotr Gołębiowski</u> Models of traffic flow distribution for various scenarios of the development of proecological transport system.....	17
<u>Rafał Kucharski, Guido Gentile</u> Indirect observation of rerouting phenomena in traffic networks – case study of Warsaw bridges .....	29
<u>Jerzy Merkisz, Marianna Jacyna, Agnieszka Merkisz-Guranowska,</u> <u>Jacek Pielecha</u> The parameters of passenger cars engine in terms of real drive emission test .....	43
<u>Edward Michłowicz</u> Logistics waste utilization system in the steel plant.....	51
<u>Tadeusz Niedziela</u> Automatic target recognition of complex internal structure .....	61
<u>Kamil Popiela, Mariusz Wasiak</u> Optimization of Unit Load formation taking into account the mass of packaging units.....	73

