GRANULAR

Crowd-sourcing data for accessibility

RIATE (CNRS – Université Paris Cité)

Ronan Ysebaert, Louis Laurian, Marianne Guérois

GRANULAR Knowledge Transfer Accelerator

5 December 2024

Funded by the European Union.Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them. UK participants in the GRANULAR project are supported by UKRI- Grant numbers 10039965 (James Hutton Institute) and 10041831 (University of Southampton).

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GENERAL FRAMEWORK

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Objectives

- Build **accessibility indicators to services** at local scale using **only** free and open sources solutions for all Europe.
- Create a **replicable framework:** possible to update, extend/focus on study areas (living labs)

Overall methodology

- **Routing**: Travel time by car using OSRM, an open source and free routing engine based on the OpenStreetMap network (congestion free).
- **Origins**: Populated 1km grid cells in 2021 (GEOSTAT, version 2023)
- **Destinations**: Urban centres and towns (European Commission)
  - Little town: more than 5K inh.
  - Medium town: more than 10K inh.
  - Large town/city: more than 50K inh.

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CITIES & TOWNS: A PROXY FOR SERVICES

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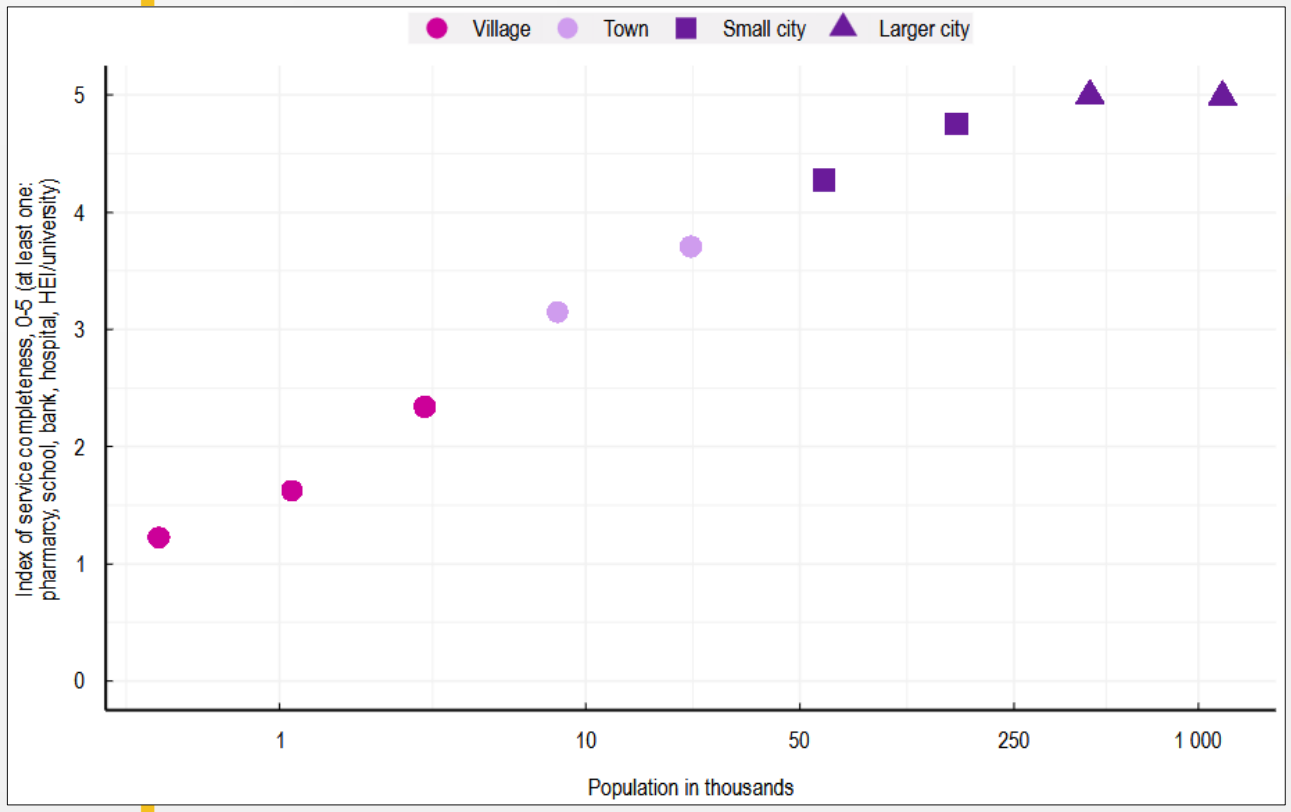
- Context : Lack of harmonized POI in Europe (out of healthcare & education services)

Prevalence of services relative to settlement population in OECD (25 countries)



Source : OECD Rural Studies, 2024, Getting to Services in Towns and Villages. Preparing regions for demographic changes

Share (%) of French towns and cities equiped by type of services and settlement population

TYPE	FACILITIES	LITTLE TOWNS	MED. TOWNS	CITIES
Education	ISCED_1 (primary schools)	100	99.6	100
	ISCED_2 (*collèges*)	85.3	97.2	100
	ISCED_3 (*lycées*)	50.4	86.8	100
	ISCED_4-5 (higher educ.)	13.8	50.2	96.1
	ISCED_6-8 (universities)	4	33.1	93.4
Health	General practitioner	99.3	99.6	100
	Ophtalmo + denstist + labo	33	71.9	100
	Pediatrician	16.2	56.6	98.7
Shops	Bakery	99.8	99.6	100
	Furniture & electronics	65.3	92.2	100
	Fish shop	31.2	58.4	100
Services	Post office	92.8	99.3	100
	IFS (group of services)	46.6	54.1	88.2
	Tax center	8.2	15.7	30.3

Realisation : RIATE, 2024

Source : INSEE, 2023, Base Permanente des équipements

33 ACCESSIBILITY INDICATORS

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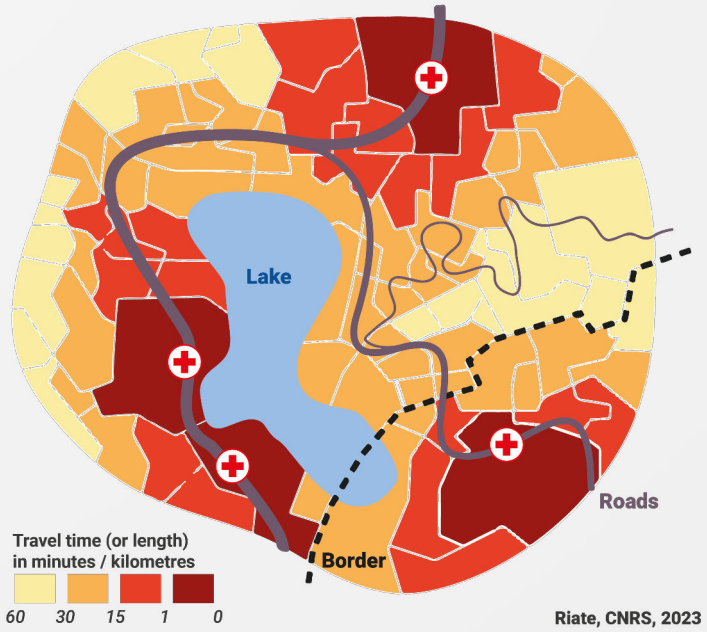
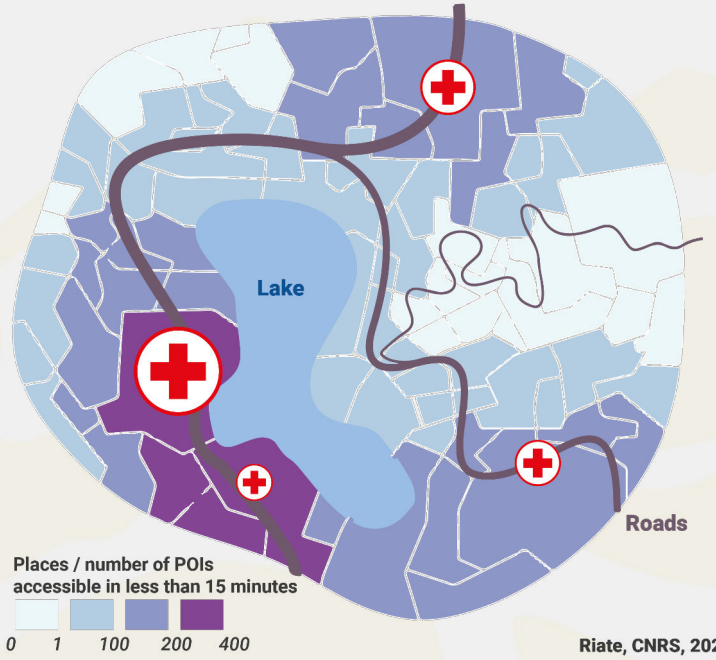
TRAVEL TIME INDICATORS



- Travel time to the 1st, 2nd and 3rd little-medium town and city = 9 indicators

In the 1km reference grid & aggregated in the NUTS2/3 division

OPPORTUNITIES



- Number of little-medium towns and cities reachable in reach, 15/30/60/120 minutes = 12 indicators
- Population living in little-medium towns and cities reachable in 15/30/60/120 minutes by car = 12 indicators

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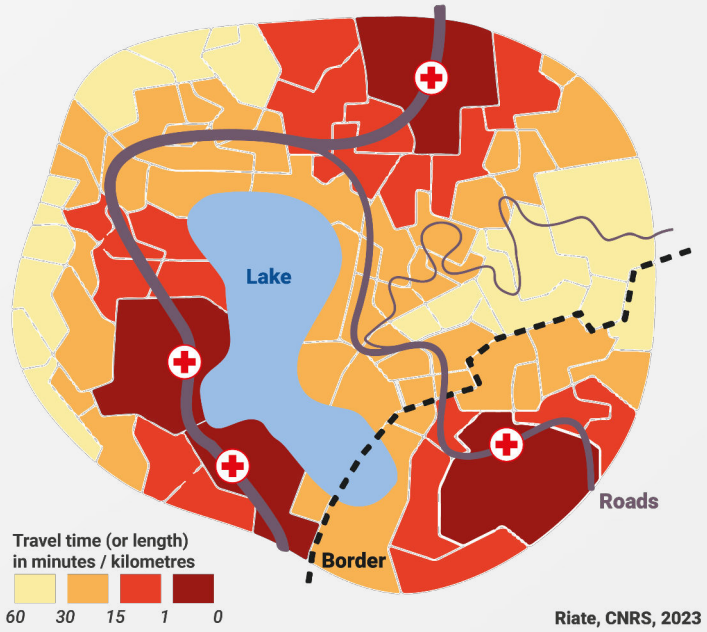
TRAVEL TIME INDICATORS



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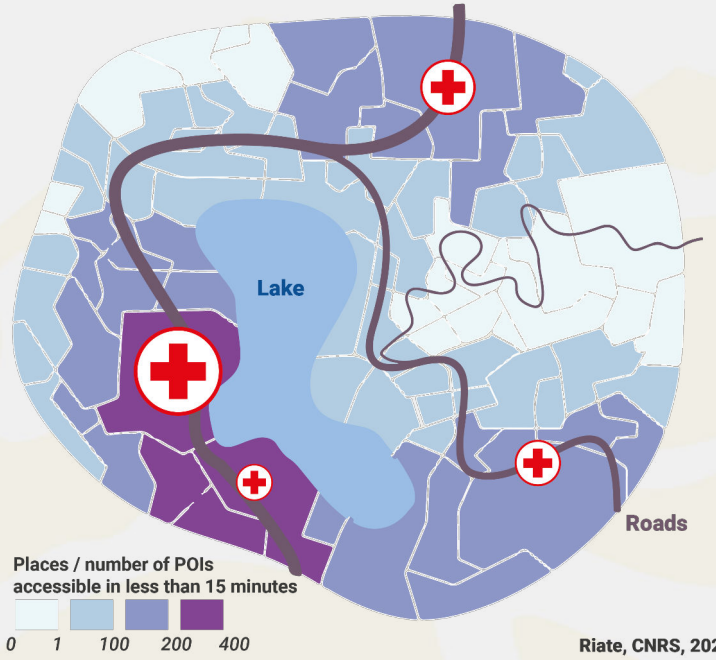

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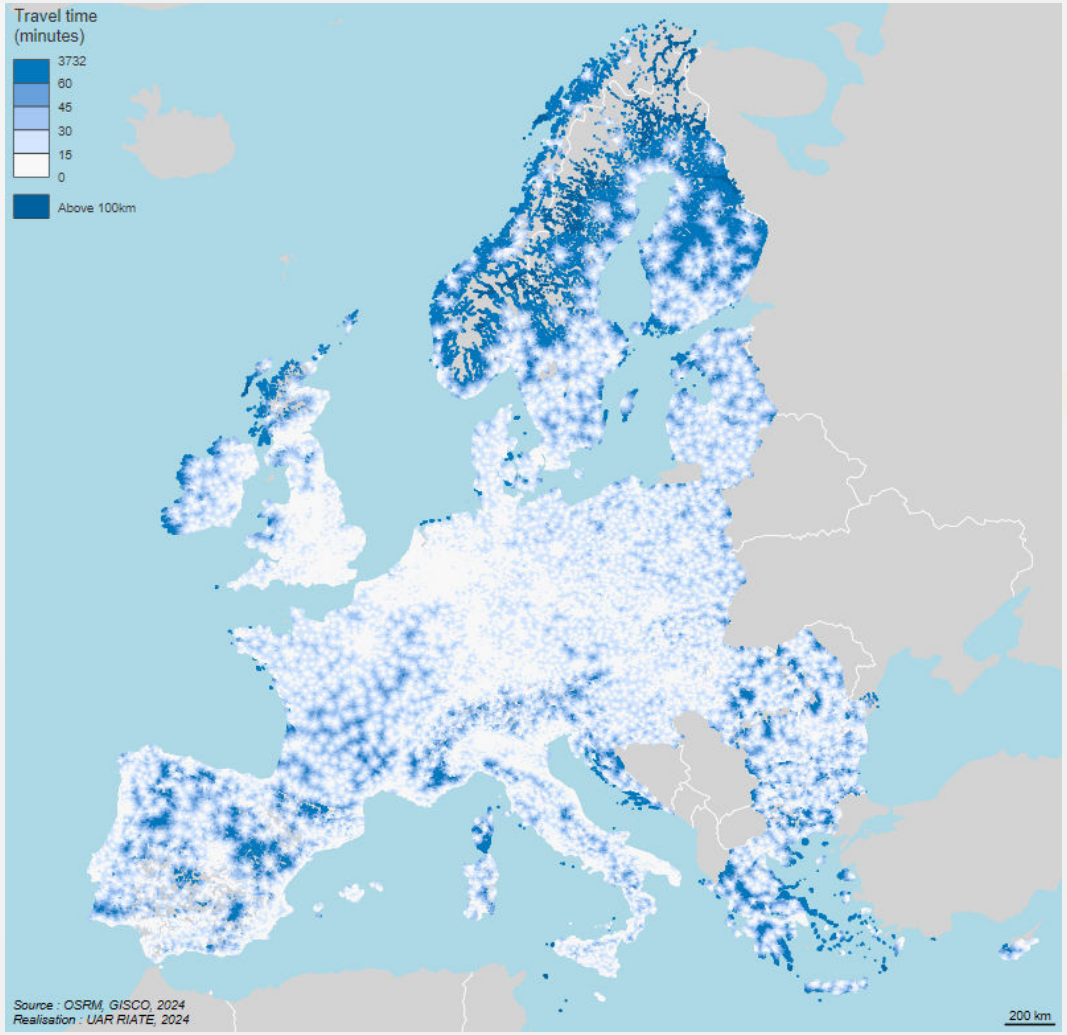
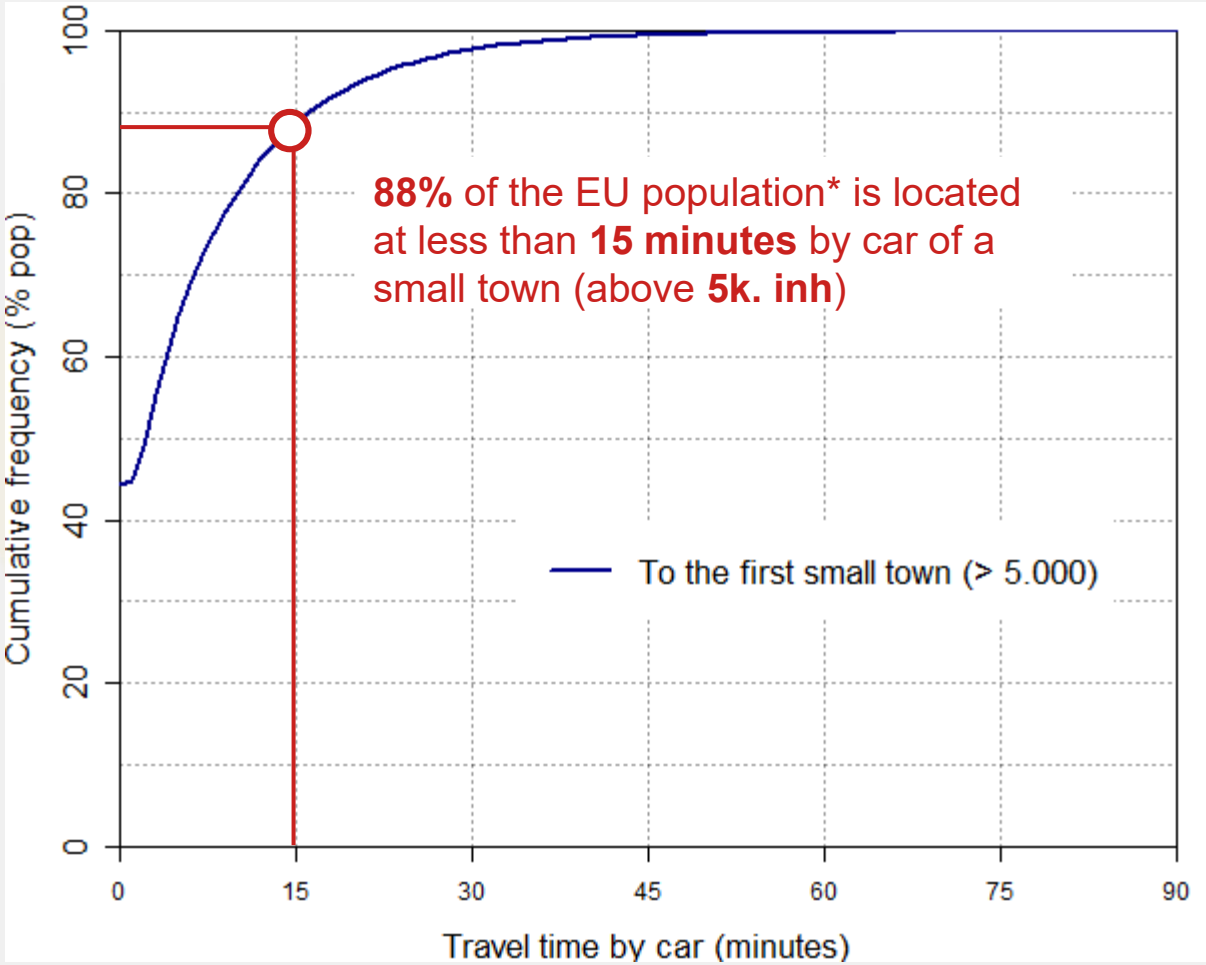
EUROPEAN OUTPUT

Travel time to the nearest small town

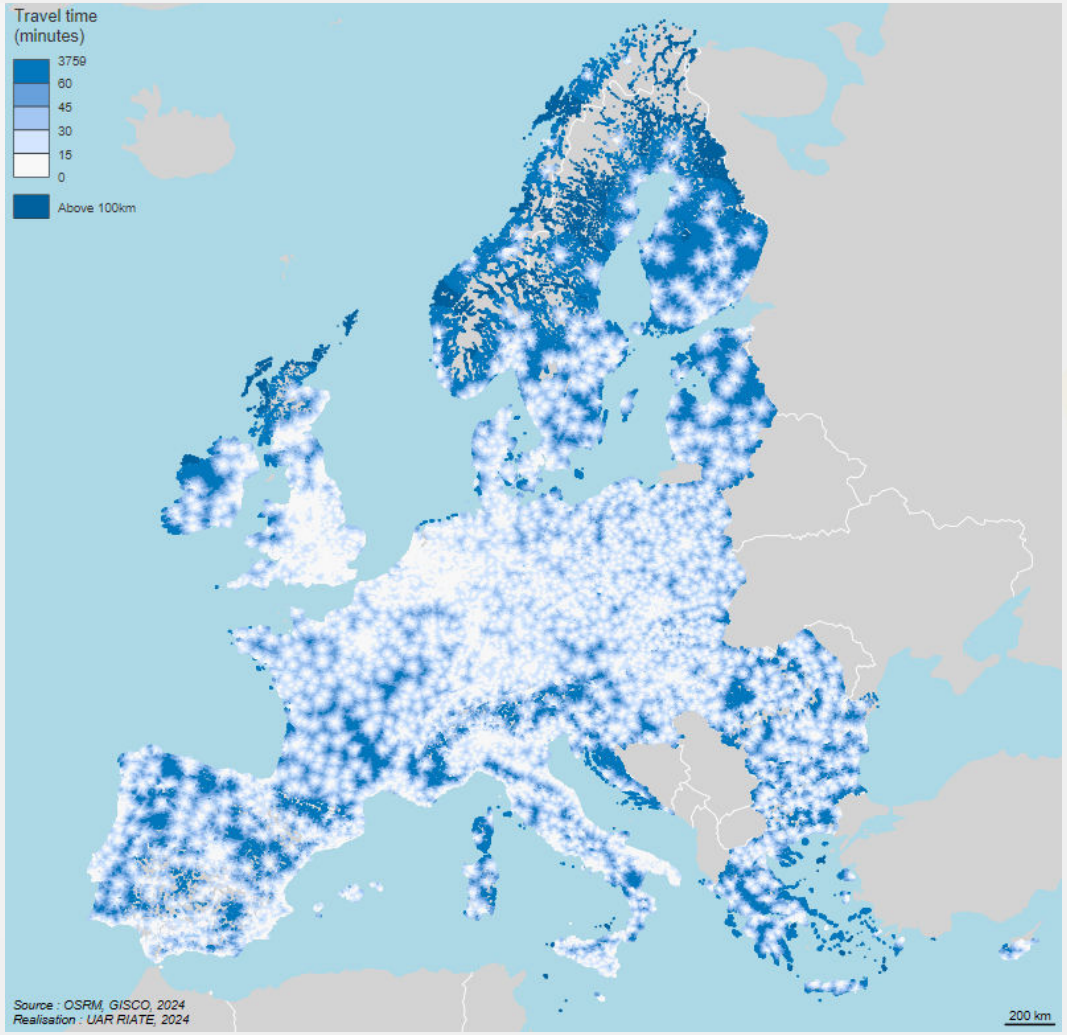


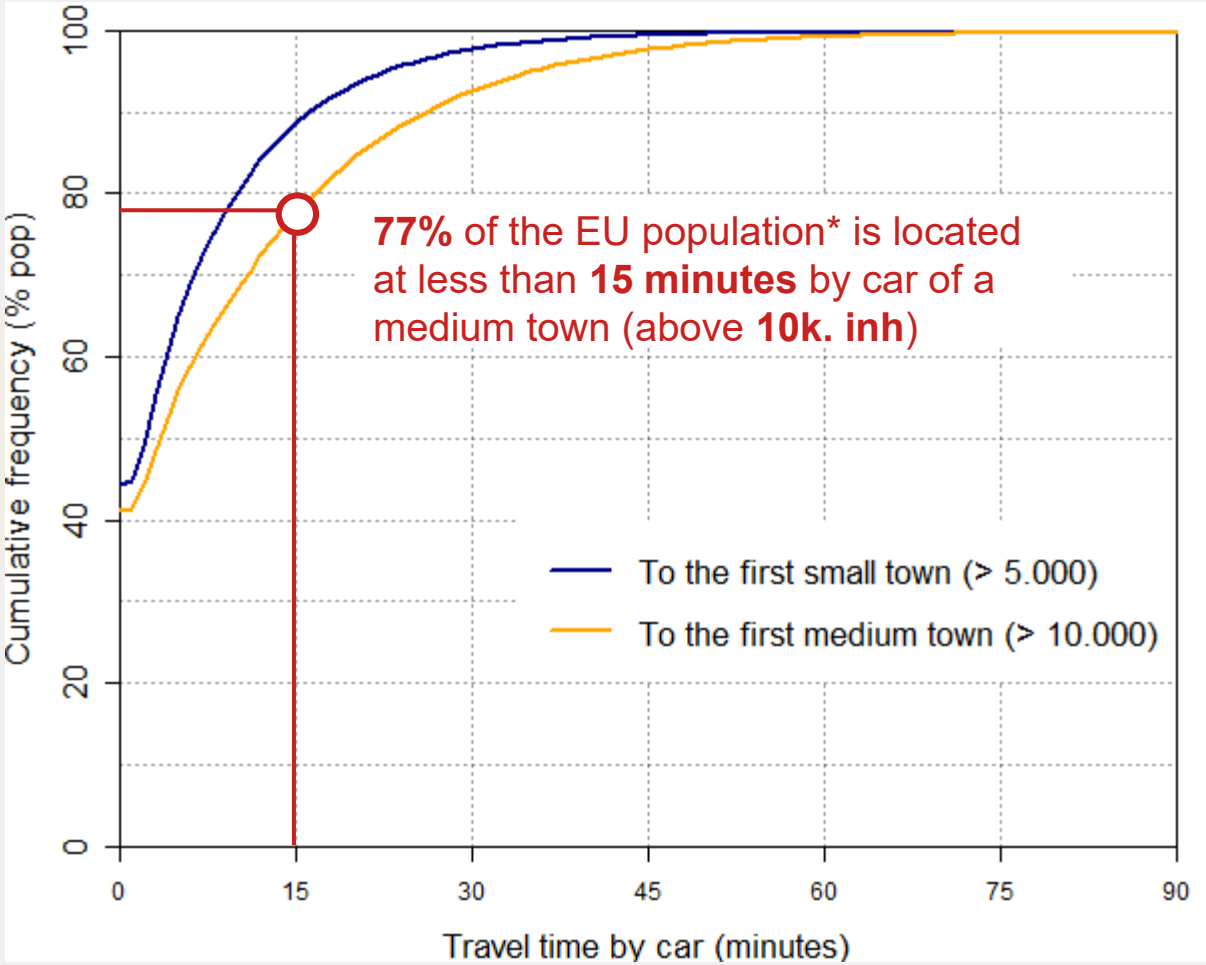


* Only grid cells located at less than 100 km of a town-city are considered (+/- 1 hour travel time) = 99,96 % of the EU population

EUROPEAN OUTPUT

Travel time to the nearest medium town

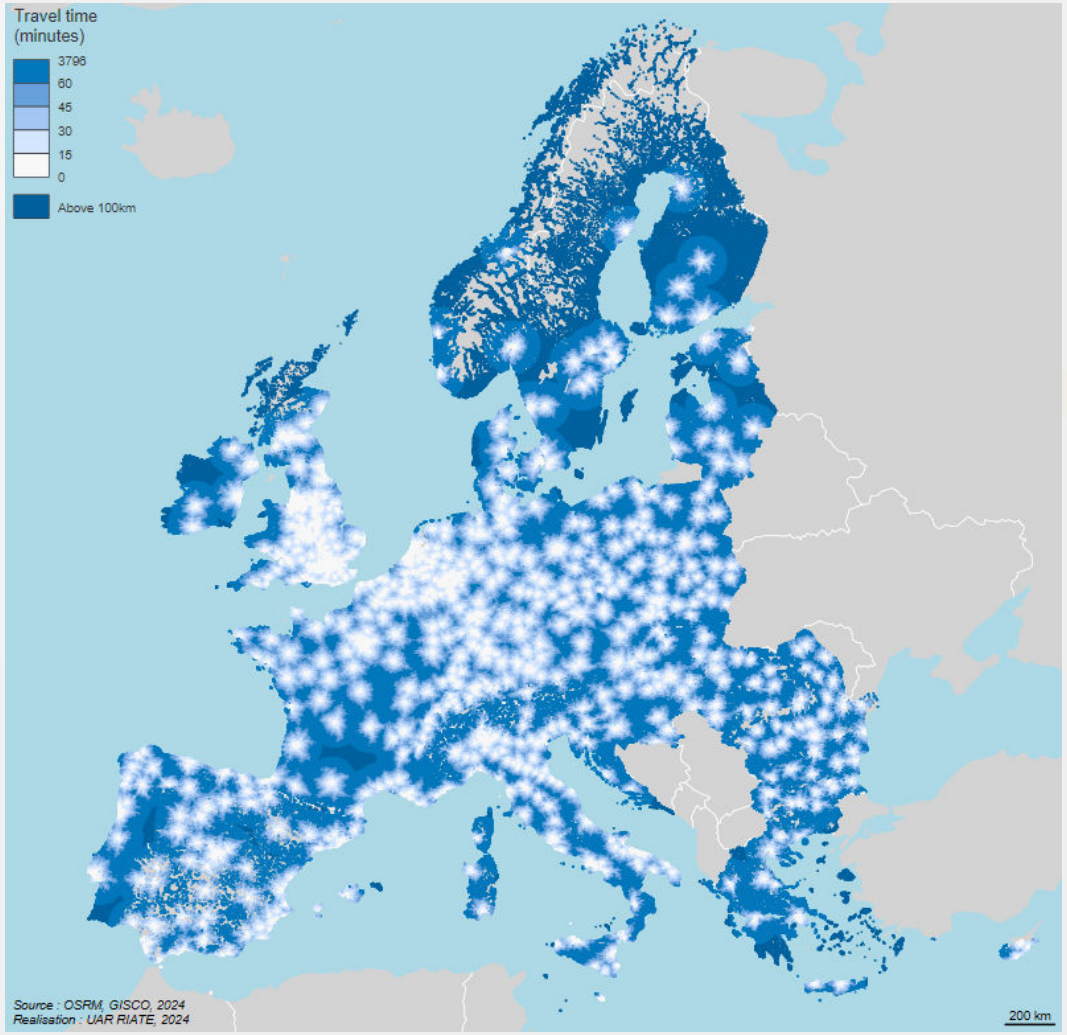


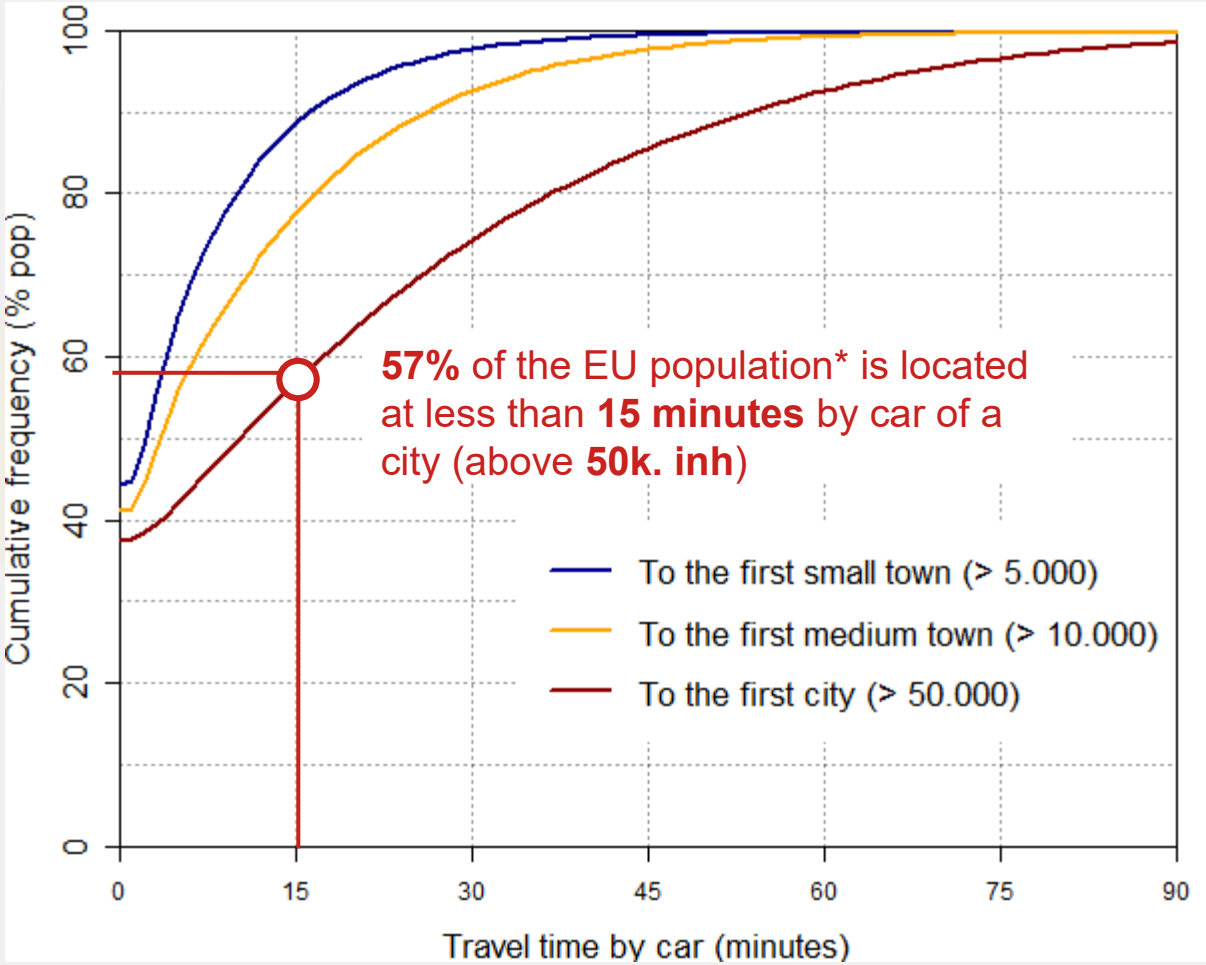


* Only grid cells located at less than 100 km of a town-city are considered (+/- 1 hour travel time) = 98,84 % of the EU population

EUROPEAN OUTPUT

Travel time to the nearest city

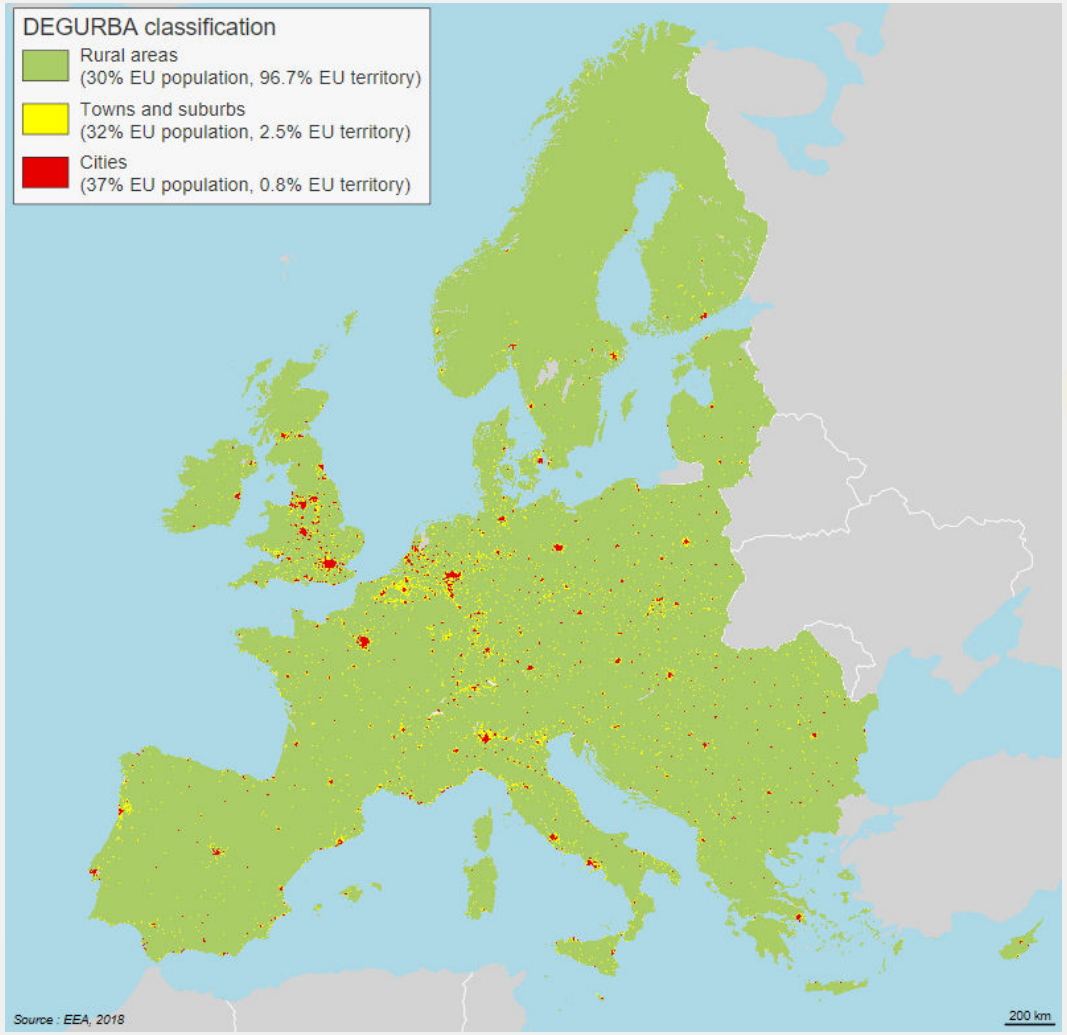


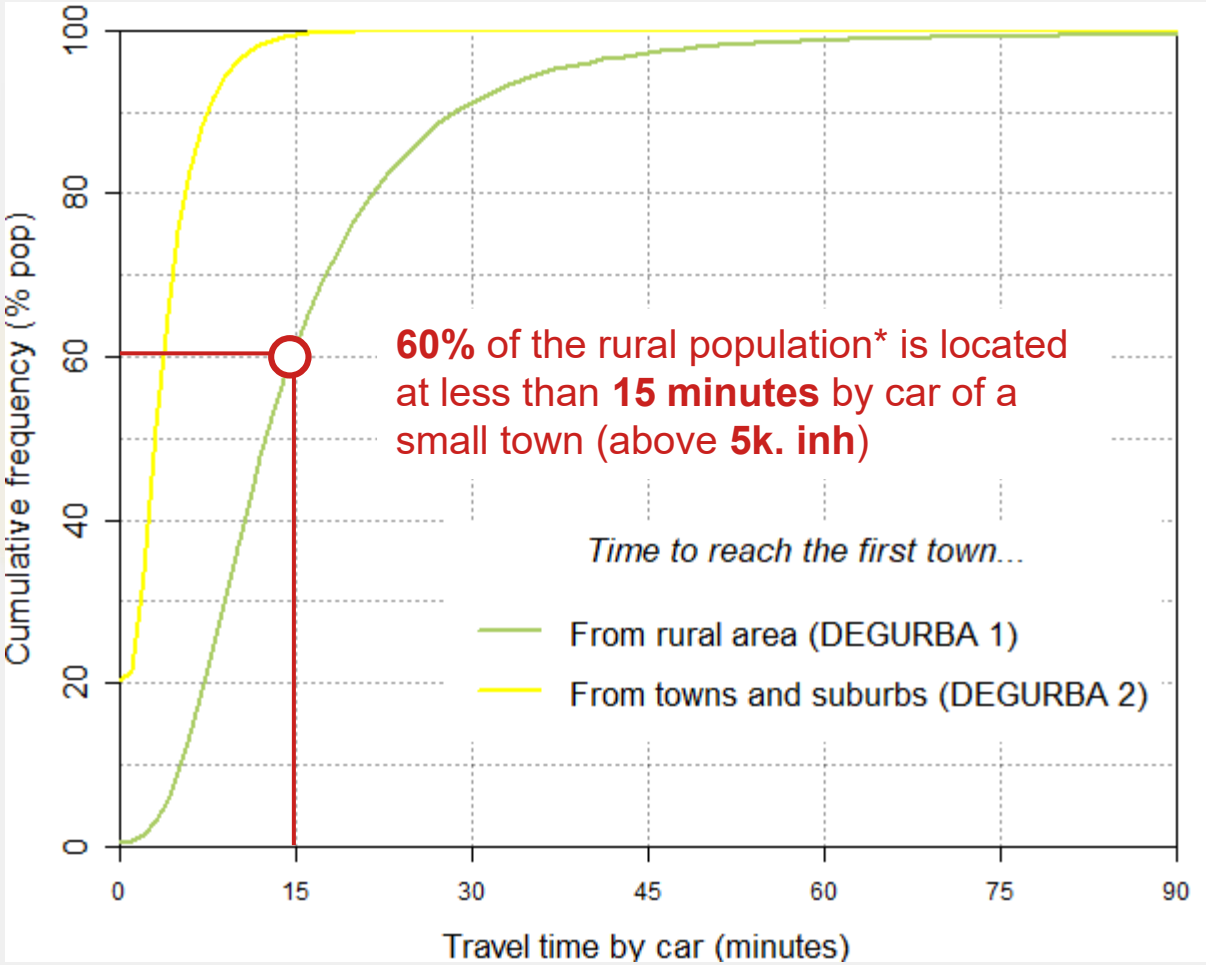


* Only grid cells located at less than 100 km of a town-city are considered (+/- 1 hour travel time) = 98,33 % of the EU population

EUROPEAN OUTPUT

Only rural cells (DEGURBA cat. 3)





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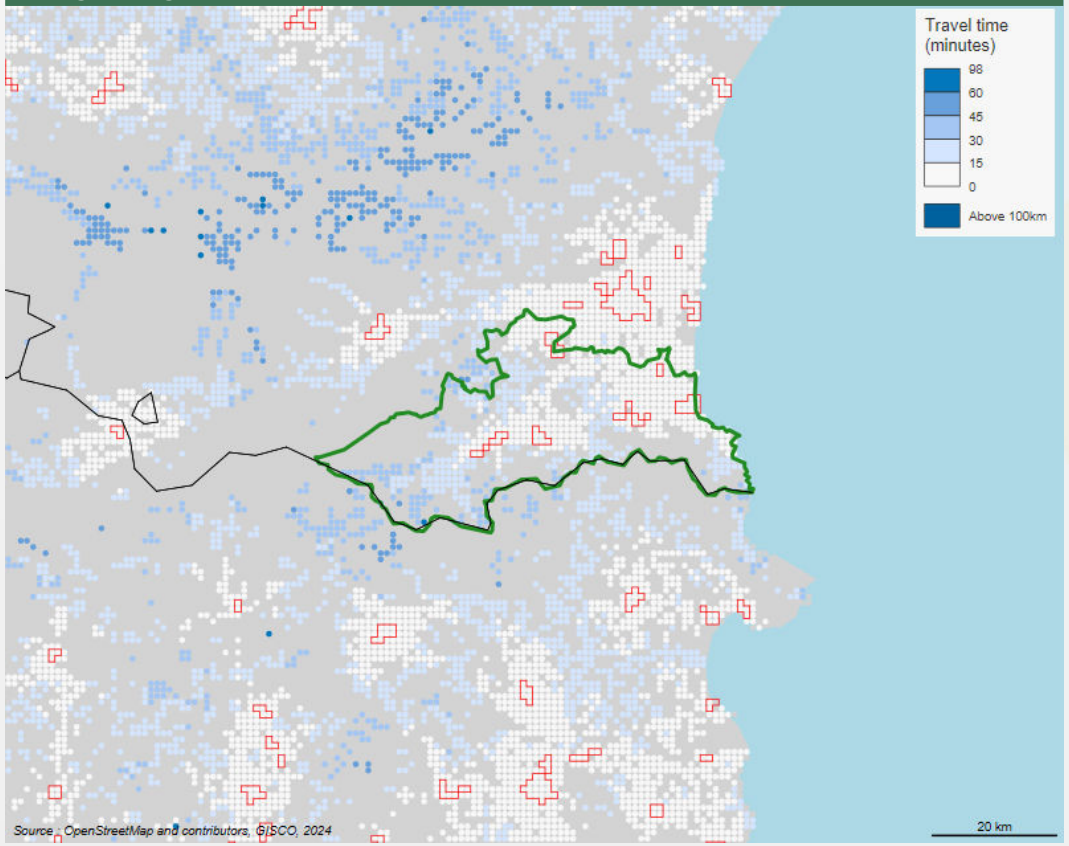
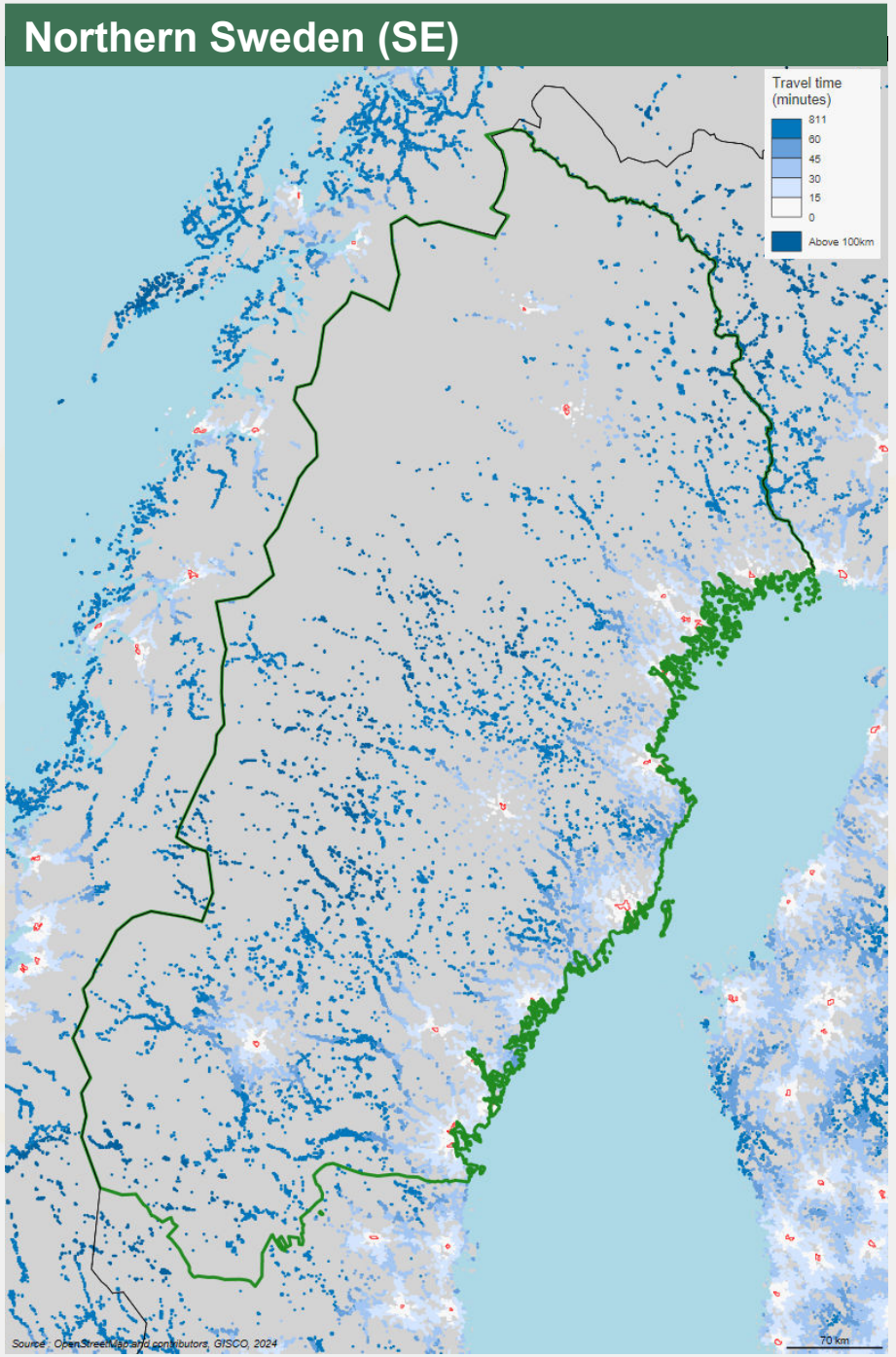
ZOOM IN GRANULAR LABS

Little towns

Pays Pyrénées Méditerranée (FR)



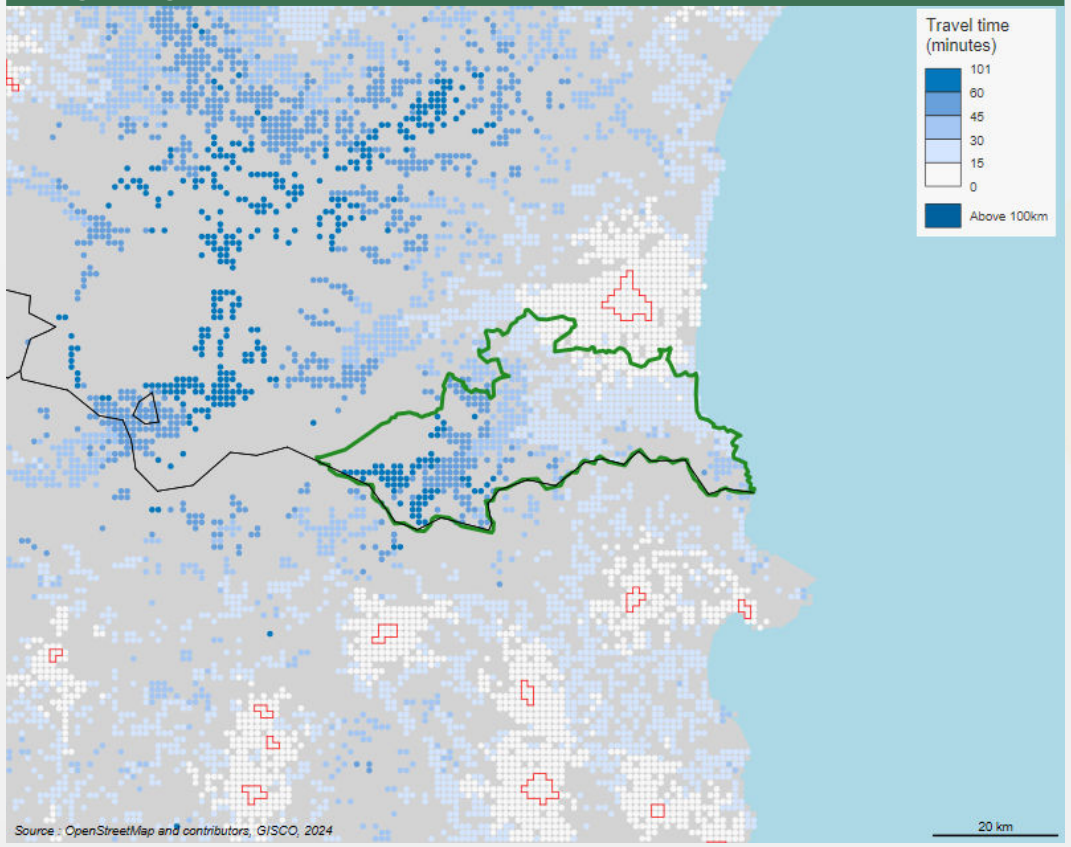
Northern Sweden (SE)



ZOOM IN GRANULAR LABS

Medium towns

Pays Pyrénées Méditerranée (FR)



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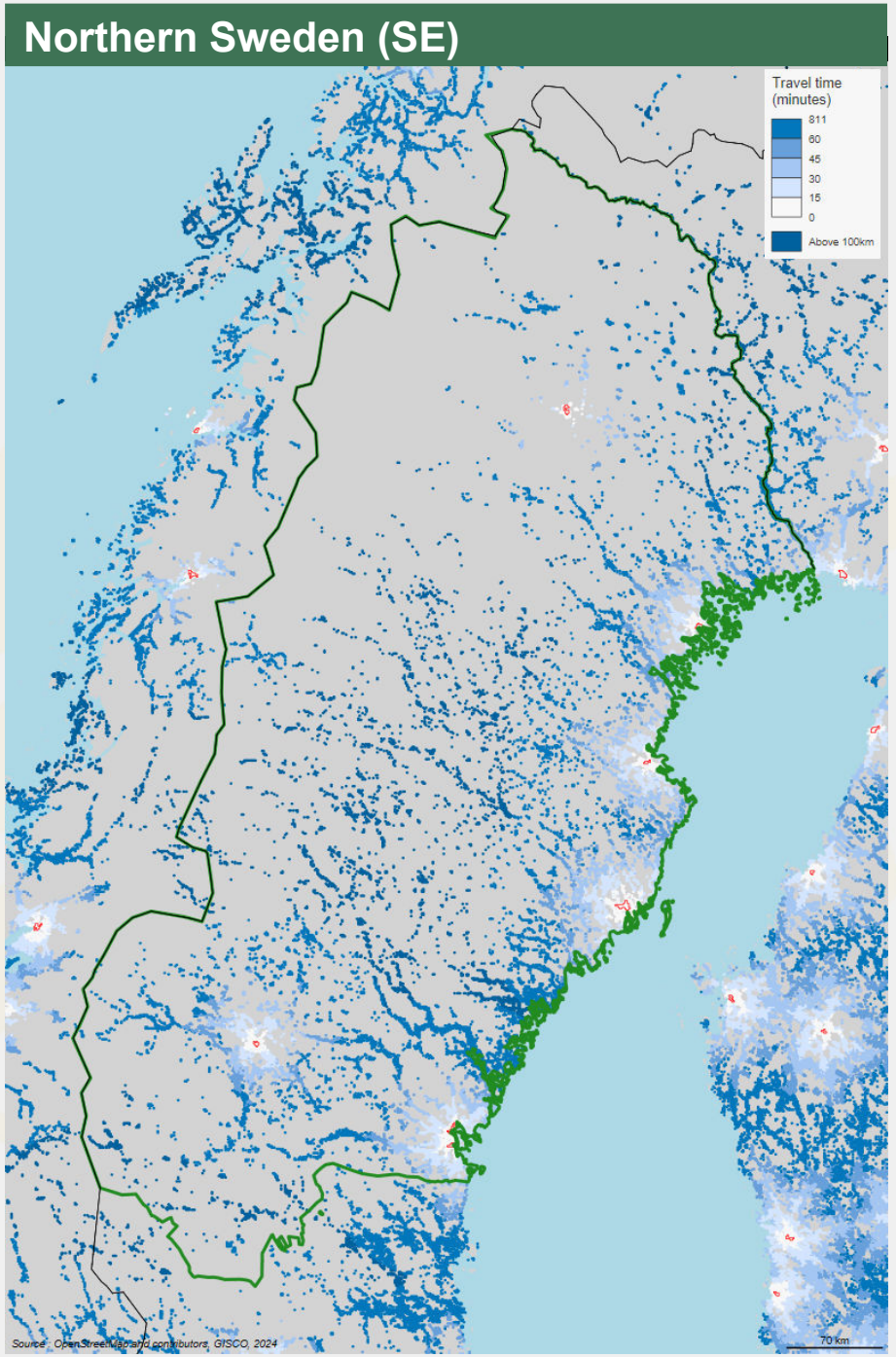
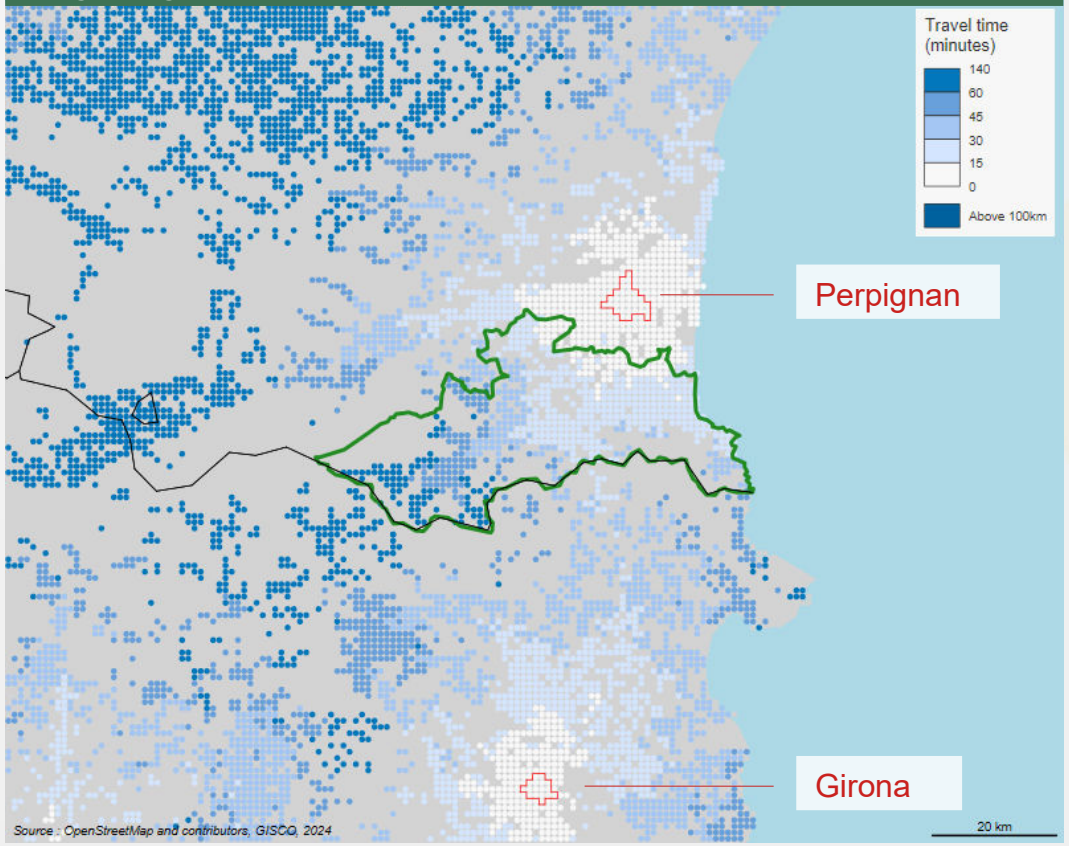


ZOOM IN GRANULAR LABS

Cities

Pays Pyrénées Méditerranée (FR)



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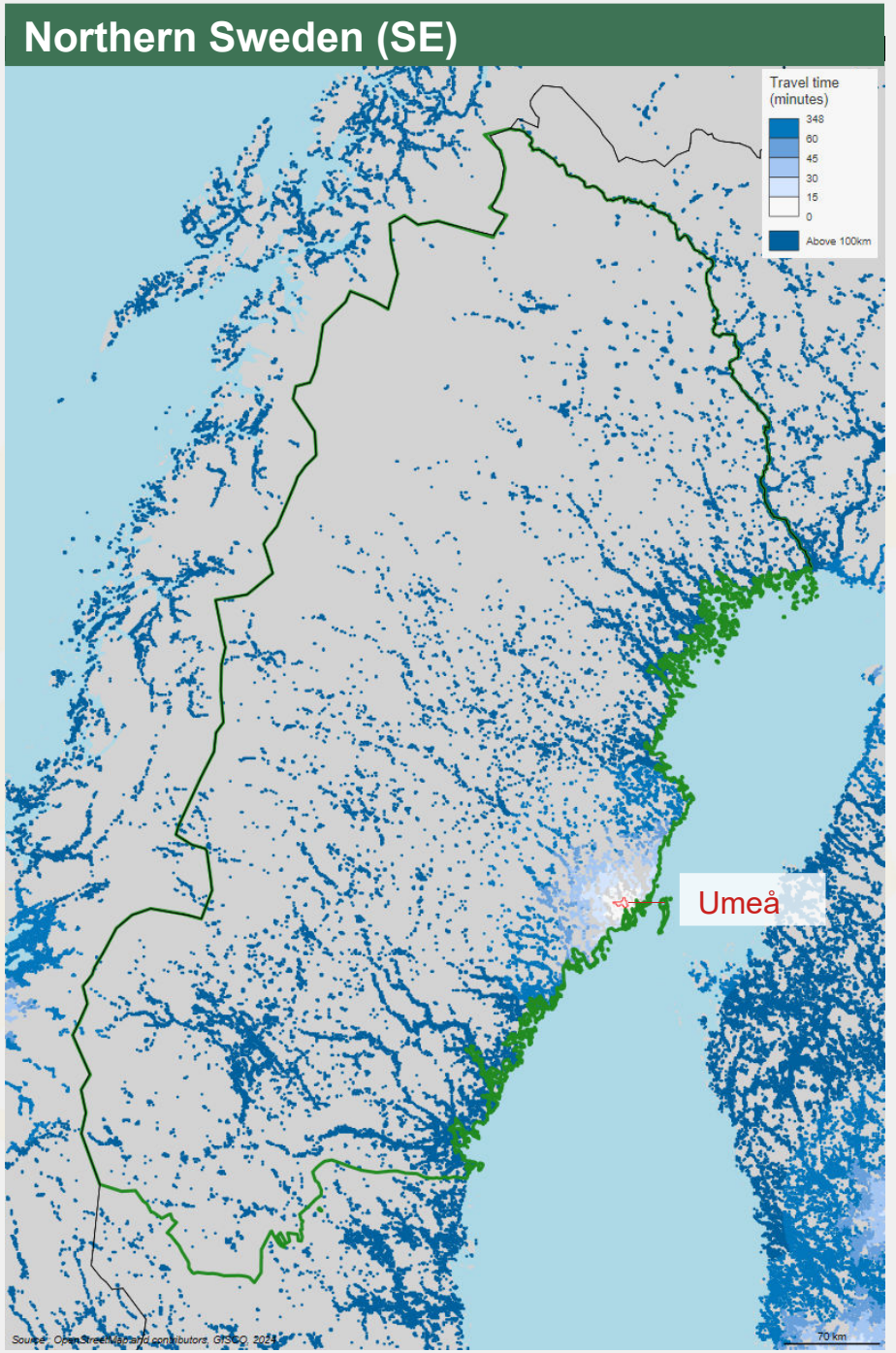

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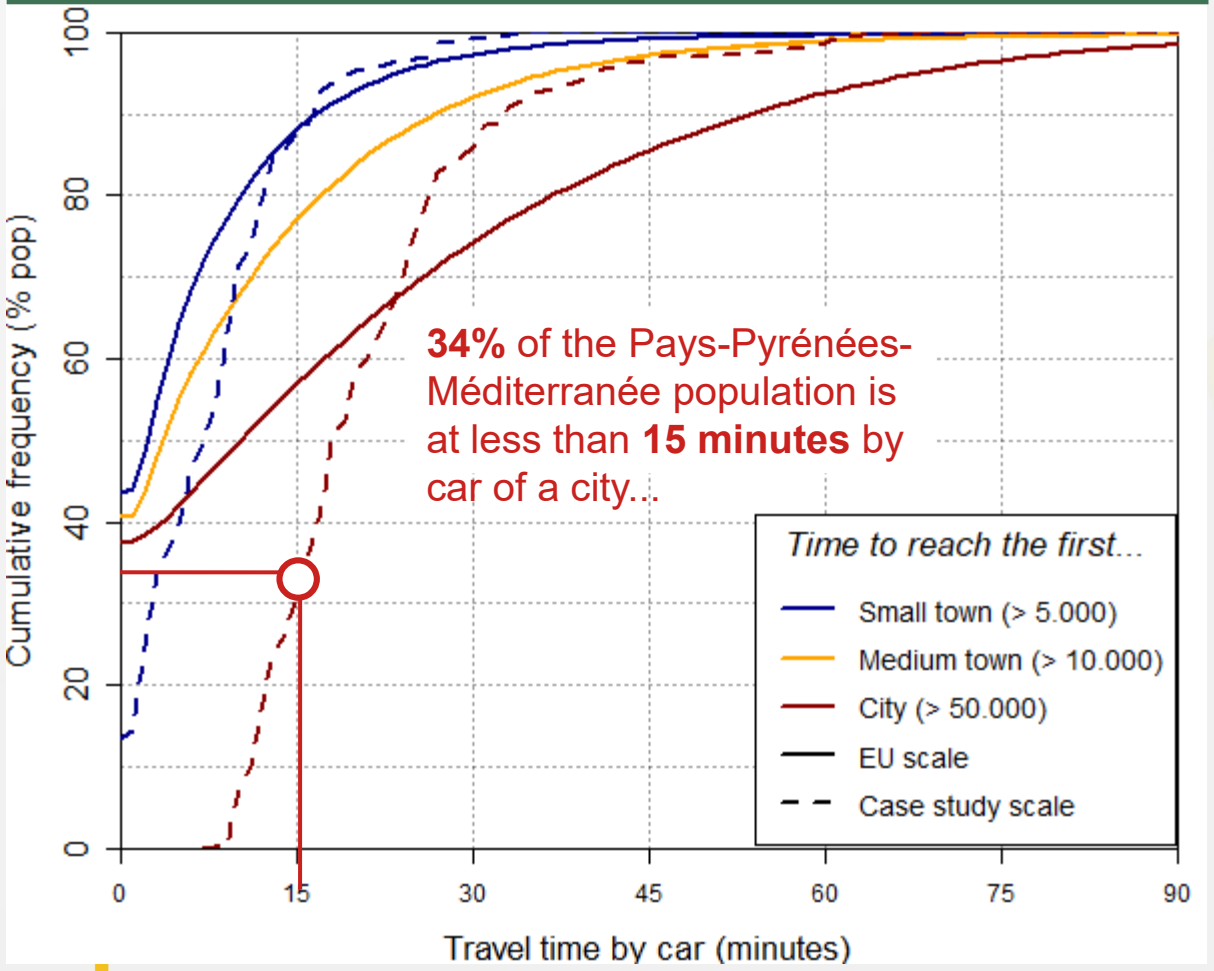
Pays-Pyrénées-Méditerranée (FR)



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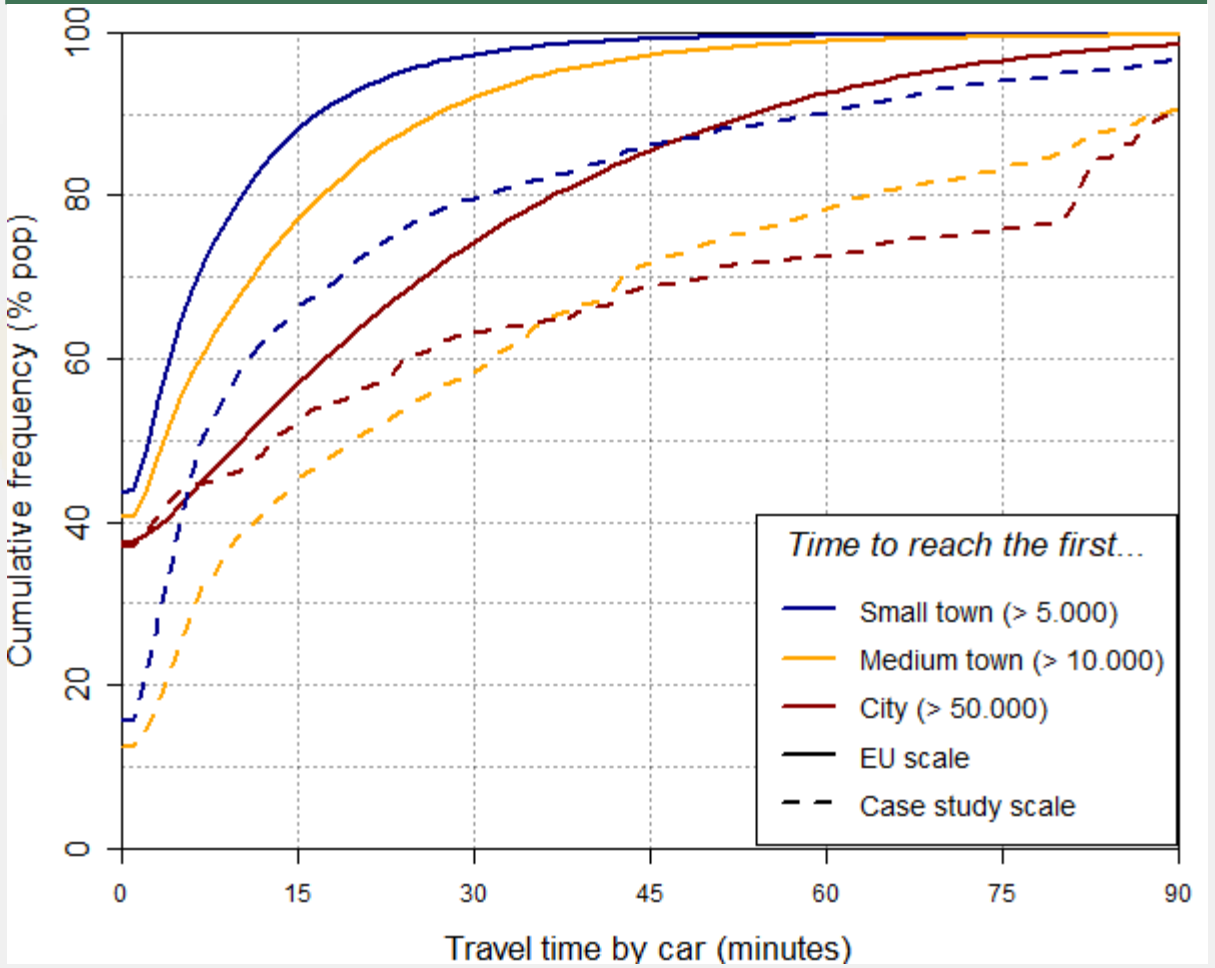

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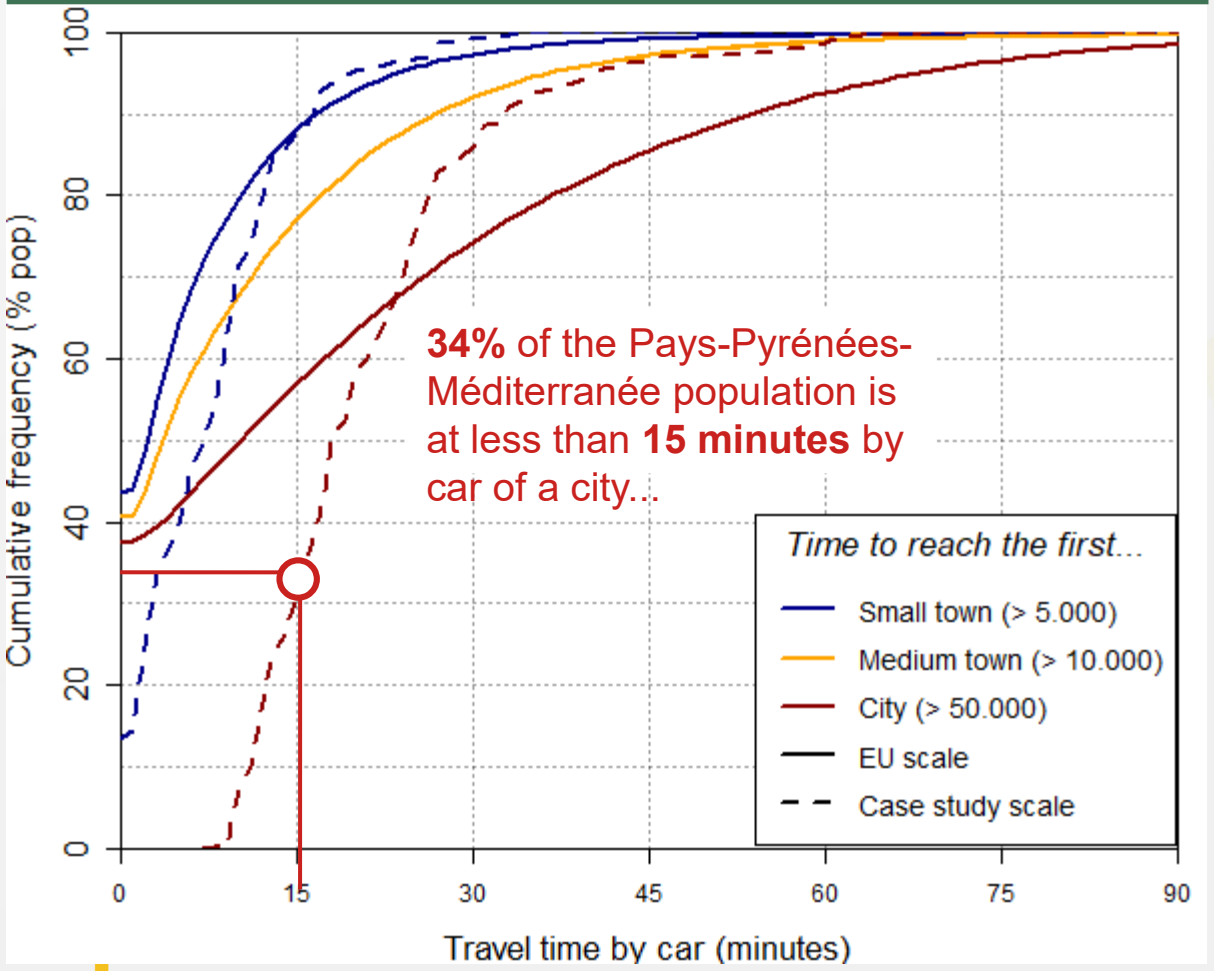

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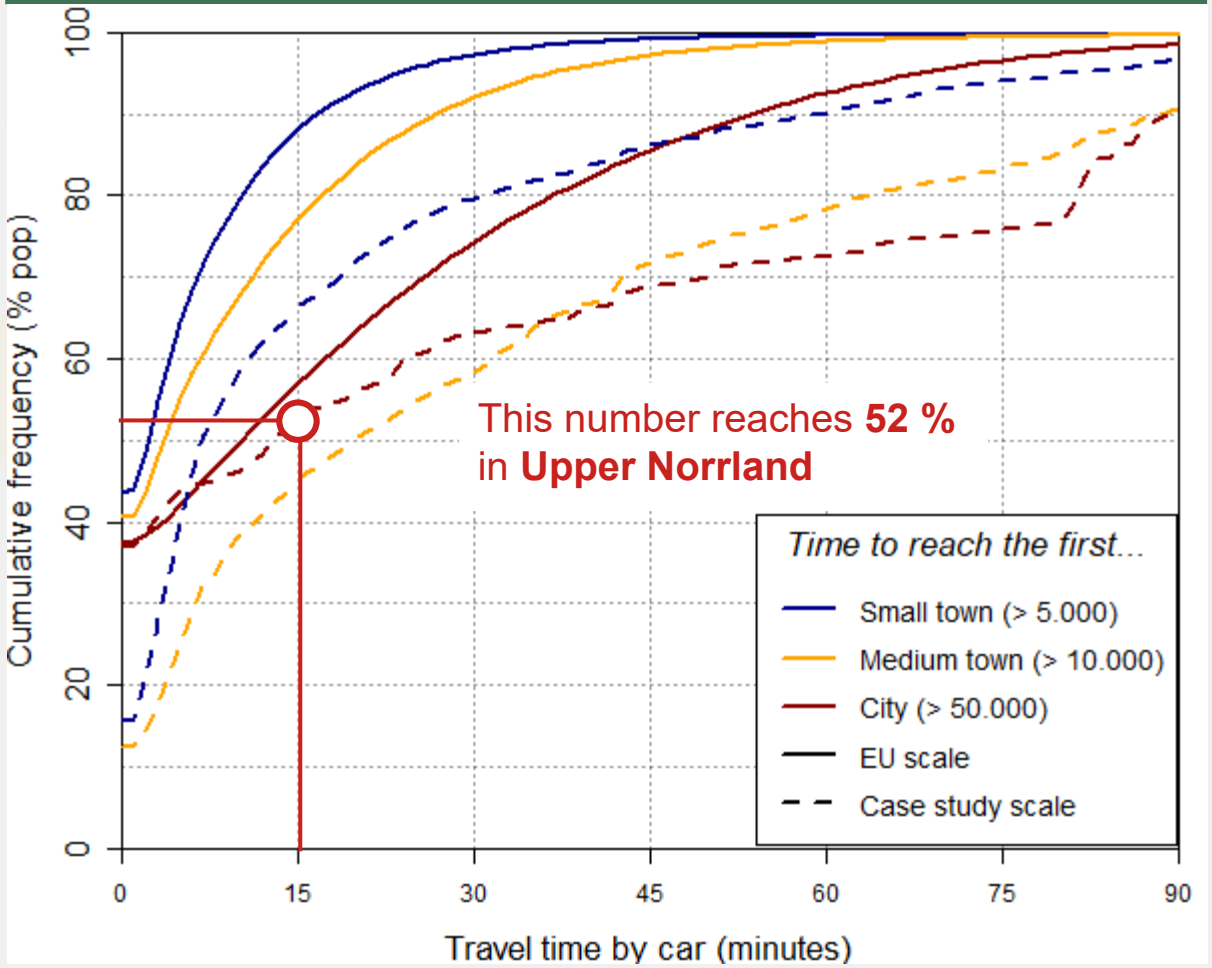

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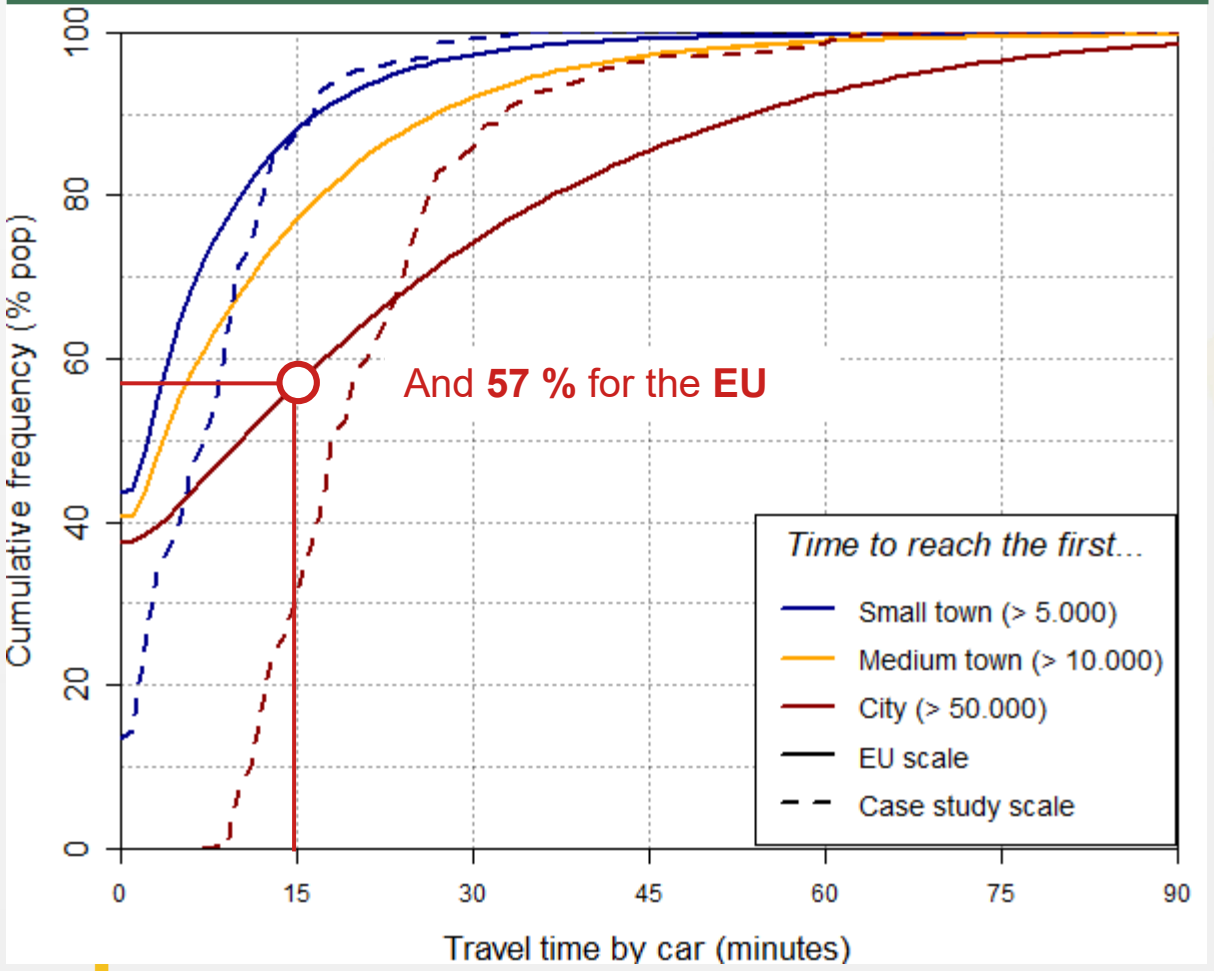

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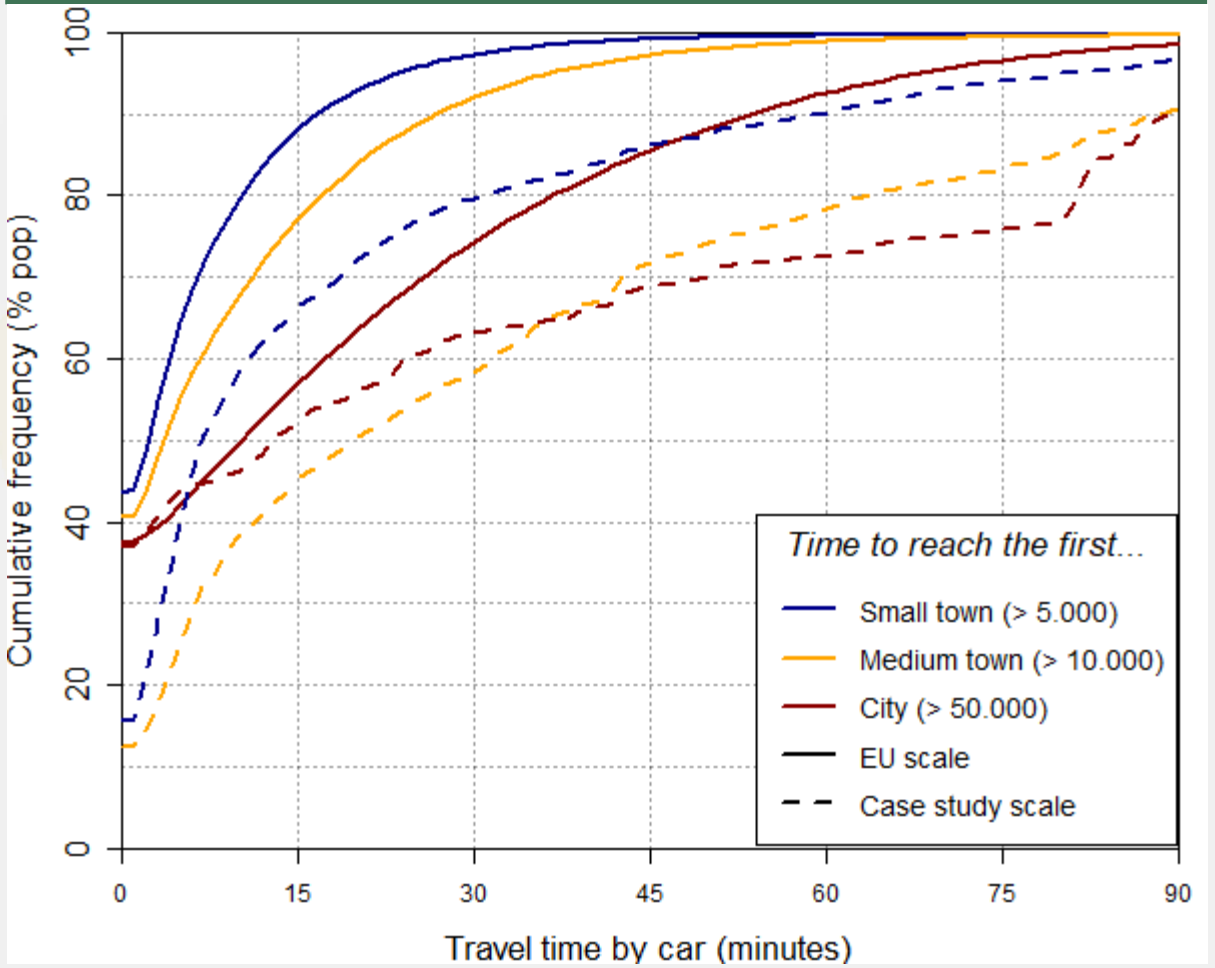

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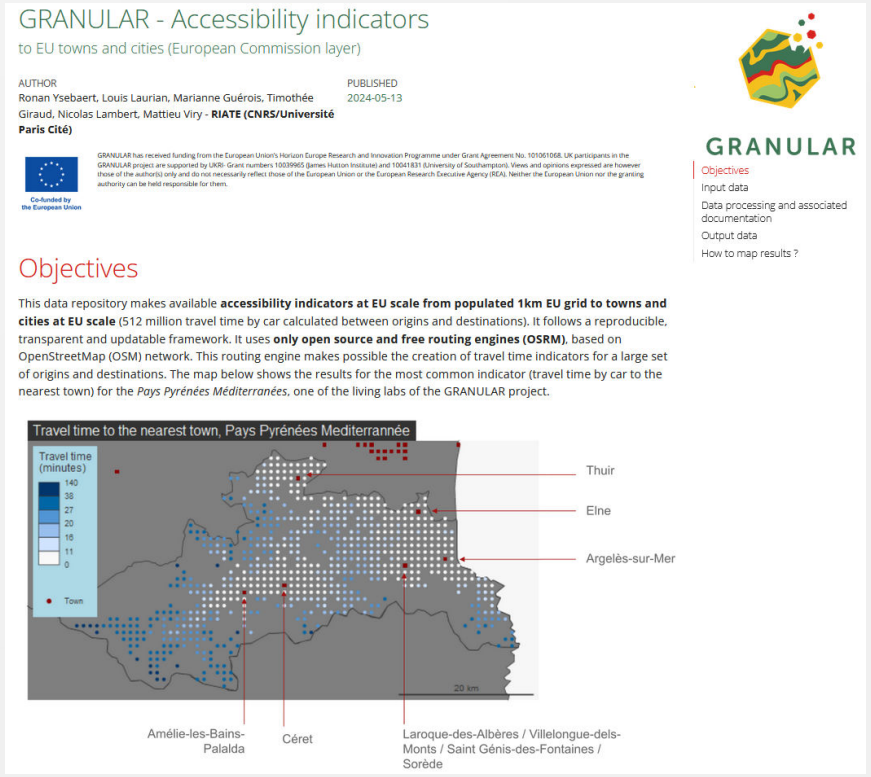
- **The reproducible workflow** implemented makes the data update and/or case-study production quite easy
- **https://zenodo.org/records/12724075**



GRANULAR - Accessibility indicators

to EU towns and cities (European Commission layer)

AUTHOR
Ronan Ysebaert, Louis Laurian, Marianne Guérois, Timothée Giraud, Nicolas Lambert, Mattieu Viry - **RIATE (CNRS/Université Paris Cité)**

PUBLISHED
2024-05-13

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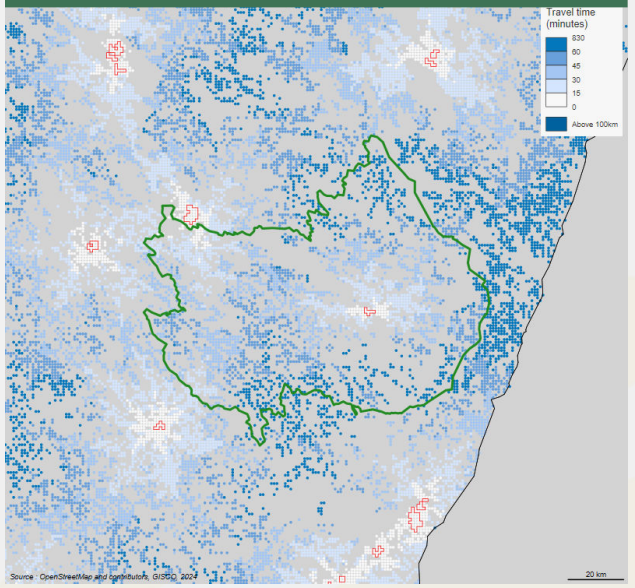
GRANULAR

Objectives

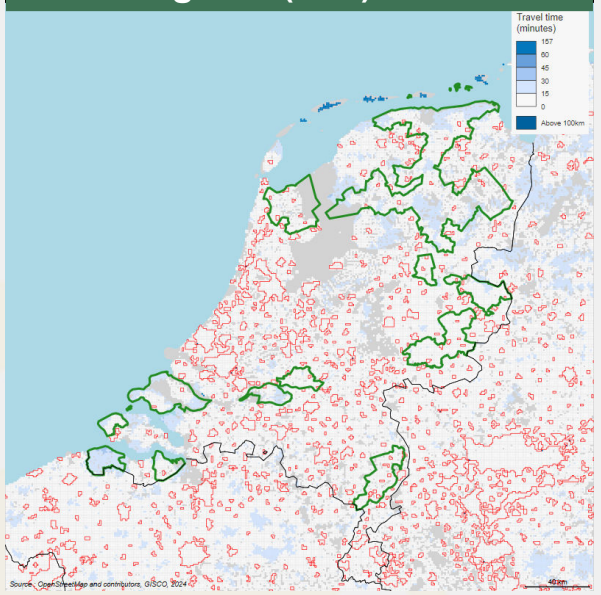
This data repository makes available **accessibility indicators at EU scale from populated 1km EU grid to towns and cities at EU scale** (512 million travel time by car calculated between origins and destinations). It follows a reproducible, transparent and updatable framework. It uses **only open source and free routing engines (OSRM)**, based on OpenStreetMap (OSM) network. This routing engine makes possible the creation of travel time indicators for a large set of origins and destinations. The map below shows the results for the most common indicator (travel time by car to the nearest town) for the *Pays Pyrénées Méditerranées*, one of the living labs of the GRANULAR project.

Travel time to the nearest town, Pays Pyrénées Mediterrannée

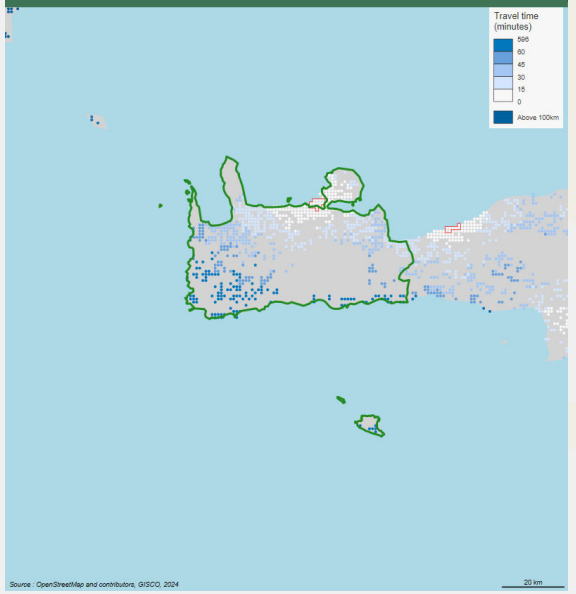
FI Replication Lab (South Savo)



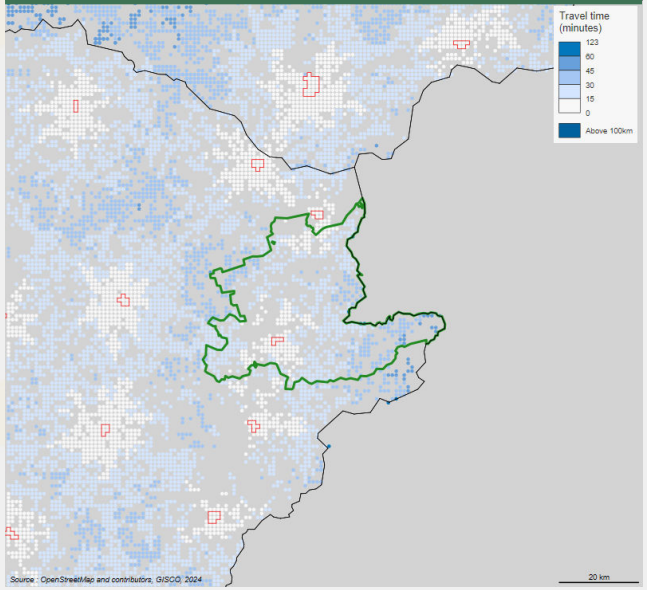
NL Living Lab (P10)



EL Replication Lab (Chania)



LT Replication Lab (Ignalina)



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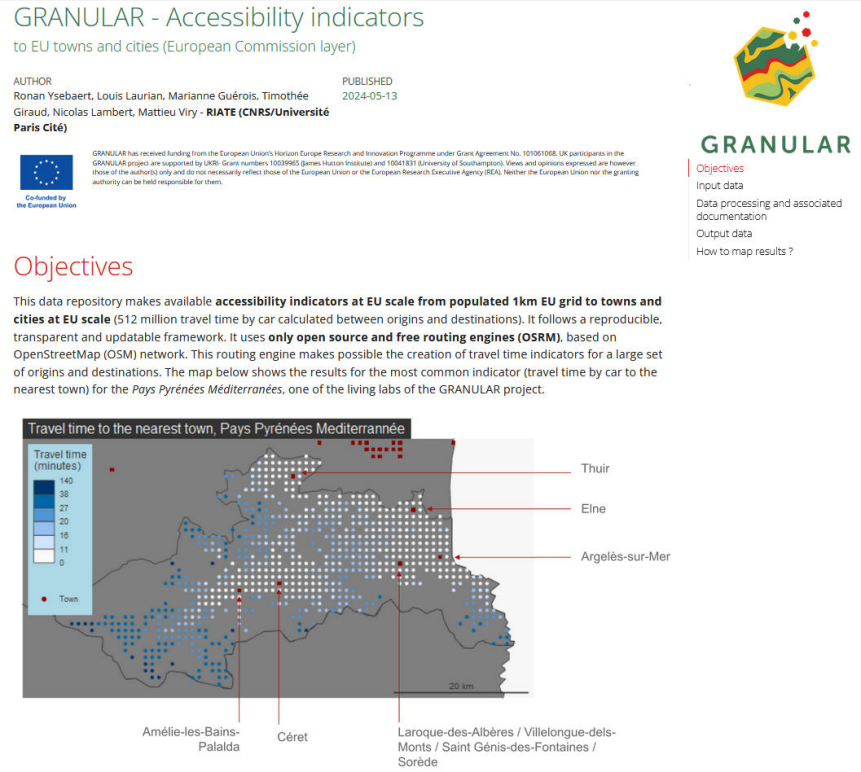
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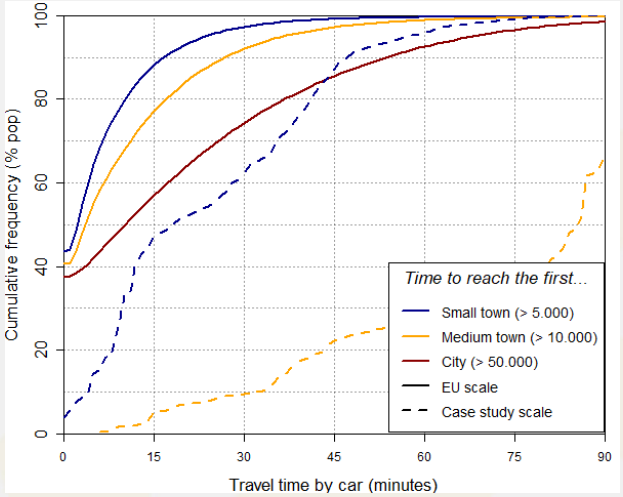

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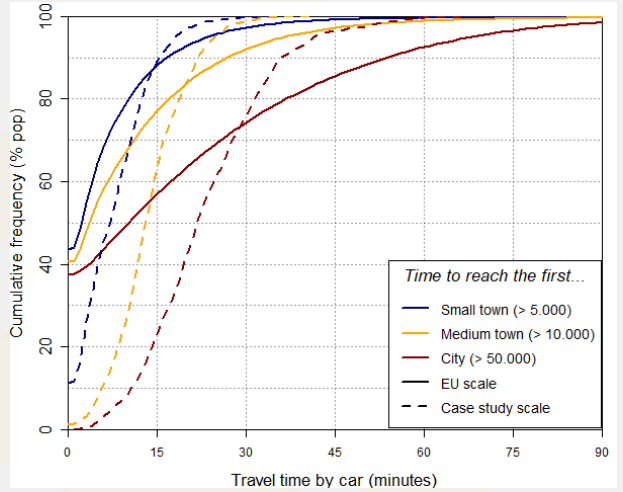

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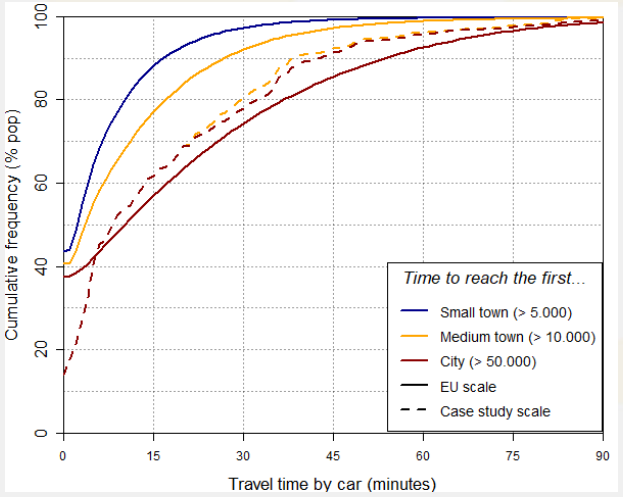

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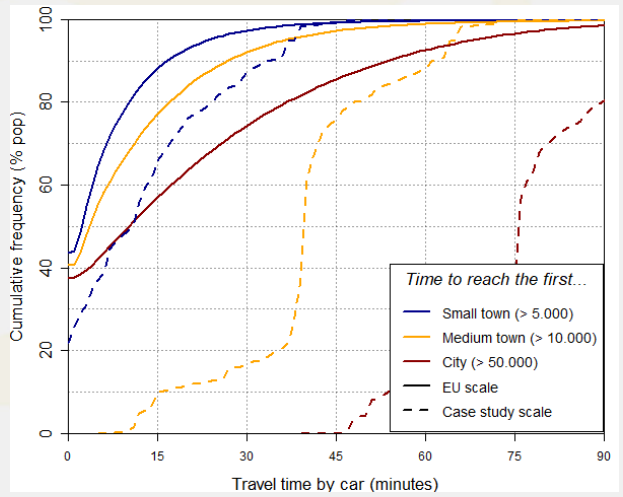

NEXT STEPS (2025)

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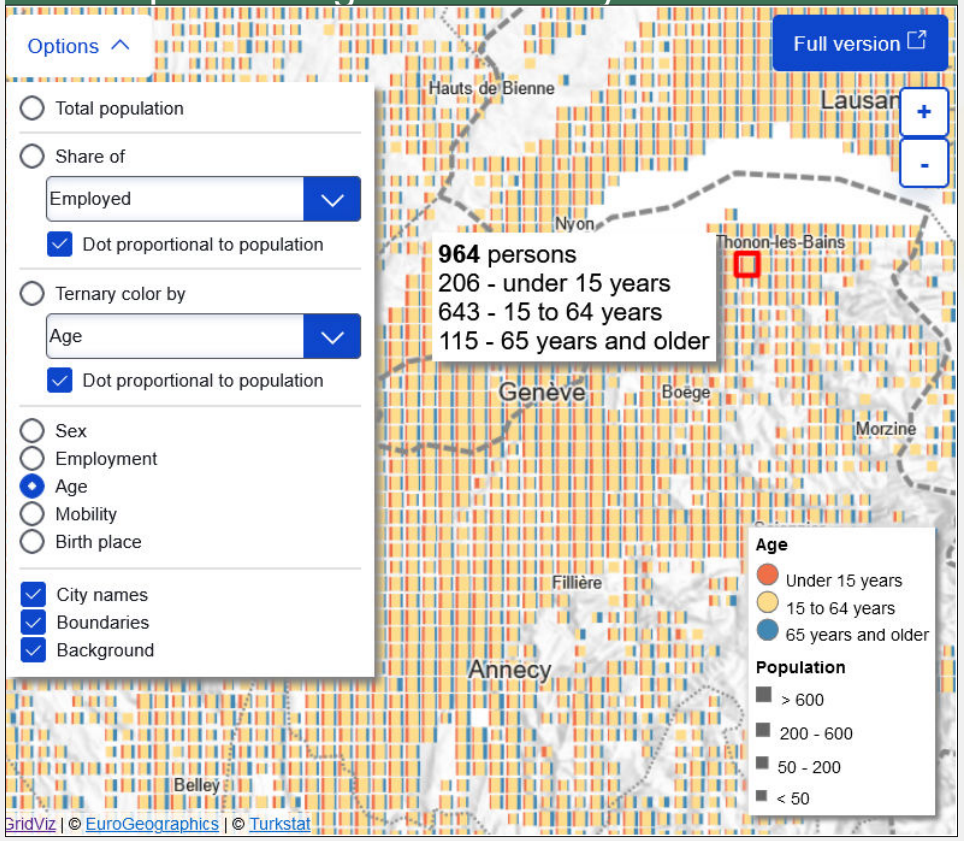
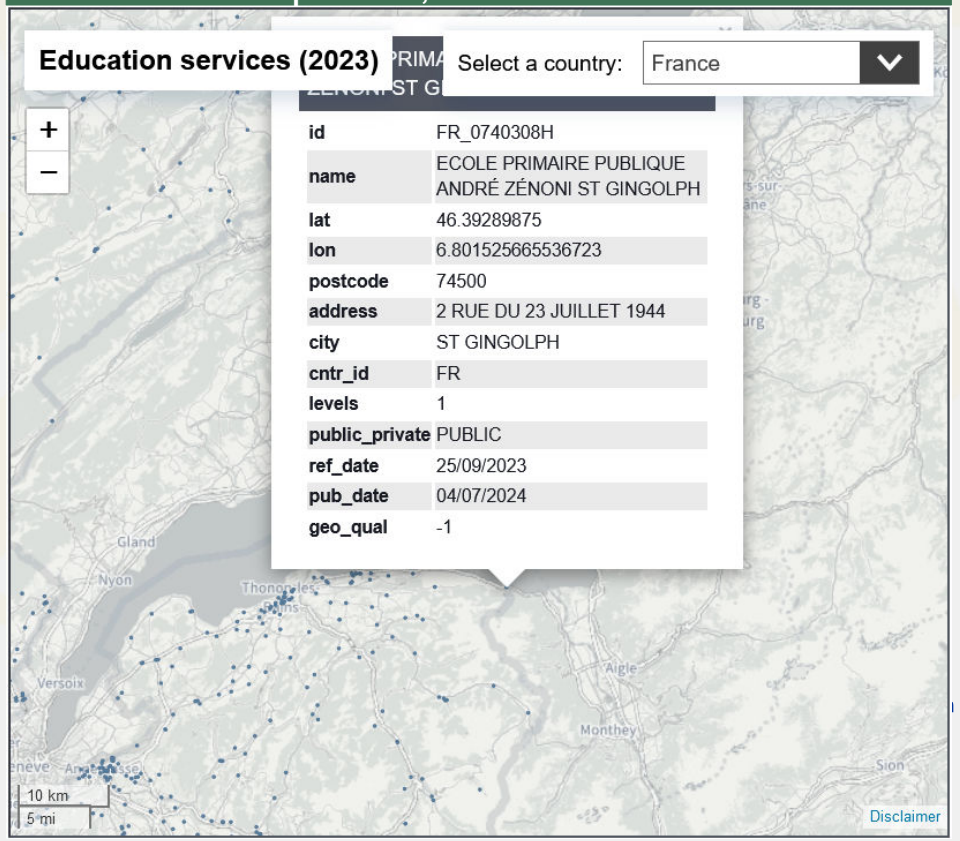
Explore last European updates : Accessibility to medium education (ISCED 2/3)

- **Routing** : bike / car, on crossborder case-study with available data

Origins: EU Census Grid version 2024
Population aged below 15 years in 2021



Destinations: Education services
Public/private, with ISCED levels



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