Hybrid Schemes for Eliminating Road Transportation Waste

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Abstract

Evidence suggests that road transportation has become an important factor of international trade and supply chains performance (US Department of Transportation, 2011; Subsecretaría de Transporte, 2013; European Commission, 2011), it is generally considered an inefficient operational activity (McKinnon et al., 1999; Swedish Association of Road Haulage Companies, 2008; Belman et al. 2005; US Department of Transportation, 2009; Instituto Mexicano para la Competitividad, 2004). In this context, mathematical modelling, operations research, and simulation have traditionally been the main approaches used by researchers to tackle these inefficiencies (Sternberg et al., 2013) through the optimisation of resource utilisation, routes, cost, time and distance.

In the last decade, however, an alternative movement to improve road transport operations has emerged. This movement represents an extension of the lean production approach that advocates the application of its principles and tools to road transport operations. Previous works related to transportation waste have focused on the elimination of efficiency wastes (Simmons et al., 2004; Villarreal 2012; Villarreal et al., 2012, Villarreal et al., 2013). These types of wastes are related to the improvement of the Operational Vehicle Effectiveness (OVE) and Total Operational Vehicle Effectiveness (TOVE) proposed by Simmons et al. (2004) and Villarreal (2012) respectively. Villarreal, et al., (2015) present a systematic method for improving road transport operations based on the elimination of the Seven Transportation Extended Wastes (STEW) proposed by Sternberg et al. (2013). This is among the first to consider the STEW scheme developed by Sternberg et al. (2013) to conduct a transportation improvement project.

It will be of interest to conduct a preliminary exploration about the possible inter-relationships between the Simmons et al. (2004) and Villarreal (2012) waste schemes with the STEWs and explore the possibility of using them for building more effective improvement procedures. This paper is intended to carry out such study and provide several potential schemes that consider the identification and elimination of both type of wastes.

Keywords
Lean transportation, efficiency wastes, truck utilization, transport waste elimination

Biography

Bernardo Villarreal is a full professor of the Department of Engineering of the Universidad de Monterrey. He holds a PhD and an MSc of Industrial Engineering from SUNY at Buffalo. He has 20 years of professional experience in strategic planning in several Mexican companies. He has taught for 17 years courses on industrial engineering and logistics in the Universidad de Monterrey, ITESM.
and Universidad Autónoma de Nuevo León. He has made several publications in journals such as Mathematical Programming, JOTA, JMMA, European Journal of Industrial Engineering, International Journal of Industrial Engineering and the Transportation Journal. He is currently a member of the IIE, INFORMS, POMS, and the Council of Logistics Management.

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