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Urban freight and procedural justice: who do we recognise as stakeholders?

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ABSTRACT

This paper reviews which actors recent urban freight scholarship recognises as stakeholders and how it represents their roles and interactions in relation to environmental and procedural justice. We conducted a systematic literature review of 54 studies using a deductive–iterative coding approach. We identified 19 stakeholders and organised them into five overarching categories: government, private sector, general public, academia, and labour & civil society. Results show that government and private-sector actors are consistently foregrounded and often positioned as central decision-makers or implementers, whereas the general public and labour & civil society, despite often being disproportionately affected, are less consistently recognised in the literature. We conclude by outlining how urban freight research can make stakeholder identification more transparent and reflexive, thereby supporting policy guidance that is both operationally effective and procedurally equitable.

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Urban freight; equity; stakeholders; last mile; procedural equity; environmental justice

1. Introduction

Freight traffic in cities is growing, driven in part by increasing consumer demand for goods and home delivery. By the first quarter of 2025, U.S. e-commerce retail sales reached \$300.2 billion, reflecting an average growth rate of 6% since 2024 (U.S. Department of Commerce, 2025). Retail's digital transformation has created a surge in demand for last-mile delivery services, resulting in smaller, more frequent, and time-sensitive shipments delivered directly to consumers' homes (Amaya et al., 2020; Chen et al., 2025; Galkin et al., 2025). To meet this demand, logistics operators have sought to maximise operational efficiency and resiliency, often by adopting hybrid inventory management practices and leveraging economies of scale that require larger networks of warehousing and distribution facilities (W&D) (Andreoli et al., 2010).

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The concentration of W&D has brought freight-related impacts to the forefront of urban land-use and environmental policy debates (Fried et al., 2025). These facilities may frequently be located near residential neighbourhoods, schools, and other sensitive land uses, sometimes exposing communities to increased air pollution, noise, traffic, safety risks, and adverse health outcomes (Fried, Goodchild, Browne, et al., 2024). The burdens frequently fall on low-income and racial minority neighbourhoods, thus raising significant environmental justice (EJ) concerns (Haarstad et al., 2024; Tejada & Conway, 2024). EJ scholarship holds that inequitable environmental outcomes frequently stem from inequitable political processes, where decisions tend to be made by those who benefit from environmental goods rather than those who bear environmental burdens (Bell & Carrick, 2017; Figueroa, 2022; Ikeme, 2003; Schlosberg, 2013).

EJ scholarship argues that addressing these governance failures requires processes that are rooted in procedural equity, a condition in which gross inequalities of political power, influence, and authority no longer shape the decision-making process (Bell & Carrick, 2017; Karner et al., 2020). Procedural equity, in turn, cannot be achieved without first resolving a prior question: who is recognised as having a legitimate stake in those decisions. This is a matter of recognitional justice, which Bell and Carrick (2017) define as the recognition and respect of people without regard for their backgrounds.

Concerns about freight's environmental and community impacts are not new. Research and advocacy calling for more equitable freight systems have been present for decades (Schneller et al., 2022; Schweitzer & Valenzuela, 2004). This research has largely explored freight from a distributive point of view (Fried, Goodchild, Sanchez-Diaz, et al., 2024), with comparatively less attention to the procedural and recognitional dimensions of justice (Cidell, 2024). Nevertheless, stakeholder engagement remains important to the development and successful implementation of urban freight (UF) policies (Bjørgen & Ryghaug, 2022; Castillo et al., 2024; Dablanc, 2011; Gunes et al., 2024; National Academies of Sciences, Engineering, and Medicine [NASEM], 2015; Holguín-Veras et al., 2018; Knoppen et al., 2021; Lozzi et al., 2026).

Yet, policymakers often struggle to meaningfully involve all relevant stakeholders across the multiple stages of policy development (Ansell & Gash, 2008; Arnstein, 1969; Richardson & Razzaque, 2006). These challenges can allow existing power asymmetries to persist or deepen, and shape policy agendas and outcomes in ways that reinforce inequity (Mizutani, 2019; Trounstone, 2018).

While the academic literature on policymaking for UF increasingly identifies stakeholder engagement as important (Bjørgen & Ryghaug, 2022; Castillo et al., 2024; Dablanc, 2011; Gunes et al., 2024; NASEM, 2015; Knoppen et al., 2021; Lozzi et al., 2026; Paddeu et al., 2024), it lacks consensus on (i) which actors are recognised as relevant stakeholders, (ii) how interactions among stakeholders are represented, and (iii) which processes are used to reach procedurally equitable outcomes. Accordingly, this study examines the recognitional and procedural dimensions of EJ in UF literature published in the last decade. It identifies which stakeholders are recognised, the roles and the interactions attributed to them, and the processes used to support multi-stakeholder deliberations.

2. Methodology

To address the gaps in literature outlined above, we review how existing UF studies conceptualise equity through the roles, responsibilities, and levels of involvement of key stakeholders. We focused on studies that engage with equity in the context of UF and last-mile delivery, without extending the search to broader social justice themes or narrowing it to a single equity dimension.

To analyse these dynamics, we define UF stakeholders as any group or individual who can influence or be affected by freight operations. This broad definition reflects the sector's complexity and the diverse, often conflicting interests at play.

We conducted a systematic literature review using Scopus and Google Scholar. Search strings were constructed from keywords identified in prior literature reviews on UF (Behrends, 2016; Buldeo Rai & Dablanc, 2023; González-Romero et al., 2025), and combined using Boolean logic following a search and screening procedure adapted from Masorgo et al. (2024) (see Figure 1). The search was conducted for articles published between 2015 and 2025, reflecting the rapid growth of UF research over the past decade. We also searched broader terms such as "freight justice" and "logistics fairness" across both databases, which yielded only records already identified through the primary search.

Eligibility was assessed on the year of issue assignment, except where a study's issue assignment postdates the search window. In those cases, the first online publication year was used, since the work was publicly available and citable within the review period. This convention is applied consistently to the eligibility screen, to Table 2, and to the annual publication trends reported below.

We then applied the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) workflow to screen the titles, abstracts, and full texts systematically, with

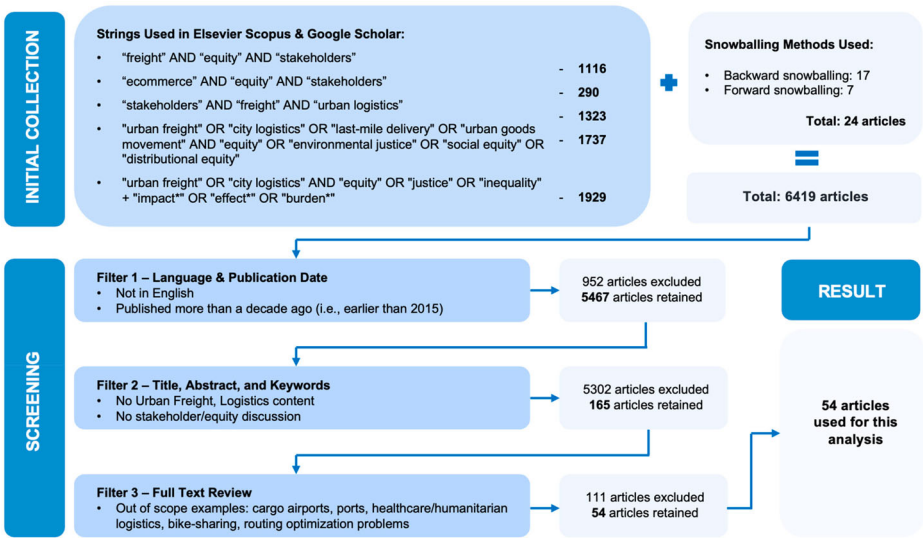


Figure 1. Systematic literature review search and screening process. The figure illustrates the two-stage collection and three-stage screening procedure used to identify the 54 records for this review.

inclusion and exclusion criteria detailed in [Figure 1](#). To supplement the database search, we applied a backward and forward snowballing method, examining the reference lists and citation networks of all included papers to capture relevant work not indexed in the primary databases. Altogether, the database searches and snowballing produced 6419 articles. Following the PRISMA screening procedure, 54 articles were retained for full analysis.

Once the process was completed, we manually coded the 54 included records to identify the stakeholders mentioned by the authors. Terminology used to describe UF processes, stakeholders and disadvantaged populations varies across geographic and disciplinary contexts. As Fried, Goodchild, Browne, et al. (2024) observe, UF literature uses different terms to describe similar logistics roles. Similarly, the framing of vulnerability differs across regions: U.S. literature tends to identify disadvantaged groups through racial and income categories, while European research more commonly refers to social exclusion, citizenship status, or immigrant populations without explicitly categorising by race (Karner et al., 2020). Our search strategy and coding approach accounted for this variation through broad search terms and a role-based coding framework that captures stakeholder functions rather than region-specific labels.

The initial codes were developed deductively based on our prior knowledge of the field. We then refined the coding list iteratively, adding or revising codes as stakeholders with distinct roles and responsibilities appeared in the reviewed records. Once the final list of codes was developed, we proceeded to review all 54 and tag the mention of a stakeholder according to the definitions laid out in [Table 1](#). Three authors independently applied the coding structure across different records to identify when a text referred to a stakeholder. After the initial round of coding, the full set of coded documents was reviewed once more in a final round of collective review to ensure that all three coders agreed on the codes assigned.

We aggregated the codes into broad categories that group stakeholders according to their roles in the UF landscape. The resulting categories preserve meaningful distinctions without fragmenting the analysis into unworkably small units. We subsequently examined interactions represented within and across stakeholder categories.

This methodology allows us to examine how often each stakeholder was mentioned and to use the surrounding context to identify the roles, interests, engagement dynamics, and interactions attributed to stakeholders in the reviewed records.

3. Results

3.1. Stakeholder categories

[Table 1](#) presents the stakeholders and their definitions, as derived from the reviewed records.

We recognise that, in practice, stakeholder identification is a complex task, as actors often have multiple roles simultaneously. For example, an order picker in an e-commerce warehouse is a key stakeholder in the delivery process but may also be a customer whose purchasing behaviour contributes to last-mile demand, while also being a resident living near freight facilities and therefore exposed to the externalities generated by the delivery process. These intersectional identities mean that the interests attributed to any single

Table 1. Comprehensive list and description of the stakeholders, based on the structured literature review.

Category	Stakeholder	Description
Government	Government Agencies	Government agencies are the national, regional, and local public bodies that collectively shape freight and climate policy. They set overarching goals, coordinate planning across jurisdictions, and regulate land use and freight activity in cities, ensuring coherent policy design and implementation across all levels of government.
	Policymakers	Government-employed professionals who convert policy goals into spatial, transportation, and regulatory decisions. This group includes transport and infrastructure planners, land-use planners, and policymakers, who together design zoning, guide mobility systems, and draft new policies that shape how cities grow and function.
	Elected Officials	Elected officials are city, regional, and national representatives chosen by voters who hold the formal authority to advance policy change. They set political direction, approve or block proposals, and use their mandate to shape which freight, land-use, and climate policies move forward.
General Public	Residents	Individuals who live near or within areas affected by UF operations and may be exposed to externalities such as noise and air pollution.
	Vulnerable Populations	Individuals or groups that are particularly vulnerable to the externalities of freight operations.
	Citizens	Individuals represented in the reviewed records in their civic capacity as members of the city in which UF operations occur.
	Customers	Individuals who purchase and receive goods in last-mile delivery. Their purchasing behaviour directly shapes delivery volumes, service models, and the overall structure of UF systems.
Private Sector	Shippers	Companies that produce or supply goods in exclusively B2B contexts, including firms that send products to other businesses and organisations that represent their collective interests. This group also includes multinational companies whose scale and influence shape industry standards, policy adoption, and innovation across freight systems.
	Carriers and couriers	Firms that physically move goods, spanning freight forwarders that coordinate shipments, transport providers that optimise vehicle use, courier and carrier companies that execute deliveries, postal operators, and the business organisations that represent their collective interests within the freight sector.
	Receivers	Companies that request, purchase, and depend on incoming goods.
	W&D Operators	Companies that manage warehouse and distribution facilities operations, overseeing storage, handling, and internal logistics.
	Developers	Companies or individuals who plan, finance, and construct warehouse facilities, creating the physical infrastructure that enables storage, distribution, and freight operations across the supply chain.
	Property Owners	Companies or individuals who hold ownership of warehouse and distribution facilities. They control the physical assets that enable storage and freight activity, influencing leasing conditions, site availability, and long-term investment decisions within the logistics real-estate landscape.
	Retailers	Businesses that sell goods to consumers (B2C), from large retail chains to small shops that generate frequent, decentralised deliveries. This group includes high-volume hypermarkets, and the organisations that represent retailers' collective interests, all of whom shape delivery demand and timing.
	Vehicle manufacturers	Companies that design, produce, and sell the vehicles used in UF, shaping the technological capabilities, sustainability options, and operational performance of fleets across the supply chain.
	Logistics Workers	This category contains drivers who operate delivery vehicles, and warehouse workers managing operations inside facilities, as well as those who represent their interests, such as labour representatives and trade unions.
Labor & Civil Society	Community Groups	Organisations that bring together the voices of residents and citizens and represent their shared concerns and priorities. They articulate community needs and advocate for equitable outcomes, and provide perspectives that help shape policy discussions.
	Gig workers	Independent couriers operating without traditional labour protections.
Academia	Academia	Researchers producing evidence, theory, and policy-relevant insights.

stakeholder category rarely map cleanly onto the lived experiences of the people within it. Yet most studies, including our review, necessarily treat stakeholders as discrete groups for analytical clarity. We acknowledge that this risks obscuring how individuals navigate competing interests, conflicting incentives, and intersecting vulnerabilities.

Following the procedure described in the methodology, we grouped the 19 stakeholders into five broad categories: Government, General Public, Private Sector, Academia, and Labor & Civil Society. Figure 2 represents a conceptual synthesis of the stakeholder categories and the interactions represented in the reviewed literature. In the figure, interactions between stakeholders are presented by the arrows between stakeholder groups. Governance interactions occur among government actors around regulatory and policy matters, such as elected mandates, goal setting, and quality of life considerations. Logistics interactions are operational and primarily involve private-sector stakeholders engaging through delivery, contracting, replenishment, and vehicle provision. Labour and infrastructure interactions capture how workers and property stakeholders operate and maintain the physical systems that support logistics. Research and collaboration interactions position academia and community groups as active participants across the broader system through research, advocacy, and collaborative engagement.

We group elected officials, government agencies and policymakers under Government because, despite their differing mandates, they derive authority from the state and are represented as collectively shaping the institutional environment in which UF operates.

The Private Sector category includes the largest number of different stakeholders and the biggest breadth of roles. It includes carriers and couriers, shippers, receivers, retailers,

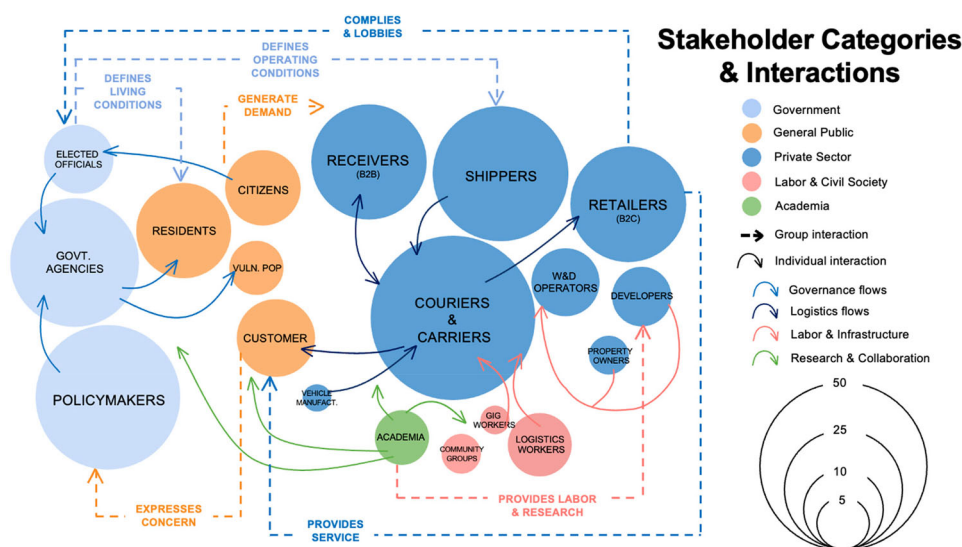


Figure 2. Stakeholder categories and interactions represented in the reviewed literature. Circle size is proportional to the number of included records in which each stakeholder was identified. Arrows distinguish between group-level interactions (dashed) and individual-level interactions (solid), and are colour-coded by interaction type: governance interactions (blue), logistics interactions (dark blue), labour and infrastructure interactions (red), and research and collaboration interactions (green). Notably academia is shown connecting to all stakeholder groups, reflecting its collaborative role across the system.

developers, W&D operators, property owners, and vehicle manufacturers. We grouped these stakeholders because the reviewed records generally portray them as the operational core of freight movement, linked by shared commercial incentives, interdependent logistics functions, and exposure to the same market and regulatory conditions.

The General Public category contains residents, citizens, customers, and vulnerable populations, which are not mutually exclusive groups and whose interactions are explained in the next section. We grouped them because the reviewed records generally represent them in relation to quality of life, safety, affordability, and environmental well-being.

The Labor & Civil society category includes logistics workers, gig workers, and community groups. We grouped these stakeholders because they represent worker and community perspectives that are not captured by government actors, private-sector ownership, or individuals classified under the General Public category.

Academia forms a standalone category because researchers provide evidence, expertise and analysis that may inform UF policy solutions which other stakeholders implement.

Table 2 illustrates that both the volume and the breadth of stakeholder-focused UF research has grown markedly over the past decade. Between 2015 and 2020 inclusive, only eight of the reviewed records appeared, and their stakeholder scope was relatively narrow, centring on government agencies and core private-sector actors such as carriers and shippers (Behrends, 2016; Lagorio et al., 2017; Matusiewicz et al., 2019; Nordtømme et al., 2015). From 2021 onward 46 published records were included in our review. This surge in volume was accompanied by a broadening of the stakeholders considered. Papers from 2023 to 2025 averaged approximately seven to eight stakeholders mentioned, with several records spanning a notably wide range of actors across government, private-sector, general public, and labour and civil society categories (Browne & Goodchild, 2023; Fried & García, 2024).

3.2. Stakeholders interactions within categories

Observing how research articles represent stakeholders connections, their interests and needs offers insight into how our field understands and represents existing dynamics. The interactions described below reflect only those explicitly reported in the reviewed records, and are examined both within and across stakeholder categories to illuminate existing reported dynamics.

3.2.1 Government

Government was the second-most frequently represented category, with at least one government stakeholder identified in 51 of the 54 records. The reviewed records commonly portray government actors as setting the regulatory and institutional conditions under which UF operates (Buldeo Rai et al., 2022; NASEM, 2015; Plazier et al., 2024; Przybylska et al., 2023; Shrestha et al., 2024). Stakeholders pertaining to this group were mentioned second most, 51 out of the 54 articles.

At a high level, government actors aim to foster economic growth and employment (Tanco & Escuder, 2021; Xiao et al., 2021), improve the urban environment by reducing air and noise pollution (Holguín-Veras et al., 2018; Tanco & Escuder, 2021), enhance

Table 2. Stakeholder groups addressed and frequency of analysis in urban freight transport literature, n = 54 (2015–2025).

	Year	Govt.			General Public				Private							Academia		Labour & Civil Society		
		Govt. Agencies	Policy-makers	Elected Officials	Residents	Citizens	Vulnerable Pop.	Customers	Shippers	Couriers and carriers	Receivers	W & D Operators	Property owners	Retailers	Deve lopers	Vehicle manu facturers	Academia	Logistics workers	Gig Workers	Community groups
Nordtømme et al. (2015)	2015	x								x	x						x			
NASEM (2015)	2015	x			x	x		x	x	x	x						x			
Behrends (2016)	2016	x	x						x	x	x									
Lagorio et al. (2017)	2017	x				x				x	x									
Yuan (2021)	2021	x	x		x		x	x	x	x	x		x		x	x				
Holguin-Veras et al. (2018)	2018		x					x	x	x	x									
Matusiewicz et al. (2019)	2019	x			x				x	x	x					x				
Amaya et al. (2020)	2020		x			x			x	x	x									
Gonzalez-Feliu et al. (2020)	2020	x								x						x				
Keeling et al. (2021)	2021	x	x				x	x	x	x		x	x			x	x			
Tanco and Escuder (2021)	2021	x			x					x	x									
Bjørgen et al. (2021)	2021		x	x		x			x	x						x	x		x	
Knoppen et al. (2021)	2021	x	x			x			x	x										
Xiao et al. (2021)	2021	x						x		x		x					x			
Rześny-Cieplińska et al. (2021)	2021	x	x		x				x	x										
Alves et al. (2022)	2022							x		x										
Castillo et al. (2022)	2022		x	x					x	x	x									
Bjørgen & Ryghaug (2022)	2022		x	x					x	x	x									
Garus et al. (2022)	2022	x	x							x										

Brettmo & Sanchez-Diaz (2022)	2022						x		x			x		x	x				
Comi & Russo (2022)	2022	x					x		x					x					
Dabblanc et al. (2022)	2022	x	x			x		x	x	x	x			x	x			x	x
Jaller et al. (2022)	2022	x	x		x			x			x	x							x
Buldeo Rai et al. (2022)	2022	x					x	x	x	x				x	x	x		x	x
Beckers et al. (2022)	2022	x					x	x	x					x					
Ciardiello et al. (2023)	2023						x	x	x			x							
Przybylska et al. (2023)	2023		x		x			x	x	x				x			x		
Browne & Goodchild (2023)	2023	x	x		x	x			x	x	x	x	x	x	x	x		x	
Buldeo Rai (2023)	2023	x	x		x	x	x		x					x	x		x	x	x
Rosales & Haarstad (2023)	2023	x							x									x	
Le Pira et al. (2023)	2023		x			x			x	x	x	x				x		x	
Dabblanc (2023)	2023	x	x		x			x	x	x	x	x	x	x	x				
Haarstad et al. (2024)	2024	x	x		x	x			x	x	x			x				x	x
McNair & Kwon (2024)	2024		x		x												x		
Brettmo & Browne (2024)	2024	x	x		x			x		x	x			x					
Fried, Goodchild, Sanchez-Diaz et al. (2024)	2024	x	x		x	x	x		x	x	x	x		x				x	
Tejada & Conway (2024)	2024	x	x		x		x	x	x	x		x		x				x	

(Continued)

Table 2. Continued.

	Year	Govt.			General Public				Private								Academia	Labour & Civil Society		
		Govt. Agencies	Policy-makers	Elected Officials	Residents	Citizens	Vulnerable Pop.	Customers	Shippers	Couriers and carriers	Receivers	W & D Operators	Property owners	Retailers	Deve lopers	Vehicle manu facturers	Academia	Logistics workers	Gig Workers	Community groups
Fried & Garcia (2024)	2024	x	x		x	x	x	x	x	x	x	x		x	x			x	x	x
Shrestha et al. (2024)	2024	x	x	x					x	x	x			x				x		
Paddeu et al. (2024)	2024	x	x	x	x	x		x	x	x		x		x			x			
Castillo et al. (2024)	2024		x	x					x	x				x						
Plazier et al. (2024)	2024	x	x		x				x	x		x		x			x			x
Park et al. (2024)	2024		x					x	x	x								x	x	
Rosales (2024)	2024	x	x	x	x					x	x		x	x	x		x	x		
Chen et al. (2025)	2025	x	x		x					x							x			
Tejada & Conway (2025)	2025	x	x		x			x	x	x	x			x						
Quiter et al. (2025)	2025		x						x	x	x			x			x			
França et al. (2025)	2025	x			x	x			x	x	x							x		
Fried et al. (2025)	2025	x	x	x	x	x	x								x					x
Galkin et al. (2025)	2025	x	x						x	x	x							x		
Lozzi et al. (2026)	2025		x					x	x	x	x									
Dablanc & Adoue (2025)	2025	x	x			x		x	x	x	x			x			x			
Gonzalez-Romero et al. (2025)	2025		x			x		x	x	x	x			x			x	x		
Peng & Joubert (2025)	2025	x	x							x	x	x		x						
		37	39	8	23	17	9	22	36	50	32	16	6	35	14	4	13	17	6	7

livability by mitigating congestion, accidents, and pressures on public space (Tanco & Escuder, 2021), and promote sustainable UF by reducing external costs and community impacts (Przybylska et al., 2023). Research by Rześny-Cieplińska et al. (2021) finds that in the pursuit of these environmental and social goals, public authorities tend to prioritise safety and health over private economic interests.

At the same time, different public actors (i.e. elected officials, policymakers, and local authorities) have distinct goals shaped by their institutional roles and interactions (Przybylska et al., 2023). Paddeu et al. (2024) highlight tensions between policymakers and elected officials, whose short-term priorities reflect their representative roles. Shrestha et al. (2024) point out that elected officials seek public consensus to overcome resistance to policy measures but require political will to manage conflicts that arise. Bjørgen and Ryghaug (2022) argue that elected officials' commitment is important to policy implementation because it can generate the political support needed for other stakeholder groups to back the policy.

The reviewed records also describe interactions between policymakers and government agencies. Policymakers may choose to work with government agencies to develop pilot programmes and gather data to aid in evidence-based decision making (Buldeo Rai et al., 2022; Lozzi et al., 2026). However, this can often be hard as agencies may have little data and expertise when it comes to matters of UF (Lozzi et al., 2026; Paddeu et al., 2024). Furthermore, Browne and Goodchild (2023) and Bjørgen and Ryghaug (2022) show how agencies with different mandates can shape similar policies that result in different outcomes.

3.2.2 *Private sector*

The Private Sector was the most frequently represented category, with 53 of the 54 records including at least one private stakeholder. Carriers and couriers appeared most frequently while vehicle manufacturers appeared least frequently.

Stakeholders involved in different parts of UF operations interact in multiple ways (Ciardiello et al., 2023). In these interactions, Rześny-Cieplińska et al. (2021) observe a significant communication gap that often leaves private firms unaware of official logistics strategies. Separately, Brettmo and Browne (2024) identify property owners as critical influencers who can provide hub space to overcome established routines. Holguín-Veras et al. (2018) demonstrate the importance of receivers through a pilot designed to change receiver behaviour, and Behrends (2016) characterises the shippers-receiver relationship as fundamental to the movement of goods between facilities where economic activities are to be executed.

The reviewed records portray receivers as seeking efficient, reliable, and timely deliveries (Holguín-Veras et al., 2018; Tanco & Escuder, 2021). Receivers often prefer tight and convenient delivery windows which frequently clash with peak traffic hours. They may also seek to minimise interruptions to business operations because off-hour deliveries can require additional staffing (Holguín-Veras et al., 2018; Tanco & Escuder, 2021). Receivers depend on consistent, high-quality service to maintain low-inventory practices and adequate off-street parking for long-haul trucks (NASEM, 2015; Tanco & Escuder, 2021).

Browne and Goodchild (2023) note that shippers, receivers, and retailers rely on carriers and couriers to move goods between them. Carriers and couriers operate in a highly

competitive environment, facing pressure to provide efficient, reliable, and cost-effective services (Holguín-Veras et al., 2018). They seek to minimise travel time and costs, avoid congestion, and secure steady, profitable work, requiring operational flexibility (Holguín-Veras et al., 2018; Park et al., 2024). They also depend on predictable, fairly regulated system conditions, reliable loading zones, consistent enforcement, and stable demand to operate safely and profitably (Castillo et al., 2024).

However, these challenges can differ significantly between large companies and smaller, independent carriers who struggle to secure profitable jobs and compete for market access (Park et al., 2024). Often, local carriers want to execute deliveries efficiently using smaller, low-emission vehicles though they need coordination among various shippers and carriers to employ a successful freight consolidation strategy (Ciardiello et al., 2023). Smaller carriers need market designs that will improve their working conditions and allow them to compete against larger companies (Park et al., 2024).

Meanwhile, for W&D operators, property owners, and developers, Brettmo and Sanchez-Diaz (2022) describe how developers and property owners work together to build warehouses and retail establishments. Fried et al. (2025) note that while W&D operators do not directly determine warehouse type or location, they influence development through “build-to-suit” demand. Comi and Russo (2022) describe how W&D operators aim to reduce operational costs by minimising resource use and reducing loaded and empty mileage. Research on UCCs emphasises operators’ need for financial sustainability, requiring sufficient user volume supported by incentives or regulations to maximise participation while minimising environmental burdens (Ciardiello et al., 2023; Jaller et al., 2022).

Lastly, vehicle manufacturers play a central role in sustainability and pollution control efforts through freight fleet electrification (Amaya et al., 2020; Castillo et al., 2022; Holguín-Veras et al., 2018). Most greenhouse gas emissions and criteria pollutants in the sector stem from vehicle use (Fried et al., 2025; Fried, Goodchild, Browne, et al., 2024; Fried & García, 2024; Yuan, 2021).

3.2.3 General public

The General Public was the second-least frequently represented category, with at least one general-public stakeholder identified in 42 of the 54 records. The reviewed records associate these stakeholders with quality of life, affordability, accessibility, and reduced exposure to congestion, noise, air pollution, and traffic risks (Knoppen et al., 2021; Przybylska et al., 2023; Tanco & Escuder, 2021).

Customers often prefer the convenience of home delivery (Ciardiello et al., 2023). Lozzi et al. (2026) describe how increased e-commerce demand following the COVID-19 pandemic led private-sector actors to expand their operations. Dablanc (2023) identifies customer demand and location as key determinants of e-commerce vehicle miles travelled. Keeling et al. (2021) note that aggregate customer power can pressure retailers to mask shipping costs to remain competitive.

Przybylska et al. (2023) recognise residents as having the highest aggregated influence on the UF system. As customers, residents contribute to demand, yet they also support traffic restrictions on large trucks in cities (Tanco & Escuder, 2021). França et al. (2025) note that there has been an increasing need to minimise the negative externalities generated by logistics flows, which citizens often perceive as a major issue.

Disadvantaged communities face disproportionate exposure to pollution, congestion, diesel particulate matter, and related health risks due to the siting of transportation infrastructure and distribution facilities (Haarstad et al., 2024). In the context examined by Yuan (2021), W&D were disproportionately located in low and middle-income minority neighbourhoods rather than in areas with the highest demand.

Fried, Goodchild, Sanchez-Diaz et al. (2024) show that individuals may simultaneously occupy multiple roles as customers, residents, members of vulnerable populations, and participants in community groups. Keeling et al. (2021) similarly recognise overlapping stakeholder roles in their parcel-locker equity study.

3.2.4 Labor & civil society

The Labor & Civil Society category includes logistics workers, gig workers, and community groups, and was represented in 20 out of the 54 records.

Fried and García (2024) report that transportation and warehouse workers are exposed to highest air pollution (PM_{2.5}) across all workplace categories. They further discuss that, when W&D move into neighbourhoods, the actual quality of employment for local residents is often contested, as many roles are temporary or offer sub-minimum wages. Historically, logistics and gig workers have been an afterthought in urban planning (Shrestha et al., 2024) even though authorities are designing frameworks to balance environmental goals with labour protection, workers are frequently missing from the formal planning and negotiating table (Fried & García, 2024). Furthermore, gig workers often operate in a legal grey area, which can lead to misclassification (Dablan et al., 2022; Fried & García, 2024).

Recent records describe growing community-group involvement in planning (Fried & García, 2024; Plazier et al., 2024). For example, community-generated truck-count data from Chicago's Little Village have helped document freight impacts while also providing valuable information for academic research (Center for Neighborhood Technology, 2024).

3.2.5 Academia

Academia was represented in 13 out of the 54 records. The reviewed records describe academic experts as providing the decision support tools that policymakers use to evaluate different market designs and infrastructure location (Chen et al., 2025; Park et al., 2024). These tools facilitate joint knowledge production by combining academic research with practical experience and building the shared situational awareness required to overcome established routines among stakeholders (Brettmo & Browne, 2024).

3.2.5 Stakeholder interaction across categories

This subsection synthesises interactions across stakeholder categories as represented in the reviewed records.

The reviewed records commonly portray government stakeholders as influencing how, where, and when private-sector actors operate through regulation and land-use policy. A direct form of interaction is regulation affecting freight operations, such as land-use planning (Buldeo Rai et al., 2022; Fried et al., 2025) and the establishment of low or zero-emission zones or designated truck routes (NASEM, 2015). Shrestha et al. (2024) highlight that government stakeholders can exercise dispositional and relational power to advance their agendas. Plazier et al. (2024) argue that the role of government stakeholders is

operationalised by the degree and type of regulation they could enforce. Ciardiello et al. (2023) show how government authorities shape the landscape in which private-sector operations unfold, while Fried et al. (2025) demonstrate that zoning actions affect both community living conditions and business activities. Przybylska et al. (2023) found that government stakeholders had high influence and interest in policy design. Lastly, Xiao et al. (2021) point out that local and regional authorities have the power to influence the real estate market in such a way as to make it infeasible for W&D development to occur.

Some researchers posit that agencies and policymakers often lack freight-specific expertise (Lozzi et al., 2026; Paddeu et al., 2024; Przybylska et al., 2023), which makes them rely heavily on regulatory measures (Przybylska et al., 2023). Common tools include delivery time windows, parking and loading restrictions, and low-emission zones (NASEM, 2015). Przybylska et al. (2023) also classified government actors as a volatile stakeholder group because they are vulnerable to changes in the political landscape. Their high relative power can be mediated by their lack of specific knowledge and expertise to leverage (BjØrgen et al., 2021). In the scenarios presented in Plazier et al. (2024), government stakeholders have to become highly knowledgeable in UF operations to develop policies that support innovation as their contributions otherwise may lead to stagnation.

The impact of the private sector is often contested. While W&D development is frequently justified to overburdened communities through promises of local employment, the reviewed records consistently find those jobs to be of low quality, characterised by wage disparities, and increasingly structured around precarious, contracted labour models that shift operational costs onto workers, a pattern disproportionately affecting migrant and minority populations (Fried & García, 2024; Park et al., 2024; Tejada & Conway, 2024; Xiao et al., 2021).

Meanwhile, the private sector is influenced by the general public category as it relies on it to consume the goods and services that they provide (Xiao et al., 2021). Multiple researchers highlight customers as the linchpin of the e-commerce sector (Alves et al., 2022; Ciardiello et al., 2023; Fried, Goodchild, Sanchez-Diaz, et al., 2024; Holguín-Veras et al., 2018; Lozzi et al., 2026; Tejada & Conway, 2024).

3.4. Stakeholder engagement frameworks

The reviewed literature identifies several frameworks through which stakeholders participate in UF governance, ranging from government-led consultation to community-driven arrangements.

Public consultation is primarily reported in the context of Sustainable Urban Logistics Plans (SULPs). BjØrgen et al. (2021) describe a collaborative process across seven Norwegian cities involving policymakers and carriers and couriers. They found that, without political and planning anchorage from elected officials, private-sector actors perceived the process as lacking legitimacy. BjØrgen and Ryghaug (2022) and Lozzi et al. (2026) report similar SLP-based consultation in Norwegian and Italian cities. Online forums provide another form of public consultation. Paddeu et al. (2024) describe these as a widely used tool through which policymakers involve stakeholders in UF decisions, although they do not grant participants decision-making authority.

Freight partnerships are long-term arrangements in which UF stakeholders, usually government agencies, shippers, and carriers and couriers, meet regularly to discuss UF issues (Browne & Goodchild, 2023; Paddeu et al., 2024). Knoppen et al. (2021) position them as a shift from one-sided consultation toward participatory planning. However, Paddeu et al. (2024) note that even established regional forums remain consultative and lack decision-making powers.

Public-Private Partnerships (PPPs) involve institutional collaboration between government agencies and private-sector stakeholders. Ciardiello et al. (2023) report their use in establishing urban consolidation centres through partnerships between government agencies and carriers and couriers, although they note that most fail financially after initial public funding ends. Shrestha et al. (2024) find that these collaborations tend to involve the same private-sector actors repeatedly. Paddeu et al. (2024) warn that poorly regulated PPPs may favour large shippers and retailers at the expense of smaller firms.

Living labs represent a co-creative framework. Lozzi et al. (2026) define city logistics living labs as multi-actor platforms in which private operators, public agencies, and citizens co-create, test, and refine solutions in real-world settings. They have been applied across policy development phases, SUDP processes, and pilot design contexts, and recommended as spaces to engage digitally excluded stakeholders and reach underserved groups such as customers without access to cars (Björger & Ryghaug, 2022; Browne & Goodchild, 2023; Garus et al., 2022; Knoppen et al., 2021; Paddeu et al., 2024). Browne and Goodchild (2023) describe living labs as spaces where stakeholders from all categories can meet, devise solutions, and implement pilots.

To drive lasting equity, Buldeo Rai et al. (2022) highlights good neighbour agreements as a mechanism to codify behavioural shifts, while Rosales (2024) and Brettmo and Browne (2024) emphasise that authorities must move beyond “less confrontational” governance and act as “outside influencers” to overcome established systemic inertia.

Lastly, citizen-led, participatory analysis enables members of the general public to lead data production and interpretation. Fried and García (2024) argue that meaningful engagement requires residents and community groups to participate as full partners from the earliest project stages, allowing communities to shape outcomes directly. Within this broader framework, Community Benefit Agreements (CBAs) and technical advisory groups are ways to formalise the participation of community groups and residents in W&D development (Buldeo Rai, 2023). Fried et al. (2025) describe arrangements in which developers establish advisory groups with seats dedicated to community representatives and CBAs that compensate residents for freight-related externalities. These instruments give the general public a formal role in decisions that are otherwise negotiated between government agencies and private-sector actors.

4. Discussion

We focus on procedural equity, understood here as the need for rules, regulations, and participatory mechanisms to be inclusive, transparent, and attentive to differences in stakeholders’ capacity to participate. More precisely, our review addresses a foundational condition for equitable processes: the identification of the stakeholders and their interactions. Building on pluralist approaches to policy development, procedural equity requires movement from symbolic consultation to meaningful collaboration, in which

diverse stakeholders, including communities, businesses, and non-state actors, can influence outcomes. (Ansell & Gash, 2008; Arnstein, 1969; Bell & Carrick, 2017; Ikeme, 2003; Richardson & Razaque, 2006)

Our review identified a broad range of stakeholders, with 19 stakeholder types mentioned multiple times. This breadth provides a basis for developing more inclusive procedures. Many of the reviewed records also emphasise collaboration as important to the development of successful UF policies and measures (Bjørgen & Ryghaug, 2022; Browne & Goodchild, 2023; Castillo et al., 2024; Holguín-Veras et al., 2018; NASEM, 2015; Paddeu et al., 2024; Plazier et al., 2024). However, the reviewed literature gives most attention to private-sector operators, such as couriers and shippers, and regulators, such as government agencies and policymakers. This emphasis partly reflects the operational focus of many records (Alves et al., 2022; Brettmo & Sanchez-Díaz, 2022; González-Romero et al., 2025; Holguín-Veras et al., 2018; Matusiewicz et al., 2019; Nordtømme et al., 2015; Paddeu et al., 2024; Park et al., 2024) and leaves scope for broader recognition of affected stakeholder groups.

Vulnerable populations, for instance, were identified in only 9 of the 54 records. This should not, by itself, be read as evidence that the literature lacks an equity concern. The equity implications of such a focus depend partly on the orientation of regulation being discussed. Some policies target companies because they seek to reduce or redirect freight-related externalities, such as emissions, congestion, noise, or pressure on public space (Amaya et al., 2020; Holguín-Veras et al., 2018; Knoppen et al., 2021). In such cases, company-focused regulation may still have distributive equity benefits, even when affected populations are not explicitly foregrounded. Other records focus on private-sector actors because policy is primarily oriented toward efficiency, optimisation, or operational adaptation. This distinction matters for interpreting the limited attention given to vulnerable populations. Their low visibility in the literature does not mean that company-focused regulation lacks equity value. It does signal a recognitional gap in the literature. If affected populations remain implicit, the policy process may reduce some externalities while still leaving unclear whose burdens, capacities, and forms of participation are being recognised. When vulnerable populations are overlooked, processes risk reproducing or augmenting inequities.

Integrating technical optimisation with equity-oriented frameworks would strengthen the legitimacy and inclusivity of policymaking, and answer the call of researchers (Bjørgen et al., 2021; Browne & Goodchild, 2023; Castillo et al., 2024; França et al., 2025; Holguín-Veras et al., 2018; Lozzi et al., 2026; NASEM, 2015; Paddeu et al., 2024; Przybylska et al., 2023), as well as ensure that freight strategies do not exacerbate existing inequities without community input.

Elected officials were also among the least frequently mentioned stakeholders (8 in 54). This omission is notable given the importance of political anchoring identified by Bjørgen and Ryghaug (2022). Without such anchoring, policy efforts may lack legitimacy, and stakeholders may feel their contributions are undervalued.

Academia occupies a somewhat different position from residents, logistics workers, private-sector actors, or public authorities. Researchers are not typically affected stakeholders, decision-makers, or implementers in the same sense, but they can shape policy-oriented UF research through problem framing, data collection, modelling, pilot design, evaluation, and the translation of findings into policy guidance. However, these

roles are not always made explicit as part of the stakeholder configuration. When they remain implicit, policy recommendations may appear as purely technical outcomes, while they can also be shaped by particular collaborative and analytical arrangements. Making these roles explicit is particularly important because academia can support processes that broaden stakeholder recognition and inclusion.

The reviewed records describe adversarial dynamics between stakeholders when policies affecting UF operational conditions are developed (Knoppen et al., 2021; NASEM, 2015). In Section 3.4 we report a range of engagement and participation frameworks identified in the reviewed literature that seek to mitigate these tensions, from government-led consultation processes and freight partnerships to public-private partnerships, living labs, and citizen-led participatory analysis. However, these approaches vary considerably in the degree of decision-making authority they afford to participants, and none is without limitations. Public consultation and freight partnerships, while widely used, tend to remain consultative and lack binding decision-making power (Bjørgen et al., 2021; Paddeu et al., 2024). Public-private partnerships risk favouring large private-sector actors unless carefully regulated (Paddeu et al., 2024; Shrestha et al., 2024), and living labs, though co-creative in design, depend on sustained institutional support to move beyond pilot stages (Lozzi et al., 2026). Citizen-led analysis and community benefit agreements offer a more direct role for affected populations but face barriers related to cost, technical capacity, and data access, while communities most burdened by freight activity may lack the resources to engage in complex data work (Fried et al., 2025; Fried & García, 2024). If these frameworks are implemented without attention to power imbalances, institutional support, and political backing, they may reinforce the asymmetries they seek to address.

5. Conclusion

Drawing on Bell and Carrick (2017), Arnstein (1969), and related EJ scholarship (Bullard, 2005; Figueroa, 2022; Ikeme, 2003; Schlosberg, 2013), procedural equity is understood here not as equal power for all stakeholders, but as recognition, representation, and meaningful influence – a framing that directly informs this review’s focus on how UF research identifies stakeholders, describes their roles and interactions, and structures engagement.

Our findings address the three gaps identified in the introduction. First, regarding who is recognised as a stakeholder, we identified 19 distinct stakeholder types across 54 reviewed records and organised them into five categories: government, private sector, general public, labour and civil society, and academia. Policymakers and carriers and couriers were the most frequently mentioned, appearing in 50 and 39 of the 54 records respectively. Vulnerable populations, elected officials, and gig workers are among the least recognised, appearing in 9, 8, 6 records respectively. These patterns indicate uneven recognition within the reviewed literature.

Second, regarding stakeholder interactions, the reviewed literature portrays government actors as setting the regulatory environment within which private-sector actors operate. The general public and labour categories are more often represented as recipients of policy outcomes than as active participants in shaping them. Cross-category interactions are dominated by government–private-sector dynamics, with comparatively limited attention to how communities or logistics workers interact with either category.

Third, regarding engagement frameworks, we identified five distinct models reported in the literature: public consultation, freight partnerships, public-private partnerships, living labs, and citizen-led participatory analysis. These frameworks offer participants different degrees of decision-making authority. Each also has limitations, and the reviewed records suggest that, without attention to power imbalances and sustained institutional support, these frameworks risk reinforcing existing asymmetries.

These findings support three contributions. First, our review provides a consolidated taxonomy of 19 UF stakeholder types, organised into five categories, that future studies can adopt or adapt to make their stakeholder identification more transparent and comparable across contexts. Second, it documents the interactions and dynamics represented across the reviewed corpus, providing a baseline for assessing changes in the breadth of stakeholder recognition and engagement. Third, by compiling and comparing engagement frameworks, our review provides researchers and practitioners with a reference for evaluating participation structures and identifying where existing approaches fall short of procedural equity.

The findings are necessarily shaped by the reviewed academic literature, which introduces important limitations. By examining what is documented in research, our review captures how scholars conceptualise stakeholder roles and interactions and the discursive emphasis that the field as a whole prioritises, not the full range of informal negotiations, political pressures, or community-driven processes that influence UF governance in practice. The identified patterns should therefore be interpreted as reflections of procedural equity as it is framed within academic discourse, not as a comprehensive account of stakeholder dynamics in practice. A related limitation is that our review treats stakeholder categories as internally homogeneous, which may obscure differences within categories and overlapping stakeholder identities.

Ultimately, the patterns of uneven recognition documented in this review indicate where further research is needed. UF scholarship has made significant progress in identifying relevant stakeholders. The next step is to design, test, and evaluate processes that support meaningful participation by these actors in shaping UF policies.

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References

- Alves, R., Lima, R. d. S., De Oliveira, L. K., & de Pinho, A. F. (2022). Conceptual framework for evaluating E-Commerce deliveries using agent-based modelling and sensitivity analysis. *Sustainability*, 14(23), 15505. <https://doi.org/10.3390/su142315505>

- Amaya, J., Arellana, J., & Delgado-Lindeman, M. (2020). Stakeholders perceptions to sustainable urban freight policies in emerging markets. *Transportation Research Part A: Policy and Practice*, 132, 329–348. <https://doi.org/10.1016/j.tra.2019.11.017>
- Andreoli, D., Goodchild, A., & Vitasek, K. (2010). The rise of mega distribution centers and the impact on logistical uncertainty. *Transportation Letters*, 2(2), 75–88. <https://doi.org/10.3328/TL.2010.02.02.75-88>
- Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4), 543–571. <https://doi.org/10.1093/jopart/mum032>
- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), 216–224. <https://doi.org/10.1080/01944366908977225>
- Beckers, J., Cardenas, I., & Sanchez-Diaz, I. (2022). Managing household freight: The impact of online shopping on residential freight trips. *Transport Policy*, 125, 299–311. <https://doi.org/10.1016/j.tranpol.2022.06.009>
- Behrendts, S. (2016). Recent developments in urban logistics research – a review of the proceedings of the International Conference on City Logistics 2009–2013. *Transportation Research Procedia*, 12, 278–287. <https://doi.org/10.1016/j.trpro.2016.02.065>
- Bell, D., & Carrick, J. (2017). Procedural environmental justice. In R. Holifield, J. Chakraborty, & G. Walker (Eds.), *The Routledge handbook of environmental justice* (pp. 101–112). Routledge. <https://doi.org/10.4324/9781315678986-9>
- Björger, A., Fosshiem, K., & Macharis, C. (2021). How to build stakeholder participation in collaborative urban freight planning. *Cities*, 112, 103149. <https://doi.org/10.1016/j.cities.2021.103149>
- Björger, A., & Ryghaug, M. (2022). Integration of urban freight transport in city planning: Lesson learned. *Transportation Research Part D: Transport and Environment*, 107, 103310. <https://doi.org/10.1016/j.trd.2022.103310>
- Brettmo, A., & Browne, M. (2024). Comparative study on urban freight transport sustainability initiatives: Two cases from Sweden. *Research in Transportation Business & Management*, 57, 101238. <https://doi.org/10.1016/j.rtbm.2024.101238>
- Brettmo, A., & Sanchez-Diaz, I. (2022). Property owners as possible game changers for sustainable urban freight. *Research in Transportation Business & Management*, 45, 100745. <https://doi.org/10.1016/j.rtbm.2021.100745>
- Browne, M., & Goodchild, A. (2023). Chapter 15: Overview on stakeholder engagement. In E. Marcucci, V. Gatta, & M. Le Pira (Eds.), *Handbook on city logistics and urban freight* (pp. 311–326). Edward Elgar Publishing. <https://doi.org/10.4337/9781800370173.00026>
- Buldeo Rai, H. (2023). Urban warehouses as good neighbors: Findings from a New York City case study. *Transportation Research Interdisciplinary Perspectives*, 19, 100823. <https://doi.org/10.1016/j.trip.2023.100823>
- Buldeo Rai, H., & Dablanc, L. (2023). Hunting for treasure: A systematic literature review on urban logistics and e-commerce data. *Transport Reviews*, 43(2), 204–233. <https://doi.org/10.1080/01441647.2022.2082580>
- Buldeo Rai, H., Kang, S., Sakai, T., Tejada, C., Yuan, Q., Conway, A., & Dablanc, L. (2022). ‘Proximity logistics’: Characterizing the development of logistics facilities in dense, mixed-use urban areas around the world. *Transportation Research Part A: Policy and Practice*, 166, 41–61. <https://doi.org/10.1016/j.tra.2022.10.007>
- Bullard, R. D., Ed. (2005). *The quest for environmental justice: Human rights and the politics of pollution*. Sierra Club Books.
- Castillo, C., Viu-Roig, M., & Alvarez-Palau, E. J. (2022). COVID-19 lockdown as an opportunity to rethink urban freight distribution: Lessons from the Barcelona metropolitan area. *Transportation Research Interdisciplinary Perspectives*, 14, 100605. <https://doi.org/10.1016/j.trip.2022.100605>
- Castillo, C., Viu-Roig, M., Nicolàs, M., & Alvarez-Palau, E. J. (2024). Tackling urban freight distribution: A public-private perspective. *Research in Transportation Business & Management*, 53, 101105. <https://doi.org/10.1016/j.rtbm.2024.101105>
- Center for Neighborhood Technology. (2024, April 3). Chicago truck data portal. Retrieved December 15, 2025, from <https://cnt.org/tools/chicago-truck-data-portal>.

- Chen, J., Lee, J., & Lee, H. (2025). A study on the site selection of urban logistics centers utilizing public infrastructure. *Sustainability*, 17(15), 6846. <https://doi.org/10.3390/su17156846>
- Ciardiello, F., Genovese, A., Luo, S., Sgalambro, A. (2023). A game-theoretic multi-stakeholder model for cost allocation in urban consolidation centres. *Annals of Operations Research*, 324(1-2), 663–686. <https://doi.org/10.1007/s10479-021-04013-3>
- Cidell, J. (2024). *A research agenda for transport equity and mobility justice*. Edward Elgar Publishing. <https://doi.org/10.4337/9781802201888>
- Comi, A., & Russo, F. (2022). Emerging information and communication technologies: The challenges for the dynamic freight management in city logistics. *Frontiers in Future Transportation*, 3, 887307. <https://doi.org/10.3389/ffutr.2022.887307>
- Dablanc, L. (2023). Land-use planning for a more sustainable urban freight. In E. Marcucci, V. Gatta, & M. Le Pira (Eds.), *Handbook on city logistics and urban freight* (pp. 246–266). Edward Elgar Publishing. <https://doi.org/10.4337/9781800370173.00022>
- Dablanc, L., & Adoue, F. (2025). New ways of collecting urban freight traffic data and applications for urban freight policies and research. *Case Studies on Transport Policy*, 19, 101315. <https://doi.org/10.1016/j.cstp.2024.101315>
- Dablanc, L., Heitz, A., Buldeo Rai, H., & Diziain, D. (2022). Response to COVID-19 lockdowns from urban freight stakeholders: An analysis from three surveys in 2020 in France, and policy implications. *Transport Policy*, 122, 85–94. <https://doi.org/10.1016/j.tranpol.2022.04.020>
- Dablanc, L. (2011). City distribution, a key element of the urban economy: Guidelines for practitioners. In C. Macharis & S. Melo (Eds.), *City distribution and urban freight transport* (pp. 13–36). Edward Elgar Publishing. <https://doi.org/10.4337/9780857932754.00007>
- Figueroa, R. M. (2022). Environmental justice. In B. Hale, A. Light, & L. Lawhon (Eds.), *The Routledge companion to environmental ethics* (pp. 767–782). Routledge. <https://doi.org/10.4324/9781315768090-75>
- França, J. G. d. C. B., Kijewska, K., Iwan, S., Isler, C. A., & Oliveira, L. K. d. (2025). Citizens perceptions of urban freight transport: An international comparison. *Transportation Research Interdisciplinary Perspectives*, 29, 101342. <https://doi.org/10.1016/j.trip.2025.101342>
- Fried, T., & García, L. (2024). Planning for equity and justice in freight. In L. Tavasszy, M. Browne, & M. Piecyk (Eds.), *Advances in transport policy and planning* (Vol. 14, pp. 173–204). Academic Press. <https://doi.org/10.1016/bs.atpp.2024.09.001>
- Fried, T., Goodchild, A., Browne, M., & Sanchez-Diaz, I. (2024). Seeking equity and justice in urban freight: Where to look? *Transport Reviews*, 44(1), 191–212. <https://doi.org/10.1080/01441647.2023.2247165>
- Fried, T., Goodchild, A. V., Sanchez-Diaz, I., & Browne, M. (2024). Evaluating spatial inequity in last-mile delivery: A national analysis. *International Journal of Physical Distribution & Logistics Management*, 54(5), 501–522. <https://doi.org/10.1108/IJPDLM-08-2023-0301>
- Fried, T., Tejada, C., Dennis-Bauer, S., Bolbaatar, O., Goodchild, A., Marshall, J. D., Olmedo, O., & García, L. (2025). Logistics of zoning, zoning for logistics: Toward healthy and equitable development for urban freight. *Journal of the American Planning Association*, 92(1), 15–32. <https://doi.org/10.1080/01944363.2025.2515134>
- Galkin, A., Švadlenka, L., Vrba, R., & Kijewska, K. (2025). Navigating the future of urban logistics: Conceptual framework for dynamic freight management. *Transportation Research Part D: Transport and Environment*, 147, 104956. <https://doi.org/10.1016/j.trd.2025.104956>
- Garus, A., Alonso, B., Raposo, M. A., Grosso, M., Krause, J., Mourtzouchou, A., & Ciuffo, B. (2022). Last-mile delivery by automated droids: Sustainability assessment on a real-world case study. *Sustainable Cities and Society*, 79, 103728. <https://doi.org/10.1016/j.scs.2022.103728>
- González-Feliu, J., Palacios-Argüello, L., & Suarez-Núñez, C. (2020). Links between freight trip generation rates, accessibility and socio-demographic variables in urban zones. *Archives of Transport*, 53(1), 7–20. <https://doi.org/10.5604/01.3001.0014.1738>
- González-Romero, I., Ortiz-Bas, Á., & Prado-Prado, J. C. (2025). Last-mile strategies in e-commerce: Identifying barriers to sustainability from online retailers' perspectives. *Research in Transportation Business & Management*, 60, 101367. <https://doi.org/10.1016/j.rtbm.2025.101367>

- Gunes, S., Fried, T., & Goodchild, A. (2024). Seattle microhub delivery pilot: Evaluating emission impacts and stakeholder engagement. *Case Studies on Transport Policy*, 15, 101119. <https://doi.org/10.1016/j.cstp.2023.101119>
- Haarstad, H., Rosales, R., & Shrestha, S. (2024). Freight logistics and the city. *Urban Studies*, 61(1), 3–19. <https://doi.org/10.1177/00420980231177265>
- Holguín-Veras, J., Encarnación, T., González-Calderón, C. A., Winebrake, J., Wang, C., Kyle, S., Herazo-Padilla, N., Kalahasthi, L., Adarme, W., Cantillo, V., Yoshizaki, H., & Garrido, R. (2018). Direct impacts of off-hour deliveries on urban freight emissions. *Transportation Research Part D: Transport and Environment*, 61, 84–103. <https://doi.org/10.1016/j.trd.2016.10.013>
- Ikeme, J. (2003). Equity, environmental justice and sustainability: Incomplete approaches in climate change politics. *Global Environmental Change*, 13(3), 195–206. [https://doi.org/10.1016/S0959-3780\(03\)00047-5](https://doi.org/10.1016/S0959-3780(03)00047-5)
- Jaller, M., Zhang, X., & Qian, X. (2022). Distribution facilities in California: A dynamic landscape and equity considerations. *Journal of Transport and Land Use*, 15(1), 755–778. <https://doi.org/10.5198/jtlu.2022.2130>
- Karner, A., London, J., Rowangould, D., & Manaugh, K. (2020). From transportation equity to transportation justice: Within, through, and beyond the state. *Journal of Planning Literature*, 35(4), 440–459. <https://doi.org/10.1177/0885412220927691>
- Keeling, K. L., Schaefer, J. S., & Figliozzi, M. A. (2021). Accessibility and equity analysis of transit facility sites for common carrier parcel lockers. *Transportation Research Record: Journal of the Transportation Research Board*, 2675(12), 1075–1087. <https://doi.org/10.1177/03611981211032214>
- Knoppen, D., Janjevic, M., & Winkenbach, M. (2021). Prioritizing urban freight logistics policies: Pursuing cognitive consensus across multiple stakeholders. *Environmental Science & Policy*, 125, 231–240. <https://doi.org/10.1016/j.envsci.2021.09.002>
- Lagorio, A., Pinto, R., & Golini, R. (2017). Urban logistics ecosystem: A system of system framework for stakeholders in urban freight transport projects. *IFAC-PapersOnLine*, 50(1), 7284–7289. <https://doi.org/10.1016/j.ifacol.2017.08.1402>
- Le Pira, M., Marcucci, E., Gatta, V., Ignaccolo, M., & Inturri, G. (2023). Participatory decision-support tools for stakeholder engagement in urban freight transport policy making. In E. Marcucci, V. Gatta, & M. Le Pira (Eds.), *Handbook on city logistics and urban freight* (pp. 327–345). Edward Elgar Publishing. <https://doi.org/10.4337/9781800370173.00027>
- Lozzi, R., Marcucci, E., & Gatta, V. (2026). Urban logistics facilities and storytelling. Stakeholder engagement, participatory policy-planning and co-creation. *Transportation Planning and Technology*, 49(1), 121–143. <https://doi.org/10.1080/03081060.2025.2537084>
- Masorgo, N., Dobrzykowski, D. D., & Fugate, B. S. (2024). Last-mile delivery: A process view, framework, and research agenda. *Journal of Business Logistics*, 45(4), e12397. <https://doi.org/10.1111/jbl.12397>
- Matusiewicz, M., Rolbiecki, R., & Foltyński, M. (2019). The tendency of urban stakeholders to adopt sustainable logistics measures on the example of a polish metropolis. *Sustainability*, 11(21), 5909. <https://doi.org/10.3390/su11215909>
- McNair, A. W., & Kwon, K. (2024). Cargo airport planning: Discerning spatial distributions of freight development in airport-adjacent communities. *Transportation Research Record: Journal of the Transportation Research Board*, 2678(3), 66–81. <https://doi.org/10.1177/03611981231178808>
- Mizutani, J. (2019). In the backyard of segregated neighborhoods: An environmental justice case study of Louisiana. *Georgetown International Environmental Law Review*, 31(2), 363.
- National Academies of Sciences, Engineering, and Medicine. (2015). *Improving freight system performance in metropolitan areas: A planning guide (NCFRP Report 33)*. The National Academies Press. <https://doi.org/10.17226/22159>
- Nordtømme, M. E., Bjerkan, K. Y., & Sund, A. B. (2015). Barriers to urban freight policy implementation: The case of urban consolidation center in Oslo. *Transport Policy*, 44, 179–186. <https://doi.org/10.1016/j.tranpol.2015.08.005>
- Paddeu, D., Parkhurst, G., Rosenberg, G., Carhart, N., & Taylor, C. (2024). Promoting sustainable urban freight through stakeholder engagement to co-create decarbonisation pathways in the UK. *Research in Transportation Economics*, 104, 101424. <https://doi.org/10.1016/j.retrec.2024.101424>

- Park, A., Rodgers, M., & Cho, S. (2024). Designing efficient and equitable freight services markets for sustainable economic performance. *American Business Review*, 27(1), 167–181. <https://doi.org/10.37625/abr.27.1.167-181>
- Peng, Z. (Xander), & Joubert, J. W. (2025). Beyond downtown: How restricted access policies shift pollution rather than eliminate it. *Transportation Research Part D: Transport and Environment*, 148, 104980. <https://doi.org/10.1016/j.trd.2025.104980>
- Plazier, P., Rauws, W., Neef, R., & Buijs, P. (2024). Towards sustainable last-mile logistics? Investigating the role of cooperation, regulation, and innovation in scenarios for 2035. *Research in Transportation Business & Management*, 56, 101198. <https://doi.org/10.1016/j.rtbm.2024.101198>
- Przybylska, E., Kramarz, M., & Dohn, K. (2023). Analysis of stakeholder roles in balancing freight transport in the city logistics ecosystem. *Research in Transportation Business & Management*, 49, 101009. <https://doi.org/10.1016/j.rtbm.2023.101009>
- Quiter, D., Engelhardt, M., Malzahn, B., & Seeck, S. (2025). Best practices for implementing sustainable urban logistics – the case of freight consolidation for a Berlin industrial area. *Transportation Research Procedia (Online)*, 90, 854–862. <https://doi.org/10.1016/j.trpro.2025.06.051>
- Richardson, B. J., & Razaque, J. (2006). Public participation in environmental decision making. In B. J. Richardson & S. Wood (Eds.), *Environmental law for sustainability: A reader* (pp. 165–194). Hart Publishing.
- Rosales, R. (2024). Is it enough to enable freight? Modes of governance for urban logistics in Norway. *European Planning Studies*, 32(12), 2473–2492. <https://doi.org/10.1080/09654313.2024.2372409>
- Rosales, R., & Haarstad, H. (2023). Governance challenges for urban logistics: Lessons from three Norwegian cities. *Environmental Policy and Governance*, 33(3), 221–231. <https://doi.org/10.1002/eet.2015>
- Rzeźny-Cieplińska, J., Szmelter-Jarosz, A., & Moslem, S. (2021). Priority-based stakeholders analysis in the view of sustainable city logistics: Evidence for Tricity, Poland. *Sustainable Cities and Society*, 67, 102751. <https://doi.org/10.1016/j.scs.2021.102751>
- Schlosberg, D. (2013). Theorising environmental justice: The expanding sphere of a discourse. *Environmental Politics*, 22(1), 37–55. <https://doi.org/10.1080/09644016.2013.755387>
- Schneller, A., Hannan, S., Bah, H. I., Livecchi, S., & Pettigrew, S. (2022). Environmental justice is exhausting: Five decades of air pollution and community advocacy at Ezra Prentice Homes in Albany, New York. *Local Environment*, 27(12), 1514–1535. <https://doi.org/10.1080/13549839.2022.2113869>
- Schweitzer, L., & Valenzuela, A. (2004). Environmental injustice and transportation: The claims and the evidence. *Journal of Planning Literature*, 18(4), 383–398. <https://doi.org/10.1177/0885412204262958>
- Shrestha, S., Haarstad, H., & Rosales, R. (2024). Power in urban logistics: A comparative analysis of networks and policymaking in logistics sustainability governance. *Environmental Innovation and Societal Transitions*, 51, 100845. <https://doi.org/10.1016/j.eist.2024.100845>
- Tanco, M., & Escuder, M. (2021). A multi-perspective analysis for the better understanding of urban freight transport challenges and opportunities in Montevideo. *Case Studies on Transport Policy*, 9(2), 405–417. <https://doi.org/10.1016/j.cstp.2020.11.005>
- Tejada, C., & Conway, A. (2024). Measuring the social effects of urban logistics facilities development, the case of New York city. *Transportation Planning and Technology*, 49(1), 7–34. <https://doi.org/10.1080/03081060.2024.2397386>
- Tejada, C., & Conway, A. (2025). An empirical approach to modeling online shopping and its effects on urban freight planning: The case of New York City. *Case Studies on Transport Policy*, 21, 101473. <https://doi.org/10.1016/j.cstp.2025.101473>
- Trounstein, J. (2018). *Segregation by design: Local politics and inequality in American cities*. Cambridge University Press.
- U.S. Department of Commerce. (2025). Quarterly retail e-commerce sales, 2nd quarter of 2025.
- Xiao, Z., Yuan, Q., Sun, Y., & Sun, X. (2021). New paradigm of logistics space reorganization: E-commerce, land use, and supply chain management. *Transportation Research Interdisciplinary Perspectives*, 9, 100300. <https://doi.org/10.1016/j.trip.2021.100300>
- Yuan, Q. (2021). Location of warehouses and environmental justice. *Journal of Planning Education and Research*, 41(3), 282–293. <https://doi.org/10.1177/0739456X18786392>