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Measuring the effects of an urban freight policy package defined via a collaborative governance model

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ABSTRACT

In recent years the European Commission has increasingly focused its attention on the development of sustainable city logistics by promulgating legislation and formal directives. Despite the efforts made, reducing freight-related congestion and polluting emissions without penalising social and economic activities within cities is still a challenging issue. City logistics measures frequently fail mainly due to a lack of support and commitment from stakeholders. A participatory approach in freight transport planning represents a reasonable and valuable option.

This paper describes the innovative governance model developed in the city of Turin in Italy that was based on a proactive and effective stakeholders' cooperation for achieving a resilient urban development. The added value of the paper also relates to the real-life assessment of the impacts the non-mandatory policy-mix implemented, based on a collaborative governance model, have on the environment and service delivery thus providing a realistic measure of the viability and effectiveness of the solution proposed. Its voluntary adoption, in fact, produces an increase in commercial vehicles' speed and a substantial reduction in CO_2 emissions while also allowing logistic service providers to perform more deliveries.

1. Introduction

The European Union (EU) is characterised by relevant conurbations playing a central role for its economic development. The transport sector is responsible for around a quarter of greenhouse gas emissions (European Commission, 2015) and urban freight accounts for 25% of urban transport-related CO_2 emissions while 30%–50% of other transport-related pollutants (ALICE/ERTRAC, 2015). In recent years the EU has increasingly focused its attention on the development of sustainable city logistics (CL) by promulgating legislation and formal directives. In 2011, the White Paper on Transport set the target of achieving essentially CO_2-free CL by 2030 (European Commission, 2011). Subsequently, a staff-working document provided a helpful framework for urban mobility planning with a focus on urban logistics underlining the need for local policy makers' involvement (European Commission, 2013). Sustainable Urban Mobility Plans (SUMPs) are promoted by the EU and represent a new tool for city planning aimed at satisfying the mobility needs of people and businesses while improving life quality (Wefering, Rupprecht, Bührmann, & Böhler-Baedeker, 2014).

EU directives and/or soft policies (e.g. non-binding exchange programmes) can hardly have a direct impact at a local level since they cannot account for relevant aspects characterising the transfer processes like, for instance, contexts, interests and opportunities of actors and institutions (Becker, 2015). Despite the efforts made, reducing freight-related congestion and polluting emissions without penalising social and economic activities within cities is still a challenging issue.

City liveability and freight distribution efficiency cannot always be appropriately pursued via pure market competition. In fact, this is hard to put in place in a working environment characterised by many market failures suggesting the need for public intervention (Holguín-Veras, Wang, Browne, Hodge, & Wojtowicz, 2014). Urban freight policies are relatively inefficient (Dablanc, 2007). Local authorities, commonly, focus on regulatory and market-based

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measures (e.g. Dablanc, 2008; Vieira, Fransoo, & Carvalho, 2015; Ville, Gonzalez-Feliu, & Dablanc, 2013) and scarcely involve private companies in the transport planning process (Lindholm & Browne, 2013). However, adopting pricing policies or widely extending road infrastructure is often not a viable option and, when implemented, can produce undesirable results (e.g. Marcucci, Gatta, & Scaccia, 2015; Marcucci, Marini, & Ticchi, 2005; Pas & Principio, 1997). CL measures frequently fail mainly due to a lack of support and commitment from stakeholders.[1] A participatory approach in freight transport planning represents a reasonable and valuable option (CIVITAS, 2015).

CL is characterised by several key stakeholders (i.e. shippers, receivers, freight carriers, residents, and local policy makers) connected by physical (e.g. goods, waste, emissions), financial, (money), and virtual (information) flows. It is safe to assume that all stakeholders are driven by their particular objectives and interests (e.g. Marcucci, Danielis, Paglione, & Gatta, 2007; Marcucci, Gatta, Valeri, & Stathopoulos, 2013; Marcucci, Stathopoulos, Gatta, & Valeri, 2012). Since they can be both private and public operators, it is needed to identify them and acknowledge their strategic relevance (e.g. De Brucker, Macharis, & Verbeke, 2013; Marcucci & Gatta, 2013, 2014, 2017). Moreover, considering their strong and frequent interactions one has to accurately account *for* and deal *with* stakeholders' points of view, analyse, compare and selectively group the various objectives/interests in order to find shared and focused solutions (e.g. Gatta & Marcucci, 2014; Macharis, 2005; Macharis, DeWitte, & Turcksin, 2010). Under this respect, CL collaborative planning procedures are fundamental (Marcucci et al., 2017). In fact, a well-functioning CL system would, most likely, benefit from adopting a collaborative approach. Operational and institutional mechanisms should be defined and implemented with the aim of achieving a successful collaboration among the stakeholders sharing the same infrastructures and characterised by peculiar, and often contrasting, objectives. A collaborative strategy should be deployed by fostering stakeholders' cooperation while promoting the understanding of the dynamic nature of city complexity (Gatta, Marcucci, & Le Pira, 2017).

Freight Quality Partnerships (FQPs) are commonly conceived as a long-term working agreement between freight stakeholders concerned with urban freight that regularly meet, on a formal or informal basis, to discuss (and sometimes find solutions to) problems occurring within a given urban area (Browne, Allen, & Attlassy, 2007). There are currently several on-going FQPs in place around the world. A comprehensive review can be found in Lindholm and Browne (2013) where each specific approach and its outcomes are analysed and compared, discussing similarities and differences, with the intent of identifying best practices. The authors, investigating six freight partnerships in five cities, do not find a one-size-fits-all type of solution. In fact, different cities have adopted alternative approaches accounting for their peculiar characteristics and prevailing problems. However, common features and clear insights emerge highlighting what is needed and what is to be avoided for constructing a successful FQP.

This paper illustrates a case of stakeholders' involvement aimed at the implementation of socially beneficial and acceptable policy solutions whose results are measured thanks to a real-life pilot project. In more detail, it describes the innovative governance model developed in the city of Turin in Italy that was based on a proactive and effective stakeholders' cooperation for achieving a resilient urban development. The added value of the paper also relates to the real-life assessment of the impacts the implemented intervention policies have on the environment and service delivery. This provides a realistic measure of the viability and effectiveness of the solution proposed.

The paper is structured as follows: section 2 briefly illustrates both geographical and regulatory characteristics of the context analysed while section 3 clarify the methodology adopted. Section 4 reports a detailed description of the case study results showing the main steps of the stakeholders' engagement process, highlighting the shared solution reached via the collaborative governance model and presenting a performance assessment of its real-life implementation. Section 5 discusses the main success factors and their implications while section 6 concludes.

2. Study context

Turin is the capital of the Piedmont region in North-West Italy and, recently (Italian Parliament, 2014), became the capital of the newly established Turin's Metropolitan Area (see Fig. 1). It is a densely populated area (6950 inhabitants/km^2) characterised by an extended Intelligent Transport System (ITS) network[2] that represents its main peculiarity with respect to other Italian cities.

The Limited Traffic Zone (LTZ) in the city centre (Fig. 1), a 2.62 km^2 area with a population density (12,600 inhabitants/km^2) twice the city average, restricts access from 7:30 a.m. to 10:30 a.m. to Euro1, Euro2, and Euro3 petrol/diesel freight vehicles. Turin's general policy and local development strategies focus on sustainability. This is confirmed by the specific initiatives taken with respect to the transportation sector as, for example, the adoption of a SUMP[3] in 2008 coherently with EU recommendations (European Commission, 2009). The Municipality of Turin developed its SUMP with a medium-term strategy (i.e. 10–15 years) defining guidelines, targets, and operational measures in order to: *improve* traffic flow conditions, *increase* average speed, *reduce* pollution, congestion and emissions, *stimulate* a renewal of vehicles fleets leading to an improvement of efficiency in logistic operations.[4] Given this context, implementing a new governance model for collaborative logistics compliant with the SUMP is challenging. Reaching and involving urban freight stakeholders – including logistic service providers – within a collaborative logistics framework represents a key success factor.

3. Methodology

Involving and listening to all key stakeholders helps obtaining relevant inputs from different and independent sources,

[1] Ex-ante policy acceptability is relevant to foresee the likely stakeholders' reaction to policy interventions (e.g. Gatta & Marcucci, 2016a; Valeri et al., 2016). Moreover, advanced techniques are needed to forecast distinctive stakeholders' preference structures (e.g. Gatta & Marcucci, 2016b; Marcucci & Gatta, 2016).

[2] The ITS network, managed by a traffic supervisor allocated in the Traffic Operation Centre managed by its in house agency, includes the following infrastructures: 330 (out of 600) controlled intersections; over 1500 inductive loops for real-time traffic flow measurement; 36 above-ground sensors; 71 cameras on 23 intersections; integration of FCD (Floating Car Data); enforcement system with two speed control trap (in two main urban roads); 36 electronic gates and 36 information panels providing access information; 26 road VMS (Variable Message Signs); 20 parking info VMS for 26 parking lot structures; 18 extra-urban displays; 36 area displays; 350 bus stop interactive displays.

[3] SUMP is not mandatory in Italy, notwithstanding art. 22 of Law n° 340/2000 (Italian Parliament, 2000) calls for long term, systematic and integrated planning instruments to be developed for urban mobility management.

[4] Usually, SUMP's transport policy objectives are: a) increase system and economic efficiency; b) increase safety and environmental quality; c) exploit infrastructure while preserving urban structure. This integrated approach to urban logistics has been developed recognising its vital role in ameliorating city mobility and liveability.

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