

Urban logistics hubs: Six case studies

Background paper

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Introduction

Urban logistics are a fundamental part of city life, involving far more than the delivery of goods purchased via e-commerce. Deliveries, collections and servicing in urban areas generate all kinds of non-passenger freight trips by trucks, vans, cargo bikes and other modes of transport. Supermarkets, restaurants, retail shops, construction companies, wholesalers and individual customers rely heavily on the distribution and return of goods, the collection of waste, and other services to fulfil their demands.

Urban logistics hubs are strategically located facilities within urban areas that serve as crucial points for the consolidation, distribution and management of freight including reverse logistics (i.e. the return of goods and waste collection). They serve as nodes in the urban logistics network, typically facilitating the last mile of the supply chain, where goods can be consolidated, sorted and dispatched, ideally to facilitate and optimise last-mile deliveries (by reducing the number of vehicles or using environmentally friendlier vehicles), reducing negative externalities.

Urban logistics hubs also face specific challenges. However, these can also be part of the solution for the challenges faced by urban logistics. Existing logistics frameworks can provide potential guidance for public authorities in their respective contexts.

The case studies outlined in this paper include advanced economies and emerging markets and hence showcase a variety of context specific challenges and solutions adopted by authorities. In some contexts, the emphasis is on integrating land-use planning with transport strategies to create efficient urban logistics hubs. Some cities have already implemented zoning policies and regulations to encourage the use of low-emission vehicles and have designated specific areas for logistics activities.

Other examples of measures that address the increasing demand for urban logistics hubs include developing brownfield sites, incentivising mixed-use development, retrofitting and repurposing existing buildings, using empty parking lots, bus depots and unused spaces in cities (e.g. spaces under elevated highways). Authorities in some cities have also deployed reduced parking, congestion charging and curbside management to manage urban freight traffic more effectively while encouraging the development of microhubs within core urban areas.

For more information see *Urban Logistics Hubs: Summary and Conclusions* (ITF, 2024).

The evolution of the urban logistics landscape in Tokyo

Tokyo's logistics landscape has evolved rapidly, illustrating the challenges of balancing land uses, addressing delivery demands, navigating zoning regulations, and managing conflicts between local and metropolitan interests.

Like many other cities worldwide, Tokyo faces a growing demand for logistics land use, resulting in logistics sprawl, which is not necessarily inefficient. Demand for parcel delivery has risen by 46% in the last decade and the city experiences a shortage of drivers and delivery workers. Moreover, many multistoried, multi-tenant facilities have emerged, with approximately 30 million m² of floorspace added between 2011 and 2021, mainly concentrated in coastal areas and along completed sections of a ring road around the Greater Tokyo Area. Up to one-third of this space is currently used by major e-commerce vendors including Amazon and Prologis.

The government supplies land for logistics facilities by using traditional port areas, industrial zones and land along new expressway sections. However, there is still a shortage, with average occupancy rates of existing facilities up to 98-99%. Sometimes, conflicts arise between local interests and the metropolitan-wide demand for logistics, often tied to taxes and potential clashes with residential areas. Residents may also raise concerns about facilities located near residential areas, leading to legal conflicts.

While some local authorities agree to host logistics facilities, others may prefer alternative land uses that generate higher tax revenues. Municipalities administer the building permits for large logistics facilities, including conversions of farmland into logistics spaces. While municipalities co-operate with the national government to accommodate the growing demand for logistics land use at the metropolitan level, the final decision rests with the municipalities themselves.

Current zoning regulations in Tokyo favour the development of last-mile facilities, encouraging smaller delivery stations employing cargo bikes and hand carts. The fact that these facilities are permitted in several land-use zones (including residential zones) has led to the development of numerous small delivery facilities in the city centre. While the location of delivery stations is not strictly regulated, parking and curb use is regulated and enforced leading to oversight of logistics activities. Stricter parking laws, enforced by private-sector agencies rather than the public sector, mean companies have begun adopting non-vehicle modes of transport.

However, the rapid growth of e-commerce and the increase in parcel deliveries could lead to a shortage of delivery stations in the future. This growth also complicates the collection of data on delivery demands by cities and the national government. Currently data collection is periodic (occurring once every ten years in the case of Tokyo) which allows co-operation between different levels of government to develop policy recommendations for logistics.

Notable innovations in Japan include national laws supporting the renovation of existing logistics facilities for efficient use and the development of autonomous vehicle technology for deliveries. The completion of the Greater Tokyo Area ring road has also significantly influenced the spatial expansion of logistics facilities (Sakai, 2023).

Fostering innovation in logistics through regulatory tools in Paris

Paris has proactive zoning plans, encouraging the development of delivery stations in mixed-use sites, offering specific plots for logistics infrastructure development within the city and ensuring flexibility by requiring structures on public land to be dismantled and recycled at the end of the lease period.

Paris faces a shortage of logistics space: 25% of regional goods move through the city, which possesses only 1% of logistics facilities. Hence, the city prioritises facilities that organise and decarbonise last-mile deliveries.

The city of Paris does not directly invest in land for logistics but uses regulatory tools such as local urban development plans (plans local d'urbanisme, PLU), major urban services zones (zones urbaines de grands services urbains, UGSU) and logistics location perimeters (périmètres de localisation logistiques, PLoc) to encourage private sector development.

The PLU creates major urban service zones to improve the reception, distribution and collection of goods and motivate modal shifts to waterways and railways. Facilities in these zones can be up to 30 000m² with mixed-use activity encouraged.

Logistics location perimeters on specific plots ensure the creation or maintenance of urban logistics spaces (5003 000m² with no storage) within property development programmes. These spaces are only for cross-docking use, can fit perfectly into a dense city, and can be combined with other activities such as retail, offices, or even housing.

In the current PLU, 60 such plots of land are identified leading to the development of around ten logistics spaces. Further, last-mile delivery stations are allowed within the city, especially in plots defined in the PLU. These facilities are not for storage but can be combined with housing, retail or offices.

The city of Paris also offers underused spaces for logistic functions through calls for projects. One example is an area under the ring road at Porte de Pantin transformed by a public-private real estate developer, Sogaris, into a logistics space, leased under a public domain occupation agreement.

The city retains ownership of the land, and it is leased for 12 years. The possibility to dismantle and recycle the structure at the lease's end exists if the city decides against continuation. Similar leases on other plots are given to Sogaris and other property developers. This tool allows flexibility in a dynamic logistics market that evolves quickly, and success depends on adaptability.

While efforts to promote multimodality involving railways face challenges due to operators' difficulties in finding a sustainable economic model and limitations with available slots for freight, there have been successful initiatives utilising river freight on the Seine for construction sites and last-mile delivery by cargo bike via river routes.

Paris' proactive stance on urban logistics in zoning plans is distinct from other regions in France, making it a unique approach. While changes in national urban planning laws may impact the city's unique definition of urban logistics, the overall strategy involves innovative zoning regulations, mixed-use plot development, leveraging underutilised spaces, and fostering partnerships with the private sector to address the scarcity of logistic facilities while promoting multimodal transportation and integrating logistics into urban areas (Nicol, 2023).

Last-mile logistics hubs in London

In recent years, specific types of logistics hubs focusing on last-mile operations have emerged in the United Kingdom, within three sectors: parcel hubs, ready-to-eat meal delivery sites (including dark kitchens), and grocery fulfilment centres. Despite making up a small percentage of urban logistics facilities, last-mile hubs are growing and evolving, raising questions about planning, sustainability and urban integration.

Last-mile hubs have experienced significant post-Covid growth due to increased online ordering, particularly in London and other major UK cities. Dark stores and kitchens have grown substantially, while parcel hubs occupy more physical space. However, data on the size and number of sites used for these purposes is limited. Governments and local authorities do not maintain specific records, while property consultants only keep comprehensive databases of sites over 9 000m². Data may be available for smaller sites but can be unreliable.

Single companies operate most recent last-mile hubs. Sharing is less common, due to operational considerations and competition between businesses. Scarce urban land is difficult to acquire and expensive, leading larger entities such as Amazon and startups with substantial venture capital to be most successful in securing leases.

Policy makers view these hubs positively due to the potential use of clean vehicles for deliveries and last-mile collection by foot or bicycle by residents. However, there are also concerns about increased traffic, noise, litter, and other negative impacts. Planning regulations and categorisations have not kept pace with the rapid development of such sites, leading to debates and objections from residents.

New policies, such as those outlined in the “Spatial Development Strategy for Greater London” (known as the London Plan 2021), encourage combining logistics sites with residential developments to reduce the quantity of land required. Nevertheless, intensification of logistics space is not always feasible, given the plot ratios needed, the problem of operational noise and opposition from local authorities due to proximity to residential areas. Meanwhile, the development of urban consolidation centres (UCCs), which would consolidate flows of goods from larger to smaller vehicles, has been limited, often requiring ongoing public subsidies to sustain.

These developments have led to uncertainties about the sustainability of operations in some logistics hubs, particularly for same-day and instant deliveries, which could potentially increase road traffic. Planning authorities also face limitations when regulating hubs in residential locations that generate substantial trips and can have other social and environmental impacts, especially in early morning and evening hours. While there is an interest in integrating technological advancements to mitigate noise and expand delivery hours, the hesitancy of local authorities to grant permissions due to potential unforeseen problems remains a significant challenge in implementing these innovations.

The policies outlined in the London Plan 2021 offer a potential solution to some of these challenges by providing a framework for land planning for urban logistics in London. Policy E4, specifically, highlights the importance of industrial, logistics and related activities in London’s economy and in supporting its growing population. The policy emphasises the need for diverse industrial functions such as food and drink preparation, creative industries, vehicle maintenance, construction, waste management, transportation, and emerging activities including data centres and clean technology.

The London Plan also attempts to address the release of industrial land for alternative uses between 2001 and 2020, which exceeded benchmarks and led to a net loss of industrial land in the city. The plan identifies

a potential scope to release further industrial land while considering existing permissions and earmarked areas for possible release in other planning frameworks.

Policy E5 focuses on strategic industrial locations (SILs), urging boroughs to assess the release of industrial land for alternative uses if vacancy rates are above average. It emphasises protection of SILs due to their critical role in London's economy, especially for logistics operations and small-to-medium enterprises. Policy E6, meanwhile, allows boroughs to designate locally significant industrial sites (LSIS) based on evidence, particularly for inner-London sites supporting sustainable distribution services. Policy E7 encourages industrial site intensification, co-location and substitution, promoting collaboration to explore intensifying industrial activities and co-locating light industrial activities with residential and other uses.

The London Plan 2021 also addresses delivery, servicing, and construction (Policy T7), emphasising the need for sustainable last-mile distribution, waste management, and supporting transport functions. Overall, the plan aims to ensure sufficient industrial and logistics capacity, protect strategic industrial locations, encourage intensification where possible, and facilitate co-location while considering the efficient functioning of the industrial market and the city's overall development objectives.

However, some commentators have expressed concern that the policies in the London Plan 2021 may be insufficient to meet the needs for industrial land in central and inner London, given the strong demand for residential development (Allen, 2023).

Logistics and the circular economy in Rotterdam

Rotterdam, like most cities, faces a growing need for logistics space within defined city limits while accommodating various other functions such as population and economic growth, greening initiatives and managing increased visitors and their related demands for goods and waste transportation. The space race necessitates increasing density within the fixed space.

Moreover, as the circular economy concept is emerging, it poses substantial implications for the city. Circular economy suggests the potential need to confine material circulation within the city limits, emphasising the importance of quantifying and efficiently utilising hub spaces. Integrating city logistics into long-term spatial planning documents becomes crucial for coordinating traffic, economic, and housing aspects.

As a framework, efficiency takes centre stage in ensuring sustainability within Rotterdam's city logistics. This efficiency extends beyond traffic management, encompassing the optimisation of commercial spaces for logistics. It requires quantifying hub space requirement – “as little as possible, but as much as necessary”. Rather than focusing on reducing logistic traffic, the focus is increasing resource and asset utilisation efficiency. For example, the framework encourages commercial urban space to not be used for regional distribution but rather to primarily serve the city. Receivers and receiving premises are also expected to contribute to increasing efficiency in terms of their ordering behaviour and by respecting building code regulations.

Moreover, the complexities of city logistics demand co-ordination across various city departments and therefore require human resource capacity. Hence, the city has human resources (albeit a small team) assigned to urban logistics.

Next, experimental initiatives such as high-frequency waste collection combined with small hubs, are underway, raising questions about the consumption of public space. The city grapples with the need for diversified logistics approaches across different urban segments and times, emphasising a balance between large and small hubs and varying vehicle frequencies.

The key takeaway from this case study is the need to integrate city logistics with other urban functions wherever possible and the distinction between logistic traffic and passenger cars. While aspiring for car-free cities, it is essential to remember that some logistic vehicles are indispensable for city functionality. One tool that cities can use is simulations for policy development, evaluation, and stimulating informed discussions about the challenges and future of city logistics, as attempted by authorities in Rotterdam (Streng, 2023).

Retrofitting logistics facilities in Sao Paolo

85% of Brazil's 200 million population resides in urban areas. Urbanisation trends and the increasing dominance of e-commerce have intensified the competition between physical and digital markets. E-commerce has risen from 4% to 16% of Brazilian commerce and is projected to reach 25% over the next five years. Abralog (the Brazilian Association of Logistics, a non-profit entity) estimates a market potential of 100 million square meters for logistics activities, of which 50 million square meters is projected for the next seven years, with Sao Paolo and the southeast region of Brazil expected to dominate the inventory.

While the demand for logistics hubs in urban areas is on the rise, there is a notable absence of dedicated urban logistic hubs in Brazil's city planning. The sector is still in its early stages, lacking collaboration between public authorities and industry, which appears to be one of the significant challenges. Moreover, challenges such as administrative delays in construction permissions (up to 36 months in some Brazilian cities), land scarcity, rising costs, and labour shortage are identified as hurdles in establishing urban logistics hubs and need attention in local and national policy agendas.

On the other hand, real estate players are proactively responding to the need for logistic spaces by acquiring properties and repurposing them. This includes retrofitting old factories and properties into spaces suitable for sorting, cross-docking, and last-mile operations. Retrofitting existing spaces to accommodate logistics operations has become a preferred strategy due to its speed and efficiency compared to starting greenfield construction projects, which can be lengthy. Sao Paolo specifically showcases a vibrant market for retrofitting logistics facilities. Sao Paolo has 0.3 million square meters of retrofitted buildings and by the end of 2024 an additional 0.5 million square meters of retrofitted buildings for logistics is anticipated.

Regarding innovation, collaboration between public authorities, the private sector, and academia to address the lack of urban logistics hubs is seen as necessary. Technology for simulation, network optimization, and urban freight routing analysis can support innovation. Moreover, there is an increasing emphasis on sustainability within logistics operations, including the adoption of renewable energy solutions and electric vehicles, reflecting a broader trend towards sustainability in the logistics sector in Brazil.

Lastly, there is room for regulatory improvements in this context, particularly in traffic management, to enhance urban mobility, facilitate sustainable logistics operations within cities, and regulate labour issues such as working times and wages (Moreira, 2023).

Developing the logistics sector in Viet Nam

The logistics industry in Viet Nam is growing at the rate of around 16% per year. The sector contributes significantly to the country's GDP, currently around 4%. The Vietnamese Government has a master plan to develop the logistics sector further to increase its contribution to GDP. The country has more than 30 000 logistics service providers, with Ho Chi Minh City accounting for 54% of the enterprises.

According to a World Bank and Vietnam Logistics Research and Development Institute project, "Diagnosis of urban logistics in Vietnam", three predominant operational models exist within the urban logistics sector: traditional retail, e-commerce, and manufacturing/construction. Each has its unique challenges related to cargo flows, stakeholder involvement, and space utilisation. Urban logistics in this context involves transporting various goods with high demands in consumer goods, industrial items, construction materials, and a significant surge in e-commerce goods following the COVID-19 pandemic.

Moreover, according to the study, warehouse space within urban areas faces limitations due to scarcity of land. Due to rapid urbanisation, there is also a high demand for cold storage facilities, especially in major cities such as Ho Chi Minh City. Big companies tend to own some large-scale warehouses and outsource small warehouses to increase flexibility and reduce warehouse investment costs. Additionally, land fund owners serving the logistics industry typically do not want to sign long-term warehouse lease contracts. They are willing to switch to real-estate business, leading to very high risks for tenants' warehouses.

Regarding transportation, trucks and motorbikes are the primary modes of transport for urban logistics, accounting for 69% and 25% respectively of the proportion of vehicles used in urban logistics activities. Bicycles account for approximately 3%. The number of motorbikes involved in last-mile delivery is significant. Traffic congestion, load limits and time constraints, and lack of storage space in big cities also pose challenges for urban logistics activities. Further, information technology (IT) application in urban logistics is varied. E-Logistics companies have a higher level of IT application (around 90%), while road transport companies lag significantly, using IT mainly for basic functions like GPS.

The World Bank study identifies solutions for sustainable development of urban logistics in Vietnam as well as barriers to implementing those solutions. Some recommendations for sustainable urban logistics include the adoption of new technologies, incentives and subsidies from the government to develop infrastructure, adopting road pricing in urban freight transport, developing city access regulations and last mile solutions, the development of urban consolidation centres (UCCs), and employing environmentally friendly vehicles to mitigate traffic congestion and environmental impact. Some barriers identified for implementation include lack of sufficient road infrastructure, low level of development in railroads, low quality of transport systems, limited institutional capacity to adopt technological requirements, weak regulations and the need for significant initial investment to build the infrastructure (Hoa, 2023).

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Urban Logistics Hubs

Urban logistics are fundamental to city life. However, freight transport is responsible for around half of local air pollutants in cities and generates congestion and other emissions. Moreover, urban logistics involves more than just e-commerce.

Recent trends in goods distribution, reverse logistics, the emergence of dark kitchens and dark stores, and growing regulatory demands, have made logistics more complex. The dual trend of logistics returning to the city and growing demand for larger sub-urban warehouses must also be considered.

Urban Logistics Hubs provides targeted advice to policy makers on proactive measures to manage the complexities of urban logistics and facilitate the uptake and success of urban logistics hubs.

Read the full report: <https://www.itf-oecd.org/urban-logistics-hubs>