CAMERA DI COMMERCIO MILANO MONZABRIANZA LODI

i-LOG UNIVERSITÀ LIUC

ALSEA ASSOCIAZIONE LOMBARDA SPEDIZIONIERI E AUTOTRASPORTATORI

The Attractiveness of the Milanese Logistics Region in comparison with Europe

Scope of the Research

- The main purpose of the study is to analyze the evolution of the logistics and transport sector within the Logistics Region of Milan (RLM), comparing it with the main European logistics systems: Île-de-France, North Rhine–Westphalia, and Catalonia.
- The goal of the research is not only to describe how the sector has evolved, but also to provide public authorities with a knowledge base and strategic framework to design policies that support and promote initiatives extending beyond purely infrastructural aspects.
- The aim is to address themes linked to territorial planning, location strategies, and the efficiency of services offered by the Lombardy logistics system as a whole.
- This is the real challenge the RLM faces, and these are the aspects the study aims to highlight by measuring the RLM's "competitive distance" from the main European logistics clusters.

A Project by Camera di Commercio di Milano, Monza Brianza e Lodi

In collaboration with Logistics & Supply Chain Center (i-LOG), LIUC – Cattaneo University

With the support of ALSEA – Freight Forwarders and Road Transport Association of Lombardy

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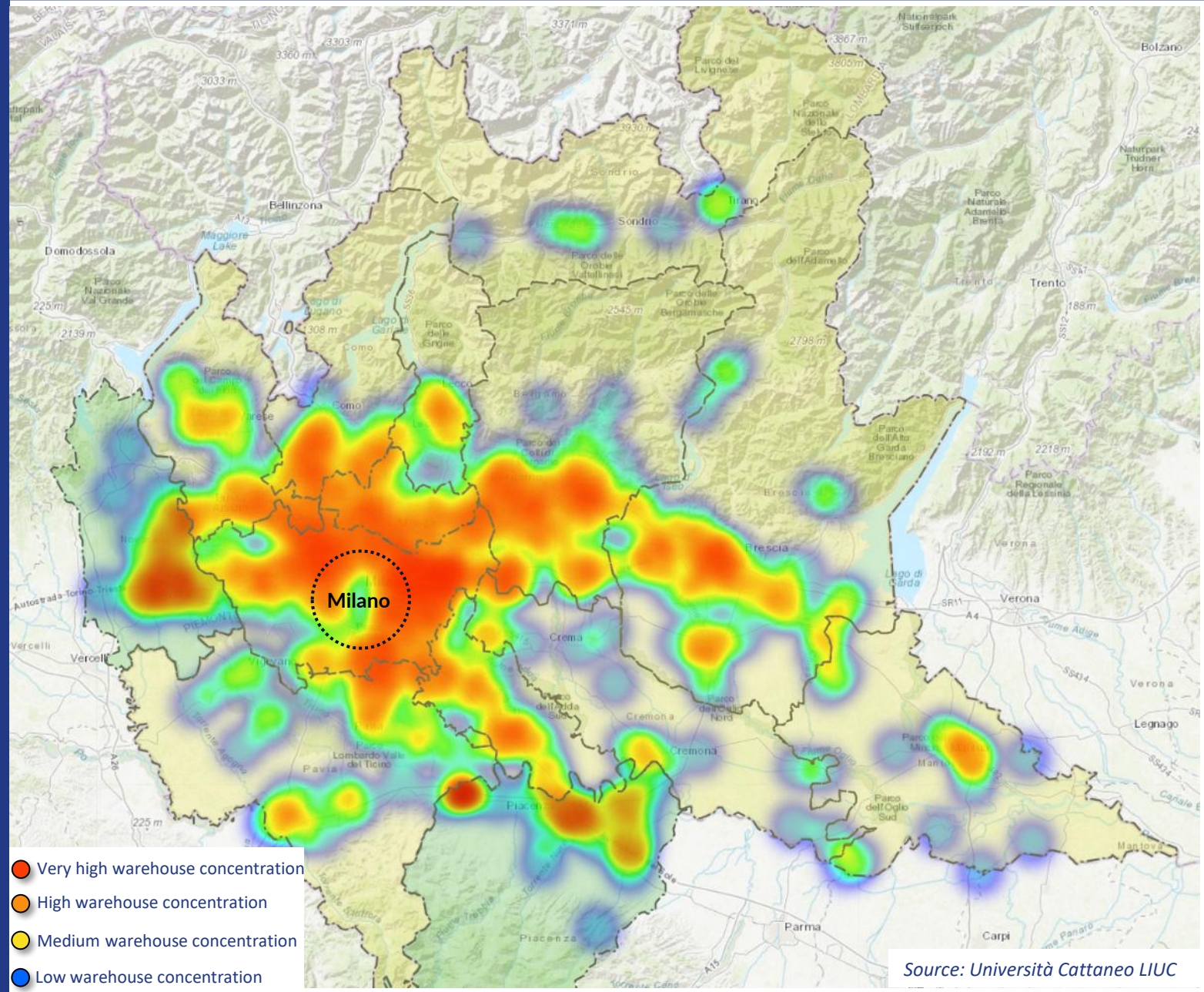
1. The Logistics Region of Milan (RLM)



Source: Università Cattaneo LIUC

- The Logistics Region of Milan (RLM) is defined as the area that includes the province of Milan, along with ones of Monza and Brianza, Lodi, Pavia, Bergamo, Brescia and, partially, the provinces of Como, Lecco, and Varese.
- Its boundaries extend beyond the administrative borders of the Lombardy Region, stretching west along the A4 towards Novara and south along the A1 towards Piacenza, whose logistics activities are closely connected to Lombardy's economic system.
- The RLM is characterized by a high concentration of logistics companies and their warehouses and distribution platforms. The figure on the side shows the heatmap of logistics warehouses within the RLM.

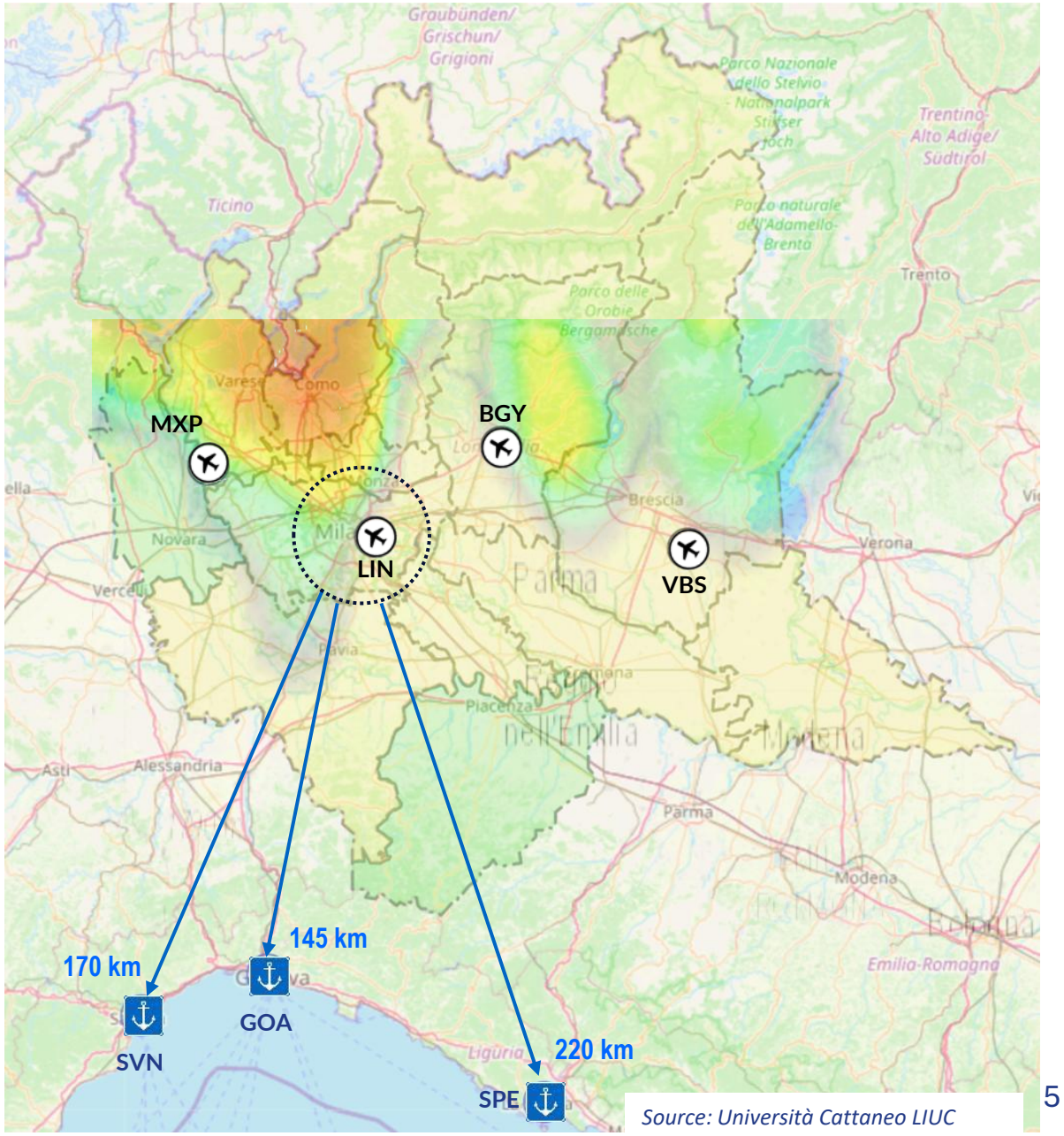
1. The Logistics Region of Milan (RLM)

In particular, beyond the regional borders are located:

- **The "Le Mose Logistics Hub" near Piacenza**, which hosts some of the most important logistics operators in Italy, including IKEA's warehouses serving Italy and Southern Europe, as well as Amazon's main Italian fulfillment center, where the company established its first warehouse in the country. The Piacenza intermodal terminal, operated by Hupac, offers services to Belgium, Poland, and Germany.
- **The Novara area**, selected by major logistics players due to the presence of the Novara freight village managed by Hupac. The freight village is strategically located along the "Rhine–Alpine Corridor," providing access to Northern Europe via the Simplon and Lötschberg routes, and ensuring numerous rail connections with Germany, France, the Netherlands, and Belgium.

International connections are guaranteed by:

- **4 airports**: Milan Malpensa (MXP), Milan Linate (LIN), Bergamo Orio al Serio (BGY), Brescia Montichiari (VBS);
- **3 seaports reachable within 4 hours by truck**, each with its own container terminal: Genoa (GOA), Savona (SVN), and La Spezia (SPE)



Source: Università Cattaneo LIUC

1. RLM's Key numbers

The RLM is characterized by being:

- A densely populated area (383 inhabitants/km²), with the highest concentration along the East–West axis (Brescia–Bergamo–Milan–Novara), to the North (Milan–Varese and Milan–Como–Lugano), and to the Southeast (Milan–Lodi–Piacenza).;
- A GDP at current prices of EUR 517.5 billion in 2024 (approximately 24% of Italy's total GDP) and a per-capita GDP of EUR 48,500, higher than both the Italian average (EUR 36,100) and the EU-27 average (EUR 38,100).
- A strong presence in international markets, as demonstrated by its high level of trade openness (Exports + Imports over regional GDP), which is close to 70% (Italy: 57.2%).
- A key hub for national logistics flows for:
  - ✓ the scale of the goods handled, both in value and volume;
  - ✓ the organizational role played by logistics and freight forwarding companies in the area;
  - ✓ the high density of warehouses and logistics-dedicated infrastructures (e.g., intermodal terminals).

Indicators	Value
Area (km^2)	27.772
Built-up Area (km^2)	3.055
Population (thousends)	10.662
Population Density (Inhabitants/km^2)	383
GDP per Capita (EUR x 1000)	48,5
Trade Openess (Exports+ Imports/ GDP)	70%
Manufacturing GDP / GDP at Current Prices	17%

Source: Istat, Camere di Commercio 2024, Copernicus anno 2018

1.1 Logistics Infrastructure Endowment

The availability and quality of network and node infrastructure (roads, motorways, railways, freight villages, rail terminals, airports, and ports) are among the key conditions for fostering territorial growth. They determine the level of accessibility to and from various origins and destinations, both in terms of the number of available transport services across different modes and in terms of their cost and quality. This assessment also includes negative externalities such as air and noise pollution, congestion levels, and accident rates.

Connections are ensured:

- By a dense network of road and rail infrastructure, linking the RLM both to other Italian regions and to European countries, particularly along the North–South axis through the Gotthard and Simplon passes;
- By a set of gateway nodes, acting as interfaces between RLM markets and national and international markets. Examples include:
  - **Milan Malpensa Airport**, by far the leading Italian hub for air cargo;
  - **The 13 intermodal terminals**, including those in Novara and Piacenza;
  - **The ports of Genoa, La Spezia, and Savona**, which serve as access points to North American and Far Eastern markets.

Indicators	Unit of Measure	Value
Motorway network length	km	928
Electrified double-track railway	km	1.070
Total area of third-party logistics warehouses	Mln m^2	19,5
Intermodal terminal capacity	Mln UTI/year	2,1
Cargo handled in *cluster* ports (2024)	mln TEU/year	4,1
Cargo handled in *cluster* airports (2024)	x 1000 Ton/Year	795
Revenue of the top 100 T&L companies	Mln.EUR	22.140
Number of LNG refuelling stations (heavy vehicles)	units	31
Number of fast EV charging stations (>50 kW)	units	3.654

Source: Istat, Camere di Commercio, GibGas, EcoMovement, Assoporti, Assoaereoporti

1.1.1 Road Infrastructure

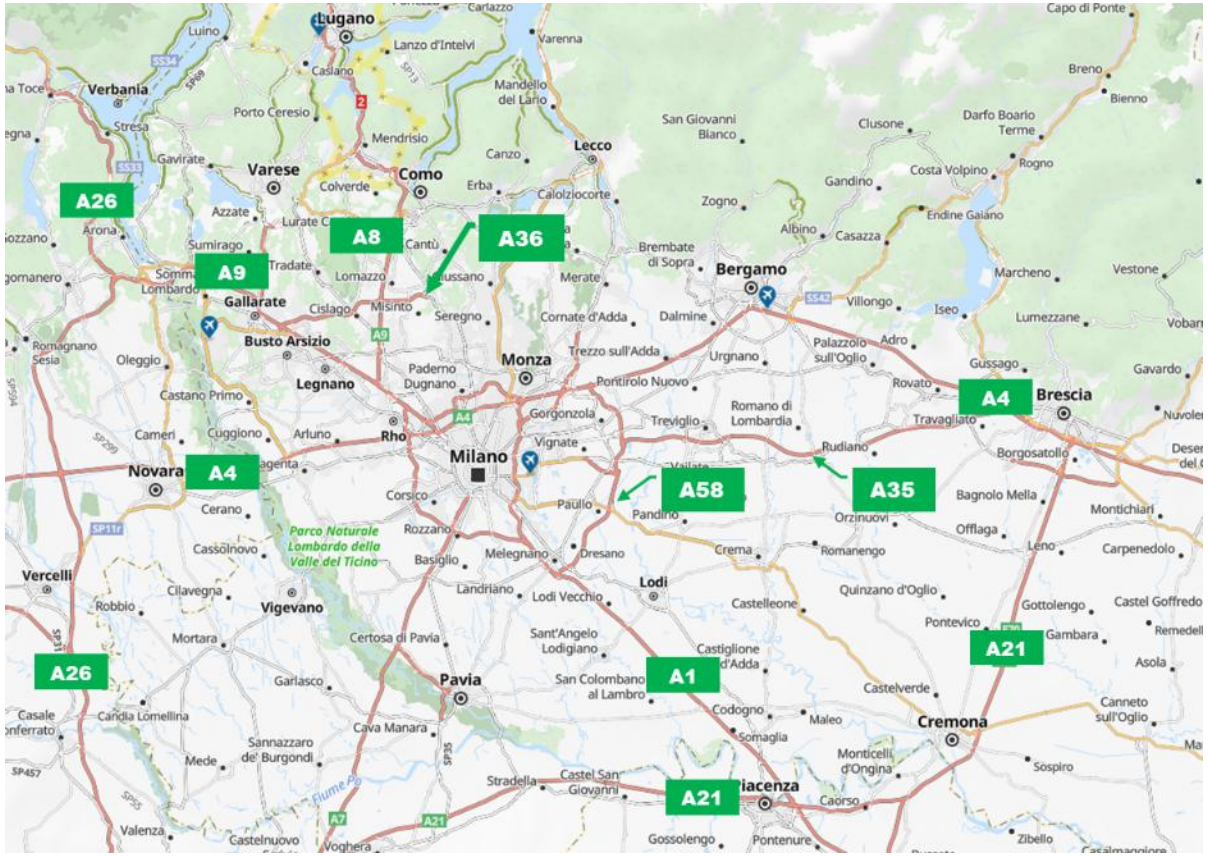
Based on data provided by the “Conto Nazionale dei Trasporti”(2022–2023), Lombardy’s road system consists of:

- **740 km of motorways;**
- **2,183 km of state roads;**
- **10,019 km of regional and provincial roads.**

In addition, the following contribute to the network:

- **Piacenza**: 87.6 km of motorways, 262 km of state roads, and 960 km of regional and provincial roads;
- **Novara**: 103 km of motorways, 59 km of state roads, and 778 km of regional and provincial roads.

RLM: Motorway Infrastructure



Note: A35: BreBeMi; A36: Pedemontana; A58: TEEM-Tangenziale Est Esterna Milano.

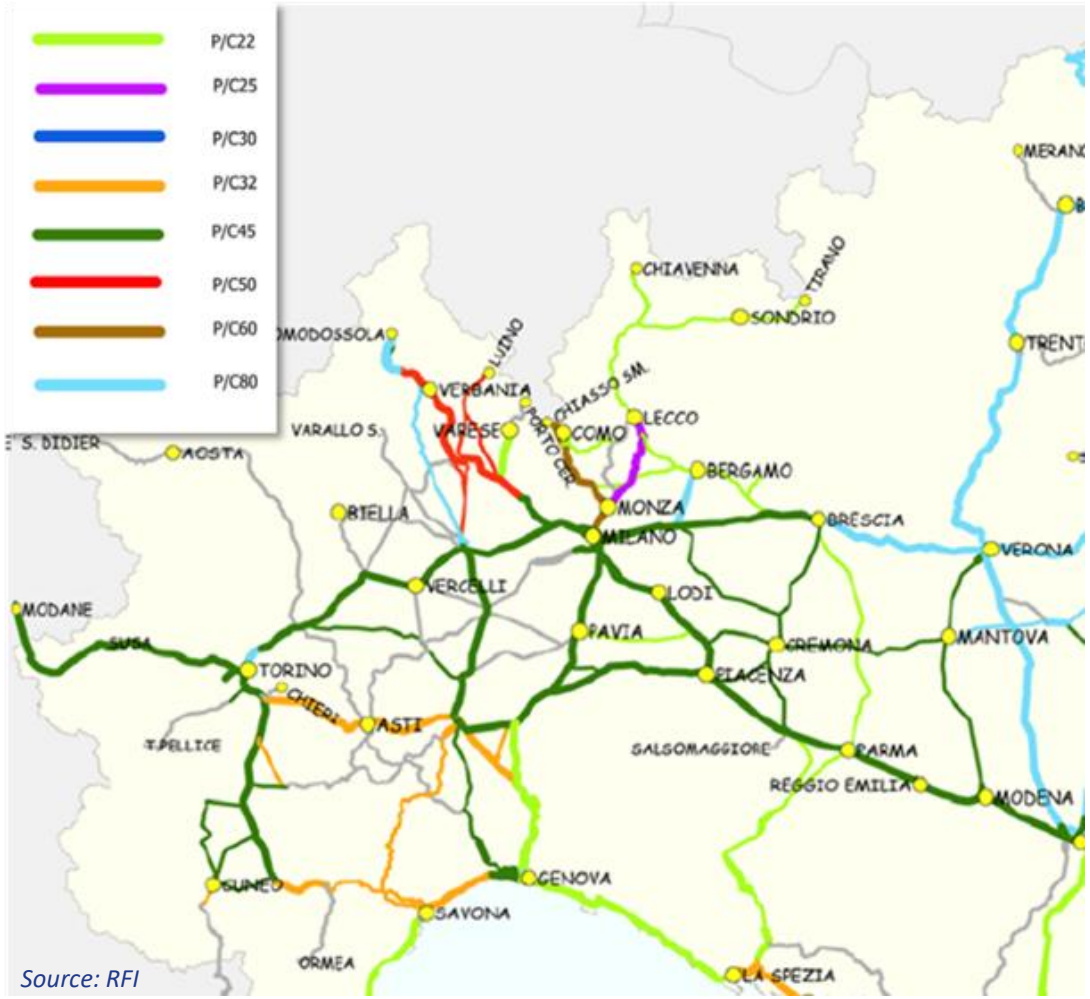
Source: ViaMichelin, anno 2024

1.1.2 Rail Infrastructure

The key railway lines for freight transport are:

- The conventional cross-country line Turin–Milan–Venice–Trieste, along TEN-T Corridor No. 3 (the Mediterranean Corridor);
- The cross-border lines Lugano–Chiasso–Como–Milan and Luino–Gallarate–Milan, both originating from the Gotthard pass.
- The Milan–Lugano axis is the main corridor connecting Lombardy with Switzerland and Northern Europe (Germany, Belgium, and the Netherlands);
- The Milan–Piacenza–Bologna line, connecting to Southern Italy;
- The Milan–Gallarate–Sesto Calende–Domodossola line, which leads to the Simplon and Lötschberg passes and thus towards Northern France;
- The Milan–Pavia–Tortona–Genoa line, a crucial connection to the Ligurian port system.

Loading gauge limits on the main railway routes of Northern Italy



Source: RFI

The coding of the lines consists of a letter — C (swap bodies), P (semi-trailers on Poche wagons), W (semi-trailers on Wippen wagons) — and a number ranging from 00 to 80 for units with a width below 2,500 mm, and from 330 to 410 for units with a width between 2,500 and 2,600 mm. For example: P/C80 = unit with a maximum width of 2,500 mm and a height of 3,300 + 800 = 4,100 mm;P/C365 = unit with a width between 2,500 and 2,600 mm and a height of 3,650 mm.

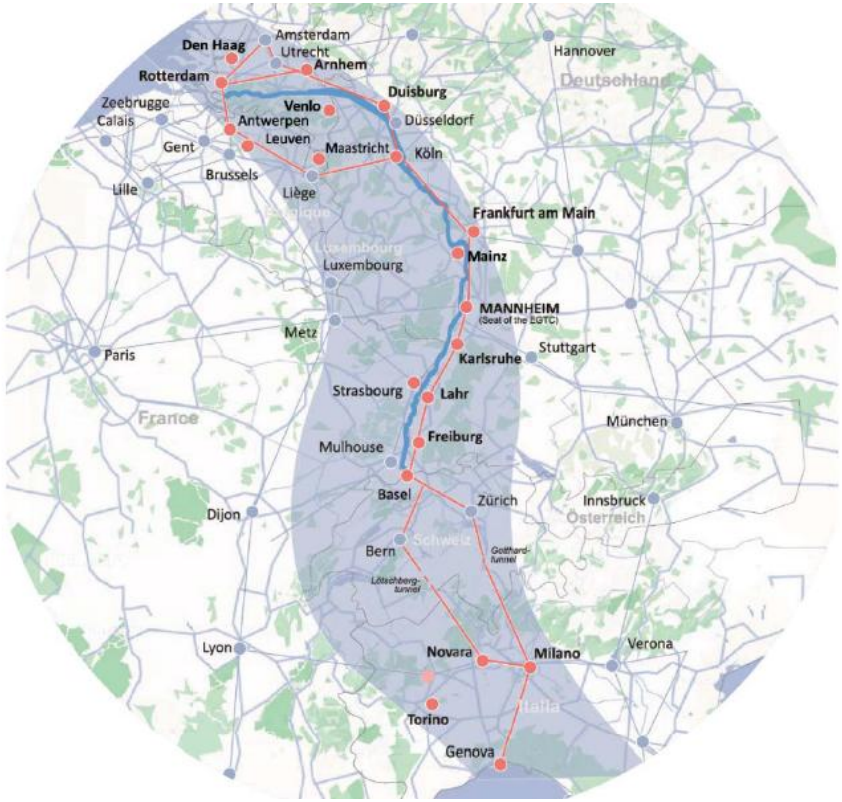
1.1.2 TEN-T Railway Networks

The RLM area is also crossed by two European transport corridors (TEN-T Networks):

- **«Mediterranean» Corridor:** the main European East–West axis, connecting Spain (Algeciras) with the border between Hungary and Ukraine (Zahony). The corridor includes the railway line running from Turin to Trieste before entering Slovenia.

Source: https://www.medrfc.eu/

- **«North Sea–Rhine–Mediterranean» Corridor:** this corridor connects Rotterdam/Antwerp with Genoa, passing through North Rhine–Westphalia, Frankfurt, and Mannheim, and then crossing Switzerland along two routes that reach the Simplon and Gotthard passes, ultimately connecting to Novara and Milan. The lines Genoa–Savona, Genoa–Tortona, and Gallarate–Luino are also included.

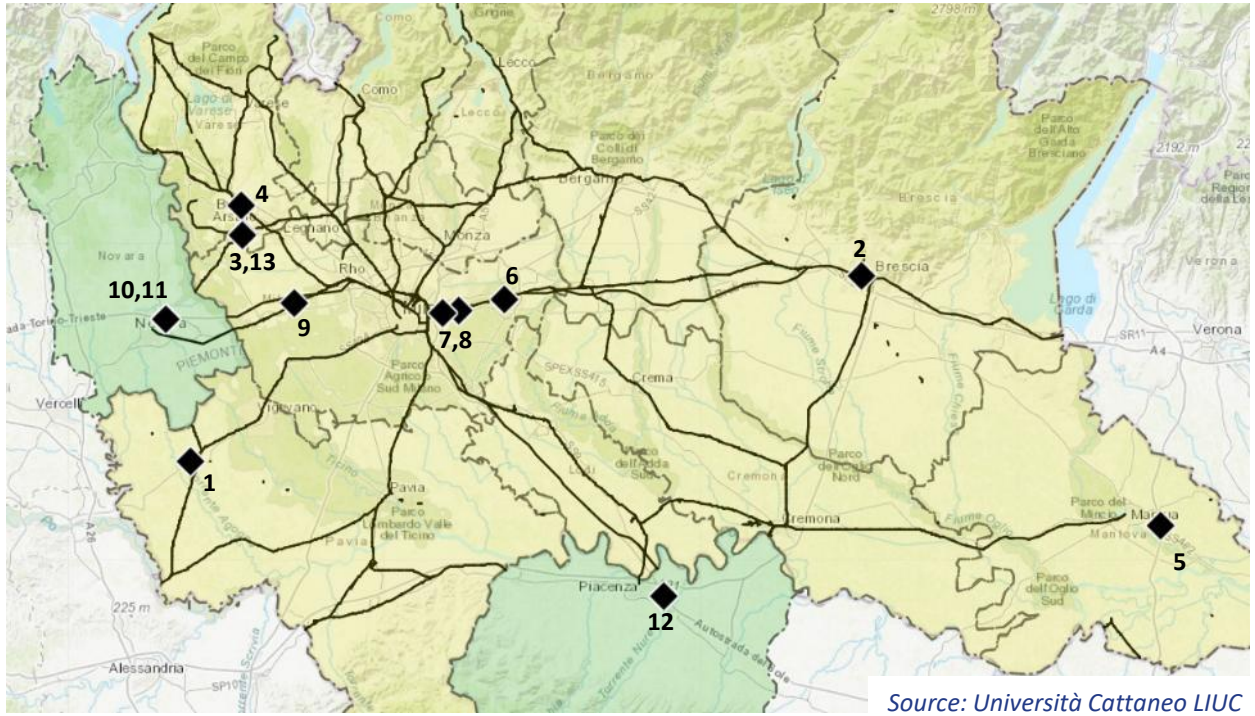


Source: https://www.egtc-rhine-alpine.eu/

1.1.3 Intermodal Rail-Road Terminals in the RLM

- There are currently **13 intermodal freight villages** operating within the RLM, offering regular services on both national and international routes. The growth of intermodal traffic has created the need to upgrade existing facilities or build new ones, resulting in a total handling capacity of 2.1 million UTI/year

- The largest ongoing investment concerns the upgrade of the Milano Smistamento terminal, involving an investment of EUR 115 million, with financial participation from the Swiss Government. The terminal will be operated by TerAlp, a company jointly owned by FS Logistics and Hupac.



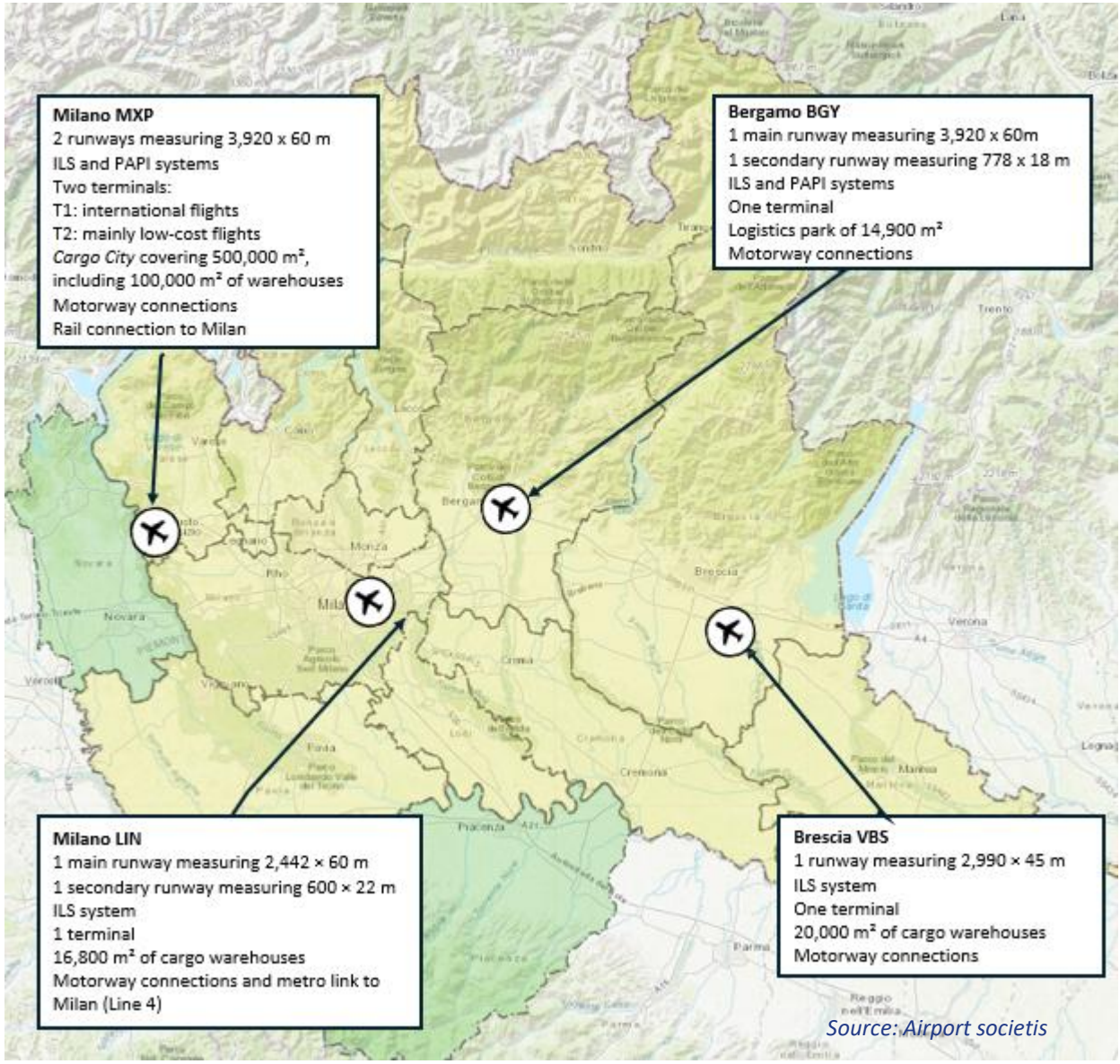
Source: Università Cattaneo LIUC

	Terminal	Operator	Size (m^2)	n. of Tracks / Length(m)	Capacity (UTI/year)	Trains per Year (2024)
1	**Arluno**	Gruppo Spinelli	54.000	3 of 300 m.	n.d	n.d
2	**Brescia**	Terminali Italia	72.400	4 of 460 m.	78.500	5.525
3	**Busto Arsizio (VA)**	Hupac	245.000	13 x 540-760 m.	440.000	3.268
4	**Gallarate (VA)**	Ambrogio Trasporti	100.000	2 of 580 m. 2 of 750 m	60.000	8.955
5	**Mantova**	Paganella Spa	70.000	4 with 2 of 730 m	100.000	1.465
6	**Melzo (MI)**	Gruppo Contship Italia	260.000	3 of 500 m. 4 of 730 m.	212.000	4.871
7	**Milano Smistamento**	Mercitalia Logistics, Hupac	240.000	5 of 750m.	390.000	10.790
8	**Segrate (MI)**	Terminali Italia	145.000	8 of 560 m.	221.000	
9	**Mortara (PV)**	Ti.Mo. S.p.A.	110.000	3 of 680 m.	83.000	1.044
10	**Novara Boschetto**	Eurogateway	50.000	4 of 600 m.	145.000	10.200
11	**Novara CIM**	Combiconnect	152.000	7 of 610 m.	140.000	
12	**Piacenza Intermodale**	Terminal Piacenza Intermodale	95.000	3 of 600 m. 1 of 500 m.	120.000	4.000
13	**Sacconago (VA)**	Malpensa Intermodale (FNM)	48.000	3 of 600/640 m	120.000	1.500

1.1.4 Airport Terminals

The Lombardy airport system handled 795,296 tonnes of freight and mail across its four airports in 2024:

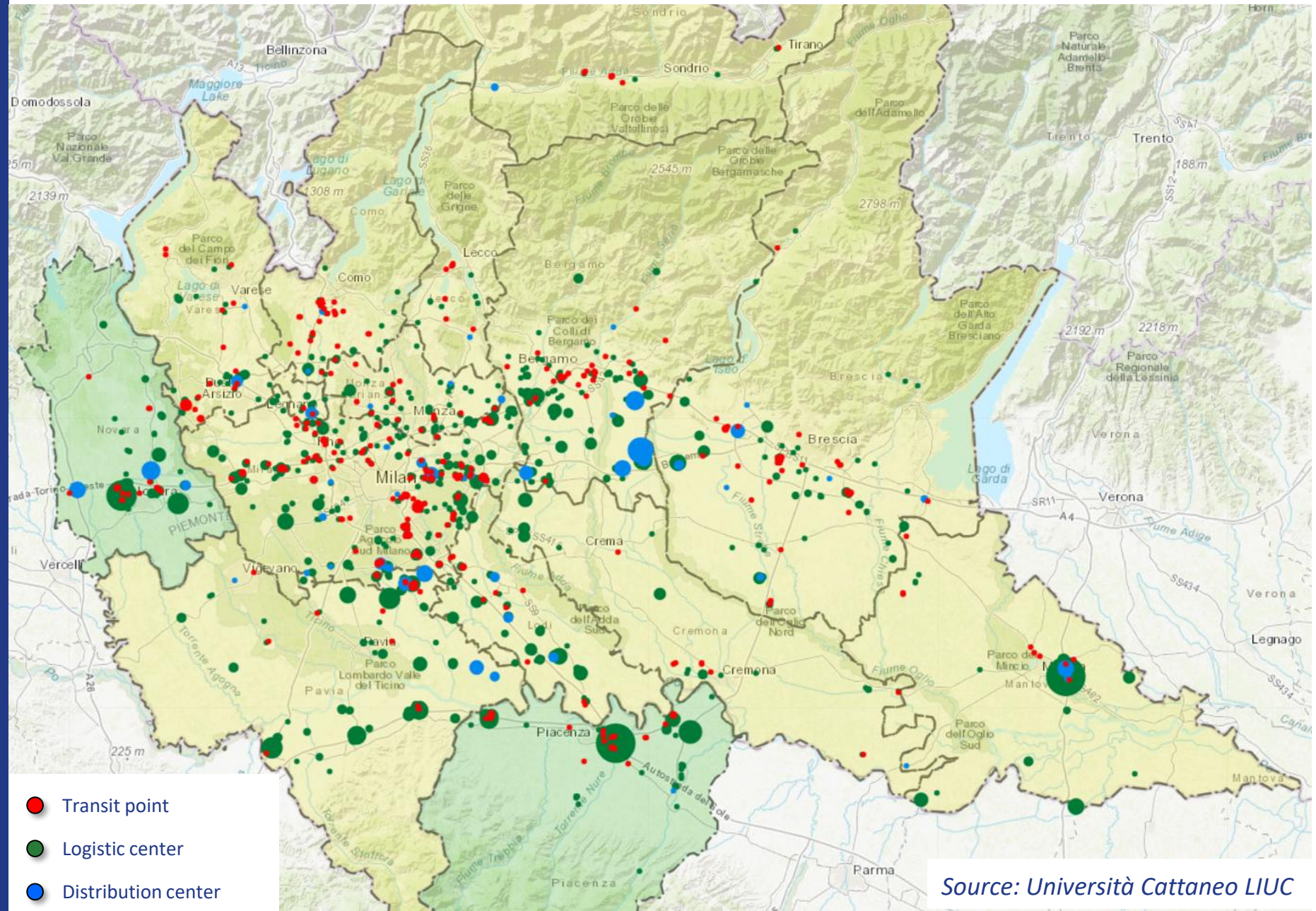
- **Milan Malpensa** handled 28.9 million passengers, making it the second busiest airport in Italy (after Rome Fiumicino) and the country's leading air cargo hub, accounting on average for 60% of total national air freight. In 2024, cargo volumes reached 731,641 tonnes (58.6% of Italy's total, equal to 1.249 million tonnes). One of its key strengths is Cargo City, covering approximately 500,000 m², with 7 first-line warehouses (direct apron access) totalling 100,000 m², including 4,000 m² of temperature-controlled space, plus 10,000 m² of office space.
- **Bergamo Orio al Serio** is the third busiest airport in Italy with 17.3 million passengers, mainly low-cost traffic. In freight, it specialises in express courier services and is recovering volumes after DHL shifted operations to Malpensa. In 2024, it handled 22,964 tonnes.
- **Brescia–Montichiari** specialises in postal traffic, serving as the hub of Poste Italiane. In 2024, it handled 38,568 tonnes, of which 26,065 tonnes were mail. Passenger activity is minimal: in 2024, only 1,001 commercial passengers, plus 7,661 general aviation passengers.
- **Milan Linate**, focused on domestic and European passenger traffic, ranked eighth nationally with 10.6 million passengers in 2024.Its role in cargo is limited, with 2,123 tonnes handled in 2024.



Source: Airport societis

**ILS: Instrument Landing System; PAPI: Precision Approach Path Indicator*

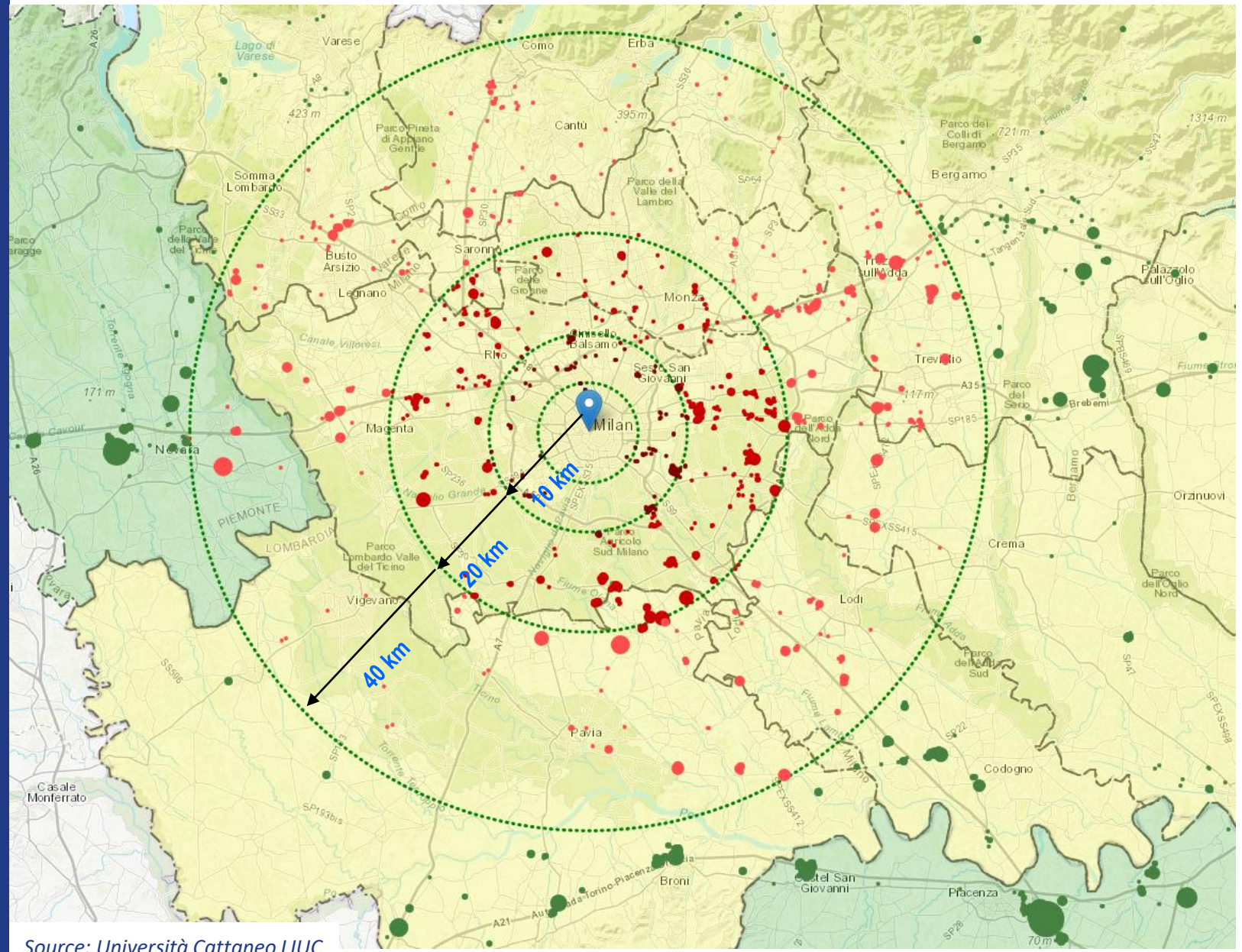
1.1.5 Mapping of Logistics Warehouses in the RLM



- The RLM has **over 1,400 warehouses**, totaling approximately **19.5 million m²** of covered space (**38% of Italy's total stock**, around 50 million m²).
- Over the past 10 years (2016–2025), the total built surface has increased by **50%**.
- The average warehouse size has grown from 13,000 m² (before 2001) to **32,000 m² in 2024**.

Source: Università Cattaneo LIUC

1.1.5 Mapping of Logistics Warehouses in the RLM



- Over 50% of logistics facilities are located within **a 40 km radius from the center of Milan.**
- **Motorway accessibility** has been the key driver behind the development of warehouses over time, which have often expanded according to purely speculative logic.
- The average size of warehouses **increases with distance from the city of Milan**, driven by land cost differentials and operational needs (last-mile proximity hubs vs. storage platforms):
  - 8,000 m² within 10 km
  - 20,000 m² beyond 40 km

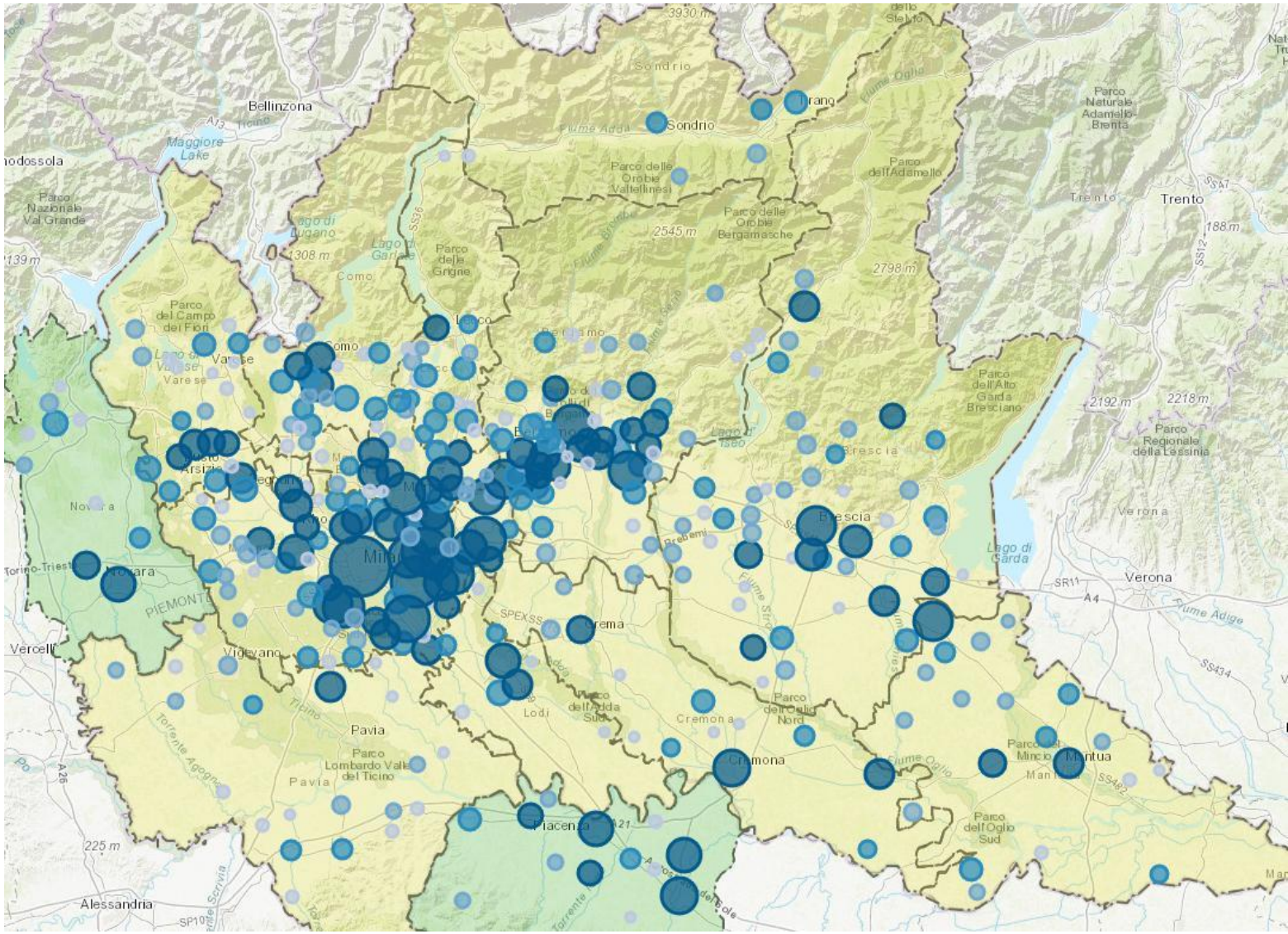
Source: Università Cattaneo LIUC

1.2 Logistics and Transport Companies in the RLM

- A total of over 15,000 logistics and transport companies operate within the RLM, many of which provide services on behalf of other operators in the sector (a typical case being independent subcontractors and handling cooperatives).

- The core of Lombardy's logistics system is made up of approximately 1,000 "orchestrator" companies, generating over EUR 30 billion in revenue (around 27% of the national total).

Revenue Distribution of Logistics and Transport Companies



Source: Università Cattaneo LIUC

1.3 Major M&A Transactions in the Last 5 Years

As previously noted, the increasing organizational and technological complexity of logistics processes has been a major driver of market restructuring, influencing both the selection of active players and the progressive consolidation of the sector. This transformation has involved not only large international transport and logistics operators, but also smaller national firms.

After entering the M&A (Mergers & Acquisitions) market relatively late, the transport and logistics sector is now showing growing momentum, driven by several strategic objectives:

- to consolidate and strengthen market positioning
- to reach the scale required to compete across multiple markets.
- to expand service offerings by integrating upstream and downstream segments of the supply chain, capturing additional value-added

Sector consolidation has taken place not only through organic growth, i.e., the gradual expansion of market share but, more importantly, through external growth, via acquisitions of companies aligned with the buyer's strategic development plans.

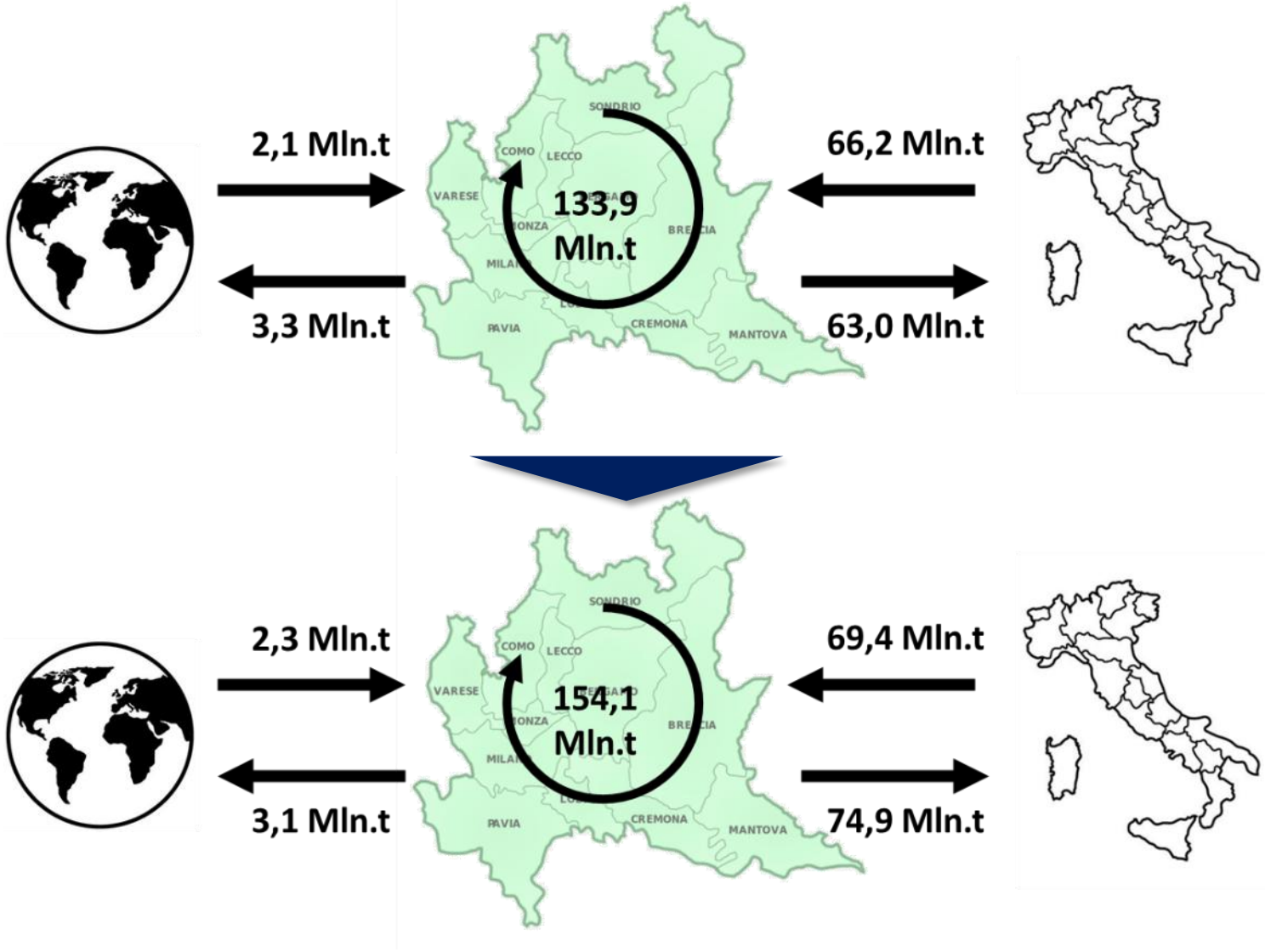
BUYER	TARGET COMPANY	OPERATION TYPE	DATE
DSV HOLDING GERMANY GMBH	SCHENKER AG	Acquisition 100%	30/04/2025
MULTI TRANSPORT OPERATOR SRL	NEW LOGISTICS ITALY SRL	Acquisition 100%	24/12/2024
MEDLOG HOLDING ITALIA SRL	MVN SRL	Acquisition 51%	14/11/2024
PLANZER TRANSPORT AG	SIFTE BERTI SPA	Acquisition 100%	31/10/2024
CMA-CGM SA	GEFCO SA	Acquisition 100%	26/07/2024
JAS JET AIR SERVICE SPA	MULTILOGISTICS SPA	Acquisition 100%	27/05/2024
RHENUS SE & CO KG	PESENTI TRASPORTI & LOGISTICA SRL	Acquisition 100%	10/11/2023
KOMBIVERKEHR DEUTSCHE MBH & CO. KG	RAIL HUB MILANO SPA	Minority stake 10%	06/01/2023
UPS INTERNATIONAL INC.	BOMI ITALIA SPA	Minority stake 5.58% and 100%	16/11/2022
FERCAM SPA	MAIMEX SRL	Acquisition 100%	08/05/2021
STEF SA	NAGEL-GROUP	Acquisition 100%	31/12/2020
RABEN GROUP BV	SITTAM SRL	Acquisition increased from 20% to 51%	04/07/2019
GRUBER LOGISTICS SPA	GARDA PLAST SPA	Acquisition 100%	24/04/2019
RHENUS LOGISTICS SPA	CESPED SPA	Acquisition 100%	05/02/2019

Source: ZEPHYR and Orbis

1.3 Change in inbound and outbound flows to/from the RLM

- Freight flows involving Lombardy are predominantly transported by road, particularly for intra-regional and national movements, which have increased by 15% and 12%, respectively, over the past five years (2018–2023).
- As for international flows, road transport remains the dominant mode along European routes.
- Over the period considered, no significant changes emerged, due in part to slowdowns caused first by the pandemic and later by weaker economic momentum at the international level.
- In particular, the downturn of the German industrial sector had a notable negative impact. Italian supply chains are closely interconnected with Germany (Italy's exports to Germany in 2023: –3.7%).

Road Freight Transport: Lombardy O/D, 2018 and 2023.



Source: LIUC Università Cattaneo elaboration *on «Conto nazionali dei trasporti» data*

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3.1.2 Île-de-France

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3.2 Results of thE Comparison Between RLM and Europe

2.1 World Bank ’s Logistics Performance Index (LPI)

- The Logistics Performance Index is a composite index developed by the World Bank that compares performance across 160 countries, active since 2007.
- It is based on a survey of 1,000 logistics professionals worldwide, who are asked to assess six dimensions:
    1. **Efficiency of the customs clearance process**
    2. **Quality of trade- and transport-related infrastructure**
    3. **Ease of arranging international shipments at competitive rates**
    4. **Competence and quality of logistics services**
    5. **Ability to track and trace shipments**
    6. **Timeliness of shipments reaching consignees within scheduled delivery times.**
- Respondents evaluate up to eight countries across these six dimensions, selected based on the country in which they operate, using a mechanism that combines randomness and trade-flow modeling.
- In the latest edition (2023), quantitative performance indicators based on shipment-tracking datasets were introduced to measure global trade speed.

2.1 World Bank 's Logistics Performance Index (LPI)

2018	LPI Rank	LPI Score	Customs Score	Infrastructure Score	International Shipments Score	Logistics Competence and Quality	Timeliness Score	Tracking and Tracing Score
Germany	1	4,2	4,1	4,4	3,9	4,3	4,4	4,2
Sweden	2	4,1	4,0	4,2	3,9	4,0	4,3	3,9
Belgium	3	4,0	3,7	4,0	4,0	4,1	4,4	4,1
Austria	4	4,0	3,7	4,2	3,9	4,1	4,3	4,1
Japan	5	4,0	4,0	4,2	3,6	4,1	4,3	4,0
Netherlands	6	4,0	3,9	4,2	3,7	4,1	4,3	4,0
Singapore	7	4,0	3,9	4,1	3,6	4,1	4,3	4,1
Denmark	8	4,0	3,9	4,0	3,5	4,0	4,4	4,2
United Kingdom	9	4,0	3,8	4,0	3,7	4,0	4,3	4,1
Finland	10	4,0	3,8	4,0	3,6	3,9	4,3	4,3
United Arab Emirates	11	4,0	3,6	4,0	3,8	3,9	4,4	4,0
Hong Kong SAR, China	12	3,9	3,8	4,0	3,8	3,9	4,1	3,9
Switzerland	13	3,9	3,6	4,0	3,5	4,0	4,2	4,1
United States	14	3,9	3,8	4,0	3,5	3,9	4,1	4,1
New Zealand	15	3,9	3,7	4,0	3,4	4,0	4,3	3,9
France	16	3,8	3,6	4,0	3,5	3,8	4,2	4,0
Spain	17	3,8	3,6	3,8	3,8	3,8	4,1	3,8
Australia	18	3,8	3,9	4,0	3,2	3,7	4,0	3,8
Italy	19	3,7	3,5	3,9	3,5	3,7	4,1	3,9
Canada	20	3,7	3,6	3,8	3,4	3,9	4,0	3,8
Norway	21	3,7	3,5	3,7	3,4	3,7	3,9	3,9
Czech Republic	22	3,7	3,3	3,5	3,7	3,7	4,1	3,7
Portugal	23	3,6	3,2	3,2	3,8	3,7	4,1	3,7
Luxembourg	24	3,6	3,5	3,6	3,4	3,8	3,9	3,6
Korea, Rep.	25	3,6	3,4	3,7	3,3	3,6	3,9	3,8

2023	LPI Rank	LPI Score	Customs Score	Infrastructure Score	International Shipments Score	Logistics Competence and Quality	Timeliness Score	Tracking and Tracing Score
Singapore	1	4,3	4,2	4,6	4,0	4,4	4,3	4,4
Finland	2	4,2	4,0	4,2	4,1	4,2	4,3	4,2
Denmark	3	4,1	4,1	4,1	3,6	4,1	4,1	4,3
Germany	3	4,1	3,9	4,3	3,7	4,2	4,1	4,2
Netherlands	3	4,1	3,9	4,2	3,7	4,2	4,0	4,2
Switzerland	3	4,1	4,1	4,4	3,6	4,3	4,2	4,2
Austria	7	4,0	3,7	3,9	3,8	4,0	4,3	4,2
Belgium	7	4,0	3,9	4,1	3,8	4,2	4,2	4,0
Canada	7	4,0	4,0	4,3	3,6	4,2	4,1	4,1
Hong Kong	7	4,0	3,8	4,0	4,0	4,0	4,1	4,2
Sweden	7	4,0	4,0	4,2	3,4	4,2	4,2	4,1
United Arab Emirates	7	4,0	3,7	4,1	3,8	4,0	4,2	4,1
France	13	3,9	3,7	3,8	3,7	3,8	4,1	4,0
Japan	13	3,9	3,9	4,2	3,3	4,1	4,0	4,0
Spain	13	3,9	3,6	3,8	3,7	3,9	4,2	4,1
Taiwan, China	13	3,9	3,5	3,8	3,7	3,9	4,2	4,2
Korea, Rep.	17	3,8	3,9	4,1	3,4	3,8	3,8	3,8
United States	17	3,8	3,7	3,9	3,4	3,9	3,8	4,2
Australia	19	3,7	3,7	4,1	3,1	3,9	3,6	4,1
China	19	3,7	3,3	4,0	3,6	3,8	3,7	3,8
Greece	19	3,7	3,2	3,7	3,8	3,8	3,9	3,9
Italy	19	3,7	3,4	3,8	3,4	3,8	3,9	3,9
Norway	19	3,7	3,8	3,9	3,0	3,8	4,0	3,7
South Africa	19	3,7	3,3	3,6	3,6	3,8	3,8	3,8
United Kingdom	19	3,7	3,5	3,7	3,5	3,7	3,7	4,0

Looking at the ranking of the top 25 countries by total LPI score, Italy maintained 19th place in 2023, with the same score as in 2018 (3.7/5), slightly below the major European countries.

2.2 ReLAI Index: Regional Logistic Actractiveness Index

To measure and compare the logistics performance of Lombardy against major European clusters, LIUC – Università Cattaneo has developed a composite index capable of quantifying the attractiveness of individual territories, evaluating five dimensions:

1. **Efficiency**: measures the cost of production factors underlying logistics and transport services that companies operating within a logistics cluster must remunerate, including transport costs across modes, warehouse rental, and cargo handling.

2. **Competitiveness**: measures a cluster's ability to attract business activity, production factors, and capital, distinguishing itself through service quality, skills, and its central positioning relative to the market.

3. **Accessibility & Connectivity:** measures the ease with which companies in a logistics cluster are connected to regional territory and international markets, based on the availability of road and rail infrastructure, and air, maritime, and intermodal services.

4. **Environmental Sustainability**: measures the level of environmental responsibility related to negative externalities generated by logistics and transport, including the share of electric light vehicles, the number of biofuel refueling facilities for heavy transport, and the number of environmentally certified warehouses.

5. **Innovation**: measures innovation capacity through the number of patents related to logistics and transport, the share of workers employed in high-technology knowledge-intensive roles, and the amount of logistics-related research produced in each region.

The **ReLAI** index is the outcome of a literature review on logistics competitiveness metrics and consultation with industry experts. It was developed using sector-specific and international databases (e.g., Eurostat, Orbis, UNCTAD, World Bank, etc.).

2.2 Framework for Developing the ReLAI Index

COSA

COME

OUTPUT

Scouting of indicators to measure regional logistics attractiveness

- Literature review of existing studies and indicators
- Interviews with experts in the different transport modes
- 50+ indicators related to logistics performance
- 4 logistics clusters in Europe

Performance indicators
Port-to-port cost from Shanghai (maritime)
Unit cost airport-to-airport to New York
Prime warehouse rental cost
Full-truckload road transport cost (>250 km)
Labor cost for handling operations
Insurance rates for theft coverage
Electricity cost
Last-mile delivery road transport cost
Share of revenue from top 100 logistics and transport companies over GDP
GDP reachable within 4 hours by truck
Quality of logistics services
Warehouse take-up rate within the cluster
Customs process efficiency
Average customs clearance time for import with physical inspection
Average port-to-port transit time from Shanghai
Average port-to-port transit time to New York
Labor availability
Tax incentives
Foreign direct investment (FDI) as a share of GDP
Motorway infrastructure index
Railway infrastructure index
Port Liner Shipping Connectivity Index
TEUs handled in ports reachable within 4 hours
Airport Connectivity Index
Share of electrified rail lines
Air cargo tonnes per IATA agent
Tonnes handled by airports reachable within 4 hours
Number of destinations (all-cargo and belly cargo)
Commercial speed of road freight transport
Share of electric commercial vehicles in fleet
Density of LNG refueling stations
Environmental certification of warehouses
Density of EV charging stations per km²
Number of hydrogen refueling stations
Intermodal freight volume per km of rail network
Share of intermodal freight over total rail freight transport
ISO 14000 certifications
Renewable energy facilities
Share of energy from renewable sources
Share of reusable packaging and pallets (PPWR)
Use of SAF in air-cargo operations
Average permit approval time for new warehouses
Number of patents in logistics innovation
Share of workers in high-tech knowledge-intensive logistics roles
Number of automated warehouses
Number of scientific publications with the keyword "logistics"
Share of companies using data analytics in transport and warehousing
High-speed internet connectivity
Share of companies using management software
Research & development (R&D) investments in logistics
Rail lines equipped with ERTMS traffic management systems
Penetration rate of e-AWB and e-CMR

Selection of the indicators that will form the ReLAI composite index

- Assessment of the relevance, representativeness, consistency, replicability, reliability, and availability of indicators across official databases
- 21 indicators structured into 5 dimensions and 4 domains (logistics; maritime, air, and land transport)

1) EFFICIENCY
Port-to-port cost from Shanghai (maritime)
Unit cost airport-to-airport to New York
Prime warehouse rental cost
Full-truckload road transport cost (>250 km)
Labor cost for handling operations

2) COMPETITIVENESS
Share of revenue from top 100 logistics and transport companies over GDP
GDP reachable within 4 hours by truck
Customs process efficiency (Customs Score)
Quality of logistics services (Logistics Quality and Competence score)
Warehouse take-up rate within the cluster

3) ACCESSIBILITY AND CONNECTIVITY
Motorway infrastructure index
Railway infrastructure index
Port Liner Shipping Connectivity Index
TEUs handled in ports reachable within 4 hours
Airport Connectivity Index

4) ENVIROMENTAL SUSTAINANILITY
Share of electric commercial vehicles in fleet
Density of LNG refueling stations
Environmental certification of warehouses

5) INNOVATION
Number of patents in logistics innovation
Share of workers in high-tech knowledge-intensive logistics roles
Number of scientific publications on logistics topic

Data collection for indicator calculation and outlier verification/removal

- Collection of updated 2024 values for all indicators, removal of potential outliers, and definition of calculation criteria (e.g., yearly average values)
- 21 updated values of the selected indicators for each European region

1) EFFICIENCY	RLM
Port-to-port cost from Shanghai (maritime)	3.749
Unit cost airport-to-airport to New York	1,44
Prime warehouse rental cost	68,1
Full-truckload road transport cost (>250 km)	1,60
Labor cost for handling operations	19,8

2) COMPETITIVENESS	RLM
Share of revenue from top 100 logistics and transport companies over GDP	4,3%
GDP reachable within 4 hours by truck	815
Customs process efficiency (Customs Score)	3,4
Quality of logistics services (Logistics Quality and Competence score)	3,8
Warehouse take-up rate within the cluster	2,9%

3) ACCESSIBILITY AND CONNECTIVITY	RLM
Motorway infrastructure index	33,41
Railway infrastructure index	38,53
Port Liner Shipping Connectivity Index	418,0
TEUs handled in ports reachable within 4 hours	4.162
Airport Connectivity Index	6.466

4) ENVIROMENTAL SUSTAINANILITY	RLM
Share of electric commercial vehicles in fleet	0,36
Density of LNG refueling stations	3,34
Environmental certification of warehouses	132

5) INNOVATION	RLM
Number of patents in logistics innovation	4,88
Share of workers in high-tech knowledge-intensive logistics roles	4,7%
Number of scientific publications on logistics topic	86

Normalization and indexing of indicators

- Definition of normalization bases (e.g., GDP, km², population, road network length) and indexing of indicators (100 = best)
- 21 normalized and indexed values of the selected ReLAI indicators

RLM	NRW	CAT	IDF
82%	100%	82%	100%
80%	100%	68%	80%
100%	67%	65%	92%
78%	76%	100%	78%
90%	67%	100%	66%
86,4%	**80,8%**	**83,5%**	**83,0%**

RLM	NRW	CAT	IDF
100%	37%	52%	62%
43%	100%	14%	63%
87%	100%	92%	95%
90%	100%	93%	90%
78%	35%	66%	100%
78,8%	**77,0%**	**64,1%**	**82,8%**

RLM	NRW	CAT	IDF
50%	100%	69%	76%
28%	65%	24%	100%
44%	100%	53%	48%
15%	100%	14%	11%
38%	91%	59%	100%
35,5%	**91,4%**	**44,3%**	**67,2%**

RLM	NRW	CAT	IDF
10%	76%	18%	100%
100%	36%	14%	79%
92%	33%	100%	83%
67,2%	**48,4%**	**42,6%**	**87,5%**

RLM	NRW	CAT	IDF
73%	100%	13%	68%
84%	77%	96%	100%
97%	100%	58%	88%
85,8%	**91,2%**	**61,4%**	**87,3%**

Weighting of indicators

- Expert-panel survey conducted to derive indicator weighting, applying the Delphi methodology
- 21 importance weights for each indicator, aggregated across the 5 dimensions

1) EFFICIENCY	24,8%
Port-to-port cost from Shanghai (maritime)	4,7%
Unit cost airport-to-airport to New York	4,3%
Prime warehouse rental cost	5,3%
Full-truckload road transport cost (>250 km)	5,3%
Labor cost for handling operations	5,2%

2) COMPETITIVENESS	25,4%
Share of revenue from top 100 logistics and transport companies over GDP	4,1%
GDP reachable within 4 hours by truck	5,3%
Customs process efficiency (Customs Score)	5,4%
Quality of logistics services (Logistics Quality and Competence score)	5,5%
Warehouse take-up rate within the cluster	5,0%

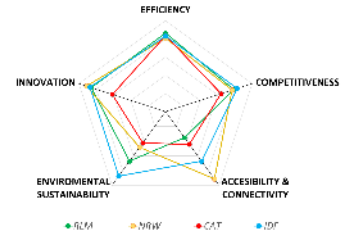
3) ACCESSIBILITY AND CONNECTIVITY	25,3%
Motorway infrastructure index	5,9%
Railway infrastructure index	5,0%
Port Liner Shipping Connectivity Index	4,7%
TEUs handled in ports reachable within 4 hours	5,0%
Airport Connectivity Index	4,6%

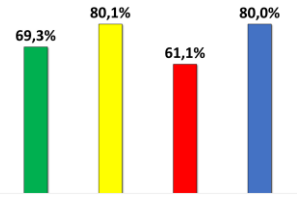
4) ENVIROMENTAL SUSTAINANILITY	11,6%
Share of electric commercial vehicles in fleet	3,9%
Density of LNG refueling stations	4,0%
Environmental certification of warehouses	3,7%

5) INNOVATION	12,9%
Number of patents in logistics innovation	3,3%
Share of workers in high-tech knowledge-intensive logistics roles	4,9%
Number of scientific publications on logistics topic	4,7%

Calculation of the ReLAI index, sensitivity analysis, and comparison of results

- Calculation of the ReLAI index, sensitivity analysis, and comparison of results
- 1 overall ReLAI index and one index for each dimension





2.3 Selection funnel of performance indicators

In developing the new composite ReLAI indicator, we sought to draw from existing indicators in the literature while incorporating expert insights on potential measures across the five dimensions of logistics attractiveness. The main reasons for excluding several of the measures listed on the previous slide are as follows:

- **Lack of available data**: a number of promising indicators emerged during the analysis. However, several could not be retrieved from major official data sources. Notable examples include labor availability at the regional level, metrics on intermodal transport share, VAT deferment data for European ports, and the average time required to obtain permits for new warehouse construction. Some indicators previously published by sources such as IATA and the World Bank are no longer updated or available, for instance, e-AWB adoption rates and average port-to-port transit times.
- **Partial data availability**: some identified indicators lacked sufficient regional granularity and were therefore excluded, as national-level figures would not adequately represent geographic differences. Examples include foreign investment share, SAF fuel adoption, deployment of the ERTMS rail system, and the number of ISO 14000 certifications.
- **Institutional data sources preferred**: to ensure consistency and long-term replicability, official institutional sources were prioritized over data collected through interviews or direct requests to individual companies. For example, labor cost data is sourced from Eurostat, while air connectivity is measured using ACI Europe's "Airport Connectivity" Index rather than the number of destinations served by key cargo carriers.
- **Avoiding redundancy**: for each dimension, the number of similar indicators was reduced to avoid overlap. For example, port-to-port cost was measured only for imports from Shanghai, used as a reference port, while road transport cost was measured only for full-truckload operations, excluding last-mile delivery costs.

2.3 The selected set of 21 indicators

1) EFFICIENCY	Reference Level	Unit of Measure	Source
Port-to-port cost from Shanghai (maritime)	Port zone	USD/TEU	Shanghai Containerized Index
Unit cost airport-to-airport to New York	Refernce Airport	EUR/kg	Confetra
Prime warehouse rental cost	NUTS-2	€/m^2 year	Garbe, JLL, Savillis.
Full-truckload road transport cost (>250 km)	NUTS-2	€/km	DHL
Labor cost for handling operations	NUTS-0	EUR/h	Eurostat

2) COMPETITIVENESS	Reference Level	Unit of Measure	Source
Share of revenue from top 100 logistics and transport companies over GDP	NUTS-2	% Revenue	Orbis
GDP reachable within 4 hours by truck	NUTS-2	mln eur	Eurostat
Customs process efficiency (Customs Score)	NUTS-0	Indicator	World Bank, LPI
Quality of logistics services (Logistics Quality and Competence score)	NUTS-0	Indicator	World Bank, LPI
Warehouse take-up rate within the cluster	NUTS-2	% warehouse	Prologis, JLL

3) ACCESSIBILITY AND CONNECTIVITY	Reference Level	Unit of Measure	Source
Motorway infrastructure index	NUTS-2	km motorways / km^2 x 1000	Eurostat
Railway infrastructure index	NUTS-2	km railways / km^2 x 1001	Eurostat
Port Liner Shipping Connectivity Index	Reference port	Indicator	UNCTAD
TEUs handled in ports reachable within 4 hours	Sum of TEU in the 4h cluster area	TEU x 1000 /year	Port Authorities
Airport Connectivity Index	Reference Airport	Indicator	ACI

4) ENVIROMENTAL SUSTAINANILITY	Reference Level	Unit of Measure	Source
Share of electric commercial vehicles in fleet	NUTS-2	% vehicles	Eurostat
Density of LNG refueling stations	NUTS-2	Stations unit /km x 100	GibGas
Environmental certification of warehouses	NUTS-2	Unit	LEED, BREEAM

5) INNOVATION	Reference Level	Unit of Measure	Source
Number of patents in logistics innovation	NUTS-2	Unit / mln Inhabitants	PATSTAT
Share of workers in high-tech knowledge-intensive logistics roles	NUTS-2	% workers	Eurostat
Number of scientific publications on logistics topic	NUTS-2	Unit	Scopus

2.3 Importance weighting of the indicators

From the results of the online survey, the following insights emerged:

- The three dimensions of efficiency, competitiveness, and accessibility together account for over 75% of the total weighting.
- The two lowest-weighted dimensions are technological innovation and sustainability, despite both being considered strategically important in emerging competitive scenarios.
- The most important indicator is the motorway infrastructure endowment index, followed by quality of logistics services and customs process efficiency, all belonging to the three highest-priority dimensions.
- The least relevant indicators are number of logistics innovation patents and environmental certification of warehouses, which fall within the lower-weighted dimensions.

1) EFFICIENCY	**24,8%**	
Port-to-port cost from Shanghai (maritime)	4,7%	13°
Unit cost airport-to-airport to New York	4,3%	16°
Prime warehouse rental cost	5,3%	4°
Full-truckload road transport cost (>250 km)	5,3%	6°
Labor cost for handling operations	5,2%	7°
2) COMPETITIVENESS	**25,4%**	
Share of revenue from top 100 logistics and transport companies over GDP	4,1%	17°
GDP reachable within 4 hours by truck	5,3%	5°
Customs process efficiency (Customs Score)	5,4%	3°
Quality of logistics services (Logistics Quality and Competence score)	5,5%	2°
Warehouse take-up rate within the cluster	5,0%	10°
3) ACCESSIBILITY AND CONNECTIVITY	**25,3%**	
Motorway infrastructure index	5,9%	1°
Railway infrastructure index	5,0%	8°
Port Liner Shipping Connectivity Index	4,7%	14°
TEUs handled in ports reachable within 4 hours	5,0%	8°
Airport Connectivity Index	4,6%	15°
4) ENVIROMENTAL SUSTAINANILITY	**11,6%**	
Share of electric commercial vehicles in fleet	3,9%	19°
Density of LNG refueling stations	4,0%	18°
Environmental certification of warehouses	3,7%	20°
5) INNOVATION	**12,9%**	
Number of patents in logistics innovation	3,3%	21°
Share of workers in high-tech knowledge-intensive logistics roles	4,9%	11°
Number of scientific publications on logistics topic	4,7%	12°

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3. RLM and European Logistics Clusters: A Comparative Analysis

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3.1.1 Catalonia

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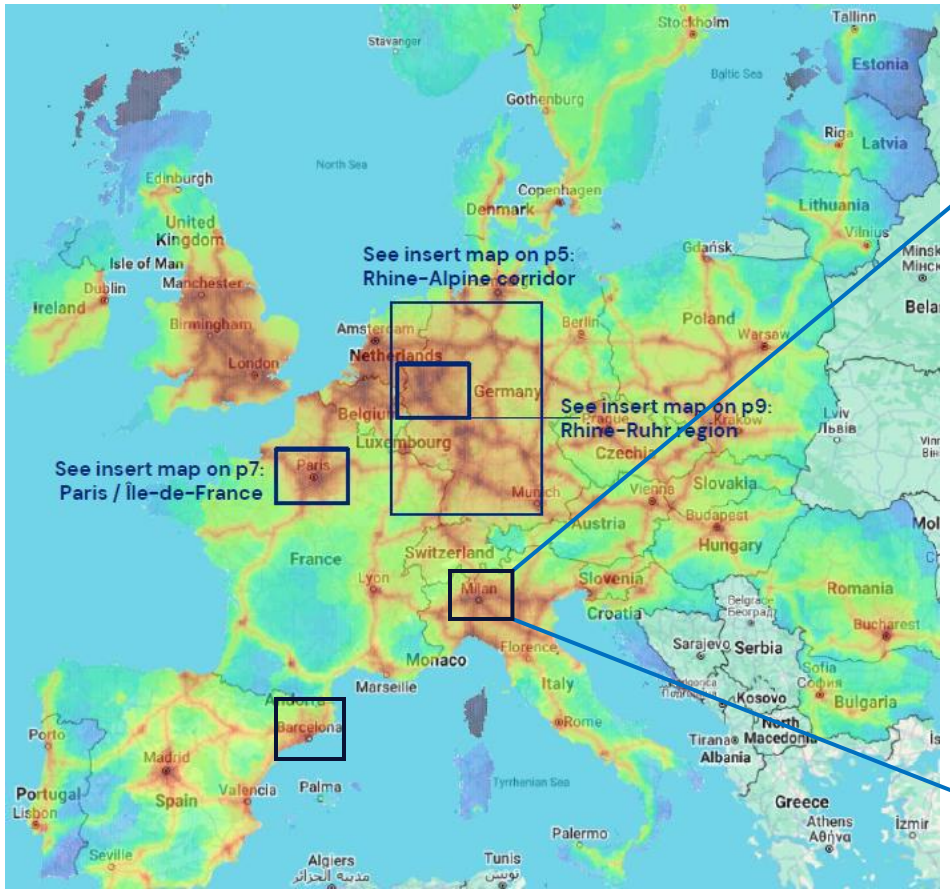
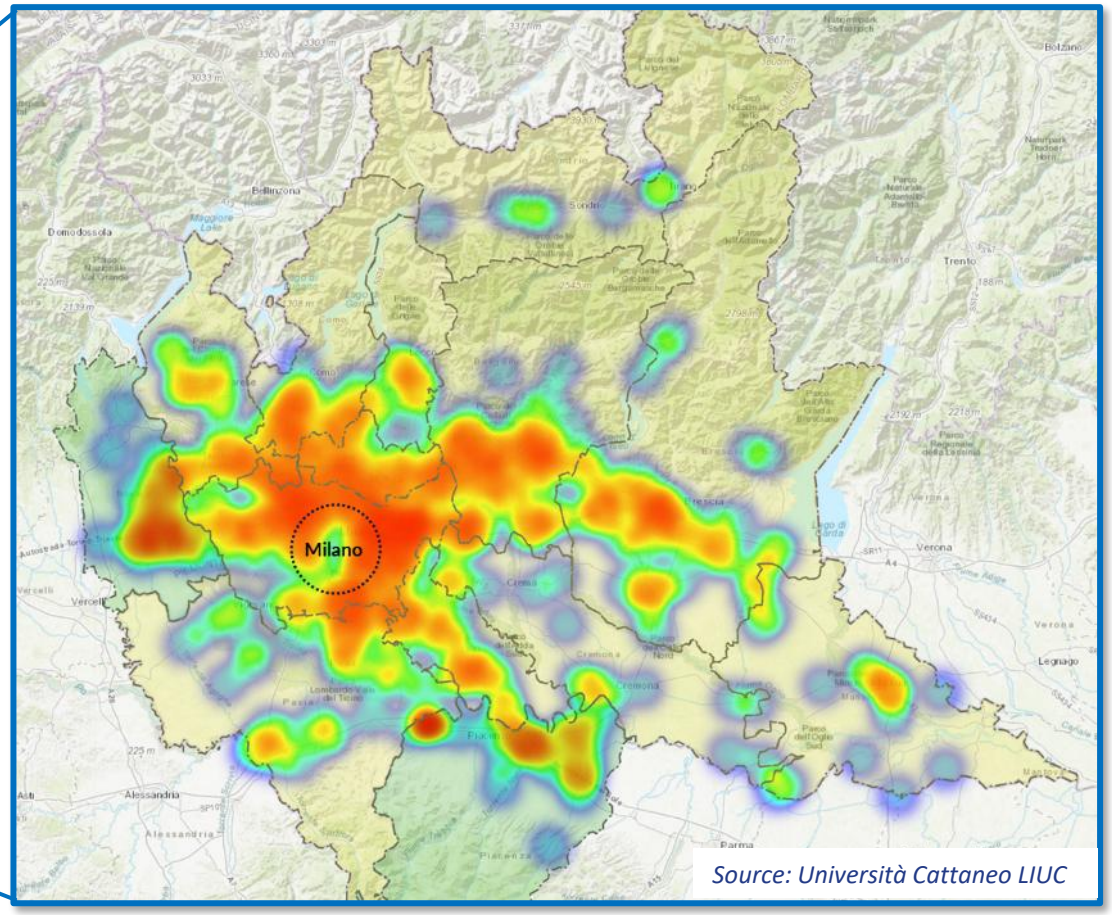
3.2 Results of thE Comparison Between RLM and Europe

3.1 The main European logistics clusters

Source: Path of distribution Europe, LaSalle 2025





Logistics Cluster: *A territory densely populated by logistics and transport companies, featuring distribution centers serving both the local market and international markets through intermodal gateways, whose logistical boundaries often do not coincide with administrative borders.*

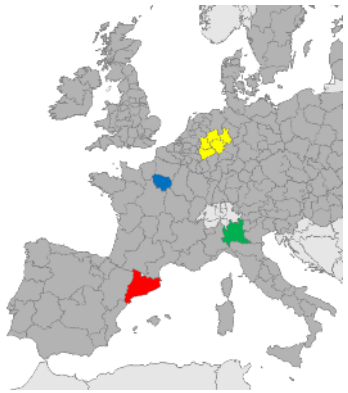
3.1 The main European logistics clusters

The selection of the other three logistics clusters was carried out in collaboration with the project's Advisory Board, based on specific criteria: belonging to EU member states; socio-economic comparability with Lombardy; presence of airports and intermodal connections with the country's main seaports; hosting the headquarters of major international logistics companies; and the presence of a network of third-party logistics warehouses. The logistics clusters selected for comparison with the **RLM** (NUTS-2 = ITC4) are:

- **North Rhine–Westphalia** (NUTS-2 = DEA): one of Europe's strongest and most consolidated logistics areas, due to its strategic geographical position. It is crossed by major Trans-European Transport Network (TEN-T) corridors, in particular the Rhine–Alpine Corridor, connecting Rotterdam with Genoa (2,500 km). It hosts the Duisburg logistics hub, which connects the Rhine river network with railway and road infrastructure, operating as a trimodal gateway for flows between Asia, Europe, and the Mediterranean.
- **Catalonia** (NUTS-2 = ES51): historically regarded as one of Europe's economic engines. It is a major maritime gateway hub in the Mediterranean, supported by a strong industrial and port base. The core of the Catalan logistics system is the Port of Barcelona, integrated with the Zona Franca and El Prat Airport, ensuring high maritime, road, and air connectivity.
- **Île-de-France** (NUTS-2 = FR10): corresponding to the Paris metropolitan area, it is Europe's leading logistics hub, according to LaSalle's Paths of Distribution Score. The region hosts large-scale logistics platforms serving European markets and an economy with high added value.

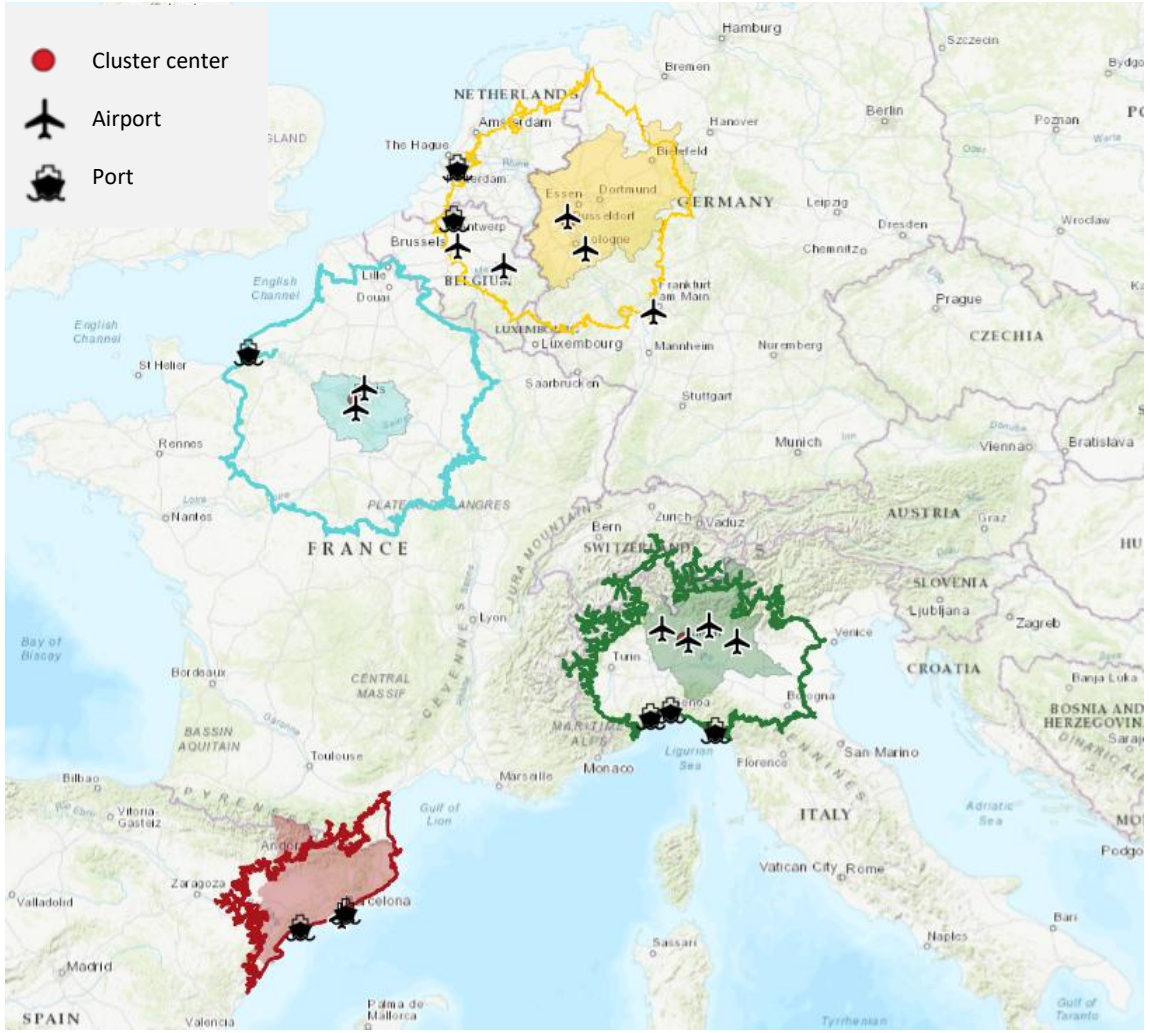
3.1 Comparative Analysis of the RLM and Europe's Logistics Clusters

Macro-Economics and Infrastructure indicator	Unit of Measure	RLM	NRW	CAT	IDF
GDP	Mrd eur	518	872	282	860
Population	x 1000	10.662	18.138	7.902	12.388
Territorial surface area	km^2	27.772	34.110	32.091	12.012
Population density	Inhabitants/km^2	383	532	246	1.031
GDP per capita	eur	48.537	48.076	35.687	69.422
Imports + Exports	Mrd eur	360	540	211	353
Degree of international trade openness	% (Imp+Exp)/GDP	70%	62%	75%	41%
Manufacturing share of GDP	%	17%	20%	12%	11%
Revenue of top 100 logistics and transport companies	Mrd eur	22,1	13,9	6,3	22,8
Motorway network	km	928	2.261	1.478	605
Electrified double-track railway network	km	1.070	3.035	1.037	1.643
Number of intermodal terminals	Unit	13	16	4	18
Number of LNG refueling stations for heavy vehicles	Unit	31	27	7	16
Number of EV charging stations	Unit	3.654	8.038	1.576	3.114



Source: Eurostat, Istat, national Statitics Offices, Università Cattaneo LIUC (anno 2024)

3.1 Catchment areas reachable within 4 hours from the cluster hub



LOGISTICS REGION OF MILAN(RLM)

- 3 seaports reachable within 4 hours by truck: GOA, SPE, SVN
- 4 airports reachable within 4 hours by truck: MXP, BGY, VBS, LIN
- 13 intermodal terminals

NORD RHINE WESTPHALIA (NRW)

- 2 seaports reachable within 4 hours by truck: RTM, ANR
- 5 airports reachable within 4 hours by truck: DUS, CGN, FRA, LGG, BRU
- 16 intermodal terminals (including 2 inland waterway)

CATALONIA (CAT)

- 2 seaports reachable within 4 hours by truck: BCN, TAR
- 1 airport reachable within 4 hours by truck: BCN
- 4 intermodal terminals

ÎLE-DE-FRANCE (IDF)

- 1 seaport reachable within 4 hours by truck: LEH
- 2 airports reachable within 4 hours by truck: CDG, ORY
- 18 intermodal terminals (including 7 inland waterway)

3.2 Indexed values of performance indicators

1) EFFICIENCY	RLM	NRW	CAT	IDF
Port-to-port cost from Shanghai (maritime)	82%	100%	82%	100%
Unit cost airport-to-airport to New York	80%	100%	68%	80%
Prime warehouse rental cost	100%	67%	65%	92%
Full-truckload road transport cost (>250 km)	78%	76%	100%	78%
Labor cost for handling operations	90%	67%	100%	66%
	86,4%	**80,8%**	**83,5%**	**83,0%**
2) COMPETITIVENESS	**RLM**	**NRW**	**CAT**	**IDF**
Share of revenue from top 100 logistics and transport companies over GDP	100%	37%	52%	62%
GDP reachable within 4 hours by truck	43%	100%	14%	63%
Customs process efficiency (Customs Score)	87%	100%	92%	95%
Quality of logistics services (Logistics Quality and Competence score)	90%	100%	93%	90%
Warehouse take-up rate within the cluster	78%	35%	66%	100%
	78,7%	**76,8%**	**64,0%**	**82,6%**
3) ACCESSIBILITY AND CONNECTIVITY	**RLM**	**NRW**	**CAT**	**IDF**
Motorway infrastructure index	50%	100%	69%	76%
Railway infrastructure index	28%	65%	24%	100%
Port Liner Shipping Connectivity Index	44%	100%	53%	48%
TEUs handled in ports reachable within 4 hours	15%	100%	14%	11%
Airport Connectivity Index	38%	91%	59%	100%
	35,5%	**91,4%**	**44,3%**	**67,2%**
4) ENVIROMENTAL SUSTAINANILITY	**RLM**	**NRW**	**CAT**	**IDF**
Share of electric commercial vehicles in fleet	10%	76%	18%	100%
Density of LNG refueling stations	100%	36%	14%	79%
Environmental certification of warehouses	92%	33%	100%	83%
	67,2%	**48,4%**	**42,6%**	**87,5%**
5) INNOVATION	**RLM**	**NRW**	**CAT**	**IDF**
Number of patents in logistics innovation	73%	100%	13%	68%
Share of workers in high-tech knowledge-intensive logistics roles	84%	77%	96%	100%
Number of scientific publications on logistics topic	97%	100%	58%	88%
	85,8%	**91,2%**	**61,4%**	**87,3%**

- For each indicator, an indexed value was calculated (best = 100).
- North Rhine–Westphalia achieves the highest score (index = 100) in 10 out of the 21 indicators across the five dimensions.
- Île-de-France records the highest score in 6 out of 21 indicators (including one tied with North Rhine–Westphalia).
- The RLM and Catalonia achieve the maximum score in only 3 out of 21 indicators.
- Significant gaps emerge in certain indicators, where the difference between the top-performing region and the others exceeds 85 points (e.g., TEUs handled in ports reachable within 4 hours).

3.2 Indexed values of indicators and their weights

1) EFFICIENCY	RLM	NRW	CAT	IDF	24,8%	
Port-to-port cost from Shanghai (maritime)	82%	100%	82%	100%	4,7%	13°
Unit cost airport-to-airport to New York	80%	100%	68%	80%	4,3%	16°
Prime warehouse rental cost	100%	67%	65%	92%	5,3%	4°
Full-truckload road transport cost (>250 km)	78%	76%	100%	78%	5,3%	6°
Labor cost for handling operations	90%	67%	100%	66%	5,2%	7°
	86,4%	80,8%	83,5%	83,0%		
2) COMPETITIVENESS	**RLM**	**NRW**	**CAT**	**IDF**	**25,4%**	
Share of revenue from top 100 logistics and transport companies over GDP	100%	37%	52%	62%	4,1%	17°
GDP reachable within 4 hours by truck	43%	100%	14%	63%	5,3%	5°
Customs process efficiency (Customs Score)	87%	100%	92%	95%	5,4%	3°
Quality of logistics services (Logistics Quality and Competence score)	90%	100%	93%	90%	5,5%	2°
Warehouse take-up rate within the cluster	78%	35%	66%	100%	5,0%	10°
	78,7%	76,8%	64,0%	82,6%		
3) ACCESSIBILITY AND CONNECTIVITY	**RLM**	**NRW**	**CAT**	**IDF**	**25,3%**	
Motorway infrastructure index	50%	100%	69%	76%	5,9%	1°
Railway infrastructure index	28%	65%	24%	100%	5,0%	8°
Port Liner Shipping Connectivity Index	44%	100%	53%	48%	4,7%	14°
TEUs handled in ports reachable within 4 hours	15%	100%	14%	11%	5,0%	8°
Airport Connectivity Index	38%	91%	59%	100%	4,6%	15°
	35,5%	91,4%	44,3%	67,2%		
4) ENVIROMENTAL SUSTAINANILITY	**RLM**	**NRW**	**CAT**	**IDF**	**11,6%**	
Share of electric commercial vehicles in fleet	10%	76%	18%	100%	3,9%	19°
Density of LNG refueling stations	100%	36%	14%	79%	4,0%	18°
Environmental certification of warehouses	92%	33%	100%	83%	3,7%	20°
	67,2%	48,4%	42,6%	87,5%		
5) INNOVATION	**RLM**	**NRW**	**CAT**	**IDF**	**12,9%**	
Number of patents in logistics innovation	73%	100%	13%	68%	3,3%	21°
Share of workers in high-tech knowledge-intensive logistics roles	84%	77%	96%	100%	4,9%	11°
Number of scientific publications on logistics topic	97%	100%	58%	88%	4,7%	12°
	85,8%	91,2%	61,4%	87,3%		

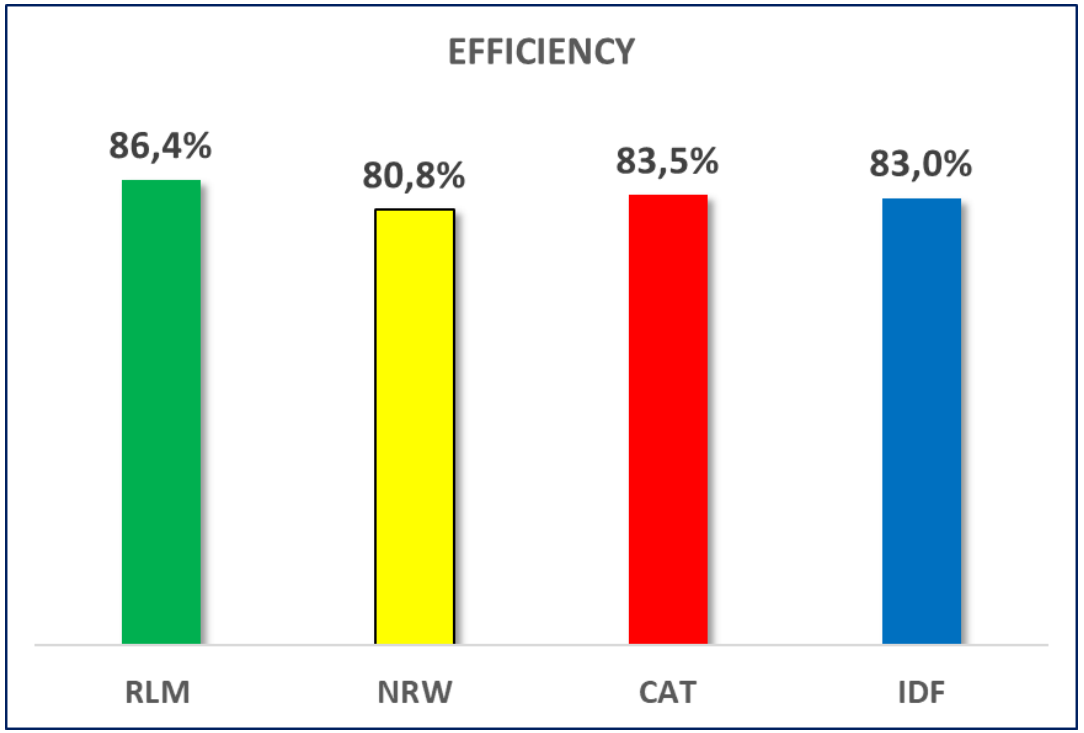
- As previously explained, the final value of the ReLAI composite index is obtained by weighting the indexed values with the vector of weights assigned by the experts.
- North Rhine–Westphalia emerges as the top-performing region in the three indicators considered most relevant by the experts, namely:

1. Infrastructure endowment
2. Quality of logistics services
3. Customs process efficiency

3.2 Index for the efficiency dimension

1) EFFICIENCY	RLM	NRW	CAT	IDF	24,8%		
Port-to-port cost from Shanghai (maritime)	82%	100%	82%	100%	4,7%		13°
Unit cost airport-to-airport to New York	80%	100%	68%	80%	4,3%		16°
Prime warehouse rental cost	100%	67%	65%	92%	5,3%		4°
Full-truckload road transport cost (>250 km)	78%	76%	100%	78%	5,3%		6°
Labor cost for handling operations	90%	67%	100%	66%	5,2%		7°
	86,4%	**80,8%**	**83,5%**	**83,0%**			

- For each dimension, a composite index was calculated based on the indexed indicator values weighted by the importance scores assigned by experts.
- The four European logistics regions considered are closely aligned in terms of efficiency, i.e., the underlying costs of logistics production factors: only a six-percentage-point gap separates the highest value (RLM = 86.4) from the lowest (North Rhine–Westphalia = 80.8).
- Overall, the RLM emerges as the most attractive logistics cluster in terms of cost competitiveness, despite achieving the maximum value (100) in only one of the five indicators (warehouse rental costs).



(*) Prime warehouse rental rates in Europe

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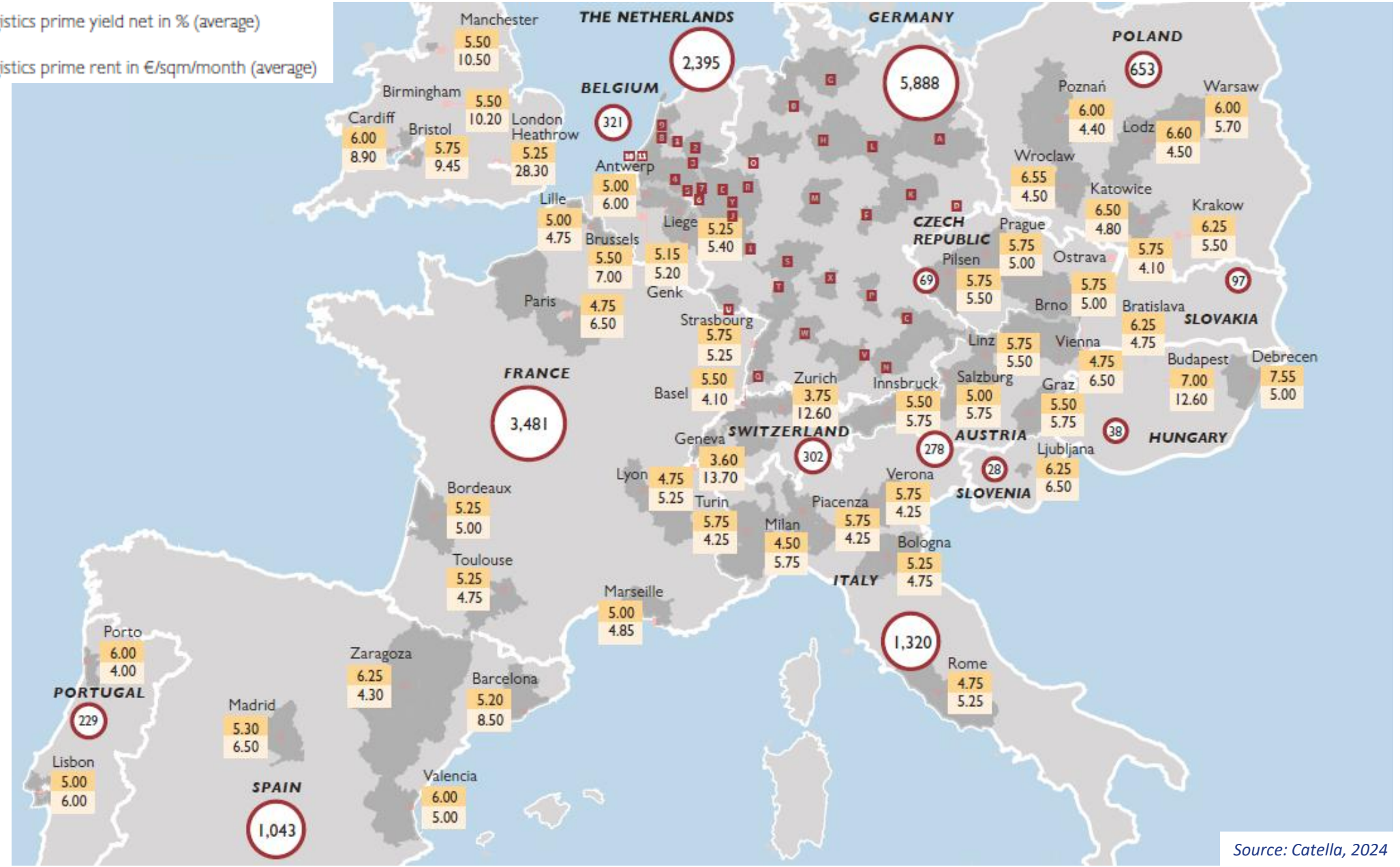
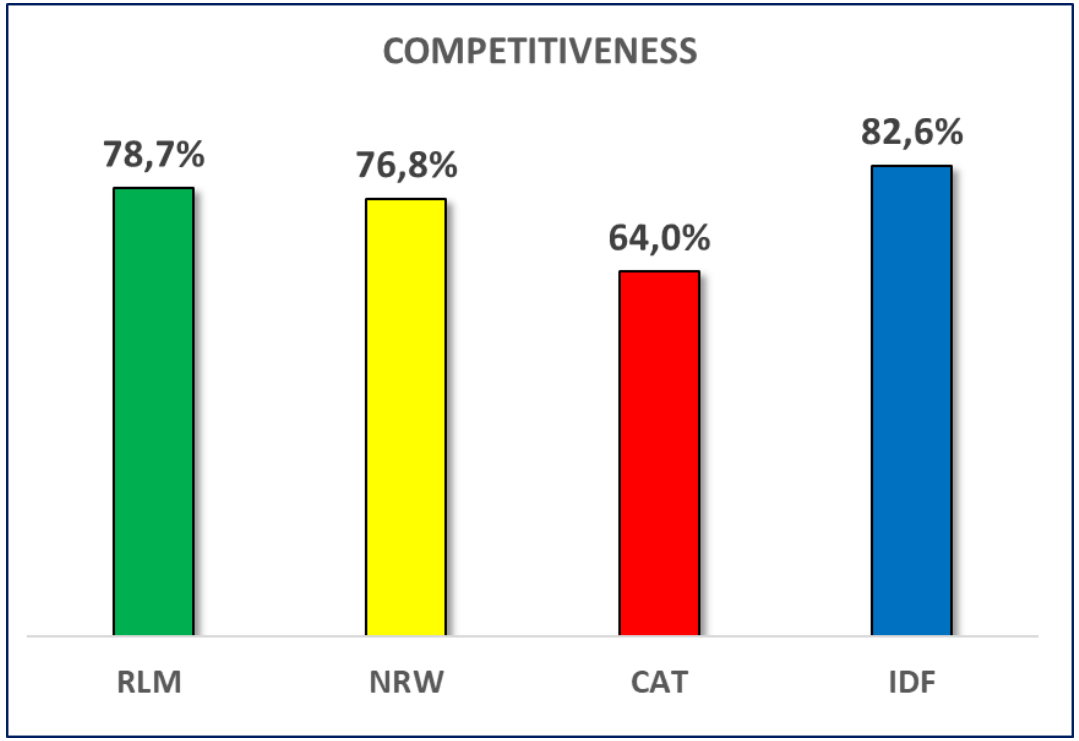


Source: Catella, 2024

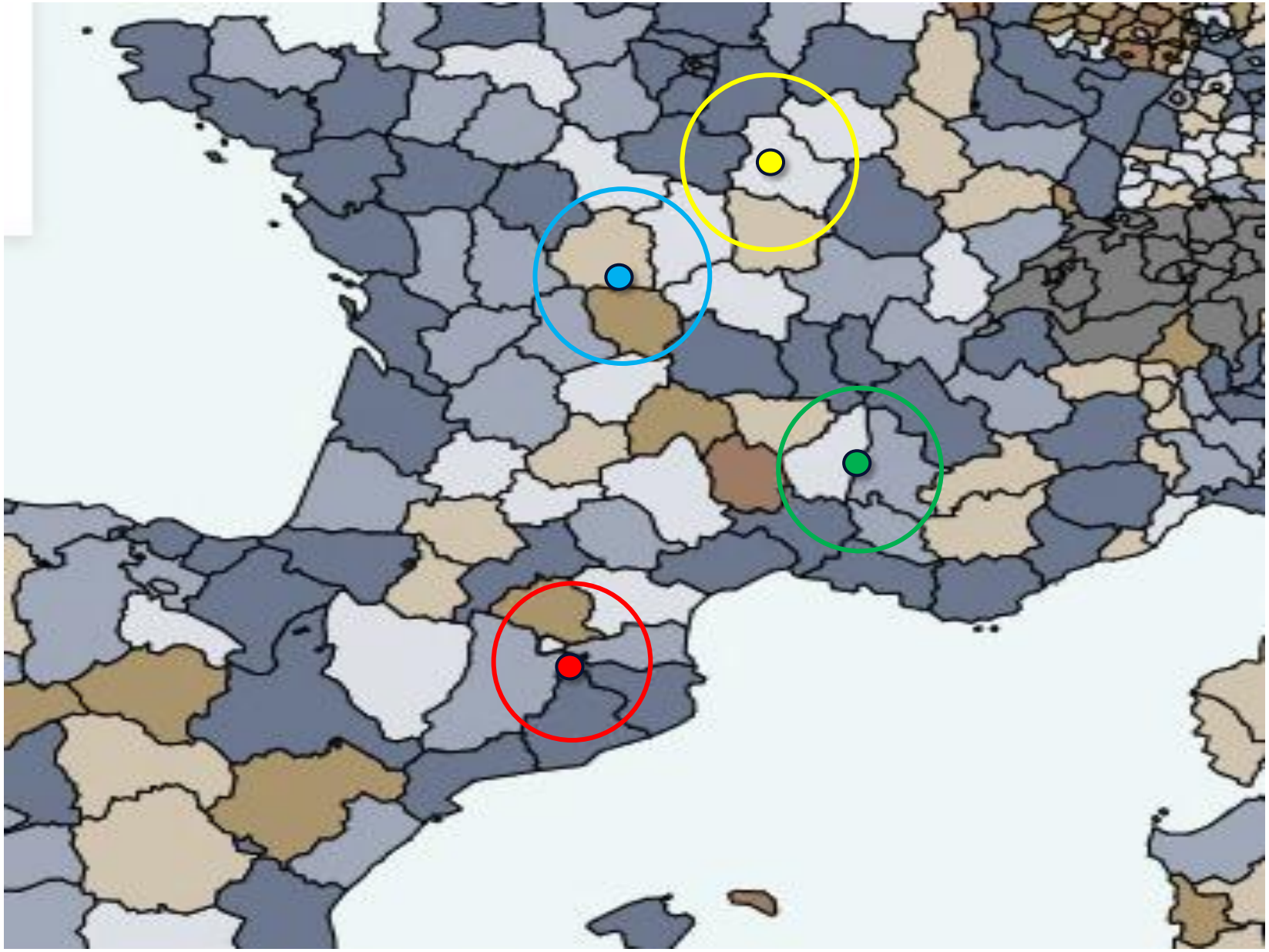
3.2 Index for the competitiveness dimension

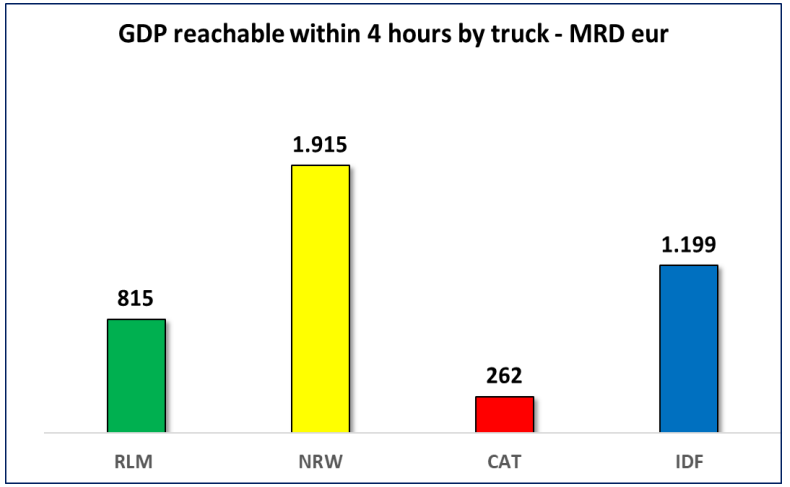
2) COMPETITIVENESS	RLM	NRW	CAT	IDF	25,4%		
Share of revenue from top 100 logistics and transport companies over GDP	100%	37%	52%	62%	4,1%		17°
GDP reachable within 4 hours by truck	43%	100%	14%	63%	5,3%		5°
Customs process efficiency (Customs Score)	87%	100%	92%	95%	5,4%		3°
Quality of logistics services (Logistics Quality and Competence score)	90%	100%	93%	90%	5,5%		2°
Warehouse take-up rate within the cluster	78%	35%	66%	100%	5,0%		10°
	78,7%	76,8%	64,0%	82,6%			

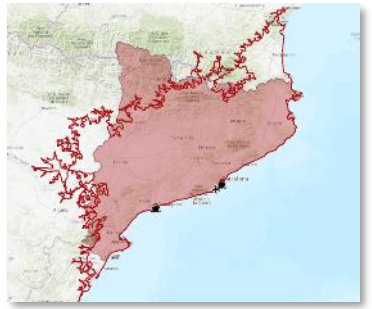
- In terms of competitiveness, Île-de-France achieves the highest index value (82.8), despite obtaining the maximum score (100) in only one of the five indicators (warehouse take-up).
- North Rhine–Westphalia, by contrast, records the maximum score in three out of five indicators, yet its overall competitiveness index is lower due to very low values in two indicators: business concentration and warehouse density. It is also a highly central area in terms of accessible GDP (*).
- The RLM (78.8) ranks second, driven by consistently high average values in four out of the five indicators.



(*) GDP by province (NUTS-3), 2023





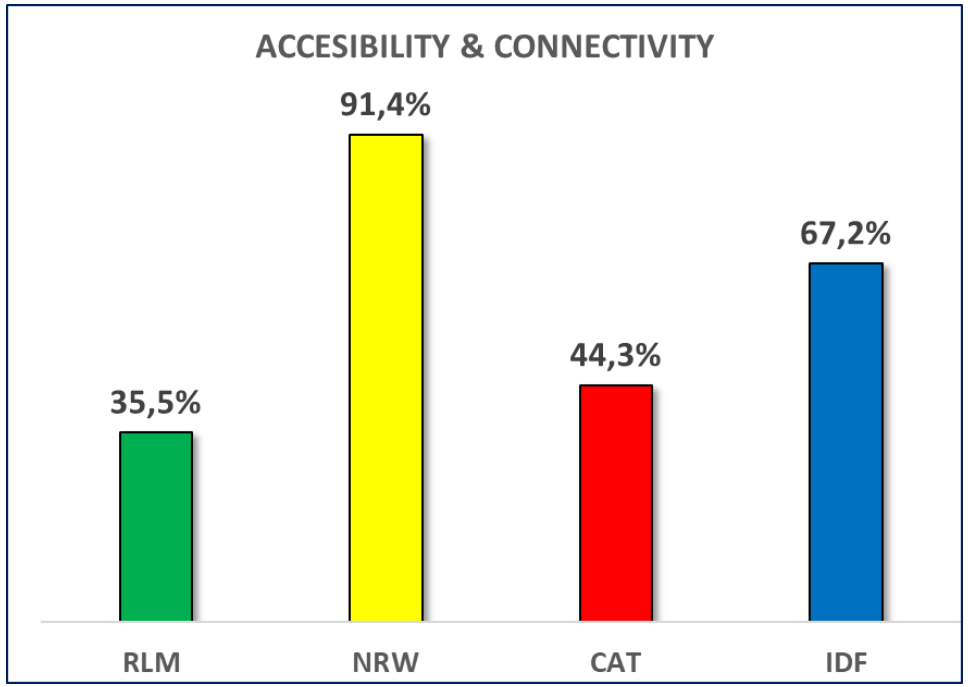


Source: LIUC Università Cattaneo Elaboration on Eurostat Data

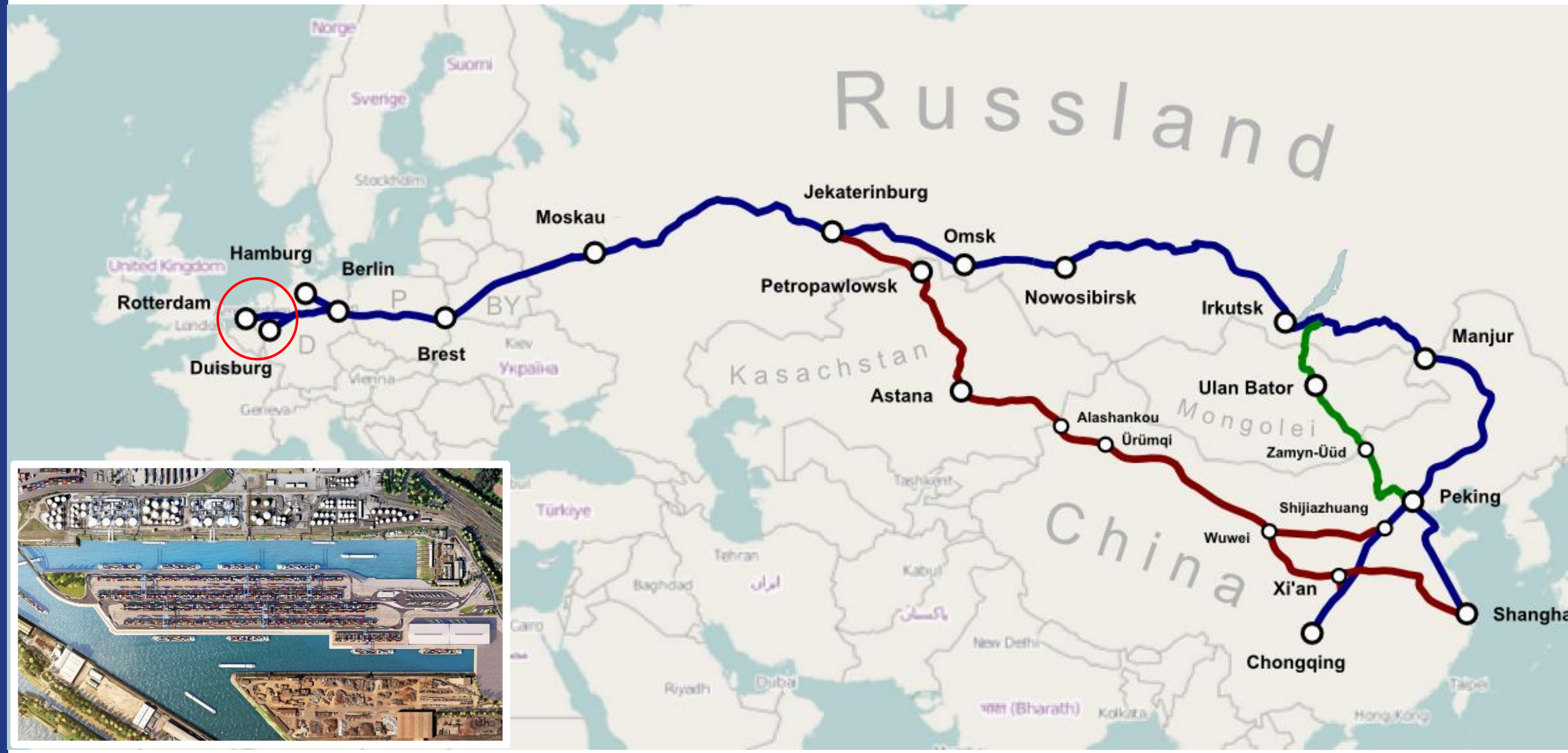
3.2 Index for the Accessibility & Connectivity dimension

3) ACCESSIBILITY AND CONNECTIVITY	RLM	NRW	CAT	IDF	25,3%
Motorway infrastructure index	50%	100%	69%	76%	5,9%
Railway infrastructure index	28%	65%	24%	100%	5,0%
Port Liner Shipping Connectivity Index	44%	100%	53%	48%	4,7%
TEUs handled in ports reachable within 4 hours	15%	100%	14%	11%	5,0%
Airport Connectivity Index	38%	91%	59%	100%	4,6%
	35,5%	**91,4%**	**44,3%**	**67,2%**	

- In terms of accessibility and connectivity, North Rhine–Westphalia registers by far the highest index value (91.4), thanks to its strong motorway infrastructure, proximity to the port systems of Rotterdam and Antwerp, which together account for one-third of all container traffic in European ports, and its network of intermodal terminals (*).
- Île-de-France, driven by the CDG hub, achieves the highest score for air connectivity, while its dense rail network also places it first in rail-based transport performance.
- The RLM, as already highlighted in 2019, suffers from a significant infrastructure deficit—not only in road transport, but across all modes—performing below the other clusters across multiple indicators.



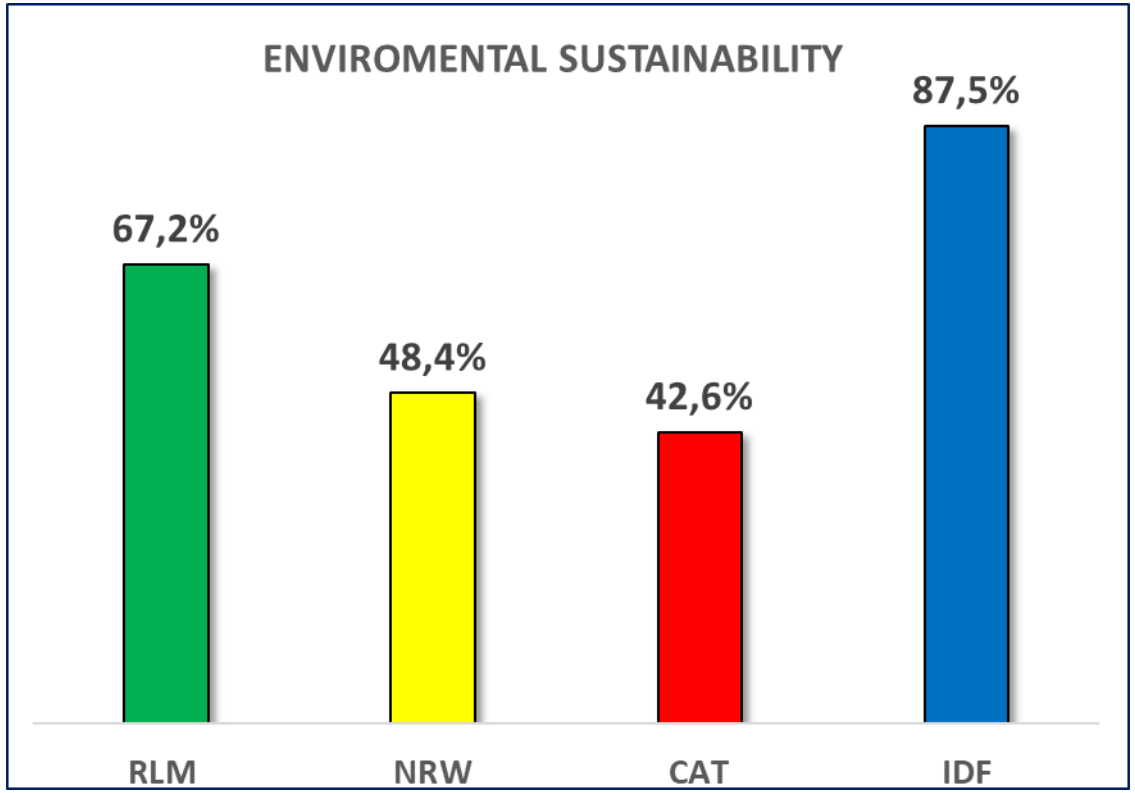
(*) North Rhine–Westphalia is the end of the Far East intermodal corridor



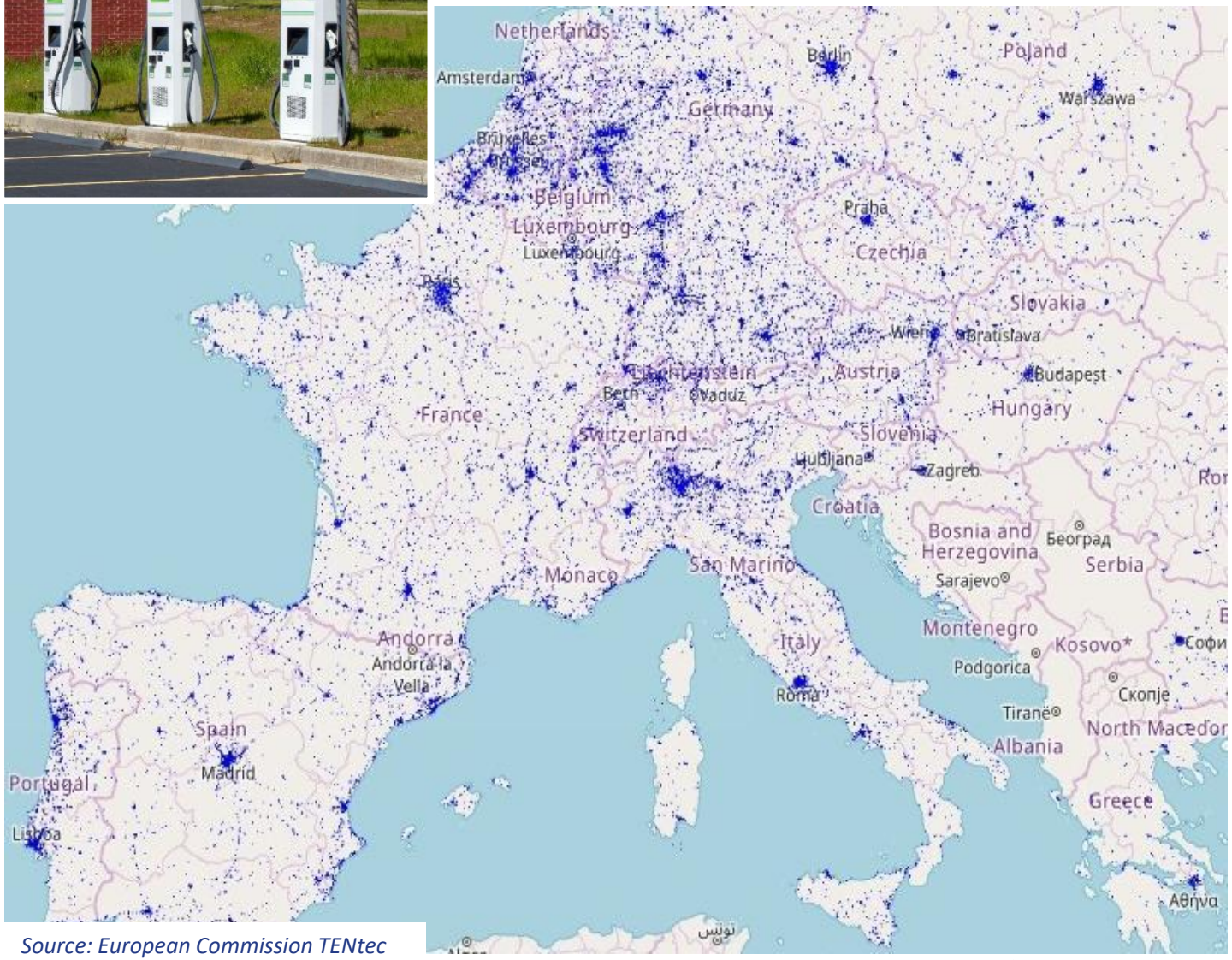
3.2 Index for the environmental sustainability

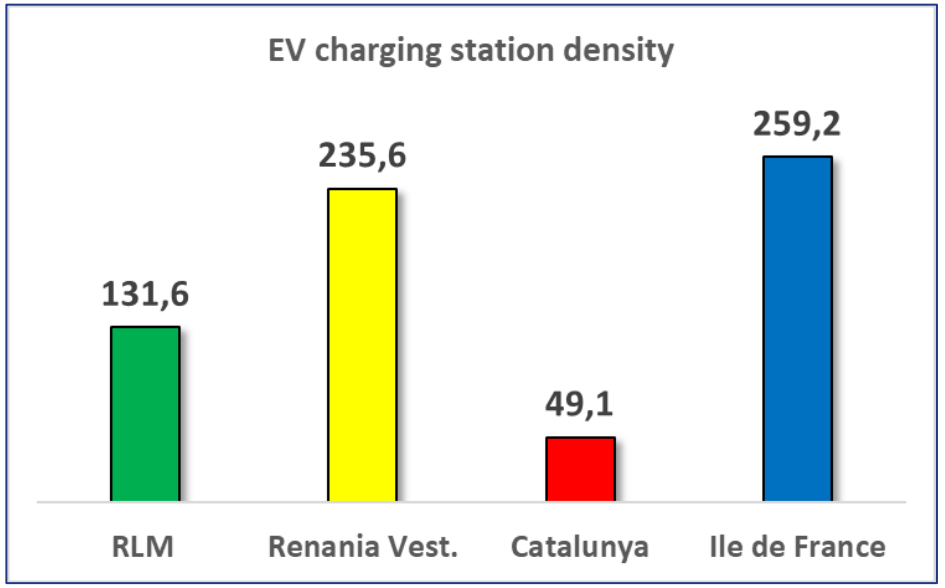
4) ENVIROMENTAL SUSTAINANILITY	RLM	NRW	CAT	IDF	11,6%	
Share of electric commercial vehicles in fleet	10%	76%	18%	100%	3,9%	
Density of LNG refueling stations	100%	36%	14%	79%	4,0%	
Environmental certification of warehouses	92%	33%	100%	83%	3,7%	
	67,2%	48,4%	42,6%	87,5%		

- In terms of environmental sustainability, Île-de-France records the highest index value (87.5), driven by the high share of electric commercial vehicles (*) and the high proportion of environmentally certified warehouses.
- The RLM ranks second, supported by its density of LNG refueling stations, an indicator in which it leads Europe, and by the large number of environmentally certified warehouses developed in the past five years.
- The lack of region-level (NUTS-2) data for the indicator on the share of intermodal freight transport penalized North Rhine–Westphalia. In fact, Germany has a higher intermodal freight volume per kilometer of rail network than the other clusters (**).



(*) EV Charging stations Distribution in Europe

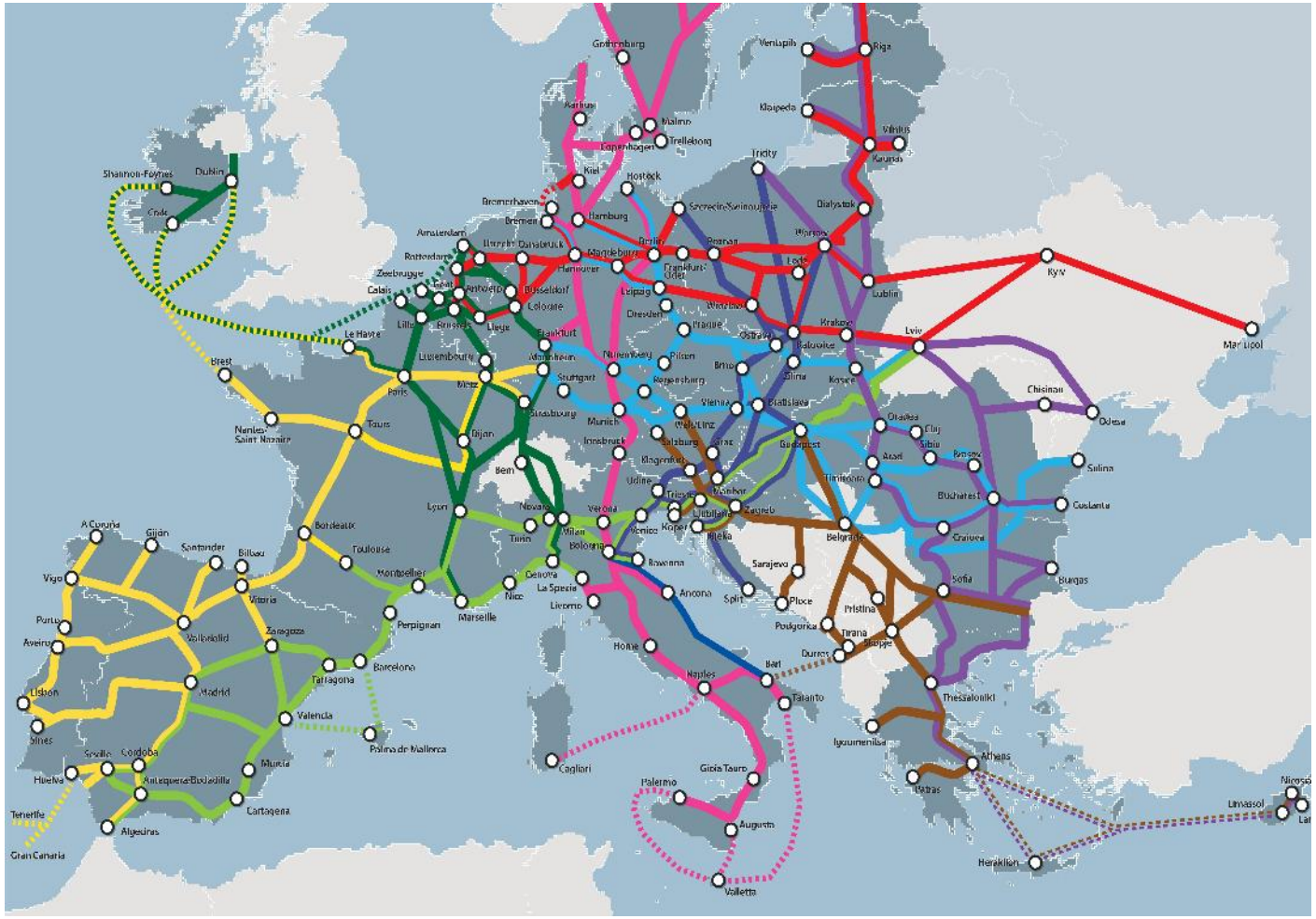


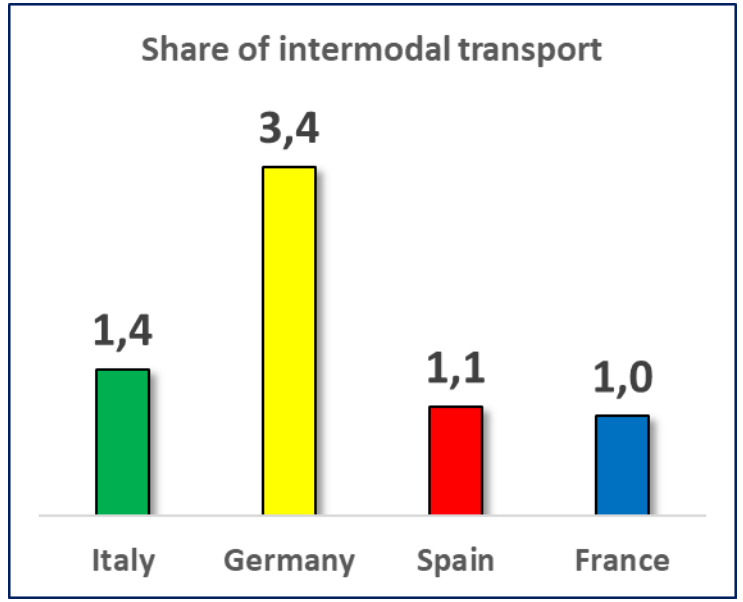


$$\frac{\text{Number of EV charging station}}{\text{km}^2 \ \text{Territory}} \times 1000$$

Source: European Commission TENtec

(**) Incidenza Trasporto merci Intermodale





Intermodal freight traffic(mln ton)

km Railway Networks

Note: the absence of region-level data does not allow this indicator to be calculated at the NUTS-2 level.

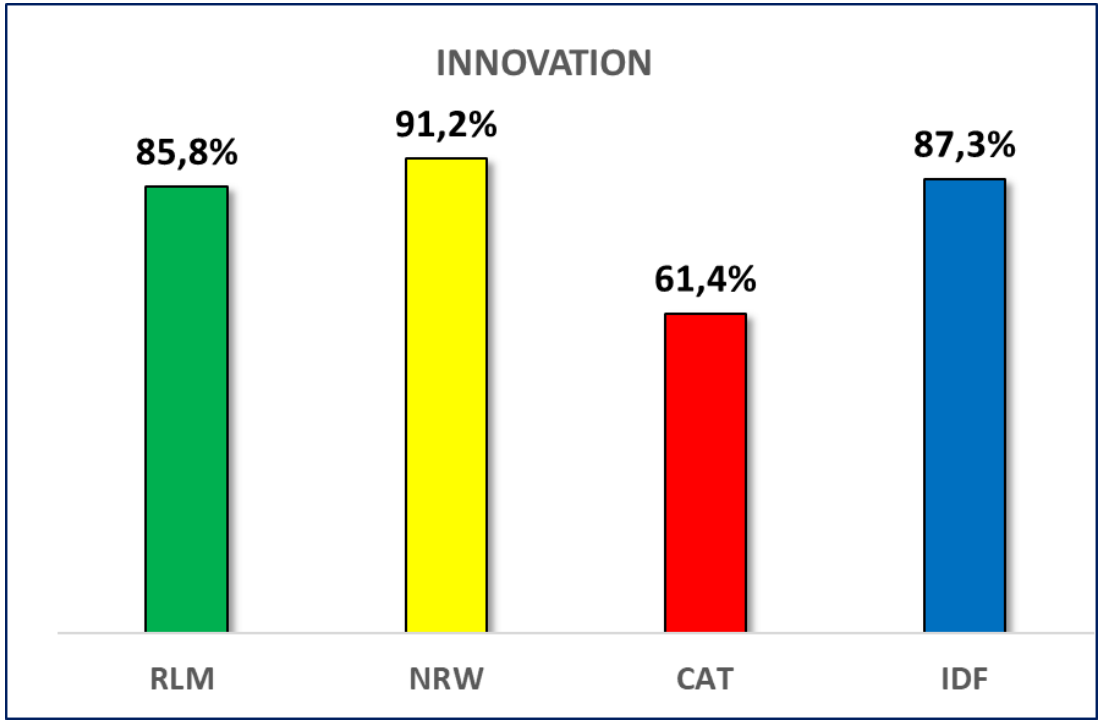
Source: European Commission TENtec

Source: LIUC Università Cattaneo elaboration on Eurostat data

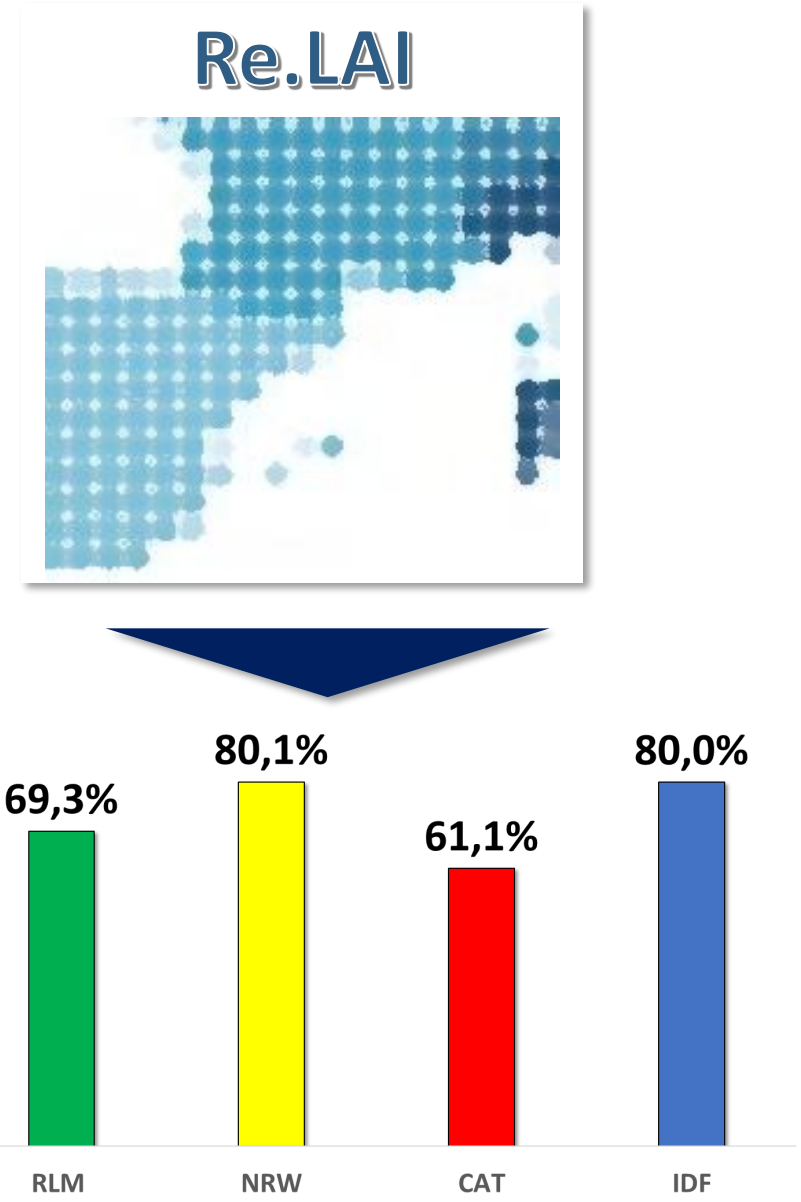
3.2 Index for the innovation dimension

5) INNOVATION	RLM	NRW	CAT	IDF	12,9%	
Number of patents in logistics innovation	73%	100%	13%	68%	3,3%	
Share of workers in high-tech knowledge-intensive logistics roles	84%	77%	96%	100%	4,9%	
Number of scientific publications on logistics topic	97%	100%	58%	88%	4,7%	
	85,8%	91,2%	61,4%	87,3%		

- In terms of technological innovation, the three clusters, North Rhine–Westphalia, Île-de-France, and the RLM, show broadly similar performance levels.
- Catalonia, by contrast, performs significantly lower, particularly with respect to the indicator “number of logistics innovation patents.”
- North Rhine–Westphalia, supported by the presence of numerous universities and research centers, achieves the highest score both in patenting capacity and in the number of scientific publications related to logistics and freight transport.



3.2 Results: the ReLAI index for the 4 logistics clusters



In the international comparison of European logistics clusters, two leading regions emerge for different reasons:

- **North Rhine–Westphalia** stands out due to its strategic geographic position at the heart of Europe, and its proximity to the continent's two major ports and their associated ecosystems. It is connected to these through a rich trimodal infrastructure network (road, rail, and inland waterways), making it a prime location for European logistics investment. Indeed, the GDP within a 4-hour trucking catchment area from the center of the cluster is more than double that of the RLM.
- **Île-de-France** benefits from the economic centrality of Paris within France, which results above all in high infrastructure density, especially regarding rail connections, as well as strong international air connectivity (CDG's connectivity index is three times higher than Malpensa's).Moreover, France is significantly more advanced than other European countries in the green transition (the share of electric commercial vans in circulation is ten times higher than in the RLM).

3.2 RLM *gap analysis*

	Δ % RLM vs Best	BEST
1) EFFICIENCY	**0,0%**	
Port-to-port cost from Shanghai (maritime)	-18%	NRW
Unit cost airport-to-airport to New York	-20%	NRW
Prime warehouse rental cost	0%	RLM
Full-truckload road transport cost (>250 km)	-22%	CAT
Labor cost for handling operations	-10%	CAT
2) COMPETITIVENESS	**-4,0%**	
Share of revenue from top 100 logistics and transport companies over GDP	0%	RLM
GDP reachable within 4 hours by truck	-57%	NRW
Customs process efficiency (Customs Score)	-13%	NRW
Quality of logistics services (Logistics Quality and Competence score)	-10%	NRW
Warehouse take-up rate within the cluster	-22%	IDF
3) ACCESSIBILITY AND CONNECTIVITY	**-55,9%**	
Motorway infrastructure index	-50%	NRW
Railway infrastructure index	-72%	IDF
Port Liner Shipping Connectivity Index	-56%	NRW
TEUs handled in ports reachable within 4 hours	-85%	NRW
Airport Connectivity Index	-62%	IDF
4) ENVIROMENTAL SUSTAINANILITY	**-20,3%**	
Share of electric commercial vehicles in fleet	-90%	IDF
Density of LNG refueling stations	0%	RLM
Environmental certification of warehouses	-8%	CAT
5) INNOVATION	**-5,3%**	
Number of patents in logistics innovation	-27%	NRW
Share of workers in high-tech knowledge-intensive logistics roles	-16%	IDF
Number of scientific publications on logistics topic	-3%	NRW

Comparing the RLM with the logistics clusters that achieve the highest score in each dimension shows that:

- The dimension where the RLM is most penalized is accessibility and competitiveness (-56%), where North Rhine–Westphalia and Île-de-France lead.
- A significant gap emerges particularly in road and rail infrastructure endowment, as well as in the lower weight of Ligurian ports compared to those in the Northern Range (Rotterdam and Antwerp).
- The RLM also shows a considerable gap in environmental sustainability, especially regarding the transition to electric vehicles.
- By contrast, the RLM performs strongly in efficiency (ranking first) and remains competitive overall.

3.2 *Key messages*

The analysis of indicators and expert interviews reveals several key insights:

- **Where is the RLM competitive?** The RLM ranks first in terms of efficiency, consistent with the findings of the 2019 study. Efficiency is measured through five cost-related indicators. Lower warehouse rental rates and lower hourly labor costs are key drivers of attractiveness, especially for logistics segments that rely heavily on warehousing activities (e.g., e-commerce fulfillment centers).

- **Where has the RLM improved compared to 2019?** The most significant improvements relate to competitiveness, especially to the quality of logistics services, and greater efficiency in customs procedures, reflected in shorter clearance times. Service quality has also improved thanks to higher-skilled labor, measured by an increasing share of workers with advanced qualifications.

- **Which gaps remain?** Compared to the main European logistics clusters—and despite accounting for 27% of Italy's logistics market and 35% of national warehouse space—the RLM remains disadvantaged in terms of infrastructure and maritime/air connectivity. A critical issue today is disruption at Alpine crossings, particularly on rail routes, which affects transit times for goods moving across the Alps. However, strong infrastructure alone is not enough to deliver high-performing logistics. Strengthening competitiveness at the European level also requires focusing on intangible drivers, particularly technological innovation, including R&D, patents, automation, and digitalization.

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