
ABSTRACTS

*doi:10.22306/al.v7i2.148**Received: 07 Jan. 2020**Accepted: 20 Mar. 2020***MEASURING AND DECOMPOSING TOTAL FACTOR PRODUCTIVITY
OF VIETNAMESE SEAPORTS**

(pages 65-72)

Tha Hien To

Le Quy Don Technical University, 236 Hoang Quoc Viet, Hanoi, Vietnam,

tohientha@gmail.com

Phuong Thanh Le

Faculty of Management and Finance, Vietnam Maritime University, 484 Lach Tray Street, Haiphong City, Vietnam,

phuonglt@vamaru.edu.vn (Corresponding author)

Van Nguyen

Faculty of Fundamental Science, Vietnam Maritime University, 484 Lach Tray Street, Haiphong City, Vietnam,

vanxpo@vamaru.edu.vn

Keywords: total factor productivity, seaports, emerging economy, Vietnam**Abstract:** In this paper the total factor productivity of Vietnamese seaports is measured and decomposed into three main components, namely technical, scale and mix efficiency. The analysis results using the data of 40 seaports show that the seaport sector is underperformed, while seaports in the northern region are the most efficient group on any measures of efficiency, southern ports are the least efficient group if scale efficiency is utilised. It has also been found that container ports outperform non-container ports, and those belonging to logistics companies are overall more efficient than their partners operated by the local governments.

*doi:10.22306/al.v7i2.156**Received: 03 Feb. 2020**Accepted: 26 Mar. 2020***MOTORCYCLE TAXI IN ADDRESSING THE RURAL TRANSPORT
CONUNDRUM**

(pages 73-84)

Samora Marche Obudho

Rongo University, Department of Social Sciences, P.O. Box 103-40404, Rongo, Kenya,

marchelesamora@gmail.com (corresponding author)

Wilson A.P. Otengah

Rongo University, Department of Social Sciences, P.O. Box 103-40404, Rongo, Kenya,

nyakonia2000@yahoo.co.uk

Taji I. Shivachi

Rongo University, Department of Social Sciences, P.O. Box 103-40404, Rongo, Kenya,

shivachitaji@gmail.com

Keywords: motorcycle taxi, rural transport conundrum, Kenya**Abstract:** Rural people need transport services to access basic services and livelihoods. This study analyses the extent to which the motorcycle taxi addresses rural transport problems. Such an analysis could inform the future of rural transport interventions. Rongo, a rural sub-county in Kenya, was chosen for the study. The analysis results using data from 289 household heads show that predominant activities in the study area transformed motorcycle taxi activities throughout the day. Motorcycle taxis offered useful rural transport services and complemented many public transport systems in facilitating access to places, markets, facilities, and activities. Respondents associated the physical characteristics of the motorcycle taxi with motivations for its use along with its actual use. Although most of the respondents expressed

satisfaction with the motorcycle taxi sector, there was a clear difference between groups. Respondents' satisfaction with motorcycle taxi services was mainly due to the motorcycle taxi physical attributes. The respondents mainly related negative reasons to motorcycle taxi riders' mannerism, unprofessional driving, and poor safety. This paper concludes that the motorcycle taxi facilitates the movement and operations in rural villages. Using motorcycle taxis have shown to have a close link to rural areas and rural life. This study calls on transport practitioners to rethink the concept and image of sustainable rural mobility and identify with rural informal motorcycle taxi transport as well. For equitable, accessible and sustainable rural transport, the transport practitioners need to empower and expand on existing realities in rural areas.

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ADJUSTING DIRECT DISTANCE TO ROAD FOR V4 COUNTRIES

(pages 85-93)

Jakub Dyntar

Department of Business Administration and Management, Faculty of Economics, Technical University of Liberec, Voroněžská 13, 460 01 Liberec, Czech Republic, EU, jakub.dyntar@tul.cz

Dana Strachotová

Department of Economics and Management, The University of Chemistry and Technology Prague, Technická 5, 166 28 Praha 6, Czech Republic, EU, strachod@vscht.cz

Marek Botek

Department of Economics and Management, The University of Chemistry and Technology Prague, Technická 5, 166 28 Praha 6, Czech Republic, EU, botekm@vscht.cz (corresponding author)

Keywords: geographical information system, data mining, vehicle routing, distribution, supply chain management

Abstract: This article describes the determination of the direct distance correction factor that reflects the actual density of the road network in V4 countries. V4 countries are the Czech Republic (CZ), Slovakia (SK), Poland (PL) and Hungary (HUN). No correction factors reflecting road density among major population places were still available for V4 countries. Three-level administrative classification and data from statistical offices concerning population density on 31 December 2017 was used. In MS-Excel was designed functions for obtaining coordinates of selected places and road distances using queries to Web Map Service Google Maps (WMS). Road distances obtained by queries represent the fastest connection on the road. The great-circle distance and spherical triangle were used to calculate direct distances from coordinates. The places were selected using ABC analysis based on the population sample and it was reduced so that the monthly limit of queries to WMS was not exceeded. The obtained values of correction factors can be used in vehicle routing. For the smallest classification items, in CZ, for 273 places with a population of over 5 000, the average values of the correction factor (k_{avg}) range between 1.277 and 1.326. In SK, for 245 places with a population of over 3 000, k_{avg} ranges between 1.424 and 1.446. In PL, for 376 places with a population of over 20 000, k_{avg} ranges between 1.206 and 1.285. Finally, in HUN, for 287 places with a population of over 5 000, k_{avg} ranges between 1.301 and 1.345.

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TRACEABILITY IN INDUSTRY 4.0: A CASE STUDY IN THE METAL-MECHANICAL SECTOR

(pages 95-101)

Rafael Granillo-Macías

Autonomous University of Hidalgo, Campus Sahagun, Department of Industrial Engineering, Cd. Sahagun, Hidalgo, Mexico, rafaelgm@uaeh.edu.mx (corresponding author)

Isaias Simón-Marmolejo

Autonomous University of Hidalgo, Campus Sahagun, Department of Industrial Engineering, Cd. Sahagun, Hidalgo, Mexico, isaiasm@uaeh.edu.mx

Isidro J. González-Hernández

Autonomous University of Hidalgo, Campus Sahagun, Department of Industrial Engineering, Cd. Sahagun, Hidalgo, Mexico, igonzalez@uaeh.edu.mx

Jorge Zuno-Silva

Autonomous University of Hidalgo, Campus Sahagun, Department of Mechanical Engineering, Cd. Sahagun, Hidalgo, Mexico, jorge_zuno@uaeh.edu.mx

Keywords: smart assets, GPS, technologies, logistics, supply chain

Abstract: With the emergence of production systems characterized by Industry 4.0 technologies, asset traceability problems have become more relevant at different echelons of the supply chain. The management of intelligent assets promoted by Industry 4.0 is considered as a process that, in addition to collecting information, allows tracking and ensuring the security of assets. This article shows various technologies for traceability and asset monitoring, from the perspective of Industry 4.0. Through a case study in the metal mechanical industry, the solutions and benefits offered by the implementation of technologies based on RFID and GPS were analysed. With this proposal, it was possible to respond to the problem of the control and monitoring of welding equipment inside and outside the company. An automatic update of the locations was also achieved, through the use of GPS. The company estimates that with this implementation levels of reliability in the inventory close to 99% can be obtained, which would lead to guarantee the traceability of the assets.

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AUTONOMOUS MOBILE ROBOT TECHNOLOGY FOR SUPPLYING ASSEMBLY LINES IN THE AUTOMOTIVE INDUSTRY

(pages 103-109)

Martin Čech

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, martin.cech@savs.cz
(corresponding author)

Pavel Wicher

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, pavel.wicher@savs.cz

Radim Lenort

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, radim.lenort@savs.cz

Tomáš Malčic

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, tomas.malcic@savs.cz

Jiří David

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, jiri.david@savs.cz

David Holman

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, david.holman@savs.cz

David Staš

ŠKODA AUTO University, Na Karmeli 1457, 293 01 Mladá Boleslav, Czech Republic, EU, david.stas@savs.cz

Jiří Záruba

ŠKODA AUTO a.s., tř. Václava Klementa 869, 293 01 Mladá Boleslav, Czech Republic, EU,
jiri.zaruba@skoda-auto.cz

Keywords: autonomous mobile robot, automated guided vehicle, assembly line supply, automotive industry, material handling

Abstract: The ever-increasing customization and differentiation of the product portfolio and the shorter life cycle of products and technologies in the automotive industry lead to the development of flexible and convertible manufacturing and logistics technologies and systems at all stages of car production. In the field of supplying assembly lines in the automotive industry, such technologies are based on Autonomous Mobile Robots (AMRs). The aim of this paper is to create a comprehensive knowledge base for design, selection and implementation of AMR technology in the form of unit load carriers for supplying assembly line in the automotive industry. The outputs of the article are based on a case study aimed at assessing the feasibility of introducing AMR technology for supplying car assembly line parts with irregular consumption. The article presents a general procedure for feasibility study of the project of AMR assembly line supply and a comprehensive set of recommendations divided into five key categories: Technology, Management, Economics, Capacity, and Vendors.

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OPTIMIZATION OF TECHNOLOGICAL JIGS FLOW IN AUTOMOTIVE USING SOFTWARE MODULE TECNOMATIX PLANT SIMULATION

(pages 111-120)

Miriam Pekarčíková

Technical University of Kosice, Faculty of Mechanical Engineering, Institute of Management, Industrial and Digital Engineering, Park Komenskeho 9, 042 00 Kosice, Slovak Republic, EU, miriam.pekarcikova@tuke.sk (corresponding author)

Peter Trebuňa

Technical University of Kosice, Faculty of Mechanical Engineering, Institute of Management, Industrial and Digital Engineering, Park Komenskeho 9, 042 00 Kosice, Slovak Republic, peter.trebuna@tuke.sk

Marek Kliment

Technical University of Kosice, Faculty of Mechanical Engineering, Institute of Management, Industrial and Digital Engineering, Park Komenskeho 9, 042 00 Kosice, Slovak Republic, marek.kliment@tuke.sk

Milan Edl

University of West Bohemia, Faculty of Mechanical Engineering, Department of Industrial Engineering and Management, Univerzitni 8, 301 00 Plzen, Czech Republic, edl@fst.zcu.cz

Ladislav Rosocha

Technical University of Kosice, Faculty of Mechanical Engineering, Institute of Management, Industrial and Digital Engineering, Park Komenskeho 9, 042 00 Kosice, Slovak Republic, ladislav.rosocha@tuke.sk

Keywords: material flow, jigs, automobile body, optimization, simulation

Abstract: Production must be adapted to the needs of the product structure while meeting the economic requirements of low cost. As processes will be monitored, managed and optimized in near real-time, decentralization of decision-making processes will also increase. Due to the heterogeneous structure of the value chain, its complexity is increasing, reorganized, causing changes to the system as a whole and will require the creation of appropriate infrastructures. Mastering the value chain dynamics is largely translated into logistics. This paper deals with the optimization of the flow of technological jigs at the workplace of the paint shop in a company that is oriented to the automotive industry. The design of an optimal solution will be verified using the selected software module Tecnomatix Plant simulation. Description and analysis of monitored flows of technological preparations are realized in the workplace Painting. The simulation model of the original state was created and by testing alternative solutions the solution of inter-operational transport was chosen, which is optimal. The use of software support in the analysis of variant solutions is of great importance especially in terms of speed of verification and achievement of results from the tested variants.

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CHOSEN ASPECTS OF A SPATIALLY FUNCTIONAL ACCESSIBILITY BY PUBLIC TRANSPORT: THE CASE OF TRNAVA SELF-GOVERNING REGION (SLOVAKIA)

(pages 121-130)

Miroslava Trembošová

Constantine the Philosopher University in Nitra, Faculty of Natural Sciences, Department of Geography and Regional Development, 94974 Nitra, Slovakia, EU, mtrembosova@ukf.sk

Alena Dubcová

Constantine the Philosopher University in Nitra, Faculty of Natural Sciences, Department of Geography and Regional Development, 94974 Nitra, Slovakia, EU, adubcova@ukf.sk

Eudmila Nagyová

Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Marketing and Trade, 94976 Nitra, Slovakia, EU, nagyoval26@gmail.com

Dagmar Cagaňová

Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Institute of Industrial Engineering and Management, 91724 Trnava, Slovakia, EU, dagmar.caganova@stuba.sk (corresponding author)

Keywords: rural area, public transport, accessibility, Trnava Self - Governing Region, Slovak Republic

Abstract: The aim of the paper is to analyze transport possibilities of Trnava Self-Governing Region (TTSK) municipalities residents to its center (regional capital) by public transport. The authors of the paper have reviewed the current trends of public transport and discussed the optimization of their capacity and timetable scheduling in terms of continuity and parallelism of bus and train transport. The research methods included GIS tools, complex accessibility calculations based on the journeys published on slovakrail.sk and www.cp.sk on a Tuesday, February 6, 2018 at four key times (4:00, 7:30, 14:00, 24:00), which were compared by four aspects: distance traveled, travel time, number of transfers, comprehensive route accessibility by three types of transport: train, bus and combined transport. The results of the research have showed that there is a certain threshold value for travel distance, time and number of transfers, which affects the commuters to either not visit the regional capital or choose to travel by a car. It was confirmed, that every type of public transport in the territory of TTSK has areas where it is currently the main way for commuting to the regional city. The authors of the paper have provided a comprehensive picture of selected aspects of spatially functional accessibility by public transport and the characteristics of individual types of transport in terms of following the scheduled route timetables in the TTSK region during the selected key times.

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IMPLEMENTING CIRCULAR ECONOMY CONCEPTS FOR SUSTAINABLE URBAN FREIGHT TRANSPORT: CASE OF TEXTILE MANUFACTURING SUPPLY CHAIN

(pages 131-143)

Bhavesh Dhonde

Department of Civil Engineering, Sardar Vallabhbhai National Institute of Technology, Surat, Pin 395 007, India, bhaveshdhonde@gmail.com (corresponding author)

Chetan R. Patel

Department of Civil Engineering, Sardar Vallabhbhai National Institute of Technology, Surat, Pin 395 007, India, chetanpatel@rediffmail.com

Keywords: circular economy, city logistics, urban freight, sustainability, sustainable development

Abstract: Rapid industrialization and mass urbanization have generated a challenging situation for the city's planners and managers to maintain a balance between economic development and a sustainable environment for its inhabitants. Circular economy concepts can offer a unique opportunity to decouple growth from resource requirements. At the core of the circular economy, is the proposition of complete elimination of waste – i.e. waste not in its traditional sense, but any form of underutilization of assets and resources. A case study of the textile manufacturing industry in Surat, India is taken to compare the performances of traditional supply chain processes and the advantages of adopting circular economy concepts. Temporal sprawl of the textile industry is used to find the changes in trip lengths of urban freight trips over the last two decades. For estimating freight trips volume and patterns, roadside interviews of freight vehicles and establishment surveys of manufacturing and trading units were conducted. Overall urban freight transport contribution from the textile industry is estimated by modelling field data. Organized trip planning and optimized utilization of payload capacities can reduce vehicular emission generated from commercial goods movement in the textile industry to 2/3rd of its current levels. The paper asserts reinforces that the integration of circular economy principles with supply chain processes is beneficial from sustainability as well as a business point of view. The congestion mitigation due to the reduced number of trips offers a further reduction in the overall traffic emissions due to better traffic flows on the city's road network.
