future transportation

Systematic Review

Planning of Urban Freight Innovation Ecosystems: A Systematic Literature Review from a Public Authority Perspective

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Abstract: This study explores the role of local authorities in achieving net zero emissions in the context of the climate crisis, with a particular focus on the freight transport sector. The study identifies the challenges of decarbonising urban freight transport and highlights the need for planning frameworks to facilitate this transition. The authors examine freight innovation ecosystems and the various actors involved in designing public policies that incentivise the creation or enhancement of these ecosystems. Through a systematic literature review, bibliometric analysis, and content analysis, this study identifies a lack of connection between the literature on these topics. However, it also highlights the potential for lessons to be learned from successful incentive frameworks in the four clusters identified. The authors propose a comprehensive incentives framework that includes both direct and indirect incentives aimed at the ecosystem and the public sector, respectively, as well as city conditions that can facilitate systemic change. Overall, this study provides valuable insights for policymakers and stakeholders seeking to promote sustainable transport and achieve net zero emissions.

Keywords: urban freight; innovation ecosystem; planning; incentives framework

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1. Introduction

With a global transport sector responsible for over 24% of global CO_2 emissions, over 14% of annual greenhouse gas emissions, and European targets becoming more strict, urgent climate action from the sector is needed. Around 77% of total transport CO_2 emissions come from road transport—the use of cars and trucks to move people and goods around and between cities and towns. This adds to the cost of congestion, estimated at around 1% of Europe's GDP [1,2].

The freight sector is considered a major player in city planning and operations, the lights goods vehicle fleet grows at a 1.7% rate annually [3] and e-commerce increases at a 10% annual rate [4]. However, from a strategic planning point of view, freight is less considered than passenger transport planning in general [5–7] (local transport plans or sustainable urban mobility plans) with EU guidance released just in 2019 [8]. Still, it has also found a place in land use planning literature [9–11] and public freight management [12].

The ecosystem in which freight activities are developed is complex [5,13]. Freight stakeholder goals are more diverse than public transport [7,14]. While public transport is often considered a public good and may be subsidised, freight is more influenced by economic demand and supply and efficiency [5,7].

Several systematic literature reviews have been produced in the last years about green and sustainable logistics [15], sustainable e-commerce [16], collaboration for sustainable logistics [17], e-commerce, and data [18]. Challenges and impacts of urban freight have also been studied in the areas of last mile logistics [13], city logistics [19] and urban freight management [12,20].

Urban logistic innovations and solutions have also been researched. Some of the most mentioned options found in the literature are crowd shipping, customer behaviour, ICT, green vehicles [21], low emission zones and road pricing, freight quality partnerships [6], speed management [22], among many others [20].

Urban freight mobility systems must be redesigned to align with climate goals [23]. A systematic approach to influence current mobility regimes, including "user preferences, policies, technologies, market rules, culture, and regulatory mechanisms" [24], is needed as technology innovation cannot solve the issue on its own.

Innovation in a broader sense responds to a co-evolutionary development between niche radical innovation (referring to the development technology that allows for a different trajectory), regimes (sets of rules, regulations, and user preferences that support any system that allows for incremental innovation), and landscapes (macro economy, ideology, and social values) [25]. Thus, organising innovation ecosystems can aid the transition to a more sustainable system, including the triple bottom line and beyond [26].

While innovation and change have been studied at the national level, city-level socio-technical systems have received less attention [27]. In this context, cities represent an ideal arena to experiment. They are the closest administrative level in which key stakeholders for transitions meet along with technology providers, research institutions, and the local government [28,29]. The local context makes it easier for actors to set goals, negotiate, solve problems, and provide feedback [27]. Still, the "legitimacy" of experimentation as a sociotechnical intervention raises significant issues at the intersection of science, policy, and practice to address societal challenges [30]. Urban experimentation has been used to overcome governance issues, stakeholder misalignment, strict regulation, and citizen disengagement.

Local governments can plan and manage innovation ecosystems that lead to a more sustainable system. Reviews of innovation ecosystems [31] and sustainable urban freight [32] provide business research agendas. In particular, identified gaps in the literature relate to research focused on cooperation between governments, the private sector, academia, and citizens [5,17,20], the view of freight as multidimensional and inserted within the economy of the city and its regulatory landscape [7], the gap in managing the transition of freight innovation [15], the lack of an institutional perspective [7,21] and the need to improve the institutional capabilities [33], better communication, and decision making for the implementation of city freight improvements between the public and private sector [34]. Furthermore, a geographical gap is identified, as more research in Asia, Africa, and Latin America is required to understand the specificities of different urban freight contexts [15] and innovation management [30]. Finally, the link between key components of urban logistics ecosystems should be researched holistically, focusing on the interaction of actors and not only on the characteristics of the elements of a system [35].

This literature review looks into the intersection of a multidisciplinary and complex issue: urban freight innovation ecosystems planning with a focus on the local public sector. The first two research questions were designed to describe the research environment of such a novel topic.

The questions that will guide the systematic literature review are as follows:

RQ1: What are the main authors, currents of thought, and sources that deal with the intersection of innovation, urban freight, and public policy?

RQ2: In which locations worldwide is knowledge about this topic generated?

Furthermore, reviews on the topic until now have focused on urban freight externalities, impacts, technology, and regulatory solutions [5–7,13,15–18,21,36]. The main gaps identified are about the lack of institutional perspective and management of the urban freight ecosystem. Therefore our third research question is as follows:

RQ3: Which are the main actors, incentives, and planning approaches when discussing urban freight transport innovation planning?

By answering these questions, we will help develop a framework of analysis that can clarify local planning approaches to develop urban freight innovation ecosystems and understand stakeholders' incentives to collaborate, which are key considerations of transitions as we see it. It can also help other disciplines beyond urban freight to understand how to include innovation as a key consideration in their decarbonisation pathways.

In Section 2, we describe the methods used for the systematic literature review, based on the PRISMA approach. We use bibliometric and content analysis to examine academic workstreams that intersect urban freight, innovation, and planning frameworks to better understand how the public sector can act in Section 3. In Section 4, we discuss the main actors, incentives, and planning approaches found in the literature and in Section 5, we conclude with gaps in the literature and a positive critique of the multidisciplinarity that urban freight innovation ecosystems require.

2. Materials and Methods

Bibliometric analysis is used in this review as it can analyse large amounts of data quantitatively [37]. This analysis can help assess academic knowledge, identify gaps, and place new research questions in the knowledge structure.

Bibliometric analysis is not new in the academic circles of logistics, innovation and transport. It has been used to analyse decades of urban studies papers [38], climate change, and organisational literature [39], and innovation ecosystems using the Web of Science database [40]. Instead, Sulistyaningsih et al. examined smart urban governance by year, author, subject, and citations based on the Scopus database [41]. Others have curated their own databases, such as one on last mile deliveries and triple bottom line dimensions [42].

2.1. Bibliometric Review Approach and First Phase of the Bibliometric Analysis

The bibliometric review methodology includes several steps (see Figure 1) based on the PRISMA flow [43]. The first step includes defining the string search in two large databases, Scopus and Web of Science. Results from the search were downloaded and merged using R Studio. Dataset A, "General", included 2098 papers after duplicates were removed. We performed a title and abstract selection and excluded 597 papers unrelated to our research topic.

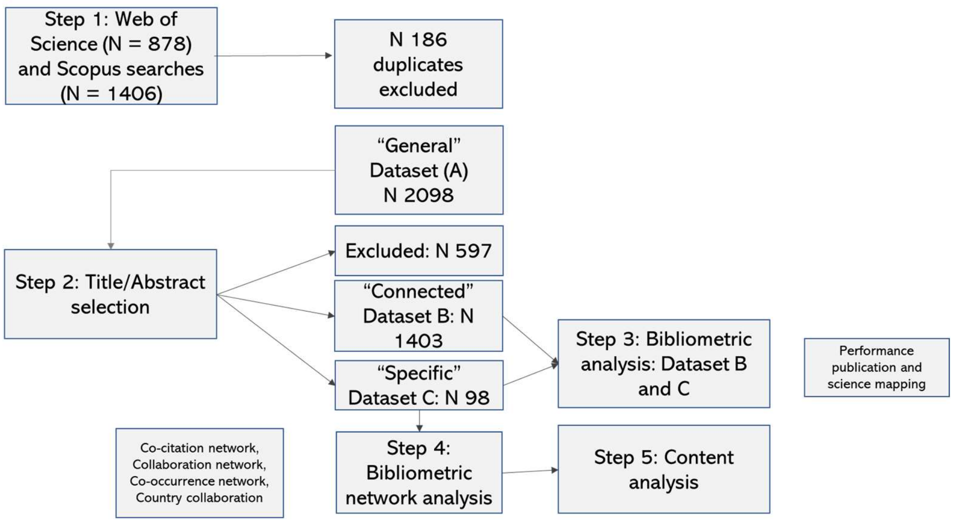

Figure 1. Bibliometric review methodology based on PRISMA [43].

Several exclusions were applied to exclude mainly natural sciences. Bibliometric analysis was chosen as the technique due to the nature of the research, which includes different groups or knowledge silos: transport planning, urban planning, economics, business, climate change, innovation, and management.

The bibliometric search was conducted between February and April 2023. Multiple combinations of words were used iteratively until the final combination was adopted: innovation AND (transport OR freight OR city AND logistics) AND public AND policy

OR policymaking AND ecosystem OR city AND management for the years 2010–2023. The selection of the time span for the SRL responds to the year of the publication of the European Union Action Plan on Urban Mobility [44] which is considered as the policy basis for the sustainable urban mobility plans established as a planning tool in 2013. The selection of the timespan of the review was ex post contrasted with the annual scientific production for both databases.

2.2. Steps 2, 3, and 4 of the Bibliometric Analysis: Title and Abstract Selection Leading to "Connected" Dataset B and "Specific" Dataset C

After performing a scan on Dataset A "General", natural sciences and transport and management documents unrelated to the research question were found. We decided to conduct a title and abstract selection and categorise them into three groups: excluded documents (597 documents), documents related to "transport or innovation" or "public policy" ("Connected" Dataset B = N.1403 documents), and documents related to "innovation and logistics and ecosystems" ("Specific" Dataset C = N. 98 documents). In this last dataset we excluded topics like "international supply chain", "humanitarian logistics" and "public transport", but kept those documents related to planning methodologies and stakeholder engagement.

Sequentially, a bibliographic analysis was made for "Connected" Dataset B and for the "Specific" dataset (Dataset C). This was intended to contrast and compare the performance and science mapping techniques and to understand whether a title and abstract overview would improve the analysis. In this review we provide a succinct comparison between Dataset B "Connected" and C "Specific". This step will provide the answer for RQ1 and RQ2.

A series of network analysis were performed on "Specific" Dataset C. These include collaboration and cross-national collaboration networks, and co-occurrence and co-citation network analysis. The analysis of collaborative networks is based on co-authorship, one of the "most thoroughly documented forms of scientific collaboration" [45].

Co-citation analysis and co-occurrence network analysis were performed in Dataset C "Specific". Co-citation happens when two documents are both cited in a third one [46]. This analysis is useful to identify key papers that influence the main clusters found. We leave the content analysis for those papers in the Dataset rather than performing a more in-depth analysis of the co-citation network.

Also, a co-occurrence network analysis is performed on "Specific" Dataset C using the author's keywords. The size of the node represents the frequency (number of occurrences), whereas the edge represents the co-occurrence of keywords, and its width represents greater or lesser frequency.

2.3. Step 5: Bibliographic Clustering and Content Analysis

Bibliographic clustering was used to create groupings that would allow for a better interpretation of the "Specific" Dataset C. If at least one cited source appears in both articles' reference lists, two articles are said to be bibliographically clustered [46,47]. The analysis was conducted using the global citation score as an impact measure and the walkstrap clustering algorithm was employed. We set the units of analysis on 50 documents to allow for a stronger clustering effect and to avoid clusters with less than 10% of total documents.

3. Results

3.1. Performance Publication and Science Mapping Analysis for "Connected" Dataset B and "Specific" Dataset C

The overall results from the literature review show the creation of three datasets, of which two go through a bibliometric analysis (see Figure 2). Annual growth rates are similar for the two datasets (see Table 1) and we see a steep increase in documents published in the period considered. This analysis seems to be aligned with previous reviews [15–17]. International authorship is slightly higher on the "Specific" Dataset C, and co-authorship rate is higher in the "Connected" Dataset B. The co-authors per paper index for all datasets are lower than in the average knowledge fields combined [45]. This means research output on these topics is collaboratively less than average. The "Specific" Dataset C also has 8% more average citations per document compared to the "Connected" Dataset B.

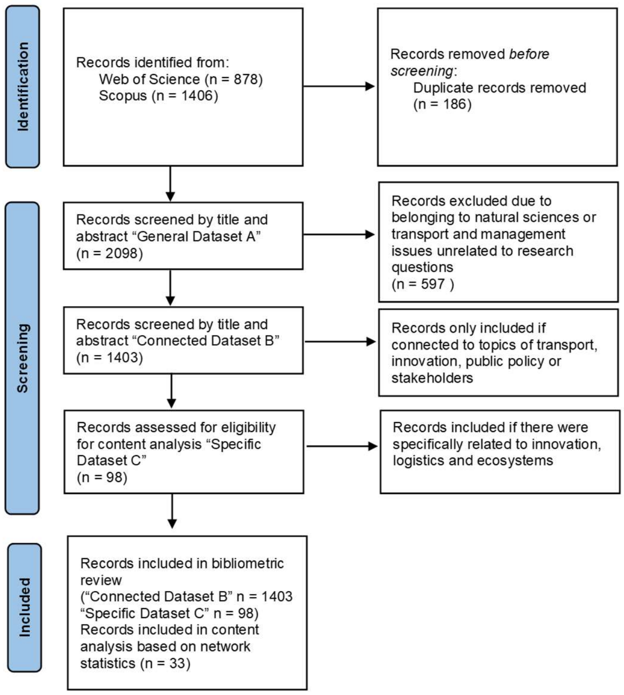

Figure 2. PRISMA methodology results.

Table 1. Summary statistics "Connected" Dataset B and "Specific" Dataset C, including annual scientific production (Source: own).

Description	**Results**	
Timespan: 2010–2023	**Dataset B**	**Dataset C**
Sources	473	63
Documents	1501	98
Annual growth rate	17.93%	18.41
Average citations per doc	26.39	33.49
Authors	3912	278
Single authors	144	6
Single authored docs	150	6
Co-authors per doc	3.29	3.12
International co-authorship %	15.26	19.39
Article	1284	88
Book chapter	17	1
Early access article	33	2
Early access book chapter	46	3
Conference paper	48	1
Review	66	3

3.2. Sources

"Specific" Dataset C shows a concentrated output with CITIES publishing 10.2% of papers and European Planning Studies 9.2% (see Table 2). It can also be appreciated that in

Dataset C we see non-transport-related sources such as *Economic Development Quarterly*, *Industry and Innovation*, *Journal on Urban Technology*, and *Environment and Planning Part A*. This shows a departure from the "Connected" Dataset B and adds the literature related to innovation, technology, and planning, which is precisely what this research intends to find, the convergence point between disciplines.

Table 2. Main sources.

Journal/Sources "Connected" Dataset B	N%		Journal/Sources "Specific" Dataset C	N%	
Transport Policy	69	4.60	Cities	10	10.2
European Planning Studies	67	4.46	European Planning Studies	9	9.2
Cities	58	3.86	Research In Transportation Business And Management	5	5.1
Transportation Research Record	53	3.53	Research In Transportation Economics	4	4.1
Transportation Research Part A: Policy And Practice	53	3.53	European Transport Research Review	3	3.1
Transportation Research Part E: Logistics And Transportation Review	46	3.06	Case Studies On Transport Policy	2	2.0
Research In Transportation Economics	27	1.80	Economic Development Quarterly	2	2.0
Journal Of Transport Geography	26	1.73	Environment And Planning A-Economy And Space	2	2.0
Case Studies On Transport Policy	24	1.60	Industry And Innovation	2	2.0
Research In Transportation Business And Management	22	1.47	International Journal Of Logistics Management	2	2.0
Transportation Research Part D-Transport And Environment	22	1.47	Journal Of Urban Technology	2	2.0

3.3. Science Mapping

Science mapping is an extensively used output for standard bibliometric analysis. It refers to a descriptive analysis of where knowledge is generated. We first look into the universities and research centres where authors are affiliated. In the most relevant affiliation areas for the "Specific" Dataset C, the University of North Carolina, Molde University in Norway, and Techion in Israel top the ranking. Delft University appears in the fifth place (while it was first in the "Connected" Dataset B). What is interesting is the appearance of several business schools like Copenhagen Business School and NECE, a Research Unit in Business Science in Portugal.

The total citations per country gives us an idea of the relative importance of the papers authored by authors affiliated to institutions in a single country. Datasets differ in total country citations. The Netherlands leads, Spain is third in "Specific" Dataset C, and China is second in both datasets. Norway, Korea, and Belgium join the ranking, and the UK falls to ninth from first in the "Connected" Dataset B (See Figures 3 and 4).

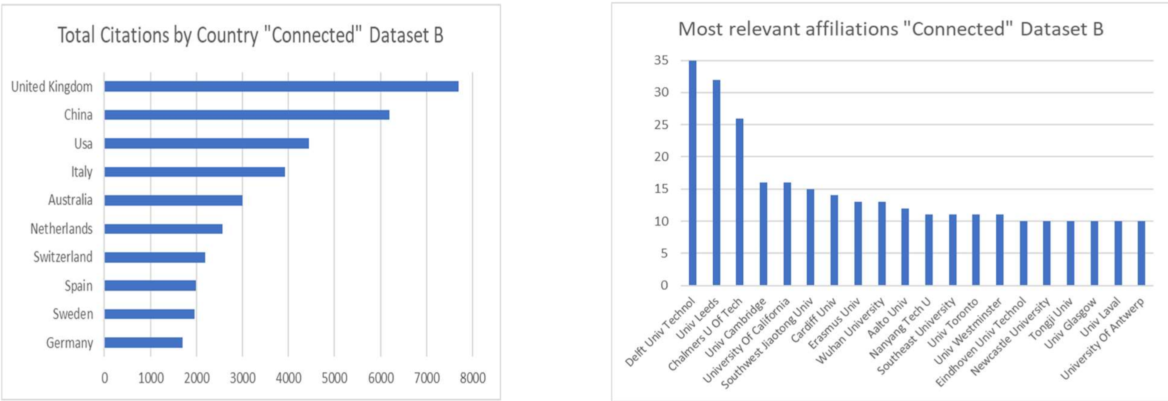

Figure 3. Most relevant affiliations and total citations per country for "Connected" Dataset B.

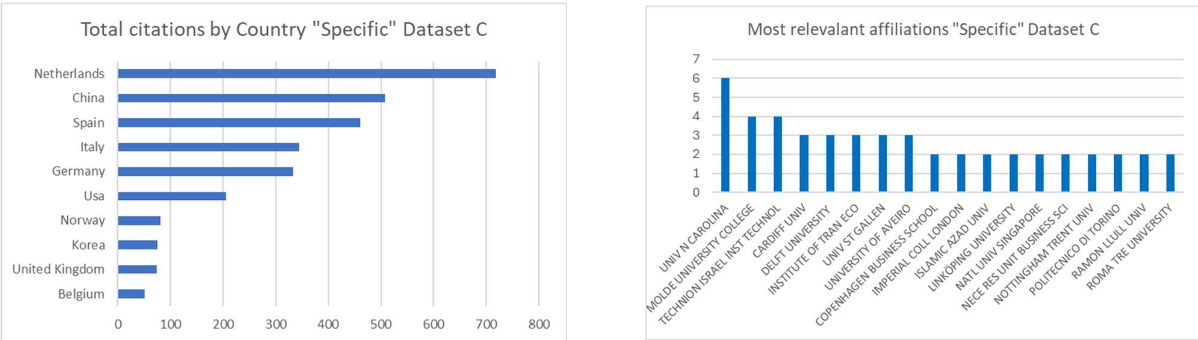

Figure 4. Most relevant affiliations and total citations per country for "Specific" Dataset C.

As regards the most important authors, we consider the local citation in both datasets. Stam tops the list on both datasets, with some authors appearing in both lists, like Feldman and Fox. Moreover, Stam's paper in European Planning Studies, Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique, is the most local and global cited document for both datasets. The first three positions on the most local cited documents (Table 3) are also part of the content analysis section. There are some differences as regards the most cited documents between the "Connected" Dataset B and "Specific" Dataset C, with four of them being in both datasets, usually on innovation. Those that appear in the "Connected" Dataset C refer to public transport [48], cities [49,50], digital [51,52], and regional innovation [53].

Table 3. Most cited documents for datasets B and C.

Dataset B	Dataset C	Short Reference	Local Citations	Global Citations
1	1	Stam, 2015 [54]	(24) 9	718
3	2	Oh et al., 2016 [55]	(6) 3	313
7	3	Alexy et al., 2013 [56]	(3) 1	238
2	4	Wareham et al., 2014 [57]	(10) 1	360
	5	Jung et al., 2017 [58]	1	15
	6	Lowe and Feldman, 2017 [59]	1	24
	7	Nepelski et al., 2018 [60]	1	14
	8	Pechlaner and Bachinger, 2010 [61]	0	42

Table 3. *Cont.*

Dataset B	Dataset C	Short Reference	Local Citations	Global Citations
	9	Montoro Sanchez et al., 2011 [62]	0	79
	10	Lindawati et al., 2014 [63]	0	40
4		Teece, 2018 [52]	(5)	418
5		Echenique et al., 2012 [50]	(4)	198
6		Banister, 2011 [49]	(3)	245
8		Kaddoura et al., 2015 [48]	(3)	15
9		Teece, 2017 [51]	(3)	70
10		Todtling and Trippl, 2018 [53]	(3)	62

3.4. Network Analysis on "Specific" Dataset C

A series of network analysis were performed on the Specific Dataset C. These include collaboration networks, cross-national networks, co-citation networks and co-occurrence networks. The first three can be found in the Appendix A and Supplementary Materials as we focus on co-occurrence network analysis.

Co-Occurrence Network Analysis

Co-occurrence analysis is useful as it is based on what authors consider the most appropriate keywords of their research. In this case the analysis shows the multidisciplinary nature of this review as well as the somewhat unconnected outliers of the literature that deal with the issue of planning for urban freight innovation ecosystems.

We can see five clusters, three of which are connected (Figure 5). Unsurprisingly, among the unconnected clusters, city logistics and smart city have the closest proximity. As it becomes closer to the other nodes (urban freight transport, agent-based models, urban governance, and urban development), the node can carry more information. Innovation has the highest betweenness score (see Appendix A). This shows if the node can move information between groups that are not connected. This is because it links what we could call the "methodological cluster", which includes co-occurrence analysis, network analysis, systematic literature review, COVID-19, crisis and freight transport, and entrepreneurship, which has the second highest betweenness score as it connects the innovation node with entrepreneurial ecosystems.

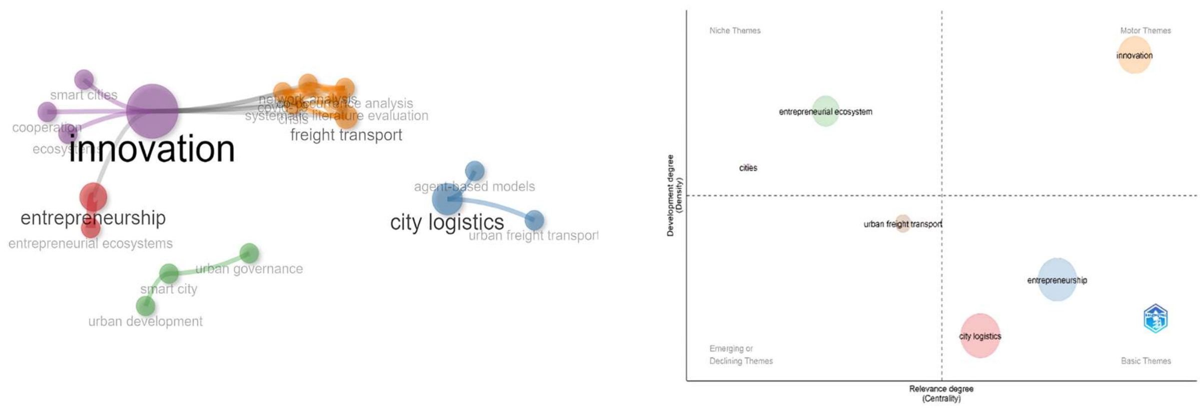

Figure 5. Co-occurrence network (**left**) and thematic chart (**right**).

We can also create a thematic map using the author's keywords to see where the focus is and where it may go. Density and centrality influence theme maps. Density is a cluster's node cohesion, and centrality is its network position [64].

Innovation is a motor theme with high relevance and density. Entrepreneurship, city logistics, and these streams are sustained and can grow.

Urban freight transport trends include electrification and digitalization. While there is a push to investigate this, they will need to engage with governance, economic geography, or innovation ecosystems to increase their network centrality.

Entrepreneurial ecosystems are niche topics that include social innovation, path development, innovation systems, and economic geography. They are the most promising research avenues for this literature review's knowledge area, along with the cities theme, on governance.

3.5. Content Analysis on "Specific" Dataset C

Four distinctive clusters appeared after conducting a bibliographic coupling in step 4 of the analysis: entrepreneurial ecosystems (EE), smart city (SC), urban freight (UF) and innovation ecosystems (IE). The *"Specific"* Dataset C included 98 documents, we limited the clustering to the 50 most important articles and selected those with a higher centrality and impact within the network (see Figure 6). This meant we furthered reduced the number of articles to be considered for content analysis to 33 articles.

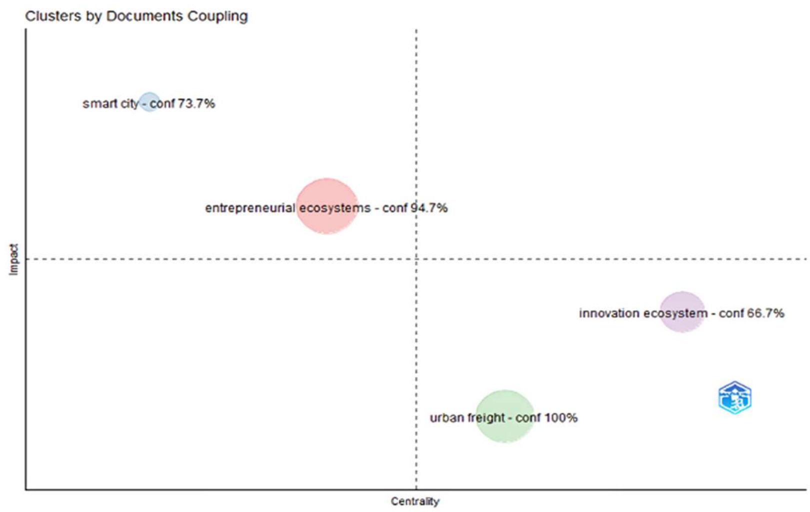

Figure 6. Document coupling clusters.

3.5.1. Cluster 1: Entrepreneurial Ecosystems EE (10 Documents)

In business literature, "ecosystem" was first used as "business ecosystems," but as it evolved to focus on innovation, it became "innovation ecosystems," "knowledge ecosystems," and "entrepreneurial ecosystems" in start-ups [65]. Stam's entrepreneurial ecosystems [54] is perhaps this group's best-known source. Similar to clusters, industrial districts, and innovation systems, the entrepreneurial ecosystem approach focuses on the external business environment, but the entrepreneur, not the enterprise, is the focus. Individuals and their environments form the ecosystem. A summary of the main methodologies, research goals, and findings from all clusters can be found in Appendix B.

The entrepreneurial ecosystem environment is thought of as something more than just "brains and money" as the only inputs [55]. This relates to the geographies of the innovation workstream and the influence of knowledge networks and its management (for instance, the designing of public policy and incentives to promote innovation) [66]. A clear case is the work of Hemmert et al. [65] in Asia.

Ecosystem Actors

A variety of actors are mentioned; however, the focus remains on the entrepreneur and start-ups [54]. Additionally, we can mention incubators, accelerators and professional service providers [67], smart city managers, SMEs and universities [68], support or entrepreneurial organisations [69,70], and venture capitals [71].

Role of Public Sector

The public sector is seen as a "feeder" which focuses on adjusting laws and regulations [54]. Contrary to the public goods theory, market failures are not specifically cited as justifications for government intervention. What is perhaps more startling is that some authors do not view regulations as part of the public sector's response to market failure, which seems contradictory.

In the entrepreneurial ecosystem approach, the role of the public sector is secondary [68]. However, innovation is viewed as an important activity for local government as it seeks to satisfy stakeholder demand (citizens) and boost entrepreneurship. Moreover, some national policies can promote innovation ecosystems in Tokyo, Seoul, Beijing, Suzhou, and Chongqing more than local policies [65].

3.5.2. Cluster 2: Smart City SC (Five Documents)

Smart city research is ambiguous [72] and a general theory is elusive [73], indicating the emergence of a new stream in the literature that needs theoretical knowledge to improve smart city strategy design and implementation.

While there is no consensus definition, the most widely accepted paradigm is the use of information and communication technologies to achieve city objectives based on institutional and cultural contexts [74]. To that end, a smart city has in its power four main activities: community building; strategic framework; services and applications; and digital infrastructure [72].

Smart City Actors

The smart city cluster prioritises the public sector. As a result, local authority departments like smart city agencies, planning, communications, and procurement become actors too [72,74]. Tech companies and the private sector are crucial. Costales advocates for local communities and social entrepreneurs to be included; however, their inclusion is sometimes forgotten by other authors [73].

Role of Public Sector

This cluster mostly references the quadruple helix strategy's public, private, research, and citizen actors. Local government is the enabling actor for smart cities as it investigates tools and strategies to improve government performance and economic growth to meet citizens' service tax expectations [74].

The goal of government is to improve quality of life and economic prosperity through economic development. Environmental sustainability is increasingly used as an indicator for economic development, but when using the smart city concept as described by Costales, other social-related measures are less considered [73] (for instance, social development).

Local government delivers new planning and operational tools, recommendations, guidelines, standards, technical requirements, and evaluation methods [72]. As an example, the Smart City Wien Agency is mentioned. It was intended to serve as the central coordination point for all internal and external stakeholders. The agency handles coordination, stakeholder management, inquiries and communications, and can document, evaluate, and carry out projects in Vienna and beyond. As the smart city strategy relies on ICT as its primary tool, it is essential that public data be made readily available.

3.5.3. Cluster 3: Urban Freight UF (10 Documents)

Nine documents were chosen for content analysis, including the top eight in addition to the systematic literature review conducted by Kervall and Palsson in 2022 [75]. In general, the literature from this cluster focuses on two primary topics: planning frameworks and stakeholder engagement.

In relation to planning for urban freight, sustainable urban logistic plans have replaced more traditional transport frameworks such as local transport plans and sustainable urban mobility plans in Europe. Fossheim and Andersson contrast Nordic and British practices [76]. Freight is typically an appendix or chapter of the local transport plan (which is a legal planning document that transport authorities are required to produce), but the freight component is not a required section of the plan. Marcucci et al. demonstrate in a case study of Turin how the city aligned the selection of freight-specific policy packages with the SUMP [77].

Urban Freight Actors

Stakeholder diversity in the logistics environment is mentioned. Private sector actors prioritised the removal of constraints for deliveries, such as congestion and access restrictions, while the citizenship and the public sector would be more concerned with pollution and congestion. The major actors consulted in relation to logistics plans are the following: logistic services providers, suppliers, receivers, parish councils, road haulage operators, delivery companies, and heavy cargo vehicles companies [76,78].

A simpler categorisation of urban freight actors is presented by Ringsberg et al., where they analyse local authorities, supply chain actors, goods receivers, and property owners as the main stakeholders to exemplify the diverse interests of freight actors in the public space [79]. Their interests vary in respect to the services freight offers, accessibility, economic interests (for example, a restaurant would use public space for increased service attention, while supply chain actors would use it for loading and unloading).

The cluster often highlights how to promote participation between the actors. Gatta, Marcucci, and Le Pira propose an innovative three-step strategy for urban freight planning decision-making processes including the desk approach to analyse the baseline and public policy options, the living lab approach for discussion and selection of policy options, and modelling [80]. Discrete choice models and agent-based models are sought as promising tools as well [77,78], as accounting for interaction effects in a complex system like urban logistics is preferable to straightforward linear input–output interactions [81].

Implementation and Innovation

The cluster mentions the challenge of implementing projects after the initial planning as stakeholders become unwilling to adapt [82] and previous research has found that fewer than half of these initiatives survive beyond their initial years and that, in many instances, they require significant public sector support in terms of funding and organisational support [81]. Examining the case of Copenhagen and Citylogistik-kbh, (an urban depot trial), it was discovered that the agency in charge of the experiment was not effectively communicating with project stakeholders, which rendered the project implementation unfeasible. The authors conclude that it is crucial to identify the solution's added value for various actors (first order observation) and the rationale at stake (money, time, space, service, and employee well-being). In this context, they introduce the concept of relational platform [83], which is used to identify areas where collaborators can create added value through co-creation and develop sustainable business models [81].

Verlinde and Macharis describe the triple helix approach in the case of Brussels [84]. The authors examine how the private sector, universities, and local government (along with a Horizon 2020 consortium) collaborated to develop a model for a mobile depot, designed an evaluation framework, and tested it in the city. They conclude that the triple helix strategy was crucial to the successful implementation of this innovative concept. Despite the fact that the pilot project was terminated due to increased funding needs, the lessons learned were documented, and all stakeholders viewed the experience as positive. Among the incentives that made this feasible, the authors note that the freight plan permitted the allocation of funds to projects that supported the plan's objectives. This was supported by fostering a sense of community and a legal and political framework that allowed for flexibility while retaining a firm's forward momentum.

The inclusion of additional stakeholders as key players is evaluated. For instance, citizens are mentioned in the quadruple helix approach, while the environment is considered as the fifth actor in the quintuple helix approach [85]. The case for incorporating the financial sector and various departments into the administration is strong. Research into what motivates stakeholders to participate is present in this cluster [63]. The perceived benefits of collaboration and the risk of losing competitive intelligence are found to be significant. Benefits anticipated included increased dependability, visibility, business analysis, benchmarking, and reputation, as well as decreased congestion, traffic delays, and pollution. Within the dangers of losing competitive intelligence, we find reasons such as information leaks, customer poaching, and exposure to best practices, among other factors.

Barriers to Change Urban Freight Systems

From a comprehension of the barriers to change to sustainable urban freight, one could consider the underlying needs and potential mitigation strategies that could work as incentives. In this regard, we incorporated into the content analysis the literature review by Kervall and Palsson, which concentrates on change barriers [75]. They divide the obstacles into eleven categories. The majority of sub-categories reflect in some manner the previously discussed incentives within the innovation, smart city, and freight clusters. Particularly those associated with the economy (short-term focus, low profitability, small actors, costs, low market value), goals (misaligned or unclear), knowledge (lack of dissemination, dispersed), and cooperation (complex alignment of interests, ambiguous gains, inadequate management support).

3.5.4. Cluster 4: Innovation Ecosystems IE (8 Documents)

Authors in this cluster highlight the lack of empirical research on innovation ecosystems [86] and the lack of research on what concrete steps firms can take to orchestrate an innovation ecosystem [87].

Innovation ecosystems are distinguished from other institutions by their four distinctive characteristics: participant heterogeneity, a coherent system-level output, the nature of interdependence between ecosystem participants, and the nature of ecosystem governance [87]. In a study on innovation research networks, Nepelski et al. discovered that the presence of a variety of stakeholders facilitates commercialization of knowledge-based research [60].

Innovation Ecosystems Actors

The orchestrator, who is responsible for designing the alignment structure and bringing in resources, infrastructure, and capabilities, plays a crucial position within the ecosystem. In this literature, large corporations typically play this role. Nevertheless, this function may be played by the public sector [88] or by another company with a key network location due to knowledge, status, or a key resource [86].

The joint value proposition is the foundation of an ecosystem. The uniqueness of an ecosystem is determined by the alignment structure of multiple actors; consequently, the design of an ecosystem is crucial as all stakeholders pursue their own agendas. This also necessitates a collaborative decision-making process. Noting that designs depend on environmental conditions is required [86]. This is already emphasised in the literature pertaining to entrepreneurial ecosystems [65].

4. Discussion

The analysis of the four clusters explained above sheds some light to answer the third research question about what the main actors, incentives, and planning approaches in the urban logistics innovation system are. In Table 4 we offer a summary for discussion including the areas which the public sector can focus incentives on.

Table 4. Content analysis clusters and incentives.

Cluster	Key Characteristics	Areas on Which the Public Sector can Focus for the Design of Incentives
EE	Contextual conditions affect the development of entrepreneurial ecosystems, where the entrepreneur is the main actor. The public sector can exercise certain degree of influence by adapting regulations and providing incentives. Knowledge sharing and funding availability are key success factors. Ecosystem support organisations can help drive the ecosystem by using partnership practices and leadership roles.	Systemic conditions: networks, leadership, finance, talent, knowledge, support services. Framework conditions: formal institutions, infrastructure, culture and demand [54] Service intermediaries: provide incentives for invention disclosure, engage research in development process, license technology, reduce transaction costs, facilitate networking and mentoring, agenda setting. Physical space intermediaries: offer affordable space, provide support services, offer intensive programming, invest in exchange for equity. Financial intermediaries: provide multistage finance, motivate to increase firm performance, innovative funding options (co-funding) [67] Market entry regulations, counter-cyclical finance mechanisms. [71] Regulation (work market flexibility, non-compete agreements), finance (venture capital, informal investors, seed capital), culture (raising awareness, giving role models), demography (attracting talent), and targeted policies like accelerators, programmes aimed at relevant parts of the population, sector, or region, government capital funding, including equity investments, match funding, grants (usually for proof of concept), loans, and guarantees. [89] Stakeholder management, action planning, communication strategies, management tools [68]. Leadership and partnership practises by utilising referrals and information sharing, direct advisor/mentoring, partner operations support, and establishing joint activities [69].
SC	Not yet an overarching theory means the concept is in development, but overall it relates with the use of information and communication tools for city wide goals. The economic goal is better considered that social and environmental goals when planning smart city initiatives. Dichotomies arise between top-down and bottom-up approaches to planning and techno-centric and human-centric.	Planning and operational tools, recommendations, guidelines, standards and technical requirements and evaluation methods [72]. City as a provider (public procurement), city as a catalyst (promotion of demand), city as learner (social–local innovations), city as experimenter (promotion of early technology development) [73] Five dimensions for contextual factors (examples: public sector information availability, transport connectivity, access to public funding, absence of negative perception of entrepreneurship) [90].
UF	Defined as a complex system with multiple stakeholders with varied goals. Existing gap between planning innovation and implementing projects. Increase in research on how to account for stakeholder preferences and participation. Increased role of local government to come up with frameworks to plan for sustainable urban freight, from defining a vision, selecting policy mixes, model implementation and develop monitoring and evaluation practices.	Based on the barriers identified: alignment of industry goals, promotion of knowledge, management support [75] Urban freight planning frameworks [76,78]. Benchmarking, visibility, reputation, exposure to best practice, information and data management [63]. Stakeholder preferences capture [77]. Triple helix approach [84].
IE	Stresses on one side the role of the main actor in the ecosystem and the strategies that firms can apply to create value (PMO, selective revealing, diversity of actors). Establishes the conditions for the design of innovation ecosystems and the role of the orchestrator throughout the innovation value creation cycle.	• Technology layer: architecture and connectivity definitions and value proposition. • Economic layer: strategic investment and support structures, along with economic incentives to promote ecosystem participation. • Institutional layer: include role definition, conflict resolution, institutional embedding, and lobbying for regulatory changes. • Behavioural strategies to influence other ecosystem components and societal stakeholders [87] Place leadership and development of platform policies [88] Strategic management, monitoring, learning communications, and project value sustainability (project management office) [91]

Entrepreneurs and businesses are the main focus of the entrepreneurial ecosystem and innovation ecosystem clusters, but the public sector is also a key player. Its geographic regulatory power helps entrepreneurs and firms in these two clusters. According to some authors [88], the public sector should lead or orchestrate green growth. The literature highlights ecosystem-supporting organisations, accelerators, and agencies. Service firms, finance and venture capital firms, and universities are also needed to develop an ecosystem [71,87]. The smart city and urban freight clusters include technology providers, smart city agencies, and urban logistics stakeholders like forwarders, delivery companies, drivers, etc. Both clusters require triple or quadruple engagement.

Only the urban freight cluster allows consolidated planning (sustainable urban freight plans and sustainable urban mobility plans). Most authors in this cluster focus on incorporating stakeholder perspectives into a structured process for vision formulation, policy selection, and evaluation. Current urban freight planning seems to ignore freight stakeholders' changing goals. Marcucci et al. and Le Pira use agent-based models to address this issue [77,78]. Theoretical planning methods for the other clusters, such as Mora et al.'s smart city approach, need more empirical research [72].

Autio compares top-down and bottom-up ecosystem design approaches in the innovation ecosystems cluster [87]. The first requires orchestrators to define value (which depends on the market) and actors to perform their roles. The public sector may overcome Autio's viability challenge (to persuade ecosystem actors that their individual value proposition will increase in line with the ecosystem value). Stakeholder management and research into what stakeholders perceive as benefits are needed to define value. Incentives can influence actors into performing their roles.

Internal or external incentives (see Figure 7) can be used to orchestrate or incentivise innovation ecosystems in the public sector. The first category consists of incentives that emphasise the internal role of the public sector and potential roles for organisations that support ecosystems. Good governance, project management, and policy design are the incentives for the public sector or semi-public organisations to benefit the ecosystem. In contrast, external incentives target the private sector, including research institutions, and consider the ecosystem as a whole. This category includes more general enabling policies like return-to-work incentives or demographic incentives like migration. Financial, infrastructure, and marketing incentives are available.

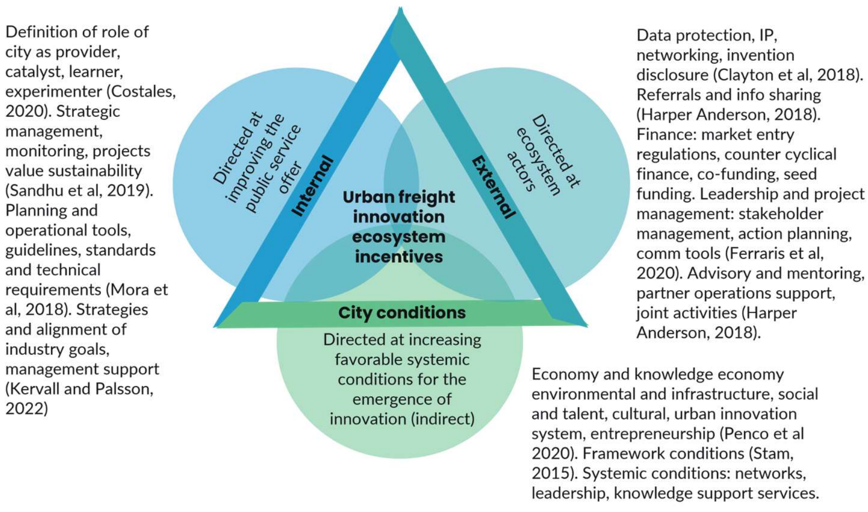

Figure 7. Incentives framework [54,67–69,72,73,75,90,91].

Entrepreneurial and innovation ecosystem literature provides most ecosystem incentives. Bosma and Stam classify enabling policies as growth-influencing instruments when contemplating high-growth businesses [89]. These are regulation (work market flexibility, non-compete agreements), finance (venture capital, informal investors, seed capital), culture (raising awareness, giving role models), and demography (attracting talent). They also include targeted policies like the following: accelerators; programmes aimed at relevant parts of the population, sector, or region; and government capital funding, including equity investments, match funding, grants (usually for proof of concept), loans, and guarantees. The authors argue that programme design affects funding efficacy using US and German examples. Clayton et al., found similar results regarding public sector venture capital managers and start-up success [67].

Ferraris et al., argue [68] that the public sector stimulates the ecosystem by (1) listening and managing stakeholders' needs, motivation, and synergies with other actors, (2) action planning, (3) communication strategies for long-term programming, and (4) management tools for measuring impact and reporting. Direct contracts to drive innovation and public procurement as a tool can also be incentives, as in Beijing (the government as a customer) and Seoul (free education for starting a business, legal administration, accounting support, and workspace support) [65]. Using referrals and information sharing, direct advisor/mentoring, partner operations support, and joint activities, entrepreneurial support organisations can also have an impact [69].

Sanshu et al. study business ecosystems in the UAE public organisation ecosystem and how project management offices link planning and implementation [91]. Strategic management, monitoring, learning communications, and project value sustainability have helped projects and the ecosystem. Internally, these offices function similarly to ecosystem support organisations and are related to the institutional aspect of Autio's research [87].

Contextual factors can also be used to incentivize an ecosystem because they affect its establishment and functioning. For instance, promoting the idea of a knowledge city rather than promoting ICTs [90]. Policies must create conditions for dissemination and support the development of an environment that can spur innovation, while built-in conditions can help entrepreneurs and new knowledge producers. Four dimensions for designing external ecosystems incentives were found in a study of sixty European cities: social and talent-cultural, economy and knowledge economy, urban environment and networking, and environmental and infrastructure.

5. Conclusions

Bibliometric analysis shows that freight innovation ecosystem research is growing. The literature review addressed three questions. The bibliometric analysis revealed the main authors, currents of thought, sources, and location.

The location of knowledge generation was identified as a major gap. Future research lines could concentrate on broadening the geographical focus of urban freight systems and planning approaches to innovation. Europe, the US, and China dominate academic knowledge, with case studies from the content analysis section mentioning South Korea and Japan. However, little is known about Latin America, Africa, the Middle East, and Oceania.

Urban freight innovation ecosystems literature lack integration as clusters identified suggests. This review can help local authorities plan by integrating workstreams and help to incorporate aspects of ecosystems that come from the geography, management and engineering silos. Future research could also measure how different planning tools and incentives mitigate for triple bottom line impacts, helping prioritise them.

The title and abstract assessment of differences between datasets show that this step is needed to ensure consistency in bibliometric methodology. Overall, the use of the bibliometric package is useful for reviewing sources and science mapping. We do need to highlight the descriptive nature of science mapping, which mostly shows where knowledge is generated but could be improved by generating some kind of impact measure considering also co-citation and collaboration networks (see Appendix A). Cross-country collaboration is scarce, and collaboration networks show the polarisation of nine small groups.

An interesting finding was with regard to the methodologies. Agent-based models are a promising tool for local governments to evaluate policy interventions due to urban freight systems' complexity, supply chain iteration, and policy impacts.

Content analysis of clusters yielded some controversial results. The triple bottom line of sustainability should be studied in relation to planning approaches and actors.

This appears to require practitioner application more than research. Additional analytical and empirical work is needed in the urban freight environment to determine if the entrepreneurial and innovation ecosystem incentives and smart city contextual factors could help them and increase urban freight collaboration.

Two things can be said about this literature review's gaps. First, based on our professional experience, planning approaches have received more attention in the grey literature than in academia. This review does not detail this because we focused on Scopus and the Web of Science. Academic case studies are occasionally published. In Europe, Horizon projects may use CIVITAS network journal outputs or topic guides. In addition, the search was limited to English and Spanish documents, which may have an impact on the scientific mapping and country collaboration exercises. Adding all documents instead of selecting them by local citation score could improve the content analysis section; however, it would also make it more burdensome.

The research aims to help practitioners understand urban freight systems, their actors, and their relationships beyond conventional planning methods. This review examines the public sector's role in urban freight innovation planning, taking into account urban freight characteristics, entrepreneurial and innovation ecosystems, and smart cities. It offers a unique perspective on the internal and external activities and incentives that the local public sector can seek to stimulate in order to establish and manage freight innovation ecosystems.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/futuretransp4030038/s1, Table S1: PRISMA 2020 Checklist. Reference [43] is cited in supplementary materials.

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Appendix A

Appendix A.1. Collaboration Network and Cross-National Collaboration

Collaboration clustering refers to nodes as authors and links are paper co-authorships. Eleven (11) clusters formed.

Six of them are associated with logistics. The red cluster includes Fossheim, Andersen, Bjorgen (Norway), and Macharis from the Vrije University of Brussels. The cluster containing Gatta and Marcucci, both professors at Roma Tre University, is the most significant one. Thirdly, the cluster from Delft University represented by Professor Tavasszy, Anand and Annema. Professor Olaru, the head of the Business School, Professor Chi, and Professor Bierman comprise the grey cluster from Australia's University of Western. Lastly, the Arviato and Asih cluster from the University of Diponegoro in Indonesia, as well as the Mangano and De Marco cluster from Politecnico di Torino.

On the innovation side, we find Feldman and Lowe from the University of North Carolina, Abutabenjeh and Azhar from Mississippi State University working on smart cities. Bengel and Bienzeisler work at the Fraunhofer Institute in Germany on the European side.

Lingens and Gassmann, from the University of St. Gallen in Switzerland, contain a cluster pertaining to ecosystems. From Techion, the Israel Institute of Technology we find Professor Frenkel and Professor Maital, co-authors of the book "Mapping national innovation ecosystems: foundations for policy consensus". When it comes to international collaboration we can see that it is not widespread, and it can also be seen in collaboration clusters. There is some engagement within Europe, as well as between the United States and Korea, and between Korea and China. The research supports the findings of other reviews concerning the lack of international collaboration [15].

Appendix A.2. Co-Citation Network

The co-citation graph displays four distinct groups which are related to the bibliographic clusters explained in Section 3 (Figure 6). The smart city cluster makes up the blue group. It includes Rob Kitchin's work on big data [92] and a paper by Caragliu, del Bo, and Nijkamp that was one of the first to try to explain the idea of smart cities at the EU level [93], a work continued by Albino et al. [94]. This cluster also contains Robert Holland's critical article on "urban entrepreneurialism" [95] in which he considers citizen participation as an alternative paradigm guiding the planning process (instead of a top-down approach).

The purple cluster contains the academic entrepreneurship research of Clarysse et al. [96]. A key document in this group is Moore's Prey and predators: a new ecology of competition, in which he introduces the concept of co-evolution of companies within an ecosystem, as opposed to the conventional notion of business competition [97]. This group also includes Adner's work on ecosystem as structure [98] and his collaboration with Kapoor on value creation in innovation ecosystems [99].

In the red cluster, we find a document authored by the database's most-cited author. The article on entrepreneurial ecosystems by Stam [54]. Not only is this article the largest node in this cluster, but it also has links to the red cluster. As shown in the graph, these two groups are also more closely related than the other two (purple and blue). Spigel's work on the relational organisation of entrepreneurial ecosystems [100] and Feld's work on start-up communities are also important parts of the green cluster [101].

The works of Taniguchi and Tamagawa [102], Gatta and Marcucci from Roma Tre [80], Ballantyne, Dablanc, and others make up the last group. These authors represent the most cited authors in the urban freight cluster as defined in the content analysis section (Green cluster in Figure 6).

Appendix A.3. Co-Occurrence Network Analysis

Betweenness is calculated by dividing the total number of shortest paths passing through the node by the total number of shortest paths in the network [37]. Page rank indicates the term's importance in the set (Table A1).

Table A1. Co-occurrence network statistics.

Node	Cluster	Betweenness	Closeness	Page Rank
Innovation	4	39	0.083	0.130
Entrepreneurship	1	10	0.050	0.047
City logistics	2	1	0.050	0.081
Smart city	3	1	0.500	0.081
Entrepreneurial ecosystem	1	0	0.033	0.032
Urban freight transport	2	0	0.033	0.043
Agent based models	2	0	0.033	0.043
Urban governance	3	0	0.033	0.043
Urban development	3	0	0.033	0.043

Table A1. *Cont.*

Node	Cluster	Betweenness	Closeness	Page Rank
Smart cities	4	0	0.045	0.019
Ecosystems	4	0	0.045	0.019
Cooperation	4	0	0.045	0.019
Freight transport	5	0	0.059	0.067
Co-occurrence analysis	5	0	0.059	0.067
COVID-19	5	0	0.059	0.067
Crisis	5	0	0.059	0.067
Network analysis	5	0	0.059	0.067
Systematic literature evaluation	5	0	0.059	0.067

Appendix B

Table A2. Summary table.

Authors	Methodology	Research Goals	Findings
		EI—Entrepreneurial Ecosystem	
Stam [54]	Review, analytical.	Reviews the entrepreneurial ecosystem literature and its shortcomings and provides a novel synthesis.	Show how the framework and systemic conditions of ecosystems lead to value creation. Framework for analysing element interaction.
Oh et al. [55]	Review.	To better define the innovation ecosystem terminology.	The concept is not well defined and lack empirical support.
Clayton et al. [67]	Literature review and content analysis.	To improve the knowledge of intermediate organisations in science commercialisation.	Categorise intermediaries in service providers, physical space and financial intermediaries and define their roles.
Ferraris et al. [68]	Interviews and expert panels.	To determine barriers and challenges of smart city developments under an open innovation approach.	Develop cross-cutting policies. Public sector as strategic leader. Promote less risk aversion. Greater use of public-private partnerships.
Abdulkader et al. [103]	Literature review.	Highlight co creation value of open innovation and mechanism of value system integration.	Interconnection between activities generates competitive advantages. Interdependence between the firm-specific frameworks activates synergies between firm and ecosystem
Hemmert et al. [65]	Primary and secondary data analysis.	Identify key features of entrepreneurial ecosystems in East Asia and analyse the differences with Western ecosystems.	High-potential start-ups and ecosystem globalisation should be public policy priorities in Asian countries.

Table A2. *Cont.*

Authors	Methodology	Research Goals	Findings
Harper-Anderson [69]	Comparative analysis of three US ecosystems entrepreneurial support organisations. Mixed methods: interviews, surveys and analysis.	To understand factors influencing connectivity between ESOs and the ecosystem.	Partnership patterns affect the ecosystem outcomes. Partnership practices depend on leadership models.
Robertson et al. [70]	Bibliographic review.	To provide an overview of entrepreneurial ecosystems to assist public sector decision making.	Knowledge-related assets, constructs, and capital as public sector tools for regional entrepreneurial growth. Triple helix configurations need to operate in order to functionally contribute to economic growth.
Frimanslund et al. [71]	Systematic literature review.	To explore the role of finance in systemic entrepreneurship and entrepreneurial ecosystems.	Finance literature is not clear on how the extended interactions unravel in an ecosystem. Networks of finance providers reduce uncertainty of start-ups with less experience.
Huggins and Thompson [104]	Interviews to experts from six cities plus commercial data on entrepreneurship activity.	To understand how adaptive cities are when conditions change to maintain their innovative capacity.	Entrepreneurial ecosystems can thrive when the nature and conditions of innovations change as new requirements allow them to maintain innovation capabilities.
		SC—Smart City	
Deng et al. [105]	Review.	To develop a digital twin cities model for governance.	Defines smart city innovations. Highlights ICT infrastructure as the centre point of the approach.
Mora et al. [72]	Multiple case study selection and pilot case study.	To understand how smart city development should be approached based on empirical data.	Developed a protocol to codify knowledge from smart city experiences. From the pilot study: important to balance top-down and bottom-up approaches of smart city, implement a triple helix approach, assemble a cross-cutting intervention logic throughout city domains.
Penco et al. [91]	Literature analysis and development of a knowledge-based city development entrepreneurship index (60 cities).	To understand if the knowledge city environment stimulates entrepreneurship.	Knowledge city environment stimulates entrepreneurial activity (good social environment and effective policies). Public policy increases competitiveness, higher returns on investments, coherent city development and pride in the city.
Costales [73]	Literature review.	Critical examination of the smart city concept.	Introduces the social innovation cycle approach to guide where policy should be directed to implement the smart city approach.
Abutabenjeh et al. [74]	Regressions analysis based on 2016 ICMA survey.	Look at the relationship between leaders' perception of economic development and whether this is important in the implementation of smart city strategies.	The importance of local economic development rises when local governments commit to smart cities technologies.

Table A2. *Cont.*

Authors	Methodology	Research Goals	Findings
		UF—Urban freight	
Marcucci et al. [77]	Multilayer network and opinion dynamics models. Case study.	To develop a model to account for stakeholders response to policy change.	Interaction between stakeholders is beneficial to reach consensus. Integration of demand choice and agent-based models.
Le Pira et al. [78]	Analysis of existing methods. Discrete choice and ABM.	To develop to account for stakeholders preferences by integrating demand choice and ABM.	The model is capable of account for dynamic interaction. It contributes to the ex-ante policy assessment.
Marcucci et al. [106]	Case study.	To highlight the value of participatory approaches for freight planning.	The voluntary adoption of non-mandatory policy (collaborative governance proposed) increases logistics services efficiency.
Lindawati et al. [63]	Case study: focus group, survey and interview. Exploratory factor analysis and regression analysis.	To understand motivations and barriers to collaboration in urban logistics in Singapore.	Perceived benefits of collaboration and the risk of losing competitive intelligence affect participation in collaborative initiatives.
Fossheim and Andersen [76]	Systematic literature review.	To review current practices on urban freight planning in the UK and Scandinavia.	Importance of integration of urban freight planning in general planning frameworks. Urban freight plans are defined with a sustainability perspective.
Verlinde and Macharis [84]	Case study.	Show the triple helix model can contribute to a more sustainable urban freight transport.	Calls to expand the triple helix model to include other stakeholders. Triple helix allowed for innovation to be put to trial. Innovative ideas need of local government support.
Anand et al. [81]	Case study. Agent-based model.	To test subsidy or tax credits policies in the implementation of urban consolidation centres using agent-based models.	UCC lack market mechanisms to internalise external costs. A multistakeholder perspective is needed to understand how a policy affects the system (ABM).
Gammerlgaard et al. [82]	Literature review. Case study.	To review the literature on urban freight governance and propose a process to improve implementation of innovation.	Increased focus on stakeholder involvement in the urban freight literature. Despite actors having different goals, value can be created through relationship platforms.
Kervall and Palsson [75]	Systematic literature review.	To contribute to the knowledge about barriers to change in urban freight systems.	Knowledge on the barriers can support managed changes towards sustainable urban freight.
Ringsberg, Brettmo and Browne [79]	Literature review, semi structure interviews.	Understand the interests of urban freight stakeholders in the use of public space in Sweden.	Urban freight stakeholder views should be considering in urban planning. Road safety, public space use pricing should be developed at local level.

Table A2. *Cont.*

Authors	Methodology	Research Goals	Findings
IE—Innovation ecosystems			
Alexy et al. [56]	Insights from review.	To understand how firms' selective knowledge reveals impacts on firms' innovation ecosystems.	The likelihood of selective sharing increases as the level of partnership uncertainty. Selective sharing increases if a company desires to enhance content compatibility, structural compatibility, or the evolution of a technology.
Ranganathan et al. [107]	Regression analysis.	To understand how competition and cooperation affect how firms interact with each other and how the group does as a whole in technology coordination ecosystem settings.	Firms with more competitive products-markets support industry standards. Heterogeneity in firm's relational influence and previous experience in collaborating improve consensus.
Linges et al. [86]	Multiple case study. Interviews.	To understand how surrounding conditions affect the design of an ecosystem.	Certainty/uncertainty of surrounding conditions affect the structure of the ecosystem, while the orchestrators knowledge of the system affect the ecosystems activities and the resources it needs.
Sotarauta and Suvinen [88]	Case study. Interviews.	To understand how place leaders guide green growth.	Place leaders generate a multitude of development processes that allow for collective learning. They amplify their power by developing policy platforms.
Autio [87]	Review. Theoretical.	Proposes an ecosystem orchestration framework including technological, economic, institutional and behavioural layers.	The framework aims to help practitioners to design ecosystems throughout the value creation cycle.
Nepelski et al. [60]	Regression analysis and index creation.	To examine the impact of organisational and geographic diversity for collaboration in EU research networks.	Institutionally diverse research networks can improve entrepreneurial ecosystems and innovation commercialisation potential.
Sandhu et al. [90]	Survey. Regression analysis.	To connect long term strategies for ecosystems with individual projects.	Project management office activities enhance ecosystem level outputs.
Sung and Wei [108]	Literature review. Interviews. Grounded model.	How Chinese companies coordinate innovation ecosystems at firm level to overcome lack of resources and capabilities.	Coordination can be performed by a hierarchical authority. The core actor can use a platform structure to coordinate members relationships.

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