

# EVALUATION OF THE USE OF PUBLIC SPACE IN CITIES: A PILOT-STUDY OF COMPETING USES INCLUDING URBAN LOGISTICS

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## **Abstract**

**Purpose:** During the last decade, the establishment of distribution systems in cities has attracted an increased interest in the society as well as in academia. City-logistic implies distribution of goods critical to the everyday life in a flexible urban environment with regard to public- and industrial stakeholder interests. Based on different stakeholder interests, there is a standing need to evaluate the use of public space (PS) in an urban environment. Yet, there is still an uncertainty about stakeholder interests as well as stakeholders rights to influence the use of PS in the urban environment. The purpose of this paper is to present a conceptual framework to evaluate the use of PS with regard to stakeholder interests.

**Research Approach:** A literature review of published research on city-logistics was conducted to create a framework for evaluation interests in PS. The conceptual framework includes the use of PS in urban environment. Based on the presented conceptual framework, stakeholder interests and rights to influence the usage of PS in an urban environment have been evaluated based on empirical data from a single in-depth case study of a Swedish city. Empirical data from participant observations and a survey questionnaire were used as empirical evidence in the evaluation.

**Findings and Originality:** The findings illustrate evaluation of stakeholder interests and rights to influence the use of PS in an urban environment. Main findings include enhanced understanding of different stakeholder interests. The paper contributes to the understanding of an issue that is important in implementing city-logistics, but still not much addressed in published logistics literature: the use of PS. The combination of published research on city-logistics, and analysis of different stakeholder's interests and rights to influence the use of PS provides interesting insight from which further research can be developed to enrich theory and management of city-logistics.

**Research Impact:** The paper contributes to existing research on city-logistics. In particular, it presents a conceptual framework to evaluate stakeholder interests' and rights to influence the use of PS for implementation of city-logistics.

**Practical Impact:** Managers are recommended to use the framework to evaluate stakeholder rights to influence the use of PS for city-logistic purposes.

**Keywords:** *City-logistics, public space, added values, framework.*

## **Introduction**

On September 25th 2015 the United Nations launched 17 goals for sustainable development of societies based on a mutual cooperation between authorities, the industrial sector, civil society and residents (United Nations, 2018). In addition, the number of residents in cities is expected to grow by 60 percent until 2030 (United Nations, 2016). Development of cities based on an expected increase of residents is addressed in UN sustainable goal 11 sustainable cities and communities, which emphasize sustainable development of services, energy, transportation, and housing for all city stakeholders (United Nations, 2018).

To enhance development of sustainable urban freight transport, city-logistic systems have been implemented in European countries such as The Netherlands, United Kingdom, and Portugal (Vaghi, 2013; Leonardi et al. 2014; Rooijen & Quak 2010). Published studies reveal that transport in urban environment is mostly operated by road (London Freight Data Report, 2014). In addition, residents in urban environments have become increasingly aware of factors that positively affect their standard of living, but require PS in the urban environment (Broere, 2016). It ought also to be noted that the PS used for speed reduction facilities to ensure safety for residents has increased as a result of concern about recent terrorist attacks (SvD, 2018).

Stakeholders in urban environments have different interests in city-logistics and interests may contradict with one another (Ballantyne, Lindholm & Whiteing, 2013). Because of this improvement of transport within urban environment requires involvement of all stakeholders (Lindholm & Blinge, 2014), and understanding of different stakeholder interests (Stathopoulos, Valeri & Marcucci, 2012). Further, the use of public space (PS) in the urban environment is linked to interests of administrators (i.e. local authorities), suppliers (i.e. distributors), carriers (i.e. transporters) property owners, receivers (i.e. business owners), residents and visitors. Despite numerous published papers on city-logistics, there is still a lack of studies which evaluate stakeholders' interests in PS within urban environments. To fill this gap, this paper presents a conceptual framework to evaluate the stakeholder interest and rights to influence the use of PS in urban environment, in accordance with the following formulated research question:

*How should the use of public space be evaluated based on different stakeholder interests?*

To answer the research question, the paper begins with a review of scientific papers on urban freight transport, city-logistics, and the use of PS in urban environments. Based on the literature review, a conceptual framework, to evaluate the use of PS based on stakeholders' interests and rights to influence the use PS in urban environment is proposed (Section 2). Next, the methodology and a case study of a street attached to a city-logistics system are presented (Section 3). To evaluate use of PS in an urban environment, the paper adopts the presented framework (Section 4). The paper ends with a results and discussion, managerial implications and suggestions for further research (Section 5).

## **Literature Review**

### **Stakeholders in city-logistics**

Ballantyne, et al. (2013), define stakeholders in city-logistics are "all that have an interest in the system of urban freight transport (individuals, groups of people, organisations, companies, etc.); whereas actors are those that have a direct influence on the system. Therefore, all actors are stakeholders, but not all stakeholders are actors." (Ballantyne et al. 2013, p. 98). Published research proposes that main stakeholders in city-logistics consist of:

- Administrators refers to local authorities who create opportunities and regulations to sustain attractive development of the urban environment.
- Suppliers, refers to actors involved in the shipment of goods increasing their efficiency and competitiveness.
- Carriers, refers to transporters who focus on to enhance efficiency and reduction of transport costs.
- Receivers, refers to offices, stores, restaurants, cafés, and end-customers who has a common interest in reliable transport of goods with a minimal impact on the urban environment. Large goods receivers in the cities are retailers and offices on the high streets.
- Residents, visitors, refer to individuals whose interest is a well-accessible, comfortable and lively city centre with reliable access to goods but who may be adversely affected

by goods transport. (Ballantyne et al., 2013; Urban Freight Initiative, 2016; Quak & Tavasszy, 2011)

Published research shows that stakeholders in city logistics have different interests and goals and this complication result in adverse impacts for the development of city-logistics initiatives (Ballantyne et al., 2013; Anand et al., 2012). For example, Anand et al., (2012) addresses severe impacts on decision making due to stakeholder goal conflicts. Stathopoulos et al., (2012) mention that the large number of stakeholders with different interests creates problems in city-planning, supported by Lindholm & Blinge (2014) who highlight the importance of including all stakeholders in plans to improve urban freight. In addition, published research shows that while public space is important for urban logistics activities so too is private space such as that used for warehouses and distribution centres (Hesse & Rodrigue, 2004). As a result it is important to recognise that the use of space in the urban environment is linked to ownership, market values, level of profitability, and user interests and rights.

#### The use of PS in the urban environment

The use of PS in the urban environment is affected by commercial interests and public interests. However, public interests in the use of PS such as for roads, curbs, pavements, are owned and managed by administrators, (i.e. local authorities) and used to enhance accessibility, safety and service in the urban environment. Because of this, PS is often taken for granted, sometimes with poorly defined and unclear rights to use them based on previous actions and practices.

#### Commercial interest in the use of PS

The review of published literature reveals that the commercial interest in the use of PS in the urban environment is used for out-door seating, loading zones for goods deliveries, and advertisement signs.

*Outdoor seating:* Restaurants and cafés provide outdoor seating for their guests especially during high season. This allows them to increase the productive space for accommodation of an increased number of customers (Heo, 2013). However, local regulations about outdoor seating differ between municipalities.

*Loading zones:* Efficient goods deliveries in urban areas require the presence of loading zones for loading and unloading of goods (Russo & Comi, 2010). The accessibility to loading zones in commercial areas decreases the total delivery time as well as dwell time of the vehicles by providing the space for parking during loading/unloading of goods. There are public loading/unloading zones, but also private loading zones and loading bays, which are designated only for the loading/unloading activities for certain goods receivers (Dezi et al., 2010; Giron et al., 2018).

*Advertisement signs:* Receivers (i.e. shops, offices, restaurants and cafés) sometimes occupy the public space with advertisement signs to attract visitors and customers. Published research also shows that the use of advertisement do not adversely affect road safety, since drivers must cope with a load of information from other vehicles, traffic- and direction signs, shop labels, and pedestrians (Yannis, et al., 2013). The advertisement signs may however impede pedestrian and traffic accessibility, pedestrian and traffic movement and visibility.

#### Public interests in interest in the use of PS

Public interests include the use of PS to enhance accessibility, safety and service in the urban environment.

#### PS to enhance accessibility

PS used in the urban environment to enhance accessibility includes the use of roads, pedestrian streets and pavements.

*Roads:* Due to competition from several stakeholders and spatial resource limitations roads in the urban environment are often heavily congested (Allen et al., 2014). This traffic impedes people and goods movement dramatically, impairs economic development and results in negative impacts on urban the liveability of cities (Browne et al., 2017). To decrease congestion in the urban environment, some cities have implemented congestion charging or road tolls. It ought however to be noted that road tolls reduce the congestion caused by private car users and not by goods transport (Holguín-Veras & Sánchez-Díaz, 2015).

*Pavements:* Pavements in the urban environment are mainly used for walking by pedestrians but also for parking of bicycles and transport vehicles during loading and unloading of goods. Due to the infrastructural design of cities the PS for parking of vehicles, to enhance accessibility of transports, and availability to pavements is limited. In addition, accessibility to PSs for loading or unloading of goods is often not taken into consideration in city- planning. Many municipalities also try to regulate PS used for parking of transport vehicles in busy areas (Giron et. al., 2018).

*Pedestrian streets:* In Europe there is a growing trend to pedestrianize the streets in the urban environment (Ballantyne, et al., 2013). This contributes to the liveability of the cities, making them more accessible and friendly for the visitors, increase retailers turnover, shop occupancy and value of the properties (Soni & Soni, 2016). To comply with interests of carriers due to pedestrian streets, goods transport are allowed to use parallel streets and then the final distance is made by foot or delivery vehicles are allowed to drive in during certain hours and/or to certain areas (Verlinde, Kin, Strale, & Macharis, 2016). Furthermore, regulations concerning the use of PS on pedestrian streets are still often unclear which contributes to conflicts between stakeholders' interests and misunderstandings in the usage of the pedestrian street.

#### PS to enhance safety

Due to recent terrorist attacks, the management of PS within European cities has received increased attention in order to find speed reduction mechanisms such as medians, pinchpoints, chicanes, vertical speed humps, lane shifts, and roundabouts. One of the measures successfully used by municipalities to ensure safety is using several speed reduction mechanisms (NACTO, 2018).

#### PS used to enhance service

PSs used to enhance service for residents and visitors in urban environment include customer parking and municipal service.

*Customer parking:* The availability of customer parking is considered to be an important service that creates an added value for visitors. Because of this receivers emphasize to have the PS used for customer parking close to their premises (Soni & Soni, 2016). However, research has been published which show that the availability of customer parking attracts additional visitors (Kumar & Ross, 2006). It ought also to be noted that customer parking is a source of financial income for municipalities.

*Municipal service:* PS used in the urban environment to provide municipal service that improve residents' quality of life (Hourie, et al., 2015), such as public waste collection points, and entry points to water and sewerage system. Allocation of the PS is conducted in compliance with regulations on safety and waste management. In addition, to provide safety and security as an added value for visitors, PS is used for tourist information signs (WTO, 1996).

#### A conceptual framework for evaluation of stakeholder interests in PSs

Evaluation of PS usage in urban environment is complex issue since interests and influence of stakeholders must be considered (Ballantyne et al. 2013). From the literature review, it emerged that the use of PS is linked to commercial and/or public interests. According to published literature, public

interests linked to use of PS has an indirect impact on the commercial interests (Figure 1) due to creation of added values for residents and visitors (e.g. customer parking, municipal service, accessibility)

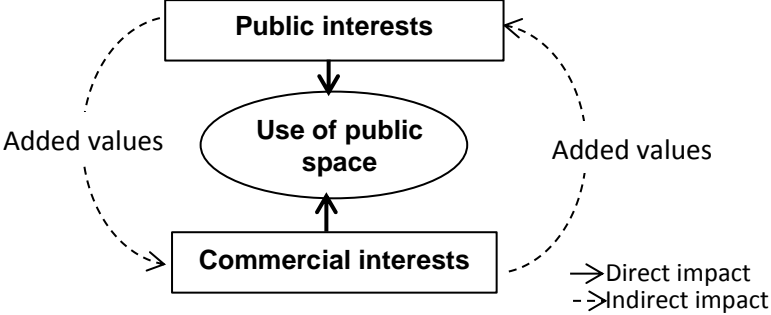


Figure 1 Conceptual framework for evaluation of stakeholder interests in public spaces

**Methods**

The objective of this paper is to evaluate stakeholder interest in the use of PSs in the urban environment. To comply with the objective, an iterative matching process between a developed conceptual framework, empirical data sources and analysis according to system combining has been applied (Dubois & Gadde, 2014). The conceptual framework was developed based on a literature-review of peer-reviewed papers published during 10 years (i.e. 2008 and 2018) in logistic and transport journals. Peer-reviewed papers were identified through a literature search based on the use of the keywords “city logistics”, “urban logistics”, “spaces”, “stakeholders” and a combination of the mentioned keywords in the titles, keywords and abstracts of peer-reviewed papers found in databases at Emerald (www.emeraldinsight.com), Wiley (www.wiley.com), Science Direct (www.sciencedirect.com) and Taylor and Francis. In addition to search in databases at publishing firms google scholar was used. The search ended up in an initial selection of 36 peer-reviewed papers. Next, duplicates in the initially selected papers were removed, which narrowed down the total amount of papers to 23. The peer-reviewed papers in the initial selection were then read to determine whether or not they matched the objective of the present paper. If the selected peer-reviewed paper matched the objective of this paper, it was selected for a final analysis. In total 11 peer-reviewed papers were selected for final analysis to be used as frame of reference and in development of the conceptual framework.

To evaluate stakeholder interest in the use of PS based on the developed framework, empirical data was collected from single casestudy (Yin, 2009) which consisted of a pilot study of a street attached to a city-logistics system. According to Dubois and Gadde, (2002), single-case studies are appropriate if the research problem includes interdependent variables. Since public interest in PS affect commercial interests, empirical data was collected from a single case study (Yin, 2009). The single case study included owners of restaurants/café with outdoor seating facilities, retailers (store managers) and managers employed at property owners and at the local authority (Table 1).

Stakeholder category	Stakeholder	Distributed questionnaires (No.)	Completed questionnaires (No.)
Receivers	Property owners	2	2
	Store	9	5
	Restaurant/café	3	2
Total:		14	9

Table 1 Stakeholders and questionnaires included in the study.

A questionnaire containing 12 semi-structured questions was used as source of empirical data. Structured questions focused on interest in the use of PS, and rights to use it in the urban environment based on the location of business and residents within buildings (i.e. ground floor; second floor; third floor; and fourth floor). In addition, the influence of the local authority, transporter, property owner, carriers and visitor interests was evaluated. Likert-scales ranged between 1 (i.e. low) to 5 (very strong) according to Trochim et. al., (2016) was used in used in evaluation of stakeholder interest and influence of stakeholder interests. Open-ended questions in the questionnaire included stakeholder opinions (Troost & Hultåker, 2016) about city-logistics, and estimation of revenues and costs linked to the use of PS. In total, the questionnaire was sent out to 14 respondents with a return of questionnaires from 9 respondents. In addition, empirical data from participant observations were used as an empirical source of evidence as suggested by Yin (2009).

## **Results and discussion**

This paper presents a conceptual framework to evaluate stakeholder interests in the use PSs in the urban environment. The results show that stakeholders' interests are linked to commercial interests and public interests in the use of PSs. Analysed results from the questionnaire and participant observations reveal that PSs in the urban environment are used for:

- Outdoor seating at restaurants and cafés: the PS is mainly used during April to October. During this period outdoor seating may act as a barrier to urban goods deliveries (both in access to establishments and in terms of finding spaces to unload).
- Loading zones: Loading zones: surprisingly, results from analysed questionnaire shows a lack of interest to use PS for loading zones. This is because stakeholders included in the study consider usage of PS for loading zones to be an issue for transporters.
- Advertisement signs: PS for advertisement signs should be considered on a year round basis. The use of advertisement signs is however sometimes a barrier for urban goods transport. This result was confirmed by one of the store owners who mentioned: "Our advertisement signs have been run-over several times by the transport companies, so we decided to place them on the building instead" (Owner, store 3).

Further, the results from analysed questionnaires retrieved from commercial business owners' shows a high interest the use of roads, pavements and pedestrian streets, followed by an average interests linked to the use of PS for municipal service, and an average or low interest in the use of PS to enhance security. Surprisingly, the results also show a low interest to use public spaces in the urban environment for customer parking and thus contradict research presented by Soni & Soni, (2016). One explanation for this is, however that the shared public space is very limited in the street under study resulting in limited interest from the stakeholders customer parking. This contradicts with the results from analysed questionnaires filled in by the property owners which show a high interest in the use of public space for customer parking.

The questionnaire also sought responses about the views of the selected stakeholders on which stakeholder should have the right to influence the use of public space. Results from the evaluation show that restaurants and cafés with outdoor seating, followed by stores located on the ground floor felt that they should have the greatest rights to influence the use of public space (presumably as such use has a direct business impact). The results also showed an interest from stakeholders to maintain a lively street with reliable access for visitors and residents. The analysis of the questionnaires indicated that the participating stakeholders considered that residents should have little or no right to influence the use of PS. This especially regards to residents on level 3 and level 4. This result requires special attention since the market price of residential city apartments in Sweden increases proportionally with the higher floor level of the apartment. Thus, a resident who owns an expensive apartment may face a view that they should have no or little right to influence the use of the PS

outside the building in which they live. The study showed that the participating stakeholders felt that administrators, carriers and suppliers should have very limited influence on the use of PS, while visitors should have no influence. However, according to analysed questionnaire results from the receivers, property owners should have great opportunities to influence the use of PS, and to decide how such space should be managed. This is an interesting result, since the streets are public spaces and thus should be managed by local authorities.

This paper targeted a limited amount of receivers and property owners on a single street in Sweden, hence, generalization is not appropriate. In addition, local authorities, carriers, and residents were also excluded as stakeholders in the study. Future research will be carried out to widen the representation to all categories of stakeholders and also to consider other streets and other cities. Finally, another avenue for future research relates to understanding costs and revenues linked to stakeholder maintenance responsibilities, and use of PS in the urban environment.

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