

**POLISH ACADEMY OF SCIENCES
COMMITTEE OF TRANSPORT**

ARCHIVES
OF **QUARTERLY**
TRANSPORT

ARCHIWUM TRANSPORTU

ISSN 0866-9546

volume 33
issue 1
Warsaw 2015

Detailed instructions for authors and contacts to editors can be found on journal's webpage:
www.archivesoftransport.com

The Archive of Transport is indexed by the Polish Ministry of Science and Higher Education and also by BazTech and IC Journals Master List.

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 © 2015 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.

The journal is supported by the Polish Academy of Sciences using funds of the Polish Ministry of Science and Higher Education



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

Phone: +48 22 234-58-55

Contents

Wojciech Gamon

Movement analysis of cooperating railway buffer heads7

Iłona Jacyna-Gołda

Decision-making model for supporting supply chain efficiency evaluation17

Grzegorz Karoń, Renata Żochowska

Modelling of expected traffic smoothness in urban transportation systems
for ITS solutions.....33

Piotr Lesiak, Tadeusz Szumiata, Marek Wlazło

Laser scatterometry for detection of squat defects in railway rails47

Elżbieta Macioszek

The road safety at turbo roundabouts in Poland57

Waldemar Mironiuk

Model-based investigations on dynamic ship heels in relation
to maritime transport safety.....69

Malwina Splawińska

Development of models for determining the traffic volume
for the analysis of roads efficiency.....81

