

## Sustainable Urban Logistics: Stakeholder Engagement Methods Hierarchy

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### Abstract

Sustainable urban logistics (SUL) presents unique challenges for local authorities due to its complexities. These complexities spanning both positive and negative outcomes, is underpinned by the atypical stakeholder compositions, often with conflicting positive objectives. This review offers direction for stakeholder engagement methods, highlighting an effectiveness ranking for engagement methods.

### Introduction

Urban population growth and economic activities are impacting sustainability outcomes in urban areas. Local authorities demonstrate increasing commitment to address freight externalities within urban cities (Liimatainen et al. 2014), however the challenge is very complex with competing objectives amongst a plethora of critical stakeholders (Ballantyne et al., 2013). Urban freight planning and policy development at local government levels and there is a lack of cohesion within the literature, particularly in the area of stakeholder engagement strategies if they exist at all (Lindholm, 2012). There is increasing recognition of the need for greater inclusivity as an important component of SUL policy acceptance and success. In addition to empirical data, we reviewed the literature to identify and classify stakeholder engagement strategies or techniques that have been documented in the literature.

Accordingly, a number of strategies or methods including but not limited to experiments, interviews (case based), surveys, focus groups, workshops (consultations) and modelling were identified. We describe, discuss and rank these below.

1. Experiments: Trials conducted to test or validate SUL plans with the aim of observing stakeholder reactions in real and usual contexts(Ando & Taniguchi, 2006; European Commission & International Road Transport Union, 2006). Often deemed as pilot trials, examples include urban consolidation centres (UCC) set ups, driverless cars, off-peak deliveries (Allen, Browne, Woodburn, & Leonardi, 2012; Fu & Jenelius, 2018). Experiments are considered as very good for engaging stakeholders as it affords them the opportunity to experience the potential impact of policy and encourages discourse. A useful example is the City of Stockholm's off-peak project that was trialled between 2014 and 2016. One of the emergent outcomes was the uninvited feedback from non-user stakeholders (landlords and tenants) who

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complained about noise disruptions to their sleep as a result of the off-peak scheme (KTH, 2016). Beyond the basic benefits, experimental and trials can be used to engage before or after policy initiatives although the former is more rewarding. Our initial observations suggest that this form of engagement is helping to bridge collaboration gaps between public and private stakeholders (Fu & Jenelius, 2018; Holguín-Veras & Sánchez-Díaz, 2016)

2. Interviews: This is a coordinated feedback interaction technique that involves eliciting responses from known participants. Often requiring participant selection, interviews support extended discussions and are active mechanisms in the sense that they allow for more in-depth evaluation of interests and perspectives compared to other techniques. Interviews are often timed and employed by trained personnel, who translate the discourse into output that reflects expectations, concerns and objectives. They can be used before, during and after policy development (Ambrosini & Routhier, 2004; Voss, Tsiriktsis, & Frohlich, 2002; Wollenburg, Hübner, Kuhn, & Trautrim, 2018)
3. Participatory Workshops: These are closely coordinated workshops that facilitate cross-party discussions and engagement through open dissemination of policy initiatives. Besides the dissemination, workshops have been known to offer opportunities for innovation through brain storming sessions that focus on gathering perspectives from different participants, either using group or individual formats (Ballantyne et al., 2013; McKinnon, Halldorsson, & Rizet, 2014). They are effective for testing decision analysis and can be used to inform future urban logistics policies. Specific techniques like the nominal group technique (NGT) and positional analysis are useful for implementing engagement workshops, helping to create neutral environments where all participants feel heard and involve. Workshops often lead to ranked preferences that are adjudged by a number of considerations including feasibility, time and cost.
4. Focus Groups: Like workshops and interviews, the participants often comprise of known parties evolving from a pre-selection strategy, where different categories of stakeholders are identified and then representatives selected to participate in sessions where they engage in dialogue around specific policy questions. There are tangible benefits that come out from the exchange and potential dialogic contexts, perhaps speeding up the stakeholder compromise process as everyone is within reach and can exchange views, perspectives and learning with the help of the moderator. A significant draw-back to the use of focus group discussions is the idea of selection bias and group think where the ‘representatives’ may not be truly typical of their wider group perspectives and in some cases, participants may not freely express themselves in the face of other more powerful stakeholders. E.g. driver’s view on worktime practices by their company where the managing director of the company is present in the group session (Lagorio et al., 2016; Ballantyne et al., 2013).
5. Surveys: Often considered less biased in the respondent composition, they accommodate a wider range of respondents, offering greater proportional insight of stakeholder perceptions on SUL policies or initiatives. They can be executed through a variety of mediums and can support significantly larger numbers of respondents

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compared to any of the other techniques. Perhaps also the most flexible method of engagement, they can be executed via a range of mediums (online and offline) and offer good indication of potential stakeholder interests, perceptions and advanced behavioural predictions for SUL initiatives, depending on the validity of the survey design (European Commission & International Road Transport Union, 2006; Schniederjans & Starkey, 2014).

6. Modelling (Scenario analysis): These are assumption-based calculations that inform policy planning and development based on creative suppositions about plausible actions and outcomes from planned SUL initiatives (Bozzo, Conca, & Marangon, 2014; Crisalli, Comi, & Rosati, 2013). For example, these have been applied to model impact of city layout changes on local logistics operations in Rome and Padua region and this offered good decision support evaluation for the local authorities involved (Comi & Rosati, 2015). Some applications models include the agent based models (ABM) which have the capability to support simulation impact for many variables like market factors, channel flows, routing efficiencies (Bruno, Genovese, & Sgalambro, 2010; De Oliveira, Lessa, Oliveira, & Gregório Calazans, 2017). Due to the paucity of these type of models, there are still validation challenges in terms of their limited application to real world scenarios and this is a significant gap within the literature (Maggi & Vallino, 2016). Additionally, the analytical hierarchy process (AHP) models also come under this method and like your ABMs, they also offer the ability to process and rank a wide variety of multi-stakeholder objectives using the pairwise majority rule (PMR) and other multi criteria decision making (MCDM) analysis frameworks (Catalano & Migliore, 2014; Nikolaou, Evangelinos, & Allan, 2013). The application of these modelling based tools to support SUL planning is very limited although they offer the most unbiased method to engaging and prioritising stakeholder objectives in complex settings.

### Ranking

Emerging from the above, we developed a simple frame for ranking different SUL engagement methods, evaluating them based on typical stakeholder complexity considerations; bias, scope and depth. Bias control relates to the control over the likelihood of a method being subjectively influenced by the preferences of certain parties without any measurable justification. This is likely to skew the engagement outcome in their favour. Scope relates to the number of competing variables that can be covered for different stakeholders within the frame. For example, the number of concerns (x) from each stakeholder multiplied by the number of represented stakeholder groups (y) will yield “xy” number of concerns. This reflects the complexity of the engagement process with time, cost and capacity constraints for policy makers based on the selected engagement method. Finally depth refers to the extent of inquiry or consideration that each objective variable can be given within the selected method.

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<b>Criteria</b>	<i>Bias Control*</i>	<i>Scope</i>	<i>Depth</i>	<i>Score</i>	<i>Engagement effectiveness ranking</i>
<b>Method</b>					
<i>Experiments</i>	5	1	2	10	6
<i>Interviews</i>	1	4	5	20	4
<i>Workshops</i>	3	3	3	27	3
<i>Focus Groups</i>	2	3	3	18	5
<i>Surveys</i>	4	5	2	40	2
<i>Modelling</i>	5	5	4	100	1

\* Scale (1-5; 1= Low, 5=High)

**Table 1- Methods Hierarchy Ranking**

By simply multiplying across the column, we have ranked the methods in terms of their overall scores.

Our results indicate that MCDM modelling will offer the most effective methods for SUL stakeholder engagement with the highest overall score (100). Surveys (40) and workshops (27) are reflected as the next most effective engagement methods. Although this simple ranking weighted technique offers some useful directions for stakeholder engagement in SUL planning, it does not argue against the viability of any of the techniques. However, despite the obvious limitations (variables and subjective weighting), we believe that the results offer some semblance of actual effective capabilities for different methods that underpin stakeholder engagement. This is also instructive for future research and collaborations, which should focus on supporting the development of deployable MCDM models for use at local authority levels. As part of our broader study under the “Promoting Sustainable Freight Transport in Urban Contexts: Policy and Decision-Making Approaches” (ProSFET) project, we hope to contribute to the literature and practice in this area.

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