European Planning Studies

ISSN: 0965-4313 (Print) 1469-5944 (Online) Journal homepage: www.tandfonline.com/journals/ceps20

Toward an urban logistics design: programming logistics in mixed-use urban projects in Île-de-France

Reece Fisher & Adeline Heitz

To cite this article: Reece Fisher & Adeline Heitz (2026) Toward an urban logistics design: programming logistics in mixed-use urban projects in Île-de-France, European Planning Studies, 34:4, 785-804, DOI: 10.1080/09654313.2025.2607058

To link to this article: https://doi.org/10.1080/09654313.2025.2607058

EUROPEAN PLANNING STUDIES
2026, VOL. 34, NO. 4, 785–804
https://doi.org/10.1080/09654313.2025.2607058

Toward an urban logistics design: programming logistics in mixed-use urban projects in Île-de-France

Reece Fisher [a] and Adeline Heitz [b]

[a]Chair Logistics City, LVMT, Université Gustave Eiffel, Ecole Nationale des Ponts et Chaussées, Marne-la-Valée, France; [b]Conservatoire National des Arts et Métiers, Paris, France

ABSTRACT

The following case study presents a method for estimating space to dedicate to logistics activities in planned mixed-use urban projects in the Paris region. As the place for logistics in cities is currently being questioned, the standardization of these facilities with respect to size, location, and form has proven difficult. Incorporating logistics space into urban projects can be a way of enabling developers to achieve their objectives for the promotion of logistics real estate while also satisfying the wants of public actors who have objectives linked to decreased externalities and a better-integrated logistics system. The method in this case study combines three categories of data to arrive at initial guidelines in terms of space to be dedicated to logistics in three mixed-use urban projects. Calling upon existing operational urban planning tools and data from a semi-private logistics real estate developer, the method involves three steps to arrive at the initial dimensions of a hypothetical logistics infrastructure in an urban project. As the projected dimensions are based strictly on the tool and project data and cannot consider the relevant surrounding activities and operator strategies, the paper then positions the assessment within a larger iterative design approach for an urban logistics infrastructure.

ARTICLE HISTORY
Received 2 August 2025
Revised 14 December 2025
Accepted 15 December 2025

KEYWORDS
Urban logistics; urban programming; logistics facilities; mixed-use project; decision-making tools; urban design

1. Introduction

Urban development is increasingly driven by the need for densification to preserve undeveloped land and limit urban sprawl (Colsaet, Laurans, and Levrel 2018). Logistics real estate development has significantly contributed to urban sprawl (Dablanc and Rakotonarivo 2010; Cidell 2010). Today, this sector is not exempt from the imperative of densification, driven by both the tightening of land-use regulations aimed at curbing sprawl and by its own evolution. With the rise of e-commerce and urban logistics, the industry now exhibits a greater demand for land in dense urban areas than ever before. Urban logistics refers to the planning, implementation, and control of the efficient movement of goods, services, and information within urban areas. It aims to optimize transportation, reduce congestion, and minimize environmental impact while ensuring timely deliveries and maintaining the quality of life for city residents (Taniguchi, Thompson,

CONTACT Reece Fisher reece.fisher@enpc.fr 14-20 Boulevard Newton, 77454 Champs-sur-Marne, France

and Yamada 2001). Urban logistics encompasses various strategies to address the challenges of increasing flows and growing e-commerce demands, such as decarbonization of vehicles, new last-mile solutions based on the reorganization of the supply chain, and the development of a new type of logistics real estate (Buldeo Rai, Touami, and Dablanc 2022). Further, urban logistics implies the involvement of public and private stakeholders including shippers, receivers, public authorities, residents, and real estate actors.

Moreover, the increasing demand for last-mile delivery and the pursuit of sustainable urban growth have underscored to the need to incorporate urban logistics into public policies. While planning and land-use regulations offer limited means to promote the urban development of logistics, local authorities can also rely on project ownership and management to embed logistics functions within mixed-use urban projects (Heitz and Berthon 2025). In doing so, they pursue a dual objective in urban planning: on the one hand, developing spaces that enhance the management of urban freight flows by providing dedicated areas for storage, cross-docking, and decarbonized last-mile delivery; on the other hand, reinforcing their vision of urban development based on functional mix, which corresponds to the mix of functions at the minimum level of scale (Wandl and Hausleitner 2021). Logistics thus becomes a valuable lever for strengthening this approach.

However, intense land competition in dense urban areas – where residential and commercial projects are favoured for their profitability and lower perceived nuisances – makes it hard for logistics to secure space, despite its crucial role in urban economies (Heitz 2021). In addition, an extensive body of literature on the evaluation of urban logistics facilities highlights key issues related to governance, public policies, socioeconomic impacts, environmental effects, and business models. Developers and public authorities often lack expertise in logistics, which can lead to poorly designed spaces that fail to meet the needs of logistics and transport operators, ultimately limiting the project's success and the viability of logistics activities in dense urban environments (Heitz and Berthon 2025).

The current challenge for public policies as project owners and project managers is to develop expertise in urban logistics design that enables the integration of logistics functions into urban projects. The objective of our article is twofold. Firstly, it aims to contribute methodologically to this expertise-building process by developing an innovative urban logistics design framework through first testing a programmatic tool. Secondly, it aims to contribute to the debate on the feasibility of functional mix at the scale of urban projects, by highlighting the associated challenges and limitations, while also exploring the potential of logistics as a lever for promoting mixed-use developments. Thus, this article presents a first attempt at defining a method for quantifying the need for space for logistics activities ('logistics needs') within three mixed-use urban and suburban projects within the Paris region. This was done using data from both a French semi-private logistics real estate developer as well as a public sector land developer working for mayors and local authorities in the Greater Paris region.

The article is structured as follows: Section 2 reviews the literature on urban logistics planning and its role in mixed-use projects. Section 3 presents the methodology. Section 4 applies this method to three case studies in the Paris region. Section 5 discusses its limitations, applicability, and implications. Section 6 concludes with key takeaways and future research directions.

2. Literature review: integrating logistics spaces into urban projects: from mobility to urban design perspectives

2.1. Developing logistics facilities to improve urban freight mobility: lessons from experimentations and evaluations

The organization of the last mile relies on two levers. The first directly concerns transport and the optimization of flows. The reorganization of the supply chain and the modal shift towards cleaner vehicles (electric, hydrogen, and gas), and alternative vehicles such as river barges and cargo-bikes are among the solutions frequently mentioned in the literature. The second lever, which is also a corollary of this decarbonized mobility, is the development of urban logistics facilities (Ploos van Amstel et al. 2021). These facilities, designed for cross-docking and storage operations, enable last-mile deliveries using small, low-carbon vehicles. Most of the facilities developed concern parcel activities, in line with the growth of e-commerce (Beziat and Heitz 2016). Over the past two decades, ULFs have expanded across metropolitan areas, especially in Europe and North America, taking on diverse forms (Buldeo Rai et al. 2022). Originally experimental and often supported by public subsidies, the urban logistics facilities have gradually become more self-sufficient. Today, they are increasingly led by private actors such as carriers, shippers, and logistics service providers.

The literature on the development of urban logistics facilities, mainly urban consolidation centres (UCCs), has primarily focused on four major issues. The first issue is the governance of these projects, the role of public policies, and private stakeholders. Several studies highlight the importance of involving various stakeholders in the development of a UCC (Ambrosini, Gonzalez-Feliu, and Toilier 2013). Researchers argue that effective collaboration through shared costs and benefits, common objectives, and strong partnerships, is essential for success. A lack of coordination among stakeholders is often cited as a key factor behind the frequent failures of UCC initiatives. Therefore, understanding the motivations and interests of the actors involved in urban logistics is crucial (e.g. Freichel, Annika, and Wörtge 2019; Bjørgen and Ryghaug 2022; Nefs and Daamen 2023). The second issue developed in the literature concerns barriers to development related to the business model, particularly the significant reliance on subsidies (e.g. Strale 2019). Most research on UCCs seems to focus on mathematical models to optimize goods distribution while considering environmental and social factors, yet often overlooks financial viability (Björklund and Johansson 2018). The success of a UCC depends on both the level of stakeholder involvement in decision-making and the ability of logistics service providers to deliver a competitive service to their customers (Anand, van Duin, and Tavasszy 2019). The third issue is the planning of these facilities and the role of public policies in promoting their integration into urban areas (Raimbault, Heitz, and Dablanc 2018; Patier and Routhier 2020; Dablanc and Rakotonarivo 2021; Kin et al. 2024). These studies highlight a growing awareness and competence among public authorities regarding urban logistics, potentially leading to better integration of these issues into territorial planning and long-term development strategies. However, the extent to which urban logistics are incorporated into planning varies across cities and countries. Even when public policies acknowledge these challenges, local authorities often lack the expertise and resources to effectively manage or influence the urban freight sector (Akgün et al. 2019). This points to a broader issue: the limited availability of tools and skills for policymakers, reflecting their level of maturity in addressing urban logistics (Cowie and Fisken 2023). Finally, the fourth issue is the impacts of these facilities on decarbonized urban freight management and flows (e.g. Allen et al. 2012; Llorca and Moeckel 2021). The impact of urban logistics facilities on CO_2 emissions has been widely studied, but findings remain mixed due to variations in implementation and operational models.

These works have focused more on urban logistics facilities development as a key element in improving freight mobility, highlighting that the approach for the urban planning of logistics is often from a transportation and flows angle. Models exist to estimate the spatial need for certain logistics activities (e.g. loading/unloading, vehicle parking, and traffic) (Routhier and Toilier 2007). Additionally, many articles have relied on modelling to estimate the urban freight facilities' environmental or socioeconomic impacts using ex-post methods (Perotti, Prataviera, and Melacini 2022; Ries, Grosse, and Fichtinger 2017). Few of them addressed the development of urban logistics facilities from the perspective of urban design, as an urban project. By framing this approach, we shift perspectives. The focus is no longer on the effects on mobility but rather on the conditions for implementing urban logistics facilities from a real-estate perspective. This transition moves the discussion from a mobility-centred approach to an exploration of the mechanisms behind the development of an urban project that incorporates a logistics function.

2.2. Integrating urban logistics functions into urban projects: the challenge of mix-used development

In the end of the twentieth century 'the crisis of traditional land-use planning, as derived from modernist functional planning principles, led to the rediscovery of the urban project tradition and a rethinking of the discipline of urbanism' (Oosterlynck et al. 2011, 6). In urban planning literature, the concept of an urban project is often defined as a strategic, place-based intervention that integrates spatial, social, economic, and environmental considerations to shape the development of urban spaces. It goes beyond traditional land-use planning by incorporating design, governance, and participatory processes. When referring to an urban project, the French definition is polysemic, as it is a form, a tool, and a part of a process within urban development (Idt 2020). The notion and definition of an urban project can depend according to the actor involved, but it generally can be understood as a concrete vision bringing together a variety of players to transform a space (Serra 2015; Healey 2017). Urban projects are more context-specific, design-oriented, and action-driven. Urban development through urban projects has also been the subject of numerous criticisms. Scholars and urban practitioners have pointed out that while urban projects aim to create cohesive and sustainable spaces, they often lead to gentrification and market-driven urbanism. Critics argue that these projects sometimes prioritize economic attractiveness and real estate profitability based on managerial modes of urban governance (e.g. Harvey 1989; Carmona, Burgess, and Badenhorst 2009).

Mixed-use urban projects are often conceived as planning strategies to mitigate these negative externalities (Gualini and Majoor 2007). By integrating functions that would have been excluded under pure market-driven logic, these projects aim to create more balanced and inclusive urban environments. Through design, they seek to foster social diversity, economic vitality, and spatial cohesion within the urban fabric with varying degrees of success. 'Mixed-use' can be understood broadly as the presence of two or more functions within the same unit of development, whether the scale be a building, a block, or a neighbourhood (Rabianski and Clements 2007). A mixed-use urban project or facility can be both a key objective in urban planning policies and a strategic tool for developers. On one hand, it aims to counteract the complete disappearance of certain activities from cities – such as industry, logistics, construction, and wholesale trade – while also integrating emerging functions like data centres, urban agriculture and proximity logistics. Additionally, it serves as a means to curb commercial and residential gentrification by maintaining a diverse economic fabric, in contrast to functionalist urban planning. Indeed, integrating a logistics function into a mixed-use urban project has presented an opportunity to counteract gentrification by reintroducing or preserving blue-collar jobs and productive activities into the city (Qin et al. 2024). On the other hand, for real estate developers, mixing uses enhances the financial viability of a project by enabling cross-subsidization between different uses within the development, ensuring a more balanced business model. A few recent examples, particularly in Paris, have incorporated logistics functions into mixed-use urban projects in an experimental manner. These cases have highlighted the financial challenge of cost-balancing for developers, as integrating logistics within dense urban environments requires innovative design solutions and economic trade-offs to ensure project viability (Buldeo Rai et al. 2022; Heitz and Berthon 2025).

2.3. Modelling and dimensioning the need for logistics: the difficulties of an ex-ante approach

The notion of 'need' is key in understanding the mechanisms behind the development of the urban logistics facilities. It helps identify the demand for logistics spaces, the specific needs of operators, and the factors influencing the integration of such infrastructure into urban areas. This includes conducting an 'initial market research study' that supports public authorities in analyzing the economic context and operational needs of potential stakeholders, allowing them to develop a model that is well-suited to the local context (Wagner, Iwan, and Kijewska 2021). This leads to the question: how can we define the logistics needs of future users of these spaces as well as those who will be served by these facilities? This requires appropriate tools to ensure that the dedicated logistics space is properly sized regarding the operational needs of future users and the volume of goods flows that this space will be able to accommodate.

Generally speaking, urban logistics needs are hard to quantify ex-ante due to the large number of scattered inputs from various stakeholders (Cardenas et al. 2017). Logistics data can be unreliable, restricted, and difficult to scale. Considering these difficulties, there have been quantitative attempts to dimension space and infrastructure related to last-mile logistics. Some authors have tried to define the optimal size and location of delivery zones, such as delivery bays or loading/unloading areas. Comi, Schiraldi, and Buttarazzi (2018) highlight the lack of integrated methods for urban freight planning that consider delivery policies and use simulation-based demand modelling to determine the optimal number and placement of delivery bays. Similarly, Dezi, Dondi, and Sangiorgi (2010) aim to optimize delivery zone size, number, and location in Bologna by analyzing data on vehicle flows, existing zones, and the city's commercial structure. Paddeu (2021) identified that there is a lack of performance measurement systems in place for ex-ante and ex-post analyses, which would quantify the performance dimensions and enable conclusions to be drawn regarding what extent project objectives are reached and policy goals are achieved.

Further, in the case of France, interviews conducted by Heitz and Berthon (2025) with French developers indicate the need of a programmatic tool to estimate space to allocate to logistics activities. Few methodologies currently exist to quantify the theoretical need for logistics spaces based on anticipated freight flows at the project level. Efforts to improve logistics space estimation have emerged in recent years, including simulation models that incorporate freight movement data (Beziat and Heitz 2022). However, these methods are still in early development stages and are not widely adopted by practitioners. Real estate developers often rely on anecdotal knowledge and direct consultations with potential tenants to estimate the demand for logistics space, leading to an ad hoc approach that may not fully optimize spatial efficiency. In many cases, developers adopt a trial-and-error approach, adjusting logistics space allocation based on early tenant feedback rather than systematic, data-driven analysis. As observed in the analysis of literature in section 2.1, we see the presence of a flows-based approach to the integration of urban logistics infrastructure in urban planning and projects, but we do not observe concretely an approach centred on real estate, either deriving from a flows-based approach or apart. It is through these observations that we are interested in testing programmatic tools in their function and place in urban logistics programming.

3. Method and data

In this section, we will present the operational tool and data used to estimate the need for logistics infrastructure generated by a mixed-use urban project. This estimation will be demonstrated using three urban projects with different functional mixes (3.1). We outline the process of assessing logistics spatial needs generated by the urban projects, and then articulate these outputs with developers to identify the 'urban logistics design' process. The final output is an iterative process outlining all the steps involved in logistics urban programming (3.2).

3.1. A process for estimating physical space 'needs' for logistics

3.1.1. Step one: generating delivery estimates for the mixed-use project

The starting point of our process involves a tool used to simulate hypothetical logistics needs in terms of packages and parcels. This tool was developed by Beziat and Heitz for the city of Paris (Beziat 2025). The tool can be used to simulate both business-to-business (B2B) and business-to-consumer (B2C) deliveries of goods using both aggregate and disaggregate data to generate a synthetic population and delivery ratios (Figure 1). The tool works by associating a volume of goods delivered with the profile of a mixed-use development. The more precise the design of the project, the closer the results will be to reality. In an urban project, the design tends to be refined over time. Thus, the project can start without knowing the exact distribution between the types of housing or the types of land uses (offices, commerce, tertiary facilities). By generating

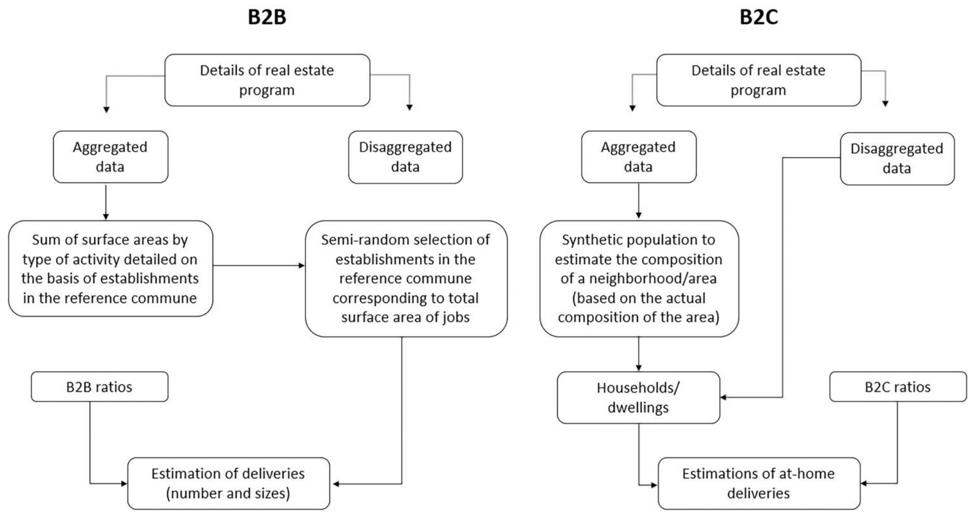

Figure 1. Diagram of O + Tool, Beziat, 2022, adapted.

a synthetic population, the tool is able to determine the composition of the future project based on the current composition of the neighbourhood known through statistical data such as the general population census. The tool depends on survey data on BtoC and BtoB flows that are injected into the models (Gardrat 2019).

Direct inputs to the B2C model include the location of the project, the total surface of housing, and the total number of housing units, where outputs include the number of at-home deliveries each year. The inputs to the B2B model include location of the project, total size, distribution of activities, and number of employees for each activity. The outputs from the programme are the number and size of packages to be delivered per year, as well as the number of logistics-related employees corresponding to the project.

Within the three case studies, both B2B and B2C projections were calculated in the first step of the process. Precise B2B projections were calculated for commerce and services (e.g. large distribution, hotels, restaurants, artisanal and personal services), public equipment (e.g. schools, hospitals, museums), and offices (e.g. financial service offices, travel agencies, public administration). These package sizes and weights were then used to estimate the total weight of merchandise transported yearly for each project. Certain assumptions regarding package weights were necessary. The maximum weight for each package class was assumed in the calculation for consistency and to avoid underestimation of spatial needs generated. Regarding O + outputs defined by type, a roll was assumed to weigh 600 kg and a palette was assumed to weigh 1400 kg. A full truckload was assumed to weigh 26 metric tons. A B2C package was assumed to weigh 30 kg, which is the maximum weight of packages entering many crossdocking facilities, information gathered from participant observation.

3.1.2. Step two: distributing the estimated packages among vehicles

Experimental data related to weight of goods transported resulted from a collaboration between Sogaris and Altaroad, a French technology startup specializing in artificial intelligence for flow management. The experiment lasted 3.5 months and involved the implementation of motion-sensing cameras and scales to weigh and record vehicles exiting a logistics platform in the suburbs of Paris. For each exit, the vehicle make, model, and total weight was recorded. From this point, the empty vehicle weights were found consulting technical data sheets and vehicle sale listings online, allowing the mass of goods transported to be calculated. The logistics platform tested encompassed clients with many typologies of activity (Heitz, Launay, and Beziat 2019), allowing a general baseline to be used for both average weight of goods transported per vehicle type and distribution of merchandise transported by vehicle type (light utility vehicle, heavy goods vehicle under 26 tonnes, and heavy goods vehicle over 26 tonnes). We therefore obtained the necessary proportions to calculate the number of goods required to transport the estimated merchandise in the new urban projects. The results used from the experiment are displayed in Table 1.

Knowing the average weight of goods transported by vehicle and the distribution of vehicles by type at the multi-activity logistics platform, we then arrive at the calculation of the number of vehicle flows associated with the new urban project. The calculation allows us to obtain the total number of movements, as well as the breakdown by vehicle type. The total number of movements brings us to the last step, which is multiplying this by the calculated space/movement ratio (see step three).

Concerning the robustness of the experimental data, two main limitations can be identified: Firstly, the experiment was conducted at a multi-client logistics platform at the site-level. There is not a way to disaggregate the data at the client level (with respect to typology of activity), therefore the vehicle weights and weight of merchandise transported are assumed to be the same for activities in both crossdocking and storage facilities. This simplified the process, whereas in reality, the use of light goods vehicles for the last mile in cities is a common practice. Additionally, to have conducted this experiment at a variety of sites could have added to the robustness in the calculation of distribution of vehicle flows and weights, especially in last-mile urban centres. Ultimately, the number of flows in this experiment was not used in the following step (space/movement ratios), as the passages at the logistics platform could not be disaggregated by activity type.

3.1.3. Step three: calculating space/movement ratios to arrive at total space required for logistics

To quantify the respective space needed for certain logistics activities, a ratio of space(m^2)/movement (delivery vehicles) was developed with the following method: Using the Sogaris carbon footprint calculation, clients have been classified based on activity using the typology proposed by Heitz, Launay, and Beziat (2019). The clients

Table 1. Results from vehicle flow experiment at suburban logistics platform.

Type of vehicle	Average weight of goods transported (kg)	Distribution of total weight of goods transported (%)	Distribution of total flows per vehicle type (%)
Light commercial vehicle	1503	9.54	44
Heavy goods vehicle <26t	9810	73.76	46
Heavy goods vehicle >26t	11802	16.7	10

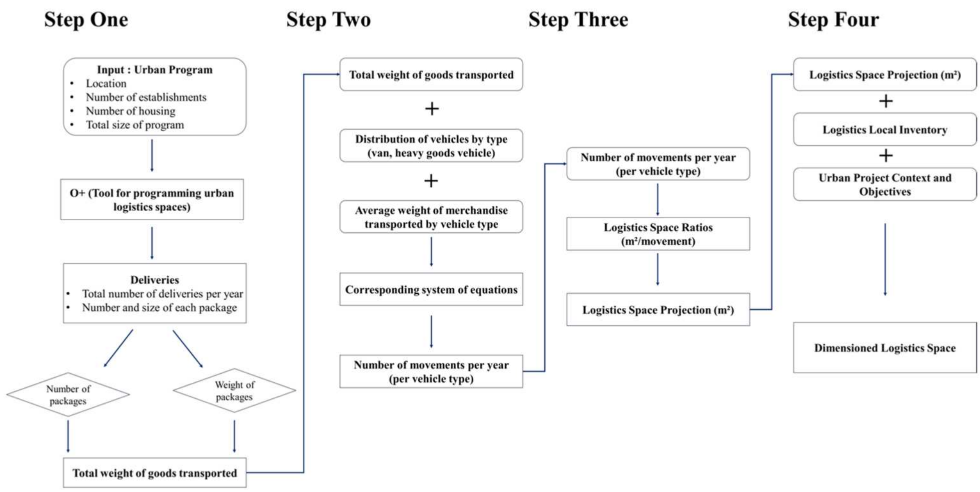

Figure 2. Diagram of process used to dimension logistics space.

were sorted more broadly into crossdocking activities, storage, or both. Their occupied surface area within the investor's real estate ecosystem was then referenced. The movement component was taken from the investor's carbon footprint calculations, where entrances/exits from the facilities were given by certain logistics operators and extrapolated to all clients. The average of the space/movement ratio was taken for each of the three activity groupings.

Finally, using O + outputs, the developer's projects were examined. Taking the estimated packages associated with the construction of the project, the total weight of the merchandise was calculated. The weight of the merchandise was then distributed among different types of vehicles with different load capacities (light utility vehicles and heavy goods vehicles) based on the flow experiment. Once the estimates of package distribution were complete, the number of predicted movements was then multiplied by the space/movement ratio. This calculation, called the 'logistics space projection' in Figure 2, becomes an element of ex-ante diagnostic for further dimensioning space for logistics in the project. Here when speaking of logistics space, we are referring to built facilities for logistical activity. More generally, the term logistics infrastructure can encompass additional forms such as loading docks, parking, delivery bays, and out-of-home delivery infrastructures. The process for obtaining a projection in terms of spatial need for logistics feeds into a larger programmatic process for urban logistics infrastructure. The definition of this process can contribute to the overall programming approach to urban planning, an iterative process that starts from an ex-ante reflection.

3.2. Case studies: multiple application of the urban logistics design process

To test the process and tools we developed, we chose to apply them to three case studies conducted between September 2024 and January 2025. Each case is an urban project led by Grand Paris Aménagement, a public land developer in the Greater Paris region, which aims to integrate logistics functions into its developments but lacks the expertise and

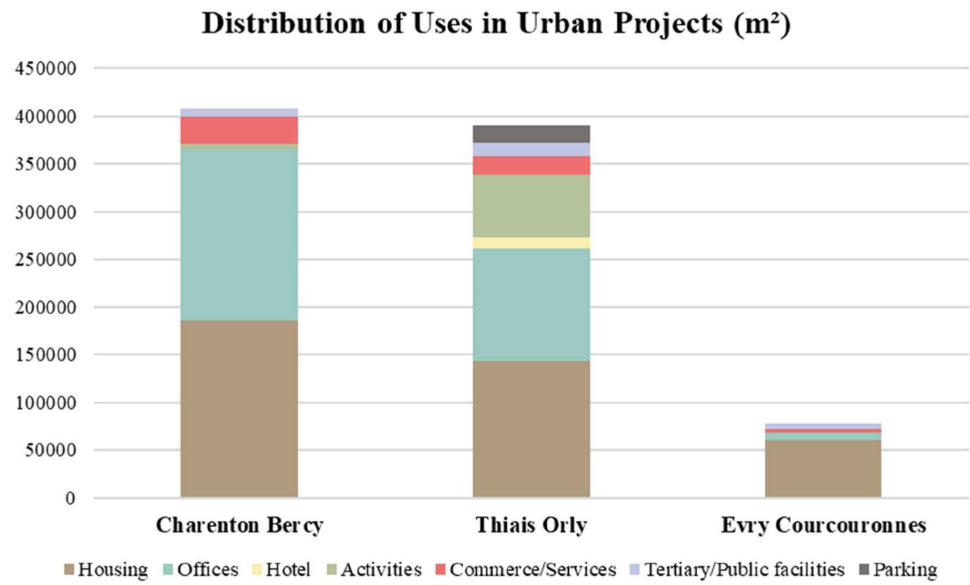

Figure 3. Distribution of uses in three case studies.

tools to do so effectively. The three case studies represent different projects in terms of programming and urban environment, allowing us to assess the adaptability and relevance of our approach across diverse contexts in the Paris Region. The breakdown of projects by size and location can be described in Figures 3 and 4.

As noted by the developer logistics has not been considered at the conception phase of these projects. Thus, these three case studies will help illustrate the need to develop concrete tools for evaluating logistics needs, allowing us to move beyond the theoretical framework of the established design process. Moreover, they will enable us to test the robustness of the theoretical model in real-world applications. Finally, these case studies will provide key insights into the sizing of logistics spaces within mixed-use urban projects.

3.3. Identifying the theorical 'urban logistics design' process through participant observation

Urban design is the process of shaping a place through an established vision while accounting for actors' interests and relevant constraints (Carmona 2014). We transpose the notion of urban design, often associated with the shaping of public space, to that of urban programming, a phase in operational urban planning between regional planning and architectural programming (Bonnevide and Marie 2021). Urban programming responds to the objectives set by urban planning to articulate between the needs of a collectivity (city, region, or town) and the objectives that private actors have for their project. When applied to logistics, 'urban logistics programming' is a process that can translate identified 'logistics needs' into a concrete urban project by integrating a logistics function from the earliest stages of development in the conception phase. To elaborate this process, we relied on participant observation, 'a method in which a researcher

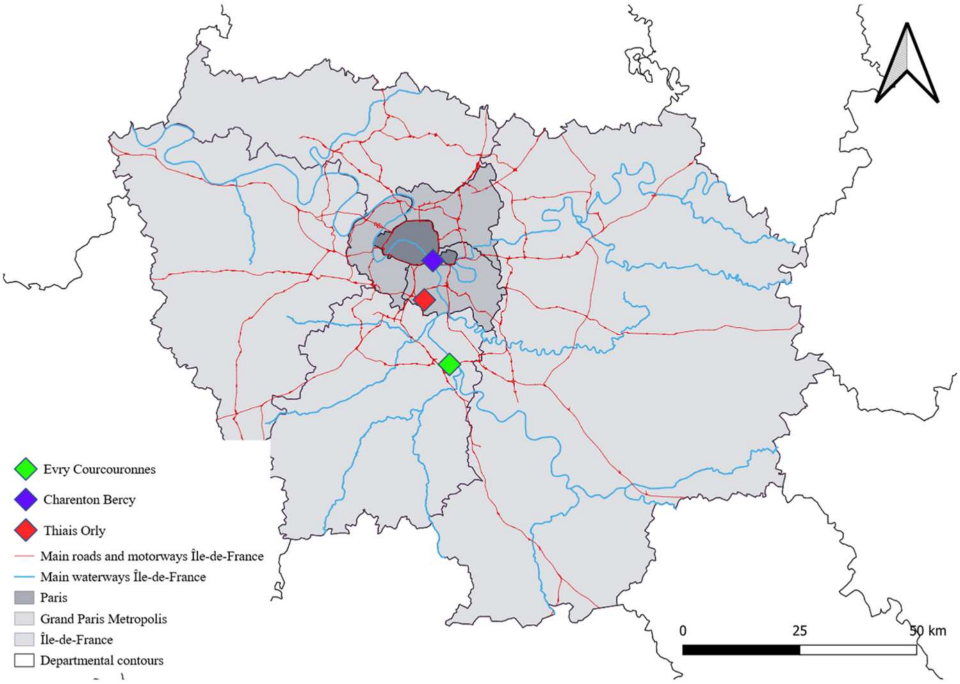

Figure 4. Location of urban projects.

takes part in the daily activities, rituals, interactions, and events of a group of people as one of the means of learning the explicit and tacit aspects of their life routines and their culture' (Musante and DeWalt 2010, 1). Increasingly used in the study of organizations, participant observation in logistics research can provide access to otherwise inaccessible information, making firsthand information available as a primary data source (Yin 2009; Pålsson 2007).

The qualitative data used in this study were collected through direct professional immersion within Sogaris, a semi-public[1] French logistics real estate developer, over a period of 18 months. Qualitative data provided by Sogaris included logistics flow experiment data as well as the company carbon footprint calculation. Participant observation provided an in-depth understanding of how logistics is integrated into urban development projects, offering direct insights into decision-making, stakeholder dynamics, and the developer's role. In addition, this method is particularly relevant as it provides access to implicit knowledge and professional practices that are often overlooked in formal interviews or policy documents. The findings were triangulated with four semi-structured interviews and document analysis (e.g. internal reports) to ensure the reliability and validity of the conclusions. Documents relevant to logistics urban planning and programming range from feasibility studies and outlines final project design, business plans, opportunity studies, and documented exchanges with relevant external parties (project managers, architects, city officials, etc.). Within the case study process, iterative feedback from the public developer and the real estate developer provided insight that informed the formalization of iterative steps in the programming process.

4. Results

4.1. Case study quantitative results

After applying this methodology, passing from the O + tool projections to movements to space, a range of 'spatial need' generated for B2B and B2C activities was calculated. With respect to the Charenton Bercy case study, depending on building activity, an estimated need for B2B logistics space was between 6508.3 and 11439.4m². This range can be explained by the three broad categories of logistics facility activity in Heitz, Launay, and Beziat (2019), where crossdocking refers to the regroupment of goods in a facility stored for less than 24 h, and storage implies a longer duration of time spent in a facility for each good. The smaller end corresponds to B2B crossdocking (such as a specialized transport terminal for palettes). The larger end corresponds to storage facilities (for example, an industrial logistics provider facility). The range of 6579.1 and 11563.8m² can be applied to the case of Thiais Orly, with 6579.1m² corresponding to a spatial diagnostic for B2B crossdocking activities and 11563.8m² corresponding to a spatial diagnostic for B2B storage activities. Following suit, the range of 1435.3–2522.8m² can be applied to the case of Evry Courcouronnes, with 1435.3m² corresponding to B2B crossdocking and 2522.8m² corresponding to B2B storage, hypothetically.

Regarding B2C projections, the projected ranges of space for both crossdocking and storage activities was much smaller as compared to those of B2B logistics space. Charenton Bercy generated a projected additional need of 78.2-137.5m² of space for B2C logistics, with 78.2m² corresponding to crossdocking activities (e.g. for express parcel transport terminals) and 137.5m² corresponding to storage activities (e.g. for specialized e-commerce distribution centres). The corresponding ranges for Thiais Orly represent as little as 51.9m² of additional logistics space for B2C crossdocking activities and as much as 91.2m² of additional logistics space for B2C storage. The same trend occurs for the case of Evry Courcouronnes, with 22.3m² of space projected for additional B2C crossdocking activities and 39.2m² of space projected for B2C storage. In addition, a calculation for B2C was made based on a possible scenario that all movements would take place on light utility vehicles and be for crossdocking activities. The corresponding total merchandise weight was distributed amongst light utility vehicles, resulting in a larger spatial projection compared to the other B2C projections. For Charenton Bercy, the scenario saw the projection grow to 340.5m². In Thiais Orly, the projection grew to 225.9m², and in Evry Courcouronnes, the projection grew to 97.1m². The ranges of projected space are summarized in Table 2.

Consistent with the developer's real estate portfolio, crossdocking activities generally consume less space than storage facilities. A projection was also calculated for facilities hosting both crossdocking and storage, falling in between the ranges provided. The logistics real estate developer confirmed the ratios generated in the case study by cross-

Table 2. Spatial logistics projections for three urban projects.

Site	B2B Logistics Spatial Requirement	B2C Logistics Spatial Requirement (with average vehicle distribution)	B2C Logistics Spatial Requirement (assuming all deliveries made by light utility vehicle, crossdocking)	Movements Associated (per year, B2B and B2C combined)
Charenton Bercy	6508.3–11439.4m²	78.2 – -137.5m²	340.5m²	31324
Thiais Orly	6579.1–11563.8m²	51.9–91.2m²	225.9m²	31536
Evry Courcouronnes	1435.3–2522.8m²	22.3–39.2m²	97.1m²	6933

referencing estimates from an external study bureau of flow capacities at a B2C parcel facility. Regarding both the size of projections for B2C activity as well as the difference between B2B and B2C projections, the seemingly small scale could be explained by the fact that delivery areas of crossdocking facilities are most often much larger than the perimeters of an urban project (excluding last-mile micro-hubs). The interpretation of the ranges provided can be seen as an additional need for B2C space in alignment with the realization of these mixed-use projects. In other words, it can be interpreted as the increased pressure put on the surrounding logistics ecosystem by the addition of space in the mixed-use projects dedicated to housing.

In terms of the space required to meet the anticipated logistics needs of a new urban project, this method reveals that B2B shipments require more space than B2C shipments. This reveals another paradox in the general urban logistics discourse: despite e-commerce bringing greater visibility to urban logistics, the custom of generally larger shipments (e.g. pallets) to businesses drives a far greater need for logistical space based on this methodology. Comparing two projects, Thiais Orly and Charenton Bercy, we can see that Charenton Bercy has a larger total developed area, but a larger proportion of the programme dedicated to housing. As a result, a similar surface area is available for B2B logistics, but with fewer B2C deliveries at Thiais Orly. Further, these results could have implications regarding ease of integration of B2C activities compared to those of B2B in urban projects. Regarding nuances between projects, they revealed significant variations in results depending on the urban characteristics and the type of urban fabric in which each project is embedded.

The methodology developed in this paper with O + therefore allowed project owners to obtain quantified estimates of the logistics spaces generated by their developments, an exercise that, until now, was often carried out intuitively or 'by rule of thumb'. While the results proved useful in informing their early strategic decisions, the combined examination of their professional practices and the insights gained from participant observation revealed the limits of this approach. O + constitutes only one brick within a much broader programming process: it can enrich and clarify practice, but does not, and cannot, replace it. For this reason, we extended our analysis beyond the quantitative estimations to reconstruct and understand the full sequence of steps involved in urban logistics programming. Doing so enables us to identify this process as it is enacted in practice and to reposition the O + tool within this wider operational context.

4.2. From spatial estimation to programmatic integration

Upon arriving at an estimated logistics space generated by the urban projects, the challenges of validating this quantification and fitting it into the general conversation of urban programming prompted discussions with the logistics and public land developers. We searched to confront the traditional programming process and position our output to define an urban logistics programming. Through discussions, iterations, and participant observation, we determined that the urban logistics design process entails (1) assessing the urban project and its context (2) evaluating the surrounding urban fabric, (3) estimating spatial needs, and (4) consulting relevant reglementary and technical documents depending on the location of the project (see Figure 5). This process is coherent with the four initial steps of urban programming identified in Bonnevide and Marie (2021) encompassing the strategic

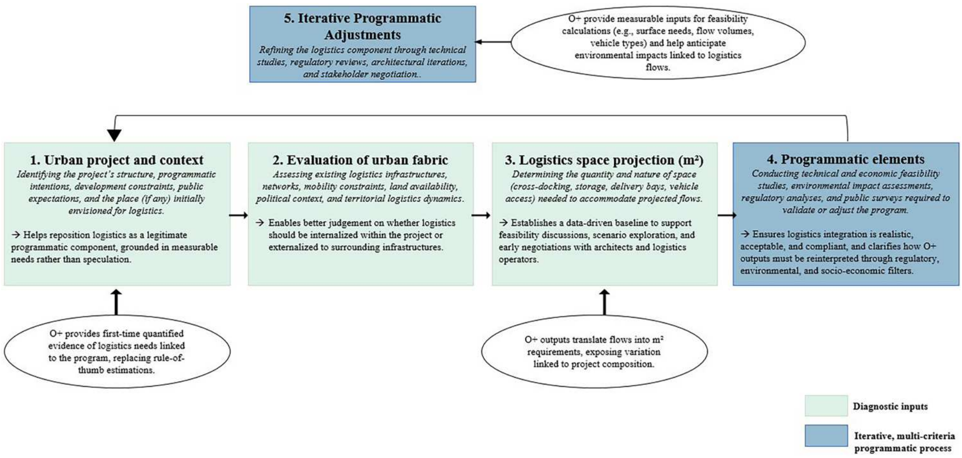

Figure 5. Iterative approach to urban logistics programming.

diagnostic for an urban project in general. The logistics programming process can be confronted by this framework and offer nuances to the existing programmatic input data. This prompted the discussion of programmatic components identified as:

1. *Urban project and context:* the urban project is the area within which logistics is being positioned. Examining the urban project with respect to developer's objectives and public expectations allows the logistics programmer to identify nuances in the positioning of logistics and the extent to which logistics has been accounted for.
2. *Evaluation of urban fabric:* evaluating the urban fabric involves assessing both the physical landscape (networks, constraints) and the broader political, economic, and social context (policies, existing infrastructures, actor dynamics). While current methods rely on planning documents and territorial diagnostics, there is still a lack of logistics-specific tools to help developers identify needs, risks, service areas, and potential upstream and downstream flows.
3. *Logistics space projection:* regarding the positioning of logistics infrastructure in a large-scale urban project, there are not existing tools which enable project owners to estimate the physical need for space that corresponds to the needs of the future project inhabitants and users. An estimation for the need for space can help imagine the function of different logistical activities that impact the project (likely last-mile deliveries, thus crossdocking activities). A method for this estimation has been established, though the process does not tackle all spatial dimensions of a logistics facility. The estimation of space goes hand in hand with the territorial diagnostic, where an actor could test whether new logistics needs generated by their project could be absorbed by the nearby territory. Integrating a logistics function is not a spatial optimization problem alone; it is a design, governance, and feasibility problem.
4. *Programmatic elements:* within urban programming, certain standard procedures such as feasibility studies, environmental impact studies, public surveying, and various diagnostics serve to inform the programmatic process. Upon analyzing their results, the functional programme can be modified to account for complementary information. These elements can be complemented and iterated within the programmatic process to refine the logistics component depending on project needs (box 5).

This triangulation allowed us to gain a comprehensive understanding of how logistics functions are integrated into urban projects. While professional immersion provides valuable empirical insights, reflexivity was maintained throughout the research process to critically assess potential biases and ensure an objective interpretation of the findings. The result of this observation enabled us to identify a theorical process of 'urban logistics programming'.

5. Discussion

5.1. The paradox of integrating logistics spaces dedicated to e-commerce

Recently, the rise of e-commerce, quick commerce, and instant deliveries has magnified the visibility of urban freight flows and put pressure on urban logistics infrastructures. While e-commerce giants like Amazon and their long-tail strategy have already drawn significant public policy attention to the growth of parcel flows in cities, the recent and massive expansion of companies like Temu and Shein has further reinforced the urgency of addressing the negative impacts of these flows on urban areas (Garland, Supply Chain Dive, 2024). Gradually, public authorities have shifted their focus from urban logistics in a broad sense to the specific issue of proximity logistics, or 'the development of logistics facilities in dense and mixed-use urban areas' (Buldeo Rai, Touami, and Dablanc 2022). The last mile is therefore becoming a fundamental issue for not only public authorities and transport and logistics companies, but also the residents. By concentrating on proximity logistics, local public policies seek to develop more sustainable and locally adapted solutions such as urban consolidation centres, micro-hubs, and cargo bike delivery networks.

Our results reveal a paradoxical situation; E-commerce and proximity logistics occupy a significant place in public discourse, the media, and academia, with a growing body of research in urban logistics dedicated to these topics in recent years. These issues are undoubtedly important and are increasingly being incorporated into public policies. However, when considering logistics flows and space requirements, this sector remains less space-intensive than B2B logistics. As a result, integrating B2B logistics into mixed-use urban projects presents greater challenges, as it demands larger dedicated spaces, which in turn impacts the project's programme and financial balance. Logistics urban design is therefore even more critical for addressing B2B activities, which often remain in the blind spot of project owners and urban developers. Ensuring their integration within urban projects requires proactive planning, as these activities tend to be overlooked despite their significant spatial needs and economic impact.

5.2. Lessons and limitations

We acknowledge the caveats of the method presented and the extent to which this method can be applied. Firstly, notes must be made concerning the updating of O + outputs. As O+ uses ratios developed in 2017 (Beziat 2017), the business-to-consumer (B2C) outputs do not take into account the boom in e-commerce stimulated by the COVID-19 pandemic (OECD 2020). To account for the growth in e-commerce year after year since 2019, a correction coefficient was applied using results from the 2023 DOMIREDO survey (Beziat 2024).

O + and its limitations can be noted by Adamy (2022), where important considerations such as demand seasonality were not accounted for, as well as the fact that ADM survey results were extrapolated from Lyon to Île-de-France during the tool's creation. Adamy further notes that O + cannot serve as a prescriptive tool, much like this method for estimating spatial logistics needs is not prescriptive, but rather useful within decision-making (Adamy 2022).

For public land developers and urban project owners, this method aligns with the programmatic approach to large-scale or mixed-use urban planning. The O + tool is not a replacement for urban programming but a complementary tool that enhances early-stage planning. It does not provide a final recommendation for building logistics infrastructure but serves as a preliminary step to engage public and private stakeholders in logistics integration and identify key data for space estimation. By enabling a more comprehensive territorial diagnosis of logistics space needs, this approach can be applied to other metropolitan contexts for verification and refinement.. Ultimately, this case study demonstrates both that logistics is a critical function within mixed-use projects and fostering collaboration between public and private stakeholders is key to addressing the needs of urban inhabitants. The contribution of O + lies in making logistics 'visible' early on, not in prescribing final infrastructure forms.

5.3. On the realities of programmatic urban logistics development

The development of a process for theoretically estimating logistics space sizing provides a valuable tool for these stakeholders, yet it remains partial. Further empirical applications are needed to validate and strengthen its robustness, ensuring its effectiveness in diverse urban contexts. At this stage, these estimates should not be used as prescriptive requirements for urban logistics development. Instead, they serve to justify logistics spaces and simulate last-mile delivery scenarios. At this phase, our method does not incorporate the financial dimension of the project, meaning it does not estimate the cost of integrating this function within the development. Moreover, operational aspects, such as the organization and utilization of current logistics sites, could influence how new logistics needs are absorbed within a future urban project. Practically, this method can support developers in justifying the inclusion of logistics facilities within mixed-use developments.

As urban and proximity logistics infrastructures veer from standardization, the elements outside of this spatial projection serve to provide specifications unique to the urban project, such as its objectives, history, and other important considerations. Around the urban project, it is relevant to consider surrounding logistics systems and infrastructure, as doing so can help the developer and planner anticipate where freight flows would be coming from with respect to distance, direction, and routes. The inventory of surrounding logistics warehouses can also help to predict whether the spatial need projection could be easily 'absorbed' by other existing infrastructures. Ultimately, these considerations contribute to the overall programming of logistics infrastructure.

6. Conclusion

This article presented a project-based approach to define urban logistics programming. Participant observation methods were combined with a logistics real estate developer's data to quantify the need for logistics space in a land developer's urban projects. The results showed us that it is possible to dimension urban logistics ex-ante by looking at the new deliveries generated by the construction of a project, the external landscape of logistics infrastructure, and project-specific objectives. The initial results showed us that B2B logistics generated a greater requirement for space than B2C logistics, largely due to size of shipments predicted by a programmatic tool. Although proximity logistics infrastructures typically accommodate B2C crossdocking activities, the integration of B2B logistics with limited negative externalities could be better realized through an ex-ante approach to urban planning of logistics. An overall method to dimension logistics has been proposed, both highlighting that spatial projections for logistics space is not enough to prescribe the construction of an infrastructure as well as showing that many factors contribute to determining the need for logistics space.

Our findings confirm that O + provides a robust diagnostic entry point for identifying the logistics needs generated by mixed-use developments. Yet, the tool alone cannot produce a facility blueprint, nor determine its feasibility, acceptability, or relevance in context. The design of logistics spaces emerges only when such diagnostic outputs are embedded within a broader programming process involving political goals, territorial assessments, architectural constraints, market dynamics, and interactions between public and private stakeholders. In this perspective, O + acts as a 'first filter' that frames the conversation on logistics integration, rather than a prescriptive method. Strengthening this articulation between quantitative tools and programmatic practices constitutes a key research and operational frontier.

This research demonstrated the transposition of certain French urban planning concepts to urban logistics, a novel method to understand logistics as a necessary territorial function and better integrate it into the urban fabric. Further research could develop methods to estimate incoming flows into a project as well as how to establish an inventory of the surrounding logistics landscape. Regarding application to urban projects, a knowledge of typical mixed-use project profiles could help standardize programmatic recommendations for logistics infrastructure. Additionally, the elaboration of a method to assess the market area of a possible urban logistics infrastructure could contribute to a better understanding of the impact of logistics on an urban project as well as the impact of a hypothetical logistics infrastructure.

Note

1. In France, a *société d'économie mixte*, directly translated as 'mixed-economy company', is a company with capital owned majorly by the public sector, with at least one private sector shareholder.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The research associated with this article has been conducted under the French doctoral financing mechanism CIFRE (Conventions industrielles de formation par la recherche), in which Reece

Fisher is financed by Sogaris. This research was part of a research partnership with Grand Paris Aménagement without financial compensation.

ORCID

Reece Fisher http://orcid.org/0009-0008-5156-1760
Adeline Heitz http://orcid.org/0000-0003-2075-9789

References

Adamy, C. 2022. "La programmation logistique: enjeux et clés d'opérationnalisation de la fonction logistique dans le projet urbain. Mémoire." Ecole des Ponts ParisTech.

Adamy, C. 2022. "La programmation logistique: enjeux et clés d'opérationnalisation de la fonction logistique dans le projet urbain. Mémoire." Ecole des Ponts ParisTech.

Akgün, E., J. Monios, T. Rye, and A. Fonzone. 2019. "Influences on Urban Freight Transport Policy Choice by Local Authorities." *Transport Policy* 75: 88–98. doi:10.1016/j.tranpol.2019.01.009.

Allen, J., M. Browne, A. Woodburn, and J. Leonardi. 2012. "The Role of Urban Consolidation Centres in Sustainable Freight Transport." *Transport Reviews* 32 (4): 473–490. doi:10.1080/01441647.2012.688074.

Ambrosini, C., J. Gonzalez-Feliu, and F. Toilier. 2013. "A Design Methodology for Scenario-Analysis in Urban Freight Modelling." *European Transport/Trasporti Europei* 54 (7): 1–21.

Anand, N., R. van Duin, and L. Tavasszy. 2021. "Carbon Credits and Urban Freight Consolidation: An Experiment Using Agent Based Simulation." *Research in Transportation Economics* 85: 100797. doi:10.1016/j.retrec.2019.100797.

Beziat, A. 2017. "Approche des Liens Entre Transport de Marchandises en Ville, Formes Urbaines et Congestion: Le cas de L'Ile-de-France." Doctoral Dissertation. Université Paris-Est. https://tel.archives-ouvertes.fr/tel-01757032.

Beziat, A. 2024, November 12. *DOMIcile ou RÉcupération hors DOmicile – DOMIRÉDO Evaluation environnementale des modes de récupération des colis [Slide show].*

Beziat, A. 2025. "O+ – Outil de Programmation de Logistique Urbaine par la Simulation [Source code]." *GitHub*. https://github.com/AdBeziat/O_plus/tree/main.

Beziat, A., and A. Heitz. 2016. "The Parcel Industry in the Spatial Organization of Logistics Activities in the Paris Region: Inherited Spatial Patterns and Innovations in Urban Logistics Systems." *Transportation Research Procedia* 12: 812–824. doi:10.1016/j.trpro.2016.02.034.

Beziat, A., and A. Heitz. 2022. "'O+' Outil de Programmation de Logistique Urbaine, Estimer les Flux de Marchandises à L'échelle D'un Projet Urbain." In *Comité des Partenaires Stratégie Logistique de la Ville de Paris*. September 22, 2022.

Björklund, M., and H. Johansson. 2018. "Urban Consolidation Centre – a Literature Review, Categorisation, and a Future Research Agenda." *International Journal of Physical Distribution & Logistics Management* 48 (8): 745–764. doi:10.1108/IJPDLM-01-2017-0050.

Bjørgen, A., and M. Ryghaug. 2022. "Integration of Urban Freight Transport in City Planning: Lesson Learned." *Transportation Research Part D: Transport and Environment* 107: 103310. doi:10.1016/j.trd.2022.103310.

Bonnevide, N., and J. Marie. 2021. *Programmation Urbaine*. Paris: Le Moniteur.

Buldeo Rai, H., S. Kang, T. Sakai, C. Tejada, Q. Yuan, A. Conway, and L. Dablanc. 2022. "Proximity Logistics': Characterizing the Development of Logistics Facilities in Dense, Mixed-Use Urban Areas Around the World." *Transportation Research Part A* 166 (2022): 41–61. doi:10.1016/j.tra.2022.10.007.

Buldeo Rai, H., S. Touami, and L. Dablanc. 2022. "Autonomous e-Commerce Delivery in Ordinary and Exceptional Circumstances. The French Case." *Research in Transportation Business & Management* 45: 100774. doi:10.1016/j.rtbm.2021.100774.

Cardenas, I., Y. Borbon-Galvez, T. Verlinden, E. Van de Voorde, T. Vanelslander, and W. Dewulf. 2017. "City Logistics, Urban Goods Distribution and Last Mile Delivery and Collection." *Competition and Regulation in Network Industries* 18 (1-2): 22–43. doi:10.1177/1783591717736505.
Carmona, M. 2014. "The Place-Shaping Continuum: A Theory of Urban Design Process." *Journal of Urban Design* 19 (1): 2–36. doi:10.1080/13574809.2013.854695.
Carmona, M., R. Burgess, and M. Badenhorst, eds. 2009. *Planning Through Projects. Moving from Master Planning to Strategic Planning*. Amsterdam: Techne Press.
Cidell, J. 2010. "Concentration and Decentralization: The New Geography of Freight Distribution in US Metropolitan Areas." *Journal of Transport Geography* 18 (3): 363–371. doi:10.1016/j.jtrangeo.2009.06.017.
Colsaet, A., Y. Laurans, and H. Levrel. 2018. "What Drives Land Take and Urban Land Expansion? A Systematic Review." *Land Use Policy* 79: 339–349. doi:10.1016/j.landusepol.2018.08.017.
Comi, A., M. Schiraldi, and B. Buttarazzi. 2018. "Smart Urban Freight Transport: Tools for Planning and Optimising Delivery Operations." *Simulation Modelling Practice and Theory* 88: 48–61. doi:10.1016/j.simpat.2018.08.006.
Cowie, J., and K. Fisken. 2023. "Urban Freight Policy Maturity and Sustainable Logistics: Are They Related?" *Journal of Shipping and Trade* 8 (1): 5. doi:10.1186/s41072-023-00133-0.
Dablanc, L., and D. Rakotonarivo. 2010. "The Impacts of Logistics Sprawl: How Does the Location of Parcel Transport Terminals Affect the Energy Efficiency of Goods' Movements in Paris and What Can we do About it?" *Procedia-Social and Behavioral Sciences* 2 (3): 6087–6096. doi:10.1016/j.sbspro.2010.04.021.
Dezi, G., G. Dondi, and C. Sangiorgi. 2010. "Urban Freight Transport in Bologna: Planning Commercial Vehicle Loading/Unloading Zones." *Procedia-social and Behavioral Sciences* 2 (3): 5990–6001. doi:10.1016/j.sbspro.2010.04.013.
Freichel, S., N. Annika, and J. Wörtge. 2019. "The Role of Urban Logistics Real Estate in Last Mile Deliveries: Opportunities, Challenges and Success Factors for Integration." *Business Logistics in Modern Management* 19: 441–457.
Gardrat, M. 2019. "Méthodologie D'enquête: Le Découplage de L'achat et de la Récupération des Marchandises par les Ménages. *Doctoral Dissertation*. LAET (Lyon, France); Métropole de Lyon).
Garland, M. 2024, August 29. "Temu and Shein Packages are Flooding Delivery Networks. Will the Surge Persist? Supply Chain Drive." https://www.supplychaindive.com/news/temu-shein-shipping-delivery-industry-impact/725215/.
Gualini, E., and S. Majoor. 2007. "Innovative Practices in Large Urban Development Projects: Conflicting Frames in the Quest for 'New Urbanity'." *Planning Theory & Practice* 8 (3): 297–318. doi:10.1080/14649350701514637.
Harvey, D. 1989. "From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism." *Geographiska Annaler B* 71: 3–17. doi:10.1080/04353684.1989.11879583.
Healey, P. 2017. *Making Better Places: The Planning Project in the Twenty-First Century*. London, England: Bloomsbury Publishing.
Heitz, A. 2021. "The Logistics Dualization in Question: Evidence from the Paris Metropolitan Area." *Cities* 119: 103407. doi:10.1016/j.cities.2021.103407.
Heitz, A., and J. Berthon. 2025. "In Search of Operational Tools in Urban Planning for the Development of Urban Logistics Spaces: The Case of Logistics Urban Design in Paris." *Transportation Planning and Technology* : 1–22. doi:10.1080/03081060.2025.2476747.
Heitz, A., P. Launay, and A. Beziat. 2019. "Heterogeneity of Logistics Facilities: An Issue for a Better Understanding and Planning of the Location of Logistics Facilities." *European Transport Research Review* 11 (1): 5. doi:10.1186/s12544-018-0341-5.
Idt, J. 2020. "10. Projet Urbain Concepts Hétérogènes Pour Objet Flou." In *Urbanisme et Aménagement Théories et Débats*, edited by S. Bognon, M. Magnan, and J. Maulat, 181–196. Malakoff, France: Armand Colin.
Kin, B., H. Buldeo Rai, L. Dablanc, and H. Quak. 2024. "Integrating Logistics Into Urban Planning: Best Practices from Paris and Rotterdam." *European Planning Studies* 32 (1): 24–44. doi:10.1080/09654313.2023.2242400.

Llorca, C., and R. Moeckel. 2021. "Assesment of the Potential of Cargo Bikes and Electrification for Last-Mile Parcel Delivery by Means of Simulation of Urban Freight Flows." *Eur. Transp. Res. Rev* 13: 33. doi:10.1186/s12544-021-00491-5.
Musante, K., and B. DeWalt. 2010. *Participant Observation: A Guide for Fieldworkers*. Lanham, MD: AltaMira Press.
Nefs, M., and T. Daamen. 2023. "Behind the Big Box: Understanding the Planning-Development Dialectic of Large Distribution Centres in Europe." *European Planning Studies* 31 (5): 1007–1028. doi:10.1080/09654313.2022.2057792.
OECD. 2020. "E-Commerce in the Time of COVID-19." In *OECD Policy Responses to Coronavirus (COVID-19)*. Paris: Éditions OCDE. doi:10.1787/3a2b78e8-en.
Oosterlynck, S., J. Van Den Broeck, L. Albrechts, F. Moulaert, and A. Verthetsel. 2011. *Strategic Spatial Projects. Catalysts for Change*. Abingdon: Routledge.
Paddeu, D. 2021. "The Five Attribute Performance Assessment (FAPA) Model to Evaluate the Performance of an Urban Consolidation Centre." *Research in Transport Economics* 90: 101065. doi:10.1016/j.retrec.2021.101065.
Patier, D., and J. Routhier. 2020. "Urban Logistics in the Light of Sustainable Development: Still a Long way to go." *Transportation Research Procedia* 46: 93–100. doi:10.1016/j.trpro.2020.03.168.
Pålsson, H. 2007. "Participant Observation in Logistics Research: Experiences from an RFID Implementation Study." *International Journal of Physical Distribution & Logistics Management* 37 (2): 148–163. doi:10.1108/09600030710734857.
Perotti, S., L. Prataviera, and M. Melacini. 2022. "Assessing the Environmental Impact of Logistics Sites Through CO2eq Footprint Computation." *Business Strategy and the Environment* 31 (4): 1679–1694. doi:10.1002/bse.2976.
Ploos van Amstel, W., S. Balm, M. Tamis, M. Dieker, M. Smit, W. Nijhuis, and T. Englebert. 2021. *Go Electric: Zero-Emission Service Logistics in Cities* (AUAS Faculty of Technology Publication Series; No. 17). Hogeschool van Amsterdam.
Qin, Z., C. Yu, H. Lin, C. Yang, and Q. Yuan. 2024. "Unraveling the Role of Freight Facility Development in the Dynamics of Gentrification." *Transportation Research Part D: Transport and Environment* 137: 104481. doi:10.1016/j.trd.2024.104481.
Rabianski, J. S., and J. S. Clements. 2007. *Mixed-use Development: A Review of Professional Literature*. Herndon, VA: NAIOP Research Foundation.
Raimbault, N., A. Heitz, and L. Dablanc. 2018. Urban Planning Policies for Logistics Facilities: A Comparison between US Metropolitan Areas and the Paris Region. Urban Logistics. Management, Policy and Innovation in a Rapidly Changing Environment, 82.
Ries, J., E. Grosse, and J. Fichtinger. 2017. "Environmental Impact of Warehousing: A Scenario Analysis for the United States." *International Journal of Production Research* 55 (21): 6485–6499. doi:10.1080/00207543.2016.1211342.
Routhier, J., and F. Toilier. 2007, June. "FRETURB V3, a Policy Oriented Software of Modelling Urban Goods Movement." In *11th WCTR*.
Serra, L. 2015. *Le Chantier Comme Projet Urbain*. Doctoral Dissertation, Thèse de Doctorat en Urbanisme et Aménagement, Paris.
Strale, M. 2019. "Sustainable Urban Logistics: What are we Talking About?" *Transportation Research Part A: Policy and Practice* 130: 745–751. doi:10.1016/j.tra.2019.10.002.
Taniguchi, E., R. Thompson, and T. Yamada. 2001. "Recent Advances in Modelling City Logistics." In *City Logistics II*, edited by E. Taniguchi, and R. G. Thompson, 3–33. Kyoto, Japan: Institute of Systems Science Research.
Wagner, N., S. Iwan, and K. Kijewska. 2021. "The Assumptions, Conditions and Barriers of the Development of the Urban Consolidation Center for Municipal Entities (UCC-ME)." *European Research Studies* 24 (1): 806–821. doi:10.35808/ersj/1996
Wandl, A., and B. Hausleitner. 2021. "Investigating Functional mix in Europe's Dispersed Urban Areas." *Environment and Planning B: Urban Analytics and City Science* 48 (9): 2862–2879. doi:10.1177/2399808320987849.
Yin, R. 2009. *Case Study Research: Design and Methods*. Vol. 5. Sage.