

Journal of civil engineering and transport

2021

Volume 3

Issue 1



transEngin

ISSN 2658-1698

e-ISSN 2658-2120



Kazimierz Pulaski University of Technology and Humanities in Radom

Journal of civil engineering and transport



 transEngin
ISSN 2658-1698

ISSN 2658-1698

e-ISSN 2658-2120

Volume 3

Issue 1



2021

Editorial Committee Contact

Journal of civil engineering and transport transEngin



Kazimierz Pulaski University of Technology and Humanities in Radom
Faculty of Transport, Electrical Engineering and Computer Science
ul. Malczewskiego 29
26-600 Radom
Poland
phone: (+48) 48 361-77-59
email: transengin@uthrad.pl
www.transengin.uniwersytetradom.pl

All articles are reviewed by two external reviewers. The list of reviewers is published in the current issue of the journal and on the website of the magazine.

ISSN 2658-1698
eISSN 2658-2120

Copyright© 2021 by Publishing House Kazimierz Pulaski University of Technology and Humanities in Radom

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.

**Journal of civil engineering and transport
transEngin**

Editorial Board / Komitet Redakcyjny

Editor-in-Chief / Redaktor Naczelny

*Aldona Kuśmińska-Fijałkowska, DSc., PhD, BEng., Assoc. Prof.
Kazimierz Pulaski University of Technology and Humanities, Poland*

Associate Editor / Koordynator Redakcyjny

*Renata Krajewska, PhD
Kazimierz Pulaski University of Technology and Humanities, Poland*

Section Editors / Redaktorzy Działów

Transport Infrastructure / Infrastruktura w Transporcie

*Andrzej Szymanek, DSc., PhD, BEng., Assoc. Prof.
Kazimierz Pulaski University of Technology and Humanities, Poland*

Transport Logistics / Logistyka w Transporcie

*Waldemar Nowakowski, DSc., PhD, BEng., Assoc. Prof.
Kazimierz Pulaski University of Technology and Humanities, Poland*

Transport Means / Środki Transportu

*Andrzej Krzyszkowski, DSc., PhD, BEng., Assoc. Prof.
Kazimierz Pulaski University of Technology and Humanities, Poland*

Traffic Control in Transport / Sterowanie Ruchem w Transporcie

*Jerzy Szymański, DSc., PhD, BEng., Assoc. Prof.
Kazimierz Pulaski University of Technology and Humanities, Poland*

Journal of civil engineering and transport
transEngin

Scientific Board / Rada Naukowa

prof. Jerzy Kisilowski - chairman, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Zbigniew Łukasik, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Andrzej Lewiński, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Janusz Dyduch, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Andrzej Chudzikiewicz, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Tomasz Perzyński, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Tomasz Ciszewski, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Jerzy Wojciechowski, Kazimierz Pulaski University of Technology and Humanities, Poland
prof. Marianna Jacyna, Warsaw University of Technology, Poland
prof. Anna Stelmach, Warsaw University of Technology, Poland
prof. Jerzy Merkisz, Poznan University of Technology, Poland
prof. Wojciech Ślączka, Maritime University of Szczecin, Poland
prof. Adam Weinrit, Gdynia Maritime University, Poland
prof. Jerzy Herdzik, Gdynia Maritime University, Poland
prof. Aleš Janota, University of Žilina, Slovakia
prof. Pavol Špánik, University of Žilina, Slovakia
prof. Anna Križanová, University of Žilina, Slovakia
prof. Zdeněk Dvořák, University of Žilina, Slovakia
prof. Algimantas Valinevicius, Kaunas University of Technology, Lithuania
prof. Robertas Keršys, Kaunas University of Technology, Lithuania
prof. Vaidas Lukoševičius, Kaunas University of Technology, Lithuania
prof. Rolandas Makaras, Kaunas University of Technology, Lithuania
prof. Algimantas Fedaravičius, Kaunas University of Technology, Lithuania
prof. Gintautas Bureika, Vilnius Gediminas Technical University (VGTU), Lithuania
prof. Olegas Prentkovskis, Vilnius Gediminas Technical University (VGTU), Lithuania
prof. Mareks Mezītis, Riga Technical University, Latvia
prof. Vanja Ambrožič, University of Ljubljana, Slovenia
prof. Artur Kahramanian, Ukrainian State University of Railway Transport, Ukraine
prof. Jiří Stodola, University of Defence, Czech Republic
prof. Zdeněk Vintr, University of Defence, Czech Republic
prof. Paulo M. S. T. de Castro, University of Porto, Portugal

Language Editor / Edytor Językowy

Małgorzata Górska, PhD, BEng.

Kazimierz Pulaski University of Technology and Humanities, Poland

Marketing / Marketing

Sylwia Olszańska, PhD, BEng.

University of Information Technology and Management in Rzeszow, Poland

Layout design / Projekt graficzny

Mariusz Dański, DSc., PhD, Assoc. Prof.

Kazimierz Pulaski University of Technology and Humanities, Poland

DTP Operator / Operator DTP

Przemysław Rudzki, MSc, BEng.

Kazimierz Pulaski University of Technology and Humanities, Poland

Publishing House

Kazimierz Pulaski University of Technology and Humanities in Radom

ul. Małczewskiego 29

26-000 Radom

Poland

tel. (+48) 48 361-70-33

fax (+48) 48 361-70-34

e-mail: wydawnictwo@uthrad.pl

ISSN 2658-1698

e-ISSN 2658-2120

Issue I. Edition 50 copies.

Printing and binding: Printing department of the Kazimierz Pulaski University of Technology and Humanities in Radom

Contents / Spis treści

1. ADAMSKI Dominik, ZAWADKA Łukasz	
Selected research capabilities of the Railway Research Institute Test Track	
Center in Żmigród on the example of Eurobalise	9
<i>Wybrane możliwości badawcze Okręgu doświadczalnego Instytutu Kolejnictwa</i>	
<i>w Żmigrodzie na przykładzie Eurobalisy</i>	
2. KRYSIUK Cezary	
Autonomous cars, development of modern transport technology	17
<i>Samochody autonomiczne, rozwój nowoczesnej technologii transportowej</i>	
3. MENES Maciej	
Two decades of hybrid electric vehicle market	29
<i>Dwie dekady rynku hybrydowych samochodów elektrycznych</i>	
4. ŁOSIEWICZ Zbigniew, MIRONIUK Waldemar, KAUP Magdalena,	
ŁOZOwicka Dorota, ŚLĄCZKA Wojciech	
Analysis of inland waterway vessel propulsion by criterion efficiency,	
ecology and safety	39
<i>Analiza napędu śródlądowych jednostek pływających według kryterium efektywności,</i>	
<i>ekologii i bezpieczeństwa</i>	

**Journal of civil engineering and transport
transEngin**

Reviewers / Recenzenci

Prof. DSc. Ing. Mareks Mezitis, Latvia

Prof. Konstantinos Demestichas, Greece

Assoc. Prof. dr.sc. Žarko Koboević, Croatia

Assoc. Prof. Andrzej Toruń, Ph.D., D.Sc. Eng., Poland

dr hab. inż. Gabriel Nowacki, prof. WAT, Poland

dr hab. inż. Tomasz Kamiński, prof. ITS, Poland

Notes / Notatki