

ISBN 978-83-959742-3-6

Conference proceedings
Transport Problems 2022

UNDER THE HONORARY
PATRONAGE OF



Silesian
University
of Technology



Krajowa
Reprezentacja
Doktorantów

KRD



27.06-01.07 2022
Katowice - Silesia

XIV INTERNATIONAL
SCIENTIFIC
CONFERENCE

XI INTERNATIONAL
SYMPOSIUM OF YOUNG
RESEARCHERS



Silesian University of Technology
Faculty of Transport and Aviation Engineering

Transport Problems 2022

Proceedings

XIV International Scientific Conference

XI International Symposium of Young Researchers

UNDER THE HONORARY PATRONAGE OF



Silesian University
of Technology

Krajowa
Reprezentacja
Doktorantów



ISBN 978-83-959742-3-6

Transport Problems
International Scientific Journal

editor-in-chief

A. Sładkowski

editorial board

P. Czech, M. Cieśla, T. Haniszewski,

M. Juzek, W. Kamiński, P. Marzec, G. Wojnar

*CONFERENCE -
TABLE OF
CONTENTS*

*SYMPOSIUM -
AUTHORS LIST*

*CONFERENCE -
AUTHORS LIST*

*CONFERENCE &
SYMPOSIUM
PROGRAM*

*SYMPOSIUM -
TABLE OF
CONTENTS*

*CONFERENCE &
SYMPOSIUM
PROCEEDINGS*

*CONFERENCE &
SYMPOSIUM
PARTICIPANTS*

**XIV INTERNATIONAL CONFERENCE
TRANSPORT PROBLEMS 2022**

TABLE OF CONTENTS

No.	Author, title	Pages	
		Begin	End
1	Bahrom ABDULLAEV, Fayzitdin MUZAFFAROV, Sokhib NAMOZOV, Khamza RAKHMATOV, Farrukh MUZAFFAROV Assessment of the stability of a freight wagon when moving in curved sections of the track	1	6
2	Raed AL TAL, Enas ZAREER, Baraah MUDRAJ, Marah AL-TAWEEL, Yazid HAMODAH Pedestrian-friendly neighborhoods, urban planning and public health synergy	7	31
3	Telman ALIEV, Tofig BABAYEV, Rauf GADIMOV Intellectualization of vibration control of malfunctions in rail transport	32	37
4	Kateryna ANDRIUSHCHENKO, Valentyna SMACHYLO, Olena SHEPTUKHA, Viktoriia RUDEVSKA An application of the ahp method for substantiation of cluster projects of transport and logistics enterprises	38	48
5	Asen ASENOV, Velizara PENCHEVA, Kremena MINEVA, Ivan GEORGIEV Prediction of fine particulate matter in low emission zones using a modified numerical method for a system of ordinary differential equations	49	61
6	Tofig BABAYEV, Sevinj BABAYEVA, Khalida MELIKOVA EU framework programmes: research & innovation in the transport area	62	66
7	Henryk BAŃKOWSKI, Janusz ĆWIEK, Andrzej SOKOŁOWSKI Evaluation of fatigue failure of draw hooks used in rail wagons	67	78
8	Danijela BARIĆ, Artur KALIN Road users' perception of road traffic safety, education and prevention: case study Croatia	79	86
9	Michael BAŽANT, Josef BULÍČEK Relationship between delay and the need for stations on single-track lines for train passing	87	98

No.	Author, title	Pages	
		Begin	End
10	Krzysztof BIZOŃ Stiffness analysis of a rail in a track using MES	99	104
11	Iryna BOZHIDAI, Anastasiia USTILOVSKA The impact of the transport sector on the economic development of Ukraine in comparison with the EU countries	105	110
12	Dorota BURCHART Environmental assessment of hydrogen production and application in transport means	111	114
13	Gintautas BUREIKA, Gediminas VAIČIŪNAS, Dachuan SHI, Armando Carrillo ZANUY Influence of track geometry condition monitoring on railway infrastructure maintenance processing	115	121
14	Wioletta CEBULSKA, Damian HADRYŚ, Marek JASIOK Engine oil contamination as a result of the running-in process of an internal combustion engine	122	131
15	Maria CIEŚLA Truck driver risk assessment and management based on FMEA methodology	132	141
16	Janusz ĆWIEK, Łukasz WIERZBICKI Basalt fiber reinforced epoxy composites for vehicle applications	142	152
17	Piotr CZUBAK, Witold SURÓWKA Transport features of a new, self-attuned conveyor	153	165
18	Fatma Zohra DJEKIRIF, Linda BOUYAYA, Rachid CHAIB, Mouna AIZI, Hizia AMANI Contribution to the evaluation of the problems related to the intensive use of the personal car during daily journeys a study in the city of Skikda – Algeria	166	174
19	Jerzy DUDA, Marek KARKULA, Radosław PUKA, Iwona SKALNA, Szymon FIEREK, Adam REDMER, Piotr KISIELEWSKI Multi-objective optimization model for multi-depot mixed fleet electric vehicle scheduling problem with real world constraints	175	186
20	Jan FIKEJZ, Tomáš DVOŘÁK Calculation of the estimated position of the train in GNSS denied conditions within the railway network model	187	195
21	Jan FILIPCZYK, Łukasz KONIECZNY Diagnosing of suspension systems in the m1 category cars in scope of road safety	196	205

No.	Author, title	Pages	
		Begin	End
22	Damian GAŚKA High energy orbits in energy harvesting	206	211
23	Phridon GOGIASHVILI, Shalva KIRTADZE, Gocha LEKVEISHVILI, David KBILASHVILI, Jumber CHOGOVDZE, Besik SIRBILADZE Improving efficiency of transporting lightweight bulky cargo by motor transport	212	219
24	Andrej GULIČ Prospects for interlinking transport, spatial, and development planning at the regional level in Slovenia	220	231
25	Tomasz HANISZEWSKI, Jerzy MARGIELEWICZ, Damian GAŚKA, Tadeusz OPASIAK Evolution of a bifurcation diagram as a tool to search for chaotic solutions in a wide spectrum of input data	232	243
26	Tomasz HANISZEWSKI, Tomasz WĘGRZYN, Bożena SZCZUCKA-LASOTA Analysis of stress concentration in crane bumper during a collision	244	257
27	Akzharkyn IGBAYEVA, Kassym YELEMESOV, Sayin BORTEBAYEV, Dinara BASKANBAYEVA, Assem UTEGENOVA Research on the wear resistance of the inner surface of a centrifugal pump housing made of fibrous concrete	258	268
28	Michał JUZEK Analysis of the impact of the gear's internal structure on the gears contact pattern	269	275
29	Grzegorz KACZOR, Maciej SZKODA, Magdalena MACHNO Method to verify the safety integrity level of rail vehicle control systems	276	288
30	Wojciech KAMIŃSKI Analysis of the running of long-distance trains on non-electrified lines in Poland	289	302
31	Abdubaki KAYUMOV, Rashidbek HUDAYKULOV, Barno SALIMOVA, Dilshod ARALOV The effect of salt accumulation on the strength characteristics of the soil of the subgrade	303	307
32	Mounira KELILBA, Rachid CHAIB Towards better efficient management of urban public transportation by bus in the city of Constantine	308	320
33	Mouloud KHELFI, Salim BOUKEBBAB, Neila BHOURI The influence of the tram operation and the traffic lights control on drivers' behaviours at a multimodal intersection in Algeria	321	332

No.	Author, title	Pages	
		Begin	End
34	Jarosław KONIECZNY, Krzysztof LABISZ Damages of the section insulator guide caused by electric arc	333	344
35	Aleksander KONIOR, Tomasz KONIOR, Krzysztof BRZOZOWSKI, Andrzej MACZYŃSKI, Artur RYGUŁA New functionalities of the weigh-in-motion system - iWIM solution	345	354
36	Dmitriy KRITSKIY, Oleksii POPOV, Sergiy YASHIN Description of the movement of unmanned aircraft transport	355	362
37	Krzysztof LABISZ, Jarosław KONIECZNY, Wojciech PAKIEŁA Surface shaping of Al parts used for engines by laser alloying with Fe powder	363	376
38	Bogusław ŁAZARZ, Łukasz MAZUREK Topology optimization of the gearbox housing with the aspect of minimising vibro-acoustic properties based on the numerical simulation	377	385
39	Aleksandra LISOWSKA, Henryk SANECKI, Maciej SZKODA Simulation method for measuring the impact energy of rail vehicles equipped with a soft absorber	386	402
40	Elżbieta MACIOSZEK, Muhammad YASIR New scenarios of autonomous and connected urban mobility: transport system simulation by digital twins	403	416
41	Ričardas MALKUS, Jūratė LIEBUVIENĖ, Vida JOKUBYNIENĖ The unified evaluation criteria system for the selection of the most preferable mode, route and means of transportation for oversized and super heavy cargoes	417	424
42	Piotr MAMCARZ, Radovan MADLENAC, Saugirdas PUKALSKAS, Dalibor BARTA, Vidas ŽURĀULIS, Paweł DROŹDŹIEL, Robertas PEČELIŪNAS Personality and traffic perception. experimental research of young adults	425	433
43	Adam MAŃKA, Jarosław KONIECZNY, Krzysztof LABISZ, Piotr KISIELEWSKI Verification of the train on railway track simulation and optimisation system	434	449
44	Jerzy MARGIELEWICZ, Damian GAŚKA, Tomasz HANISZEWSKI, Tadeusz OPASIAK New design solutions of energy harvesters	450	456
45	Jakub MARSZAŁKIEWICZ Airplanes with a frontal stabilizer (canard) on the example of selected patents and constructions	457	468

No.	Author, title	Pages	
		Begin	End
46	Andrea MATERNOVÁ, Matúš MATERNA Human as a main threat: undeclared dangerous goods in maritime transport & aviation	469	484
47	Ugnė Koletė MEDŽEVEPRYTĖ, Rolandas MAKARAS, Alfredas RIMKUS Efficiency of an off-road heavy duty series hybrid vehicle based on modified WHTC cycle	485	493
48	Mauzhuda MUZAFFAROVA Dilatation of the method of fixation moveable sands	494	500
49	Gabriel OGUNKUNBI, Ferenc MESZAROS Beyond car dependency: an analysis of the public perception of urban vehicle access regulations	501	511
50	Myroslav OLISKEVYCH, Viktor DANCHUK Algorithm of vehicle routing of solid waste collection in the megalopolis with fixing level of containers filling	512	524
51	Tadeusz OPASIAK, Jerzy MARGIELEWICZ, Damian GAŚKA, Tomasz HANISZEWSKI The problem of using the size and type of a flexible coupling in a drive system	525	534
52	Yury OSENIN, Darya KRIVOSHEYA, Vadim ANTOSHKIN Improved efficiency of disc brake with integrated friction units	535	542
53	Maciej PALUCH, Marcin NOGA Analysis of the impact of the implementation of the energy recovery system and the addition of inert gas to the air – fuel mixture supplying the internal combustion engine in modern hybrid car – ecology and operational parameters	543	549
54	Stanislav PALUCH, Juraj DUBOVEC The number of spare vehicles determination in a regular bus transport	550	557
55	Grzegorz PERUŃ Visual testing VT - characteristics of diagnostic methods and fields of application in the transport	558	567
56	Grzegorz PERUŃ Characteristics of penetrant testing (PT)	568	575
57	Grzegorz POKORSKI, Bogusław JAGUSIAK Application of transport security system imaging for emergency mass notification systems	576	587

No.	Author, title	Pages	
		Begin	End
58	Olena PYLYPENKO Crises as a factor of innovative development and their manifestation in the transport sphere	588	596
59	Zhanarys RAIMBEKOV, Kunduz SHARIPBEKOVA, Bakyt SYZDYKBAYEVA, Aleksander SLADKOWSKI Assessment of logistic factors and forecast of their impact on economic growth: on the example of Kazakhstan	597	613
60	Inna RIEPINA, Larysa LIGONENKO, Oleksandr SADOVNYK, Lyubov DZYUBENKO, Vita KOVTUN Innovative tools for the development of transport entrepreneurship: european experience and ukrainian needs of the postwar economic revival	614	623
61	Katarzyna SICIŃSKA, Maria DĄBROWSKA-LORANC, Agnieszka KRUPIŃSKA Distraction in traffic in Poland - use of mobile phones	624	636
62	Valeriy SIKULSKIY, Kateryna MAIOROVA, Iurii VOROBIOV, Petro FOMICHEV, Svitlana MYRONOVA Convergence technology of vehicle parts surface finishing	637	647
63	Stasys SLAVINSKAS, Vida JOKUBYNIENĖ Performance and emissions characteristics of a diesel engine fuelled with carbon nanoparticles blended diesel and biodiesel	648	660
64	Liudmyla SLIUSAREVA, Valentyna SMACHYLO, Iryna BOZHIDAI Logistics ratings and their impact on consumer purchasing behavior in Ukraine	661	668
65	Gergana STANEVA, Rosen IVANOV, Georgi KADIKYANOV Octave bands analysis of the car noise emissions at different speed	669	678
66	Stasys STEIŠŪNAS, Gediminas VAICĪŪNAS Study of the dependence of effectiveness of automatic rolling stock wheel damage detection systems on weather conditions	679	685
67	Monika STOMA, Agnieszka DUDZIAK, Paweł DROŹDZIEL Modern safety systems in the acceptance of vehicle users	686	698
68	Saulius STRAVINSKAS, Alfredas RIMKUS, Jonas MATIJOŠIUS Evaluation of vibration and noise characteristics of a compression-ignition engine fuelled with natural gas-biodiesel dual fuel	699	707
69	Marcin ŚWITAŁA, Agnieszka ŁUKASIEWICZ The residents of small towns as users of public transport in the time of Covid-19 pandemic	708	719
70	Mateusz SZARATA Bus lane implementation strategy	720	731

No.	Author, title	Pages	
		Begin	End
71	Bożena SZCZUCKA-LASOTA, Tomasz WĘGRZYN, Anita UŚCIŁOWSKA, Jan PIWNIK Plastic properties of AHSS weld - estimation of process parameters by simulation usign method of fundamental solutions	732	742
72	Igor TARAN, Vadim LITVIN The interdependence of bus driving mode and energy efficiency: case study of urban passenger transport	743	757
73	Gediminas VAIČIŪNAS, Stasys STEIŠŪNAS Investigation of the efficiency of additional engine oil fine filtration equipment installation on diesel trains	758	763
74	Aleksandra VASILJ, Biljana ČINČURAK ERCEG, Aleksandra PERKOVIĆ Legal framework for addressing air traffic noise	764	776
75	Tomasz WĘGRZYN, Bożena SZCZUCKA-LASOTA, Bogusław ŁAZARZ, Tadeusz SZYMCZAK, Krzysztof Ireneusz WILCZYŃSKI Regenerative MMA welding of concrete mixer truck made of Hardox 450 steel	777	784
76	Robert WIESZAŁA, Sandra OMYLIŃSKA, Jacek MENDALA Quality requirements of means of transport on the example of cars	785	791
77	Wojciech ZALEWSKI, Magdalena OSIŃSKA Changes in the perception of telematics technology by road transport companies in 2020-21	792	807
78	Weronika ŻMUDA, Piotr CZUBAK Investigations of transport possibilities of the new vibratory conveyor equipped with a single electrovibrator	808	819

XI INTERNATIONAL SYMPOSIUM OF YOUNG RESEARCHERS TRANSPORT PROBLEMS 2022

TABLE OF CONTENTS

No.	Author, title	Pages	
		Begin	End
1	Artur BUDZYŃSKI, Aleksander ŚLADKOWSKI The use of machine learning to improve road transport management processes	820	829
2	Anna FLIS, Aneta OCIECZEK, Adam KAIZER The diversity of sorption properties of rice during maritime transport as an element of risk assessment in the logistics process	830	843
3	Krystian FURGAŁA, Klaudia MOSUR, Sandra OMYLIŃSKA, Sylwia RAK, Damian HADRYŚ assessment of selected safety systems for transport with using forklifts	844	855
4	Joanna GAJDZISZEWSKA, Karol PAPAJ, Kamil PAPAJ, Patryk WOJDAŁA The use of UAVS in the transport of goods in urban areas	856	864
5	Karol KAMPA, Jakub LECH, Adam JABŁOŃSKI, Marcel GRUSZCZYŃSKI, Kamil ULMAN, Krystian SZEWCZYŃSKI Project of using a computer game for modeling road traffic in urban areas	865	877
6	Piotr KOCIUBA, Damian HADRYŚ The clothing and equipment of the cyclist as safety elements when using the bicycle for extreme rides	878	887
7	Agnieszka KUSZ, Paulina ROBAKOWSKA, Damian HADRYŚ, Wioletta CEBULSKA Waste and pollution from usage of traditional car and hybrid car	888	896
8	Elżbieta MACIOSZEK, Aleksander SOBOTA, Paulina ŚWIĘRK The impact of selected factors on the sale of tickets in ticket vending machines in the GZM metropolis	897	906
9	Elżbieta MACIOSZEK, Agata KUREK Preferences for choosing a parking space by drivers using PPZ in a selected city in Poland	907	915
10	Jakub MARSZAŁKIEWICZ Development of commercial aircraft in terms of aircraft interior architecture	916	925

No.	Author, title	Pages	
		Begin	End
11	Sandra OMYLIŃSKA, Vanessa MARTINEZ, Magdalena ZEGAREK, Krystian SZEWCZYŃSKI Research of the reaction time to the light stimulus with the use of a reflex simulator	926	937
12	Marcin PODCZASZYŃSKI, Maciej KOREJWO, Damian HADRYŚ The impact of transport belts damage on securing the load on the vehicle	938	947
13	Aman SHAKENOV, Aleksander SŁADKOWSKI, Ivan STOLPOVSKIH Influence of temperature regimes on the wear of tires of mining dump trucks	948	953
14	Magdalena SKIBA Solutions of temporary traffic organisation employed in Wrocław	954	965
15	Aleksander SOBOTA, Krzysztof DREWNIOK The importance of correct determination of the bus lines running time in public transport	966	980
16	Bartosz STOŁTNY, Grzegorz PERUŃ The impact of the SARS-CoV-2 virus on the aviation industry	981	989
17	Bartosz STOŁTNY, Grzegorz PERUŃ Methodology of verifying the technical condition of an aircraft piston engine	990	999