



RURALITIC

RURAL REVIVAL,
A LIFE IN THE INSPIRATIONAL
COUNTRYSIDE

Deliverable 6.1

PopFlows

European Residential Mobility Data Platform



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Project references

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Project summary

Over the past few decades, rural areas have experienced profound socio-demographic transformations, driven by their roles in ecological, digital, and bio-economic transitions. These transformations, further accelerated by the Covid-19 pandemic, have led to significant diversification, rendering rural regions complex and unequal – similar in many ways to major cities. Thus, a key problem concerns our knowledge about – and perception of these places because the tools, concepts, and above all the public policies traditionally applied are no longer suited to address the increasing diversity of contemporary rural areas. Our consortium, RURALITIC, is academically armed and well prepared to tackle these challenges. The first step involves rethinking 'the rural' and examining the intricate relationship between social groups and geographical spaces. This conceptual requalification of what rural areas are, and what they can be, will enable the development of new scientific concepts and tools, including new data, surveys, indicators, knowledge, and typologies. These developments will provide a synthesized view of current dynamics and processes of change and support foresight for public authorities. Secondly these new concepts and typologies will then be deployed to analyse the drivers of attractiveness, existing public policies, and innovative initiatives within rural areas. By implementing pilot projects and creating an initiative library, we'll tailor recommendations to diverse social and rural contexts. Finally, RURALITIC aims to envision and produce various scenarios for Europe's rural future. The main outcome will be a shift from generic, one-size-fits-all public policies towards place-based and territorially tailored approaches for rural areas, while remaining fully aligned with the core orientations of European policies on sustainable prosperity, resilience, connectivity, and infrastructure.

Project keywords

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DEM	Demonstrator, Pilot, Prototype	☐
DEC	Websites, Patent Fillings, Videos, etc. https://popflows.ruralitic.eu/	☒
Other	(please describe the type)	☐

Dissemination level

Code	Definition	Selection
PU	Public	☒
SEN	Sensitive, only for members of the consortium (including the Commission Services)	☐
CI	Classified, as referred to Commission Decision 2001/844/EC	☐

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Introduction

Residential mobility plays a significant role in shaping territorial dynamics across Europe. By redistributing populations between places, it directly affects population size and demographic structures, and indirectly influences housing markets, land use, access to services, and local public finances. These effects are particularly pronounced in rural and intermediate territories, where relatively small population changes can result in tangible impacts with significant social, economic, and political implications.

Over the past decades, residential mobility dynamics have intensified and diversified, reflecting profound structural transformations in European socio-economic and territorial systems. These transformations are linked to evolving labour markets, including greater employment flexibility and spatial mismatches between jobs and housing; the rise of remote and hybrid work; changes in housing systems and affordability; shifting lifestyles and residential preferences; increasing digitalisation; and, more recently, the disruptive effects of the Covid-19 pandemic on mobility behaviours and location choices. As a result, European territories, especially rural areas, can no longer be understood as homogeneous or static spaces. Instead, they are increasingly shaped by selective residential mobility processes, producing differentiated trajectories of attractiveness, decline, and recomposition.

Despite the central role of residential mobility in these transformations, comparative and longitudinal analysis at the European level remains limited. This limitation stems from several structural challenges: the fragmentation of national statistical systems, heterogeneous definitions, administrative and statistical territorial units used for data collection and assignment, uneven temporal coverage, and the absence of harmonised tools enabling multi-scalar and policy-relevant exploration of residential mobility dynamics.

Within this context, WP6 of the RURALITIC project focuses on residential mobility as a key driver of territorial attractiveness, land-use dynamics, and housing pressures, with a particular emphasis on rural diversity and territorial inequalities. Addressing these issues requires not only high-quality data, but also analytical and visual tools capable of translating complex residential mobility information into insights that are usable by researchers, policymakers, and territorial practitioners.

PopFlows was developed in response to these analytical and data-related limitations.

PopFlows is a European data platform designed to support the analysis of residential mobility across space and over time. Its primary objective is to provide a harmonised analytical infrastructure that enables systematic comparison of residential mobility dynamics across European territories.

More specifically, PopFlows aims to:

- provide access to longitudinal residential mobility data covering multiple decades and nine European countries: **Austria, Finland, France, Germany, Italy, Spain, Sweden, Switzerland, and the United Kingdom.** Denmark was integrated subsequently, bringing current coverage to ten countries. Portugal and Poland are not currently integrated because the relevant data became available too late for the present development cycle. Their possible future integration is not a committed expansion and will be reassessed depending on platform uptake and available human and budgetary resources;
- enable comparative analysis across territories, geographic scales, and national contexts;
- analyse territorial levels and migration balances, inter-territorial mobility flows, and changes in mobility dynamics over time as separate dimensions;
- support research on territorial inequalities, rural diversity, and population redistribution processes;
- contribute to evidence-based policy design, particularly in relation to rural development, housing, land use, and territorial cohesion.

PopFlows focuses explicitly on residential mobility, defined as changes in the usual place of residence, i.e., the location where a person resides for the majority of the year. The platform integrates both internal (within-country) and, where available, international mobility components, while excluding short-term, seasonal, and daily commuting movements, which fall outside its analytical scope.

By combining harmonised European data, a multi-scalar analytical framework, and an intuitive user-oriented interface, PopFlows constitutes a core empirical and analytical infrastructure for WP6. It provides a shared basis for understanding how residential mobility contributes to differentiated territorial trajectories and supports the broader ambition of RURALITIC to rethink rural diversity and territorial inequalities in Europe.

1. Data Foundations of PopFlows

Popflows is grounded on a unique, harmonized official data produced by national statistical offices in **ten European countries: Austria, Denmark, Finland, France, Germany, Italy, Spain, Sweden, Switzerland, and the United Kingdom**. These datasets were assembled through a **coordinated effort of the RURALITIC project partners**, who mobilised their national expertise to identify, access, document, and harmonise the relevant residential mobility data. Depending on national statistical systems, data sources include population registers, census-based residential mobility tables, and administrative records. All datasets refer strictly to changes of usual place of residence, in line with the analytical scope of WP6. A complete list of these datasets is provided in Annex 1 (Tables 2 to 6).

1.1. Types of data integrated

The PopFlows database integrates four main categories of data, which together constitute a comprehensive empirical basis for analysing residential mobility across European territories.

First, the platform integrates **residential mobility flow data**, structured as annual origin–destination matrices between territorial units. Each matrix records changes of usual place of residence between an origin and a destination unit and is indexed by year, spatial level, and available population categories (e.g., gender, age group, or citizenship status). Depending on national statistical systems, the flow data include domestic inter-territorial mobility at LAU and NUTS levels, as well as internal mobility flows within spatial units, international inflows and outflows, and selected socio-demographic breakdowns provided by national statistical offices.

Second, PopFlows integrates **population stock data** serving as denominators for indicator computation. Population stocks are aligned with mobility flow data along three dimensions: time, spatial unit, and socio-demographic category. For each indicator, the denominator corresponds exactly to the population group analysed in the flow data (e.g., female population stocks for female residential mobility flows), ensuring internal consistency of all standardised measures.

Third, the platform relies on **harmonised geographic reference data** based on European LAU and NUTS classifications. These references provide stable spatial identifiers used to link flows, population stocks, and indicators across years, to handle boundary changes, and to support consistent aggregation and comparison across spatial scales, from LAU to NUTS levels.

Finally, PopFlows incorporates the **DEGURBA territorial typology**, linked to each spatial unit and used to classify territories along urban–intermediate–rural dimensions. This typology enables the aggregation and comparison of residential mobility indicators across different settlement contexts, while preserving the underlying territorial units and time series. This typology is static and refers to the most recent available year, as

collecting and harmonising such data on an annual basis is challenging. For Scotland, England, and Wales, national typologies have been used at the LAU level, as these countries are no longer covered by the DEGURBA territorial typology. Other typologies, including those developed within the framework of the project, may eventually be integrated.

1.2. Data harmonisation procedures

Given the structural heterogeneity of national statistical systems, residential mobility data integrated into PopFlows are processed through a two-level, explicitly documented rule-based harmonisation pipeline.

National-level preparation and standardisation

At the first stage, residential mobility datasets are processed within each country. This step aims to produce nationally consistent datasets before any cross-country integration. National-level processing includes:

- Standardisation of variable names, formats, and coding schemes, ensuring uniform identification of origin, destination, year, spatial level, and population category across all national datasets;
- Harmonisation of population categories, by mapping national socio-demographic classifications (e.g., age groups, gender, citizenship) onto a common reference framework where feasible; when exact correspondence is not possible, categories are restricted to comparable subsets and documented explicitly;
- Restructuring of national datasets into a common origin–destination data model, ensuring that all residential mobility data conform to a unified flow table structure;
- Management of spatial unit changes over time, including administrative mergers and splits, using country-specific correspondence tables to ensure temporal consistency of territorial units.

At this stage, no cross-country aggregation or transformation is applied. Differences in spatial resolution, temporal coverage, and available population breakdowns are preserved and recorded in country-level metadata.

European-level integration and alignment

In a second stage, nationally harmonised datasets are integrated into a single European database covering the **ten** countries included in PopFlows.

This integration step includes:

- Alignment of national datasets within a common European scheme, ensuring consistency of variable definitions, spatial identifiers, and population categories across countries;

- Standardisation of geographic identifiers, based on European LAU and NUTS reference systems, allowing datasets produced under different national nomenclatures to be queried jointly;
- Deterministic aggregation of residential mobility flows to higher geographic levels, enabling consistent analysis at NUTS-3, NUTS-2, and NUTS-1 levels from locally observed data;
- Explicit handling of structural heterogeneity, whereby datasets with partial coverage (e.g. missing international flows or limited socio-demographic breakdowns) are retained but flagged.
- No spatial interpolation, redistribution of flows, or statistical adjustment is applied during European-level integration.

Consistency checks and validation

Throughout the harmonisation process, systematic validation procedures are applied to ensure internal coherence of the integrated database:

- Flow consistency checks, verifying the coherence between inflows, outflows, and net balances across spatial levels and years;
- Temporal continuity checks, identifying structural breaks linked to changes in data production or administrative boundaries;
- Cross-dimensional checks, ensuring consistency between flows, population stocks, and population partitions used for indicator computation.
- Detected inconsistencies, missing values, and breaks in series are documented rather than corrected ex post, preserving transparency regarding data limitations.

1.3. Indicator computation

All residential mobility indicators are computed upstream, outside the application layer, and stored in dedicated indicator tables. The PopFlows application does not recompute indicators at runtime; it only queries and aggregates pre-computed values. This design choice ensures full reproducibility, consistencies across modules, and efficient application performance.

Indicator computation follows a single, standardised computational framework applied uniformly across countries, years, spatial levels, and population categories. For each valid combination of parameters, the following indicators are derived:

- internal residential mobility, when explicitly identified in national data;
- domestic inflows and outflows between territorial units;
- international inflows and outflows, where available in national datasets;
- net residential mobility balances, computed separately for domestic, international, and total flows;
- all indicators expressed both as absolute counts and as rates per 1,000 inhabitants, using population stocks aligned by year, spatial unit, and population category.

Indicator computation strictly preserves the structure of the underlying flow and population data. No smoothing, modelling, reweighting, or statistical adjustment is applied at any stage. When indicators are aggregated across spatial levels or territorial typologies, aggregation is performed deterministically from pre-computed indicators, using explicit geographic or typological correspondence tables.

This approach guarantees that identical indicators are used consistently across the Territories, Trajectories, and Statistics modules and that analytical results differ only as a function of perspective (territorial, relational, or temporal), not of underlying computations.

1.4. Data quality and comparability

Throughout the data construction process, differences in national coverage, temporal depth, spatial resolution, and available socio-demographic breakdowns are systematically identified, documented, and preserved.

Rather than enforcing artificial uniformity, PopFlows makes these differences visible through metadata and data availability constraints. Indicators are only computed and displayed for combinations of country, year, spatial level, and population category. Missing values, breaks in series, and country-specific limitations are not imputed or corrected ex post.

Users are provided with the information necessary to assess the robustness and limits of comparisons across countries and territories.

Harmonisation in PopFlows refers to common definitions, coding rules, geographic references and indicator computations; it does not imply that all countries form a balanced panel covering identical years. Cross-country comparisons are therefore restricted to years, spatial levels and indicators that are jointly available for the countries being compared, and no extrapolation or imputation is used to fill unavailable years. This is particularly important for the analysis of the Covid-19 period. Countries whose series end in 2020 or 2021 can be used to document pre-Covid dynamics and the immediate pandemic shock, but not to characterise subsequent post-Covid trajectories. Longer post-Covid comparisons rely on countries with series extending beyond 2021. The application and its metadata make country-year availability explicit, so that differences in temporal coverage are treated as a documented limitation rather than being obscured by statistical adjustment.

2. Geographic and Temporal Coverage

PopFlows provides harmonised access to residential mobility data across **ten** European countries, drawing exclusively on official national statistical sources. The platform has been designed to support cross-country comparability while preserving the richness and specificities of national datasets.

2.1. Geographic coverage and spatial resolution

PopFlows supports analysis across multiple nested geographic levels, enabling both fine-grained local analysis and broader regional comparison. Depending on national availability, the following spatial resolutions are covered:

Local Administrative Units (LAU-1 or LAU-2), allowing detailed analysis of local residential mobility dynamics;

NUTS-3 regions, suitable for sub-regional comparison and functional territorial analysis;

NUTS-2 and NUTS-1 regions, enabling regional and macro-regional level perspectives.

All spatial units are aligned with harmonised European geographic references (LAU/NUTS), ensuring consistency across countries and over time.

2.2. Temporal coverage

Residential mobility time series span from the early 1990s to 2024, depending on the country and indicator. This extensive temporal coverage enables:

- analysis of long-term structural trends in residential mobility;
- identification of turning points and regime changes;
- comparison of pre- and post-Covid dynamics;

Temporal availability varies across countries (see Table 1 for details), and these differences are explicitly documented and reflected in the platform.

Table 1. Time periods covered by national residential mobility datasets

Country	Time coverage
Austria	2002-2023
Denmark	2007-2024
England/Wales	2012-2020
Scotland	2002-2023
Finland	1990-2024
Spain	2003-2021
Switzerland	2011-2023
Italy	2002-2024
Germany	2022-2024 (NUTS-3/NUTS-2) 2000-2024 (NUTS-1)
France	2012-2021
Sweden	2000-2024

3. Architecture and Functional Structure of the Platform

PopFlows is organised around a modular architecture, designed to reflect distinct but complementary analytical perspectives on residential mobility. The platform is structured into three main analytical modules: Territories, Trajectories, and Statistics. They together provide a comprehensive framework for analysing residential mobility across space and over time.

This architecture is based on a deliberate analytical separation between:

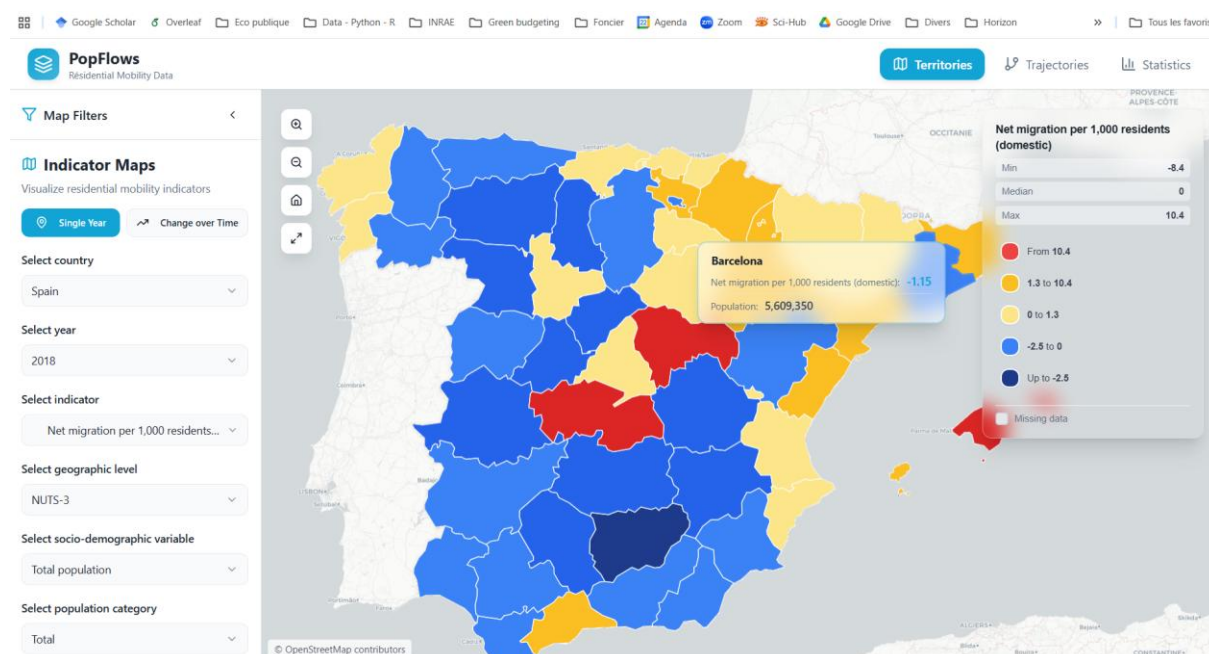
- territorial states and balances of residential mobility,
- inter-territorial mobility relationships,
- and temporal and comparative dynamics.

This separation supports the analysis of territorial distributions, mobility connections, and longitudinal trends as analytically distinct perspectives.

3.1. Territories: Territorial Levels, Intensities and Balances

The Territories module is dedicated to the analysis of territorial levels and balances of residential mobility (see Figure 1 for an example). It addresses the question: where is residential mobility high or low, and which territories experience demographic gains or losses driven by net residential mobility balances?

This module operates exclusively on pre-computed indicator tables, producing one observation per territorial unit for a given parameter set. The analytical focus is on territorial differentiation, not on relationships between places.

Figure 1. Territorial distribution of migration balances in Spain in the Territories module

Indicators and dimensions

The module provides access to a harmonised set of residential mobility indicators, including:

- internal residential mobility;
- domestic inflows and outflows;
- international inflows and outflows, where available;
- net residential mobility balances (domestic, international, and total).

All indicators are available as rates per 1,000 inhabitants, ensuring comparability across territories of different sizes. Where permitted by national data, indicators can be disaggregated by socio-demographic dimensions such as age group, gender, citizenship, socio-professional category, and housing occupancy status.

Functional operations

For a given query, the module performs:

- selection of country, year (or start - end year), geographic level (LAU or NUTS), indicator, and population category;
- extraction of the corresponding indicator values;
- rendering through parameter-driven indicator maps.

Legends and value classifications are generated dynamically based on the selected indicator and year. Missing or structurally unavailable data are preserved and explicitly signalled.

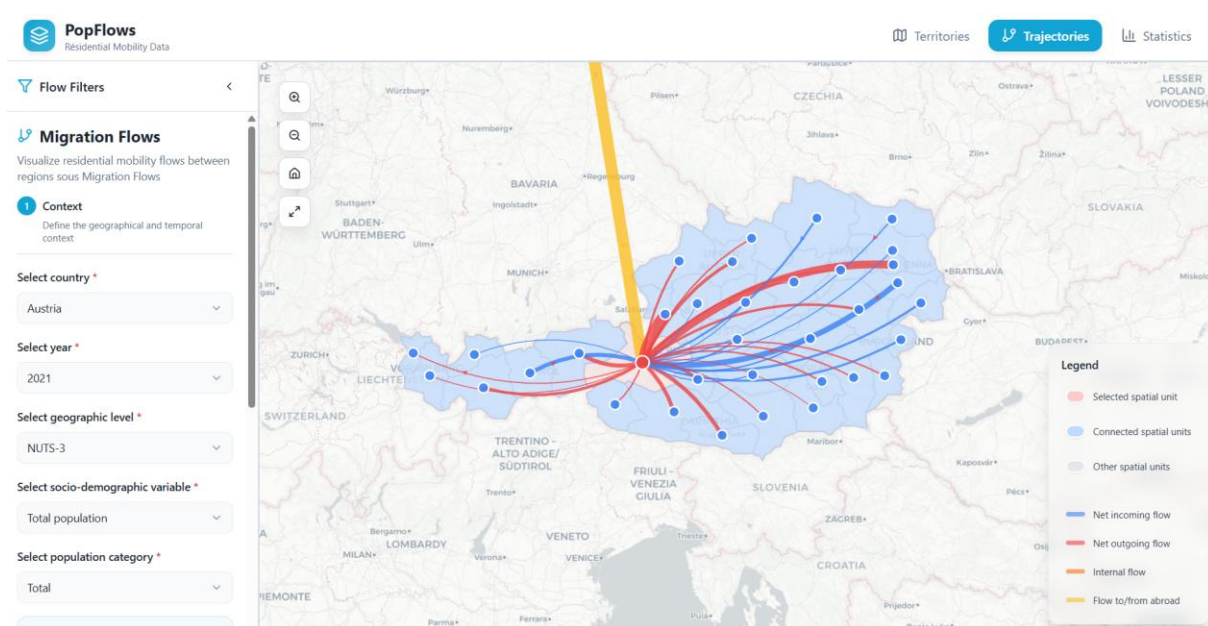
The Territories module supports territorial diagnostics, identification of spatial contrasts, and exploratory comparison across territorial contexts.

3.2. Trajectories: Residential Mobility Between Territories

The Trajectories module analyses residential mobility as a system of origin–destination relationships between territories (see Figure 2 for an example). It addresses the question: how are territories connected through residential mobility, and what are the main directions of population redistribution?

This module operates directly on harmonised origin–destination flow tables, preserving the directional and relational structure of mobility data.

Figure 2. Net residential mobility trajectories between territories at NUTS-3 level (Salzburg, Austria) in the Trajectories module



Flow data

The module relies on national origin–destination matrices capturing:

- domestic residential mobility flows between territorial units;
- international flows where the origin or destination lies abroad;
- socio-demographic breakdowns, where available.

Special attention is paid to preserving the integrity of national data structures. In cases where only net flows are available at specific geographic levels (for Germany at NUTS-3 and NUTS-2 levels), these constraints are explicitly respected and documented.

Functional operations

For a selected context, the module performs:

- extraction of all incoming and outgoing flows for a given territorial unit, year, spatial level, and population category;
- computation and display of net flows where applicable;
- optional filtering of flows based on magnitude thresholds or top-N criteria;

Visual outputs are produced through parameterised flow maps, enabling the identification of dominant mobility corridors, asymmetrical relationships, and territorial dependencies.

3.3. Statistics: Temporal Dynamics and Comparative Analysis

The Statistics module provides a temporal and comparative analytical perspective on residential mobility, based on a set of four complementary statistical outputs. Together, these outputs allow users to analyse the structure and evolution of residential mobility over time for a selected spatial unit, with a particular focus on contrasts between urban, intermediate, and rural territories, in line with the objectives of the RURALITIC project.

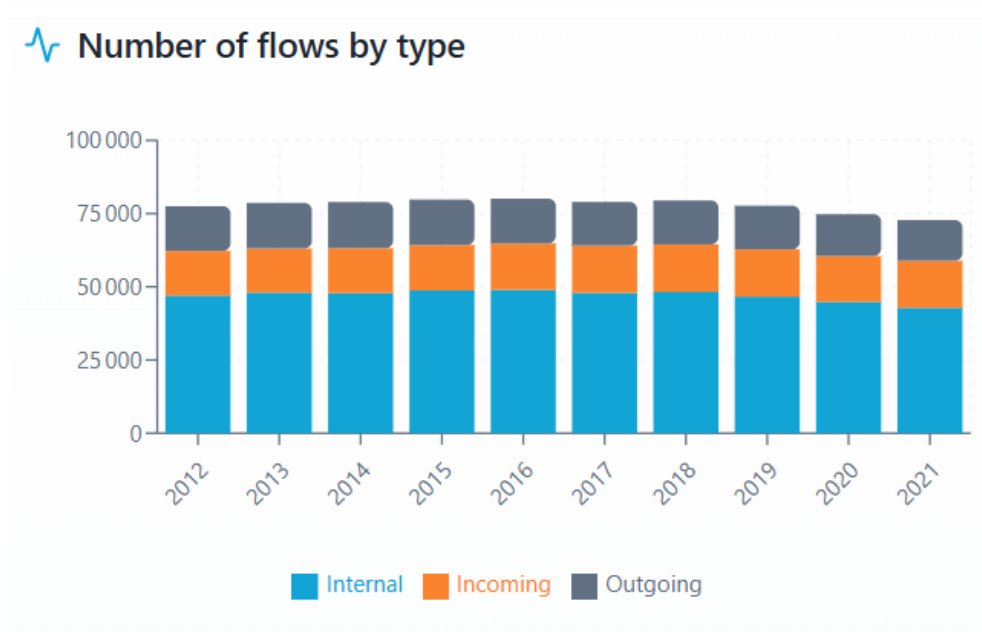
All statistics displayed in this module are derived from pre-computed indicator or flow tables and rely exclusively on deterministic aggregation and comparison operations. No indicators are recalculated within the application.

Number of moves by type

The first graphical output (see Figure 3 for an example) displays the number of residential moves by type over time, decomposing total mobility into:

- internal moves,
- incoming moves,
- outgoing moves.

Figure 3. Time series of internal, incoming, and outgoing residential moves in the NUTS-3 region of Côte-d’Or (France)



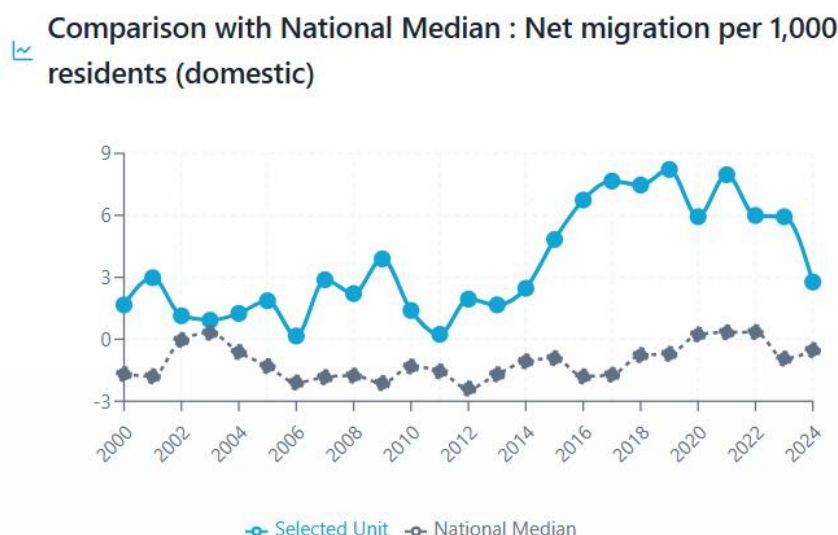
This stacked time series provides a synthetic view of how the composition of residential mobility evolves within a selected territorial unit or at aggregated levels. It allows users to distinguish changes driven by internal redistribution from those linked to exchanges with other territories.

This graph is particularly useful for identifying structural shifts in the balance between internal and external mobility components over time.

Comparison with the national median

The second output compares the selected territorial unit to the national median for a given residential mobility indicator, across time (see Figure 4 for an example).

Figure 4. Comparison of residential mobility rates between the NUTS-3 region of Uppsala (Sweden) and the national median



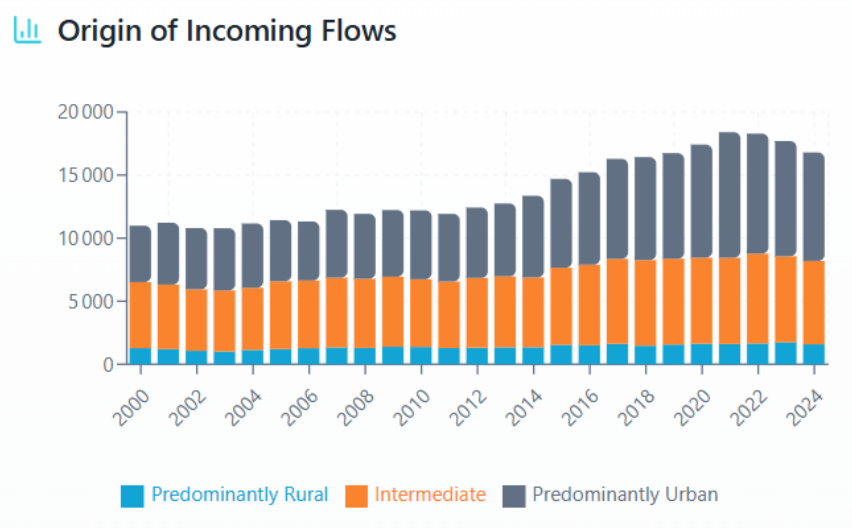
This comparison graph supports benchmarking by situating local or regional mobility dynamics within a national reference frame. It allows users to assess whether a territory consistently exhibits above-average or below-average mobility levels, and whether observed gaps are stable, widening, or narrowing over time.

This output is central for interpreting territorial dynamics in relative rather than absolute terms, which is essential for cross-territorial comparison.

Origin of incoming flows by territorial typology

The third graph decomposes incoming residential mobility flows according to the territorial typology of origin, distinguishing between predominantly rural, intermediate, and predominantly urban areas (see Figure 5 for an example).

Figure 5. Incoming residential mobility flows to the NUTS-3 region of Uppsala (Sweden), disaggregated by territorial typology



This output makes it possible to analyse where the incoming population originates from, and how this composition changes over time. It provides a direct empirical basis for examining:

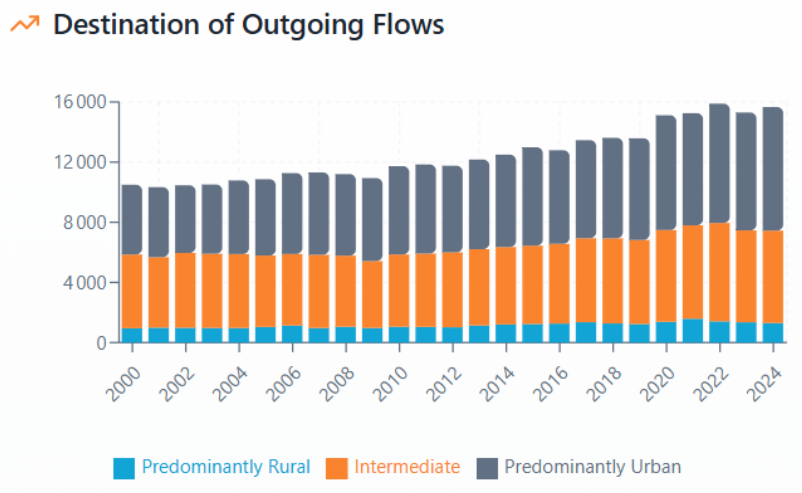
- rural–urban and urban–rural mobility relationships,
- the role of intermediate territories in redistribution processes,
- shifts in the sources of territorial attractiveness.

This graph is particularly relevant for RURALITIC, as it links residential mobility to broader processes of rural attractiveness and inter-territorial rebalancing.

Destination of outgoing flows by territorial typology

The fourth graph mirrors the previous one by decomposing outgoing residential mobility flows according to the territorial typology of destination (see Figure 6 for an example).

Figure 6. Destination of outgoing residential mobility flows from the NUTS-3 region of Uppsala (Sweden), by territorial typology



By showing where residents move to when leaving a given territory, this output allows users to:

- identify preferential destinations of out-migration,
- assess whether outflows are directed primarily towards urban, intermediate, or rural areas,
- compare the structure of outgoing flows with that of incoming flows.

Together with the previous graph, this output enables a bidirectional analysis of residential mobility exchanges across territorial types, rather than a simple net-balance interpretation.

Analytical contribution of the Statistics module

By combining these four outputs, the Statistics module allows users to:

- analyse long-term trends in residential mobility and its components;
- benchmark territorial dynamics against national reference values;
- examine urban–intermediate–rural redistribution processes in both directions;
- interpret territorial balances observed in the Territories module and relational patterns identified in the Trajectories module.

Within the RURALITIC framework, the Statistics module plays a key role in linking residential mobility dynamics to territorial typologies and long-term demographic trajectories, providing an empirical foundation for comparative and policy-relevant analysis.

PopFlows does not seek to model housing supply or planning regulation directly. Residential mobility is an observed outcome that may be shaped by housing availability and prices, land-use and planning rules, labour-market conditions, accessibility and other local characteristics. The platform therefore does not attribute observed mobility patterns causally to any one of these drivers. This separation is deliberate: planning

systems and regulatory constraints differ substantially across countries and are explanatory/contextual factors rather than residential mobility measures themselves.

Conclusion

This deliverable has presented PopFlows as the operational data platform developed within WP6 of the RURALITIC project to support the analysis of residential mobility across European territories. Rather than introducing new concepts or indicators, PopFlows consolidates, harmonises, and operationalises existing national data into a coherent European analytical framework.

The added value of PopFlows lies in its capacity to:

- combine longitudinal, multi-scalar, and cross-national data on residential mobility;
- distinguish clearly between territorial distributions, inter-territorial mobility trajectories, and temporal dynamics;
- translate complex origin–destination data into interpretable analytical outputs for research and policy analysis.

By mobilising official data from **ten** European countries and relying on a coordinated effort within the RURALITIC consortium, the platform addresses a long-standing gap in the availability of comparable and policy-relevant residential mobility data at the European level.

PopFlows constitutes a shared empirical infrastructure for WP6. It provides the foundation for subsequent analytical work on territorial attractiveness, rural diversity, housing pressures, and land-use dynamics, and supports comparative analyses across rural, intermediate, and urban contexts. The platform has been designed to support future updates, including the integration of additional countries and additional analytical components. **Portugal and Poland are potential future extensions. Their integration will be reconsidered subject to platform uptake and available project resources.**

Within WP6, PopFlows serves as a shared empirical infrastructure supporting subsequent analyses of residential mobility, territorial attractiveness, and rural diversity.

In terms of policy relevance and added value relative to existing information, PopFlows complements national statistical systems by transforming fragmented national sources into a common, documented and multi-scalar framework in which the same indicators can be explored across countries, territorial levels and years, while retaining origin-destination relationships. For policy users, this makes it possible to identify territories experiencing persistent inflows or outflows, benchmark local dynamics against national reference values, distinguish the rural, intermediate or urban origins and destinations of moves, and identify mobility corridors or changes that warrant further investigation. These diagnostics can help target subsequent analysis of housing needs, service provision, infrastructure and territorial cohesion. PopFlows should therefore be used as a comparative diagnostic and screening tool: it can indicate where and when important changes occur and place them in a wider European context, but causal attribution and policy evaluation require the complementary econometric and policy analyses developed in the other WP6 tasks.

Appendix

Appendix 1: List of Datasets Used in PopFlows

Table 2. Data sources used for domestic residential mobility

Cou ntry	Dataset
AT	Statistics Austria. (2024). <i>Internal migration within Austria by commune of origin and destination since 2002 (OGDEXT_BINNENWAND_1)</i> [Data set]. Retrieved from https://data.statistik.gv.at/web/meta.jsp?dataset=OGDEXT_BINNENWAND_1
CH	Federal Statistical Office (FSO). (2025). <i>Internal migration of the permanent resident population by cantons of destination and origin, citizenship (category), sex and age (px-x-0103010200_151)</i> [Data set]. Retrieved from https://www.pxweb.bfs.admin.ch/pxweb/en/px-x-0103010200_151/px-x-0103010200_151/px-x-0103010200_151.px
DE	Statistisches Bundesamt (Destatis). (2025). <i>12711 0022 – Migrations between German federal states (Wanderungen zwischen den Bundesländern)</i> [Data set]. GENESIS Online. Retrieved from https://www-genesis.destatis.de/datenbank/online/statistic/12711/table/12711-0022
DE	Statistisches Bundesamt (Destatis). (2025). <i>Kreiswanderungsmatrix – Inter-district migration matrices in Germany (years 2022–2024)</i> [Data set]. Statistikportal. Retrieved from https://www.statistikportal.de/de/veroeffentlichungen/kreiswanderungsmatrix
DK	Statistics Denmark. (2026). <i>Internal migration between municipalities by in-migration municipality, out-migration municipality, age, sex and time</i> . Retrieved from https://www.statbank.dk/FLY66
ES	Instituto Nacional de Estadística (INE). (2025). <i>Microdata – Residential mobility flows (Estadística de Variaciones Residenciales, EVR) by municipality, 1998–2021</i> [Microdata]. Retrieved from https://www.ine.es/dynngs/Microdatos.htm
FI	Statistics Finland. (2025). <i>11a1 – Intermunicipal migration by area of arrival and departure, 1990–2024</i> [Data set]. StatFin PxWeb API. Retrieved from https://pxdata.stat.fi/PxWeb/pxweb/en/StatFin/StatFin_muutl/statfin_muutl_pxt_11a1.px/
FR	INSEE. (2016-2025). <i>Detailed files “Residential Migrations” – Population censuses: Individual-level data on current and previous place of residence (2013-2022)</i> [Microdata]. Retrieved from https://www.insee.fr/fr/information/2383290
GB	National Records of Scotland. (2025). <i>Migration within Scotland, mid-2002 to mid-2023</i> [Data set]. Retrieved from https://www.nrscotland.gov.uk/publications/migration-flows/
GB	National Records of Scotland. (2025). <i>Rest of the UK migration, mid-2002 to mid-2023</i> [Data set]. Retrieved from https://www.nrscotland.gov.uk/publications/migration-flows/
GB	Office for National Statistics. (2023-2025). <i>Internal migration in England and Wales</i> [Data set]. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/internalmigrationinenglandandwales
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Internal migration – Italian and foreign (28_185_DF_DCIS_MIGRAZIONI_1)</i> [Data set]. Retrieved from https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1_POP_1.0/POP_MIGRATIONS/DCIS_MIGRAZIONI/IT1_28_185_DF_DCIS_MIGRAZIONI_1_1.0
SE	Statistics Sweden (SCB). (2025). <i>Internal migration between counties by sex and county, Sweden, 2000–2024</i> [Data set]. Retrieved from https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START_BE_BE0101_BE0101J/InOmflytt

Table 3. Data sources used for international residential mobility

Cou ntry	Dataset
AT	Statistics Austria. (2025). <i>International migration since 2002 by age group, commune and nationality (OGD_bevwan020_AUSSENWAND_201)</i> [Data set]. data.statistik.gv.at. Retrieved from https://data.statistik.gv.at/web/meta.jsp?dataset=OGD_bevwan020_AUSSENWAND_201
AT	Statistics Austria. (2025). <i>International migration since 2015 by age group, commune and nationality (OGD_bevwan020_AUSSENWAND_202)</i> [Data set]. data.statistik.gv.at. Retrieved from https://data.statistik.gv.at/web/meta.jsp?dataset=OGD_bevwan020_AUSSENWAND_202
CH	Federal Statistical Office (FSO). (2025). <i>Immigration of the permanent resident population by Year, Canton, Citizenship (category), Sex and Age (px-x-0103020200_101)</i> [Data set]. Federal Statistical Office STAT-TAB. Retrieved from https://www.pxweb.bfs.admin.ch/pxweb/en/px-x-0103020200_101/px-x-0103020200_101/px-x-0103020200_101.px
CH	Federal Statistical Office (FSO). (2025). <i>Emigration of the permanent resident population by Year, Canton, Citizenship (category), Sex and Age (px-x-0103020300_101)</i> [Data set]. Federal Statistical Office STAT-TAB. Retrieved from https://www.pxweb.bfs.admin.ch/pxweb/en/px-x-0103020300_101/px-x-0103020300_101/px-x-0103020300_101.px
DE	Statistisches Bundesamt (Destatis). (2025). <i>12711 0023 – Migration between Germany and foreign countries: by federal state, years, nationality, sex</i> [Data set]. GENESIS Online. Retrieved from https://www-genesis.destatis.de/datenbank/online/statistic/12711/table/12711-0023
ES	Instituto Nacional de Estadística (INE). (2025). <i>Microdata – Residential mobility flows (Estadística de Variaciones Residenciales, EVR) by municipality, 1998–2021</i> [Microdata]. Retrieved from https://www.ine.es/dynqs/Microdatos.htm
FI	Statistics Finland. (2025). <i>11ae – Vital statistics and population by area, 1990–2024</i> [Data set]. StatFin PxWeb API. Retrieved from https://pxdata.stat.fi/PxWeb/pxweb/en/StatFin/StatFin_muutl/statfin_muutl_pxt_11ae.px/
GB	National Records of Scotland. (2025). <i>International migration, mid-2002 to mid-2023</i> [Data set]. Retrieved from https://www.nrscotland.gov.uk/publications/migration-flows/
GB	Office for National Statistics. (2024). <i>Estimates of the population for England and Wales: Mid-2011 to mid-2023 detailed time series</i> [Data set]. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/estimatesofthepopulationforenglandandwales
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Immigrants – province of next residence (28_185_DF_DCIS_MIGRAZIONI_4)</i> [Data set]. Retrieved from https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1,POP,1.0/POP_MIGRATIONS/DCIS_MIGRAZIONI/IT1,28_185_DF_DCIS_MIGRAZIONI_4,1.0
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Emigrants – province of previous residence (28_185_DF_DCIS_MIGRAZIONI_6)</i> [Data set]. Retrieved from https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1,POP,1.0/POP_MIGRATIONS/DCIS_MIGRAZIONI/IT1,28_185_DF_DCIS_MIGRAZIONI_6,1.0

Table 4. Data sources used for population stock

Cou ntry	Dataset
AT	Statistics Austria. (2025). <i>Population at the beginning of the year from 2002 onwards (uniform regional structure as of 1.1.2025); Municipality (aggregated to political district) by year</i> [Data set]. STATcube – Statistical Database. Retrieved from https://statcube.at/statistik.at/ext/statcube/jsf/tableView/tableView.xhtml
CH	Federal Statistical Office (FSO). (2025). <i>Population of the permanent resident population by spatial unit, citizenship (category), sex and age (px-x-0102010000_101)</i> [Data set]. Federal Statistical Office STAT-TAB. Retrieved from https://www.pxweb.bfs.admin.ch/pxweb/en/px-x-0102010000_101/px-x-0102010000_101/px-x-0102010000_101.px
DE	Statistisches Bundesamt (Destatis). (2025). <i>Population: Federal states (Länder), reference date, sex, nationality, age (12411 0014)</i> [Data set]. GENESIS Online / Federal Statistical Office of Germany. Retrieved from https://www-genesis.destatis.de/datenbank/online/statistic/12411/table/12411-0014
DE	Statistisches Bundesamt (Destatis). (2025). <i>Population: Administrative districts, reference date, sex, age groups (12411 0018)</i> [Data set]. GENESIS Online / Federal Statistical Office of Germany. Retrieved from https://www-genesis.destatis.de/datenbank/online/statistic/12411/table/12411-0018
DK	Statistics Denmark. (2025). <i>Population at the first day of the quarter by region, sex, age and marital status</i> . Retrieved from https://www.statbank.dk/FOLK1A
ES	Instituto Nacional de Estadística (INE). (2025). <i>Population by sex, municipalities and age (five year groups) (API identifier: 33570)</i> [Data set]. datos.gob.es / INE. Retrieved from https://www.ine.es/jaxiT3/Tabla.htm?t=33570
ES	Instituto Nacional de Estadística (INE). (2025). <i>Population by sex, municipalities and nationality (main nationalities) (API identifier: 33572)</i> [Data set]. datos.gob.es / INE. Retrieved from https://www.ine.es/jaxiT3/Tabla.htm?t=33572
FI	Statistics Finland. (2025). <i>11ae – Vital statistics and population by area, 1990–2024</i> [Data set]. StatFin PxWeb API. Retrieved from https://pxdata.stat.fi/PxWeb/pxweb/en/StatFin/StatFin_muutl/statfin_muutl_pxt_11ae.px/
FR	INSEE. (2016-2025). <i>Detailed files “Residential Migrations” – Population censuses: Individual-level data on current and previous place of residence (2013-2022)</i> [Microdata]. Retrieved from https://www.insee.fr/fr/information/2383290
GB	National Records of Scotland. (2025). <i>Mid Year Population Estimates Time Series Data</i> [Data set]. Retrieved from https://www.nrscotland.gov.uk/publications/population-estimates-time-series-data/
GB	Office for National Statistics. (2024). <i>Estimates of the population for England and Wales: Mid-2011 to mid-2023 detailed time series</i> [Dataset]. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/estimatesofthepopulationforenglandandwales
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Resident population: Italy, Regions, Provinces by nationality, age, sex (164_164_DF_DCIS_RICPOPRES2011_24)</i> [Data set]. Retrieved from https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1,POP,1.0/POP_INTCENSPOP/DCIS_RICPOPRES2011/IT1,164_164_DF_DCIS_RICPOPRES2011_24,1.0
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Demographic balance from 21 October 2011 to 21 December 2018 (164_164_DF_DCIS_RICPOPRES2011_2)</i> [Data set]. Retrieved from https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1,POP,1.0/POP_INTCENSPOP/DCIS_RICPOPRES2011/IT1,164_164_DF_DCIS_RICPOPRES2011_2,1.0
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Resident population by age, sex and municipality (22_289_DF_DCIS_POPRES1_1)</i> [Data set]. Retrieved from https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1,POP,1.0/POP_POPULATION/DCIS_POPRES1/IT1,22_289_DF_DCIS_POPRES1_1,1.0
IT	Istituto Nazionale di Statistica (ISTAT). (2025). <i>Resident foreign population by age, sex and municipality (29_7_DF_DCIS_POPSTRRES1_1)</i> [Data set]. Retrieved from

	https://esploradati.istat.it/databrowser/#/en/dw/categories/IT1,POP,1.0/POP_FOREIGNIM/DCIS_POPSTRRES1/IT1,29_7_DF_DCIS_POPSTRRES1_1,1.0
SE	Statistics Sweden (SCB). (2025). <i>Population by region, marital status, age and sex, 1968–2024 (BE0101A – BefolkningNy)</i> [Data set]. SCB Statistical Database / PxWeb. Retrieved from https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START_BE_BE0101_BE0101A/BefolkningNy/

Table 5. Data sources used for Rural-Urban Typology

Country	Dataset
EU	Eurostat. (2025). <i>Local administrative units (LAU) 2023 – NUTS 2021, EU-27 and EFTA / available candidate countries (validated 2023)</i> [Data set]. European Commission. Retrieved from https://ec.europa.eu/eurostat/web/nuts/local-administrative-units
EU	Eurostat. (2023). <i>NUTS 2016 - NUTS 2021</i> [Data set]. European Commission. Retrieved from https://ec.europa.eu/eurostat/web/nuts/history
GB	Office for National Statistics. (2025). <i>Rural–urban classification (2021) of local authority districts (2024) in England and Wales</i> [Data set]. UK Government. Retrieved from https://www.data.gov.uk/dataset/8daa9988-f4e6-40e3-82df-58bb0ae947a3/rural-urban-classification-2021-of-local-authority-districts-2024-in-ew
GB	Scottish Government. (2024). <i>Scottish Government Urban Rural Classification 2022: Census 2022 population estimates tables</i> [Data set]. Scottish Government. Retrieved from https://www.gov.scot/publications/scottish-government-urban-rural-classification-2022/documents/scottish-government-urban-rural-classification-2022---census-2022-output-area-lookup/

Table 6. Geodata used for administrative boundaries

Country	Dataset
EU	Eurostat. (2023). <i>Local administrative units (LAU) – Geographical data</i> [Data set]. European Commission. Retrieved from https://ec.europa.eu/eurostat/web/gisco/geodata/statistical-units/local-administrative-units © EuroGeographics for the administrative boundaries
EU	Eurostat. (2021). <i>Territorial units for statistics (NUTS) – Geographical data</i> [Data set]. European Commission. Retrieved from https://ec.europa.eu/eurostat/web/gisco/geodata/statistical-units/territorial-units-statistics © EuroGeographics for the administrative boundaries
GB	Office for National Statistics. (2025). <i>Local Authority Districts (December 2024) Boundaries UK BGC</i> [Data set]. UK Government. Retrieved from https://www.data.gov.uk/dataset/af158609-c1ec-40a6-a8ee-0b0feb698463/local-authority-districts-december-2024-boundaries-uk-bgc