

**Transitioning Urban Consolidation Centres initiatives in successful operations:
A Collection of EU case experiences.**

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Keywords – Urban Logistics; Freight Transport; Urban Consolidation Centres

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1. Introduction

Freight transport accounts for 8-15% of total traffic flow in urban areas within the European Union. Most of these activities are undertaken by diesel powered vehicles with extremely disproportionate levels of CO₂, NO_x and particulate matter emissions. Accordingly, a variety of strategic options have been advanced as key solutions for addressing fossil fuel demand and emissions in urban freight transport. Accordingly, previous studies have identified the use of consolidation centres (UCCs) within urban areas as a viable solution for reducing environmental and social impacts within cities (Browne et al., 2005; Allen et al., 2007). Within the EU, the uptake of UCC projects has been on the increase over the last decade with a variation of results for the implementing local authorities (Janjevic and Ndiaye, 2017). Although initiated as projects with definitive resources allocated for their setting up and initial running, the common objective for the majority of Local Authorities has been to see these UCC projects run as permanent operations within the different localities (Browne et al., 2005).

The failure or success of UCC initiatives is of interest to numerous stakeholder groups and offers an area of contemporary interest in the area of city logistics. However, we observe that the literature on UCC transition from project to operations phase is acutely lacking, with implications extending to replication of unsustainable UCC models and increasing pressure on city logistics stakeholders.

In this study, we investigate existing UCC initiatives within the EU, identifying some reasons for failures as well as critical success factors for transition from project to operations phase. The findings from our study offer knowledge insights that can help municipalities and their stakeholders design and implement sustainable UCC initiatives.

The rest of this paper is arranged as follows; section 2 sees a review of the existing literature; section 3 presents the research methodology and in section 4 our findings are presented and discussed. Finally in section 5, we offer some conclusion and directions for future research inquiry in this area.

2. Literature Review

Within urban logistics, a lot of emphasis has been placed, in recent years, on Urban Consolidation Centres (UCCs). The term UCCs identifies logistics facilities situated in relatively close proximity to the geographic area that they serve (be that a city centre, an entire town or a specific site such as a shopping centre), to which many logistics companies deliver goods destined for the area. From these facilities, consolidated deliveries are carried

out within that area; often, a range of other value-added logistics and retail services can be provided (Allen et al., 2007; Gogas and Nathanail, 2017). UCCs (also referred to as Urban Distribution Centres, UDCs) serving to execute consolidated deliveries within the local municipality areas can certainly be valuable facilities, but they should not be seen as a quick *one-size fits all* solution for any sort of problem related to logistic in urban areas.

UCCs have become increasingly attractive options for a number of municipalities in the quest to address freight externalities, however, Browne et al., (2005) highlight the lack of comprehensive frameworks for evaluating the impacts of UCCs, suggesting an imbalance in terms of types of impacts measured. UCC initiatives are often driven by the need to reduce vehicular traffic in urban areas and offer local authorities useful control and opportunities for collaboration with freight stakeholders (Allen et al., 2012).

The EU (including the UK) has supported a significant number of UCC initiatives in the last decade with a variety of outcomes. UCC initiatives are often tied to specific objectives common to the municipality where the project is being trialled. As a result, the measures of successful implementation or trial may differ from one locality to the other. Common objectives include emissions reductions, reduction of congestion, service promotion, land appropriation, economic and territorial cohesion. Furthermore, the implementation of urban logistics initiatives can be significantly affected by political decisions; often, in the European context, local political situations might be uncertain and volatile, producing significant changes in the administrative landscape. This is not ideal for the stability and certainty requested for the success of most of the urban logistics initiatives

Allen et al., (2012) highlight that nearly two-thirds of UCCs initiatives in countries like the UK and France failed to go beyond feasibility studies, whilst countries like Germany, Italy and the Netherlands saw a vast majority achieving trial or operational scheme. This dichotomy in reported progress of UCC initiatives could be linked to the limited understanding of urban logistics on the part of the local councils (Ballantyne et al., 2013), limited or distorted objective focus on retail and similar establishments (Browne et al., 2005) as well as knowledge gaps relating to cost, risk and revenue sharing models that could lead to successful implementation and transition (van Duin et al., 2010; Janjevic and Ndiaye, 2017). Traditionally, other forms of flows (such as the ones related to construction materials, waste management, materials needed in the facilities management cycle, catering industry) that could also be integrated in UCC platforms (Lebeau et al., 2017) remained out of the picture with most UCC initiatives and as these now constitute a great part of the demand flows for urban logistics, many existing UCC models have been rendered unsuitable for purpose.

Since most UCC initiatives are driven by project funds, a common objective from the trial phase is the self-sustenance and financial viability of the facilities following the project phase (Allen et al., 2007; Janjevic and Ndiaye, 2017). However, the literature is fairly limited in this regard and none of the existing studies offer transitional metrics from real case examples. Recognising the complexity of interests in urban logistics initiatives, the literature suggests that the design and implementation of urban logistics solutions should be guided by a careful assessment of their estimated impacts; furthermore, an early involvement of stakeholders from both public and private sectors should be sought, in order to evaluate the long-term sustainability of potential solutions (Browne et al., 2005; van Duin et al., 2017; Gogas and Nathaniel, 2017). This recognition of gaps in terms of adequate tools from addressing multi-stakeholder issues at strategic levels as opposed to just operational concerns is important to the policy and decision-making process of the planning and implementation of UCC initiatives (Kin et al., 2017).

As highlighted by Lagorio et al. (2016), so far UCCs effectiveness has been assessed mainly through multiple or single case studies analysing best practices and pilot projects. However, little is reported about the reasons for the failure of such facilities; being very difficult finding information on failed UCC projects and initiatives. The availability of adequate tools, capable of addressing, from a multi-stakeholder perspective, also strategic issues (for instance, related to the investment planning phase) rather than just operational ones (concerned with the day-to-day functioning of already established logistical platforms) could be of interest to stakeholders involved in the policy and decision-making processes that guide UCC initiatives. For example, questions concerning the traditional weaknesses of UCCs in attracting stable and viable revenues for meeting multiple stakeholder interests are yet to be explored. Accordingly, our study seeks to contribute by examining factors that underline successful transition of UCCs from trial projects into viable operations.

3. Research approach

A multiple case study approach was adopted in this study (Eisenhardt and Graebner, 2007). Incorporating interview and observation and documentary review techniques, data was collected from seven cases. These cases were identified following an extensive review of UCC projects, which was conducted by reviewing the literature and EU databases for information on commissioned UCC initiatives. Following the identification of specific projects, considerations for surveying specific projects was made with regards to geographic distribution, accessibility to facility and data availability. To date, over 30 in-depth

interviews have been conducted, in addition to site visits and observations and extensive reviews of documentary evidence across 4 European countries; Italy, Sweden, Spain and the UK. We conducted a thematic analysis of the data, employing an iterative coding approach to support research validity and reliability. Data was arranged in case structures and analysed in 3 coding stages. Final themes were subject to independent assessment and cross-evaluation by members of the research team. The next section presents an overview of the cases, including some data extracts from both primary and secondary sources.

4. Cases

In this section of the report, we present summaries from several real-world case studies, highlighting some of the critical engagement issues as well as learning. Table 1 below presents a transition status of the cases investigated.

Location	UCC case initiative	Duration	Status
Parma, Italy	EcoCity / Agri-food and Logistics Centre	2008 - Date	Transferred
Huddinge, Sweden	Soderton 8	2014 – date	Transferred
Lucca, Italy	Lucca Port/ Metro s.r.l	2007	Not transferred
Sheffield, UK	Meadowhall/ Clipper Logistics	2006	Transferred
Vecenza, Italy	Veloce, Vicenza	2004	Not transferred
Padua, Italy	CityPorto	2004	Transferred
Barcelona, Spain	SuperBlock/ Catalonia	2016	Not transferred

Table. 1 - UCC cases with transition status

4.1 Parma (Italy) Case Study - EcoCity

Established in 2008, the “Agri-Food & Logistics Centre – CAL” was designed as an Urban Consolidation Centre platform in order to manage last mile deliveries of agri-food goods within Parma’s city centre. The project was first financed by the Emilia-Romagna region and the local municipality, which created “EcoCity”, a company owned by Parma’s city council that also managed all its operations (Morganti and Gonzalez-Feliu, 2015).

The project required a first investment of 2M€ and was soon praised as a best practice example (Fitconsulting, 2013). Specifically, the project consisted in the creation of an UCC, where agri-food products were daily brought by carriers and then delivered to customers via methane-fuelled vehicles, with an optimized load capacity and following optimal routes (Morganti and Gonzalez-Feliu, 2015).

An innovative characteristic of the project was digitalisation, offering the opportunity for local stores participating in the initiative, to order products directly through EcoCity website and getting them delivered in a few hours, straight into stores (Vaghi and Percoco, 2011). By

2015, the project involved, “16 transport operators and carriers, 17 food manufacturers and suppliers (fresh and dry products), 7 corporate chain retailers and 10 produce wholesalers” (Morganti and Gonzalez-Feliu, 2015) serving approximately 250 local food businesses, resulting in the management of roughly the 8% of all the food distributed in Parma. From an environmental point of view, the EcoCity project helped reducing PM and NOx emissions by 29% and 22% respectively (Morganti and Gonzalez-Feliu, 2015).

Although seemingly very good from an operational and environmental point of view, the EcoCity project encountered similar issues as many city logistics pilot projects faced before it. Financially, the project continuously increased its debt, without being able to repay investors. In 2013, the total amount of EcoCity’s debt was 14.5 M, leading to the distraint of several vehicles by creditors (ParmaQuotidiano, 2013a; La Repubblica, 2013).

Parma city council tried to sell EcoCity to private partners four times (ParmaQuotidiano, 2014). They failed on three occasions as no company showed interest in investing into it, until, 2014 when the Coop Taddei Group decided to acquire EcoCity, leaving the EUR14.5M debt to the local administration (ParmaQuotidiano, 2013b; ParmaQuotidiano, 2014).

Even though no data was found regarding the final transfer price, the city council had previously lowered the requested price from 332,000€ to 265,600€ (ParmaQuotidiano, 2013b). It is reasonable to assume that the price dropped further, underlining the serious issue of UCCs valuation and transition post implementation, particularly as financially sustainable ventures.

4.2 Lucca (Italy) Case Study - LuccaPort

Opened in 2007, LuccaPort is an Urban Consolidation Centre, located in Lucca (Tuscany - Italy), managed and owned by Lucca Holding and, therefore, by Lucca city council as it is Lucca Holding’s only shareholder (Scintu, 2016). Lucca City Council invested a significant amount of money in the LuccaPort project – approximately 5 million euros; with the purpose of promoting sustainable freight transport in the urban context of Lucca (whose city centre is characterised by historic medieval structures), reducing the high level of pollution that was on the increase in the city centre area (Salotti, 2017a).

LuccaPort is located in a highly strategic geographical area, well connected with the principal highways and is equipped with an electric fleet of vehicles as part of a city-centre congestion and pollution decrease initiative. This involved receiving goods from carriers and fulfilling their last mile deliveries via LuccaPort’s alternative fuel fleet (Salotti, 2015).

Ambitious, the project has been running for several years without generating the expected results, resulting in the dismissal of the previous managing company (Metro s.r.l) with a view to transferring to a new management firm (Salotti, 2017b). However, this strategy has not been successful as no company has shown any interest in the project, the closest transfer opportunity resulted in a withdrawal by Manutencoop facility management in 2015 (Il Sole 24 Ore, 2017).

To solve the issues generated by LuccaPort, the current local administration has decided to explore different options. Firstly, LuccaPort will undergo a new phase of study where the focus will be put on the understanding of the criticalities encountered during its activity. Secondly, collaborating with an IT company the city council wants to understand how to integrate the study of big data with Lucca's urban structure, to gain specific data about congestion. Lastly, by trying to get funded by the Life Aspire project, a European initiative aimed at promoting sustainable urban logistics, the city council is raising funds to back this 'new' project (Salotti, 2017b).

4.3 Huddinge (Sweden) Case Study – Södertörn 8

The Södertörn UCC initiative is focused on consolidating supplies to public schools within the Stockholm sub-region. A total of 8 municipalities participated in the scheme, which transited into an operation in 2017, following 2 years of trial. The regional authority worked closely with a number of partners to review and plan the transition into an operational venture, following the successful trialling of the UCC. Some emergent indicators of its successful transition include early and pre-implementation consultation with a wide range of stakeholders, including the selection of a transition partner prior to the commencement of the project phase.

4.4 Sheffield (UK) Case Study – Meadowhall

Meadowhall represents one of the UK's largest shopping locations sprawling a large expanse of land and river and hosting over 20 million visitors annually. Although there are a number of alternative transport modes including train-tram, the principal access mode is road. With increasing number of shoppers and pressure on retailers, the resulting traffic congestions, land use and emissions raised concerns for the city and Meadowhall's management.

Clipper Logistics were appointed to trial and manage a consolidation facility for retailers in 2006 following some consultation and mini-tender process (Allen et al., 2014). Some key indicators for the project included carbon emissions reduction, efficient delivery and reverse

logistics. The project remains operational with claimed savings in transport journeys, emissions and capacity utilisation.

Our recent observations have seen the opening of new shopping facilities in the area with some infrastructure investment in specialised retailing around the area. There are still gaps in terms of measurement metrics for reported emissions data, scope of indicators measured in terms of the UCC and its contribution as a freight solution as well as stakeholder engagement methodology employed in the tender process. However, a significant outcome is the successful experimentation and implementation of the UCC initiative.

4.5 Vicenza (Italy) Case Study - Veloce

Veloce Vicenza is a city logistics initiative that was established in Vicenza (Italy) by its local administration in 2004 (FerPress, 2017). It functions as an UCC which is located outside the city centre; where carriers can bring goods, which are then delivered within the city centre via sustainable vehicles such as electric or low-emission ones (Ville et al., 2010).

The initiative is most renowned for the legal feud between the local authority and international logistics companies such as DHL, TNT, UPS and FedEx (Ville et al., 2010). This was firstly originated by the regulations that the local authority imposed to all logistics companies operating within the city centre, forbidding them to enter all Vicenza LTZ areas – basically precluding them any sort of entrance to the city centre. Consequently, in 2008 DHL Express Ltd, TNT Global Express SpA, Federal Express Europe Inc. and United Parcel Service UPS Italia SRL, instituted an association, the AICAI (Italian Association of International Air Express Carriers), requesting before the Veneto (Italian region in which Vicenza is located) regional administrative court – TAR – the cancellation of such ordinances. In the first place, the court's verdict was favourable to the AICAI, annulling the Vicenza city council's orders. However, the city council submitted an appeal to the Italian State Council, who overturned the previous results in 2009, justifying Vicenza local authority's regulations as "necessary for the protection of the cultural and environmental heritage" (Ville et al., 2010).

Although the verdict allowed Veloce Vicenza to be the only entity managing last mile deliveries in the city centre, carriers have tried to find alternative ways to overcome the restrictions. For example, in 2011, carriers began using '*riscios*' (a type of bicycle), to complete their last mile deliveries, boycotting the Veloce Vecenza UCC facility (Negrin, 2011). As a result, the project has suffered financially and remains a burden on the local authorities who have had to invest further funds to make the project continue (Il Gazzettino,

2015). Although, the project has been represented as ongoing, its success status remains doubtful when the engagement failures and cost to the city authorities are taken into consideration. Perhaps its study may afford some lessons on limitations to the powers of city authorities to enforce sustainable urban logistics.

4.6 Padua (Italy) Case Study - CityPorto

Established in Padua (Italy) in 2004, CityPorto represents the urban logistics strategy put in place by the Padua city council in order to manage last mile deliveries within Padua city centre, utilising low-emission and electric vehicles. CityPorto's vehicles are kept in and managed by the city's local urban consolidation centre (Interporto Padova S.p.A.), which covers an area of 1.1M m² (Interporto Padova S.p.A., 2013). The project represents one of the few successful UCC projects within Europe.

The fundamental prerequisite that this project has been able to satisfy has been the establishment of a dialogue with different stakeholders (Gonzalez-Feliu and Morana, 2010). Indeed, contrary to what happened in the Vicenza case above, (where international carriers have been forbidden to enter the city centre without any sort of dialogue taking place before this decision) Padua city council opted to collaborate with logistics providers (DHL, Bartolini and GLS). These providers bring goods to the UCC and the last mile deliveries are managed by CityPorto fleet (Interporto Padova S.p.A., 2013).

The overall performance of the service has been constantly improving: deliveries increased 126% between 2005 and 2015; environmental indicators have reported significant decline in terms of PM pollution, CO₂, SO_x and NO_x emissions (Trasporti-Italia, 2015). Furthermore, Interporto is constantly investing in its capacity – which now is roughly 1M containers/year – and into CityPorto's fleet – new methane-fuelled vehicles joined the fleet in 2017 (Il Mattino di Padova, 2017).

Padua's model has been recognized as best practice also by other Italian cities, such as Aosta, Rovigo and Modena. These are collaborating with Padua to implement similar city logistics solutions within their cities (Il Mattino di Padova, 2017). Critical factors identified included strong partner relationships such as that between Interporto S.p.a. and logistics companies and inclusive stakeholder collaboration. This project denotes that, contrary to the Vicenza example, efficiency can be reached through an enhanced dialogue between city councils managing UCCs and logistics providers, fostering collaboration instead of competition.

4.7 Barcelona (Spain) Case Study - SuperBlock

In the recent years, Barcelona, the largest city and capital of Catalonia (an autonomous community of Spain) has been facing serious issues linked to pollution. In fact, the Catalan city has been constantly exceeding the recommended thresholds set by the World Health Organization with regard to nitrogen dioxide and particles (Brass, 2017). This, has then been linked to an average of more than 3500 premature deaths caused by pollution per year (Garfield, 2016). With urban freight is expected to increase by 40% by 2050, there are serious concerns of its impact on the society (Hu, 2016; Michell, 2017). In this regard, in 2013, the local administration initiated the “Urban Mobility Plan” (Navarro, 2016). Its objectives involved reducing traffic by 13% and air pollution levels by 21% by 2018 through a ‘Superblock’ initiative (Hu, 2016). These Superblocks exploits the unique layout of Barcelona which is based on a distinctive grid system (Figures 1), refocusing planning on traffic reduction, liveability and creating a better environment for residents (Stewart, 2017).

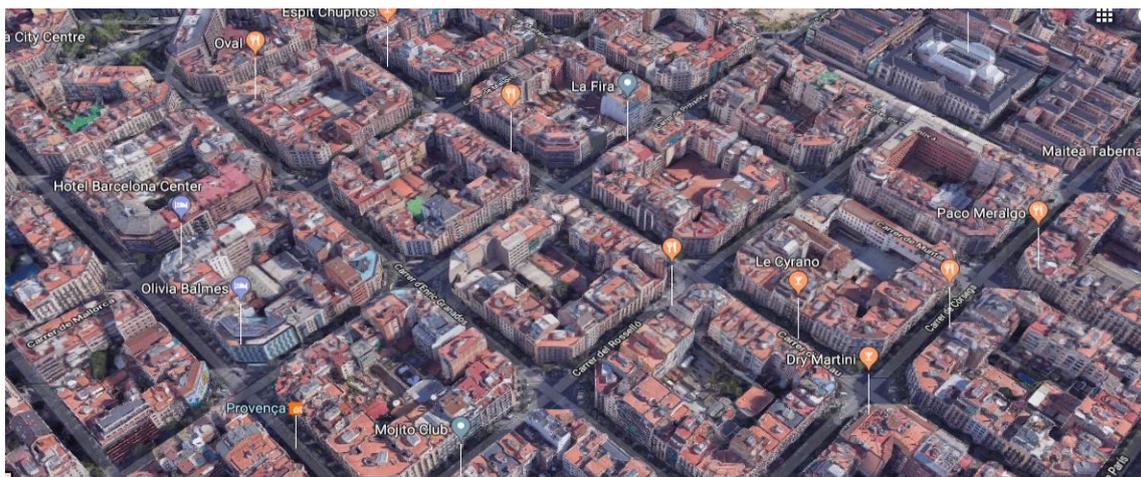


Figure 1 - Barcelona grid system (Source: Google Maps)

In 2016, the first Superblock pilot project was implemented in Poblenou – a neighbourhood in Barcelona – and five further pilot projects were originally scheduled for implementation in 2017 (Hu, 2016). Although results have been positive with regard to air pollution, traffic congestion and freight delivery, the first pilot project in Poblenou, which cost approximately €55000, received mixed reactions from citizens (Hu, 2016; Garfield, 2016).

In this regard, Vincente Guallart, founder of the Institute for Advanced Architecture of Catalonia commented the implementation of the Superblock in Poblenou as follows: “*The big mistake done with the test was to build without a budget and without discourse with the citizens*” (Brass, 2017).

This case study illustrates the impact of inadequate stakeholder engagement and structured planning phases which can lead to a long-term unfeasibility of UCC projects. Nevertheless, the Superblock project is still going on, even though it will probably need more time to be implemented than what was scheduled. It is, however, noteworthy to highlight the importance of stakeholders' engagement in planning phases in order for such projects to be accepted by communities and attain long term sustainability vis-à-vis transferability.

5. Findings

Based on the short cases reported above and analysis of the data, we extracted success themes. These crucial success factors for UCC facilities can be classified as: *Engagement*, *Interoperability*, *Contractual Duration*, *Impact Modelling*. These are discussed below in addition to a listing of some emergent stakeholder categories highlighted in our data.

5.1 Engagement

Our findings reemphasize the importance of stakeholder engagement as crucial to the success of sustainable urban logistics initiatives. In many of the failure cases, we found low stakeholder engagement. For example, in the Lucca case, where the local authority exclusively held control and *later* attempted to transfer. This position corresponds with the literature on UCC and stakeholder engagement (Ballantyne et al., 2013; van Duin et al., 2017). Perhaps the importance of this finding relates more to the gaps in UCC initiative design and the scarcity of learning in terms of stakeholder engagement for UCC initiatives. The Vicenza case, which has become well documented, offers learning on limitations to the powers of city authorities in terms of failure to effectively engage stakeholders in the design and implementation of urban freight solutions. Although a few engagement techniques for modelling multi-stakeholder perspectives in urban logistics have been developed, their application in real UCC cases remains lacking (Bjerkan et al., 2014; Macharis et al., 2014; Duin et al., 2017). Additionally, we found that many local authorities still lack the required expertise for employing multi criteria decision making (MCDM) systems to obtain optimised stakeholder preference overlap in the mapping, consultation and decision process for urban freight solutions (Kin et al., 2017).

5.2 Interoperability

Closely linked to the integration of multi-criteria decision systems, our findings also identified interoperability of UCC information and communications technology (ICT)

infrastructure as a cause of failure. ICT interoperability relates to the ease of connectivity of dedicated computer infrastructure for the exchange and analysis of information. According to the CEO of a leading UCC handler in Sweden, interoperability in terms flexibility and speed of ICT legacy systems were some defining issues that needed to be addressed in the transfer process, posing a significant challenge for their on-going UCC operations. He suggested that *“most UCC ICT models are built with specific configurations and this often creates difficulties at the point of transition because of the extra investment required to improve the ease of connectivity. This is a common challenge when we have to integrate new suppliers into existing legacy frameworks every time there is a tender process”* (MD, Widrikssons).

5.3 Contractual duration

Additionally, contract durations for operations is another important factor that impacts UCC transition. In many of the successful transfer or transition cases, the duration of management contracts averaged five years or more. Examples include CityPorto and Padua, which has now been in operation for over ten years, Widrikssons and the Soderton initiative, which is presently operational, and Clippers Logistics and Meadowhall that has been operational for over five years. Some of the interviewees indicated that key financial considerations in the uptake of UCC management operations, stemmed from the justifiable returns that can only truly be achieved in the long term. Not only did this improve the financial returns but it also indicated the willingness to create sustainable relations on the part of the parties involved.

5.4 Impact modelling

Finally, our findings indicated that UCC design and implementation should be guided by a careful assessment of their estimated impacts. Data from the Padua and Barcelona cases suggest that inadequate impact modelling and assessment frameworks can undermine the transition process. In the Padua case, respondents revealed extensive assessment frameworks that precluded the initiative. This framework remains flexible and has been updated regularly with the incorporation of bio-fuel vehicles as a good example. However, we observed that the scarcity of robust impact modelling tools that can support strategic planning in this area remains a challenge (Janjevic and Ndiaye, 2017). For this reason, the availability of adequate tools, capable of addressing strategic issues (for instance, related to the investment planning phase) rather than just operational ones (concerned with the day-to-day functioning of already established logistical platforms) could be of interest to stakeholders involved in the policy- and decision-making process.

5.5 Emerging Stakeholders' categories

The complexity of impact assessment is exacerbated by the fact that a wide range of stakeholders is involved in UCC systems. Table 2 highlights emerging stakeholder categories which were observed in the mentioned case studies; for each of the stakeholder categories, impact focus categories are reported. It can be noticed that impact focus categories vary greatly across stakeholders' groups; as such, this might lead to several stakeholders' tensions that have been observed in some of the mentioned cases.

This highlights the fact that stakeholder engagement is very crucial to the success of UCC initiatives; although the literature is advancing, the access to and application instances of existing stakeholder engagement techniques in urban logistics planning remains relatively rare. Local Authorities and planning bodies require expert solutions that use decision support systems in order to obtain optimised stakeholder preference overlap in the mapping, consultation and decision process for urban freight solutions.

Stakeholder Group	Impact Focus Categories	Data Source (Country)
Local Authorities	Nuisance, Safety, Time, Viability, Transferability, ROI,	Sweden, Italy, Spain
Commuters (Public Transport)	Time, Safety, Nuisance	UK, Sweden, Italy, Spain
Pedestrians	Safety. Nuisance	UK, Sweden, Italy, Spain
UCC project managers	Viability, Interoperability, Transferability, Duration	UK, Sweden, Italy, Spain
Academic partners	Learning, Transferability	UK, Sweden, Italy
EU Commission	Viability, Efficiency, Effectiveness, Duties	N/A
Financing partners	Viability. ROI	Italy, Sweden
UCC employees	Viability, Long-term, Working Conditions	Sweden, Italy
International logistics companies	Accessibility, ROI, Time and Customer retention	Italy
Alternative vehicle OEMS	Viability, Scalability, ROI	Italy, Sweden
Land and property owners	Property rights, viability, ROI	Spain, Italy, Sweden,
Education providers	Learning	Sweden
IT providers	ROI, Viability and Efficiency	Sweden
Insurance	ROI, Risk management	Italy, Sweden, Spain
Suppliers	Time, Effectiveness, Efficiency, Scope	UK, Italy, Spain, Sweden
Service users	Quality, Efficiency, Effectiveness	UK, Italy, Spain, Sweden
Trade Unions	Membership rights, Job Security, Working Conditions	Italy

Commuters (Private)	Safety, Time, Emissions, Nuisance	UK, Italy, Sweden, Spain
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Table 2 - Identified UCC Stakeholder categories (atypical)

6. Conclusion

Our study sought to examine transferability in the use of UCCs to promote sustainable urban logistics. Although adopting a local authority perspective, the focus ascertained the importance of multi-stakeholder perspectives in the design and implementation of UCCs. From the case studies analysed, many of the UCCs are designed to effect last mile deliveries that require more significant collaboration in order to produce lasting results. Our findings underline the importance of stakeholder engagement as a critical component for UCC initiatives, in addition to interoperability, impact modelling and contract durations. In affirming the findings from previous studies (Browne, 2005; van Duin et al., 2010; Ballantyne et al., 2013), our study also extends the literature in this area by highlighting the importance of multi criteria decision-making systems that can support local authorities in modelling and managing stakeholders at strategic levels very early on in the project life cycle.

Interoperability is of contemporary interest as it underpins the future of logistics. In particular, UCC initiatives have to incorporate flexible ICT legacy systems that ease integration for management companies. This perhaps reflects an area of future research in terms of exploring ICT technologies that promote interoperability in the ICT infrastructure of UCCs.

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