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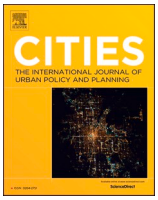

# Exploring Swedish urban freight stakeholders' interests in public spaces

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ABSTRACT

Urban stakeholders have divergent interests in the use of public space in cities and should be considered in city-planning of urban freight. This paper explores Swedish urban stakeholder's interests in the use of public space. A literature review on Urban Freight Stakeholders (UFSs) with direct impact on city-planning, and their interest' in the use of public space was conducted and used as a theoretical foundation in a cross-case analysis of two Swedish cities. Forty-five semi-structured interviews, and forty-one answers from a multiple-choice question were used as empirical data in the evaluation of UFSs' interests. The paper shows that interests' of UFSs which contribute to attractive urban environment should be considered in city-planning of urban freight. In addition, policies on road safety, decoration of the city environment and pricing the use of public space in cities need to be developed at local authorities. The paper confirms property owners as UFSs with similar accessibility and service interests as local authorities in the city-planning of urban freight. The literature review of published research and a cross-case analysis of Swedish UFSs' interests in public space in two cities provides insights for further development of research to enrich theory and city-planning of urban freight.

## 1. Introduction

Efficient urban freight transport supports economic activities in cities and helps to ensure that socio-economic systems function in a way that meets the needs of urban stakeholders. Planning for urban freight transport is a complex task that requires understanding of freight activities and commerce, and involvement of public- and private stakeholders to ensure that the interests of all stakeholders are addressed (Holguín-Veras & Sánchez-Díaz, 2016; Stathopoulos et al., 2012).

Urban Freight Stakeholders (UFS) have different and sometimes conflicting interests in public space (Ballantyne et al., 2013; Machado-León et al., 2020; Pitera et al., 2017), which are affected by the infrastructural capacity limitation of the space (Girón-Valderrama et al., 2019; Machado-León et al., 2020) and the growth of urban population (Ivanov & Goodchild, 2018). According to Ballantyne et al. (2013) UFS are all actors that have a direct impact on city-planning of urban freight. These actors have access, service, and economic interests in use of public spaces in the city (Amaya et al., 2020; Ballantyne et al., 2013; Holguín-Veras et al., 2020; Macharis et al., 2014). Public spaces in cities are a necessary condition for mobility of people and urban freight and to support activities. For example, public space in the city provides opportunities for citizens to linger, meet and interact with each other and rest (Von Schönfeld & Bertolini, 2017). They also create access to shops, restaurants, cafés, and food-trucks and thus support to economic activities (Mehta, 2015). Local authorities develop, set, and implement space management- and vehicle parking policies (Marcucci et al., 2015; Nourinejad et al., 2014). Policies on use and management of public space comprise usage of the curb side for commercial vehicles operations (Marcucci et al., 2015), for municipal service e.g. water distribution, sewerage, and waste collection (Broere, 2016), and safety (Pitera et al., 2017). Based on the above public space in this study is defined as an area in the city used for fulfilment of UFSs access-, service-, and economic interests.

The paper provides valuable insights into UFSs access, service, and economic interests in public space within city-planning of urban freight. City-planning of urban freight comprise consideration to UFSs divergent and sometimes conflicting interests in the use of public space (Ballantyne et al., 2013; Lindholm, 2012; Macharis et al., 2014). Policies enforced by local authorities may also act as a barrier to urban freight (Macharis et al., 2014; Rose et al., 2016; Stathopoulos et al., 2012), and adversely impact economic interests of UFSs due to costs of road pricing, parking of vehicles and unloading/ loading of goods (Amaya et al.,

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2020; Holguín-Veras et al., 2020; Marcucci et al., 2015). Goods receivers in cities may, for example, have economic interests in the use of public space for advertisement and retail of products (Mehta, 2015). Further research is also needed on property owners' interests in city-planning of urban freight (NYSERDA, 2018).

The paper extends and supports previous published studies on UFSs with direct impact on city-planning of urban freight (e.g. Ballantyne et al., 2013; Macharis et al., 2014), and the importance to consider different stakeholders perspectives (e.g. Marcucci and Gatta, 2016; Ballantyne et al., 2013; Gatta, Marcucci, 2016a, 2016b; Marcucci & Gatta, 2016). This paper aims to explore UFSs' interests in the use of public space to enhance city-planning of urban freight. The paper is one of few papers which present a cross-case analysis UFSs' interests in use of public space in cities (Lagorio et al., 2016). Due to the importance to consider UFSs' interests in city-planning of urban freight the following two research questions (RQs) have been used in this study:

**RQ1**. Which UFS with direct impact on the city-planning of urban freight have interests in the use of public space?

**RQ2**. Which access, service and economic interests in the use public space exists at UFS?

## 2. Literature review

### 2.1. Urban freight stakeholders

Several authors have identified UFSs involved in the development urban freight. Muñuzuri et al. (2005) identified UFSs based on their responsibility in implementation of urban freight solutions as carriers/ logistics operators, receivers, and local authorities. Taylor (2005) identified four categories of UFSs based on their role in urban freight and business needs i.e. shippers; freight carriers; residents, and planners and regulators. Likewise, Behrends (2011) identified three categories of UFSs in development of sustainable intermodal urban freight transport; shippers and receivers, authorities, and carriers. Rose et al. (2016) however categorised UFSs as internal business-, external business, government and community stakeholders based on management of resources, use of public space, and legitimacy in the city.

City-planning of urban freight includes consideration to interests of shippers, receivers, logistic service providers, local authorities, and citizens (Macharis et al., 2014); Ballantyne et al., 2013; Macharis et al., 2014; Cascetta et al., 2015; Marcucci et al., 2017; Marcucci & Gatta, 2016). Local authorities strive to balance between interests of UFSs with or without direct impact on urban freight transport based on private and public perspectives in city-planning of urban freight (Ballantyne et al., 2013;Cascetta et al., 2015; Marcucci et al., 2017). UFSs without direct impact on city-planning of urban freight (i.e. citizens, visitors, tourists) are directly affected by urban freight decisions, but have no role in the in the decision making process (Cascetta et al., 2015; Marcucci et al., 2017). Based on direct impact on city-planning of urban freight (Ballantyne et al., 2013; Cascetta et al., 2015; Macharis et al., 2014; Marcucci et al., 2017), this paper categorise UFSs into:

*Local authorities:* enforce policies on management of- and accessibility to public space (e.g. public roads, pavements, loading zones, pedestrian streets, parking of vehicles) (Gatta, Marcucci, 2016b; Macharis et al., 2014; Nourinejad et al., 2014; Rose et al., 2016; Stathopoulos et al., 2012). A well-functioning policy includes measurement of integration of UFSs' interests in city-planning of urban freight (Marcucci et al., 2017). Vehicle parking policies comprise a) time restrictions; b) pricing strategies; strategies on land use and space management, and d) parking enforcement (Nourinejad et al., 2014). In addition, local authorities finance construction and management of public infrastructure (e.g. roads, streets, railroads) (Muñuzuri et al., 2005) and subsidize some services such as public transit (Gammelgaard, 2015; Macharis et al., 2014). To make proper use of financial resources obtained through taxes local authorities strive to optimize the use of the existing infrastructure and transport network at low costs by city-planning. To create an attractive business environment in cities local authorities should consider public interests of citizens, visitors, and tourists (Marcucci et al., 2017). To prevent conflicts of interest between UFSs in city-planning of urban freight policies, local authorities should establish mutual relationships with stakeholders (Lindholm, 2012; Gatta and Marcucci, 2014). The interactions between different UFSs are beneficial in achieving different alternatives, maximization of consensus building and minimization of utility losses in implementation of urban freight policies (Marcucci et al., 2017). Published research also addresses that policy makers' should have knowledge and awareness of UFSs' interests in development of urban freight policies (Marcucci and Gatta, 2014; Gatta, Marcucci, 2016b; Marcucci & Gatta, 2016; Von Schönfeld & Bertolini, 2017).

*Supply chain (SC) actors:* consist of transport providers (e.g. shippers, carriers), and goods receivers directly involved in urban freight activities (Ballantyne et al., 2013; Macharis et al., 2014; Russo & Comini, 2010; Stathopoulos et al., 2012). Through their relationships, shippers, carriers and goods receivers influence the location of economic activities (Macharis et al., 2014) in cities. Shippers are companies that are sending goods to the goods receivers based on the common aim to maximize efficiency and service level in terms of costs and reliability of goods deliveries (Ballantyne et al., 2013; Macharis et al., 2014; Quak & Tavasszy, 2011; Russo & Comini, 2010). Thus, shippers are the customers of the carriers contracted by goods receivers (Macharis et al., 2014). Carriers are companies directly responsible for the delivery of goods- and services to the goods receivers (Österle et al., 2015). The common interest of carriers' is to maximize efficiency in the door-to-door pick-up and delivery of goods to the receivers at minimal costs (Macharis et al., 2014). These companies are logistic service providers, production companies owned by shippers (Gentile & Vigo, 2013; Macharis et al., 2014), or construction companies (Ballantyne et al., 2013). The business of carriers' may be affected by traffic and access regulations set by local authorities (Ballantyne et al., 2013).

Goods receivers are consignees of goods such as shops, offices, hotels, construction sites, restaurants, cafés (Ballantyne et al., 2013; Macharis et al., 2014; Quak & Tavasszy, 2011), street-vendors (i.e. food-trucks) (Mehta, 2015). Goods receivers common interests comprise frequent on-demand transport of goods at low costs, to receive real-time information about goods deliveries prior to their arrival, and to receive goods as Off-Hour Delivery (e.g. 7 PM to 6 PM) (Holguín-Veras et al., 2020) to reduce the risk of theft, complaints and congestion. To increase Off-Hour Deliveries published studies suggest implementation of green vendor certification, rather than increased taxes (Marcucci & Gatta, 2017). Moreover, food-trucks have short-term charging and sales agreements with local authorities or property-owners, or in some cases do not have any agreement at all. Since street-vendors such as food-trucks may impede mobility of pedestrians and occupy space, their interests tend to be marginalised by local authorities (Ehrenfeucht, 2017; Forkuor et al., 2017; Loukaitou-Sideris & Ehrenfeucht, 2009).

*Property owners* are private or public owned companies that own, develop, let in residential or commercial properties in cities. These have a direct impact on city-planning of urban freight due to ownership of unloading/ loading zones, and in determination of goods delivery restrictions in certain areas which affect their tenants (companies) business (Ballantyne et al., 2013).

### 2.2. Urban freight stakeholders' interests in the use of public space

According to reviewed published literature of this study, UFSs' service, accessibility, and economic interests in public space should be considered in city-planning of urban freight.

#### 2.2.1. Service interests

Service interests in public space include to meet requirements on provision of municipal services, traffic safety, customer parking and

loading zones (Hourie et al., 2015; Kumar & Ross, 2006; Pitera et al., 2017; Soni & Soni, 2016). Local authorities, have service interests in fostering of an attractive environment and in economic development of the city. Such service interests include the use of public space used for public waste collection, and distribution of water/ sewerage (Broere, 2016), and road safety (Pitera et al., 2017). The local authorities service interests in public space to ensure road safety are linked to prevention of safety conflicts between road-users and SC actors. Pitera et al. (2017) showed that conflicts in the city exists between cyclists and delivery trolleys, cyclists and other traffic, and cyclists and trucks conducting turning manoeuvres. To ensure traffic safety, especially of Vulnerable Road Users (VRUs) (European Commission, 2010), local authorities implement speed reduction mechanisms on public roads.

Local authorities and SC actors have shared interests in public space used for customer parking and loading/ unloading zones (Kumar & Ross, 2006; Soni & Soni, 2016). Marcucci et al. (2015), for example, investigated the role of parking and pricing policies linked to transport providers' interests in loading/ unloading zones and space used for vehicle parking. The availability of customer parking is an important service that attracts additional visitors to cities (Kumar & Ross, 2006). Goods receivers also emphasize the importance to have access to space used for customer parking close to their premises (Soni & Soni, 2016). However, UFS sometimes have conflicting interest in use of public space used for public roads since adverse externalities (noise, pollution, vibrations) are produced by transport vehicles in cities (Holguín-Veras et al., 2020). Also SC actors have common interests in punctual shipment/ deliveries of goods (Macharis et al., 2014) which may be affected by regulations- and policies on parking times, hour zones, and for unloading/ loading of goods set by authorities (Rose et al., 2016). To reduce the adverse impact of externalities of transport in compliance with UFSs' interests, published research suggest implementation of off-hour delivery programs, time slotting of pick-ups and deliveries at large traffic generators, receiver-led delivery consolidation programs, changes in the destination of deliveries, and mode shift programs (Holguín-Veras et al., 2020). Published studies also estimate that approx. 60 % of retailers in the food, house accessory, and stationary sector are willing to adopt Off-Hour Deliveries in the city (Holguín-Veras et al., 2014; Marcucci & Gatta, 2017).

#### 2.2.2. Accessibility interests

UFSs share accessibility interests in public space used for public roads, pavements *(incl. the curbside)*, and pedestrian streets to access the city.

*Public roads* are used by motorised vehicles involved in urban freight, private and public transport, and emergency transport (Machado-León et al., 2020; NYSERDA, 2018). However, the spatial limitation of the city, and competing interests in the use of public roads creates congestion and conflicts between VRUs (e.g., cyclists, passenger vehicles, pedestrians) and carriers (Pitera et al., 2017) and impact the efficiency and safety in urban freight of goods (Machado-León et al., 2020; Pitera et al., 2017). Congestion impacts the costs of logistics operations (Alvarez et al., 2018), impedes the movement of people and goods, and impairs the economic development with negative impacts on liveability of cities (Browne et al., 2017). To reduce congestion, road pricing has been implemented by local authorities in some cities. Road pricing will however not reduce congestion caused by carriers, since it mainly affects congestion caused by private car users (Holguín-Veras & Sánchez-Díaz, 2016). Road pricing may also sometimes act as a barrier to urban freight (Rose et al., 2016).

*Pavements* (or sidewalks) in cities are mainly used for walking and for access to business entrances. However, they are also used for parking of private vehicles, transport vehicles during unloading/ loading of goods (Machado-León et al., 2020), parking of service vehicles (Girón-Valderrama et al., 2019). Carriers, shippers, and goods receivers have accessibility interests in the availability (i.e., finding them free) and number of unloading/ loading zones (Russo & Comini, 2010; Marcucci and Gatta, 2014; Gatta, Marcucci, 2016b). They also have accessibility interests in public space used for parking of vehicles during unloading/ loading of goods (Manzano dos Santos & Sanchez-Diaz, 2016). Difficulties in finding a parking during unloading/ loading of goods have been addressed by carriers as the main barrier to efficient urban freight (Manzano dos Santos & Sanchez-Diaz, 2016). To meet carriers' interests on unloading/ loading of goods published studies suggest a use of public unloading/ loading zones, but also private loading zones, which are designated only for the unloading/ loading activities for certain goods receivers (Dezi et al., 2010; Goodchild & Ivanov, 2017). However, the accessibility interests of carriers' and retailers' in unloading/ loading zones differ from transport operators, who have interests in time windows for unloading/ loading of goods (Marcucci and Gatta, 2014; Gatta, Marcucci, 2016b).

Local authorities have accessibility interests in pavements and pedestrian streets through development of traffic and access policies (Macharis et al., 2014; Rose et al., 2016). They also regulate public space used for parking of transport vehicles in busy areas (Goodchild & Ivanov, 2017). In order to reduce conflicts at pavements, guidelines on facility size required for urban freight vehicle parking and navigation and specified strategies have been published by local authorities in some cities (Transportation for London, 2017).

*Pedestrian streets* in cities are designed for pedestrians and sometimes permit access to bicycles. In order to contribute to development of liveable cities, by making them more accessible, increase retailer's turnover, shop occupancy and value of the properties, there is a growing trend at local authorities to pedestrianize streets in Europe (Soni & Soni, 2016). Since pedestrian streets do not permit deliveries by truck, carriers are referred to use parallel streets for unloading/ loading of goods, which is thereafter transported by foot or by delivery vehicles allowed to drive in during certain hours and/or to certain areas (Verlinde et al., 2016). However, access policies and use of pedestrian streets are still often unclear, which contributes to conflicts between UFSs' interests.

#### 2.2.3. Economic interests

UFSs' economic interests in use of public space are affected by policies on road pricing (congestion charging) and vehicle parking pricing enforced by local authorities (Holguín-Veras et al., 2020). The main purpose of road pricing is to foster an improved utilisation of transport capacity by implementation of tolls which, due to increased costs, would lead to a decrease of truck traffic on public roads (Holguín-Veras et al., 2020). Published studies show however that road pricing has limited impact on peak-hour truck traffic, as carriers have limited power compared to their customers (Holguín-Veras et al., 2020). Road pricing is the least preferred policy by UFSs (Amaya et al., 2020). The main incentive to vehicle parking pricing is to foster an efficient use of pavements. However, as sufficient public space for parking of vehicles is not allocated at right locations on pavements, vehicle parking pricing is not likely to work (Holguín-Veras et al., 2020).

UFSs have economic interests in management of public space, and in retail of products (Heo, 2013; Yannis et al., 2013). Local authorities have economic interests in management of public space due to enforcement of space management policies (Marcucci et al., 2015), which however may differ between cities. Likewise, goods receivers have economic interests in the use of public space within retail and advertisement of products to support revenue generation (Legohérel et al., 2013). For example, restaurants- and cafés providing outdoor seating increase their revenue by increasing the productive space for accommodation of customers by occupying space in the city (Heo, 2013). Goods receivers in cities sometimes occupy public space with advertisement signs to attract customers. The use of advertisement does not adversely affect road safety, since drivers are familiar with the need to cope with considerable information from other vehicles, traffic and direction signs, shop labels, and pedestrians (Yannis et al., 2013). In addition, public roads and open public spaces are used by street-vendors within retail of products (Mehta, 2015). To attract a high number of customers these usually

locate at lively and crowded areas, which may impede movement of pedestrians and urban freight (Forkuor et al., 2017; Loukaitou-Sideris & Ehrenfeucht, 2009).

## 3. Materials and methods

### 3.1. Study design

To comply with the complexity, spatial limitations and UFSs' divergent interests in public space (Anand et al., 2012; Stathopoulos et al., 2012) the study was designed according to a deductive research approach (Spens & Kovács, 2006) including a multiple case study (Yin, 2009). Yin (2009) recommends the use of case studies if the objective is to clarify a particular and a complex situation by investigation of a contemporary phenomenon within its real-life context. Two Swedish city centre areas were selected as cases in this study (see Section 3.2).

### 3.2. Study context areas

Two Swedish city centre areas were selected as cases; study area 1and study area 2. These were selected based on:

- Both cities had taken urban freight initiatives which comprise city-planning of urban freight in two equally large areas of the city centre, and both had held regular meetings with UFSs.
- An approximately equal number of citizens living in the city centre area.
- Established business associations for management of common issues regarding use of public space in both cities.
- Urban freight transport along public roads and pedestrian streets in the city with an equal total length.
- The same political governance (the socialists).
- A broadly similar city centre design in study area i.e. two floor buildings with shops/ restaurants on the ground level, residential homes on the first floor level, a public open space, pedestrian streets.
- An equal size, mix and number of micro and small sized i.e., less than €10 Million in turnover (European commission, 2021) shippers, goods receivers, and property owners with business in the study areas.
- An equal number of food-trucks.
- Excluded from the study were urban freight initiatives developed solely for provision of goods to city malls.

#### 3.2.1. Study area 1

The city centre went through a total reconstruction (between 2016 and 2020) to create an attractive urban environment. The city-planning of a re-built city centre included an urban freight initiative to ensure sustainable transport of goods to goods receivers situated in buildings along two public roads with pavements and a pedestrian street. Food-trucks were situated on the city square. The public road and the pedestrian street included unloading/ loading zones and the city square included public space for food-trucks. Buildings included in the study are labelled in grey (Fig. 1).

#### 3.2.2. Study area 2

In 2012 an urban freight initiative was included in the existing city-planning to enhance sustainability in urban freight. At the time of the study, this urban freight initiative comprises a consolidation centre, an independent freight transport operator, and a non-profit firm (owned by the city's property owner association and the merchant trade association), responsible for transportation services and communication with local authorities. In study area 2 goods receivers were situated in buildings along two public roads with pavements, three pedestrian streets, and a small square also used by the food-trucks. The public roads and the pedestrian streets included unloading/loading zones. Buildings included in the study are labelled in grey (Fig. 2).

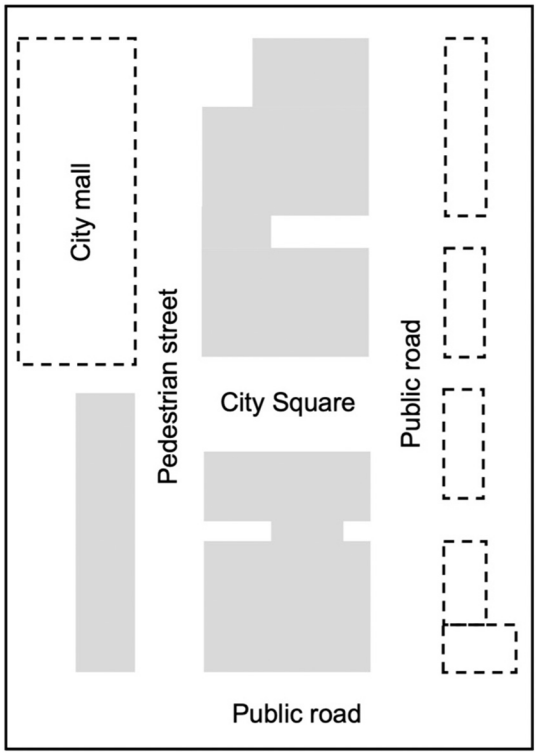


**Fig. 1.** Study area 1.

### 3.3. Data collection

Following the deductive research approach (Spens & Kovács, 2006) data were collected from a literature review (LR), semi-structured interviews and a questionnaire used in a multiple case study (Yin, 2009) of

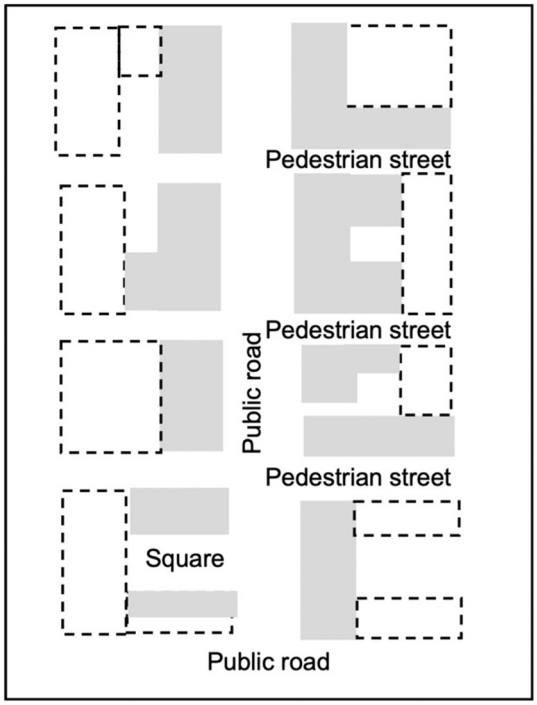


**Fig. 2.** Study area 2.

the two Swedish cities.

The study started with the LR on urban freight stakeholders and their interests in public space, which constitutes the frame of reference of this paper (Section 2). Following Wohlin (2014) on forward snowballing relevant scholarly papers to be included in the LR were identified though a three-step iteration process. In step one relevant scholarly papers published between 2008 and 2021 were identified using the Boolean operator "AND" in combination with the keywords "urban freight", "interest," "public spaces", and "actors" in database search at the publishers Emerald, Elsevier, and Taylor and Francis. Thereafter duplicates were removed, which ended up in 145 tentative scholarly papers. In Step 2 the papers were scanned based on the match between the aim of the study and the title, abstract, and place of citation of each tentative paper, which resulted 53 scholarly papers. Step 3 comprised a full analysis of the papers identified in step 2, which ended up in 45 scholarly papers to be used in this study. These are marked in the reference list with a "*". Additionally, Google Scholar was used to identify five published scientific reports and eight book chapters, and one European directive relevant for the study.

#### 3.3.1. Semi-structured interviews and the questionnaire

Semi-structured interviews in the multiple case study were conducted with UFS representatives (Table 1) in the two selected Swedish cities (see Section 3.2). The interviews were conducted according to Harrell and Bradley, (2009) and comprised five questions which focused on urban freight stakeholders service, accessibility, and economic interests in public space, and two open-ended questions to explore urban freight stakeholders' suggestions to improve the use public space. All interviews were conducted face-to-face and lasted for approximately 30 min and were transcribed (Yin, 2009).

At the end of each semi-structured interview, the representatives were asked to send a response by post to a questionnaire of one Multiple-Choice Question (MCQ) with multiple choices about the influence of another stakeholders' use of public space on city-planning of urban freight. A five-point Likert scale (1 = no influence 5 = very high influence) was used to evaluate the response (For interview questions and the MCQ question, see Appendix I).

### 3.4. Participants

Within the two study context areas three categories of UFSs (local authorities, SC actors, property owners) were strategically selected. These were identified through contact with local politicians at local authorities involved in each city's urban freight initiative. Thus, participants in this study also were the representative participants (in the two study areas) of each city's urban freight initiative. Since most of these participants were shops, restaurants, cafés and food trucks, the study emphasizes goods receivers' interests based on a "stakeholder-specific design" (Gatta, Marcucci, 2016b).

Citizens, visitors, and tourists were excluded from the study since they have no role in the decision-making process of urban freight (Cascetta et al., 2015; Marcucci et al., 2017). In addition, citizens, visitors, and tourists also constitute a heterogenous group of Vulnerable Road Users (VRUs) as pedestrians, cyclists, motorcyclists, and/or people with disabilities/reduced mobility and orientation (European Commission, 2010). Since citizens, visitors, and tourists interests in public space are considered in implementation of policies and exhibition of detail plans at local authorities in Sweden, and this study emphasize goods receivers' interests, we have identified this as an area for further research. Representatives from UFSs were asked to participate in the interviews and to answer the MCQ. All accepted (in total 49) to participate in the interview and 43 (87,7 %) answered the MCQ (Table 1).

### 3.5. Data analysis

The literature included in the LR was analysed for "urban freight stakeholders" and "Urban freight stakeholder interests' in public space" with manifest content analysis (Boyatzis, 1998). The results of the LR were used as a guide to data collection (interview questions and the questionnaire) and as units of analysis (i.e., UFSs' service, accessibility, and economic interests in public space) in this study. Manifest content (Boyatzis, 1998) was used in the analysis of the transcribed tape-recorded interviews. Analysed data were sorted into the pre-decided units of analysis. Mean-values were calculated on the answers to the MCQ. In the cross-case analysis of the two Swedish cities, data from the different sources were continuously compared for triangulation and validation of the results (Easterby-Smith et al., 2015; Yin, 2009). The analysis and the results were continuously discussed between the three authors, who were all involved in the writing process.

## 4. Results and discussion

Results from the conducted literature review (LR) showed that UFS with direct impact on city-planning of urban freight consist of local authorities, SC actors and property owners. The LR further addressed that these UFSs have service, accessibility, and economic interests in public space.

### 4.1. Swedish urban freight stakeholders' interests in the use of public space

The results from the cross-case analysis of the two context areas in the two Swedish cities are reported and discussed in relation to each category of UFS and their interests in public space found in the LR.

#### 4.1.1. Local authorities interests' in use of public space

According to the LR local authorities have service interests in public space used for service points, green spaces, road safety, parking of vehicles and for unloading/loading of goods. For this, local authorities implement policies on space management- and vehicle parking (e.g. Marcucci et al., 2015; Nourinejad et al., 2014). Conducted interviews showed that local authorities service interests' in public space used for service points (i.e., waste collection, access to the water/ sewage system)

**Table 1**
Urban freight stakeholders and data collection methods used in the study.

| Urban freight stakeholder category | Urban freight stakeholder | | Interview study area 1 | Interview study area 2 | Questionnaire study area 1 | Questionnaire study area 2 |
|---|---|---|---|---|---|---|
| Local authorities | Local authority | | 1 | 1 | 1 | 1 |
| Supply chain (SC) actors | Shipper | | 1 | 1 | 1 | 1 |
| | Carrier | | 1 | 1 | 1 | 1 |
| | Goods receiver | Shop | 15 | 11 | 13 | 8 |
| | | Restaurant/café with outdoor seating | 4 | 3 | 3 | 3 |
| | | Restaurant/café | 3 | 2 | 3 | 2 |
| | | Food-truck | 1 | 2 | 1 | 2 |
| Property owners | Property owner | Property owner | 1 | 1 | 1 | 1 |
| Total | | | 27 | 22 | 24 | 19 |

on pedestrian streets and pavements should be considered in city-planning of urban freight. Conducted interviews also confirmed published research on local authorities' accessibility interests' in public space for roads, pavements, and pedestrian streets. Interviews with local authorities in the two cities further indicated a lack in service interest in space used for road safety barriers (i.e., elevated humps), due to high establishment costs and that these may act as a barrier to urban freight. The use of elevated humps in cities may increase the risk of crashes between cyclists and carriers (Pitera et al., 2017). Since, local authorities implement policies about protection of VRUs (e.g. cyclists) which include use of elevated humps, the result indicate that local authorities also should consider such policies in city-planning of urban freight. The result is supported by Holguín-Veras et al. (2020) who state that public space in cities is regulated by local authorities for many purposes.

The LR showed that local authorities' endeavour creation of an attractive city environment (Marcucci et al., 2017). Interviews with local authorities in both Swedish cities specifically addressed good relationships with UFSs that contribute to attractiveness of the city environment (i.e., shops, restaurants- and cafés with outdoor seating, property owners) in city-planning of urban freight. The result indicates a relationship between this interest and economic interests' of local authorities with regard to financing of management of public space. According to interviews with local authorities in both cities management of public space is financed by taxes, or as one of the clerks explained:

> "Management of public space in the city is financed 60% by fees and 40% by public taxes" (Clerk local authority City 2).

The interviews with local authorities in both cities further showed that economic interests in public space comprise revenues in terms of charging-fees in use of public space for (i) unloading/loading zones paid by carriers (ii) pavements used for outdoor seating paid by restaurant and cafés, and (iii) open space used for product retail paid by food-trucks. Thus, the result confirms published research on local authorities financing of management of public space through charging-fees paid by food-trucks (Martínez et al., 2018). Management of public space based on fees implies that the local authority is a commercial stakeholder in city-planning of urban freight. This may be contrary to the governance role of the local authority with responsibilities for management of public space, since the costs of public space should be met through taxes to foster behaviour changes with public benefits (Holguín-Veras et al., 2020). Thus, results from conducted interviews suggest that local authorities should develop policies about pricing the use of public space on pavement, pedestrian streets, and squares in compliance with city-planning of urban freight.

#### 4.1.2. SC actors' interests in use of public space

The LR showed that SC actors' service, accessibility, and economic interests in use of public space should be considered by local authorities (public sector) in city-planning of urban freight. According to the interviews, SC actors in the two Swedish cities constitute a heterogeneous group of large and small companies (private sector) with divergent interests, and differences in communication and cooperation with local authorities about the use of public space. Interviews with goods receivers showed that shops and restaurants experience a lack in communication and cooperation with local authorities about their use of public space in city-planning of urban freight. Shops and restaurants also addressed that they have service interests in the use of public space for decoration (e.g. flower-pots) due to creation of an attractive city environment. Shops in both cities mentioned however that public space used for decorations should be considered in city-planning of urban freight at local authorities, since such decorations may act as a barrier to urban freight. The results shows that local authorities need to develop and implement policies about the use of public space intended for decoration in compliance with city-planning of urban freight. Moreover, the cross-case analysis of SC actors' accessibility interests in pavements and pedestrian streets showed that shops in both cities emphasized the importance to meet economic interests of restaurants- and cafés with outdoor seating. According to shop interviews in both cities, restaurants- and cafés with outdoor seating contribute to an attractive and vibrant city environment which should be considered in city-planning of urban freight.

Interviews with goods receivers in both Swedish cities showed that their accessibility interests in public roads, pavements (incl. the kerb-side) and pedestrian streets are adversely affected by parked private, carrier, and service vehicles. This was especially addressed by the shops along pedestrian streets who experienced that their shopwindows blocked by carrier vehicles during opening hours. The result confirms previous studies about regulating the access to pedestrian streets during certain hours, allowing only small transport vehicles to access (Verlinde et al., 2016). The result may however be contradictive to published studies which show that carriers are adversely affected by initiatives to restrict access (e.g. Holguín-Veras et al., 2020).

Interviews with SC actors in the two Swedish cities shows that restaurants and cafés with outdoor seating have economic interests in pavements. Analysed interviews specifically address that pavements are used for outdoor seating by restaurants and cafés during March to October, and contributes to an increase in their average annual revenue by 10–25 %. Likewise, interviews with shops in both cities addressed economic interests in the use of pavements and public space on pedestrian streets for advertisement signs and commercial sales during whole year, which may for some shops increase the daily revenue by up to 49 %. Interviews with shops, carriers and shippers in both cities also showed common economic interests in the use of pavements for unloading/ loading of goods, and that this interest in some cases contradict with economic interests of restaurants- and cafés with outdoor seating. This was also confirmed by the interviews with restaurants- and cafés with outdoor seating in both cities. The cross-case analysis of interviews with SC actors in both cities also addressed a lack of consideration of carriers' interests within city-planning at local authorities leading to conflicts.

Interviews with shops in the two Swedish cities showed conflicts of interests between shops' economic interests in public space used for advertisement signs on pedestrian streets, and carriers' accessibility interests in pedestrian streets. According to interviews with shops in city 2 advertisement signs have been run-over by carriers' vehicles. This was also confirmed in the interviews with carriers who indicated that they experience advertisement signs as a barrier to urban freight. To prevent conflicts between UFSs in city-planning of urban freight, the results indicate a need for policies about the use of public space for advertisement signs set by local authorities. Interviews with carriers in both cities also showed adverse impact their accessibility interests in finding space for unloading/ loading of goods. This is confirmed by previous published studies (Manzano dos Santos & Sanchez-Diaz, 2016; Verlinde et al., 2016).

#### 4.1.3. Property owners' interests in the use of public space

The LR showed that few studies have been published on property owners' interests in city-planning of urban freight. Interviews with property owners in the two Swedish cities showed that their service interests in public space for waste collection, access to the water/ sewage system on pedestrian streets and pavements should be considered in city-planning of urban freight. According to interviews, property owners in both cities also have accessibility interests in unloading/ loading zones of goods on pavements to comply with carriers' accessibility interests. The cross-case analysis of property owners' interests in public space further indicted that they have accessibility interests in roads, pedestrian streets, and pavements linked to economic interests in management, sales- and letting of properties and that this should be considered in city-planning of urban freight.

According to interviews with property owners in both cities, goods receivers' and local authorities' service and economic interests should be considered city-planning of urban freight since these contribute to an

attractive city environment. However, the cross-case analysis of property owners' interests noted a difference between the two cities in their views on shops' interests' public space in city-planning of urban freight. This was only addressed by property owners in city 2, who mentioned that these interests contribute to development of an attractive city environment. Property owners in both cities addressed, however, that food-trucks' and carriers' economic interests in public space varies and may because of this act as a barrier to urban freight. Because of this, the study indicate that food-trucks and carriers shall be assigned fixed space for their business by local authorities in city-planning of urban freight. For development of an attractive city environment, interviews with property owners in both cities indicate a need for increased cooperation between property owners in city-planning of urban freight. Thus, the results from analysed interviews with property owners indicate their importance as an UFS in city-planning of urban freight.

### *4.2. Influence of Swedish UFSs' use of public space in city- planning of urban freight*

The analysed results of the MCQ about the influence of UFSs' interests in the use of public space (Fig. 3) indicated that restaurant/cafés with outdoor seating, restaurant/cafés without outdoor seating and property owners' interests in the use of public space should have the highest influence on city-planning of urban freight. The results confirm the results from the cross-case analysis of interviews with UFSs' which shows that UFSs whose interests in public space contribute to the attractiveness of the city environment should be considered in city-planning of urban freight. The analysis of the influence of UFSs' interests further indicate that the local authorities (i.e. mean value 3,3) and shops (i.e. mean value 3.1) interests in the use of public space should influence city-planning of urban freight at an average level. Thus, the result indicates that local authorities in both cities should implement policies about the use of public space, and regarding shops usage of public space. According to analysed MCQ results carriers' and shippers' interests in the use of public space should have less influence (i.e. both mean value 2.9) on city-planning of urban freight compared to t other categories of UFS except food-trucks. One explanation for this is that their business usually is situated outside the city centre and thus not directly contribute to the city environment. Finally, the analysis of the MCQ indicated that food-trucks interests in the use of public space should have least impact (i.e. mean value 2,5) on city-planning of urban freight. One explanation for this is that food-trucks use of public space varies and may act as a barrier to urban freight which was indicted during the interviews with property owners. The results of the MCQ thus confirm the suggestion that food-trucks should be assigned fixed space for their business.

## 5. Conclusions

There is growing interest in efficient use of public space as cities all of the world implement urban freight initiatives. This paper explores UFSs' interests in the use of public space and the influence of such interests in city-planning of urban freight. This is addressed in literature review of UFSs and their interests in the use of public space. The results obtained from the literature review showed that UFSs with direct impact on city-planning of urban freight includes local authorities, SC actors and property owners, and that these have service, accessibility, and economic interests in the use of public spaces. To extend and complement published research, the paper presents a cross-case study of UFSs interests in two Swedish cities. The cross-case study addressed that local authorities should develop policies about pricing the use of public space due to economic interests in charging-fees for management of public space. The results further showed that SC actors with service and economic interests which contribute to an attractive city environment (e.g. restaurants- and cafés with outdoor seating) should be considered in city-planning of urban freight. These interests contribute to their annual revenue but may conflict with accessibility interests of carriers and shippers. To prevent conflicts in city-planning of urban freight local authorities should develop and implement policies about the use of public space used for decoration and advertisement signs. The study also addresses that food-trucks should be assigned fixed places in city-planning of urban freight due to their economic interests in use of public space. The cross-case study addresses property owners due to their accessibility and economic interests in public space as important UFSs in city-planning of urban freight. The study specifically shows that property owners have accessibility interests in unloading/ loading zones of goods on pavements, and economic interests in the public space linked to creation of an attractive city environment.

As in the case of qualitative case studies, the results obtained of this study cannot be generalised in a statistical sense (Yin, 2009). The study

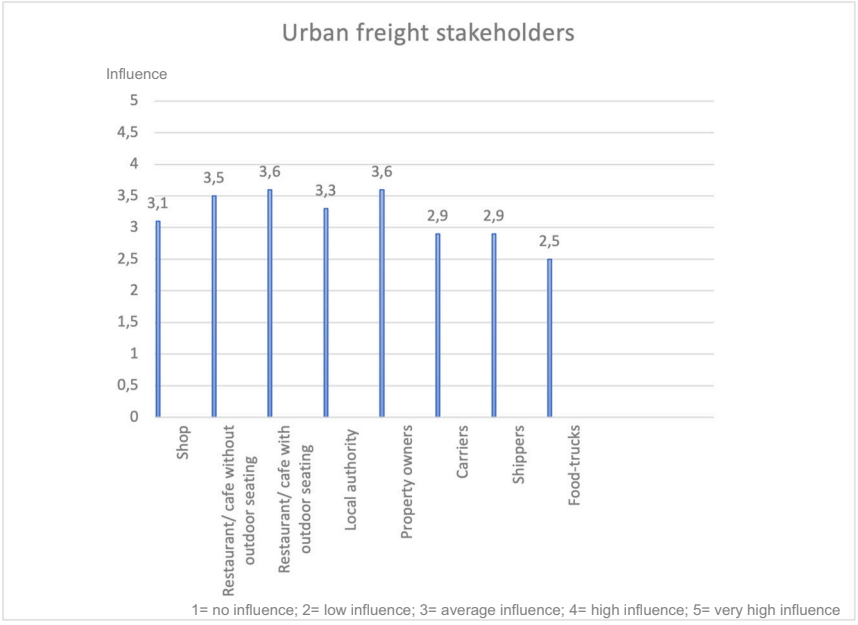


**Fig. 3.** Estimated mean influence of urban freight stakeholders' use of public space in city-planning ($n = 43$).

emphasizes goods receivers' interests assuming similarities in their interests in the use of public space which could bias the answers in the MCQ. The results obtained might be influenced by the selection of a spatially limited study area in the city centre of two Swedish cities. This is a possible weakness of the paper whose utility however is prevalently ascribable to obtain deeper knowledge rather than to generalise the presented results. For generalisation of results future research should focus on quantification of UFSs' interests in the use of public space. Future research should also explore: 1) transferability of results e.g., areas and larger study areas in other cities with urban freight initiatives; 2) consideration to citizens and VRUs legitimate interests in the use of public space; 3) increase the number of shippers, and carriers, and 4) take explicit consideration to policies on pricing the use of public space in cities in city-planning of urban freight.

To conclude, the paper provides in-depth understanding of UFSs' interest in public space both theoretically and practically. The presented research fills a gap scientific published studies about UFSs use of public space in cities and leaves recommendations that cities can consider in city-planning of urban freight.

## CRediT authorship contribution statement

**Henrik Ringsberg:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization, Validation. **Alena Brettmo:** Investigation, Writing – original draft, Conceptualization. **Michael Browne:** Writing – original draft, Writing – review & editing, Validation.

## Declaration of competing interest

We have no conflicts of interest to disclose.

## Data availability

Data will be made available on request.

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*Authorship contributions*

**Conception and design of study**: Henrik Ringsberg, Michael Browne, Alena Brettmo.

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**Drafting the manuscript:** Henrik Ringsberg

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**Approval of the version of the manuscript to be published (the names of all authors must be listed)**: Henrik Ringsberg, Alena Brettmo, Michael Browne

## Appendix I

*Interview questions*

*General questions*

1. The main characteristics of the company/ organisation business is as (only one choice is possible)

☐ A restaurant with out-door seating
☐ A restaurant without out-door seating
☐ A café with out-door seating
☐ A café without out-door seating
☐ Shipper
☐ Carrier
☐ Shop
☐ Food-truck
☐ Property-owner, private
☐ Property owner, municipality
☐ City cityplanning, municipality
☐ Other

2. My work in the company/organisation is as a (only one choice is possible):

☐ Owner
☐ Owner/manager
☐ Manager
☐ Employee

*Interests in the use of public spaces*

1. For what/which purposes does the company/ organisation have interest in the use public spaces

☐ Advertisement signs
☐ Out-door seating's
☐ Loading/unloading zone of goods (permanent)
☐ Loading/unloading zone of goods (preliminary)
☐ Customer parking, bike
☐ Customer parking, car
☐ Maintenance (e.g. accessibility to sewage/ electricity)
☐ Product retail
☐ Product advertisement
☐ Traffic barrier
☐ Other please notify

Could you please further elaborate little on your provided answers based on the company's' accessibility, service and economic interests?

2. During what months does the company use public spaces in the city centre?
3. Estimate to what extent (in %) the company use of public space contributes to the annual revenue (only one answer is possible)

☐ 0
☐ 1–9
☐ <10–24
☐ >25–49
☐ >50–74
☐ >75–100

Could you please further elaborate little bit more on your provided answer?

4. In what way do you think cooperation on use of public spaces purposes in the city center could be improved?
5. Is the business of your company/ organisation disturbed by another stakeholders' use of public space? If yes in what way?
6. How much influence does the company have on the use of space in the city centre (Please evaluate your answer based on: 0 = no influence; 1 = very limited influence; 2 = limited influence; 3 = neutral influence; 4 = large influence, 5 = very large influence).
7. Do you have anything else to add regarding the use of public space in city centers?

*Multiple choice question*

How much influence should *ANOTHER STAKEHOLDER* have on decisions regarding the use of space in the city centre? Please evaluate your answer based on: 1 = no influence; 2 = low influence; 3 = average influence; 4 = high inflence, 5 = very high inflence.

* ANOTHER STAKEHOLDER:

☐ A restaurant/café with out-door seating
☐ A restaurant/café without out-door seating
☐ Shippers
☐ Carriers
☐ Shop
☐ Food-truck
☐ Property-owner
☐ Municipality
☐ Residents
☐ Visitors

If possible, please motivate your answer:

## References


Alvarez, P., Lerga, I., Serrano-Hernandez, A., & Faulin, J. (2018). The impact of traffic congestion when optimising delivery routes in real time. A case study in Spain. *International Journal of Logistics Research and Applications, 21*(5), 529–541. https://doi.org/10.1080/13675567.2018.1457634

Amaya, J., Arellana, J., & Delgado-Lindeman, M. (2020). Stakeholders perceptions to sustainable urban freight policies in emerging markets. *Transportation Research Part A, 132*, 329–348. https://doi.org/10.1016/j.tra.2019.11.017

Anand, N., Quak, H., van Duin, R., & Tavasszy, L. (2012). City logistics modeling efforts: Trends and gaps - A review. *Procedia - Social and Behavioral Sciences, 39*, 101–115. https://doi.org/10.1016/j.sbspro.2012.03.094

Ballantyne, E. E. F., Lindholm, M., & Whiteing, A. (2013). A comparative study of urban freight transport planning: Addressing stakeholder needs. *Journal of Transport Geography, 32*, 93–101. https://doi.org/10.1016/j.jtrangeo.2013.08.013

Behrends, S. (2011). *Urban freight transport sustainability*. Sweden: Chalmers University of Technology. PhD thesis.

Boyatzis, R. E. (1998). *Transforming qualitative information thematic analysis and code development*. Thousand Oaks, CA: Sage Publications.

Broere, W. (2016). Urban underground space: Solving the problems of today's cities. *Tunnelling and Underground Space Technology, 55*, 245–248. https://doi.org/10.1016/j.tust.2015.11.012

Browne, M., Macharis, C., Sanchez-Diaz, I., Brolinson, M., & Billsjö, R. (2017). Urban traffic congestion and freight transport: A comparative assessment of three European cities. In *Proceedings of the interdisciplinary conference on production, logistics and traffic, Darmstadt, Germany*.

Cascetta, E., Carteni, A., Pagliara, F., & Montanino, M. (2015). A new look at planning and designing transportation systems: a decision-making model based on cognitive rationality, stakeholder engagement, and quantitative methods. *Tranport Policy, 38*, 27–39.

Dezi, G., Dondi, G., & Sangiorgi, C. (2010). Urban freight transport in Bologna: Planning commercial vehicle unloading/ loading zones. *Procedia - Social and Behavioral Sciences, 2*(3), 5990–6001. https://doi.org/10.1016/j.sbspro.2010.04.013

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2015). *Management and business research* (5th ed.). London, UK: SAGE.

Ehrenfeucht, R. (2017). Do food trucks and pedestrians conflict on urban streets? *Journal of Urban Design, 22*(2), 273–290. https://doi.org/10.1080/13574809.2017.1281731

European Commission. (2010). *Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport*. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:207:0001:0013:en:PDF. (Accessed 20 September 2022).

European Commission. (2021). *What is a SME?*. https://ec.europa.eu/growth/smes/sme-definition_en. (Accessed 22 May 2021).

Forkuor, J. B., Akuoko, K. O., & Yeboah, E. H. (2017). Negotiation and management strategies of street vendors in developing countries: A narrative review. *Journal Indexing and Metric, 7*(1), 1–13. https://doi.org/10.1177/2158244017691563

Gammelgaard, B. (2015). The emergence of city logistics: The case of Copenhagen's Citylogistik-kbh. *International Journal of Physical Distribution and Logistics Management, 45*(4), 333–351. https://doi.org/10.1108/IJPDLM-12-2014-0291

Gatta, V., & Marcucci, E. (2014). Urban freight transport and policy changes: Improving decision makers' awareness via an agent-specific approach. *Transport Policy, 36*, 248–252. https://doi.org/10.1016/j.tranpol.2014.09.007.*

Gatta, V., & Marcucci, E. (2016a). Stakeholder-specific data acquisition and urban freight policy evaluation: Evidence, implications and new suggestions. *Transport Reviews, 36*(5), 585–609. https://doi.org/10.1080/01441647.2015.1126385

Gatta, V., & Marcucci, E. (2016b). Behavioral implications of non-linear effects on urban freight transport policies: The case of retailers and transporters in Rome. *Case Studies on Transport Policy, 4*, 22–28. https://doi.org/10.1016/j.cstp.2015.08.001

Gentile, G., & Vigo, D. (2013). Movement generation and trip distribution for freight demand modelling applied to city logistics. *European TransportTransporti Europei, 54*(6), 1–27.

Girón-Valderrama, G. C., Machado-León, J. L., & Goodchild, A. (2019). Commercial vehicle parking in downtown Seattle: Insights on the Battle for the curb. *Transportation Research Record, 2673*(10), 770–780. https://doi.org/10.1177/0361198119849062

Goodchild, A., & Ivanov, B. (2017). The final 50 feet of the urban goods delivery system. *System, 54*, 55. https://trid.trb.org/view/1495883.

Heo, C. Y. (2013). *Restaurant revenue management. Revenue management for hospitality and tourism*. Woodeaton, Oxford: Goodfellow Publishers ltd.

Holguín-Veras, J., Amaya Leal, J., Sanchez-Diaz, I., Browne, M., & Wojtowicza, J. (2020). State of the art and practice of urban freight management part II: Financial approaches, logistics, and demand management. *Transportation Research Part A, 137*, 383–410. https://doi.org/10.1016/j.tra.2018.10.036

Holguín-Veras, J., & Sánchez-Díaz, I. (2016). Freight demand management and the potential of receiver-led consolidation programs. *Transportation Research Part A, 84*, 109–130. https://doi.org/10.1016/j.tra.2015.06.013

Holguín-Veras, J., Wang, C., Browne, M., Darville Hodge, S., & Wojtowicz, J. (2014). The New York City off-hour delivery project: Lessons for city logistics. *Procedia Social Behaviour Science, 125*, 36–48. https://doi.org/10.1016/j.sbspro.2014.01.1454

Hourie, E., Malul, M., & Bar-El, R. (2015). The social value of municipal services. *Journal of Policy Modeling, 37*(2), 253–260. https://doi.org/10.1016/j.jpolmod.2015.01.014

Ivanov, B., & Goodchild, A. (2018). The final 50 feet of the urban goods delivery system. In *Proceedings of the 2018 annual meeting of the transportation research board, May 17–18, 2017, Washington DC, USA*.

Kumar, S., & Ross, W. (2006). Effects of pedestrianisation on the commercial and retail areas: Study in Khao San road, Bangkok. *World Policy and Practice, 13*(1), 37–48. *.

Lagorio, A., Pinto, R., & Golini, R. (2016). Research in urban logistics: A systematic literature review. *International Journal of Physical Distribution and Logistics Management, 46*(10), 908–931. https://doi.org/10.1108/IJPDLM-01-2016-0008

Legohérel, P., Poutier, E., & Fyall, A. (2013). *Revenue management for hospitality and tourism* (2nd ed.). Woodeaton, Oxford: Goodfellow Publishers Limited.

Lindholm, M. (2012). How local authority decision makers address freight transport in the urban area. *Procedia – Social and Behavioral Sciences, 39*, 134–145. https://doi.org/10.1016/j.sbspro.2012.03.096

Loukaitou-Sideris, A., & Ehrenfeucht, R. (2009). *Sidewalks: Conflict and negotiation over public space*. Cambridge Massachusetts: Massachusetts Institute of Technology.

Machado-León, J. L., Girón-Valderrama, G. C., & Goodchild, A. (2020). Bringing alleys to light: An urban freight infrastructure viewpoint. *Cities, 105*, 1–13. https://doi.org/10.1016/j.cities.2020.102847

Macharis, C., Milan, L., & Verlinde, S. (2014). A stakeholder-based multicriteria evaluation framework for city distribution. *Research in Transportation Business & Management, 11*, 75–84. https://doi.org/10.1016/j.rtbm.2014.06.004

Manzano dos Santos, E., & Sanchez-Diaz, I. (2016). Exploring carriers' perceptions about city logistics initiatives. *Transport. Res. Record: J. Transport. Res. Board, 2547*(1), 66–73. https://doi.org/10.3141/2547-10. *.

Marcucci, E., & Gatta, V. (2016). How good are retailers in predicting transport providers' preferences for urban freight policies?...And vice versa? *Transport Research Procedia, 12*, 193–202. https://doi.org/10.1016/j.trpro.2016.02.058

Marcucci, E., & Gatta, V. (2017). Investigating the potential for off-time deliveries in the city of Rome: Retailers perceptions and stated reactions. *Transport Research Part A, 102*, 142–156. https://doi.org/10.1016/j.tra.2017.02.001

Marcucci, E., Gatta, V., & Scaccia, L. (2015). Urban freight, parking and pricing: Evaluation from transport providers' perspective. *Transportation Research Part A, 74*, 239–249. https://doi.org/10.1016/j.tra.2015.02.011

Marcucci, E. L., Pira, M., Gatta, V., Inturri, G., Ignaccolo, M., & Pluchino, A. (2017). Simulating participatory urban freight transport ploicy-making: Accounting for herogenous stakeholders' preferences and interaction effects. *Transportation Research Part E, 103*, 69–86. https://doi.org/10.1016/j.tre.2017.04.006

Martínez, L., Short, J. R., & Estrada, D. (2018). The diversity of the street vending: A case study of street vending in Cali. *Cities, 79*, 18–25. https://doi.org/10.1016/j.cities.2018.02.018

Mehta, V. (2015). The street as ecology. In J. Agyeman, & S. Zavetovski (Eds.), *Incomplete streets: Processes, practices, and possibilities*. London: Routledge. https://doi.org/10.4324/9781315856537.

Muñuzuri, J., Larrañeta, J., Onieva, L., & Cortés, P. (2005). Solutions applicable by local administrations for urban logistics improvement. *Cities, 22*(1), 15–28. https://doi.org/10.1016/j.cities.2004.10.003

Nourinejad, M., Wenneman, A., Habib, K. N., & Roorda, M. J. (2014). Truck parking in urban areas: Application of choice modelling within traffic microsimulation. *Transportation Research Part A: Policy and Practice, 64*, 54–64. *.

NYSERDA. (2018). *Complete streets considerations for freight and emergency vehicle operations, Prepared for: New York State Energy Research and Development Authority (Project 83178)*. Retrieved from. The City College of New York https://www.metrans.org/assets/upload/complete%20streets%20freight%20booklet_v6_hires-0.pdf.

Österle, I., Aditjandra, P. T., Vaghi, C., Grea, G., & Zunder, T. H. (2015). The role of a structured stakeholder consultation process within the establishment of a sustainable urban supply chain. *Supply Chain Management: An International Journal, 20*(3), 284–299. https://doi.org/10.1108/SCM-05-2014-0149

Pitera, K., Pokorny, P., Kristensen, T., & Bjørgen, A. (2017). The complexity of planning for goods delivery in a shared urban space: A case study involving cyclists and

trucks. *European Transport Research Review., 9*(46). https://doi.org/10.1007/s12544-017-0262-8

Quak, H., & Tavasszy, L. (2011). Customized solutions for sustainable city logistics: The viability of urban freight consolidation centres. In J. van Nunen, P. Huijbregts, & P. Rietveld (Eds.), *Transitions towards sustainable mobility*. Berlin, Heidelberg: Springer.

Rose, W., Mollenkopf, D. A., Autry, C., & Bell, J. E. (2016). Exploring urban institutional pressures on logistics service providers. *International Journal of Physical Distribution and Logistics Management, 46*(2), 153–176. https://doi.org/10.1108/IJPDLM-03-2015-0068

Russo, F., & Comini, A. (2010). A classification of city logistics measures and connected impacts. *Procedia - Social and Behavioural Sciences, 2*, 6355–6365. https://doi.org/10.1016/j.sbspro.2010.04.044

Soni, N., & Soni, N. (2016). Benefits of pedestrianization and warrants to pedestrianize an area. *Land Use Policy, 57*, 139–150. https://doi.org/10.1016/j.landusepol.2016.05.009

Spens, K. M., & Kovács, G. (2006). A content analysis of research approaches in logistics research. *International Journal of Physical Distribution and Logistics Management, 36* (5), 374–390.

Stathopoulos, A., Valeri, E., & Marcucci, E. (2012). Stakeholder reactions to urban freight policy innovation. *Journal of Transport Geography, 22*, 34–45. https://doi.org/10.1016/j.jtrangeo.2011.11.017

Taylor, M. A. P. (2005). The City logistics paradigm for urban freight transport. *City*, 1–19.

Transportation for London. (2017). *Kerbside loading guidance* (2nd ed.) (2nd ed.,. *44*. Transportation For London (TFL).

Verlinde, S., Kin, B., Strale, M., & Macharis, C. (2016). Sustainable freight deliveries in the pedestrian street: Facilitating the necessity. *Portfolio, 1*, 97–109.

Von Schönfeld, K. C., & Bertolini, L. (2017). Urban streets: Epitomes of planning challenges and opportunities at the interface of public space and mobility. *Cities, 68*, 48–55. https://doi.org/10.1016/j.cities.2017.04.012

Wohlin, C. (2014). *Guidelines for snowballing in systematic literature studies and a replication in software engineering, EASE '14, May 13 - 14 2014, London, United Kingdom*. https://doi.org/10.1145/2601248.2601268

Yannis, G., Papadimitriou, E., Papantoniou, P., & Voulgari, C. (2013). A statistical analysis of the impact of advertising signs on road safety. *International Journal of Injury Control and Safety Promotion, 20*(2), 111–120. https://doi.org/10.1080/17457300.2012.686042

Yin, R. K. (2009). *Case study research: Design methods* (4th ed.). Thousand Oaks, CA: SAGE Publications.