Chaire LOGISTICS CITY

Université Gustave Eiffel

University of Tokyo
Department of Civil Engineering
TransportHub Seminar
16 December 2025

Spatial analyses of logistics facilities in cities, international comparisons from large cities around the world

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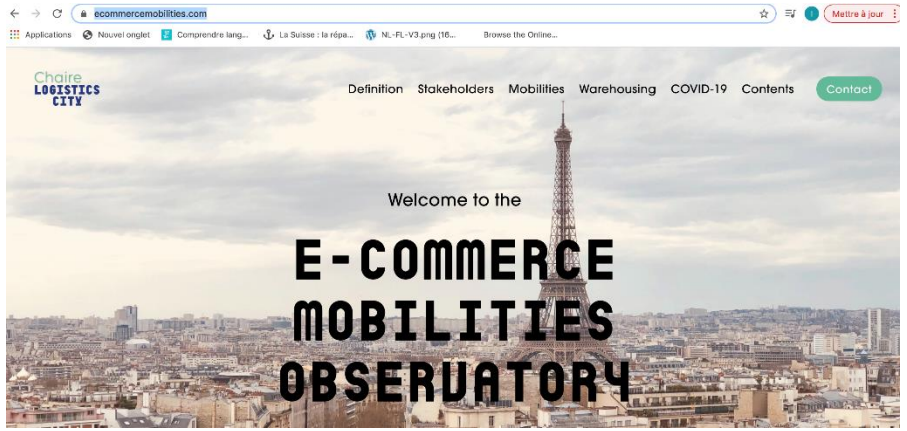
Université Gustave Eiffel

Logistics City Chair, University Gustave Eiffel, France

1. Warehouses, logistics real estate
2. E-commerce logistics
3. Public policies



https://www.lvmt.fr/chaires/logistics-city/

Objectives of this research

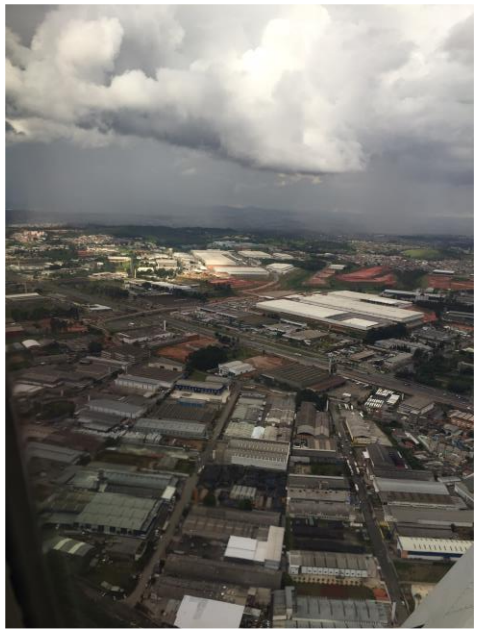
1. To keep a dataset on warehouse spatial patterns in cities around the world
2. To look at relationships between warehouse spatial patterns, urban forms and local planning policies
3. To look at the new formats of urban warehouses
4. To focus on two emerging policies and their impacts on warehousing
    - 'No net land take' regulations and their impact on logistics facilities
    - The production of photovoltaic energy from logistics facilities
5. To propose a Warehouse Policy Index

Warehouses, new logistics landscapes in large cities

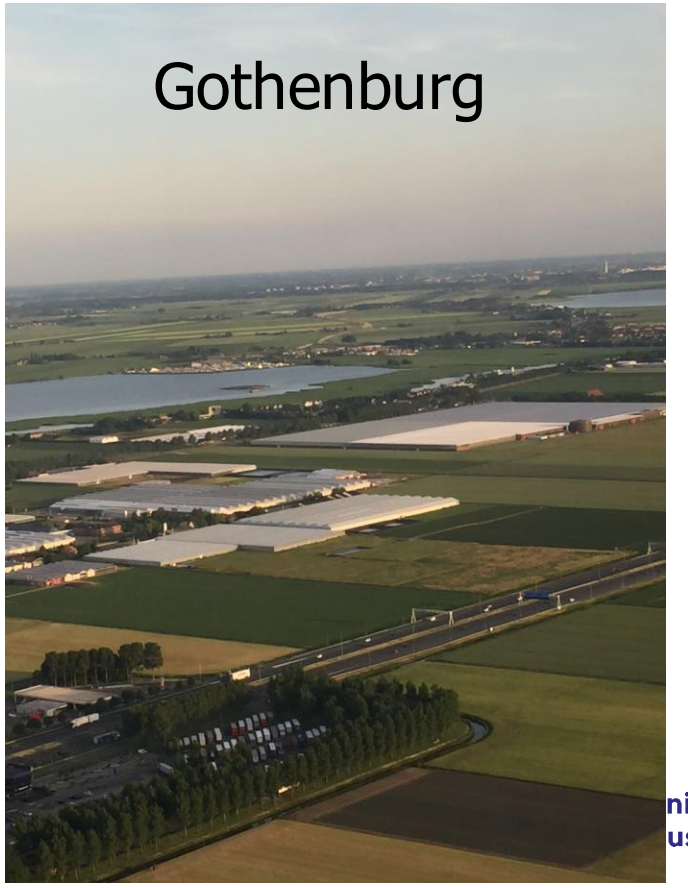
Los Angeles

Buenos Aires

Sao Paulo



Gothenburg



Vertical development in Tokyo, Seoul, Hong Kong…

Prologis building in Tokyo

Goodman building in Hong Kong (24 levels)

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Two recent evolutions in Europe and the US

Solar panels
Amsterdam

Reduction in land footprint

Amazon *fullfilment center* in Delaware, US

350,000 m2 on 70,000 m2 footprint

The new warehouses: vertical and producing electricity

- Carbon footprint of a warehouse (life cycle analysis): 1 kg CO_2 per m2 (Afilog)
- About 20 new vertical warehouses in the Paris region are in operation today

Paris Vitry, 2025

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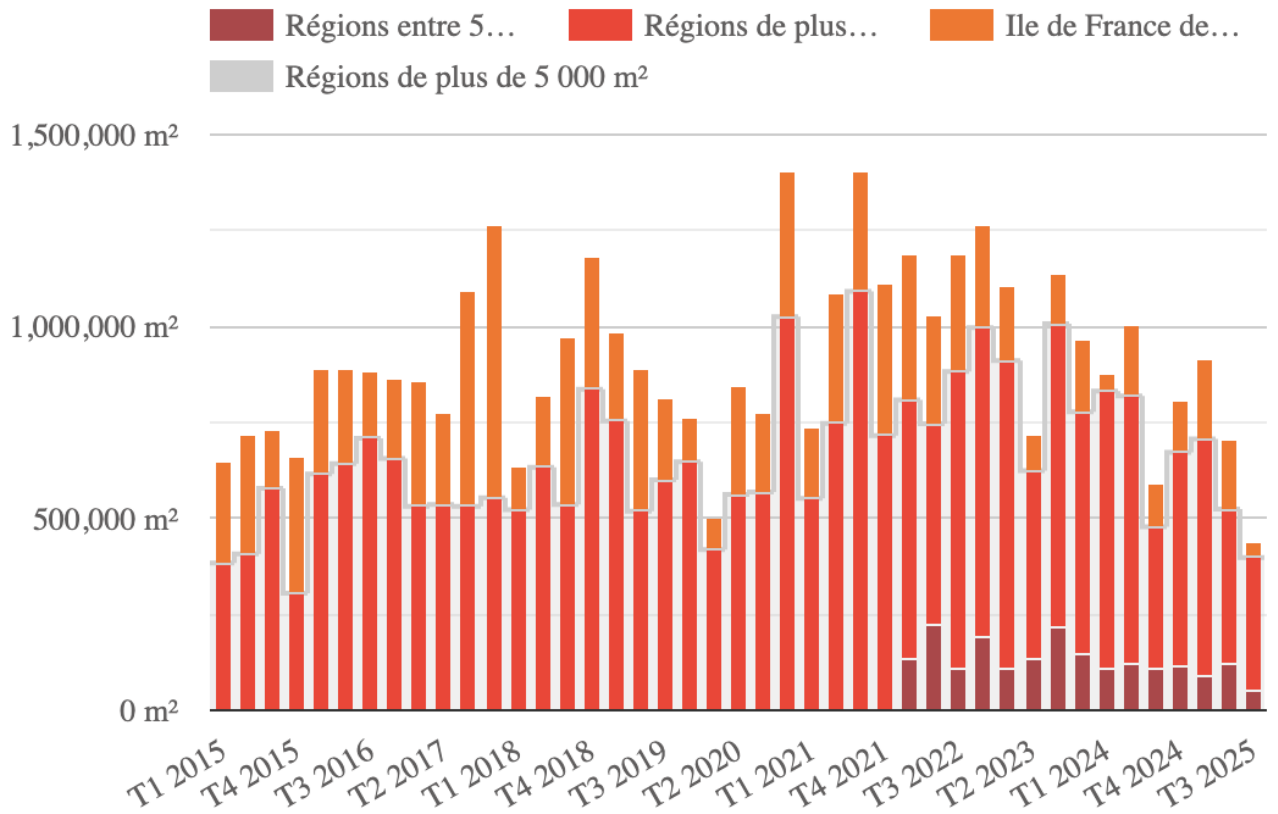
Logistics: a huge real estate market

- Warehouses = 50% revenue, costs, jobs of logistics
- Companies and processes are homogenizing
- Deceleration of market in Europe since 2025



ImmoStat

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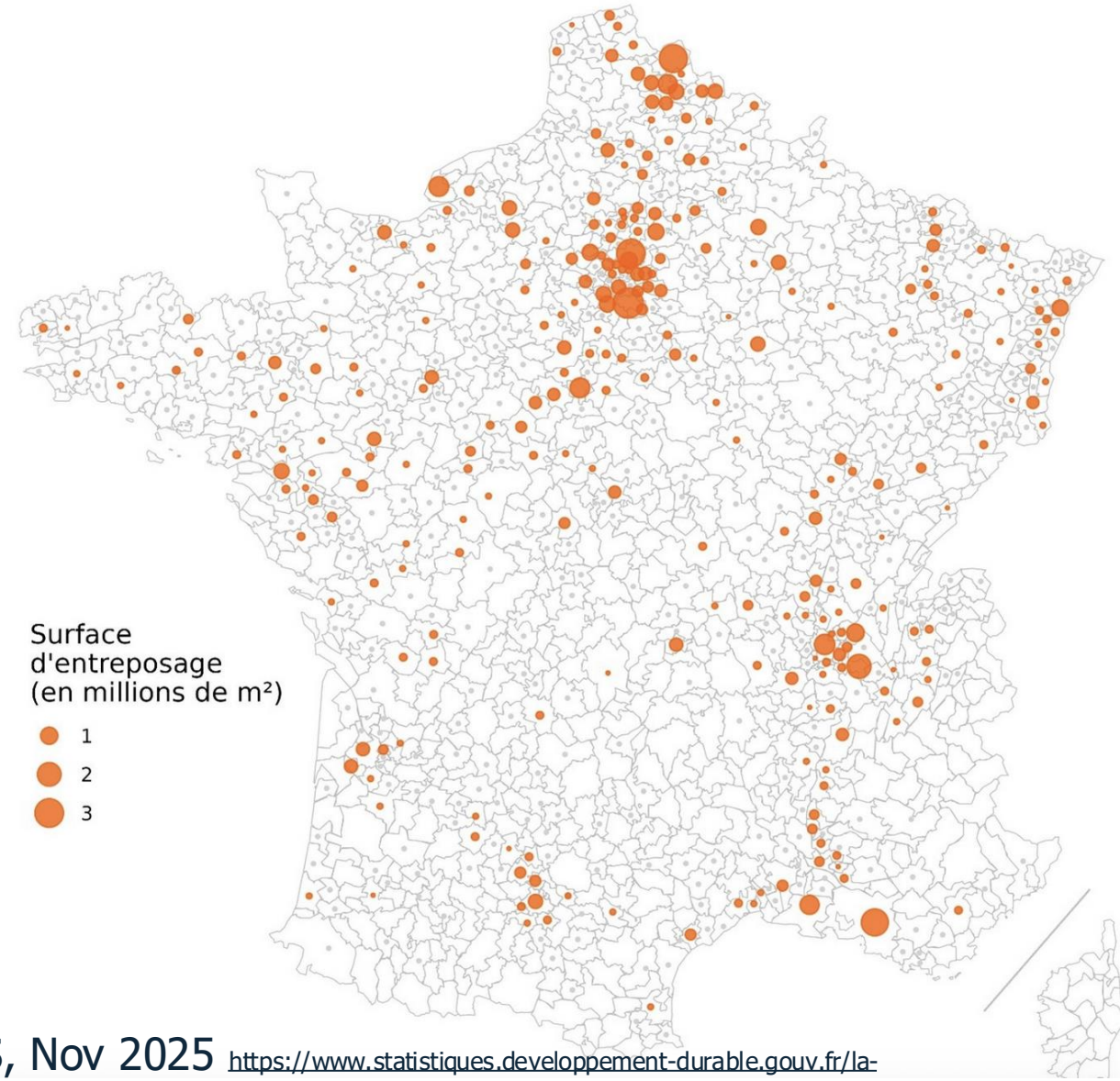
Why look at warehouses?

Main spatial dynamics

- Spatial dynamics influence upstream/downstream freight transport distances
- Three spatial dynamics:
  - Concentration in large metropolitan areas (polarization)
  - Logistics sprawl within these metro areas
  - At the same time, new (very small) market of urban warehouses

Surface totale de stockage des entrepôts de 10 000 m² ou plus, par EPCI de localisation en 2024



SDES, Nov 2025 https://www.statistiques.developpement-durable.gouv.fr/la-surface-des-entrepots-et-plateformes-logistiques-de-10-000-m2-ou-plus-en-hausse-de-23-en-2024?rubrique=&dossier=1349

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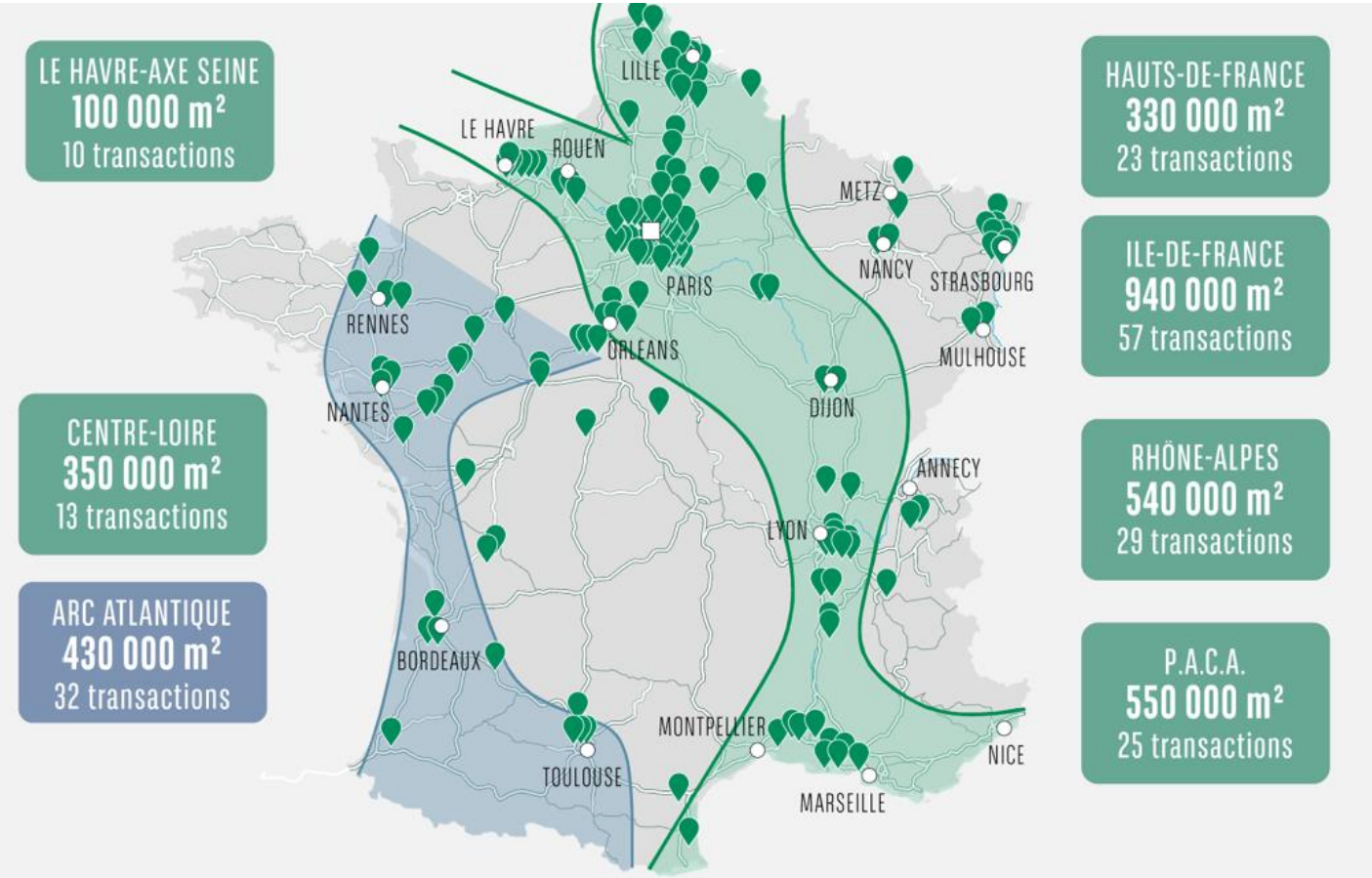
Lille, Paris, Lyon and Marseille concentrate 60% of all logistics property investments in France (2024)



BNB Parisbas real estate, ImmoStat data

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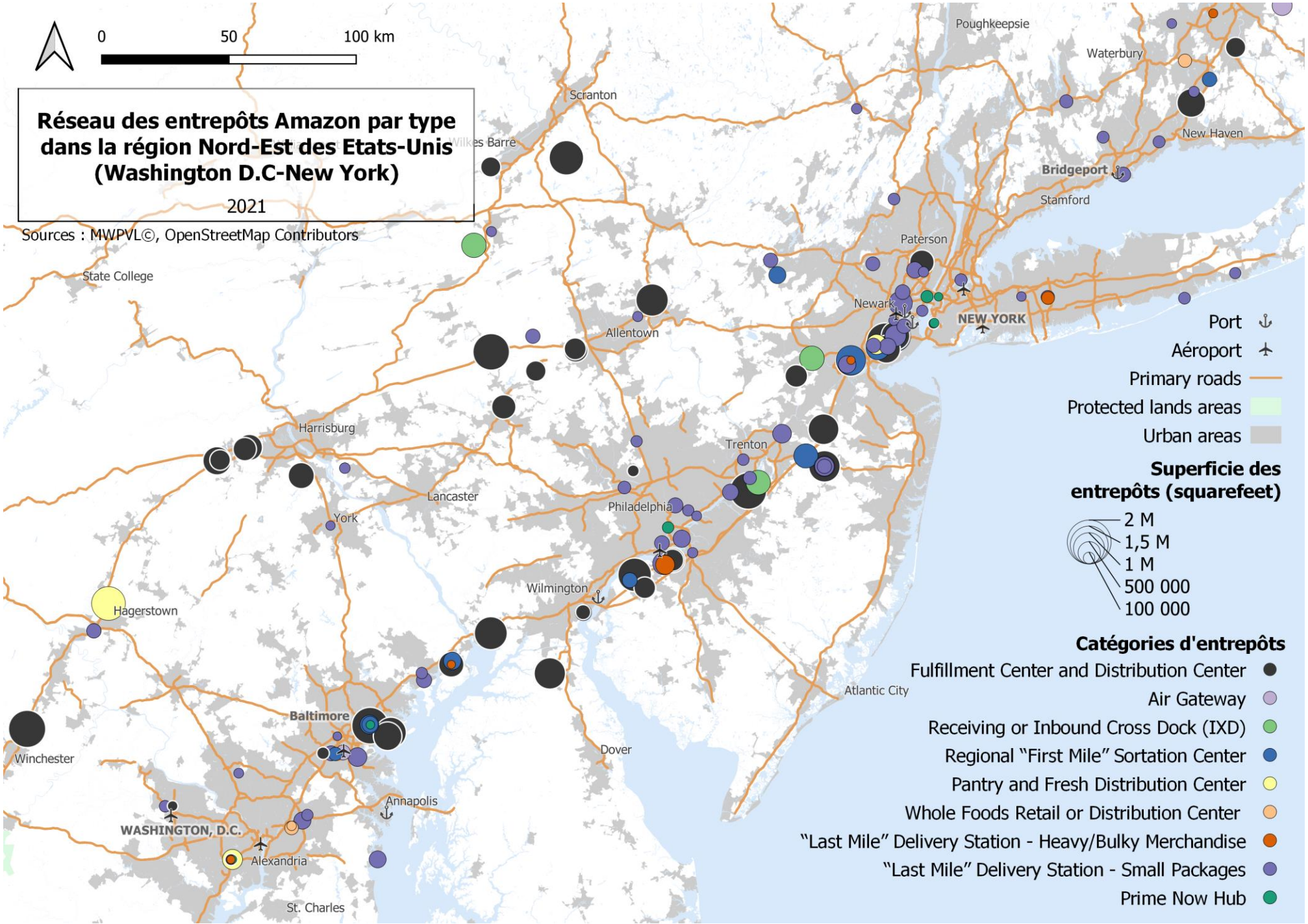
How to explain concentration in largest cities?

- Faster economic growth
- Largest consumer market
- Large and diverse workforce (need for 0.30 to 0.50 staff/m2)
- Nodes of good transport infrastructure
- “Gateway cities”
- Supply of modern logistics real estate (where the global logistics real estate industry prefers to make investments)



Warehousing clusters in megaregions

T. Lecourt,
M. Schorung
Logistics City Chair, 2021

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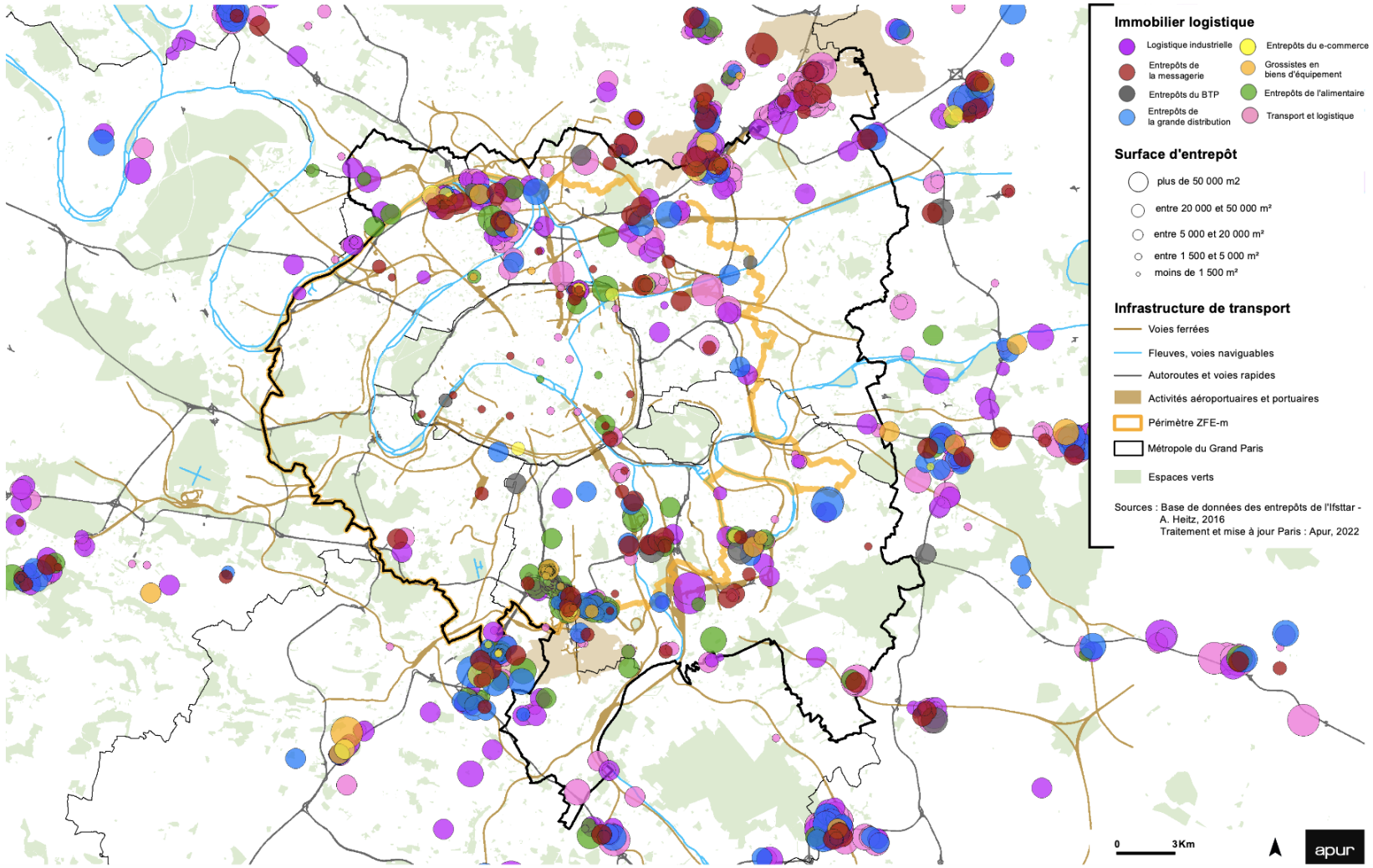
Warehouses in the central area of the Paris region

L'IMMOBILIER LOGISTIQUE DANS LA METROPOLE DU GRAND PARIS



Immobilier logistique

- Logistique industrielle
- Entrepôts de la messagerie
- Entrepôts du BTP
- Entrepôts de la grande distribution
- Entrepôts du e-commerce
- Grossistes en biens d'équipement
- Entrepôts de l'alimentaire
- Transport et logistique

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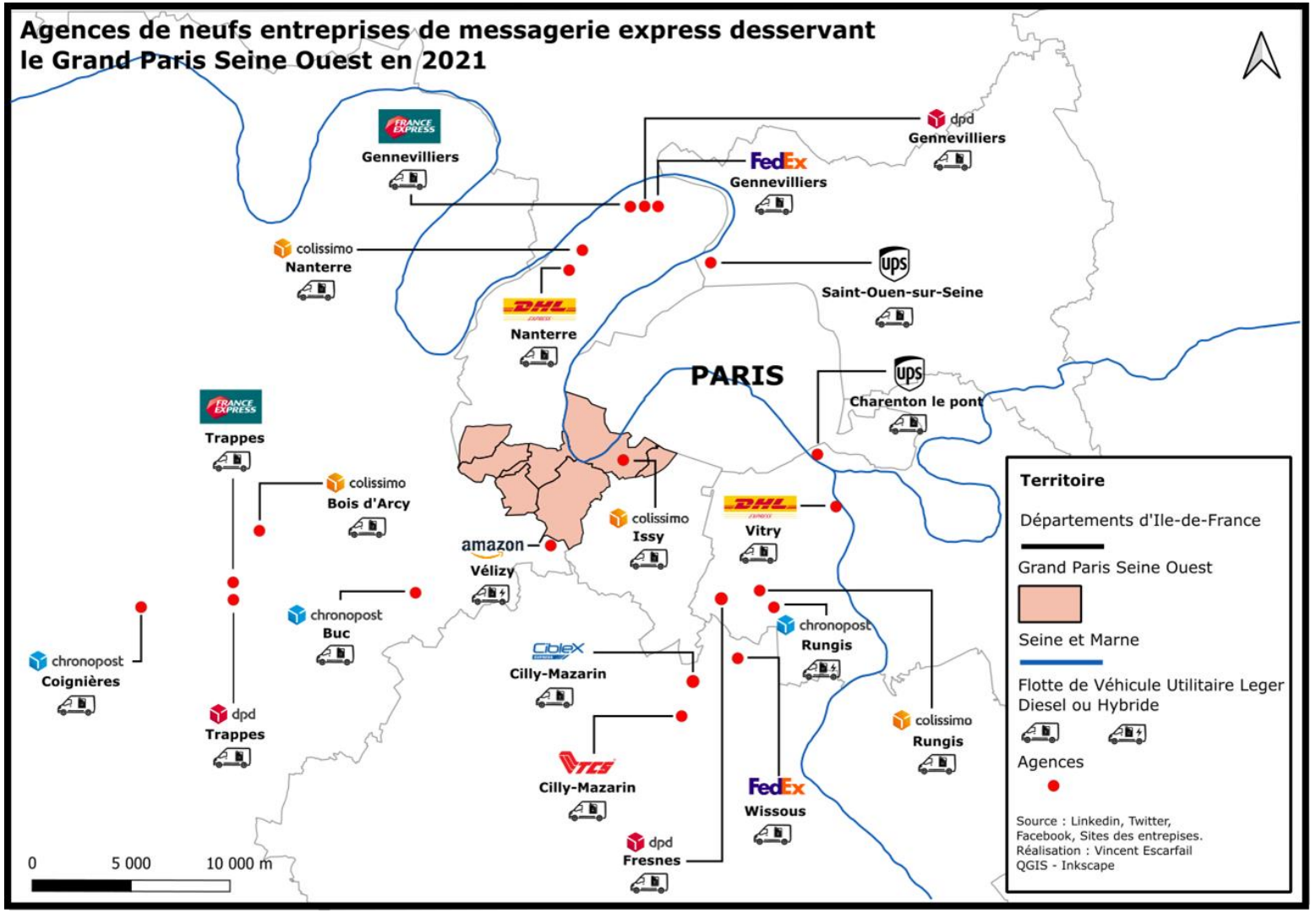
Wealthy areas served by warehouses located elsewhere: example of Issy/Boulogne



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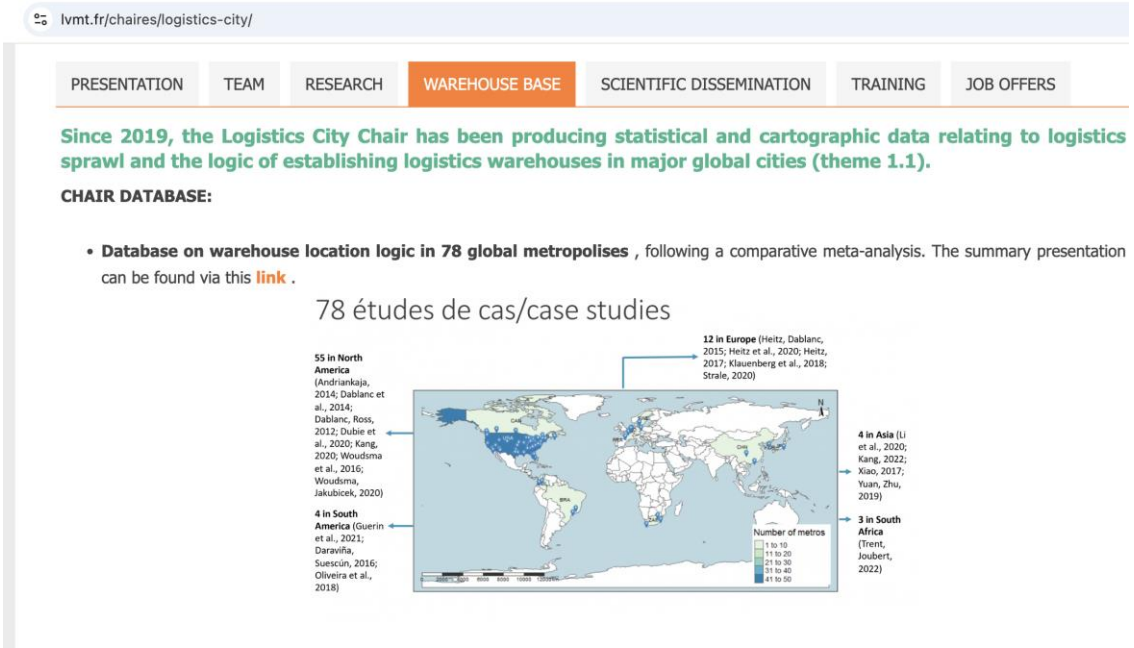
Base Entrepôts (Warehouse Database)

- Database of indicators from spatial analyses of warehouses
- 81 metropolitan case studies identified in the literature (Dablanc et al., 2024)
- 17 indicators for each case study
- Seven hypotheses



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Indicators

- Name and size of studied metro area
- Type of metropolitan area
- Population (million - most recent year)
- Population density (inhabitants/km^2)
- Name of warehouse data source
- Number of warehouses (most recent year)
- **Number of warehouses per million people** (most recent year)
- % change per year in number of WH per million people
- **Number of warehouses per 1000 km^2** (most recent year)
- Average size of warehouses (m^2)
- Time period studied for logistics sprawl analysis
- Number of years of analysis
- Average distance of warehouses to centre of gravity (most recent year) (km)
- Change in average distance of WHs to centre of gravity (over the years) (km)
- **Change in average distance of WHs to centre of gravity per year** (km/year) (logistics sprawl)
- Cluster indicator
- **Type of land use control**

Hypotheses linking urban forms and the spatial distribution of warehouses

	Hypotheses
H1	There are more warehouses/pop in large and medium metropolitan regions than in smaller ones.
H2	There are more warehouses in global hub metropolitan regions (or Gateways) than in regular ones.
H3	There are more warehouses in metropolitan regions belonging to mega-regions than in « regular » ones.
H4	The increase in the number of warehouses over time is more significant in medium and large metropolitan regions than in smaller ones.
H5	The increase in the number of logistics facilities over time is positively related to the importance of the role of global logistics hub (or Gateways) played by an urban area.
H6	Logistics sprawl is positively related to the differential in land/rent values for logistics land uses between suburban and central areas in an urban region.
H7	Logistics sprawl is negatively related to the degree of regional logistics land-use control.

L. Dablanc

Relationships between spatial patterns of warehouses and urban forms

- Overtime increase in number of warehouses and number of warehouses per capita in all cases
- The larger the city, the higher the number of warehouses per capita
- Logistics sprawl in 80% of cases
- LS positively linked to land cost differentials between central and suburban areas
- LS positively linked to availability of large land parcels in suburban areas
- LS negatively linked to regional land use control

Logistics sprawl: decentralization of warehouses in suburbean areas of large cities

- The spatial deconcentration of logistics facilities in metropolitan areas overtime
- Caused by land cost, large urban developments, and needs for modern facilities
- Logistics sprawl generates considerable additional vehicle-miles and CO_2 emissions in urban areas

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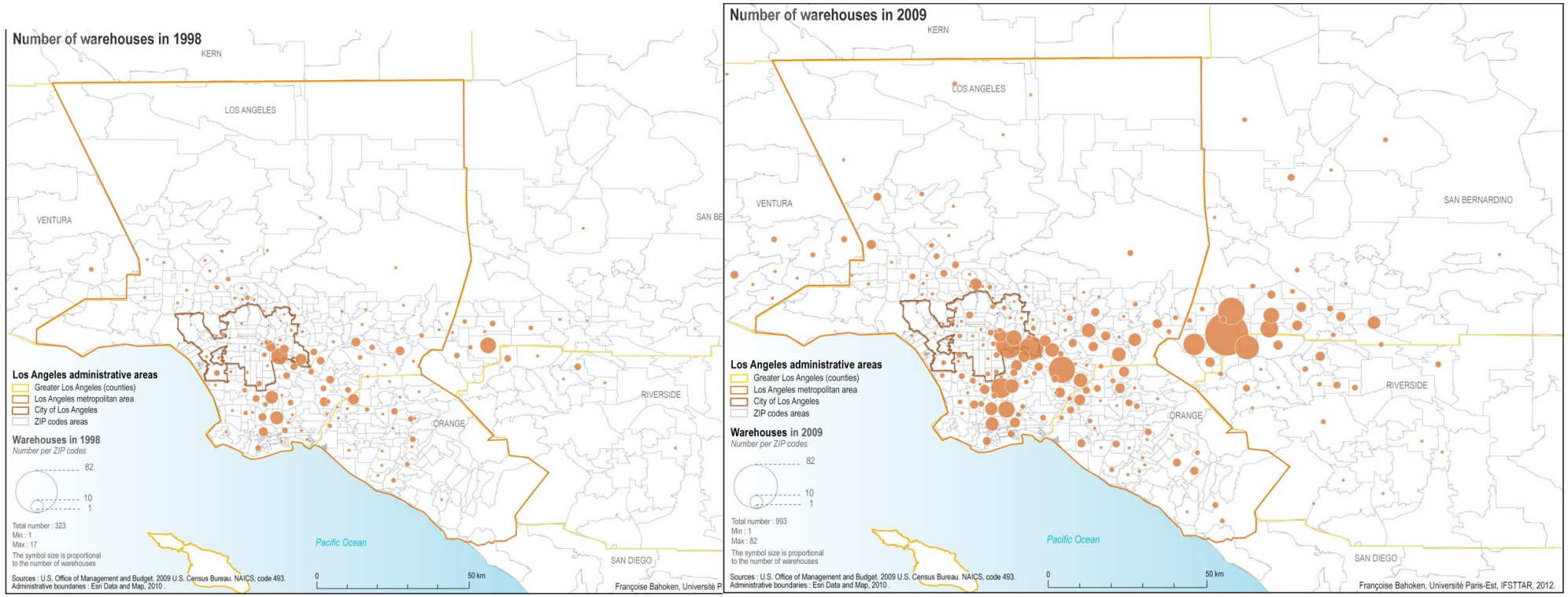
Logistics sprawl in 57 metropolitan areas in the world

Region	Logistics sprawl in km/year (average of logistics sprawl ratios in all the case-studies of each region)
Asian cities	0.5
North American cities	0.3
Latin American cities	0.2
European cities	0.15

Base Entrepôts, Dablanc, 2024



Dablanc and Farr, 2012

Los Angeles, warehouses 1998-2009

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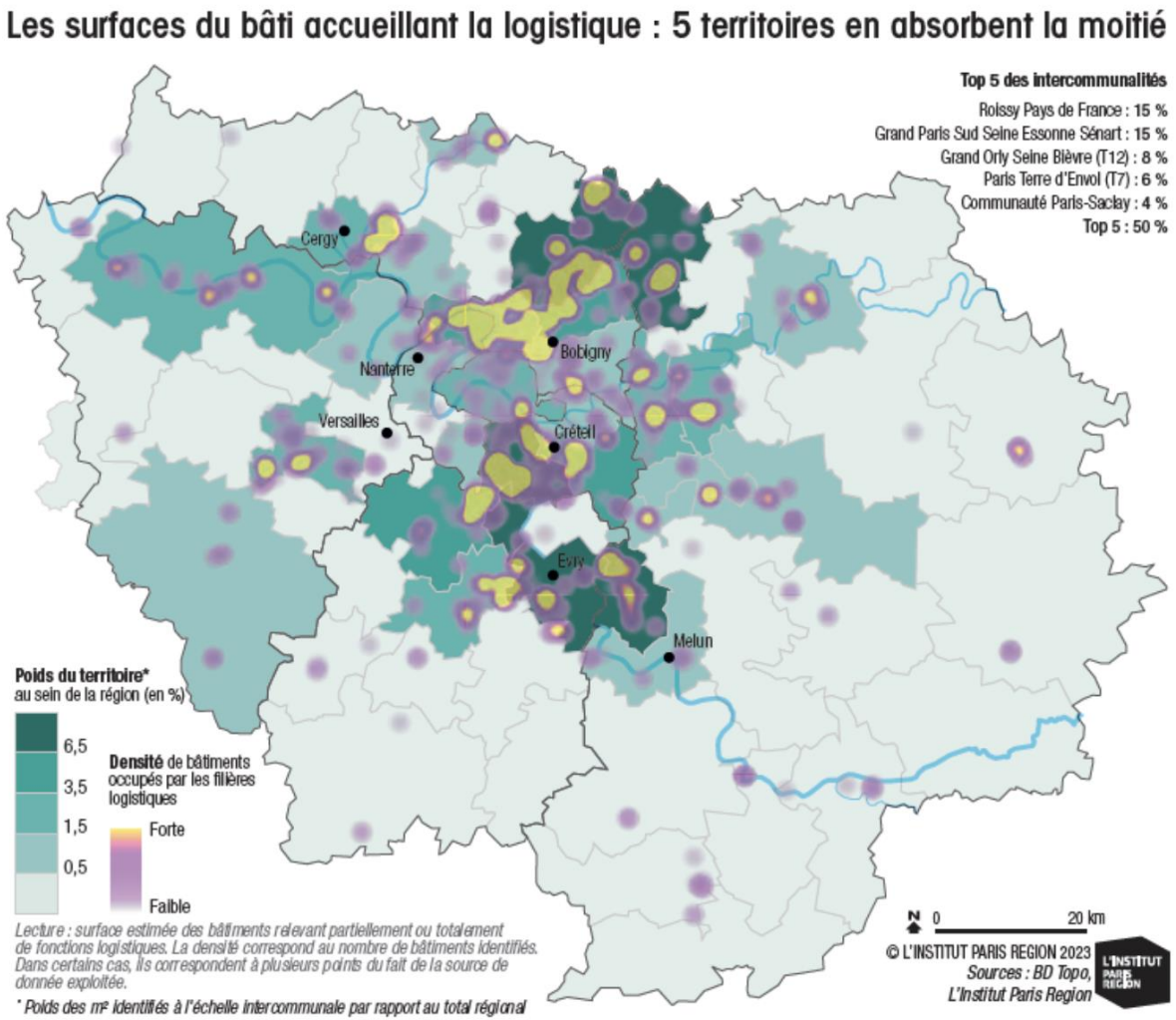
Testing new methods for WH identification: example of the Paris region

- Mixed method to identify warehouses including form recognition
- 2114 warehouses
- 1.76 warehouse per 10,000 pop: role of **gateway**
- 0.25% of total land of the region

(Chaire Logistics City, 2025)

https://rpubs.com/mohammedyounes/wh_v1
M. Younes, Chaire Logistics City, 2025

2114 warehouses dispatched on 280 municipalities



« Logistics sprawl »

Institut Paris Region, 2023

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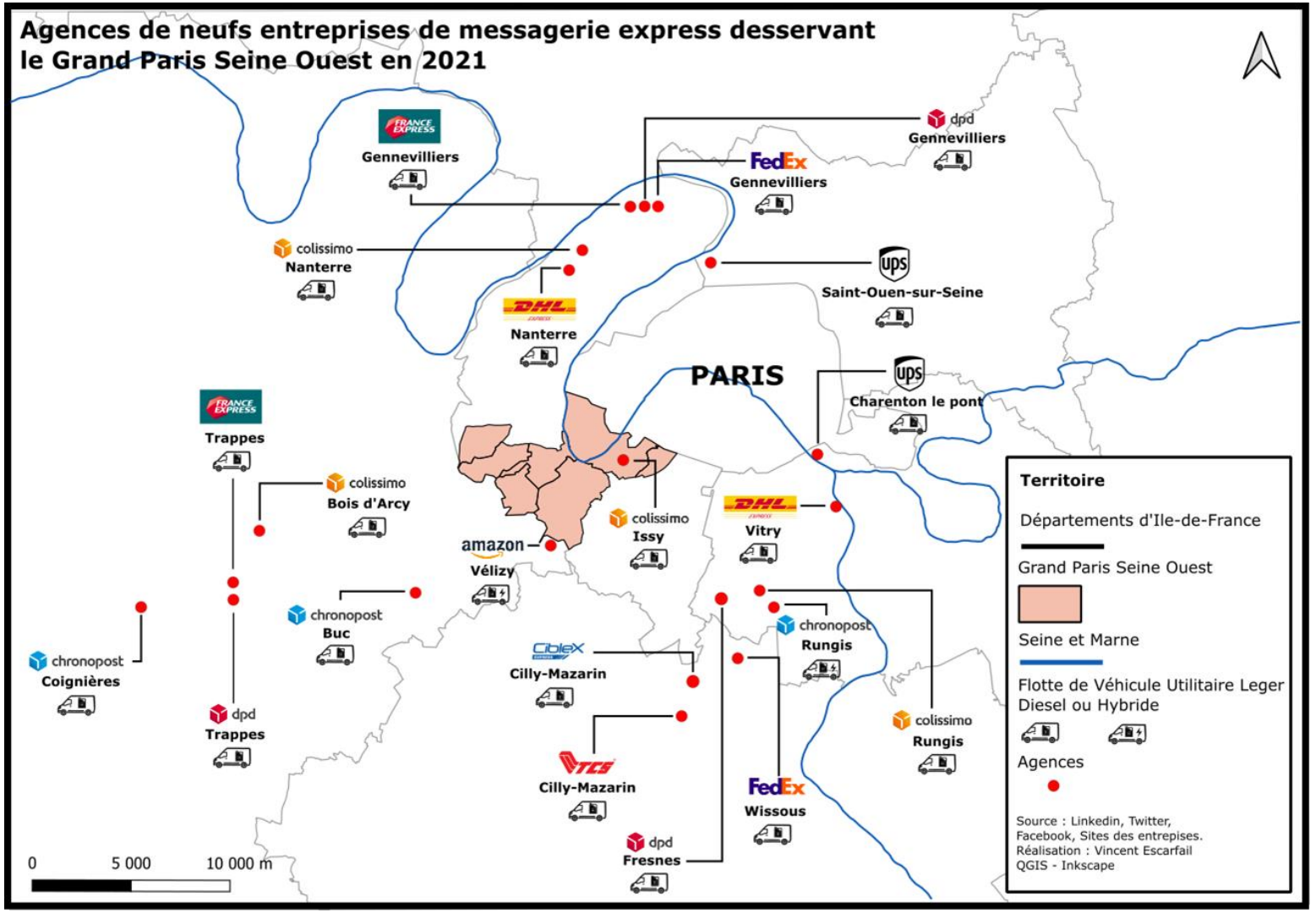
Wealthy areas served by warehouses located elsewhere: example of Paris wealthy suburbs



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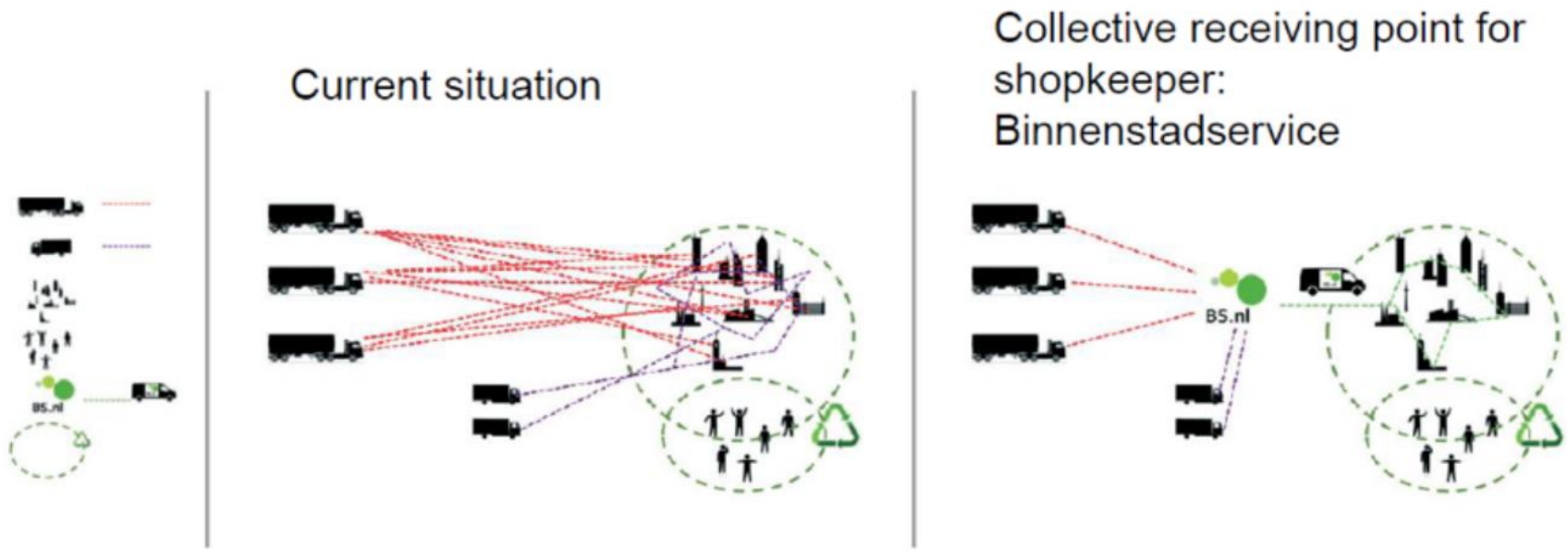
Specific formats of urban warehouses

- Urban consolidations centers (1990s – 2000s)
- Niche market of micro-hubs and urban warehouses
- Large logistics hotels
- Freight villages (2000s-2010s)

Urban consolidation centers

An urban consolidation center (UCC) is a logistics facility close to the geographic area that it serves to which many logistics companies deliver goods destined for the area, from which **consolidated deliveries** are carried out within that area



UCCs do not work very well

binnenstadservice nederland

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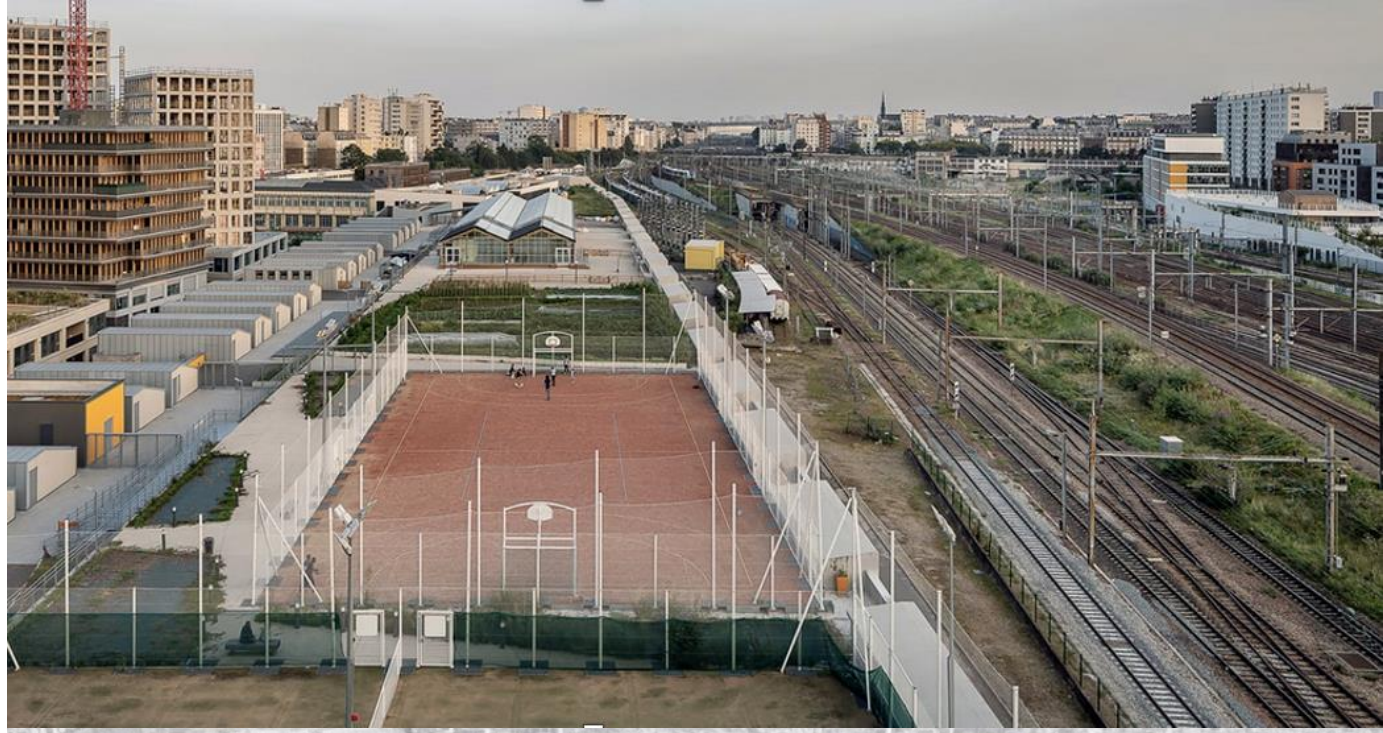
Logistics hotels

- Urban
- Multi-use
- Multi-level
- Sometimes multi-modal



Chapelle International, Sogaris (since 2018)

Connect, Prologis (under construction)

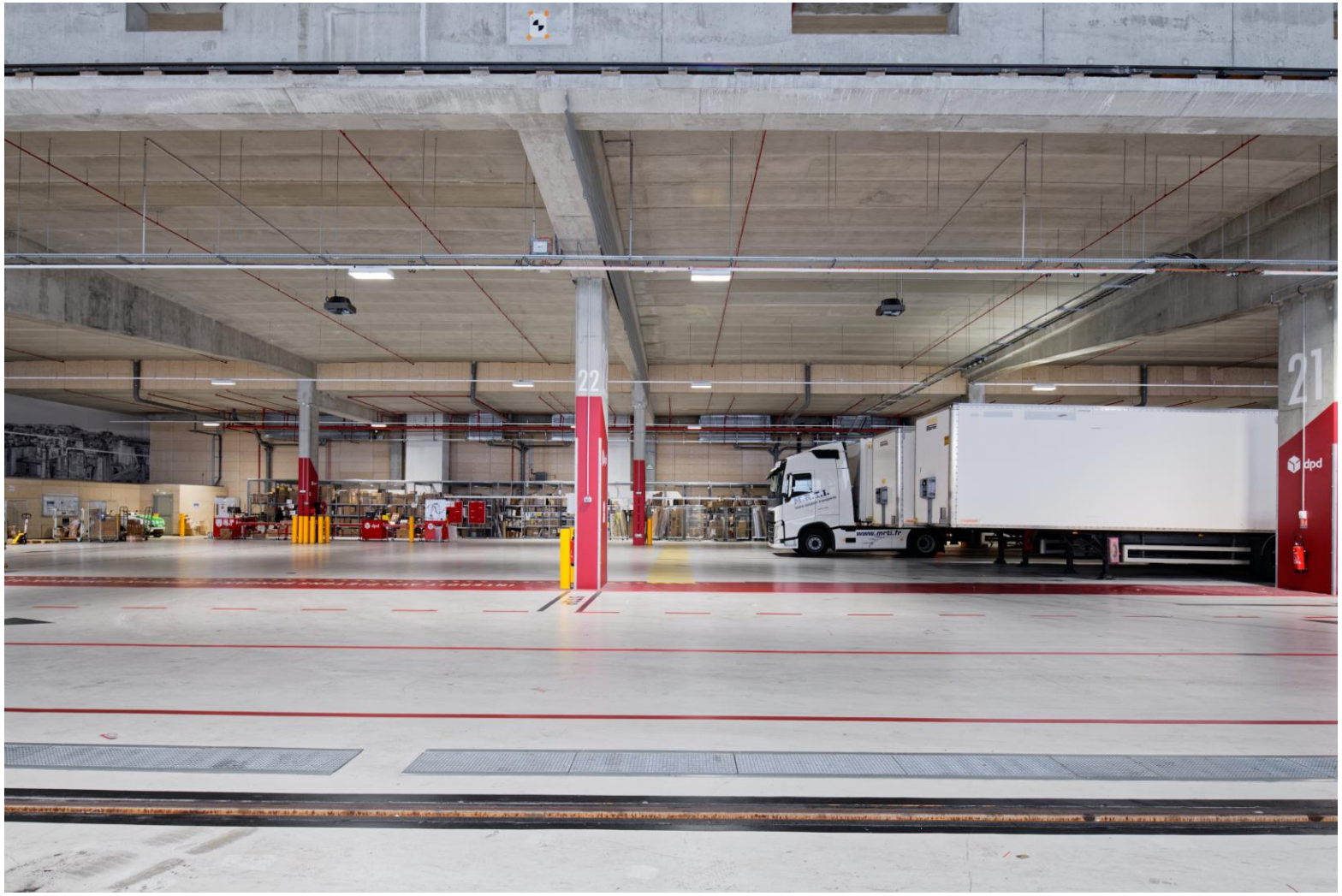
Chapelle logistics hotel (45,000 sq m)

- Recycling of a former freight rail area
- Four levels
- Multi-use: logistics, offices, data center, sports, urban farm
- Rail infrastructure (unused yet)

Hôtel logistique de Chapelle international (18e arr.) inauguré en juin 2018. © JGP

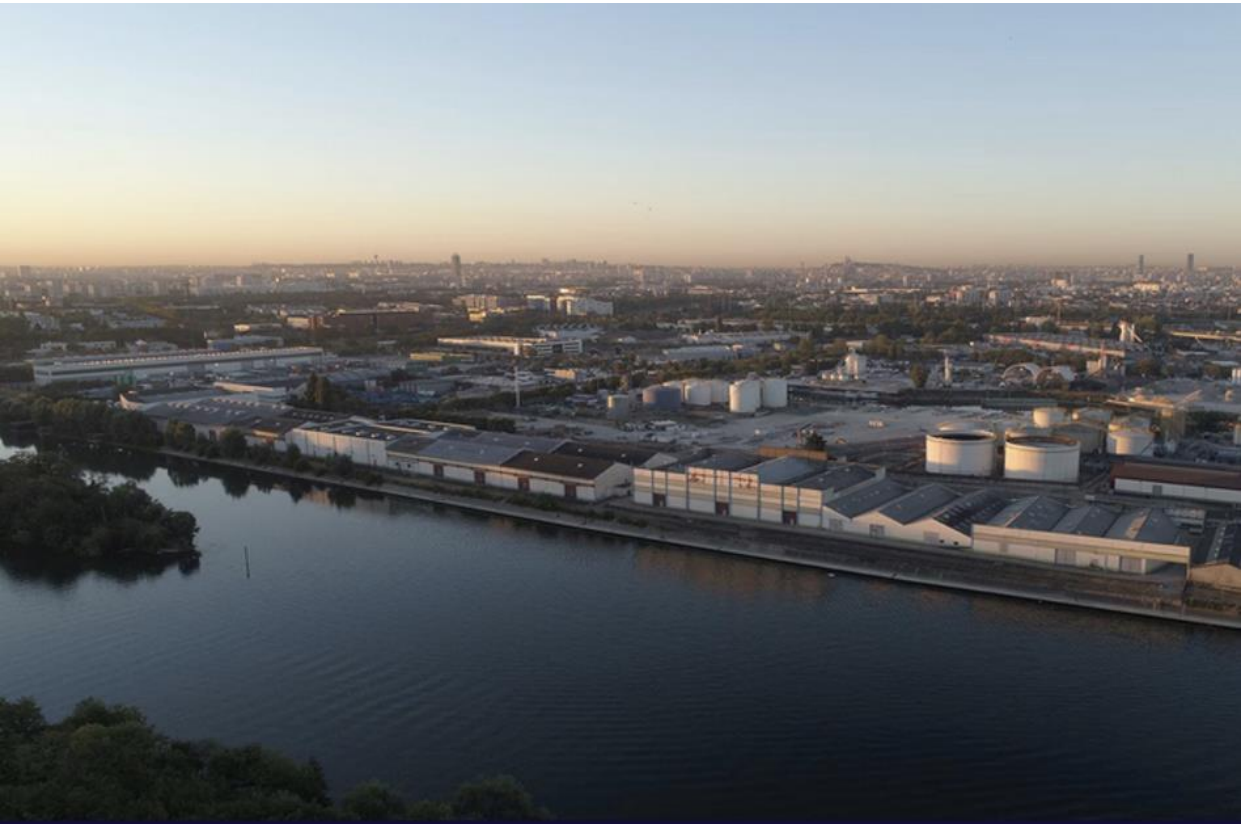
L. Dablanc

Chapelle International (logistics hotel)



Green Dock (Goodman) controversy

Today (brownfield)



Planned

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Green Dock carbon assessment

- Project in port of Gennevilliers (Haropa)
- 4 logistics levels, 93,000 m2
- Use of waterway transport
- 20,000 PV
- Current public enquiry (closing tomorrow)
- Huge local opposition (zone Natura 2000, biodiversity)

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Electric vans on the roof of an old Paris warehouse

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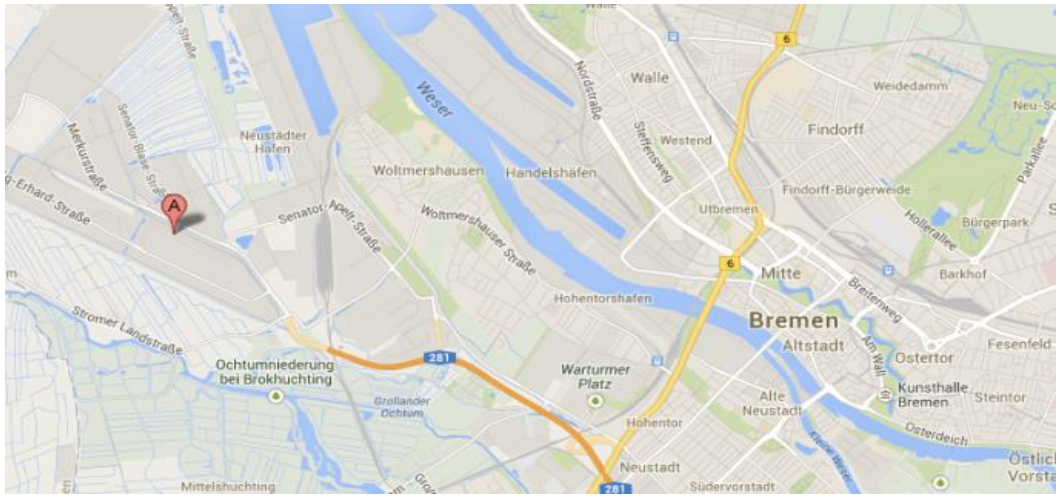
Integrated logistics parks, freight villages

A delimited set of buildings and services dedicated to logistics activities, with objectives of synergy and better efficiency
Managed by a unique entity often owner of the buildings

- *Güterverkehrszentren* (GVZ) in Germany
- *Interporti* in Italy
- *Centros de Transportes* in Spain
- *Plates-formes logistiques* in France
- *Logistics clusters*, *logistics centers*, everywhere, US
- *Logistics parks*: everywhere, a less integrated version
- *Distribution parks:* everywhere, Asia

GVZ Bremen

- A large intermodal terminal, proximity to major port, private ownership of buildings, city logistics



New urban warehouses are based on goods flow consolidation … and use of trucks

Tokyo

Brooklyn

Paris

Hôtel logistique de Chapelle international (18e arr.) inauguré en juin 2018. © JGP

‘Proximity logistics’ (H. Buldeo Rai): different functions

‘Dark stores’

‘Dark kitchens’

Urban warehouses

Logistics hotels

Urban distribution centers

Pick-up points

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Delivery services from underground municipal car parks

Under the Louvre, Paris

Louvre

Under Plaza Mayor, Madrid (FM Logistic Ibérica)

News

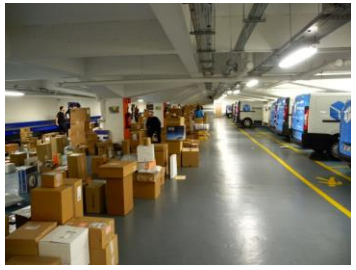
CITYLogin opens micro-hub under Madrid's Plaza Mayor

CITYLogin and Madrid's Municipal Transport Company (EMT) have inaugurated a micro-fulfilment centre under Plaza Mayor, the Spanish capital's famous main square. The 200-sqm…

On October 20, 2021

Opera

Beaugre-nelle



Concorde

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An interactive map of available logistics microhubs in London

https://crossriverpartnership.org/urban-logistics-hubs/

Urban Logistics Hubs in London

CROSS RIVER PARTNERSHIP

Delivering London's Future Together

Urban logistics hubs and micro logistics hubs play an important role in promoting sustainable and efficient freight activity in London. Their use allows goods to be rationalised and distributed via low and zero-emission vehicles for the 'last mile' of the supply chain. This **improves air quality, reduces delivery vehicle trips, and decreases traffic congestion on roads.**

Use the interactive map below to **explore potential sites that have been advertised by Local Authorities and Landowners for use as urban logistics hubs and micro logistics hubs** across central London.

Cross River Partnership (CRP) would like to recognise and thank the Central London Sub-Regional Transport Partnership (CLSRTP), and Transport for London as the funder for this online tool.

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Urban logistics hub under Paris ring-road

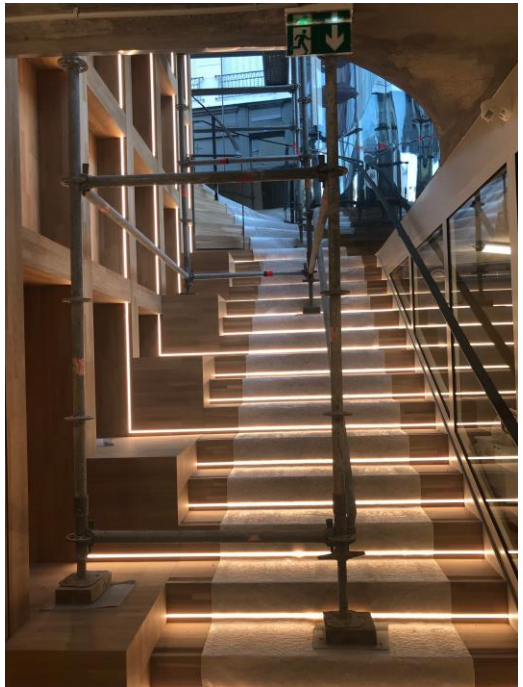
Site de logistique P4 Porte de Pantin de Sogaris - Architecte Syvil

City of Paris

Luxury urban logistics facilities

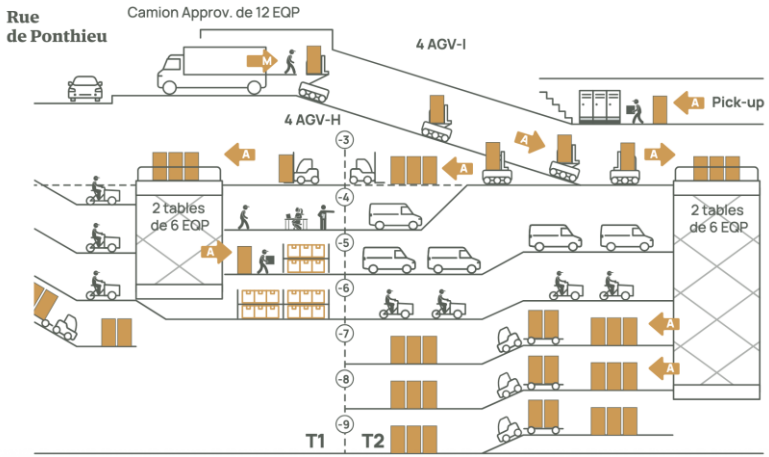
- Atelier Logistique (10,000 m2) rue de la Boétie
- Arsenal de Foch (parking Indigo avenue Foch, 12,000 m2)
- Grenier St Lazard by Pompidou center

Grenier St Lazard (Paris 3rd)



Arsenal de Foch

Atelier Logistique



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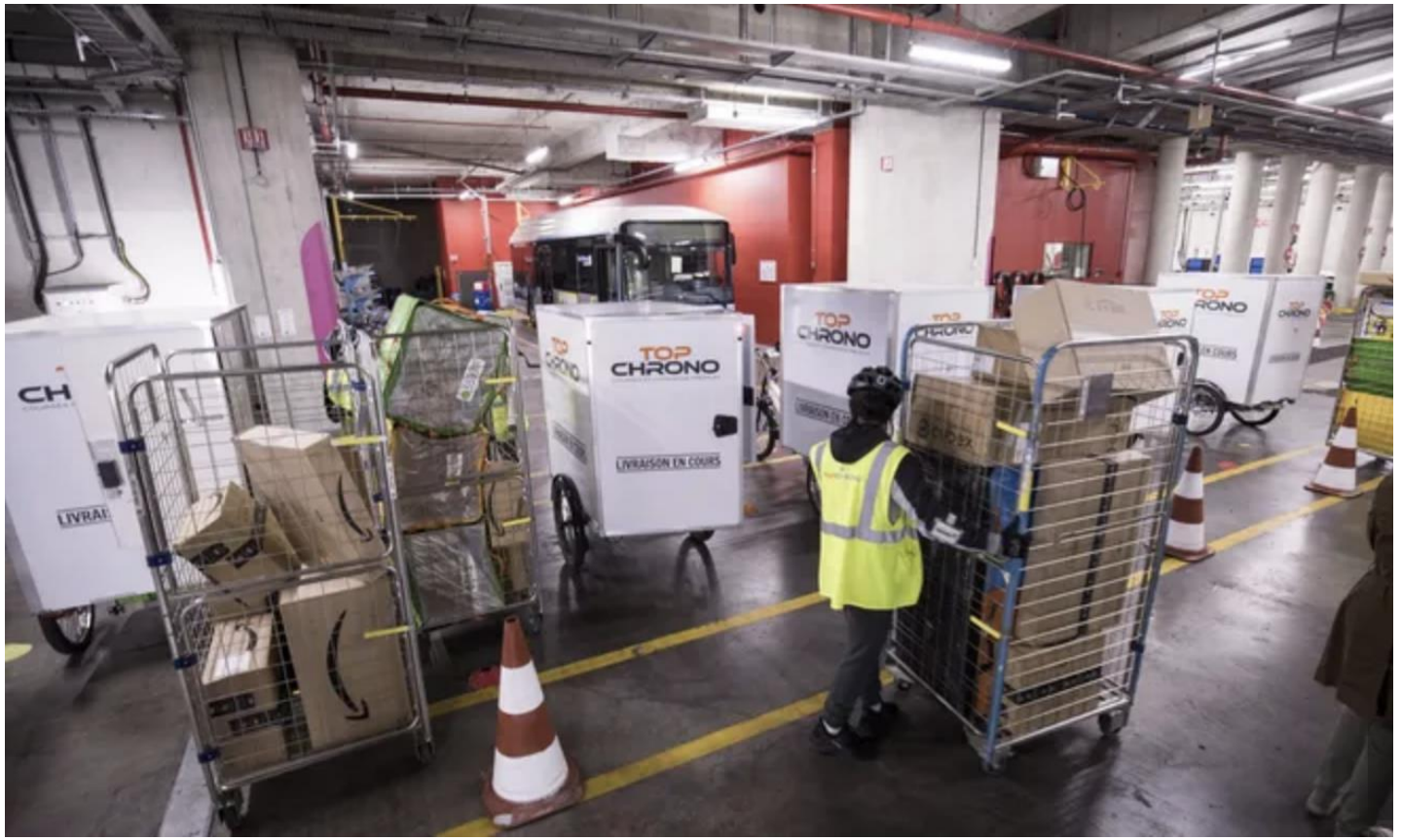
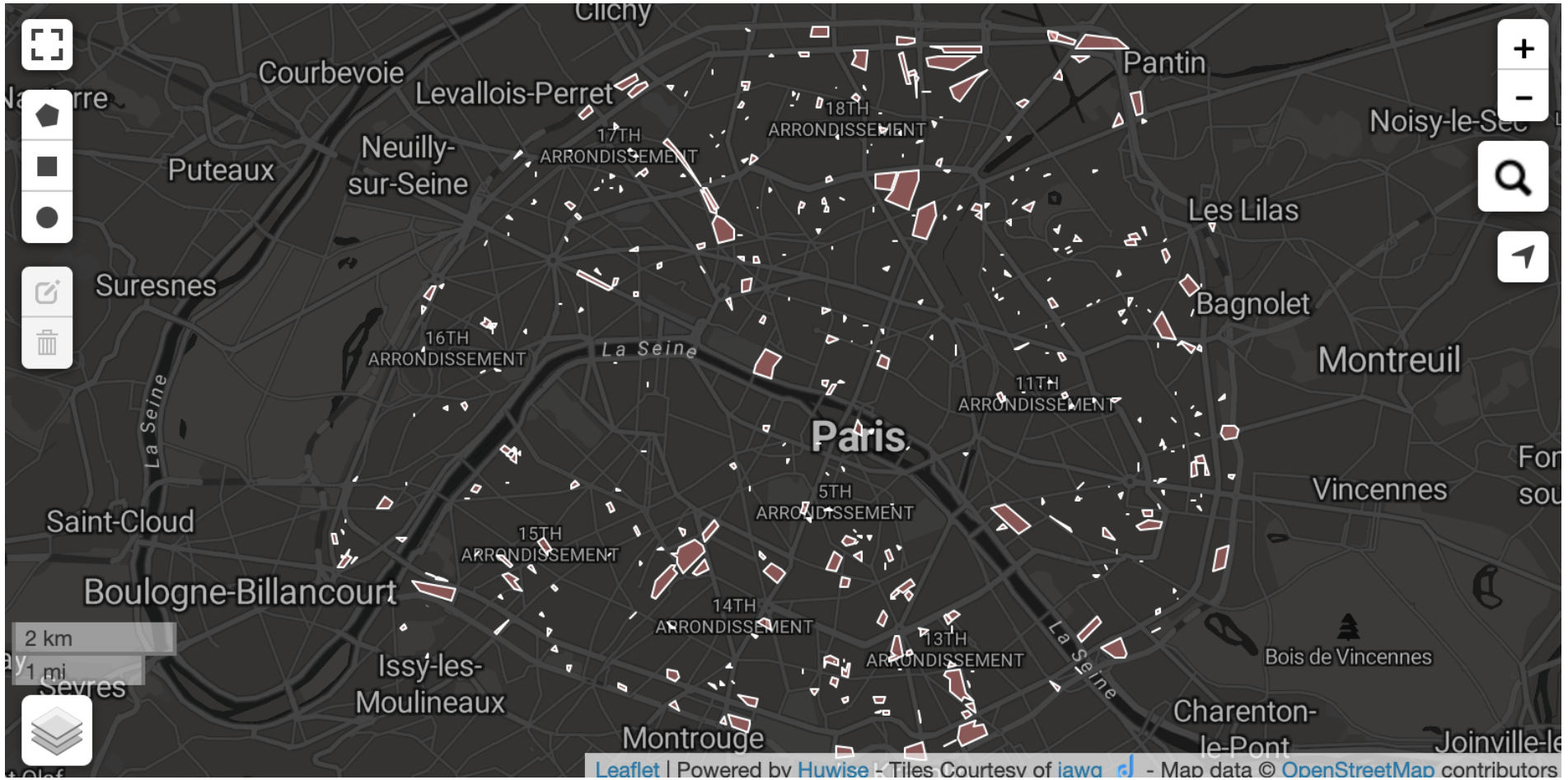
« Time-sharing »

Amazon, Paris
use of of three bus garages during the day



L. Dablanc

Zoning ordinance of Paris: promoting/obliging the implementation of logistics facilities



P 9-11

n_sq_ple
100 259

arrondissement
9

perimetre
P 9-11

a04_dest
Equipement de logistique urbaine de 800 m² minimum

a04_loc
2-20 rue Bruno Coquatrix; 16-30

https://opendata.paris.fr/explore/dataset/plub_plocequi/map/?basemap=jawg.dark&location=12,48.85853,2.33559

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150 land parcels with a compulsory logistics hub in any development project

ANNEXE IV Périmètres de localisation d'équipements

2e	P 2-8	Équipement de santé	32 rue Dussoubs
3e	P3-1	Équipement de logistique urbaine de 800 m² minimum	36 à 56 rue Rambuteau 154 à 188 rue Saint-Martin 11 à 17 rue du Grenier Saint- Lazare 21 à 33 rue Beaubourg
3e	P3-2	Équipement de petite enfance	64 rue de Saintonge
3e	P3-3	Équipement de sécurité	14 rue Perrée 2-4 rue Paul Dubois 1-3 rue Gabriel Vicaire

Extrait de l'Annexe IV

Warehouse Policy Index
1. Selection of ten indicators linked to public policies

- Number of warehouses per capita
- Index of logistics sprawl (change in average distance of warehouses to their barycenter)
- Index of warehousing clustering
- Index of accessibility of warehouses to public transport (bus, train, subway stations)
- Index of accessibility of warehouses to highway entrances, key freight infrastructure and intermodal facilities
- Differential of warehouse rental prices between center and periphery
- Breakdown of warehouses per category (storage/distribution, cold)
- Index of verticality (average number of building levels)
- Truck traffic generated by warehouses in an urban region
- Share of warehouse rooftop area covered with solar panels

2. Relationship between indicators and public policies

INDICATOR	MEANING OF INDICATOR	POLICIES INVOLVED
Number of warehouses per capita	• Contributes to building a knowledge base for a freight or master plan diagnostic • Over a certain number of warehouses per capita (eg 1 for 10,000), city defined as a "logistics gateway" playing a logistics role that is national or international	• Spatial planning, zoning • Contributes to the integration of logistics issues into spatial planning and zoning • Being a logistics gateway can be an opportunity (economic gains and jobs come with supply chain efficiency) and a threat (additional freight trips)
Logistics sprawl (change in average distance of warehouses to their barycenter)	• Can be used to identify potential risks and mitigation strategies • eg a loss of warehouses in dense areas can increase difficulties to serve new markets and urban logistics services (cycle-logistics, circular economy) • LS ratio compared with "residential sprawl" (decentralization of homes) and "economic sprawl" (decentralization of activities): if LS higher than economic and residential sprawls, potentially longer delivery routes	• Transportation planning, spatial planning • Awareness on the need to reduce truck traffic, leading to policies such as road pricing • Potential sign of overconsumption of land for warehouses, leading to policies such as "zero net land take" and logistics clustering ("freight villages")

Accessibility of warehouses to public transport	• Can reduce the use of cars by warehouse workers, improve service and working conditions, increase attractivity of logistics jobs for young workers	• Planning and transportation policies and economic development policy • Access to transit can increase the attractivity of a region for logistics developers
Truck traffic generated by warehouses in an urban region	• Average number of trucks and vans in and out of a warehouse and average distances covered • Can require costly empirical surveys or company interviews • Automated collection of truck traffic data from technology	• Environmental policy • Calculating emissions from regional freight traffic generated by warehouses can serve an environmental policy
Share of warehouse roof area covered with solar panels	• Photovoltaic on warehouse roofs provides electricity for self-consumption, neighbors or to the grid • Indicator better calculated in the future with satellite imagery data analytics methods	• Environmental policy • Can represent a useful contribution to national or regional policies aiming at a transition to cleaner energy

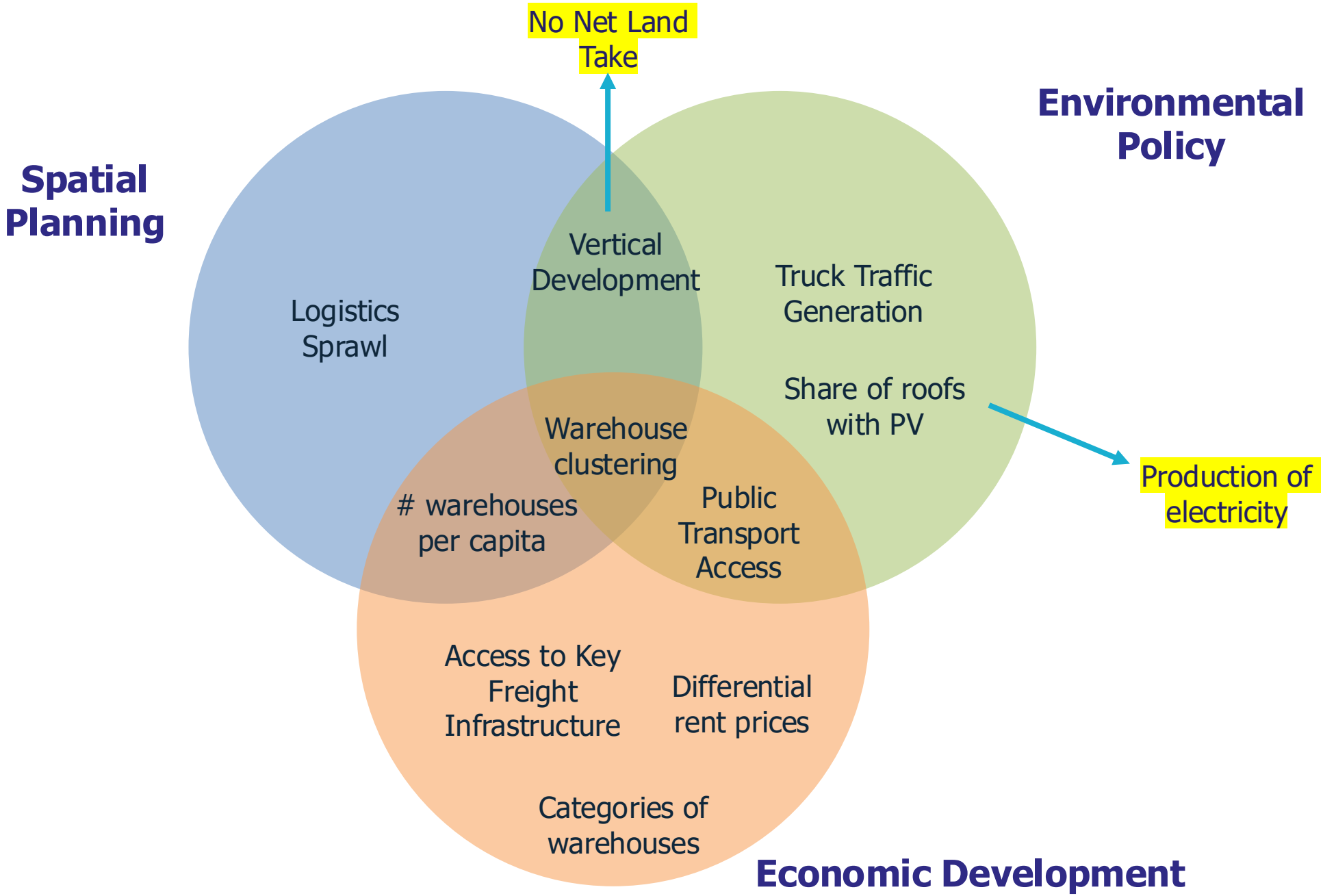
Breakdown of warehouses per category	• Type (industrial or consumer logistics, e-commerce logistics, agriculture logistics, etc.) of WHs in a region • Subset indicator: average size of warehouses per category	• Economic development policy, benchmark with other regions • A low average size may signal lack of modern warehouses
Verticality or average number of warehouse stories	• A high number of multi-story warehouses = reduced land take • Shows architectural innovation	• Planning policy can promote verticality as a way to reduce land consumption due to logistics development
Truck traffic generated by warehouses in an urban region	• Calculating the average number of trucks and vans in and out of a warehouse and average distances	• Calculating emissions from regional freight traffic generated by warehouses can serve an environmental policy
Warehousing clustering	• Clustering of warehouses in logistics parks increases quality of services to park users and concentrates truck-miles travelled to a few corridors • Clustering provides more opportunities to use multimodal transport, reducing the use of road transport	• May indicate regional oversight over local land use decisions related to large warehouses • Can be linked to policies aimed at environmental justice.

3. Warehouse Policy Index framework

- Calculate the ten indicators for a city
- Grade them (1 to 4)
- Compound (or not) the grades for each policy (Spatial Planning, and/or Economic Development and/or Environmental Planning) and for all policies

Provides a general assessment of the readiness and direction of local public policies regarding logistics developments

To be used to compare cities?


No Net Land Take
Spatial Planning
Environmental Policy
Vertical Development
Logistics Sprawl
Truck Traffic Generation
Share of roofs with PV
Production of electricity
Warehouse clustering
warehouses per capita
Public Transport Access
Access to Key Freight Infrastructure
Differential rent prices
Categories of warehouses
Economic Development

Policy of ‘no net land take’

- Logistics = 0.78% developed land in France
- Development on greenfields reduces biodiversity and infiltration of rainwater
- 2021 EU strategy for soil protection: objective of “no net land take" by 2050
- Became a law in France with intermediate objective by 2030
  - Regional master plans identify targets for local zoning plans
- Logistics not a formal target but frequently discussed
  - Logistics development industry sees no net land take as both a threat to future developments and an opportunity to innovate
  - Innovation includes the use of industrial and retail brownfields, underused urban areas such as former parking lots or gas stations and vertical or underground logistics facilities

Regulation of the production of green energy by use of warehouses

- Warehouse rooftops seen as available surfaces for solar panels and vegetation
- Payback time of zero to 11 years (Grebski, Maryniak, 2020) for the investor
- 2022 EU initiative to accelerate use of the "vast and underutilized potential of rooftops to produce clean energy"
- **French code of construction: 30% cover (40% in 2026 and 50% in 2027) with solar panels or vegetation** of new commercial, industrial and logistics rooftops + parking facilities
    - According to industry: 50 million sq ft of warehouse rooftops could be covered between 2023 and 2028 (AFILOG, 2023)
- Aligns with industry's long term objectives of reduction of energy costs while in the short-term introduces architectural constraints and costs

Conclusion on spatial patterns and warehouses

- A very active real estate market with huge impacts on freight transportation
- A new niche market in central areas can help consolidate freight operations and reduce freight veh-kms and reduce warehousing spatial footprint
- Need for zoning plans and architectural innovation
- A Warehouse Policy Index can indicate the readiness, direction or performance of a local policy and provide elements for comparisons

Ressources

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