# Enabling sustainable development of urban freight from a local authority perspective

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**- WORK IN PROGRESS PAPER -**

## Abstract

On the path towards sustainability for the urban area, local authorities make decisions that affect freight transport. However, local authorities might not always be aware of the effect their decisions and policy making have on freight and its stakeholders – in many ways, urban freight transport is a neglected field. The purpose of this paper is to contribute to the enabling of local authorities to include freight in the urban transport planning for sustainable development. In order to get urban freight on the overall transport planning agenda for the local authorities, there is a need to understand the urban freight transport of today and what sustainable urban freight transport is. The complexity can be illustrated through a description of the stakeholders and their interactions as well as through the factors that affect the outcomes of sustainable urban freight transport. Seven qualitative studies have been performed, based on case studies on cities in Northern Europe, in order to get a comprehensive picture of the situation as well as how to handle it. The paper concludes that in order for local authorities to include freight transport in the overall transport planning, there is a need for planning resources and information. There are several possibilities, where freight partnerships, information exchange and increased capacity in personnel at local authorities are some, but what is always necessary is to include relevant stakeholders in the process. A model for a transport planning process, including the relevant factors, of urban freight transport is suggested.

# Introduction

Urban transport is not sustainable. The situation is serious and requires action by governments, communities and businesses (Low, 2003). Towns and cities in Europe generate 85% of the gross domestic product (GDP) in the European Commission (2007). In Sweden, 85% of the population lives in urban areas (so-called localities) (SCB, 2008). Congestion, noise, emissions and traffic menaces contribute to the total urban experience. The transport activities are increasing in urban areas, but they are also needed, since goods deliveries are needed to service businesses and persons in the urban area. Urban mobility is an important facilitator of growth and employment, because mobility of persons and goods is essential to the smooth functioning of the economy. However, increased traffic in towns and city centres has a strong negative impact on sustainable development. A number of health researchers demand stricter restrictions on air quality in European urban areas, on the grounds that citizens are entitled to clean air (Brunekreef et al., 2012). Furthermore, one in three fatal accidents happen in urban areas (European Commission, 2007). Along with decreased possibilities to store goods in the shops for retailers, in line with more expensive costs for urban retail areas, the freight transport increases. At the same time, certain demands on the freight transport to deliver within a short time window could increase the risk that the same amount of goods are delivered on more vehicles.

According to several studies done in different cities, private cars outnumber light- and heavy-goods vehicles (LGVs and HGVs) (Schoemaker et al., 2006). While freight transport only represents from 10% to 18% of the vehicles in cities, it nevertheless accounts for 40% of air pollution and noise emissions (European Commission, 2006). The majority of products shipped into urban areas are produced outside these areas. These products consist of many different components, which are assembled from different areas around the world and shipped from various locations to customers in urban areas. There are also goods produced within urban areas that must be transported inside the area or out from the area. Waste, bulk transport and service transport, i.e. transport activities in close relation to the provision of a service such as maintenance of products, are other goods flows that exist in the area.

Much has happened within the field of urban freight transport during the last decade and it is now a bit higher on the agenda for many local authorities (e.g. Cherrett et al., 2012; Stathopoulos et al., 2012). Although the research regarding urban freight transport has increased considerably during this time frame and it is no longer possible to say not much is being done within the field, to a large extent, the research conducted evaluates single measures to solve specifically occurring urban freight transport problems without taking a systematic approach. But, the fact remains that many of those do not last after external project funding, e.g. through EU projects, has ended (see, e.g. Quak, 2011). Local authorities do not know how to regulate and control freight transport, and the regulations implemented often increase the transport costs and environmental impacts without the local authority having an understanding of urban freight transport (Dablanc, 2007). Regulations, i.e. time windows, are among the most common actions taken by local authorities in order to control or reduce the negative sustainable impacts of freight transport (Quak & de Koster, 2006).

Freight transport is, from a local authority side, seen as a “business problem” (Dablanc, 2007), which more or less fixes itself since there is an economic interest in doing so. This is partly true, since there are no heavy vehicles or goods transport systems that are in the area just driving around for fun. There is an interest from the transport operator’s side, amongst others, to have an as efficient transport as possible. But, the possibilities to perform an efficient transport are sometimes in conflict with, e.g. regulations on infrastructure or the transport of people. To avoid these conflicts, and to create an urban environment with good conditions for all types of necessary transport operations, the local authorities need to consider aspects of both people and freight in the planning processes. Furthermore, little attention has been given in the research to how specific policy measures are affecting goods movements (Allen et al., 2003), and it is not clear how the movements of urban goods should

be developed into sustainability or how the system should be dealt with and changed (van Binsbergen & Visser, 2001). This is still true, and there is a need for more analysis in order to understand the implications of changing the practices and outcomes of urban freight transport measures (Patier & Browne, 2010).

The purpose of this paper is to contribute to the enabling of local authorities to include freight in the urban transport planning for sustainable development, through the analysis of studies in Northern European cities. The paper is outlined as follows. The research approach is introduced, followed by a discussion on sustainable urban freight development. Thereafter three areas is analysed from the research: urban freight practice of today, inclusion of urban freight in the transport planning process, and, the freight transport planning process where a model is presented. The paper ends with some conclusions from the research.

## Research approach

The research that is presented in this paper is based on studies over seven years and seven qualitative studies have been performed, based on case studies on cities in Northern Europe (Germany, Sweden, Lithuania, Poland, UK, Holland, Estonia), in order to get a comprehensive picture of the situation as well as how to handle it. The methods used to gain data consist of a questionnaire study, interviews, observation and participation and workshops. The empirical data is based on 1 questionnaire and 152 interviews (see Table 1). The interviews have been fairly divided between local authority representatives and freight stakeholders. Deputy mayors, freight planners, traffic planners, environmental officers and economy or strategic planners of authorities represent local authority representatives. The freight stakeholders have in turn been divided between transport operators, haulers, trade associations, service transport operators, property owners and freight terminal operators.

The studies in Germany, Lithuania, Poland and Estonia was started through peer reviews of the transport planning in general in those cities, in a project where the aim was to develop and implement Sustainable Urban Transport Plans (SUTPs). The peer reviews were conducted through a process whereby the cities first of all wrote a report of their performance within sustainable transport in the city, i.e. a “self assessment report” based on a template that was the same for all of the cities. In this report they had to answer questions regarding the municipality profile, plans and policies that could affect the SUTP. When this report was finalised, a group of experts (“peer review team” – including the author) read the report, reflected on it and, thereafter visited each city for about a week. During this week, the peer review team conducted interviews with city representatives, stakeholders and politicians, etc. to confirm the contents of the self-assessment report and find missing pieces, as well as help the cities find relevant factors to act upon when planning and adopting an SUTP. Both the self assessment and peer review guides have been developed in previous projects and tested through those and in this research project adapted to the prerequisites defined by the project. Transport in general was included in this review and has given a good insight in the level of inclusion of freight in the cities of the study.

Interviews have been an important data collection method and have been of a semi-structured type. The results from the interviews consist of facts about behaviour and attitudes, as well as of structures. To get comparative results, certain questions needed to be answered in all interviews and the interviews were planned with the same structure in all cities, focusing around themes of: planning procedures, cooperation internally, cooperation with stakeholders, city logistics, freight flows and impacts.

**Table 1 Interviews**

| | Germany | Sweden | Lithuania | Poland | UK | Holland | Estonia | *Sum* |
|---|---|---|---|---|---|---|---|---|
| Local authority | 4 | 11 | 16 | 14 | 16 | 1 | 9 | 71 |
| Freight stakeholder | 4 | 8 | 24 | 16 | 14 | 1 | 14 | 81 |
| *Sum* | 8 | 19 | 40 | 30 | 30 | 2 | 23 | 152 |

The questionnaire used was a part of evaluating stakeholder cooperation by local authorities, and focused on the freight quality partnership in Gothenburg and London respectively.

## Sustainable development of urban freight

Goods are important for the quality and liveability of the urban area, since without goods transport, there would be no shopping, no offices, no restaurants, etc. Goods transport is a driver of the urban economy but also an issue that is important from an emissions perspective (2007). Furthermore, vehicles serving urban delivery operations are a well-established contributing factor to urban traffic congestion and increasing atmospheric pollution (Yannis et al., 2006). Four out of five European citizens live in an urban area and are therefore immediately affected by the quality of the urban environment (European Commission, 2005). An urban area, a city or a metropolitan area is not just a collection of buildings and sufficient infrastructure to support those buildings; each is very much dependent on the relationship between different stakeholders in the area or those somehow connected to the area. Cities that want to compete in the globalised economy need to have the right mix of assets and effective transport services in order to succeed (Docherty, 2004). Freight transport is a part of the many different transport operations performed. Cycling, walking, public transport and private car use are among the means in use. During a day, most of the transport operations performed involve moving people from one place to another. This is what we see and notice when we walk around in an urban area. However, both people and freight need to use the same infrastructure.

There are differences between urban distribution and other types of goods movements, since the prerequisites are different in the urban area compared to the infrastructure between terminals outside urban areas. The infrastructure is often different with smaller roads, barriers like one-way streets, possible regulations for HGVs, etc. There are also unbalanced flows in the urban area, where a high quantity of goods is transported into the urban areas, but much less is transported out – with ordinary distribution vehicles. Most goods are either consumed within the area or transported out from the area as waste, by private cars or other ways by the consumers of the goods. But, there are also opportunities for distribution in urban areas that do not exist in other areas since distances are often short and the consignments often small, which makes it possible for distribution of goods by smaller vehicles, or even bicycles. There is also a possibility to use new types of specific urban consolidation centres and other types of innovative measures.

Urban freight transport is not a static situation. New establishments constantly arise that need transport support within an area as well as external establishments, e.g. external shopping centres, which affect the consumption and consumer behaviour within the city centre. Consumers change the behaviour in ways of shopping whereas e-commerce is taking a larger amount of the market share. There are as well developments in vehicle technology and the technology used to improve a single route or shipment, which affects the outcome of urban freight transport. Urban freight is affected not just by the size of the urban area, but also by the urban form: commercial and land use patterns; the strategic

organisation of product supply chains in terms of the location of warehousing facilities; and the fact that the logistics management of road freight operations is affected by geographical location, land use patterns and trade imbalances (Allen et al., 2012).

A problem noticed during several years of study within the topic of urban freight transport is that there are a large variety of definitions of the topic. There are similarities between those concepts but little coherence in how they are used. An urban area consists of a city centre together with suburban areas. “Urban freight”, “city logistics” and “urban distribution” are terms used for goods movements in a city or urban area. “Freight” is the carriage of goods and sometimes the term “goods transport” is used for the same purpose. The term “distribution” is used for the last part of the supply chain, where the goods reach the consignee. City logistics seem to be the main phrase used when coming to European Commission (EC) projects or authority-initiated projects, whilst urban freight and distribution terms are used more in research.

## Urban freight practice of today

Urban freight could be goods movements performed entirely within the urban area, but are mostly just a small part of a transport or supply chain. It can be concluded that the field of urban freight transport is complex and that there is a lack of understanding of the field, but also that it is not considered in the local authority transport planning of today. There is a need for a more systematic and holistic approach in order to grasp the complexity that covers many different types of transport operations, in order for local authorities to get a wider understanding.

Freight is an acknowledged contributor to the unsustainability of the urban area. Sustainable urban freight transport is what should be strived for. To reach this for an urban area it is necessary to include freight transport in the overall transport planning, but also a need for a long-term perspective and a development of current transport planning methods in order to include freight. The existing models, frameworks and tools focus on transport planning in general, or for specific measures. Awareness of how environmental aspects could be considered in different areas is also important.

Throughout the interviews that form the empirical data basis for this thesis, it was evident that urban freight transport is not a field that is handled to any appreciable extent in any of the cities of the study, and that the awareness is low. In 2004, Zunder and Ibanez showed through their survey of self-selecting respondents in EU projects that few local authorities in Europe have any person dedicated to work with urban freight transport. Those results are confirmed by the studies presented in this paper. Of the local authorities interviewed, only one had personnel working full time with freight transport in the urban area. Urban freight transport does not have a proportional part of the transport planning in local authorities compared to other types of transport like walking, cycling and public transport. This could be exemplified by Gothenburg where there are ten times as many persons working with cycling aspects than with freight at the local authority (Jäderberg, 2012). Furthermore, even though freight operations in most cities are recognised as an important driver of the urban economy, these is rarely handled on other occasions than when complained about, through restrictions or for solving a specific occurring problem.

There is a lack of data (statistics) for urban freight transport, why the use long-term planning tools similar to the ones used in public transport planning are not used. The lack of data is partly due to the resistance from transport operators to share information of their operations, with the argument that they do not want their transport operation data to be public – i.e. to share it with competitors, partly due to the local authorities’ incapability to know what kinds of data are needed and, therefore, not being able to perform, e.g. traffic counts of surveillance of transport operations in the urban areas. Data collection on freight transport is not done in any of the cities in this research on a regular basis. This could explain the short-termism in

any understanding of what the outcomes of, e.g. imposed regulations might imply for the freight transport situation in urban areas.

The results from the interviews show that the interest for capacity building of freight transport is low. However, there is some awareness of possible activities or measures for dealing with freight transport, but the dissemination from earlier activities in other cities is often insufficient to make it possible for new cities to test those activities without remaking past mistakes.

## Inclusion of urban freight transport in authority transport planning

Before working with freight transport in the urban area, there is a process to get the topic on the agenda for local authorities. Four main areas are identified through urban freight literature in order to work in a more structured way with urban freight transport for local authorities: measures; evaluation; transferability; and stakeholder involvement. Working with *measures* is the most common approach for local authorities to tackle singly occurring problems. There are three main types of measures that are trialled in many cities: infrastructure, regulations and consolidation. However, single measures are not enough to reach sustainability and there are few measures that have a good business case. Evaluation becomes important in order to understand the effect of the measures implemented. *Monitoring and evaluation* (ex-ante and ex-post) based on *performance indicators* (accessibility, environmental, costs, life quality and delivery characteristics) are shown to play an important role in the development of actions regarding urban freight transport. Evaluation is in turn important for the dissemination and *transfer of knowledge* between different cities/local authorities. Finally, it could be concluded that *stakeholder involvement* increases the possibilities for long-term successful results.

Stakeholders of urban freight transport have been addressed in previous literature by numerous authors (e.g. Anand et al., 2012; Russo & Comi, 2011; Taniguchi & Tamagawa, 2005; van Binsbergen & Visser, 2001). Hull (2008) draws the conclusion that few persons working at the level of local authorities sufficiently understand the local structures well enough to find out how to work across them, but the responsibility for implementing sustainable transport solutions is placed on the local transport authorities. The paradigm of sustainability should be shared by all public sector actors, as well as key stakeholders. Successful partnerships require engagement, priorities and agendas. This is also confirmed by (Banister, 2002) who states that to reach a sustainable city, active citizen support, new forms of communication between citizens and experts and the involvement of all major stakeholders is needed. There must be a willingness to change, and the active involvement of all actors is the most effective way of achieving a change. Stakeholder co-operation is one of the identified success factors of different projects (Hesse, 1995) and van Binsbergen and Visser (2001) suggest that policy makers should work with a concept of consultative planning whereby top-down long-term approaches are complemented with bottom-up implementation.

## Freight transport planning process

For local authorities, the way to manage and affect urban freight transport is through good policies and regulations. If transport policies take into consideration urban freight transport and set a good framework for the regulations of freight transport movements, which correspond to stakeholder possibilities and city prerequisites, there is a good opportunity for the development of a healthy and sustainable freight transport situation. Since there is an abundance of different possible solutions to reach sustainable urban freight transport as well as numerous different prerequisites for different cities, it could be very difficult for local authorities to know what to do and where to start. Timms (2011) concludes that the “world of information” is growing more and more complex and that there are several factors that need to be considered regarding policy transfer in order to make it easier and more accessible. An important factor is to identify the actors and stakeholders involved in knowledge transfer and understand what different roles the different actors could play, as mentioned above. Decision makers need to consider combinations of data collection methods in order to figure out the

best way of tackling freight in their city (Ambrosini et al., 2010). It is also a fact that many solutions to reduce or make urban freight transport more efficient have been implemented in cities without a thorough ex-ante evaluation (Filippi et al., 2010).

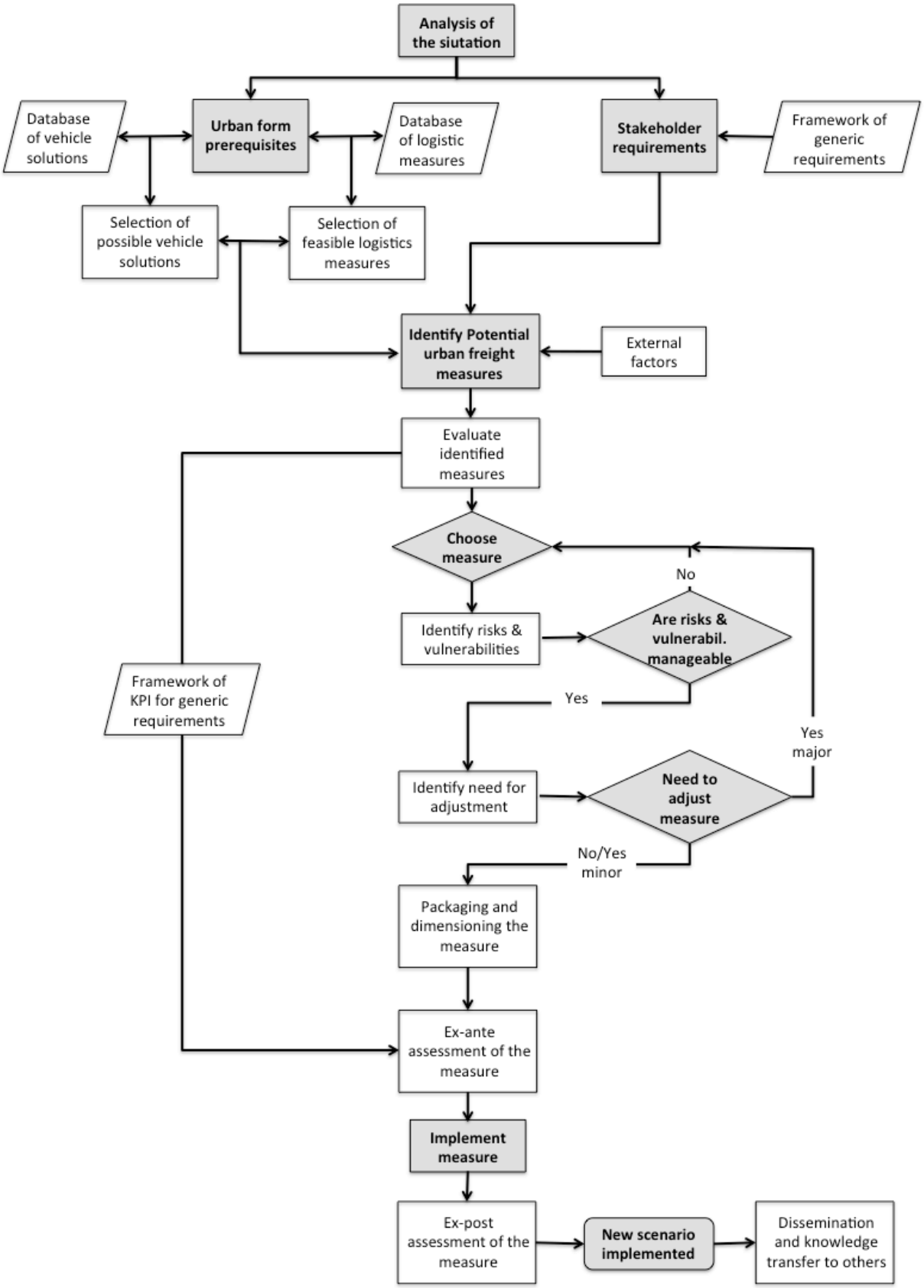


**Figure 1 Transport planning process for freight in urban areas.**

Figure 1 shows a process model for urban freight transport planning. The development of the process is based on a traditional transport planning process (Black, 1981), whereby traffic strategies consist of prognosis-based documents at the local authority. The process presented below has been adapted from the TURBLOG (2011) process model for transferability. Richardson and Haywood (1996) concludes that transport planning often fails due to the incapability to comprehend the complexities, why this model aims at explaining the complexity of the transport planning. Stakeholders, urban prerequisites risks and vulnerabilities need to be addressed. Uncertainties need to be dealt with, and Marchau et al. (2008) suggest an adaptive approach whereby vulnerabilities are identified and the implementation reassessed and redefined in order to be ahead of the problems and avoid failure; therefore, this step is included in the process. This could therefore be seen as an input to more volition-based traffic strategies, including contextual requirements and prerequisites of the urban area and stakeholders.

The model takes the starting point of analysing the situation (which could be the identification of a problem, or, potential to reduce impacts), which is the main issue for every specific area. The starting point does not need to be to solve a negative problem, or respond to complaints, but instead should be a way of working towards a more attractive urban area taking all aspects and modes of transport into consideration. The urban form and the stakeholder requirements are handled in parallel. Stakeholders need to be identified as well as their requirements, which are suggested to be based on a framework of generic requirements (environmental, costs, accessibility, quality of life and delivery characteristics). The urban form prerequisites need to be investigated (urban characterisation, external factors, activity characterisation and freight characterisation) for the specific area of interest. It is thereafter possible to crosscheck these characteristics with possible measures and vehicle solutions that could be applicable of which both need to be a subject for transfer of knowledge from other cities. Possible measures then need to be evaluated and compared in order to choose a measure that fits all requirements sets. Risks and vulnerabilities need to be handled. Both ex-ante and ex-post evaluations are important parts that need to be addressed more thoroughly by local authorities in order to show the effect of each implemented measure. The KPIs are an important part of the process model and e.g. Patier and Browne (2010) suggest suitable key indicators. Once the measure is implemented and properly evaluated, it is important to disseminate the project and transfer knowledge to others (both positive and negative experiences).

By presenting this model, this research has contributed to an improved understanding of how freight transport could be addressed in the transport planning processes of local authorities. The model gives the possibility to in a structured way identify and evaluate potential measures and give the local authority a well grounded decision for what to do.

## Conclusion

In this paper, the purpose has been to show the process of how to include urban freight transport in the overall transport planning by the local authority. Summarising the status of today, based on the empirical data in this research: there is a neglect of freight in urban transport planning; urban freight is mainly handled as restrictions or response to complaints; when urban freight is handled, it is often as single measures; and, there are contextual differences between cities, but not necessarily a different approach between cities.

The paper contributes to the research through a presented framework model with factors to consider for policy makers in the urban freight transport planning process. However, a significant practical implication is that for the LA's, there is a need for more simple ways of handling freight transport, as the basic problem is the lack of knowledge. Therefore, there need to be more focus on knowledge transferability. Information sharing through public-private partnerships is in this study showed to be efficient for successful policy implementation and, research in this area need to be developed. It is important to highlight

that the model presented is to be used once freight transport is acknowledged, and not a process of how to include freight in the overall transport planning.

The overall conclusion of the paper is that in order for local authorities to include freight transport in the overall transport planning, there is a need for resources and information. There are several possibilities, where information exchange and increased capacity in personnel at local authorities are some, but it is necessary to include relevant stakeholders in the process. To work with freight transport, a thorough transport planning process is essential, whereby urban prerequisites and stakeholder requirements are taken into consideration.

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