Recent Developments in City Logistics Research: A Literature Review

S Istiqomah\textsuperscript{1*}, Yuniaristanto\textsuperscript{2} and W Sutopo\textsuperscript{2}

\begin{itemize}
  \item \textsuperscript{1} Master Program of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret Surakarta, Indonesia
  \item \textsuperscript{2} Department of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret Surakarta, Indonesia
\end{itemize}

Email: silviistiqomah23@gmail.com

Abstract. City logistics is an important problem of the modern urban logistics system that needs to be resolved. In this review, we can integrating economic, environmental, and social dimensions problem to analyze the relevance of urban logistic issues and to identify gaps. This problem require cooperation between several type of stakeholders. The stakeholders have different objectives and decision spaces. We identify some information and research, so this literature review can contribute to the evolution of knowledge management. The literature review can develop opportunities and challenges for understanding about development of city logistics.

1. Introduction

The city is a place for community activities concerning the economy, social activities, and the biggest politics. In the times, shipping goods became one of the important activities and had a significant impact on the condition of the community. A lot of community comments about the impact received from the city logistics, there are good impacts that can be beneficial, there are also negative impacts that make people's lives worse. With this problem, the development of urban logistics needs to be analyzed to sustain the life of the city and business activities that encourage the growth and development of the city.

City logistics is one of the most widely debated problems in most cities in the world. Current issues are related to phenomena such as urbanization or the revival of people's expectations of the level of well-being [1]. With existing developments, city logistics is influenced by several sectors, infrastructure, social, economic, and environment. With the linkages between sectors, this research is expected to be able to provide advice or development for integrated city logistics problems. Many things need to be regulated regarding city logistics in order to achieve mobility, sustainability, and life in the city [2]. The design and planning of city logistics produced will have an impact on people's welfare and good social conditions [3]. One of the most important things and has a significant influence on city logistics is stakeholders. There are some of the most important stakeholders, namely shippers, shippers, local governments and residents (consumers) who maintain different goals and perspectives towards their own goals [4]. Differences often occur between the interaction of private and public stakeholders [5]. Given the differences between several stakeholders, stakeholder behavior needs to be considered in evaluating city logistics activities [6]. City logistics is regulated with the aim to plan, manage, and control the movement of goods efficiently and effectively in networks between regions in a city to reach an optimal point by considering the results of integration of several different stakeholder goals [7].
purpose of this paper is to present various aspects of urban logistics and current trends to provide a comprehensive view of this broad field of research. Then research trends in urban logistics are used to identify more aspects that are not being addressed.

2. Framework for The Review

The review framework of the results of this study is based in part on the analysis of the urban transport domain by Odgen in Anand (2012). The author explores several things about city logistics by studying stakeholders, descriptors, and the objectives associated with them. In addition, this review literature will explore the solution approaches and methods used to solve existing problems. In this chapter, we explain some problems related to city logistics. With the presence of various stakeholders related to city logistics, there are several perspectives used in developing this review.

Relationships that occur between stakeholders have different impacts for each stakeholder involved. In addition, there are several other impacts generated by the city logistics in the environmental and social sectors. The movement of goods is influenced by various parameters (e.g., infrastructure conditions, industrial structures) and on the other hand, it affects different parameters (e.g., congestion, accessibility, pollution, etc.). Causes and effects of the movement of goods are also interdependent. According to various market segments, the stakeholders that influence the domain of urban transportation are mainly 1) Producers & Shippers, 2) Freight Transport and Logistics Operators, 3) Receivers, 4) Residents, 5) Public Authorities, 6) Other Stakeholders. Private stakeholders seek to maximise profits, and there is thus an implicit need to achieve a reduction in transportation costs as well as an increase in sales, while keeping in mind that their customers expect a service that is both economical and reliable. In the discussion of the stakeholders involved, the original intent and purpose of engagement must be known, the method used, the participants, a summary of stakeholder concerns, expectations and perceptions, a summary of the discussion, and a list of strong outputs (decisions, actions, proposals, and recommendations).

Some researchers discuss and analyze various perceptions, needs, goals, and perspectives from stakeholders to address different problems in city logistics. The main purpose of the decisions they make is to increase the potential and actions that will be realized. According [38] relies on inter-city public transportation with rail-based by analyzing stakeholder goals and interests. According [37] tried to consider the key factors for city logistics by considering various stakeholder perspectives. According [35] point to the importance of considering diverse preferences among stakeholders for local policy makers with compilation preferences. According [36] focused exclusively on stakeholders' perspectives to design and evaluate last mile solutions. They first presented different criteria for three types of stakeholders: industrial, institutional and consumer; secondly developed stakeholders' interactions with respect to their interests and finally the proposed conceptual framework to demonstrate the key considerations of stakeholders.

3. Research Methodology

There are methods used to produce this paper, some methods obtained from the literature review have the same procedures adopted in various fields of research [8][9][10]. The present study adopts the eight step methodology proposed by [41] to conduct the SLR: (i) research problem formulation, (ii) literature search, (iii) data collection, (iv) quality assessment, (v) data analysis and synthesis, (vi) interpretation, (vii) presentation of results, (viii) and updating of the review. From the first stage, we formulated the problem to be solved. In this report, the problem to be solved is about city logistics. The second stage is looking for literature to add references in problem solving and problem viewpoints, in this stage some literature has been obtained from 2010 to 2020. In the third stage, there is no primary data taken from research, data obtained from several news, conditions and current research. For the fourth stage, it does not produce anything significant because the research conducted only compares the various studies that have been done to obtain solutions to the current problems. The next stage regarding analysis, this analysis is drawn from the various conclusions of each study that has been conducted. the final stage is
the interpretation of results and conclusions from various studies that have been conducted to determine trends and gaps regarding city logistics.

The first thing to do is to determine the topic from the literature review that will be discussed. Then look for papers and discussions that are relevant to the topic to be discussed. Then analyze the data that has been obtained to find out the objectives that can be done for the development and literature study of the paper that will be produced. The first step is to look for keywords that are relevant to city logistics with the scientific platform Scopus and Web of Science released since 2010. Then for supporting material obtained from several articles related to the citation relationship contained in the selected paper. From the selected paper, it can be the primary data used to discuss the development of city logistics. After several papers have been obtained, they will be chosen based on the topics to be discussed. The document filtered according to the review title and abstract of each existing paper. Last step, the document filtered again based on full paper that has a relationship with the topic to be discussed. Literature review data obtained from 2010 to 2020, filtered based on Review articles and Research articles, and filtered based on each sub-theme to be discussed, then selected articles that are full text review.

4. City Logistics Modeling

Some things that will be discussed in this literature study are about stakeholders, the relationship between stakeholders activities (descriptors), the purpose of each research conducted, the solution approach, and the method used in each problem solving.

4.1 Stakeholder

In this chapter discusses several sub-chapters that have a direct relationship with city logistics. The first thing that will be discussed is the stakeholders involved. In the development of urban logistics, there is a relationship between stakeholders involved. Knowledge is needed about the relationships between stakeholders and the roles of each stakeholder involved. The main stakeholders are shippers, transportation of goods, local authorities and residents (consumers) who have their respective goals and differ in the logistics scope of the city and these stakeholders have diverse perspectives on their own goals [4]. There are several difficulties discussed in the latest urban logistics development, the first difficulty is the high number of stakeholders involved from different circles and having their respective goals [11]. Often conflicting interactions usually occur between private and public stakeholders [5]. The next problem is the lack of real data on city logistics. there were some local authority stakeholders who were previously less interested in providing data because public stakeholders caused real data shortages in the context of city logistics [12].

City logistics involves several stakeholders in interactions, especially from the commodity, transportation and infrastructure sectors. The involvement of these stakeholders makes the attributes and behavior of each stakeholder need to be considered in the decision making and chosen business strategy. Stakeholders in the city transport domain can be divided into two categories: 1) public sector stakeholders which include traffic authorities, infrastructure authorities, cities, train terminals / port authorities etc. All these stakeholders can be referred to as "administrators". 2) Private sector stakeholders which include producers, suppliers, shippers, shippers, trucking companies, truck drivers, shop assistants, recipients, etc. So far the existing stakeholder classifications are only divided into senders, transporters and recipients.

4.2 Descriptors

Descriptors are the classification of activities and interactions among stakeholders [13]. In fact, this descriptor is a typical indicator that is observed, measured and analyzed to find out the results that can be used for the development of future urban goods movement. Analyzing the effects of several different descriptors provides insight into how the system works and how to modify the system to achieve the desired goals.
Table 1 Key urban freight and logistics stakeholders (Source: Bossche et al, 2017)

| Producers & Shippers | Freight Transport and Logistics Operators | Receivers |
|----------------------|------------------------------------------|------------|
| 1. Producing the goods.  
2. Often located outside cities.  
3. Some outsource transport and logistics operations.  
4. Others operate own fleet | 1. Visible face of urban freight logistics operations.  
2. Provide transport and distribution services.  
3. Highly heterogeneous group (small family companies up to major international transport companies).  
4. Hired by producers, shippers or receivers.  
5. Behaviour reflects the need to meet customers' requirements. | 1. Highly heterogeneous group: small retailers, international retail chains, shopping centres, households, etc.  
2. Each segment has specific demands (in terms of delivery time, transport conditions, pricing, etc.).  
3. Expect high quality of service (reliability, flexibility, short transit times) at reduced prices. |

| Residents | Public Authorities | Other Stakeholders |
|-----------|--------------------|--------------------|
| 1. May also be Receivers (ecommerce).  
2. Expect proper quality of life (no pollution, security, clean built environment, quiet green areas, charming leisure and shopping zones, etc.).  
3. Expect access to a wide range of high-quality goods at affordable prices.  
4. Expect customised and variety of goods. | 1. Commonly municipalities and local agencies  
2. Balance between promoting sustainable urban development and fostering economic growth.  
3. Limited intervention in urban freight logistics activities. | 1. Investors, Infrastructure providers, landowners, software providers, manufacturers, nongovernmental organisations  
2. Not directly involved in the urban freight logistics operations. |

Table 2 Urban freight descriptors (Source: adapted from Ogden in Anand, 2012)

| Market | Descriptor | Market | Descriptor |
|--------|------------|--------|------------|
| **Commodity** | Freight Generation  
Commodity Flow  
Industry Structure | Traffic Service | Traffic Design  
Traffic Flow  
Pollution Level |
| **Transport Service** | Vehicle Loading  
Vehicle Design  
Trip Generation  
Cost | Infrastructure | Land Use  
Location  
Building & Site Design  
Modal Transfer |

4.3 Objective
The framework carried out at the initial stage is to determine the research objectives and aspects related to the themes to be discussed. The complexity of aspects related to urban logistical problems has been facilitated by the development of technology. We try to broaden our views on some of the problems at hand and some alternative solutions used in city logistics. City logistics has a less stable trend in its completion. In the settlement used, it needs renewal in regulating policies and explaining their impact on the community. So that this development takes time to be accepted among the people. Infrastructure was approved recently because it concerns the claimed logistics efficiency of the city [14].

Most of the goals to be achieved still consider one stakeholder, so that the results of city logistics research have positive and negative impacts that can be felt directly by the community. Therefore the objectives of each stakeholder must be accommodated with the latest models or research. This is done so that city logistics can work efficiently and effectively. By synchronizing several objectives, the researcher can draw a conclusion that shows that the results achieved can make the city better condition for each aspect and stakeholders involved.

4.4 Solution Approach
There are several approaches used in dealing with urban logistics problems. According [33] divide into 3 approaches, the approach used is the policy, technology and planning approach. To explore the results of this review, a social approach is also carried out in order to understand the impact of city logistics in society, both in terms of economy, environment, and also the development that will be accepted by the community. Understanding of each approach taken needs to be known, this is needed to facilitate the classification of objectives and models of existing problem solving.

a. Policy: This model analyzes the appropriateness of the regulations used in city logistics and analyzes the impact resulting from the policies that are already running or planned for the environment and related stakeholders.

b. Planning: This model analyzes infrastructure planning or things that will be implemented to support the city's logistics success.

c. Technology and information: This model analyzes the technology that is developing, the technology that will be used, and the technology that is suitable for use in solving problems related to city logistics. This development needs to be analyzed to determine the impact produced by the technology that will be used in the development of city logistics.

d. Social: This model analyzes the social impacts resulting from various city logistics situations. several aspects that need to be considered so as not to cause harm or negative impacts on the community and also stakeholders associated with city logistics.

4.5 Method
There are several settlement methods used. Quantitative modeling methods, case studies, surveys, and experimental simulation. This method is a method that is widely used in solving existing city logistics problems. Some of the approaches taken aim to overcome various problems regarding city logistics, some of them only aim to minimize the negative impact resulting from a decision that is applied to city logistics. Multi-criteria analysis is used mostly as a qualitative method in city logistics, this is due to the large number of stakeholders involved with different interests. Various different goals to be achieved by each stakeholder make the method of completion and approaches so varied, this is done so that research can approach the real conditions. With the different types of problems, the solutions needed to suit each problem are needed. With a variety of ways of resolution, the resulting optimization will also vary. Therefore, the method used must also be in accordance with the problem to be solved. Neghabadi et al (2018) describe several methods that can be used to solve problems, this is explained in Figure 1.

Table 3 Description of Objective Problem (Source: Ogden and Woudsma in Anand et al (2015).)
| Purpose                  | Description                                                                                                                                                                                                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Economy                 | Develop and improve the transport system towards improving the local, regional and national economy  
                        | Focus on the trade sector that is directly related to the economic region  
                        | Focus on ports and intermodal facilities                                                                                                                                                                   |
| Efficiency              | Minimization or cost of travel for transportation operations related to endroute travel, endpoint activity and energy  
                        | Focus on congestion, transportation of goods, and the cost of transporting goods  
                        | Lack of road networks including road design and geometry, maintenance, road boards, management of regional traffic and capacity associated with the main road  
                        | Costs at the end point (endpoint costs) associated with loading and unloading, parking, activities at the terminal, operating hours and the way in and out to the location  
                        | Energy costs related to vehicle speed, as well as character and delivery type                                                                                                                                 |
| Safety on the road      | Minimization of property damage, accidents and deaths related to accidents  
                        | Focus on policies related to traffic management, road design, vehicle design, driver training and land use                                                                                                                                                      |
| Environment             | Focus on agreed mitigation, air and vibration Threats received by large vehicles and activities taken in residential areas                                                                                                                                              |
| Infrastructure and Management | Adjustment of education costs through regulations, price controls, taxation and investment  
                        | Road construction and maintenance with the help of the freight forwarding sector                                                                                                                                                                                |
| Urban Structure         | Focus on the interaction between transport facilities and urban structures including the interaction between cargo and urban structure, the size of the city and the effect on transport costs, and the load as urban land users |

**Figure 1. Method Category**
5. Recent Development

All aspects of contribution have a relationship. Existing aspects have been active in their own fields, if these aspects have poor performance or poor decisions, if one of the stakeholders does not consider the impact that will occur on the stakeholder or the negative impact produced, then this needs to be justified so that the logistics conditions of the city are comfortable for all communities. The various negative social, environmental and economic impacts of city logistics can be managed by city leaders. Developments occurring in the industrial world "Industry 4.0 (fourth industrial revolution)" can change and synchronize business content and related environments, this can be one of the pioneers of a dynamic market structure. With technology, the core idea of Industry 4.0 has been to use information technology that has emerged to implement the Internet of Things (IoT) and services, so that business processes and engineering processes can be well integrated, making it easy to process and monitor the results of developments that have been made. In addition, in depth so that production operates in a way that is flexible, efficient, and environmentally friendly with low quality and cost [15].

The Era of Digitalization is the most important thing in a business today, it is used in realizing a reliable and sustainable future transportation system and supply of goods. Digitalisation basically has the sense of capturing analog signals and turning them into digital forms for the purpose of producing digital representations that can be stored or processed electronically. The digital logistics ecosystem is based on four main driving factors: technology, processes, organization and knowledge [16]. The goal of a sustainable digital logistics ecosystem is to rethink digital-based business models and redesign the way business processes along the supply chain lead to sustainable development and to balance sustainability in terms of economic, social and environmental dimensions and reflect the interconnection between them [17].

5.1 Stakeholder

There are several stakeholders who have a goal in developing city logistics. The objectives of each stakeholder are different, some are still related and some are very different. But almost all want the costs in city logistics to be minimal and have a slight negative impact on society. All stakeholders of the city are interested, they all have a common goal of making the city attractive (economic, social, traffic, ecology, culture and others) [18]. Administrators, residents, shippers, freight carriers and urban expressway operators are stakeholders who are considered to arrange the transportation of goods and logistics inside urban and metropolitan areas [19].

5.2 Descriptors

Night delivery, logistics providers can make lower costs and shorter delivery times, and from the public, lower emissions and traffic density during the day can be reduced [20]. Using an e-grocery delivery system will help companies and consumers alike buy goods more easily, and the growth of e-grocery is more focused on strengthening customer loyalty and acquisition rather than economic benefits [21]. The scenario analysis produced by the simulation can be used to investigate the logistics and transportation of goods in relation to land use, delivery of demand and supply goods, logistics profiles and performance and impact of the road network [22]. City logistics measures that can be taken to regulate freight transport and logistics within urban and metropolitan areas, implementation measures require a full assessment of social costs and who has to abide by them [19]. With limited land and increasing logistics delivery activities, Urban Underground Logistics is one of the solutions that need to be studied and considered to get the optimal solution for several problems [23].

5.3 Method

To solve problems involving many stakeholders, the hybrid MCDM model is one of the methods used by combining the Delphi, AHP and SWARA methods [18]. Kayikci (2018) uses qualitative methods and connected semi-structured interviews to find out the benefits of the logistics digitalization process and test the impact of the sustainability of digitalization in logistics. According [42] used an agent-based model to investigate parking and shipping management systems together with UDCs. According [40]
used a nested logit model based on a survey in Rome to study stakeholder reactions to existing urban transport policies. According [35] discuss a special agent approach to increasing the awareness and ability of decision makers to make better decisions. Liu et al (2018) use simulation as one of the methods to solve urban logistical problems, the method used is a systematic architecture of dynamic optimization based on real-time information for sustainable reverse logistics. with the different goals of the stakeholders, the best solution is needed to produce a good and structured decision, so that it can be obtained in the development of consensus-based strategies [24]. According [39] SCOR simulation is the most suitable method used in measuring the performance of several stakeholders involved in the newspaper industry supply chain case. Analysis of environmental problems and Macro situations (PEST-SWOT) is a strategic analysis method that combines SWOT and PEST to identify the advantages, losses, opportunities and threats that will be generated, first used to analyze the internal and external factors involved [23]. According [34] using agent-based modeling methods in order to know the interaction between the stakeholders involved and netlogo as one of the tools to solve the problem of distributing newspapers to consumers who are scattered. gaps that occur in the quality and price of beef commodities are resolved by the supply chain model using Mix Integer Linear Programming (MILP), this is done so that the government can make good decisions to improve the existing conditions [25].

5.4 Objective

Political regulations that can integrate various community needs in city logistics [18]. Saskia et al (2015) explained that with e-grocery, purchasing goods from sellers to consumers is more efficient and easier, because technology can cut processes that usually require a lot of time. Kayikci (2018) explains the advantages of digitizing city logistics in three sustainable dimensions (economy, environment and society) more easily and attractively. The simulation method used can solve several problems at once, can reduce the total logistics cost, energy consumption, and the total logistics distance, optimize the configuration of logistics resources, and achieve sustainable reverse logistics services [26].

5.5 Solution Approach

There are several approaches taken in this city logistics problem. technological, political, planning and social approaches. Political initiatives are made to be used by the public in order to regulate their logistics business activities and make them sustainable [27-28]. e-grocery is a process of technological innovation using the internet, explaining supplier-retailer relationships more easily [21]. The results showed that the use of digital technology and applications in logistics within FMCG companies and transportation service providers have a large sustainability impact, especially the sustainability impact of digitalization. [29]. Internet of Things technology is used to build a supportive environment to get real time data and accurate data that can support the development of city logistics [27]. The agent-based modeling approach makes it possible to represent the city logistics domain in its original form by modeling the city logistics entity as an autonomous agent [30]. The simulation is able to point out the relations existing among city logistics measures, decision-maker choice dimensions by using a multi-stage demand model and a discrete choice approach for each decision level [22]. Smart City logistics on cloud computing model (Cloud Smart City logistics) is one of the methods used to achieve goals in an effective and efficient way, in addition to the many negative impacts that can be minimized by the development that is implemented in logistics activities. [31]. GIS is one of the technology tools that can support decision making that can consider several stakeholders involved to reach good decisions [32].

6. Conclusions and Suggestions

There are several developments that make the distribution of city logistics easier to do. One of them is by involving technology, this will digitize the flow of goods delivery so that we can track the location of goods easily. In addition, the number of parts in the shipping groove that can be trimmed, this will make the goods sent will immediately arrive at the desired destination. To digitize this process, it may
reduce the social and environmental impacts that will be caused. But further study is needed to discuss the optimization of the existence of technology for city logistics.

This literature study discusses the impact of digitalization in the field of logistics. In addition, the impact of adopting digitalization for the logistics process will be reviewed further. This research is a new approach to understanding the sustainability implications of logistical perspectives. Many problems occur in the development of urban logistics. One consideration is the goal of stakeholders. Many papers discuss stakeholder objectives, but many have not considered the multiple stakeholders involved. The goals of the multiple stakeholders involved can minimize problems that occur because of differences in the objectives to be achieved. Therefore, agent-based is one method that is done to achieve all the desired goals. The planned development is an underground logistics system to reduce pollution. But this needs more research to be ready to be implemented [23].

Smart logistics can be utilized in various forms. From services to consumers, RFID (Radio Frequency Identification), GPS, cloud computing, and other information technology into the logistics process, this can have a good impact so that it becomes efficient and cost-effective. The concept used by smart logistics does not have a significant difference with logistics 4.0. Important components for smart logistics will be connected to data, sophisticated analytics, autonomous decisions, and IoT. Therefore, smart logistics will make the process between e-commerce markets-sellers-logistics companies-and end customers more effective and efficient. So there is a synergy of utilities that are integrated end-to-end and ultimately have an impact not only in terms of profit for business, but also for human life itself. The company utilizes shipping needs with a technology-based logistics network. For example, with real-time tracking updates, alternative pick-up points, and package tracking options that can be utilized by consumers.

One of the developments carried out is the process of improvement that exists in the city logistics. This process makes the process easier to do. Further research is expected to be able to accommodate all the objectives of the stakeholders involved, then to minimize the negative impacts generated. One thing that needs to be eliminated is about the increased congestion, air credit, economic and social society. With digitalization, it is hoped that all parties can feel it.

References

[1] Bozzo, R., Conca, A., Marangon, F. (2014). Decision Support System for City Logistics: Literature Review
[2] Taniguchi, E., Thompson, R. G., Yamada, T. (2014). Recent trends and innovations in modelling city logistics. Procedia-Social and Behavioral Sciences, 125, 4-14.
[3] Rao, C., Goh, M., Zhao, Y., Zheng, J. (2015). Location selection of city logistics centers under sustainability. Transportation Research Part D: Transport and Environment, 36, 29-44.
[4] Taniguchi, E., Thompson, R.G., Yamada, T. (2012). Emerging techniques for enhancing the practical application of city logistics models. Procedia-Social and Behavioral Sciences, 39, 3-18.
[5] Gonzalez-Feliu, J., Taniguchi, E., d'Arcier, B. F. (2013). Financing urban logistics projects. From public utility to public-private partnerships. Chapter in "Sustainable Urban Logistics: Concepts, Methods and Information Systems", Part of the series EcoProduction, pp 245-265
[6] Tamagawa, D., Taniguchi, E., Yamada, T. (2010). Evaluating city logistics measures using a multi-agent model. Procedia-Social and Behavioral Sciences, 2(3), 6002-6012.
[7] Amaral, R. R., Aghezzaf, E. H. (2015). City Logistics and Traffic Management: Modelling the Inner and Outer Urban Transport Flows in a Two-tiered System. Transportation Research Procedia, 6, 297-312.
[8] Behrends, S. 2016. "Recent Developments in Urban Logistics Research - A Review of the Proceedings of the International Conference on City Logistics 2009-2013." Transportation Research Procedia 12: 278-287.
[9] Gahm, C., F. Denz, M. Dirr, and A. Tuma. 2016. "Energy-efficient Scheduling in Manufacturing Companies: A Review and Research Framework." European Journal of Operational Research 248 (3): 744-757.

[10] Wee, B. V., and D. Banister. 2016. "How to Write a Literature Review Paper." Transport Reviews 36 (2): 278-288.

[11] Maggi, E., Vallino, E. (2015) Simulating urban mobility and the role of public policies: the challenges of Agent Based Models.

[12] Russo, F., Comi, A. (2011). A model system for the ex-ante assessment of city logistics measures. Research in Transportation Economics, 31(1), 81-87.

[13] Anand, N., Quaka, H., Duina R.V., Tavasszy, L. (2012). City logistics modeling efforts: Trends and gaps - A review. The Seventh International Conference on City Logistics. Procedia - Social and Behavioral Sciences 39 (2012) 101 – 115.

[14] Jha, M. K., S. Shariat, J. Abdullah, and B. Devkota. 2012. "Maximizing Resource Effectiveness of Highway Infrastructure Maintenance Inspection and Scheduling for Efficient City Logistics Operations." Procedia - Social and Behavioral Sciences 39: 831-844.

[15] S. Wang, J. Wan, D. Li, C. Zhang, Implementing smart factory of industrie 4.0: an outlook, International Journal of Distributed Sensor Networks (2016).

[16] M. Stuermer, G. Abu-Tayeh, T. Myrach, Digital sustainability: basic conditions for sustainable digital artifacts and their ecosystems, Sustain Sci 12 (2017) 247-262.

[17] K. van Marwyk, S. Treppte, 2016 Logistics Study on Digital Business Models, Roland Berger, White Paper, 2016.

[18] Tadic, S., Zecevic, S., Krstic, M. (2018). Assessment of the political city logistics initiatives sustainability. Transportation Research Procedia 30 (2018) 285-294.

[19] Russoa, F., Comi, A. (2010). A classification of city logistics measures and connected impacts. Procedia Social and Behavioral Sciences 2 (2010) 6355-6365.

[20] Tadić, S.; Zečević, S. 2015. Integrated planning aimed at sustainability city logistics solutions (in Serbian: Integrisano planiranje u cilju održivosti rešenja city logistik), Tehnika, in press.Saska, S., Marei, N., Blanquart, C. 2015. Innovations in e-grocery and logistics solutions for cities. Transportation Research Procedia 12 (2016) 825 - 835. The 9th International Conference on City Logistics, Tenerife, Canary Islands (Spain), 17-19 June 2015.

[21] Comi, A., Rosati, L. (2013). CLASS: a City Logistics Analysis and Simulation Support System, Procedia - Social and Behavioral Sciences 87 (2013) 321 - 337 1877-0428.

[22] Chen, Z., Dong, J., Ren, Rui. 2017. Urban underground logistics system in China: Opportunities or challenges?. ScienceDirect Underground Space 2 (2017) 195-208.

[23] Rubini et al, 2018.

[24] Lupita, A., Rangkui, S.H., Sutopo, W., Hisjam, M. (2017). A supply chain model to improve the beef quality distribution using investment analysis: A case study. AIP Conference Proceedings 1902, 020003 (2017).

[25] Liu, S., Zhangb, G., Wanga, L. (2018). IoT-enabled Dynamic Optimisation for Sustainable Reverse Logistics. Procedia CIRP 69 (2018) 662 - 667.

[26] Tadić, S.; Zečević, S.; Krstić, M. 2014b. City logistics initiatives aimed at improving sustainability within existing context of urban area (in Serbian: Inicijative city logistik u cilju poboljšanja održivosti unutar postojećeg konteksta urbane sredine), Tehnika, 61(3): 487-495.

[27] Awasthi, A., Chauhan, S.C. 2012. A hybrid approach integrating Affinity Diagram, AHP and fuzzy TOPSIS for sustainable city logistics planning. Applied Mathematical Modelling 36, 573-584.

[28] Kayikci, Y. (2018). Sustainability impact of digitization in logistics. 15th Global Conference on Sustainable Manufacturing, Procedia Manufacturing 21 (2018) 782-789.

[29] Anand, N., Duinb, J.H.R. V., Tavasszy, L. (2016). Framework for modelling multi-stakeholder city logistics domain using the agent based modelling approach. Transportation Research Procedia 16 (2016) 4 – 15.
[30] Nowicka, K. 2014. Smart City logistics on cloud computing model. Procedia - Social and Behavioral Sciences 151 (2014) 266 – 281

[31] Guerlain, C., Cortina, S., Samuel, R. 2015. Towards a collaborative Geographical Information System to support collective decision making for urban logistics initiative. Transportation Research Procedia 12 (2016) 634 – 643

[32] Anand, N., Duina R.V., Quaka, H., Tavasszy, L. (2015). Relevance of City Logistics Modelling Efforts: A Review, Transport Reviews, 35:6, 701-719, DOI: 10.1080/01441647.2015.1052112

[33] Febriandini, I. F., Yuniaristanto, Sutopo, W., and Hisjam, M. (2019). Analysis daily newspaper distribution in Solo by Agent Based Simulation. IOP Conf. Series: Materials Science and Engineering 528 (2019) 012033

[34] Gatta, V., and E. Marcucci. 2016. "Stakeholder-specific Data Acquisition and Urban Freight Policy Evaluation: Evidence, Implications and New Suggestions." Transport Reviews 36 (5): 585-609.

[35] Harrington, T. S., J. Singh Srai, M. Kumar, and J. Wohlrab. 2016. "Identifying Design Criteria for Urban System 'Last-Mile' Solutions - A Multi-stakeholder Perspective." Production Planning & Control 27 (6): 456-476.

[36] Kiba-Janiak, M. 2016. "Key Success Factors for City Logistics from the Perspective of Various Groups of Stakeholders." Transportation Research Procedia 12: 557-569.

[37] Kordnejad, B. 2016. "Stakeholder Analysis in Intermodal Urban Freight Transport." Transportation Research Procedia 12: 750-764.

[38] Putri, A.S., Sutopo, W., Hisjam, M. (2017). Framework of Supply Chain Simulation Using SCOR Model in Newspaper Industry. 2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)

[39] Stathopoulos, A., Valeri, E. and Marcucci, E. (2012) Stakeholder reactions to urban freight policy innovation, Journal of Transport Geography, 22, 34-45.

[40] Thome, Antonio Marcio Tavares, Scavarda, Luiz Felipe, Scavarda, Annibal Jose, 2016. Conducting systematic literature review in operations management. Prod. Plann. Contr. 27 (5), 408e420.

[41] Wangapisit, O., Taniguchi, E., Teo, J.S.E. and Qureshi, A.G. (2014) Multi-agent systems modelling for evaluating joint delivery systems, ProcediaSocial and Behavioral Sciences, 125, 472-483.