MAKING CITY LOGISTICS WORK:
A CLASSIFICATION OF DIRECT AND INDIRECT POLICIES IMPACTING LAST-MILE DELIVERIES

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OVERVIEW OF RESEARCH OBJECTIVES AND METHODS

Collect and classify policies

This work aims to collect and classify policies that directly and indirectly influence urban logistics in order to highlight and measure also the often overlooked contribution that indirect policies can have in improving urban logistics. This collection and classification is carried out through an academic and grey literature review, including the analysis of case studies of European cities and consultations with policy makers.

Indirect policies overlooked contribution

Academic and grey literature exploration

WHAT IS CONSIDERED AS A DIRECT OR INDIRECT POLICY?

DIRECT

A policy, public or private, that directly addresses some aspects of the delivery in its different phases: initial departure (i.e. warehouse), trasportation, final arrival (i.e. client delivery).

e.g.: Change of vehicles to electric alternatives, Cargo bike use, Blind spot sensors requirement on trucks, Off-peak deliveries hours

INDIRECT

A broad public policy that pursues wide-ranging objectives across multiple sectors, with last-mile deliveries being only one of its areas of impact.

e.g.: Low Emission Zones (LEZ), Mixed land zoning, Parking law enforcement, Green vehicle subsidies

STEP-BY-STEP DEVELOPMENT

ACADEMIC LITERATURE REVIEW

- Collection and classification of identified direct and indirect policies
- Evaluation of literature attention differential about direct and indirect policies
- Extraction of policy classification sets from the literature

GREY LITERATURE AND CASE STUDIES REVIEW

- Collection and classification of identified direct and indirect policies
- Policy makers consultations

Classification of policies using information and indicators to highlight their characteristics, objectives, and impact on urban logistics.

ACADEMIC LITERATURE REVIEW METHOD

4 main steps were followed for perform the systematic literature review following “Preferred Reporting Items for Systematic reviews and Meta-Analyses” (PRISMA) guidelines

1 **IDENTIFICATION**	Search strategy, databases selection, search terms and keywords used, and other criteria
2 **SCREENING**	Screening of identified articles through timeframe, language, publication criteria, geographic limitation
3 **ELIGIBILITY**	Titles and abstracts screened to eliminate irrelevant studies according to the inclusion and exclusion criteria
4 **INCLUSION**	Full-text articles assessed for eligibility to ensure compliance with the inclusion criteria and relevance for the research.

1 - IDENTIFICATION

SEARCH STRING

Policy or Policies
AND
Urban Logistic* OR City logistic* OR Regional Logistic*
AND
Last-mile OR Last mile

DATABASES

- Web Of Science (WOS)
- Scopus

RESULTS

- Scopus: 106
- WOS: 196

Total: 302

2 - SCREENING

PUBLICATION CRITERIA

- Journal articles
- Literature review articles

LANGUAGE

- English

TIMEFRAME

From 2008 to June 2025

GEOGRAPHIC LIMITATIONS

- No geographic limitations

RESULTS

- Scopus: 71
- WOS: 153

Total: 220

3 – ELIGIBILITY

INCLUSION CRITERIA

- Reference to at least 1 direct or indirect urban logistics policy

EXCLUSION CRITERIA

- Duplication
- Unaivailability of full text

RESULTS

- Scopus: 58
- WOS: -

Total: -

4 - INCLUSION

FULL TEXT EVALUATION

RESULTS

- Scopus: 54
- WOS: -

Total: -

GREY LITERATURE AND CASE STUDY REVIEW METHOD

Identification of 15 different size european case study cities for policy screening and classification

- **METROPOLITAN LEVEL CITIES** (> 2 milions of inhabitants)
e.g.: Paris, Berlin, London, Madrid, Rome

- **MAJOR SIZED CITIES** (between 500.000 and 2 milions of inhabitants)
e.g.: Milan, Munich, Barcelona, Lion, Bruxelles

- **MEDIUM SIZED CITIES** (< 500.000 of inhabitants)
e.g.: Brescia, Lille, Antwerp

Evaluation of the maturity of urban freight policies in selected cities, complemented by interviews with two policymakers from cities at different maturity levels, aimed at gathering feedback on perceived challenges, policy objectives, and identification of best practices

CLASSIFICATION - FIRST RESULTS

Congestion pricing	4
Dedicated bus stops	1
Effects/Results monitoring	1
Emission pricing	1
Green vehicles subsides	3
Improved traffic management	1
Increase of cyclist safety (e.g., cycle lanes, improved street intersections)	2
Intelligent Transportations System (ITSs)	1
Low Emission Zones (LEZ)	5
Mixed land zoning	1
Mobility Infrastructure investments	1
Parking and traffic police enforcement	2
Parking pricing	2
Public electric charging cost reduction	1
Public electric charging infrastructure implementation	1
Road tolling	1
Speed limit reduction	1
Urban Agricolture	1

INDIRECT POLICIES

Indirect policies present in 13 paper out of 30

Total: 30

Paper analised so far: 30

DIRECT POLICIES

Total: 131

Advanced analytics integration	1
Autonomous vehicles implementation	5
Crowdshipping	6
Cultural campaigns for flexible delivery windows	1
Delivery van access to public transport lanes	1
Delivery vehicles bans (e.g., type, lenght and weight)	3
Delivery vehicles emissions limitations	1
Development of Sustainable Urban Logistics Plans (SULPs)	1
Drone implementation - Air drones	7
Drone implementation - Land drones	7
Fleet optimisation (e.g. mixed-fleet)	1
Freight dedicated loading and unloading zones	1
Freight underground tunnel	1
Green transportation requirement in public procurement	1
Green vehicle implementation - Cargo bikes	1
Green vehicle implementation - Electric vans	18
Green vehicle implementation - Light Electric Vehicles (LEV)	3
Green vehicle implementation - Low emission vans	6
Internet of Things devices integration	2
Inventory management	1
Loading areas increase	1
Loading bays parking enforcement	1
Loading zones booking	1
Loading zones space management (e.g., less parking, but bigger)	1
Load-pooling (i.e., vehicles deliver for multiple carriers simultaneously)	1
Logistics sub-contractor use	1
Mobile depots implementation	2
New Light Electric Vehicle (LEV) development	1
Off-peak hour deliveries	6
Packaging and vehicle loading optimisation	2
Pricing on express deliveries	1
PUDOs-Lockers	6
Repurposing of Passenger Rail for Freight in Times of Crisis	1
Retailer-consumer real time information share	1
Routing optimisation	14
Shipping consolidation	5
Taxation on on-demand deliveries	1
Taxis as freight	1
Technological Improvement - Wireless charging	1
Third delivery attempt exclusion	1
Truck Priority traffic signal control	2
Urban Consolidation Center (UCC) development	10
Urban Consolidation Center (UCC) share	1
Vans real-time tracking	1

CLASSIFICATION - FIRST RESULTS

Classification of the direct and indirect policies for their evaluation

- **POLICY NAME**
- **TYPE OF POLICY** (Public / Private)
- **POLICY IMPACT LEVEL** (Limited / Limited-Moderate / Moderate / Moderate-Extensive / Extensive)
- **TYPE OF IMPACT** (Economic / Social / Environmental / Technological / Territorial-Spatial)
- **LEVEL OF APPLICATION** (City or Metropolitan / Provincial or Regional / National or European)
- **POLICY CATEGORY** (Innovative Vehicle Last-Mile Freight Delivery Strategies / Urban Goods Consolidation Last-Mile Freight Delivery Strategies / Technological and Routing Improvements in City Logistics Strategies / Emerging Planning Tools and Policies for Last-Mile Delivery
- **SHORT DESCRIPTION OF THE POLICY**
- **CITIES APPLICATION: EXAMPLES**

CLASSIFICATION - FIRST RESULTS

DIRECT POLICIES	Public/Private	Policy impact level	Type of Impact					Level of application			Policy Category	Short description of the Policy	Cities application: examples
		(Limited, Limited-Moderate, Moderate, Moderate-Extensive, Extensive)	*Economic*	*Social*	*Environmental*	*Technological*	*Territorial / Spatial*	City/Metropolitan	*Provincial / Regional*	*National / European*			
Green vehicle implementation - Electric vans	Private	Moderate-Extensive	x	x	x	x		x			Innovative Vehicle Last-Mile Freight Delivery Strategies	Shift to electric vans for last-mile deliveries to reduce greenhouse gas emissions and air pollution in urban areas.	-
Routing optimisation	Private	Extensive	x		x			x	x		Technological and Routing Improvements in City Logistics Strategies	Use of digital tools and algorithms to improve delivery routes, minimizing travel distance, time, and environmental impact.	-
Urban Consolidation Center (UCC) development	Public/Private	Moderate-Extensive	x		x		x	x	x		Urban Goods Consolidation Last-Mile Freight Delivery Strategies	Establishment of logistics hubs on the outskirts of cities to consolidate goods from multiple suppliers before final delivery into the urban core, improving efficiency and reducing traffic.	-
Drone implementation - Air drones	Private	Limited				x		x	x		Innovative Vehicle Last-Mile Freight Delivery Strategies	Introduction of unmanned aerial vehicles (UAVs) for lightweight, rapid deliveries, especially in areas with traffic congestion or limited access.	-
Drone implementation - Land drones	Private	Limited				x		x			Innovative Vehicle Last-Mile Freight Delivery Strategies	Use of autonomous ground-based delivery robots for short-distance, last-mile parcel deliveries in urban environments.	-
Green vehicle implementation - Low emission vans	Private	Extensive	x	x	x			x	x	x	Innovative Vehicle Last-Mile Freight Delivery Strategies	Shift to low-emission vehicles (e.g., hybrid, Euro 6 diesel) use as a transitional step toward zero-emission logistics.	-
Crowdshipping	Private	Limited	x					x			Technological and Routing Improvements in City Logistics Strategies	Leveraging non-professional individuals (citizens or commuters) to deliver packages, often coordinated via digital platforms, to increase delivery flexibility and reduce costs.	-
Off-peak hour deliveries	Public/Private	Limited-Moderate	x		x		x	x			Technological and Routing Improvements in City Logistics Strategies	Shifting deliveries to nighttime or off-peak periods to reduce congestion, improve delivery speed, and optimize the use of road infrastructure.	-
PUDOs-Lockers	Private	Limited-Moderate	x	x		x	x	x			Urban Goods Consolidation Last-Mile Freight Delivery Strategies	Deployment of Pick-Up and Drop-Off points or automated lockers to consolidate deliveries and reduce the number of individual delivery stops.	-
Autonomous vehicles implementation	Private	Limited				x		x	x		Innovative Vehicle Last-Mile Freight Delivery Strategies	Integration of self-driving delivery vehicles into urban logistics systems to enhance efficiency and reduce labor costs and human-related delivery delays.	-

Sources:

- Lyons, T., & McDonald, N. C. (2022). Last-Mile Strategies for Urban Freight Delivery: A Systematic Review. Transportation Research Record, 2677(1), 1141-1156. https://doi.org/10.1177/03611981221103596
- Viu-Roig, M., & Alvarez-Palau, E. J. (2020). The Impact of E-Commerce-Related Last-Mile Logistics on Cities: A Systematic Literature Review. Sustainability, 12(16), 6492. https://doi.org/10.3390/su12166492

CLASSIFICATION - FIRST RESULTS

INDIRECT POLICIES	Public/Private	Policy impact level	Type of Impact					Level of application			Policy Category	Short description of the Policy	Cities application: examples
		(Limited, Limited-Moderate, Moderate, Moderate-Extensive, Extensive)	*Economic*	*Social*	*Environmental*	*Technological*	*Territorial / Spatial*	City/Metropolitan	*Provincial / Regional*	*National / European*			
Low Emission Zones (LEZ)	Public	Moderate-Extensive		x	x		x	x	x		Emerging Planning Tools and Policies for Last-Mile Delivery	Designated urban areas where access is restricted or regulated for high-emission vehicles to reduce air pollution and encourage cleaner transport modes.	-
Congestion pricing	Public	Limited-Moderate	x	x	x			x			Emerging Planning Tools and Policies for Last-Mile Delivery	A policy that charges vehicles for entering high-traffic areas during peak times to reduce congestion, improve air quality, and promote more efficient transport.	-
Green vehicles subsides	Public	Extensive			x	x			x	x	Innovative Vehicle Last-Mile Freight Delivery Strategies	Financial incentives provided to individuals or companies to encourage the adoption of low-emission or electric vehicles, supporting the transition to sustainable urban transport.	-
Increase of cyclist safety (e.g., cycle lanes, improved street intersections)	Public	Limited		x			x	x	x		Emerging Planning Tools and Policies for Last-Mile Delivery	Implementation of infrastructure and regulatory measures (e.g., cycle lanes, safer intersections) to protect cyclists and promote cycling as a safe and viable urban transport mode.	-
Parking and traffic police enforcement	Public	Limited-Moderate	x				x	x			Emerging Planning Tools and Policies for Last-Mile Delivery	Active monitoring and enforcement of parking and traffic regulations to ensure compliance, reduce illegal parking, and maintain urban mobility flow.	-
Parking pricing	Public	Limited-Moderate	x				x	x			Emerging Planning Tools and Policies for Last-Mile Delivery	Use of pricing for on-street and off-street parking to manage demand, discourage car use in congested areas, and promote alternative transport modes.	-

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- Lyons, T., & McDonald, N. C. (2022). Last-Mile Strategies for Urban Freight Delivery: A Systematic Review. Transportation Research Record, 2677(1), 1141-1156. https://doi.org/10.1177/03611981221103596
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CLASSIFICATION - FIRST RESULTS

POLICY CATEGORIES:

- **Innovative Vehicle Last-Mile Freight Delivery Strategies**
  e.g.: Delivery drones, Cargo bikes
- **Urban Goods Consolidation Last-Mile Freight Delivery Strategies**
  e.g.: Urban Consolidation Centers (UCC), Lockers
- **Technological and Routing Improvements in City Logistics Strategies**
  e.g.: Off-hour deliveries, Routing optimisation
- **Emerging Planning Tools and Policies for Last-Mile Delivery**
  e.g.: Limited traffic zones, Delivery van management

TYPE OF IMPACT

Economic
Defined as the contribution to the sale price of products, a firm's costs and revenues (micro level), and economic returns either through economic growth or productivity growth (macro level).

Environmental
Defined ad the contribution to the management of the environment, for example, natural resources, environmental pollution, climate and meteorology

Social
Defined as the contribution to community welfare, quality of life, behavior, practices and activities of people and groups

Technological
Defined as the contribution to the creation of product, process and service innovations

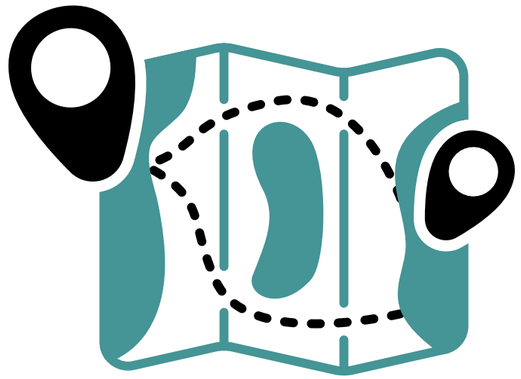
Territorial/Spatial
Defined as the contribution to the organisation and modification of territories and spatialities and their use

PARKING ENFORCEMENT POLICY - EXAMPLES

Castillo, J.C., Goicochea, E., Chong, M. and Rodriguez, M. (2019), "Inmegacity characterization: trends and realities", Management Research, Vol. 17 No. 2, pp. 187-204. https://doi.org/10.1108/MRJIAM-05-2018-0835

PRELIMINARY FINDINGS

- The **contribution of indirect policies to urban logistics is often overlooked** in the scientific literature. References to direct policies outnumber indirect ones by more than a factor of four (131 compared to 30).
- Interest in the topic has grown significantly since the Covid-19 pandemic, with the number of **contributions per year doubling in the post-pandemic period**.
- **Direct policies** typically follow a **business-as-usual logic**, focusing on the optimisation of existing delivery systems through improved vehicle technologies or organisational tools. They also tend to emphasise **economic, environmental, and technological impacts**, often giving **disproportionate attention to niche or limited-impact innovations**—such as drones—over policies with potentially greater transformative capacity, like congestion pricing.
- **Indirect policies** are more often associated with **broader environmental and social objectives** and tend to involve higher-impact interventions that **challenge the current urban logistics paradigm**. These policies may not target freight explicitly but have significant consequences for the configuration and functioning of urban logistics systems.



THANKS FOR THE ATTENTION!

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