

A Transport Strategy Developing Process Based on Stakeholder Engagement

Afaf Haial

Equipe MOAD-SCM

Ecole Mohammadia d'Ingénieurs, Mohammed V University

Rabat, Morocco

afafhaial@gmail.com

Abdelaziz Berrado

Equipe AMIPS

Ecole Mohammadia d'Ingénieurs, Mohammed V University

Rabat, Morocco

berrado@emi.ac.ma

Loubna Benabbou

Equipe MOAD-SCM

Ecole Mohammadia d'Ingénieurs, Mohammed V University

Rabat, Morocco

benabbou@emi.ac.ma

Abstract

Transportation is a major logistical driver as it is the responsible of connecting nations, people or even moving the products between different stages in a supply chain. By means of well-handled transportation system, products or services will be arrive safe, on time and at the lowest cost. However, developing the appropriate transportation strategy, that improves the performance of the transportation system, requires a great level of involvement by concerned stakeholders.

Stakeholder engagement is emerging as an essential element in the establishment of efficient transportation decisions in which several resources have to be dedicated from the beginning of the developing transportation strategy process. The aim of this paper is to suggest a transportation strategy developing process to help transportation managers in making the appropriate transportation strategy while highlighting the role of stakeholder engagement in achieving a successful and efficient transportation strategy.

Keywords

Transportation; Transportation strategy; Supply chain management; Stakeholder engagement.

1. Introduction

Transportation can be seen as a basic human activity, as it results from the need to reach various services and activities (Baykasoglu et al., 2011; Crainic, 2003). This eternal need of transportation in people's life has led many researchers to look for finding new ideas in order to make an effective and reliable transportation system.

Transportation plays a crucial role in seamless supply chain as it is the responsible for the flow of goods between each successive stage in a supply chain from suppliers to customers (Jacyna, 2013).

In today's constantly changing environment, transportation managers are being asked to know how to successfully navigate these changes and make the appropriate and effective transportation strategy decisions to properly make the products or services arrive safe to customers at right time, right place and right cost. However, developing an efficient and effective transportation strategy requires a great level of involvement by concerned stakeholders.

Stakeholder engagement is emerging as an essential element in the establishment of efficient transportation decisions in which several resources have to be dedicated from the beginning of the developing transportation strategy process (Le Pira, 2015). Several researchers have pointed out the importance of engaging many interests' stakeholders in transport strategy-making i.e. (Hensher et al., 1999; Granger et al., 2016).

The aim of this paper is to suggest a model to help transportation managers in developing the appropriate transportation strategy while highlighting the role of stakeholder engagement in achieving a successful and efficient transportation strategy.

The remainder of this communication is organized as follows. In the next section, a review of literature on existing developed transportation strategies in many areas is presented. Stakeholder engagement will be analyzed in relation to transportation strategies development in section 3. The proposed model is described in section 4. Finally, conclusion and future research follow.

2. Importance of transportation strategy

Several research works can be found in literature that covers the topic of developing successful transportation strategies. They are generally carried out to provide a safe evacuation of people and goods. For example, (Morichi, 2005) stressed the importance of developing a long term transport strategy for Asian megacities to adapt to the country's rapid growth. (Bae et al., 2003) evaluated feasible transport policy options to examine some of the problems that afflict a city with some of the worst traffic congestion in the world. (Dodgson et al., 2015) addressed, in their paper, the development and deployment of an innovation transportation strategy that can contribute to the operation and use of an efficient and effective transport system for its clients and users. The innovation strategy is undertaken iteratively and informed by learning, drawing on evidence from the external environment, and appraising internal resources, capabilities, and processes, to build, supplement, and organize an organization's innovative capabilities in a changing environment while involving the active participation of several stakeholders.

From a different perspective, (Te Brömmelstroet et al., 2010) highlighted the importance of developing an integrated land use and transport strategy in establishing more efficient and sustainable urban environments. (May et al., 1995) added that the design of integrated transport strategies with a combination of infrastructure, management and pricing measures brings a number of benefits in achieving better performance against transport policy objectives.

In addition, the paper of (Meyer, 1999) identified several strategies for improving the effectiveness of transportation demand management as an important component of transportation policy, including: incorporating TDM as part of the solutions for regional transportation planning, linking TDM to land use decisions, making the costs of travel more apparent to the user, and making TDM implementation more palatable to the general public. Furthermore, the paper of (Saranen et al., 2010) provided knowledge on the transportation strategies employed in international lean oriented supply chains involving developing economies; he highlighted the importance of developing efficient transportation strategies in the whole supply chain.

However, several researchers have pointed out the importance of involving many interests' stakeholders in the transportation strategy development in order to make successful, efficient and effective transportation strategies. In the following, we discuss the overall role of stakeholder engagement in achieving efficient transportation strategies.

3. Stakeholder engagement in transportation strategy development

The concept of stakeholder refers to those categories of individuals or organizations that have a stake in an organization (Mori, 2010). According to (The Project Management Institute (PMI), 2008), project stakeholders are groups which are actively taking part in a project or those likely their interests can be affected by the consequences of project implementation or completion. As much cited, the definition of stakeholder has been formulated by (Freeman, 1984), where the stakeholders are defined as any individual or group of individuals that can influence or are influenced by the achievement of the organization's objectives (Macharis, 2005). It has been supported by any researchers that when project stakeholders take part in different stages of projects, several benefits can be gained (Skitmore et al., 2012; Tam et al., 2009). (Li et al., 2012) pointed out that stakeholders are formed by the people who can potentially affect the project process, whose have positive and negative impacts on their living environment and have direct benefits and/or losses from the project implementation. According to (Atkin et al. 2008), it is inevitable to identify and analyze the concerns of stakeholders in projects during the participation process as to reach a consensus on project process and to avoid project disputes and failures.

Stakeholders engagement is considered as the process of involving stakeholders concerns, needs and values in the decision-making process, with the goal of achieving more informed, transparent and efficient decisions (Cascetta et al., 2015; Cascetta et al., 2013, Kelly et al., 2004). Several researchers have pointed the importance of involving the

stakeholders in the project realization regarding many fields. In transportation sector, the participation of stakeholders is emerging as a basic component of the establishment of efficient transportation strategies in which the human and financial resources have to be dedicated from the beginning of process (Le Pira, 2015). In fact, the transport policy has become a multi-agent, multi-sector and multi-modal process which must balance and engage with a wide-range of interests, issues and policy areas (Booth et al., 2001).

It has only been in more recent years that the stakeholders have become engaged in making the transportation decisions, and invited to give their ideas and express their needs and concerns. The awareness of including the stakeholders in the transportation strategy-making is a consequence of the failure of many projects because of lack of consensus building. Stakeholder involvement and participation become fundamental to find an alternative being the best trade-off between the most shared solution based on consensus building and the optimal one based on the results of technical evaluations (Le Pira, 2015).

In transportation sector, there are lots of decisions concerning several issues, with diverse stakeholders involved from organizations to citizens. Stakeholders can be grouped under three broad categories: government/authorities, businesses/operators and communities/local neighborhoods (Kelly et al., 2004). Examples of each are shown in the table below.

Table 1 Typical stakeholders involved in transport strategy making process according to (Kelly et al., 2004)

Government/Authorities	Businesses/Operators	Communities/Local neighborhoods
Ministry of Transport	Transport Operators/providers	Transport Users
Other National Ministries	Private Financiers	Citizens
Local Authorities	National Business Associations	Media
Politicians	Major Employers	Transport user association
National parliament	Retailers	Environnemental association
Local Authorities (Provinces and municipalities)		

Selecting the most effective technique for engaging stakeholders among various engagement tools, which are widely described in (Cascetta et al., 2013) like workshops and interviews, has become a necessary in order to reach a viable and accepted solution to the transportation problem.

Different levels can be identified and adopted in the stakeholder engagement process. (Kelly et al., 2004) have proposed five levels of stakeholder engagement. The first level is the “stakeholder identification”, the second one which is “listening” deals with collecting information about stakeholder expectations, requests and concerns. The third level of “information giving and gathering” or “communication” deals with describing the alternative ways of providing information to different stakeholder groups, and obtaining general feedback on transport proposals. “Consultation” is the fourth level in which decision-makers listen to the different points of view of the selected stakeholders on the proposed project. Finally, in the fifth level of “participation”, the groups, who are directly interested, become joint partners of the project choice and in the project implementation. From a similar point of view, (Erkul et al., 2016) proposed different levels of stakeholder engagement process, from the identification of stakeholders to be involved, consultation and informed participation to negotiation and resolution of concerns.

A good overall stakeholder engagement will end the complaints and worries, stopping the community from coming to a limit which can cause damage to business performance (Erkul et al., 2016). An effective engagement of stakeholders in making efficient decisions has many benefits. These include:

- Better quality transport strategies and schemes;
- Reductions in costs and delays to a project;
- Smoother implementation of the transport project.

In fact, the interaction among the stakeholders increases the degree of consensus of the collective decision. (Le pira et al., 2015) affirmed that interaction among stakeholders is fundamental for the success of the participation process because it allows reaching more shared decisions. (Le pira et al., 2013) added that the social interaction is a key of success in transport planning, because it fosters the emergence of coalitions among stakeholders towards a shared solution. (Le pira et al., 2013) considered that studying the stakeholder network and the opinion dynamics can help to understand how to make a good involvement process and can be helpful to make the planning process transparent, effective and cost efficient. Moreover, (Mori, 2010) considered that involving stakeholders in strategic decision-making results in a process characterized by rationality and intuition, in the sense of that because of the gathering of

rich information from a variety of stakeholders characterized by different backgrounds, perspectives, and levels of expertise, the decision makers enter into decision situations with known in order to determine the value of the possible consequences of an action and develop a set of alternative actions to select the optimal alternative that is expected to best achieve one's goals or objectives (Mori, 2010; Kørnøv et al., 2000).

Several researchers have highlighted the importance of involving the stakeholders in developing efficient and effective transportation strategies. Table 2 provides a summary of various studies on stakeholder engagement in transportation strategy development. For example, (Erkul et al., 2016) discussed the large number of benefits of involving the stakeholders and taking their views into consideration in transportation projects. (Bickerstaff et al., 2002) noted that stakeholder participation should be fitted into all stages of the transport strategy making process. (Gil et al., 2011) presented the methodology and results of a participative transport management planning model. All the relevant stakeholders were involved in the development process of a sustainable transport strategy. (Hensher et al., 1999) emphasized that an efficient and effective freight transport strategy can be aided by early professional contributions from key stakeholders. They noted that the development of freight transport strategies needs to investigate the interests of the various sectors of the industry in depth. Furthermore, reference (Al Nahyan et al., 2012) noted that multiple stakeholders including government agencies, sponsors/clients, management firms, consultants and contractors influence the various stages of the transportation infrastructure development. He highlighted the need for effective communication, coordination and knowledge sharing amongst the stakeholders in all stage of project development.

In addition, (Granger et al., 2016) stressed that the truly effective transport will only develop if all stakeholders work together. (Statopolous et al., 2012) highlighted the importance of recognizing and adequately understanding the concerns of different stakeholders and their problem identification with respect to urban freight transportation in order to introduce urban transportation policies successfully. Also, (Puckett, 2012) pointed out the importance of recognizing the concerns of different stakeholders in the introduction of city logistics policies. (Sussman et al., 2005) stressed the importance in bringing in stakeholder participation early on in the transportation strategic process. (Vieira et al., 2014) proposed different approaches based on the multi-agent paradigm in solving transportation problems. Therefore, there has been a movement towards the development of transportation strategies in more in more participative way. In the following, we propose a transportation strategy development process that effectively involves the stakeholders in all the phases of the process in order to guide in making the appropriate and the most participative transportation strategy.

Table 2. A summary of articles dealing with stakeholder engagement in transportation strategy development

References	Emphasized issues
(Erkul et al., 2016)	The importance of Stakeholder Engagement in Mega Transport Infrastructure Projects
(Bickerstaff et al., 2002)	The rhetoric and realities of public involvement in transportation planning
(Gil et al., 2011)	Stakeholders participation in municipal transport planning processes
(Hensher et al., 1999)	The importance of involving stakeholders in the formulation of a freight transport strategy
(Al Nahyan et al., 2012)	The need for effective communication, coordination, knowledge sharing among all concerned stakeholders in the development of transport infrastructure.
(Granger et al., 2016)	The involvement of concerned stakeholders in the development of a better European transport system
(Statopolous et al., 2012)	Stakeholder reactions to urban freight policy innovation
(Puckett, 2012)	The importance of recognizing the concerns of different stakeholders in the introduction of city logistics policies
(Vieira et al., 2014)	Strategies for agents participating in combinatorial auctions in the transportation planning of oil derivatives
(Sussman et al., 2005)	Approach based on stakeholder engagement to Transportation Planning process
(Vigar, 2006)	Deliberation, Participation and Learning in the Development of Regional transport Strategies
(Le Pira, 2013)	Role of stakeholders interaction in making appropriate transport decisions

4. A process for developing transportation strategy based on stakeholder engagement

In order to develop an efficient and efficient transportation strategy in more participative way, we propose a transportation strategy development process that effectively involves the stakeholders in all the phases of the process. As depicted in figure 1, the process involves four stages while involving the stakeholders into. We have adopted the five levels of stakeholder's engagement proposed by (Kelly et al., 2004) which are previously described. We have also been inspired by the same work of (Kelly et al., 2004) in developing the transportation strategy development process.

The first stage of the proposed model identifies the transportation strategy development context as well as the stakeholders to be involved in. It also defines, while involving the stakeholders concerned, the objectives that must be achieved in order to reach the final goals related to the transportation strategy, the constraints and the key performance indicators that should be established, so the effectiveness of the transportation strategy can be assessed. The second stage involves the generation of the transportation strategy options, then a technical analysis (e.g Multi Criteria Decision Analysis methods) of each option is undertaken in order to determine the best option that meets the stated objectives and the targets set for the key performance indicators, while taking into account the views of stakeholder groups. The third stage includes all necessary preparatory of resources needed in order to bring the

scheme to the point of operation, this stage can be supported by the participation of the stakeholders. Finally, the fourth stage involves an evaluation of the outputs of the implemented alternative in order to determine whether the objectives have been met.

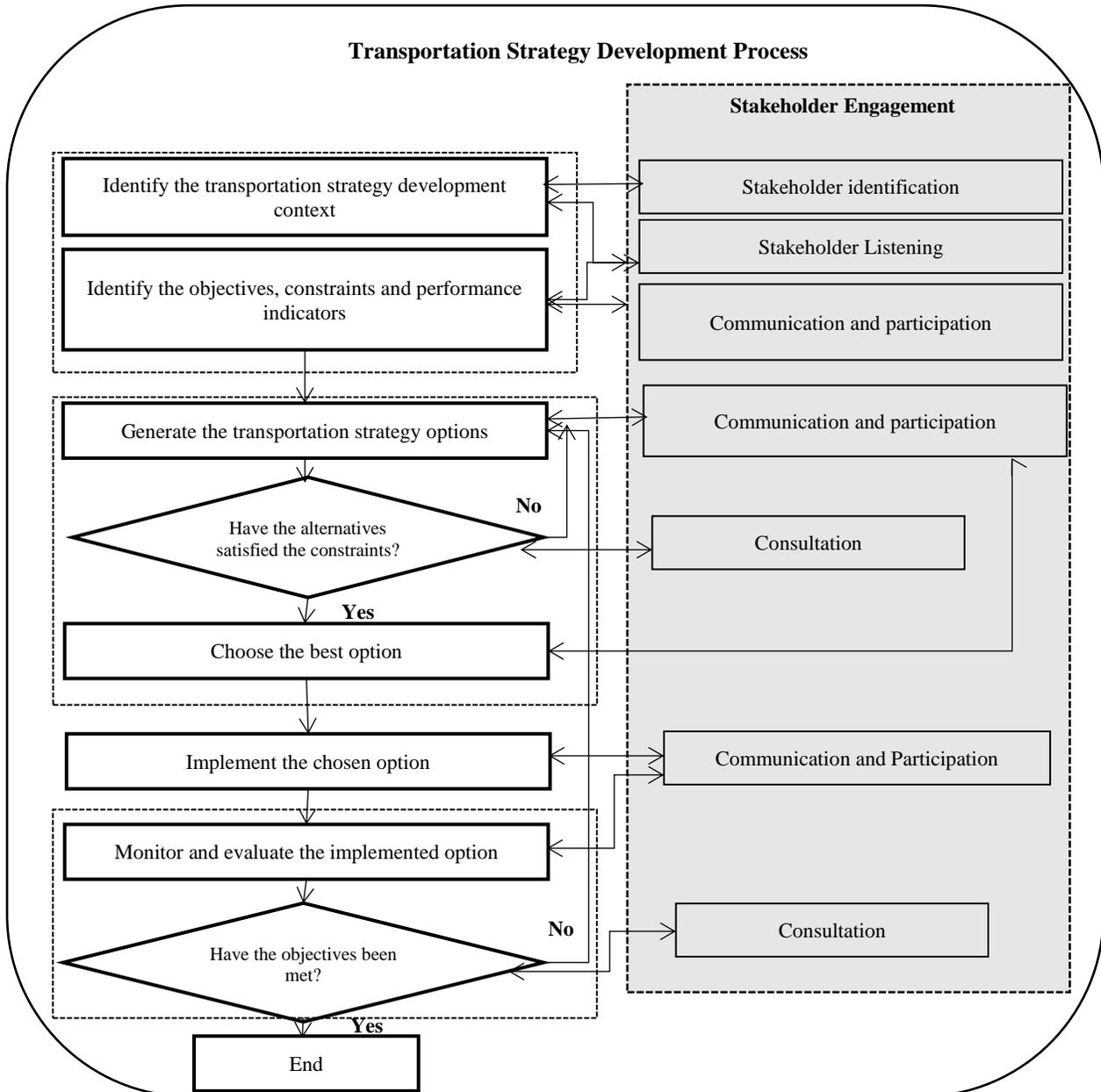


Figure 1. A transport strategy developing process based on stakeholder engagement

By engaging the stakeholders in the transportation strategy development process, a transparent and participative atmosphere can be created to reach successful outcomes. In this respect, the transportation managers should focus on the stakeholder engagement as a basic component in developing successful transportation strategies.

Conclusion

The development of an efficient and efficient transportation strategy needs to investigate the interests of various stakeholders. This paper presented a transport strategy developing process based on stakeholder engagement to help

transportation managers in making the appropriate transportation strategy. This process provided an effective stakeholder engagement in all its phases.

A literature review on the developed transportation strategies and on the stakeholder engagement in the transport strategy design is presented. Based on this review, we were able to highlight the importance of involving the concerned stakeholders and taking their views into consideration into all stages of the transport strategy making process.

In terms of perspective, this transport strategy development process will be extended to comprise all the components of a transport strategy in a supply chain. Furthermore, this process will be applied to a real case study of a pharmaceutical supply chain .

Acknowledgements

This work was conducted within the research project RSCM2015-2018. We would like to thank the Moroccan MS, MESRSFC and CNRST for their support.

References

- Al Nahyan, M. T., Sohal, A. S., Fildes, B. N., & Hawas, Y. E. Transportation infrastructure development in the UAE: Stakeholder perspectives on management practice. *Construction Innovation*, vol. 12, no 4, p. 492-514, 2012.
- Atkin, B., & Skitmore, M. Editorial: stakeholder management in construction. *Construction Management and Economics*, vol. 26, no 6, p. 549-552, 2008.
- Bae, C. H. C., & Suthiranart, Y. Policy options towards a sustainable urban transportation strategy for Bangkok. *International Development Planning Review*, Vol. 25, no. 1, pp. 31-51, 2003.
- Baykasoglu, A. and Kaplanoglu, V. Evaluating the basic load consolidation strategies for a transportation company through logistics process modelling and simulation, *Int. J. Data Analysis Techniques and Strategies*, Vol. 3, No. 3, pp.241–260, 2011.
- Bickerstaff, K., Tolley, R., & Walker, G. Transport planning and participation: the rhetoric and realities of public involvement. *Journal of Transport Geography*, Vol. 10, no. 1, pp. 61-73, 2002.
- Booth, C., Richardson, T. Placing the public in integrated transport planning. *Transport Policy*, vol. 8, no 2, p. 141-149, 2001.
- Cascetta, E., Carteni, A., Pagliara, F., & Montanino, M. A new look at planning and designing transportation systems: A decision-making model based on cognitive rationality, stakeholder engagement and quantitative methods. *Transport policy*, Vol. 38, pp. 27-39, 2015.
- Cascetta, Ennio, and Francesca Pagliara. Public engagement for planning and designing transportation systems, Vol. 87, pp. 103-116, 2013.
- Crainic, T. G. (2003). Long-haul freight transportation. In *Handbook of transportation science*. Springer US, pp. 451-516, 2003.
- David A.Hensher, Thomas F. Golob. Searching for policy priorities in the formulation of a freight. *Transportation Research Part E*, vol. 35, pp.241±267, 1999.
- Dodgson,M.,Gann, D., Davies, A.. Innovation strategy in new transportation systems: The case of Cossrail. *Transportation Research Part A* , Vol.77,pp.261–275, 2015.
- Erkul, M., Yitmen, I., & Çelik, T. Stakeholder Engagement in Mega Transport Infrastructure Projects. *Procedia Engineering*, Vol. 161, pp. 704-710, 2016..
- Freeman, R. E. Strategic Management: A stakeholder Approach, *Pitman*, Boston, 1984.
- Gil, A., Calado, H., & Bentz, J. Public participation in municipal transport planning processes—the case of the sustainable mobility plan of Ponta Delgada, Azores, Portugal. *Journal of Transport Geography*, Vol.19, no.6, pp. 1309-1319, 2011.
- Jacyna, M. Cargo flow distribution on the transportation network of the national logistic system. *Int. J. Logistics Systems and Management* , Vol. 15, Nos. 2/3, pp.197–218, 2013.
- Kelly,J.,Jones,P.,Barta,F.,Hossinger,R.,Witte,A.,Christian A Successful transport decision-making: A project management and stakeholder engagement handbook. *Guide maps consortium*, 2004.
- Kørnø, L., & Thissen, W. A. Rationality in decision-and policy-making: implications for strategic environmental assessment. *Impact assessment and project appraisal*, Vol. 18, no. 3, pp. 191-200, 2000.
- Le Pira, M., Ignaccolo, M., Inturri, G., Garofalo, C., Pluchino, A., & Rapisarda, A. Agent-based modelling of Stakeholder Interaction in Transport Decisions. In *Selected Proceedings of the 13th World Conference on Transport Research (WCTR)*, 15th-18th July, 2013.

- Le Pira, Michela, G.Inturri, M.Ignaccolo, A.Pluchino. Analysis of AHP methods and the Pairwise Majority Rule (PMR) for collective preference rankings of sustainable mobility solutions. *Transportation Research Procedia* Vol. 10, pp. 777-787, 2015.
- Li ,T.H.Y., Skitmore, S.T. Ng, M. Conflict or consensus: An investigation of stakeholder concerns during the participation process of major infrastructure and construction projects in Hong Kong. *Habitat International*, Vol. 36, no. 2 , pp. 333-342, 2012.
- Macharis, C. The importance of stakeholder analysis in freight transport, *European Transport Journal*, no. 25-26, 2005.
- May, AD. and Robert ,M. The design of integrated transport strategies. *Transport policy*, Vol. 2. No.2, pp. 97-105, 1995.
- Meyer, MD. Demand management as an element of transportation policy: using carrots and sticks to influence travel behavior, *Transportation Research Part A*. Vol. 33, pp. 575±599, 1999.
- MORI, Neema. Roles of stakeholders in strategic decision-making of microfinance organizations. *International Business & Economics Research Journal*, vol. 9, no 7, pp. 51-64, 2010.
- Morichi, S. long-term strategy for transport system in Asian megacities. *Journal of the Eastern Asia Society for Transportation Studies*, Vol. 6, pp. 1 - 22, 2005.
- Project Management Institute (PMI). A guide to the project management body of knowledge (4th ed.). *Pennsylvania: PMI*, 2008.
- Puckett, S. M. Improving our understanding of freight travel decision making: motivations, constraints, incentives and interactions. *Travel Behaviour Research in an Evolving World*, 169, 2012.
- Richard J. Granger, Tomasz Kosmider. Towards a better European transport system. *Transportation Research Procedia* , Vol. 14, pp. 4080 – 4084, 2016.
- Saranen, J., Szekely, B., Hilmola, O-P. and Toikka, T. Transportation strategy in international supply chains – the case of Russia. *Int. J. Shipping and Transport Logistics*, Vol. 2, No. 2, pp.168–186, 2010.
- Skitmore M., T.H.Y. Li, S.T. Ng. Public participation in infrastructure and construction projects in China: from an EIA-based to a whole-cycle process. *Habitat International*, Vol. 36, no.1, pp 47-56, 2012.
- Stathopoulos, A., Valeri, E., & Marcucci, E. Stakeholder reactions to urban freight policy innovation. *Journal of Transport Geography*, Vol. 22,pp. 34-45, 2012.
- Sussman, J., Sgouridis, S., & Ward, J. New approach to transportation planning for the 21st century: Regional strategic transportation planning as a complex large-scale integrated open system. *Transportation Research Record: Journal of the Transportation Research Board*, no. 1931, pp. 89-98, 2005.
- Tam, C.M., Zeng, S.X., Tong, T.K.L.. Conflict analysis in public engagement program of urban planning in Hong Kong”. *Journal of Urban Planning and Development*. Vol. 135, no. 2, pp. 51-55, 2009.
- Te Brömmelstroet, M., & Bertolini, L. Integrating land use and transport knowledge in strategy-making. *Transportation*, vol. 37, no 1, p. 85-104, 2010.
- Vieira, K.P. and Tacla, C.A. Strategies for agents participating in combinatorial auctions in the transportation planning of oil derivatives. *Int. J. Logistics Systems and Management*, Vol. 17, No. 3, pp.261–274, 2014.
- Vigar, G. Deliberation, participation and learning in the development of regional strategies: transport policy making in North East England. *Planning Theory & Practice*, Vol. 7, no. 3, pp. 267-287, 2006.

Biography

Afaf Haial is a PhD student in Modeling and Decision Support - Supply Chain Management research structure at Ecole Mohammadia d'Ingénieurs (EMI) at Mohamed V University. She received her engineering's degree in industrial engineering from the Ecole Nationale Supérieure des Mines de RABAT (ENSMR) in 2013. Her main research interests are supply chain management, transport policy with a special focus on pharmaceutical products.

Dr. Abdelaziz BERRADO is an Associate Professor of Industrial Engineering at EMI School of Engineering at Mohamed V University. He earned MS/BS in Industrial Engineering from same institution, an MS in Industrial and Systems Engineering from San Jose State University, and a PhD in Decision Systems and Industrial Engineering from Arizona State University. His research interests are in the areas of Data Science, Industrial Statistics, Operations and Supply Chain Modelling, Planning and Control with application in different industries. His research work is about developing frameworks, methods and tools for systems' diagnostics, optimization and control with the aim of operational excellence. He published several papers in international scientific journals and conferences' proceedings. In addition to academic work, he is a consultant in the areas of Supply Chain Management, Data

Mining and Quality Engineering for different Industries. He was also a senior engineer at Intel. He is member of INFORMS and IEEE.

Dr. Loubna BENABBOU is an Associate Professor of Industrial Engineering at Ecole Mohammadia d'Ingénieurs (EMI) at Mohamed V University. Her research work lie in the application of decision/ management sciences and machine learning techniques to transform data for making better decisions and improving operational processes. Dr Benabbou has been supervising several undergraduate and graduate students in projects for different Industries related to the areas of Decision sciences, Data valorisation and Operations Management. Several of her research paper related to these fields has been published in international scientific journals and conferences' proceedings. She was also a trader at Casablanca stock-exchange and financial analyst and risk manager at the Caisse Marocaine des retraites the Moroccan largest intuitional fund manager. She is member of INFORMS, IEEE and International society of MCDM. Dr Benabbou is an industrial engineer from EMI, she earned MBA and PhD in Management and Decision sciences from Laval University.