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Introducing elements of due diligence in sustainable urban freight transport planning

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Abstract

This paper presents the findings from a Delphi study that has investigated the feasibility of local authorities adopting an updated transport planning process that incorporates the concept of due diligence. The Delphi panel consisted of twenty experts representing local authorities, academia and other relevant freight stakeholders from Sweden, the United Kingdom (UK), Germany, France and The Netherlands that were engaged via email survey. This resulted in the development of a refined theoretical framework that enables freight to be fully considered in local authority transport planning.

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Keywords: urban freight; transport planning; stakeholder involvement; due diligence

1. Introduction

A large proportion of negative externalities experienced in urban areas, such as noise, visual intrusion and emissions can be attributed to freight transport operations. Nevertheless, many local authorities seem to lack formal strategies that take into account freight transport movements, in the same way that passenger mobility is addressed (Lindholm and Blinge, 2014). Since freight is currently not addressed to any great extent by local authorities in the

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development of transport strategies, there is a need to find structured methods of including freight in transport and policy planning (Ballantyne et al., 2013). Local authority transport planning is discussed in this paper within the context of transport related decisions made by civil servants, local officers, and locally elected politicians. It could be difficult for local authorities to know where to start, when planning for urban freight, since there are a variety of logistics or regulative measures that could be implemented. However, the 'world of information' is becoming increasingly complex and there are several factors that need to be considered regarding policy transfer in order to make it easier and more accessible (Timms, 2011).

Recent research has highlighted the difficulties of finding suitable and sustainable solutions to common problems associated with urban freight (Quak, 2011). This research aims to examine whether the principle of due diligence (a required step in business merger decisions) could be used in local authority transport policy decision making to ensure that freight is adequately considered from an earlier point in the process. However, one of the major barriers in the development of such a process is the lack of knowledge and awareness amongst local authorities, with regards to the importance of accommodating freight in urban transport planning. However, over the last few years' research has noted an increasing local authority awareness of freight activities, particularly in the urban context (Lindholm, 2012).

Previous studies have highlighted a significant lack of freight stakeholder involvement in urban transport planning and policy making (Ballantyne et al., 2013; Lindholm and Browne, 2014) which have prompted the necessity to include stakeholders in decision and policy making to a greater extent. This research has aimed to identify opportunities for stakeholders to become involved in freight transport planning, and to examine the concept of due diligence used in business mergers and acquisitions to ensure a comprehensive evaluation is conducted. Therefore, the purpose of this paper is twofold, firstly to present the benefits of using elements of due diligence in urban freight transport planning to better accommodate the needs of freight stakeholders; and secondly, to present the findings of a Delphi study that has investigated the feasibility of local authorities adopting this process. The remainder of this paper is structured as follows: the first section describes the desk based literature review and the Delphi method; followed by a discussion around planning for urban freight, and the potential to incorporate due diligence in transport planning; then we present findings from the Delphi study including the proposed transport planning process incorporating due diligence; and finally the paper concludes with some recommendations on updating urban freight transport planning.

2. Research approach

To the authors' knowledge, the idea of including and applying elements of the due diligence process to local authority urban transport planning has not previously been explored in academic research. Similarly, incorporating the due diligence concept as a method of considering urban freight transport in the local authority transport planning process has never before been assessed. In this paper we use a literature review and analysis of existing transport planning processes in order to develop a revised transport planning process incorporating elements of due diligence. Thereafter, the feasibility of using such a process is tested using a Delphi approach.

A systematic desk based literature review was conducted to determine current processes used in urban transport planning and urban freight transport planning, in addition to an overview of the due diligence process. However, our analysis and findings also build upon comprehensive previous reviews of urban freight and approaches to transport planning adopted by local authorities (Ballantyne et al., 2013; Lindholm, 2012; Lindholm and Behrends, 2012). This previous research, spanning Northern Europe, has been in the form of literature reviews, interviews, case studies and workshops carried out since 2005 by the authors – studying in detail more than 24 local authorities as case studies and performing more than 80 interviews with urban freight stakeholders. Those case studies and interviews have together with three workshops (Ballantyne, 2013) on the topic increased the understanding of how stakeholders of urban freight perceive and address urban freight transport issues.

Based on the detailed literature review, a suggested transport planning process for freight has been developed. A Delphi survey approach was then used to gather expert opinions on the feasibility of this proposed transport planning process for local authorities to better consider the needs of commercial freight vehicles.

The Delphi technique is a method of gathering opinions from a panel of experts that was originally developed in the 1950's for the US Air Force to assist with long-range forecasting (Linstone and Turoff, 2011). The method takes

its name from the ancient Greek oracle at Delphi that was believed to deliver knowledge from the god Apollo to help make important policy decisions (Geist, 2010; Marchais-Roubelat, 2011). Since its conception, the method has been used extensively in decision and policy-making in both public and private sectors in the areas of healthcare, management, and education; as well as for market and academic research purposes (Meijering et al., 2013; Gupta and Clarke, 1996). One of the main benefits of using the technique is that it enables many experts to have equal involvement in a decision-making process regardless of their geographic location, compared to formal meetings or interviews that require physical attendance, thus increasing the level of participation and range of perspectives included (Geist, 2010). Other advantages of this technique include: panellists remaining anonymous and, completing the questionnaires independently of other participants, which allows changes of opinion without judgment from others (Geist, 2010; Rowe et al., 1991).

As with all research methods, the Delphi technique has some limitations such as panellists "falling victim to the band wagon effect" (Geist, 2010, p. 148), where ratings and comments conform to false information if panellists are given distorted feedback between rounds. Another potential disadvantage, although not limited to Delphi surveys is that panellists' may succumb to fatigue if a large number of topics or questions are posed or if those questions are difficult to understand (ibid). Gupta and Clarke (1996) also note that poorly designed questionnaires, unreliable analysis of results, limited feedback and consensus, and poorly selected panel members can each have a negative effect on the overall results of a Delphi study.

Although the classical Delphi method takes the form of a series of 'pen and paper' questionnaires administered through the post, more modern adaptations use a web-based questionnaire that automatically updates the content each time participants supply feedback, they also allow participants to feedback multiple times during a specified timeframe (Geist, 2010). The Delphi study described in this paper is a somewhat 'hybrid' of the formats described above, with two rounds of questions plus a final round for feedback and information. The study uses email as opposed to a postal questionnaire, and an editable word document questionnaire in place of a web-based survey tool to gain expert opinion and feedback. The survey has been confined to two pages (including images) in the first and second round in an attempt to reduce potential participant fatigue. The third, and final, round was used to present the final transport planning process that incorporates due diligence, as well as to reveal panellists feedback from round two. Throughout the study, the due diligence concept was never mentioned to panellists since it only provides a theoretical underpinning for the research and is not core to the Delphi evaluation, and therefore avoided panellists judging due diligence instead of the urban freight transport planning process presented.

The number of panellists in Delphi studies varies, but indications from other research initiatives show that between fifteen and thirty participants depending on the format of the Delphi approach adopted is considered appropriate (Kauko and Palmroos, 2014; Loo, 2002). Furthermore, the selected panellists are likely to be formed from a convenience sample because they have met specific pre-determined criteria (Mead and Mosely, 2001). For this study, sixty individuals representing local authorities, academic researchers and consultant practitioners were initially invited to join the Delphi panel. From the list of invited participants, 20 took part in the first round of the study, with three unable to take part as they had either retired or were no longer in post; five responded to the invitation but declined to take part due to heavy workload commitments; whilst thirty-two did not respond. The respondents remained anonymous to each other throughout the study. Participants were selected for their knowledge and previous experience of urban freight and or transport planning, regardless of whether they represented academia, local authorities or another type of stakeholder (e.g. consultants or industry representatives) with relevant knowledge (see Table 1).

Table 1. Delphi panellists divided into type of stakeholder

	Academia	Local authorities	Other
Round 1	5	10	5
Round 2	4	7	4
Round 3	Distributed to all panellists		

The final Delphi panel of 24 experts representing 15 different cities from Sweden, the United Kingdom (UK), Germany, France and The Netherlands were sent the first round of the Delphi survey via email correspondence. The

first round invited feedback and comments on the usefulness and practicalities of implementing the suggested changes to transport planning. The questionnaire comprised of seven questions, where the first three were to identify the respondents (name, role and geographic location). The next two questions regarded the general awareness of freight transport planning in the town or city that the respondent represents (either as a local authority or, where the respondent is employed). The final two questions focused on the transport planning process and stakeholder involvement. For the transport planning process the respondents were asked to provide feedback on the following: if elements were missing, if the process was logical, if it was feasible and if the respondents had any general comments or suggestions on the process presented.

For the second round, respondents were presented feedback from the first round, including summarised responses to issues raised by respondents in the first round. Only 11 of the 20 respondents from the first round participated in round two, but four additional respondents that were initially approached to take part in the first round participated in the second round. For comparison, the initial revised transport planning process from round one was presented alongside the updated process that incorporated revisions from feedback collected following round one. Respondents were then asked to comment on the updated process as per round one: if any elements are missing, if the order of activities is logical, if this process is feasible for local authorities to incorporate. Additional feedback was also sought on: whether any elements would be key for a simplified version of the process, if a simplified version would be useful, if there are any potential barriers for uptake of this process and how those barriers could be overcome, and finally, to provide any additional general comments. The third round of the Delphi study was used to present the final version of the transport planning process to all panellists.

3. Urban freight transport planning

The origins of transport planning are found in economics and engineering, with the main aims of accommodating traffic demand and ensuring societal benefits (Banister, 2002; Goodwin, 1999), which traditionally uses quantitative methods to develop prognosis-based traffic strategies. A classic, seven step transport planning process which has been used by local authorities since the 1950's is described by Black (1981). However, despite its long-standing use amongst local authority transport planners, Black's process lacks a detailed qualitative assessment of the situation or problem; and adopts a rather weak theoretical framework that fails to understand the behavior of people. Furthermore, the current planning process described by Black highlights a serious deficiency in terms of stakeholder involvement.

By examining the classic transport planning models presented by Banister (2002) and Black (1981), it is also evident that these models prioritise the movement of people and do not explicitly address the movement of goods. In 1996, based on transport planning for infrastructure, Richardson and Haywood concluded that transport planning processes are likely to fail due to the fact that it is almost impossible to take into account the complexities of sustainability. Thus, a need for transport planning processes that include socio-political, economic and environmental aspects is required. Therefore, the traditional predict and provide method of transport planning is no longer useful in today's complex environment (Goodwin, 1999).

As urbanisation increases, freight is needed to maintain economic activity in towns and cities. With the objective of reaching a sustainable transportation system in each city, such as the ones stated by the European Commission (2011, p. 9) of 'essentially CO2 free city logistics in major urban centres by 2030', local authorities need to be aware of the different activities as well as their potential impacts. Hence, the transport planning process is a complex task for which Quak (2011) states that there is a high degree of uncertainty caused by three general factors: (1) the large number of potential policy packages (2) the method of implementation and, (3) the response of users to each of those policy packages. Since our focus is on urban freight transport, we suggest a fourth factor be added to this list: (4) the freight stakeholders' response to the policy packages. However, the transportation planning process is very much dependent on the individual planners and policy makers, since they may have different ways of interpreting concepts such as sustainable development (Quak, 2011). In order to integrate different policies when working with transport planning, it is important to deal effectively with any sustainability aspects that are being raised (May et al., 2003).

A recent European Commission strategy suggests that local authorities approach including sustainability in transport planning by using Sustainable Urban Mobility Plans (SUMPs) (European Commission, 2009). The SUMP

is a way of integrating different strategies and policies in the area of transport, whilst accommodating the need for having both a continuous planning process together with a plan for how to address transport. Freight transport however, remains a minor element of the SUMP strategy relative to the movement of people.

Urban freight transport operations are generally performed by trucks on the road network, as alternative modes are largely unsuitable, and therefore most urban freight transport models are focused on vehicle management. Road freight transport management (RFTM) is essential, including both infrastructural and non-structural measures such as route optimisation (Taniguchi et al., 2014). The RFTM process suggested by Taniguchi et al. (2014) includes the 'Plan, Do, Check, Act' (PDCA) procedure, which is useful to consider when addressing planning processes. Although not necessarily directly connected to RFTM, several researchers have identified the need to involve different types of actors and stakeholders in urban freight transport planning in order to identify problems, needs and solutions (Ogden, 1992; Taniguchi and Tamagawa, 2005; Ballantyne et al., 2013).

There are a variety of ways for local authorities to better address urban freight transport. Firstly, local authorities need to be aware of the importance of including freight in transport planning. Secondly, there is a need for a thorough planning process that assists local authorities with identifying what is required. From a study of five of the most common urban freight transport policies - time windows, vehicle type restrictions, loading/unloading policies, fiscal policies and the promotion of transshipment and consolidation centres, Danielis et al. (2010) shows that policies have differentiated impacts according to the type of goods and the distribution channels employed. Nevertheless, Quak and de Koster (2006) highlight that more than 90% of local authorities sought to implement time-windows with the main objective of creating a more appealing shopping environment, without necessarily considering differentiated impacts. If decision makers frame the issues of urban freight transport as an infrastructure problem or even as a non-existent problem, it is unlikely that the intended outcomes sought will be reached (Lindholm, 2012). Further, lack of understanding of the problem could lead to sub-optimisation of the implemented measure or policy. Therefore, there is no single policy that can fulfil all the demands and features of urban freight transport, since the nature of stakeholder requirements vary significantly.

Tools and frameworks for urban freight transport need to be continuously developed and improved (Anand et al., 2012). The Multi-Actor Multi-Criteria Analysis (MAMCA) methodology is a valuable and recognised tool for approaching the decision-making process and is suitable for use with freight transport. The methodology, further developed by Macharis (2005), is an important input to the analysis that needs to be made and highlights the importance of including the stakeholders' views. The MAMCA model includes seven steps: 1) definition of problem and identification of alternatives; 2) identification of key stakeholders and their objectives; 3) translation of stakeholder objectives into criteria; 4) construction of indicators for each criterion; 5) construction of an analysis matrix where each alternative is connected to the objectives of the stakeholders; 6) completion of multi-criteria analysis giving a ranking of the alternatives; and 7) implementation. The steps in the methodology give valuable input to the qualitative evaluation that is discussed in this paper. Furthermore, as concluded by Macharis et al. (2010), even though the results of the analysis are a tool to help in understanding the possibilities, the final decision still lies in the hands of the decision makers and the extent of their 'political courage'.

4. Using due diligence in urban transport planning

In this paper, we suggest that elements of due diligence could be usefully applied to urban transport planning in order to avoid sub-optimisation of freight transport operations. Due diligence is essentially a process to collect and evaluate information in order to determine risks and opportunities, and to thoroughly assess a potential measure or action. It is traditionally used in the early phases of business mergers and acquisitions to evaluate a company's financial situation and to avoid non-disclosure of key information. Carleton and Lineberry (2004, p. 51) explain in simple terms that due diligence is 'the investigation of one party by another, to gather information that will assist in decision making and risk analyses'. Howson (2003) defines due diligence as 'A process of enquiry and investigation made by a prospective purchaser in order to confirm that it is buying what it thinks it is buying.' Hence, due diligence is about ensuring that a buyer understands exactly what they are purchasing, all gaps are identified and that an audit has been performed, thereby reducing future risks whilst assessing future prospects and showing how they can be realised (Howson, 2003).

By including aspects of due diligence in transport planning, local authorities could better address sustainability in relation to all aspects of urban freight transport, through the consideration of multiple stakeholder requirements. Due diligence also has the potential to be a valuable tool in ensuring trust amongst stakeholders, which research by Hofenk (2012) has demonstrated to be important for reaching successful outcomes. The inclusion of due diligence in a formal transport planning process could lead to a more well-grounded disclosure, thus having a more positive impact on day-to-day urban freight transport activities. As such, due diligence has the potential to be a valuable tool in ensuring good transferability of knowledge as well as increasing trust amongst stakeholders (Foos et al., 2006).

Rhodes et al., (2003) outline the following process to apply due diligence: firstly, define future plans for the collaboration; set metrics for the collaboration; identify the key areas of risk and suggest actions to address them; benchmark an organisation against an industry best practice; provide the basis for a deal that will balance the needs of all partners; bring the two parties together in a way that avoids surprises at a later stage; encourage the two parties to have more challenging and difficult conversations earlier in the relationship; and finally, increase the overall chances of success. By using this outline, the adaptation of the due diligence process for urban freight transport could lead towards the creation of a process similar to that shown in Fig. 1 below. Whilst it should be understood that there is no unique matching of solutions to specific city contexts, this type of model could nevertheless help a city to refine the number of potential solutions that it should consider.

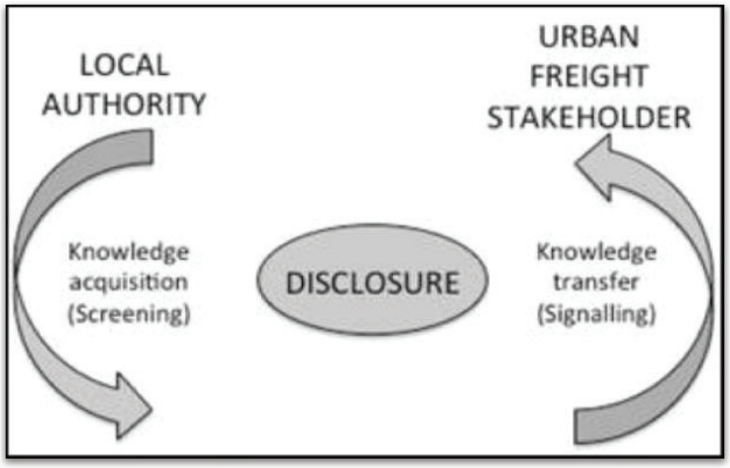

Fig. 1. The due diligence process aiming at overcoming information asymmetries (adapted from Pack (2002) to the urban freight context)

By merging a collaboration strategy from Rhodes et al. (2003) and, the identification of problems and city characteristics as described by Macário and Marques (2008) in processes of transferability of knowledge; with the traditional transport planning process as described by Black (1981) and Banister (2002), we propose an urban transport planning process that includes due diligence as shown in Fig. 2.

Richardson and Haywood (1996) identify that transport planning often fails due to the incapability of local authorities to comprehend the complexities of different stakeholder needs. Our suggested process therefore aims to address these complexities, where stakeholder requirements, urban prerequisites, risks and vulnerabilities are taken into consideration. In addition, it is necessary to deal with uncertainties and vulnerabilities, and therefore the adaptive approach suggested by Marchau et al. (2008) has been included in step 7d (see Fig. 2) of our process, whereby vulnerabilities are identified and the implementation reassessed and redefined in order to be ahead of the problems and to avoid failure.

Round 1 Proposed transport planning process

1. Assigning a person with responsibility for the process
2. Perform an analysis of the situation (identification of a problem, or, potential to reduce impacts)
3. Identify stakeholders
4. Identify a team for the process
5. Identify the requirements (urban characteristics and stakeholder requirements)
6. Identify potential urban freight measures (a number of activities that can solve the problem, or, reduce impacts in the specific area addressed – taking the requirements into consideration)
7. Evaluate the identified measures
    a. Identify which indicators that are relevant for evaluation for the specific measure
    b. Assess the financial implications (business model)
    c. Perform an ex-ante evaluation
    d. Identify risks and vulnerabilities
    e. Identify needs for adjustments (or change of measure) based on the risk assessment
    f. Provide a basis for implementation that will balance the needs of all stakeholders
    g. Define a plan for implementation (packaging and dimensioning the measure based on the results of the assessments)
    h. Define a stakeholder collaboration plan
8. Implementation
9. Monitoring and ex-post evaluation
10. Dissemination and knowledge transfer to others

Fig. 2. Freight transport planning process including elements of due diligence.

5. Findings and suggested updated process

To identify the context of the cities that the Delphi panellists represented, it was considered important to determine whether any of the participants' cities had an existing freight transport plan specifically outlined and/or included in a wider transport strategy for the local authority. From the results of the first round, it was noticeable that freight transport is not generally included within transport and traffic planning at a local authority level. Interestingly, only panellists from three cities reported to have a specific freight transport plan or strategy, albeit having very recently introduced the strategy/plan. The majority of panellists said that freight transport is either partly dealt with in a wider transport strategy or not at all. However, the fact that many panellists highlighted a number of cities that are partly including freight indicates a positive trend towards greater acknowledgement of freight in recent times, since previous studies have clearly indicated that freight is not high on local authority agendas (Lindholm and Blinge, 2014; Ballantyne et al., 2013; Stathopoulos, 2012). Nevertheless, just one of the respondents indicated that freight is always taken into consideration when planning for transport in the urban area, whilst most respondents indicated that freight is just occasionally taken into consideration.

When it comes to the suggested transport planning process, the respondents all agreed with the logic of the process. However, in general the process was considered too theoretical and resource demanding which could lead to difficulties in uptake by local authorities. Due to current lack of knowledge it could be difficult to incorporate a process as complicated and resource demanding as the suggestion presented to the participants of the Delphi study. A clear request from almost half of the participants was to design a relevant but simpler process that can be used by smaller towns and cities or for small transport related projects. One suggestion was to develop a set of questions about urban freight transport that can be considered for all local authority transport planners in order to increase the

awareness of freight, as well as to help them to take important initial steps towards the inclusion of freight in general transport planning. For this reason, acquisition regarding an adapted or scaled-down process was specifically added to the second round.

From a theoretical perspective, the panellists identified some missing elements from the proposed process. For instance, several participants mentioned that gaining acceptance from politicians was lacking. It was also noted that it is important to consider the general acknowledgement of freight by local authorities in order to improve the level of freight's inclusion in general transport planning processes, and several respondents mentioned that a 'pre-process' is needed, in order to cope with the awareness raising. Additionally, panellists felt that it is important to define the aim and objectives of the process at an early stage, along with obtaining political acceptance, as several respondents also recognised the importance of communication and information to citizens about freight and current demand management measures being implemented. Two respondents mentioned the value of inserting an evaluative loop of the process between step 6 and 8, which would further help to improve the quality of the chosen measure.

Finally, the respondents were all asked about the value of including stakeholders in urban freight transport planning. Not surprisingly all respondents were of the opinion that this is necessary in order to reach effectiveness in processes as well as actions. Although Delphi participants were not explicitly informed in this round that this process adopts the concept of due diligence as a way of ensuring freight movements are considered throughout existing transport planning processes, the participants did not highlight any views that opposed the process, even though some clarifications were asked for, especially in steps 7g and 7h, which were addressed in the updated process. This suggests that in general participants were in favour of including a wider variety of stakeholders (including freight stakeholders) in transport planning. The comments about adding an evaluative loop between some of the steps also support the concept of due diligence, since due diligence is essentially about avoiding non-disclosure of information through a complete and continuous process.

5.1 Updated urban freight transport planning process

The updated version has been streamlined with clearer wording, as well as highlighted key elements in bold. However, the suggested process shows that all steps are necessary to fully integrate freight in transport planning processes and to avoid sub-optimisation of implemented measures. Simpler processes can be found in other research, but those do not fully incorporate the complete extended range of stakeholders suggested here or requirements (such as urban characteristics).

A question was raised about whether a set of questions on urban freight transport could be developed in order to increase local authority transport planners' awareness of freight related issues, and although not directly related to this study, this was considered a useful suggestion. Subsequently, a 'Pre-process' (step 0) has been added to indicate where these awareness raising questions could be used.

Missing elements that were identified by panellists have also been included in the final process: gaining acceptance from politicians; a pre-process for raising awareness; early definition of the aim and goal of the process; and communication to citizens. In addition, clarification of steps 7g and 7h was asked for, and these have now been revised and appear as steps 8f and 8g. Other amendments include combining steps 7f and 7g into step 8f, and revising step 7h, which now appears as 8g. A few panellists mentioned the value of inserting an iterative loop of steps 6 to 8 to improve the quality of the chosen measure, which has also been incorporated.

The updated process (see Fig. 3), could be used for individual targeted demand management measures, either formally or informally; but also as an overall and integrated transport planning tool, whilst the key elements could be used as a checklist when starting to plan for a project, measure or solution to a specific problem involving freight. It is important to note that the suggested planning process does not end after implementation and evaluation; it should instead be viewed as a continuous process where stakeholder involvement, dissemination and information exchange is important both throughout and following the process. It should also be noted that there is a difference between approaching stakeholders and including their opinions, thus it is important to plan for continuous and long-term involvement of stakeholders in the transport planning processes.

The Delphi panellists agreed on the usefulness of this comprehensive process. However, the fact that local authorities at this point still do not put freight high on the agenda is likely due to lack of resources and awareness.

Round 2 Updated transport planning process

0. Pre-process: raising awareness of the importance of freight transport acknowledgement.
1. **Aim of process**, including political agreement & involvement of other planning processes.
2. **Assign a person** with responsibility for the process as well as clearly defining the role.
3. Identify stakeholders
4. Identify a team for the process
5. **Definition of the strategy requirements** (identify problems, urban characteristics and stakeholder requirements)

Iterative process, step 6-8:

6. Identify potential measures
7. **Select measure** (that is most consistent with the findings from step 5)
8. Due diligence of potential measures:
    a. Identify which indicators are relevant for the specific measure
    b. Assess the financial implications
    c. **Ex-ante evaluation**, (including data collection)
    d. Identify risks and vulnerabilities
    e. **Identify needs for adjustments** (or change of measure) based on the risk assessment
    f. Define a plan for implementation that will balance the needs of all stakeholders
    g. Develop an action plan for engaging with stakeholders.
9. **Implementation** & dissemination to a wider public
10. Monitoring and **ex-post evaluation** data collection & continuous work with the process.

Fig. 3. Updated freight transport planning process (after Delphi round 1) including elements of due diligence.

5.2 Final urban freight transport planning process

After the second round of Delphi panel responses, the process has been further developed incorporating respondents comments and suggestions, see Fig. 4.

Following the second round of the Delphi, all panellists acknowledged the pre-process of raising awareness as an important step. However, further clarity is required to identify and involve those stakeholders that would benefit from greater knowledge about urban freight movements and how that can be achieved. Ballantyne et al. (2013) present a simple framework for identifying key actors and types of stakeholders of urban freight. Other feedback considered, included: reinstating the "analysis of the situation" into the process because it was felt necessary for gaining political understanding and acceptance, as well as providing an opportunity to identify the urban characteristics of an area of interest (all of the city or just a specific part of the city). Step 8g, could adopt a process like the Design and Monitoring Framework (DMF) used in the Smartfusion project (2015). One panellist mentioned that not only financial implications need to be considered, but also the legal aspects of a decision. This is now included in step 8b together with the note to set up a business model for the measure, which is a prerequisite in order to compare implications of different measures.

Round 3 Final transport planning process

0. Pre-process: raising awareness of the importance of freight transport acknowledgement by local authorities.
1. **Assign a person** with responsibility for the process as well as clearly defining the role (including the owner of the process – whom is the assigned person supposed to report to).
2. Perform an **analysis of the situation**
    a. Identification of problem or potential to reduce impacts
    b. Define the area of interest
    b. Identify urban characteristics of the defined area
3. **Aim of process**, including political agreement & involvement of other planning processes.
4. Identify relevant stakeholders for freight and start a long-term dialogue process (including other disciplines of transport, e.g. public transport or cycling, which can have conflicting interests) and **stakeholder requirements**
5. **Ex-ante evaluation**, (including data collection)

Iterative process, step 6-8:

6. Identify potential measures
7. **Select measure** (that is most consistent with the findings from step 5)
8. Due diligence of potential measures:
    a. Identify which indicators are relevant for the specific measure
    b. Assess the financial & legal implications (set up a business model)
    c. Update the data collection depending on relevant indicators
    d. Identify risks and vulnerabilities
    e. **Identify needs for adjustments** (or change of measure) based on the risk assessment
    f. Define a plan for implementation that will balance the needs of all stakeholders
    g. Develop an action plan for engaging with stakeholders.
9. **Implementation** & dissemination to a wider public
10. Monitoring and **ex-post evaluation** data collection & continuous work with the process.

Fig. 4. Final freight transport planning process (after Delphi Round 2) including elements of due diligence.

A need for a Q&A has been identified as potentially more useful than the key elements as shown in bold in Fig. 3 and 4. The process does require guidance and a detailed description of each step in order to be of more practical use to local authorities. Nevertheless, the fact remains that freight needs to become a natural part of overall planning rather than a "stand-alone" process. Barriers to incorporating a process such as this have been identified as: lack of interest in freight issues; lack of knowledge about freight transport operations; lack of time and resources available for freight compared to passenger transport. Panellists' suggested that these barriers can be addressed by assigning more resources to freight issues and by finding ways to address the knowledge gap in relation to freight, additionally several panellists mentioned regulation as the only way to better acknowledge freight. In reality this can be challenging, however developing a good stakeholder dialogue could help.

5.3 Discussion of findings

The process proposed in this paper involves the following: understanding the concept, identifying potential benefits and gaps in current freight planning approaches, reducing potential risks associated with excluding freight transport, as well as assessing future impacts. The process we propose is of a somewhat more qualitative nature than the notion of due diligence in its primary context of business finance suggests, however it is similar to the 'human due diligence' approach as outlined by Harding and Rouse (2007), since this process has the potential to focus on the requirements of stakeholders, the characteristics of the urban area and the potential measures that could be

implemented. However, there remains an obvious need to get freight transport higher on local authorities' agendas. Delphi panellists confirmed that freight transport is not generally included in transport planning at local authorities, whilst acknowledging little awareness of freight operations and difficulties in incorporating freight into existing planning processes. In general, the panellists were in favour of including a wider variety of freight stakeholders in transport planning.

Freight should be a natural part of transport planning for an urban area, but also importantly an integrated part of all planning processes. Depending on size of measure, problem, geographical area or other definitions of scope, the process can be reduced to involve fewer steps, as suggested in the abridged process where a few key steps are highlighted. However, it is important to be aware of the complexity of the situation in order to cope with the issue as a whole. More simple transport planning processes are available, e.g. the PDSA cycle as suggested in RFTM by Taniguchi (2014) that should not be forgotten as a useful and efficient tool when time and resources are scarce. Also, the SUMP (2014) processes as suggested by several European entities are important, if the element of freight is taken into consideration. However, the proposed process in this paper shows all steps that are necessary to fully consider freight in transport planning processes as well as to avoid sub optimisation. If implementing such a process, many of the steps will occur as a matter of course for every new project under development. Economic issues, such as resources and time, are important to bear in mind, particularly in steps 2 and 4 where requirements are defined. If resources are scarce, then there is a need to identify a measure that meets those requirements as effectively and efficiently as possible.

The Delphi technique is a valuable approach for testing and evaluating the usefulness of a concept, as well as attempting to satisfy conflicting opinions of various stakeholders in order to find a mutually agreed way forward (Loo, 2002). Since a number of Delphi rounds were planned for this study, the invited panellists were informed that their commitment to participate would involve commenting on and analysing the usefulness of the proposed planning process through several rounds over a number of months. Therefore, we are confident that the panellists' expertise represents the views of key stakeholders in urban freight and local authority freight transport planning. Although, this study has not included a test of the Delphi panellists' consensus regarding the final proposed planning process, such confirmation could be achieved through a follow-up survey or round of interviews with a separate sample of stakeholders, independent of those on the Delphi panel, as suggested by Loo (2002).

6. Conclusion

If due diligence is required in business merger decisions, why not include it in transport policy decision making? In this paper we suggest that local authorities introduce the concept of due diligence into their transport planning process as a way of assessing freight transport requirements prior to policy decisions. Elements of due diligence provided the theoretical basis for improving traditional approaches to transport planning that considers freight movements. Since there appear to be few known transport planning approaches that include multiple private sector stakeholders, the due diligence process used in business pre-merger evaluations was identified as a valuable and useful concept for adaptation into transport planning.

We recommend that local authorities re-consider their approach to transport planning and learn to accommodate the views of urban freight transport operators and other relevant urban freight stakeholders. For now, according to the Delphi panellists, the process remains too complex to integrate into existing transport planning frameworks. However, it is our belief that the process proposed in this paper, inspired by the concept of due diligence, could be adopted by local authorities, and lead to improved sustainability of urban freight transport through better, more comprehensive planning.

An improved transport planning process that incorporates freight transport could lead to benefits for business as well as for policy makers, since all stakeholders are taken into consideration. Our suggested process is more consistent and transparent compared to traditional quantitative methods and takes all possible requirements and prerequisites into consideration, compared to previous freight transport planning processes that traditionally focus on specific measures. Therefore, the result should be seen as a refined theoretical framework for how to fully consider freight in transport planning at a local authority level. The findings are also intended to foster greater discussion on the benefits of including freight in transport policy and planning. The process presented in Fig. 4 is a theoretical contribution to existing frameworks and planning processes, and contributes to research by focusing

specifically on freight. In addition, incorporating elements of due diligence have proven a useful way of considering all stakeholders and information. It is intended that this planning framework can be of practical relevance to local authorities and further research will include practical application of the process.

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