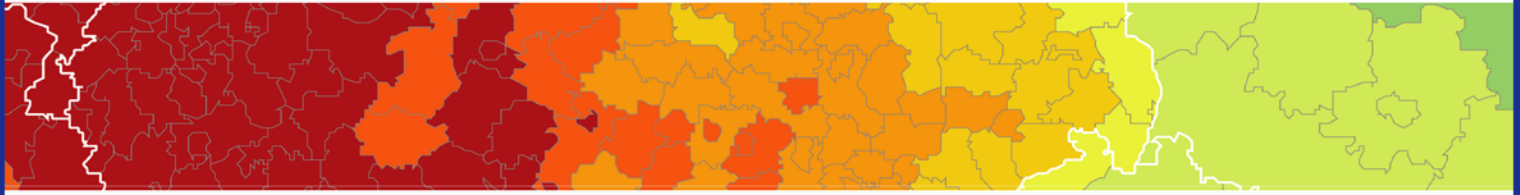


Inspire policy making by territorial evidence



# PROFECY – Processes, Features and Cycles of Inner Peripheries in Europe

(Inner Peripheries: National territories facing  
challenges of access to basic services of general  
interest)

Applied Research

Final Report

## Annex 3. Visualization of Input Data as Basis for the Delineation of Inner Peripheries

Version 07/12/2017

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This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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# PROFECY – Processes, Features and Cycles of Inner Peripheries in Europe

## Table of contents

List of Maps .....	ii
Abbreviations .....	iv
1 Introduction .....	1

## List of Maps

Map 1.1: Comparison of different grid resolutions.....	4
Map 1.2: Identified regional centers. ....	5
Map 1.3: Urban morphological zones.....	6
Map 1.4: LAU-2 units in Europe. ....	7
Map 1.5: Road network in Europe. ....	8
Map 1.6: Highway ramps / motorway access.....	9
Map 1.7: Density of motorway access points per sqkm.....	10
Map 1.8: Density of motorway access points per inhabitant. ....	11
Map 1.9: Rail network in Europe. ....	12
Map 1.10: Passenger train stations.....	13
Map 1.11: Density of passenger train stations per sqkm at NUTS3 level (all station types)...	14
Map 1.12: Density of passenger train stations per inhabitant at NUTS-3 level (all station types).....	15
Map 1.13: Density of major passenger train stations per sqkm at NUTS-3 level.....	16
Map 1.14: Density of major passenger train stations per inhabitant at NUTS-3 level.....	17
Map 1.15: Doctors in Europe (GP - general practitioners).....	18
Map 1.16: Density of doctors (GP - general practitioners) per sqkm. ....	19
Map 1.17: Density of doctors (GP - general practitioners) per inhabitant. ....	20
Map 1.18: Hospitals in Europe. ....	21
Map 1.19: Density of hospitals per sqkm. ....	22
Map 1.20: Density of hospitals per inhabitant. ....	23
Map 1.21: Pharmacies in Europe. ....	24
Map 1.22: Density of pharmacies per sqkm in Europe. ....	25
Map 1.23: Density of pharmacies per inhabitant in Europe. ....	26
Map 1.24: Schools in Europe (primary and secondary education). ....	27
Map 1.25: Primary schools in Europe. ....	28
Map 1.26: Secondary schools in Europe.....	29
Map 1.27: Density of primary and secondary schools per sqkm.....	30
Map 1.28: Density of primary and secondary schools per inhabitant.....	31

Map 1.29: Density of primary schools per sqkm. ....	32
Map 1.30: Density of primary schools per inhabitant. ....	33
Map 1.31: Density of secondary schools per sqkm.....	34
Map 1.32: Density of secondary schools per inhabitant.....	35
Map 1.33: Cinemas in Europe. ....	36
Map 1.34: Density of cinemas per sqkm. ....	37
Map 1.35: Density of cinemas per inhabitant. ....	38
Map 1.36: Supermarkets and convenient stores in Europe. ....	39
Map 1.37: Supermarkets in Europe.....	40
Map 1.38: Convenient stores in Europe. ....	41
Map 1.39: Density of retail facilities (combined supermarkets and convenient stores) per sqkm. ....	42
Map 1.40: Density of retail facilities (combined supermarkets and convenient stores) per inhabitant. ....	43
Map 1.41: Density of supermarkets per sqkm.....	44
Map 1.42: Density of supermarkets per inhabitant.....	45
Map 1.43: Density of convenient stores per sqkm ....	46
Map 1.44: Density of convenient stores per inhabitant. ....	47
Map 1.45: Bank offices in Europe.....	48
Map 1.46: Density of bank offices per sqkm. ....	49
Map 1.47: Density of bank offices per inhabitant. ....	50
Map 1.48: Population density 2015 (NUTS-3).....	51
Map 1.49: Population change 2001-2015. ....	52
Map 1.50: Average annual population change, 2001-2015 (average annual change rates)..	53
Map 1.51: Net migration 2014/2015. ....	54
Map 1.52: GDP per capita 2015. ....	55
Map 1.53: Unemployment rate 2016. ....	56
Map 1.54: Accessibility potential road, 2014 (ESPON Matrices). ....	57
Map 1.55: Accessibility potential rail, 2014 (ESPON Matrices).....	58
Map 1.56: Accessibility potential air, 2014 (ESPON Matrices). ....	59
Map 1.57: Accessibility potential multimodal, 2014 (ESPON Matrices).....	60

## Abbreviations

EC	Eurocity train
EU	European Union
GDP	Gross domestic product
GIS	Geoinformation system(s)
GP	General practitioner(s)
HSL	High-speed line(s)
IC	Inter city train
Inh.	Inhabitant(s)
km	Kilometer(s)
LAU	Local administrative unit(s)
n.a.	Not available / not applicable
NUTS	Nomenclature des unités territoriales statistiques
OSM	OpeStreetMap
PPS	Purchasing-power-standards
SGI	Services-of-general-interest
sqkm	Square kilometer
TOR	Terms-of-reference
UMZ	Urban morphological zone(s)

# 1 Introduction

Complementing the data collection (see Annex 2 of the Draft Final Report), following is a map gallery illustrating the compiled input data. Additional useful comments will also be given to certain datasets / indicators. The visualized input data were used as inputs for the delineations of inner peripheries in Delineations 1, 2, 3 and 4.

The sequence of maps in this gallery follows the sequence of datasets presented in Tables 3.1 to 3.3 of Annex 2. The following maps have been generated:

## ***Background information:***

Map 1.1: Comparison of different grid resolutions.

Map 1.2: Identified regional centers.

Map 1.3: Urban morphological zones.

Map 1.4: LAU-2 units in Europe.

## ***Transport networks:***

Map 1.5: Road network in Europe.

Map 1.6: Highway ramps / motorway access.

Map 1.7: Density of motorway access points per sqkm.

Map 1.8: Density of motorway access points per inhabitant.

Map 1.9: Rail network in Europe.

Map 1.10: Passenger train stations.

Map 1.11: Density of passenger train stations per sqkm at NUTS3 level (all station types).

Map 1.12: Density of passenger train stations per inhabitant at NUTS-3 level (all station types).

Map 1.13: Density of major passenger train stations per sqkm at NUTS-3 level.

Map 1.14: Density of major passenger train stations per inhabitant at NUTS-3 level.

## ***Health care systems:***

Map 1.15: Doctors in Europe (GP - general practitioners).

Map 1.16: Density of doctors (GP - general practitioners) per sqkm.

Map 1.17: Density of doctors (GP - general practitioners) per inhabitant.



Map 1.18: Hospitals in Europe.

Map 1.19: Density of hospitals per sqkm.

Map 1.20: Density of hospitals per inhabitant.

Map 1.21: Pharmacies in Europe.

Map 1.22: Density of pharmacies per sqkm in Europe.

Map 1.23: Density of pharmacies per inhabitant in Europe.

***Education:***

Map 1.24: Schools in Europe (primary and secondary education).

Map 1.25: Primary schools in Europe.

Map 1.26: Secondary schools in Europe.

Map 1.27: Density of primary and secondary schools per sqkm.

Map 1.28: Density of primary and secondary schools per inhabitant.

Map 1.29: Density of primary schools per sqkm.

Map 1.30: Density of primary schools per inhabitant.

Map 1.31: Density of secondary schools per sqkm.

Map 1.32: Density of secondary schools per inhabitant.

***Other services-of-general-interest:***

Map 1.33: Cinemas in Europe.

Map 1.34: Density of cinemas per sqkm.

Map 1.35: Density of cinemas per inhabitant.

Map 1.36: Supermarkets and convenient stores in Europe.

Map 1.37: Supermarkets in Europe.

Map 1.38: Convenient stores in Europe.

Map 1.39: Density of retail facilities (combined supermarkets and convenient stores) per sqkm.

Map 1.40: Density of retail facilities (combined supermarkets and convenient stores) per inhabitant.

Map 1.41: Density of supermarkets per sqkm.

Map 1.42: Density of supermarkets per inhabitant.

Map 1.43: Density of convenient stores per sqkm.

Map 1.44: Density of convenient stores per inhabitant.

Map 1.45: Bank offices in Europe.

Map 1.46: Density of bank offices per sqkm.

Map 1.47: Density of bank offices per inhabitant.

***Statistical indicators:***

Map 1.48: Population density 2015 (NUTS-3).

Map 1.49: Population change 2001-2015.

Map 1.50: Average annual population change, 2001-2015 (average annual change rates).

Map 1.51: Net migration 2014/2015..

Map 1.52: GDP per capita 2015.

Map 1.53: Unemployment rate 2016..

***Accessibility indicators (previous ESPON studies):***

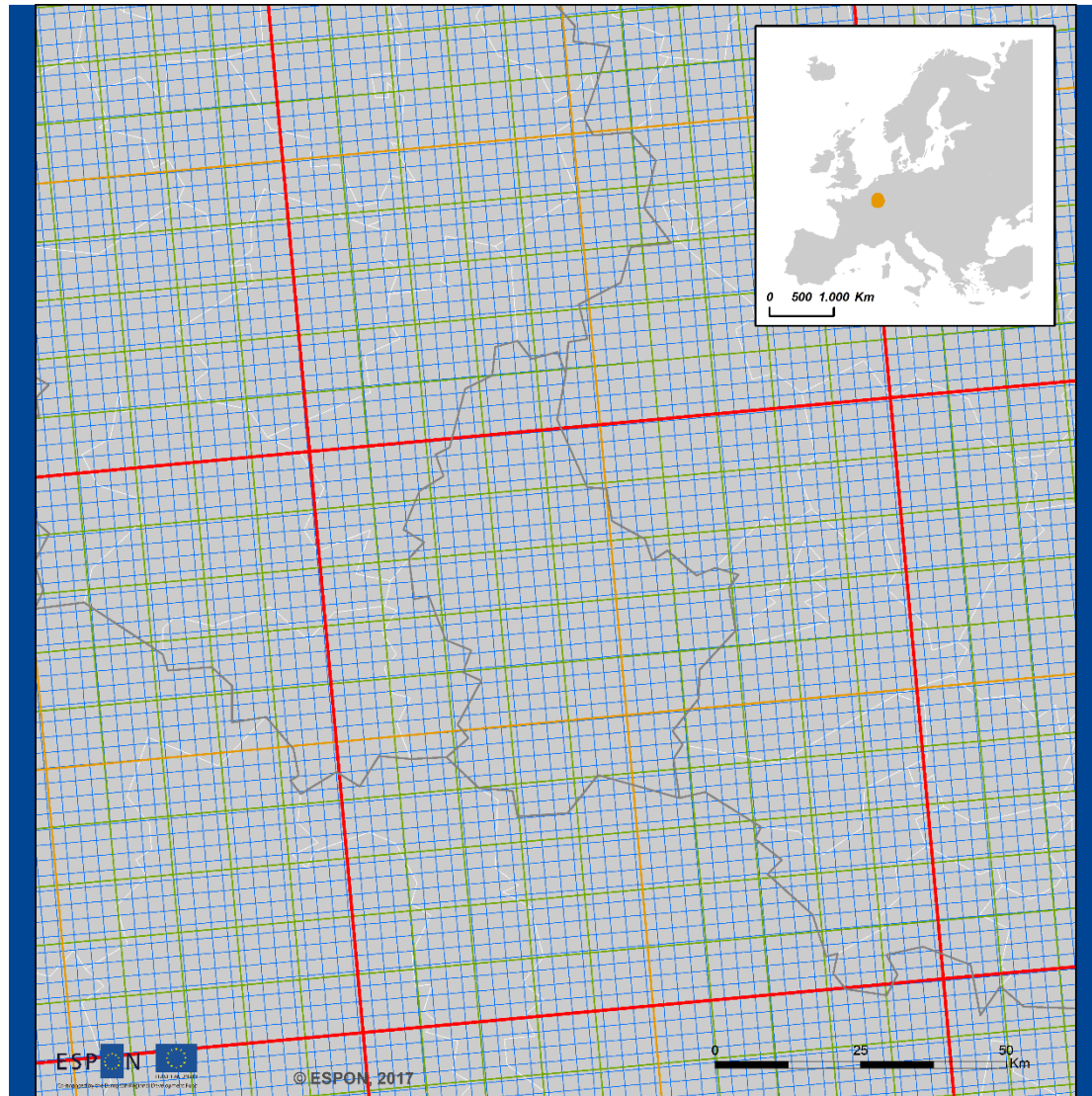
Map 1.54: Accessibility potential road, 2014 (ESPON Matrices).

Map 1.55: Accessibility potential rail, 2014 (ESPON Matrices).

Map 1.56: Accessibility potential air, 2014 (ESPON Matrices).

Map 1.57: Accessibility potential multimodal, 2014 (ESPON Matrices).

Map 1.1: Comparison of different grid resolutions.



<b>ESPON Reference Grids:</b>	<b>ESPON TRACC:</b>	— Country boundaries
10x10 km	2.5x2.5km	NUTS-3 region2
50x50 km		
100x100 km		

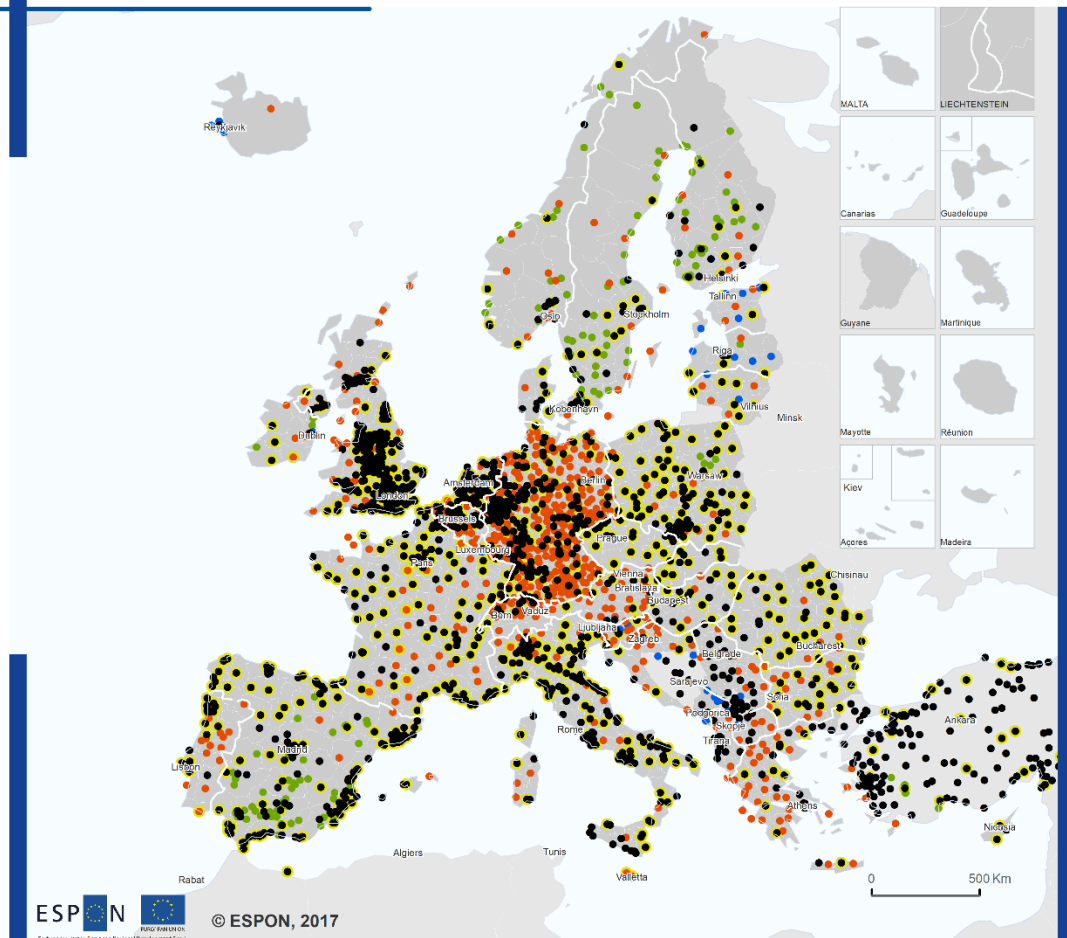
Level: Grid systems  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 ESPON Reference Grids;  
 ESPON Database, 2016;  
 ESPON TRACC, 2011.  
 © EuroGeographics Association for  
 administrative boundaries

### Grid resolution:

After testing different resolutions, the resolution of 2.5 x 2.5 km for the European-wide grid system was selected, appearing as the most suitable one for European-wide analysis in ESPON Profecy, resulting in almost 920,000 grid cells

Map 1.2: Identified regional centers.

## Regional Centres in Europe



### Criteria for the selection of regional centres (Delineation 1)

- Criterion 1: Cities > 50,000 inhabitants
- Criterion 2: NUTS-3 region centroids and number of inhabitants < 50,000
- Criterion 3: Urban Audit City
- Criterion 4: additional centres (1): ten largest cities in a country, if not included in criteria 1-3
- Criterion 5: additional centres (2): additional five cities in large regions > 15,000 inh., if not included in criteria 1-4

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 RRG GIS Database, RRG, 2016  
 CC - UMS RIATE fund RRG or  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

### Criteria for the selection of regional centres:

Criterion 1: all cities with more than 50,000 inhabitants

Criterion 2: NUTS-3 region centroids (whatever their population size)

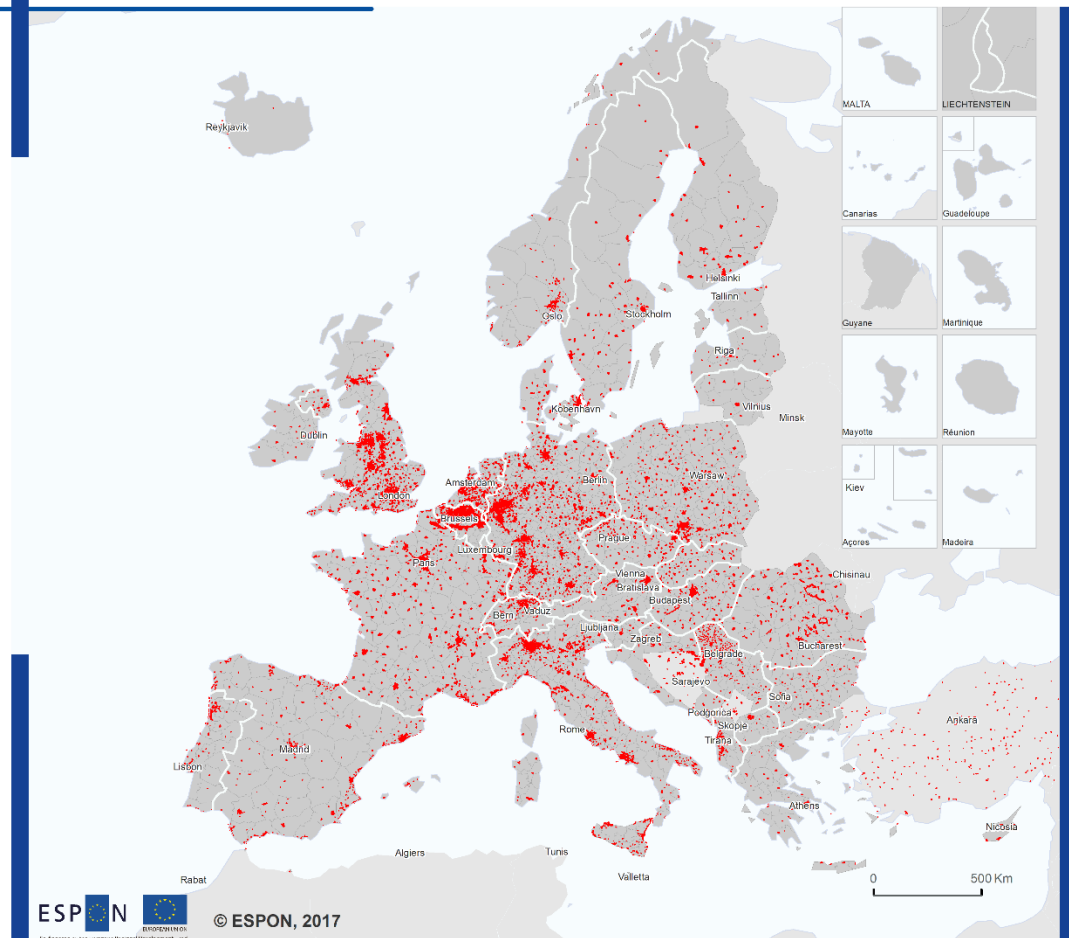
Criterion 3: cities participating in urban audit programme

Criterion 4: ten largest cities in a country, if not yet included in criteria 1 to 3

Criterion 5: five largest cities > 15,000 inhabitants in large NUTS-3 regions, if not already included in criteria 1 to 4

Map 1.3: Urban morphological zones.

## Urban morphological zones



### Urban morphological zones (EU Member States) and urban areas (non-EU countries)

■ Urban areas (proxy for places of work)

Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
ESPON M4D, 2012; OpenStreetMap (OSM), 2016  
CC - UMS RIATE and RRG for administrative boundaries

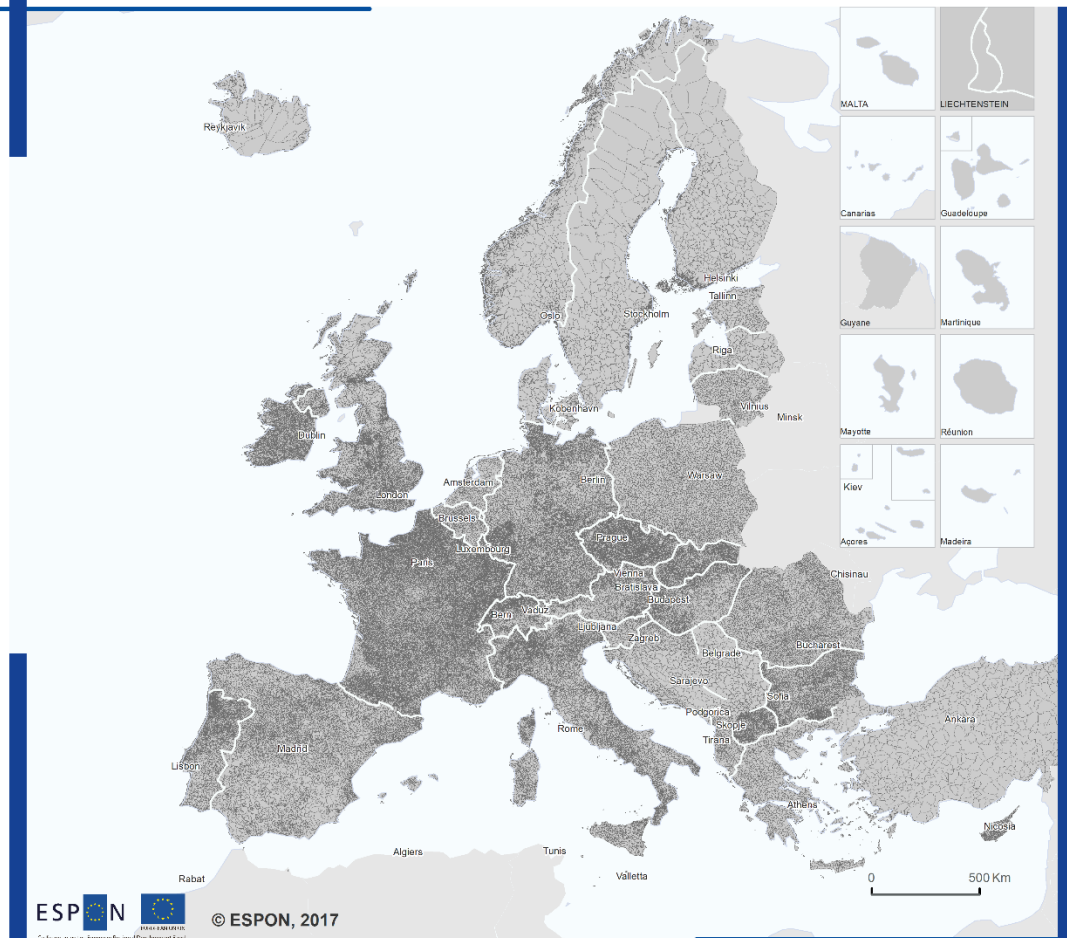
Note:  
Outermost regions excluded from analysis.

### UMZ and access to jobs:

Since European-wide data on jobs (places of work) are not available as a GIS database, UMZ were used as a proxy, assuming that the majority of jobs is located within urban areas. Thus, in Delineation 3 the access to jobs at grid level was modelled as airline travel time from each grid cell to the closest UMZ point.

Map 1.4: LAU-2 units in Europe.

### Seamless and comprehensive LAU-2 layer



#### LAU-2 units in Europe

LAU-2 boundaries

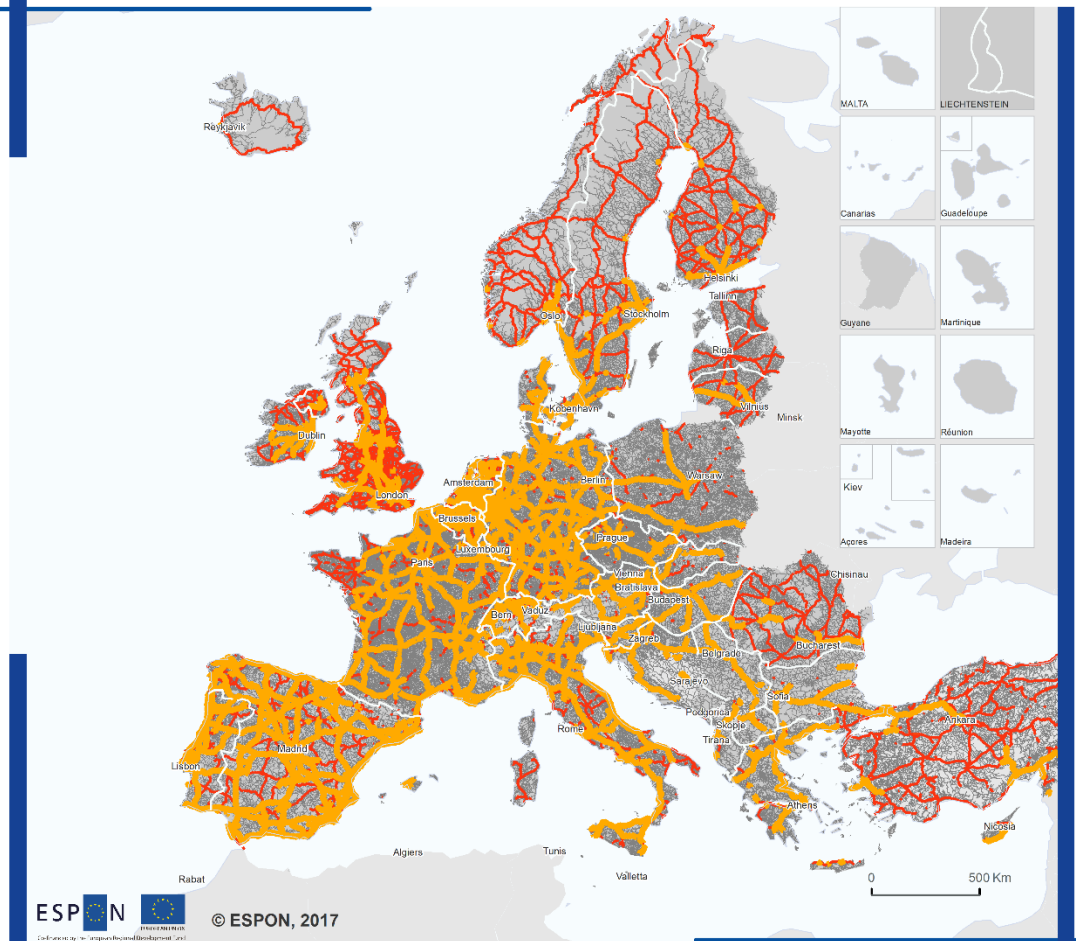
Level: LAU-2 units (Turkey: districts)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 EBM V.62 (2013, EBM V60 (2011),  
 GADM (2016)  
 CC - UMS RIATE and RRG for  
 administrative boundaries  
 Note:  
 Outermost regions excluded from analysis.

#### Seamless LAU-2 layer:

The seamless LAU-2 layer for the entire ESPON space has been generated by combining different individual layers, as indicated in the map legend.

Map 1.5: Road network in Europe.

### Road networks in Europe (2016)



ESPON © ESPON, 2017

#### Road networks in Europe (2016)

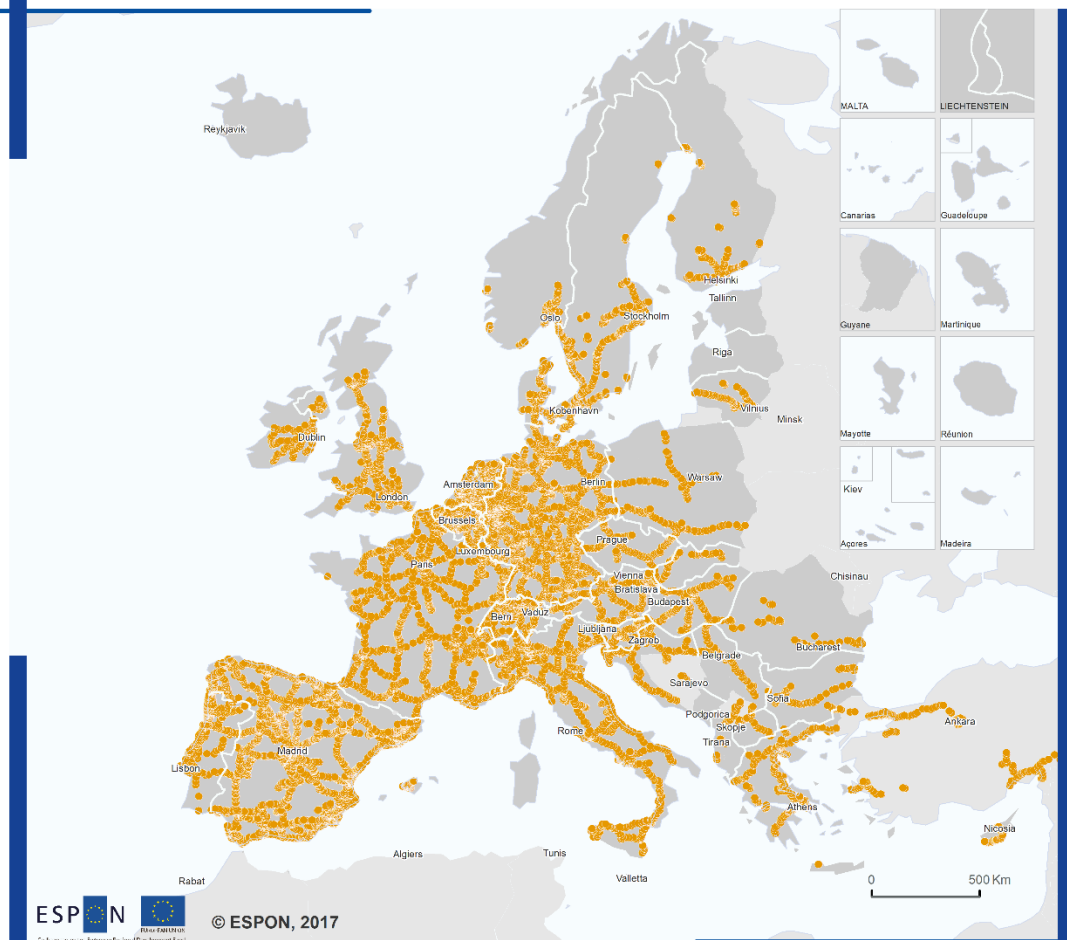
- Motorway
- Express road
- Other road

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.6: Highway ramps / motorway access.

## Highway ramps in Europe



### Motorway access points (2016)

- Motorway access

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 RRG GIS Database, RRG, 2017  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

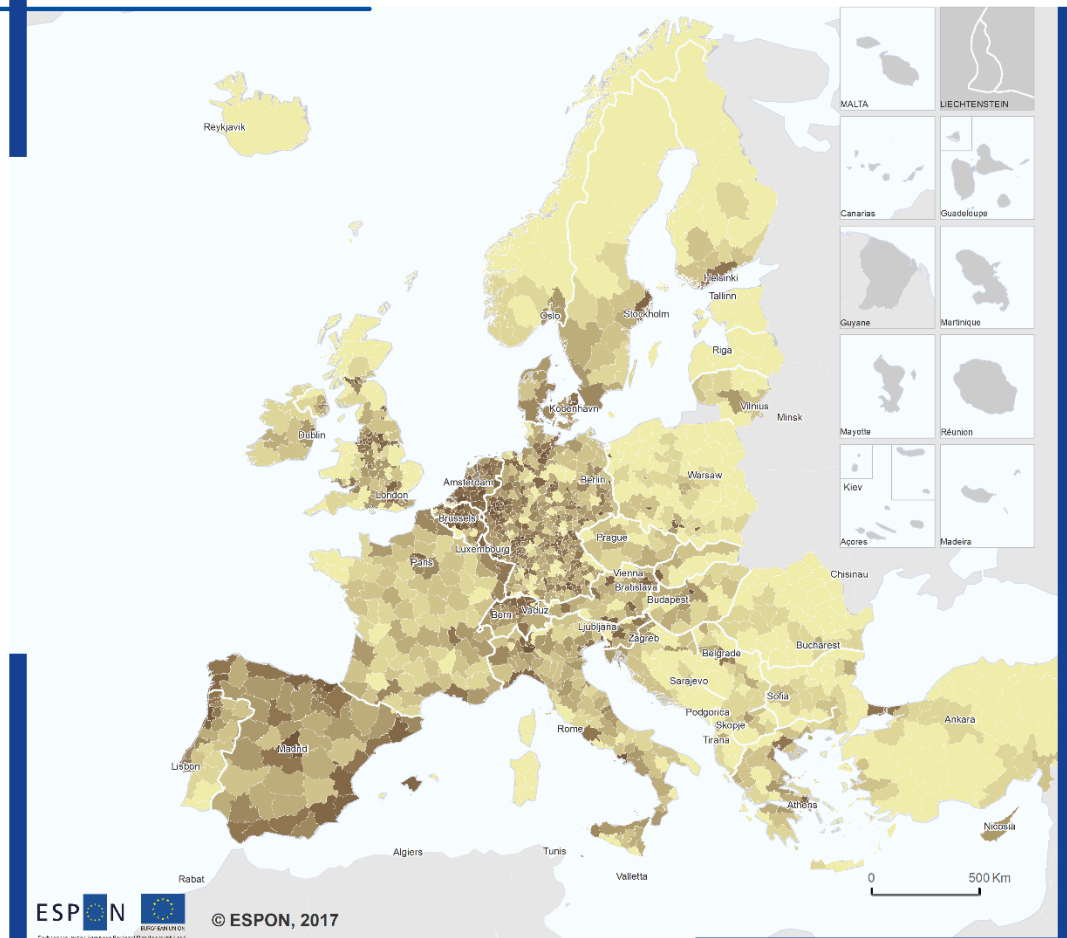
### Highway ramps / motorway access:

Unlike suggested in the TOR, highway ramps are not being used as a variable for the delineation of inner peripheries, because they do not represent a trip “destination” in the mere sense; however, the number and density of motorway access points have been calculated for each NUTS-3 region and will be used as a variable for the analysis and characterization of inner peripheries in Europe.

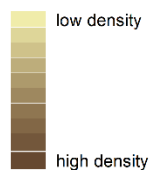


Map 1.7: Density of motorway access points per sqkm.

## Highway ramps in Europe



**Density of motorway access points (2016)**  
(number of highway ramps per sqkm)

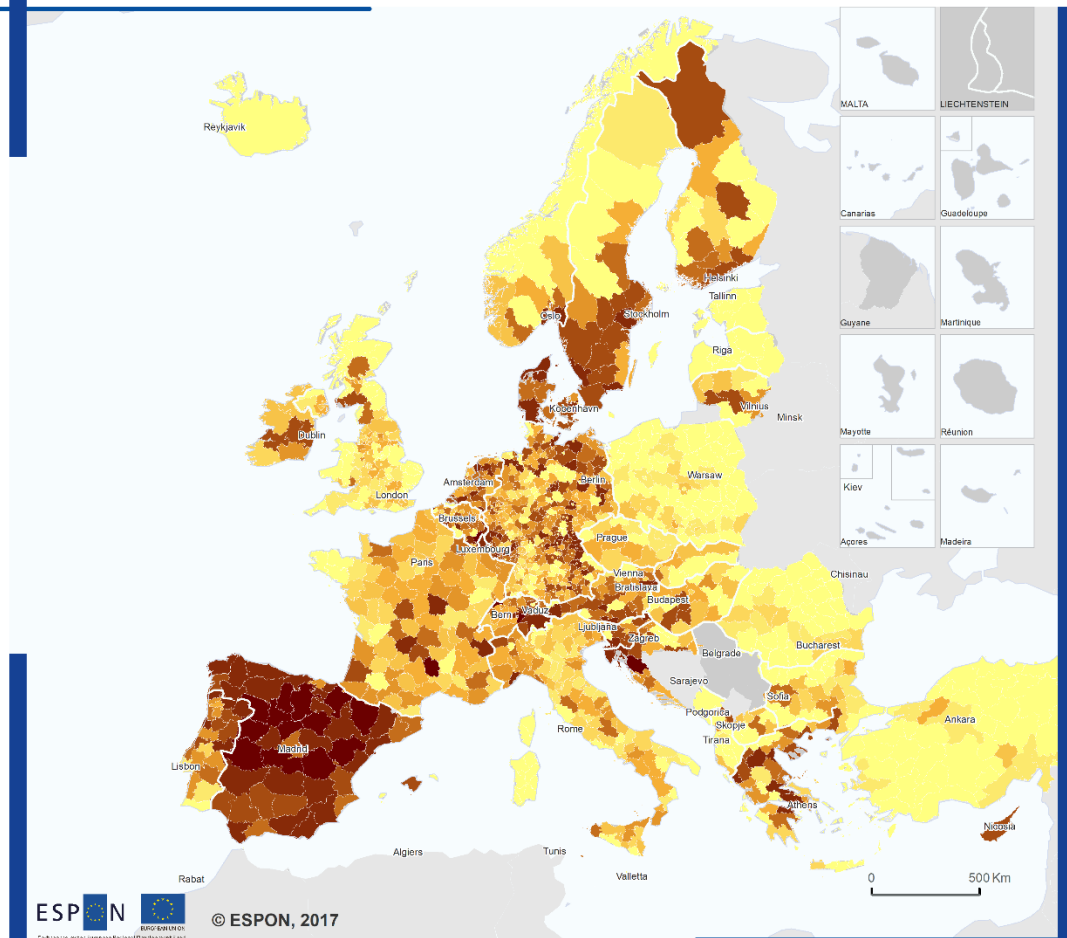


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE and RRG for  
administrative boundaries

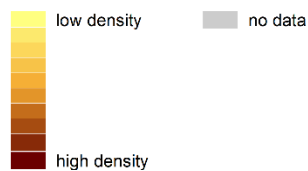
**Note:**  
Outermost regions excluded from analysis.

Map 1.8: Density of motorway access points per inhabitant.

## Highway ramps in Europe



**Density of motorway access points (2016)**  
(number of highway ramps per inhabitant)

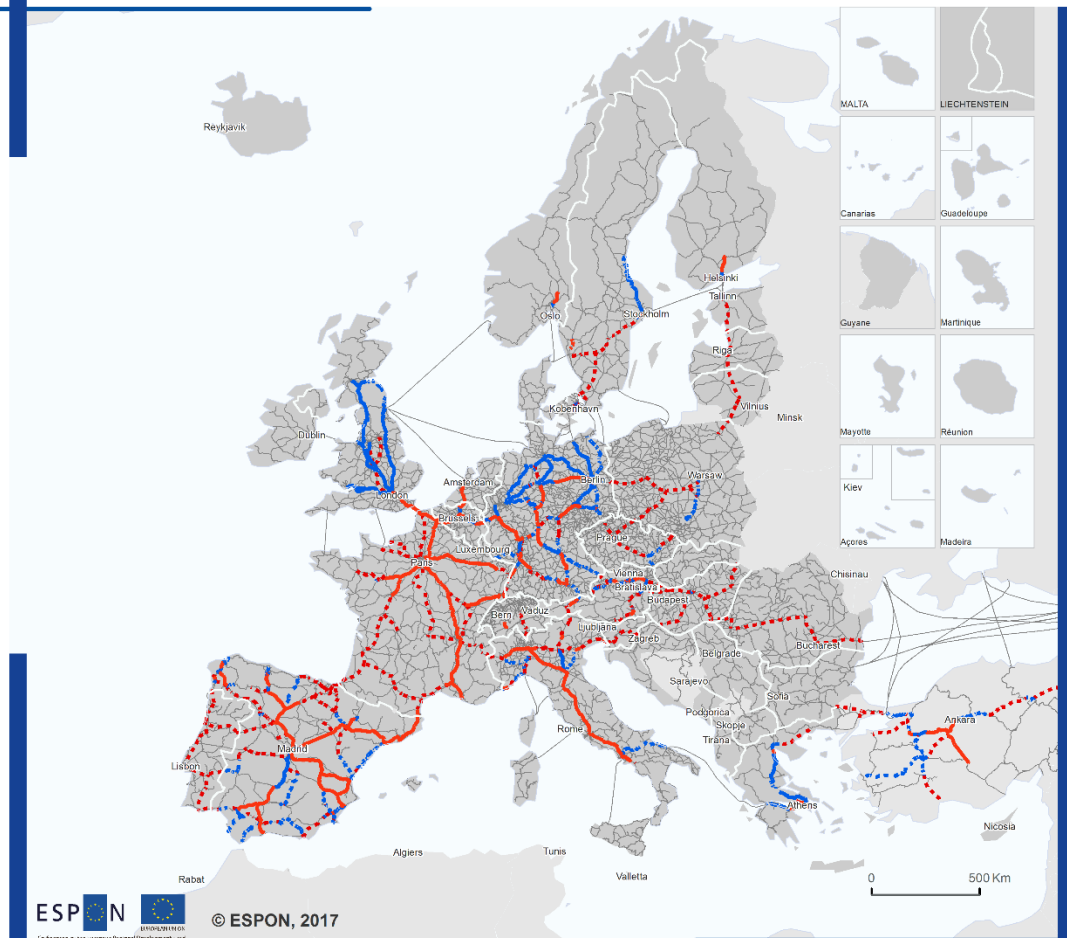


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE and RRG for  
administrative boundaries

Note:  
Outermost regions excluded from analysis.

Map 1.9: Rail network in Europe.

## Public transport networks: Railways



### Railway network in Europe: Existing and planned high-speed lines

- Upgraded high speed rail line
- Upgraded HSL in future
- New constructed and dedicated HSL
- New constructed and dedicated HSL in future
- No high speed rail line, rail ferry

Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE for administrative boundaries

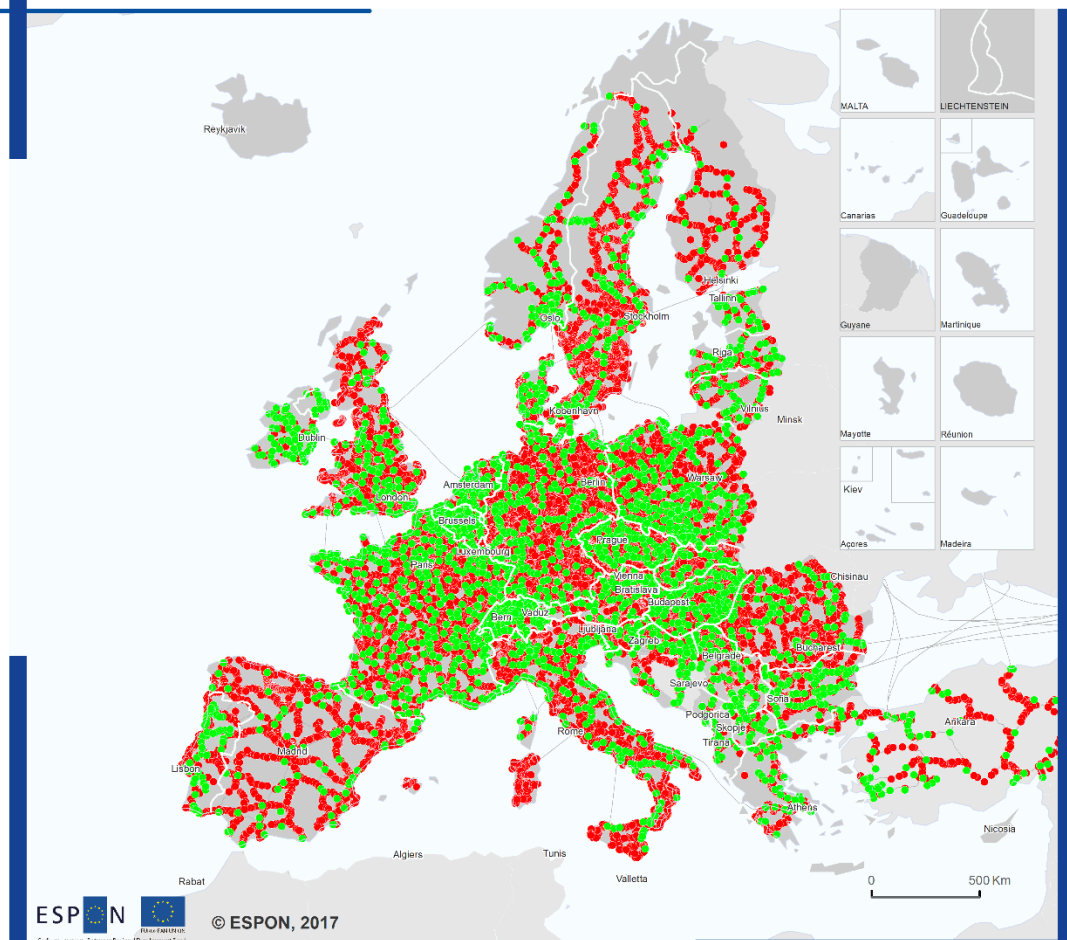
Note:  
Outermost regions excluded from analysis.

### Rail network:

The rail network includes all passenger railway lines under operation today. Rail links with cargo services only were excluded. As there is no comprehensive and complete European-wide bus network geodatabase available, it was decided to cease the analysis of IP regions in Europe based on public transport. Using railway networks alone does not suffice.

Map 1.10: Passenger train stations.

## Public transport networks: Railways



### Railway stations

- Main station (IC/EC, high-speed trains, important crossroad station)
- Station
- Rail link, rail ferry

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 RRG GIS Database, RRG, 2017  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

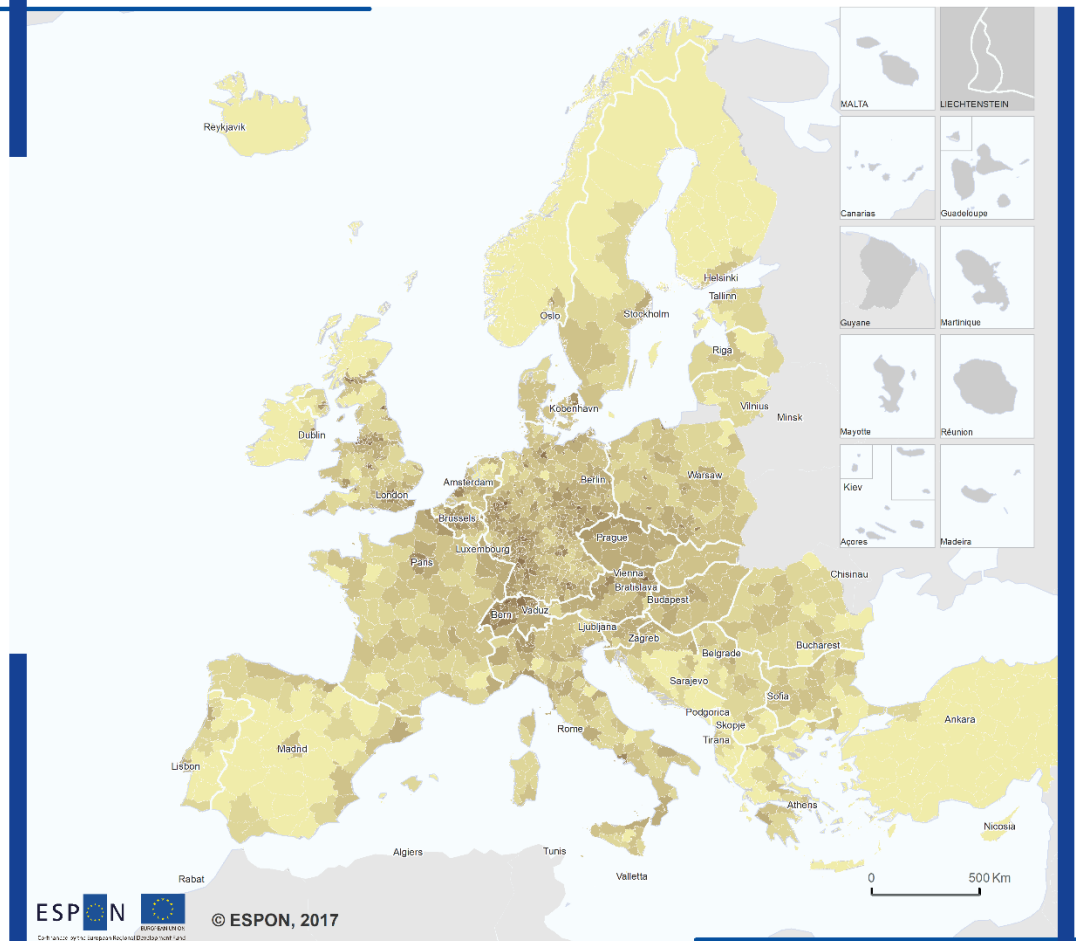
### Passenger stations:

Passenger stations represent important services-of-general interest. Thus, access to passenger train stations were used as one of the variables in Delineation 3. All train stations, including main and secondary ones, were considered.

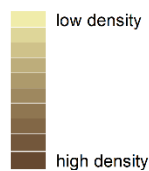
In addition, the density of train stations is used as variable for the characterization and analysis of inner peripheries.

Map 1.11: Density of passenger train stations per sqkm at NUTS3 level (all station types).

## Passenger train stations in Europe



**Density of passenger train stations (all station types) (2016)**  
(number of passenger stations per sqkm)

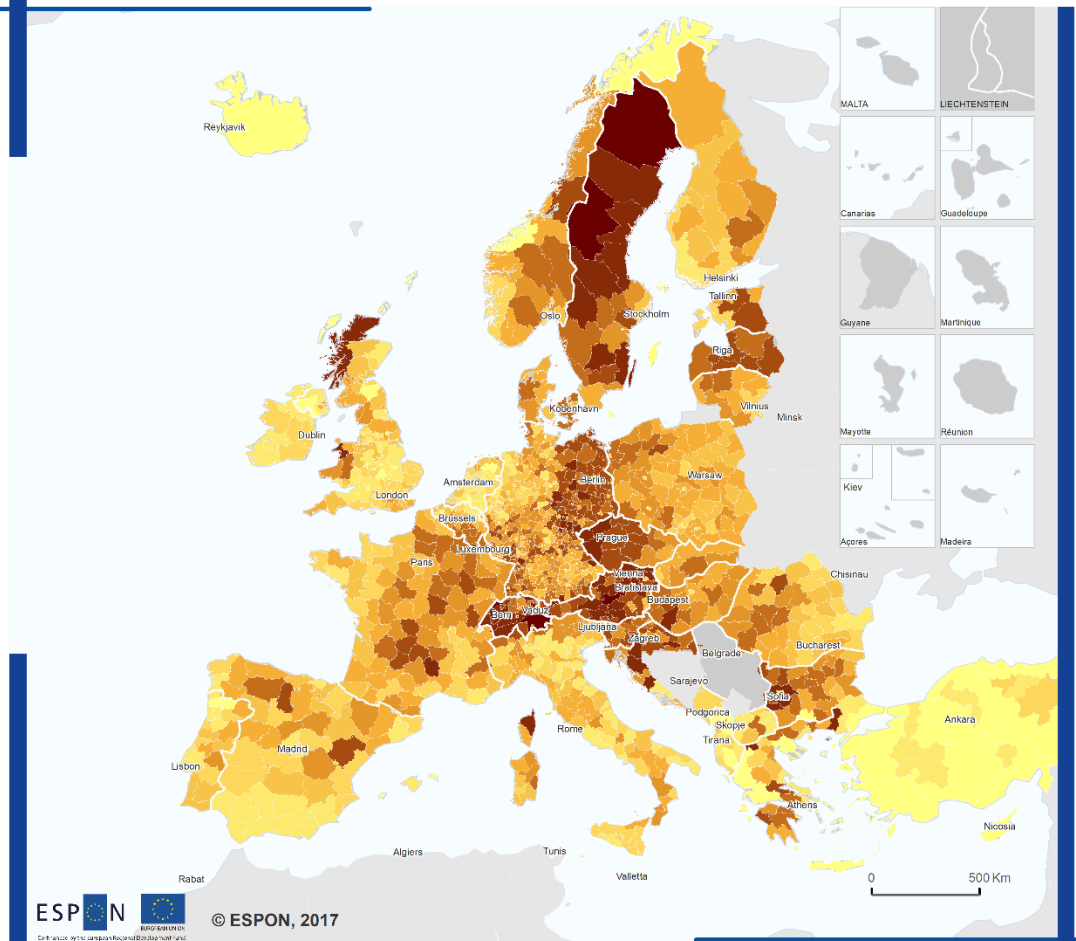


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE and RRG for  
administrative boundaries

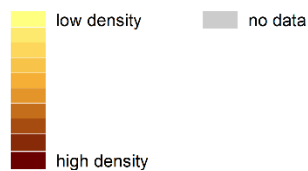
Note:  
Outermost regions excluded from analysis.

Map 1.12: Density of passenger train stations per inhabitant at NUTS-3 level (all station types).

### Passenger train stations in Europe



**Density of passenger train stations (all station types) (2016)**  
(number of passenger stations per inhabitant)

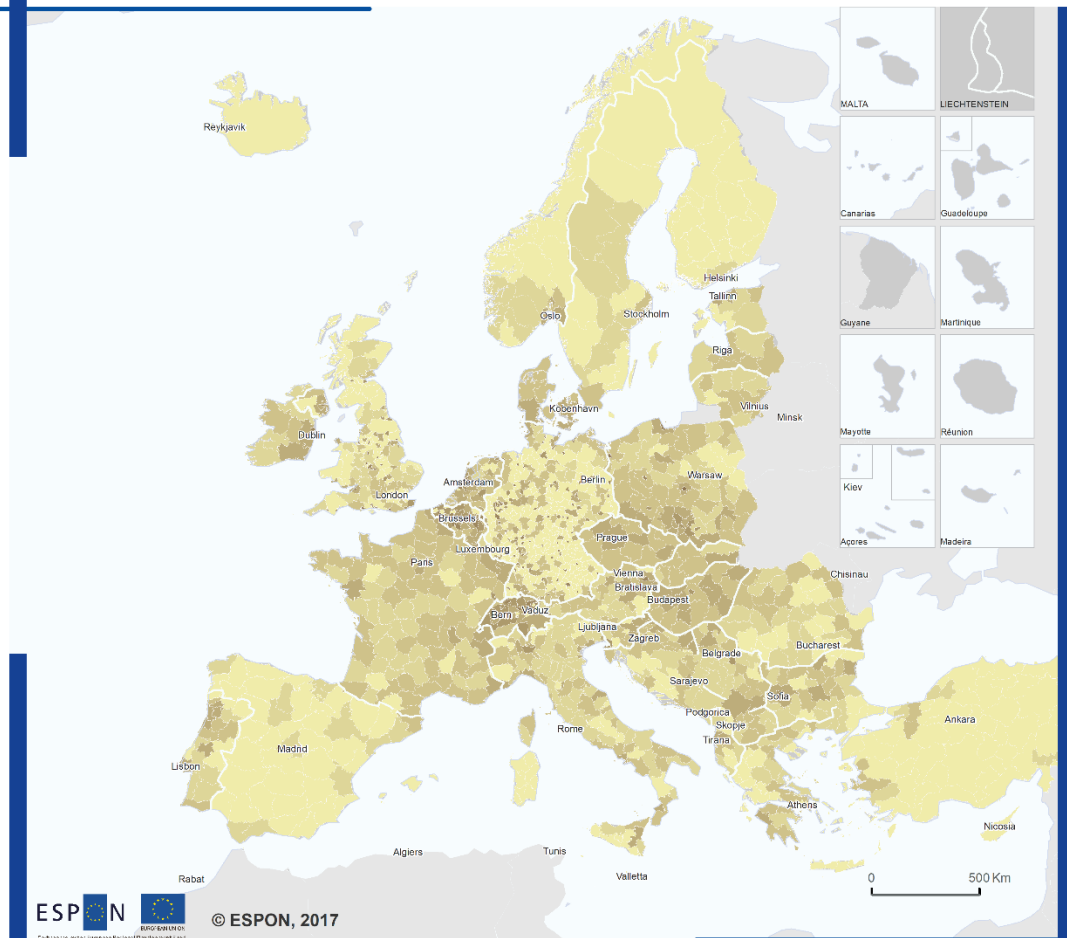


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE and RRG for  
administrative boundaries

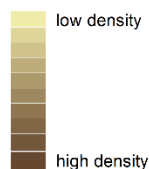
**Note:**  
Outermost regions excluded from analysis.

Map 1.13: Density of major passenger train stations per sqkm at NUTS-3 level.

## Passenger train stations in Europe



**Density of major passenger train stations (2016)**  
(number of passenger stations per sqkm)



Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE and RRG for  
administrative boundaries

**Note:**  
Outermost regions excluded from analysis.

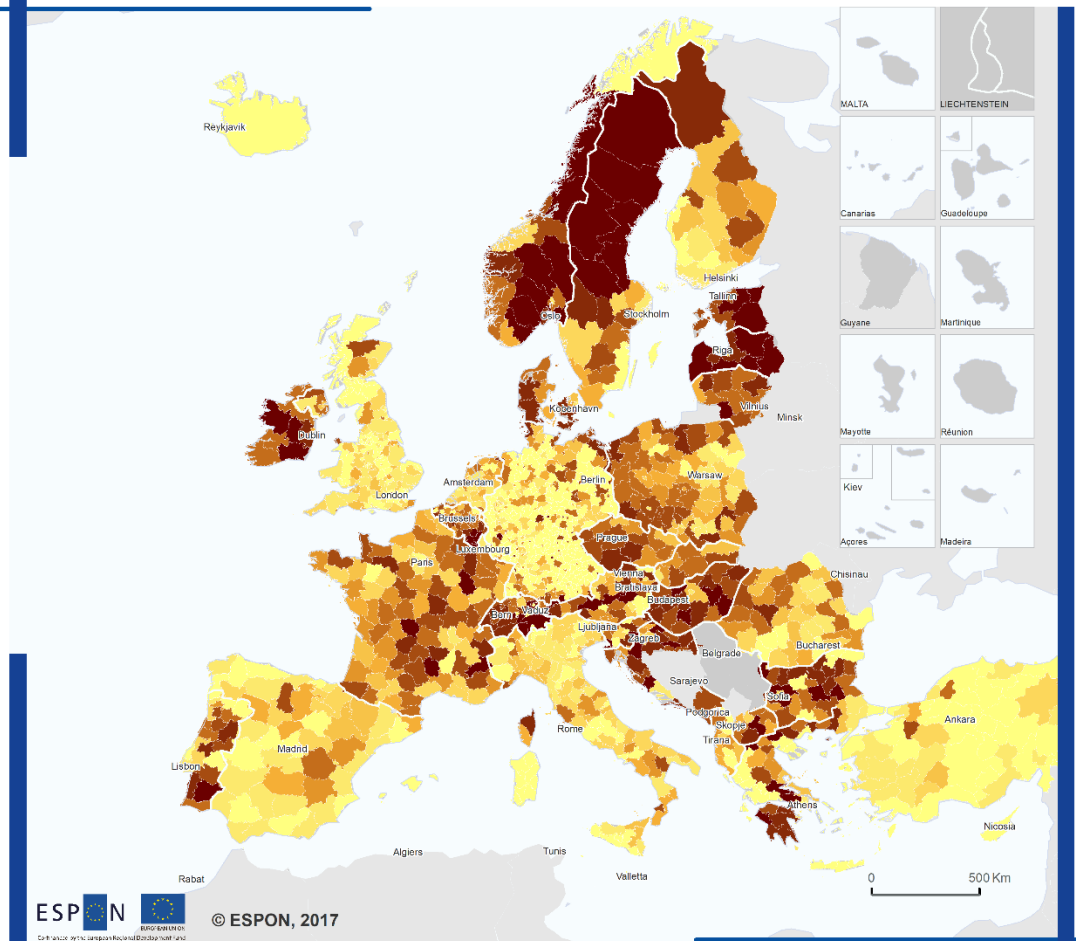
Major passenger train stations include intercity and Eurocity train stations, high-speed train stations, as well as main stations with interconnecting train services.

### Major passenger train stations:

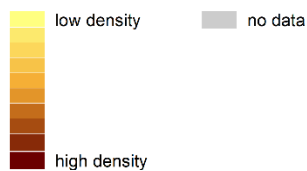
Major passenger train stations include intercity and Eurocity train stations, high-speed train stations, as well as main stations with interconnecting train services.

Map 1.14: Density of major passenger train stations per inhabitant at NUTS-3 level.

## Passenger train stations in Europe



**Density of major passenger train stations (2016)**  
(number of passenger stations per sqkm)



Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
RRG GIS Database, RRG, 2017  
CC - UMS RIATE and RRG for  
administrative boundaries

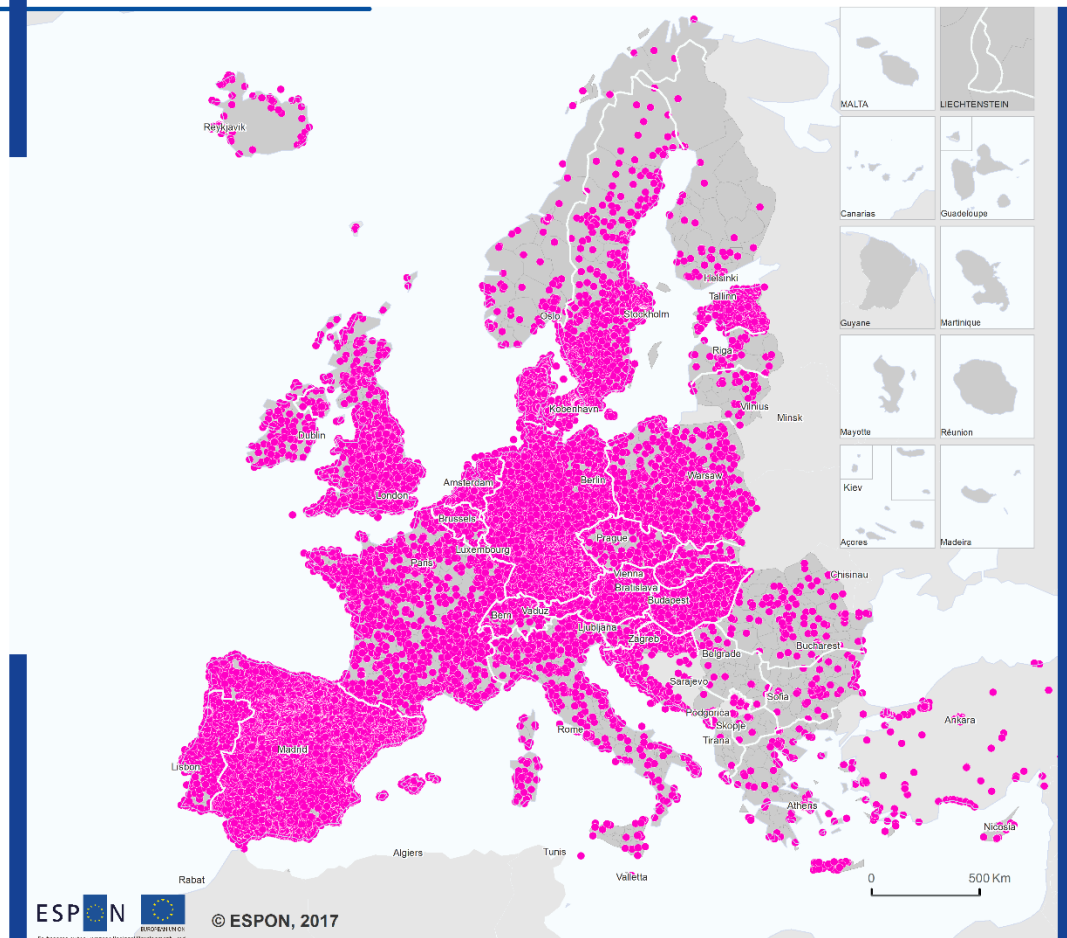
**Note:**  
Outermost regions excluded from analysis.

Major passenger train stations include intercity and  
Eurocity train stations, high-speed train stations, as  
well as main stations with interconnecting train  
services.



Map 1.15: Doctors in Europe (GP - general practitioners).

### Services-of-general interest (SGIs): Doctors



#### Doctors in Europe (GP - General practitioners)

- Doctors (general practitioners)

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016; Hungarian  
 Ministry of Health, 2017; SNS - Serviço Nacional  
 de Saúde, 2017; Croatia Ministry of Health, 2017;  
 1177 Vardguiden (SE), 2017; Sundhed DK, 2017;  
 Eesti Haigekassa, 2017; Principality of  
 Liechtenstein, 2017; Ministry of Welfare Iceland,  
 2016  
 CC - UMS RIATE for administrative boundaries

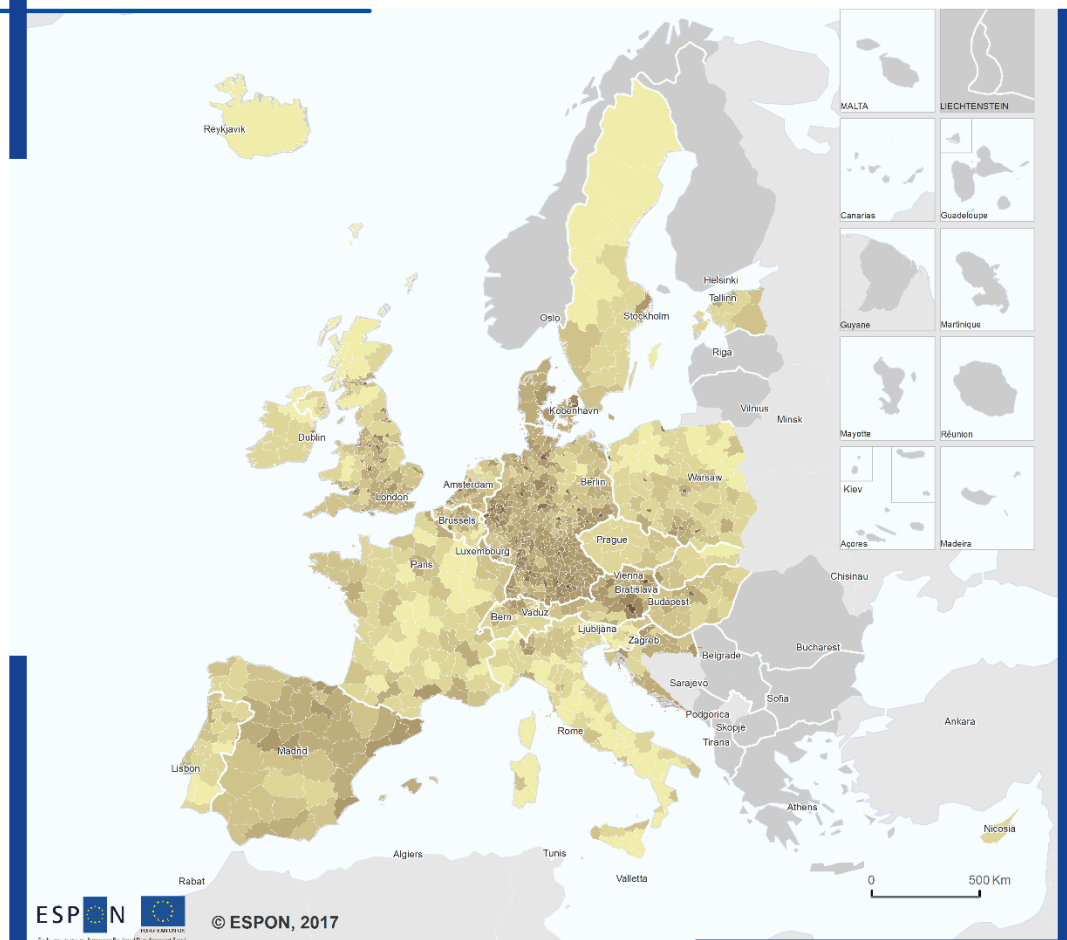
Note:  
 Outermost regions excluded from analysis.

#### Type of doctors:

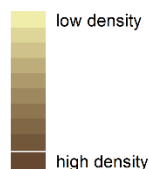
Focus was given on compiling a database of general practitioners / general surgeries. Specialized doctors (like dentists) and specialized surgeries have been excluded. However, in case of doubt, a doctor location remained in the dataset. Surgeries have been included in this doctors layer (in some countries, surgeries are rather combined with hospitals).

Map 1.16: Density of doctors (GP - general practitioners) per sqkm.

**Services-of-general interest (SGIs): Doctors**



**Density of doctors (general practitioners)  
(number of surgeries per sqkm)**



Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Hungarian  
 Ministry of Health, 2017; SNS - Serviço Nacional  
 de Saude, 2017; Croatia Ministry of Health, 2017;  
 1177 Vardguiden (SE), 2017; Sundhed DK, 2017;  
 Eesti Haugekassa, 2017; Principality of  
 Liechtenstein, 2017; Ministry of Welfare Iceland,  
 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

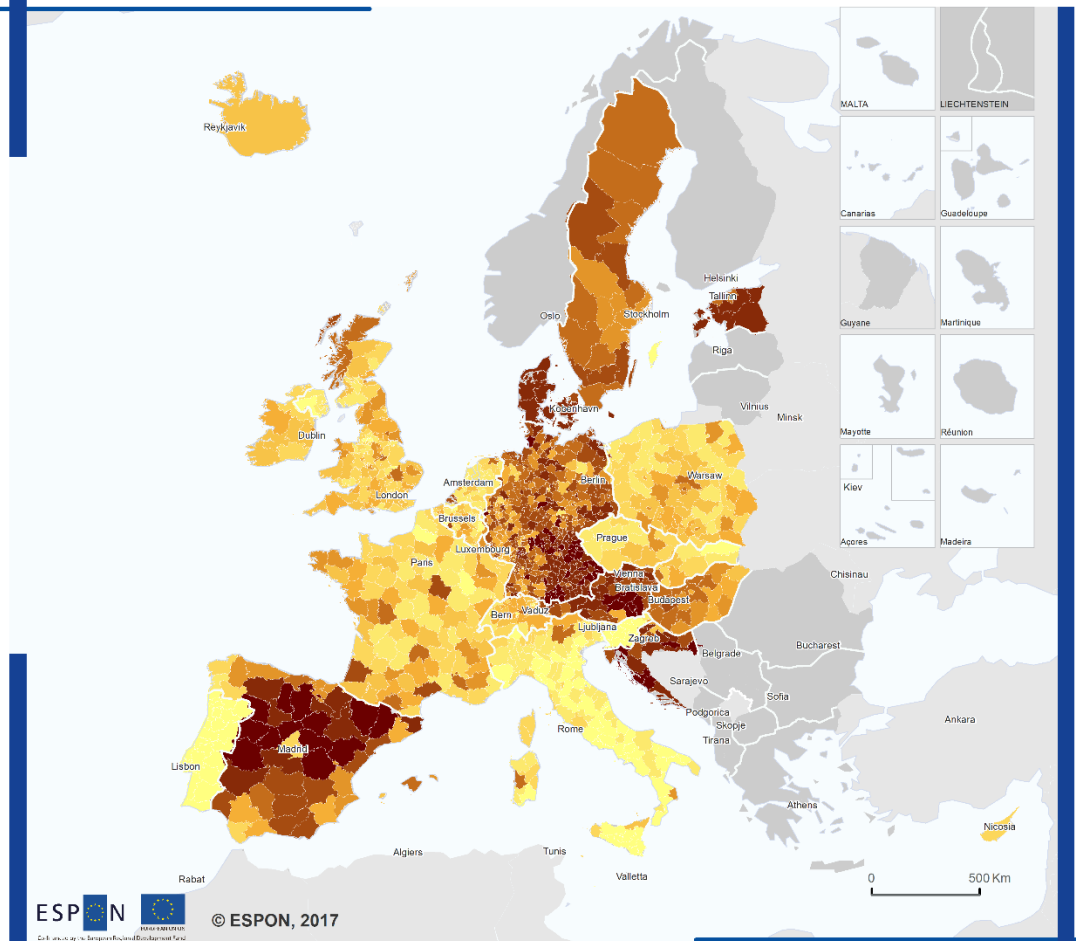
The following countries have been excluded  
 from analyses, because the OSM database  
 is too incomplete, and alternative data sources  
 providing complete address information for all  
 doctors have not been found so far:  
 AL, BG, EL, FI, KS, LT, LV, ME, MK, MT,  
 NO, RO, RS, TR.

**Doctors in OSM database:**

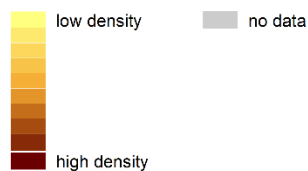
The OSM database seems quite incomplete as regards general doctors for some countries. Thus, despite all efforts to complement the OSM database by other data sources, the following countries have been excluded from analysis: Albania, Bulgaria, Finland, Kosovo, Lithuania, Latvia, Montenegro, Macedonia, Malta, Norway, Romania, Republic of Serbia, and Turkey.

Map 1.17: Density of doctors (GP - general practitioners) per inhabitant.

**Services-of-general interest (SGIs): Doctors**



**Density of doctors (general practitioners)  
(number of surgeries per inhabitant)**



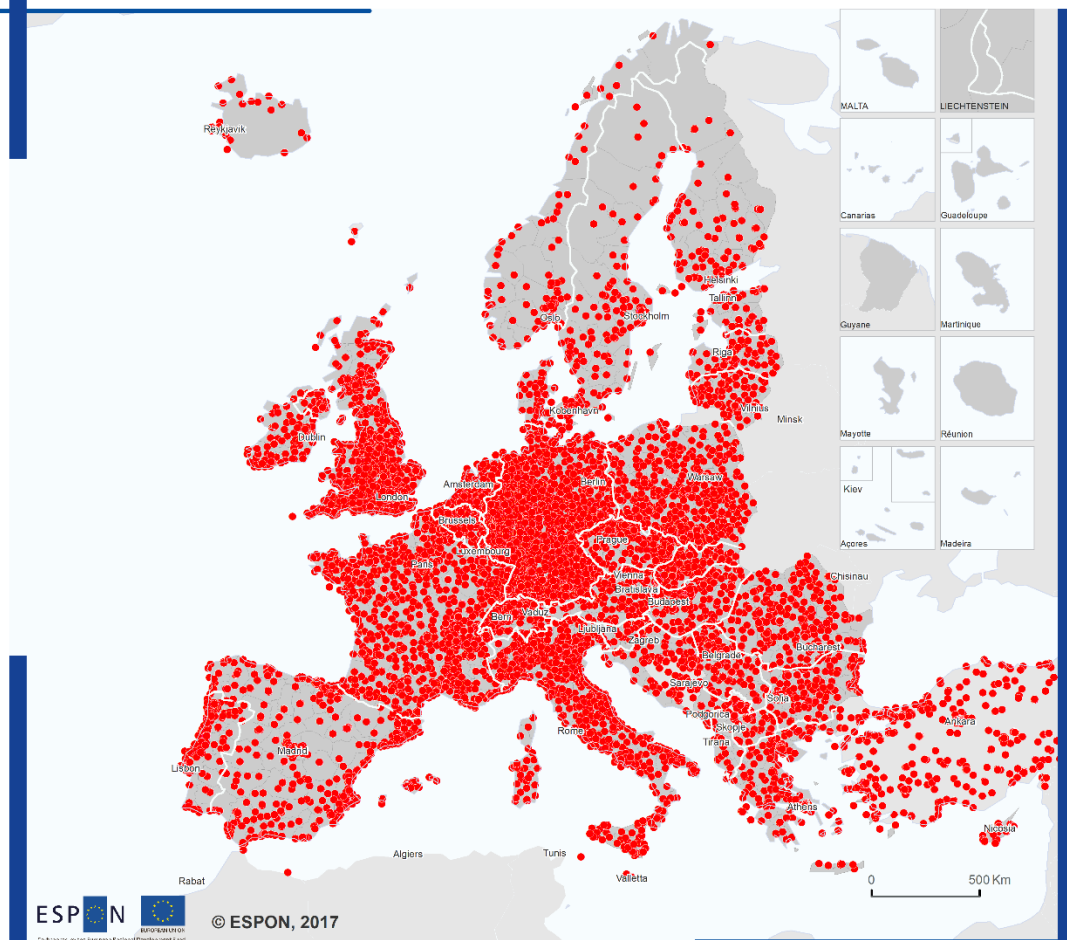
Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Hungarian  
 Ministry of Health, 2017; SNS - Serviço Nacional  
 de Saúde, 2017; Croatia Ministry of Health, 2017;  
 1177 Vardguiden (SE), 2017; Sundhed DK, 2017;  
 Eesti Haugekassa, 2017; Principality of  
 Liechtenstein, 2017; Ministry of Welfare Iceland,  
 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

The following countries have been excluded  
 from analyses, because the OSM database  
 is too incomplete, and alternative data sources  
 providing complete address information for all  
 doctors have not been found so far:  
 AL, BG, EL, FI, KS, LT, LV, ME, MK, MT,  
 NO, RO, RS, TR.

Map 1.18: Hospitals in Europe.

## Services-of-general interest (SGIs): Hospitals



### Hospitals in Europe

- Hospital

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016; Catalog of World Hospitals, 2011;  
 Croatian Health Insurance Fund, 2017; Eesti Haigekassa, 2012; HLMO, 2011;  
 Hospitals Worldwide, 2012; Institute for Economic & Social Reforms, 2012;  
 Italian Ministry of Health, 2010; Kurklinikverzeichniss, 2017; Lietuvos Medicina, 2012;  
 Ministerul Sănătății, 2017; Slovenian Ministry of Health, 2017; Ministry  
 of Welfare Iceland, 2016; STMAS, 2009; Wikipedia, 2012  
 CC - UMS RIATE for administrative boundaries

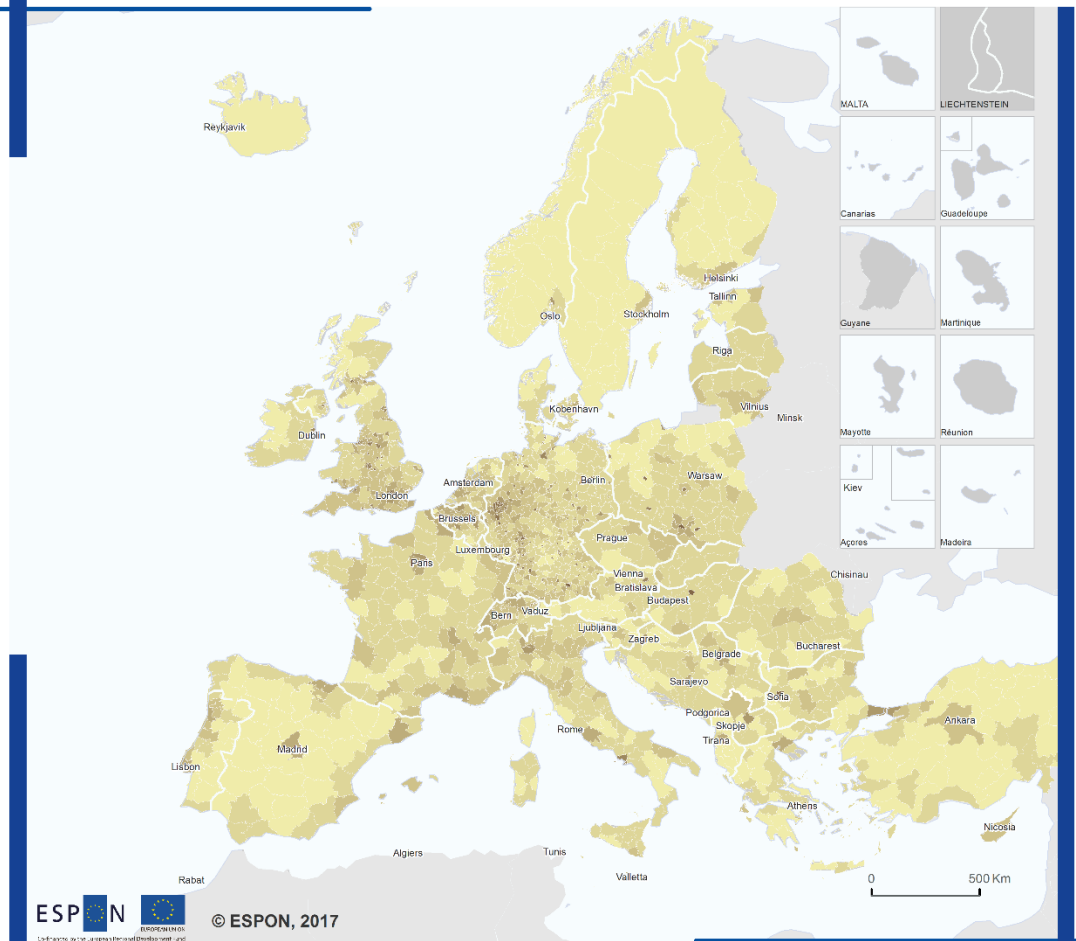
Note:  
 Outermost regions excluded from analysis.

### Type of hospitals:

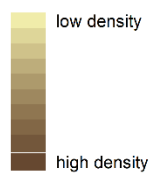
Focus was given on compiling a database of general hospitals. Specialized hospitals like hospices, wellness clinics, rehabilitation centres, sanatoriums etc. have been excluded. However, in case of doubt, a hospital remained in the dataset.

Map 1.19: Density of hospitals per sqkm.

**Services-of-general interest (SGIs): Hospitals**



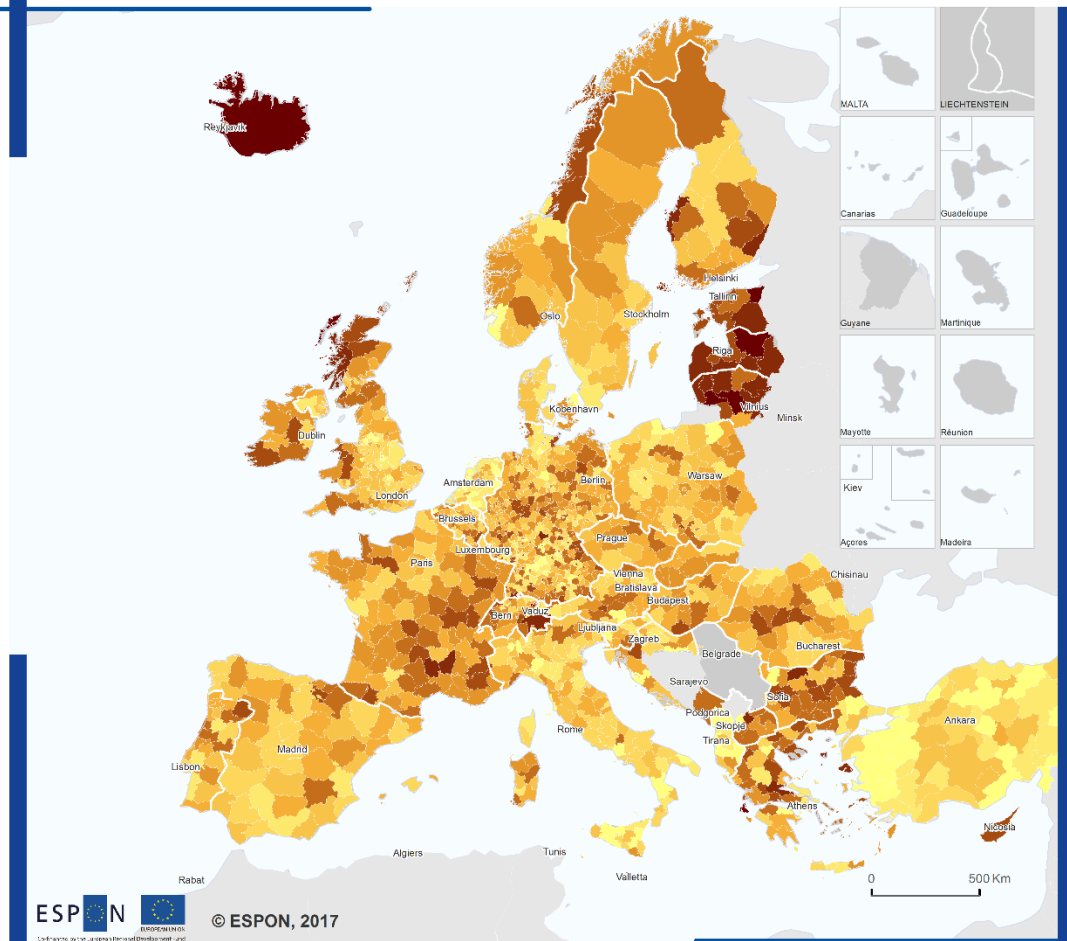
**Density of hospitals  
(number of facilities per sqkm)**



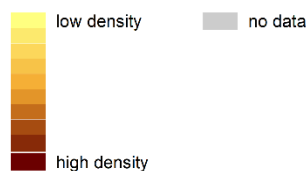
Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; ; Catalog of World Hospitals, 2011;  
 Croatian Health Insurance Fund, 2017; Eesti Haigekassa, 2012; HLMO, 2011;  
 Hospitals Worldwide, 2012; Institute for Economic & Social Reforms, 2012;  
 Italian Ministry of Health, 2010; KurKlinikverzeichnis, 2017; Lietuvos Medicina, 2012;  
 Ministerul Sănătății, 2017; Slovenian Ministry of Health, 2017;  
 STMAS, 2009; Wikipedia, 2012; Ministry of Welfare (Iceland,  
 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries  
 Note:  
 Outermost regions excluded from analysis.

Map 1.20: Density of hospitals per inhabitant.

**Services-of-general interest (SGIs): Hospitals**



**Density of hospitals  
(number of facilities per inhabitant)**



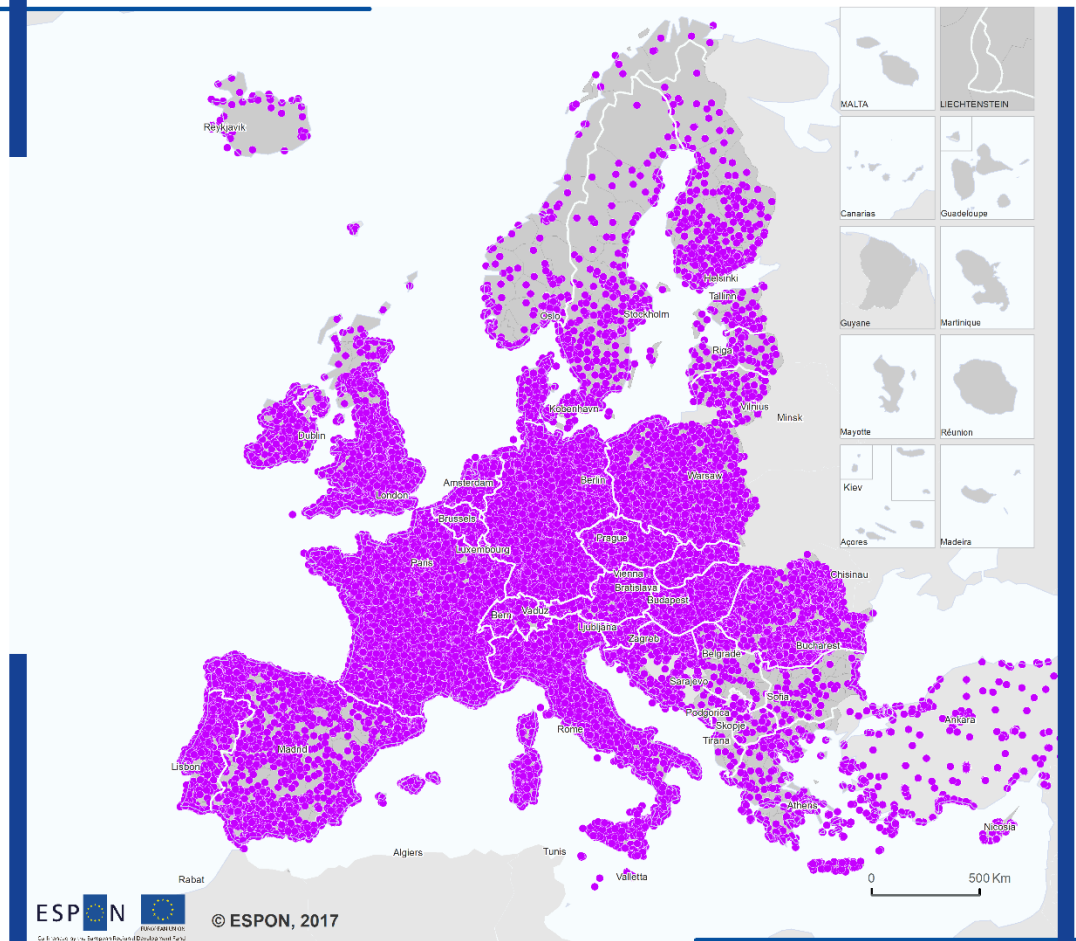
Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; ; Catalog of World Hospitals, 2011;  
 Croatian Health Insurance Fund, 2017; Eesti Haigekassa, 2012; HLMO, 2011;  
 Hospitals Worldwide, 2012; Institute for Economic & Social Reforms, 2012;  
 Italian Ministry of Health, 2010; Kurklinikverzeichnis, 2017; Lietuvos Medicina, 2012;  
 Ministerul Sănătății, 2017; Slovenian Ministry of Health, 2017;  
 STMAS, 2009; Wikipedia, 2012; Ministry of Welfare (Iceland),  
 2016

CC - UMS RIATE and RRG for  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.21: Pharmacies in Europe.

### Services-of-general interest (SGIs): Pharmacies



#### Pharmacies in Europe

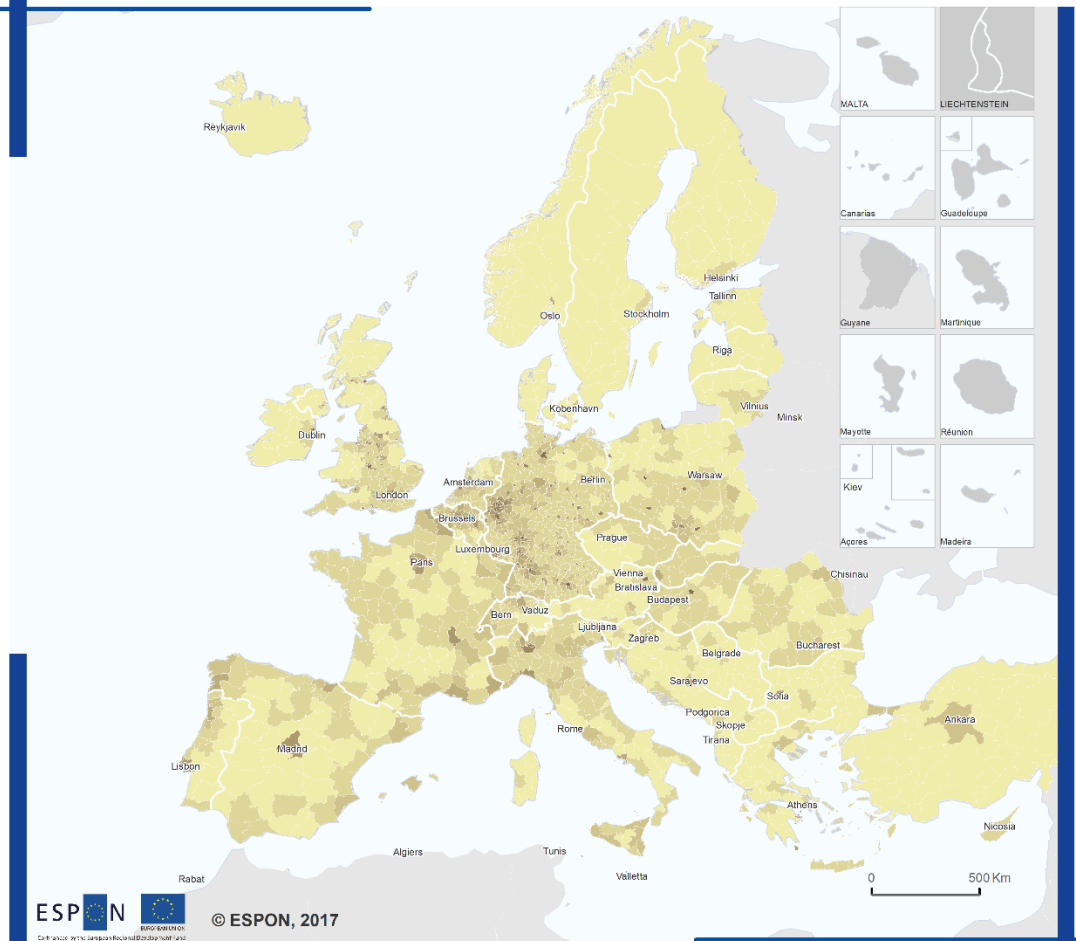
- Pharmacies

Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
OpenStreetMap (OSM), 2016;  
Croatia Health Insurance Fund, 2017;  
Icelandic Medicines Agency/lyfja.is, 2017  
CC - UMS RIATE for administrative boundaries

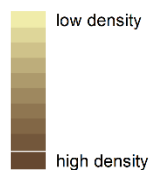
Note:  
Outermost regions excluded from analysis.

Map 1.22: Density of pharmacies per sqkm in Europe.

**Services-of-general interest (SGIs): Pharmacies**



**Density of pharmacies  
(number of facilities per sqkm)**



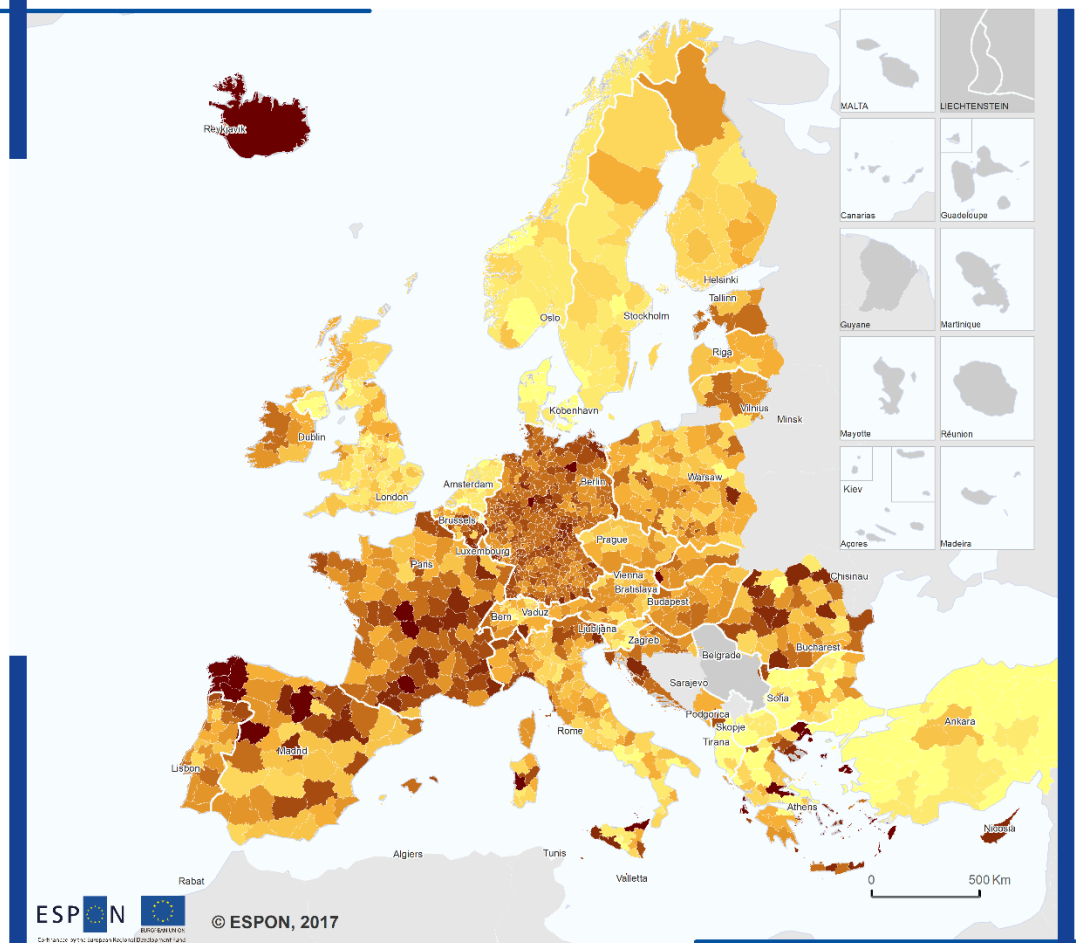
Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016;  
 Croatia Health Insurance Fund, 2017;  
 Icelandic Medicines Agency/lytja.is, 2017  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

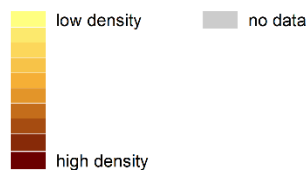


Map 1.23: Density of pharmacies per inhabitant in Europe.

**Services-of-general interest (SGIs): Pharmacies**



**Density of pharmacies  
(number of facilities per inhabitant)**

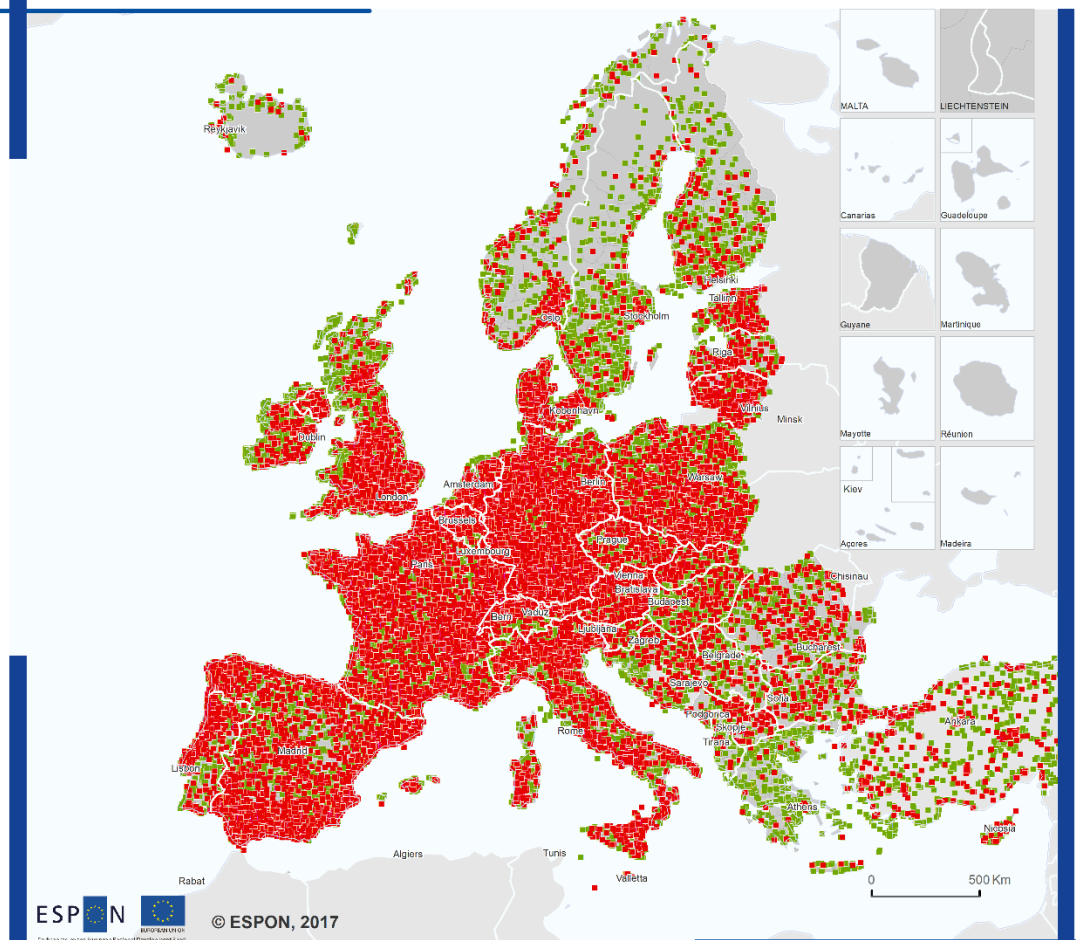


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016;  
 Croatia Health Insurance Fund, 2016;  
 Icelandic Medicines Agency/lyfy, 2017  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.24: Schools in Europe (primary and secondary education).

**Services-of-general-interest (SGIs): Schools**



**Primary and secondary schools in Europe**

- Primary school
- Secondary school

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016;  
 Registro Estatal de Centros Docentes No  
 Universitarios, 2017; Bulgarian Ministry of Education  
 and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE for administrative boundaries

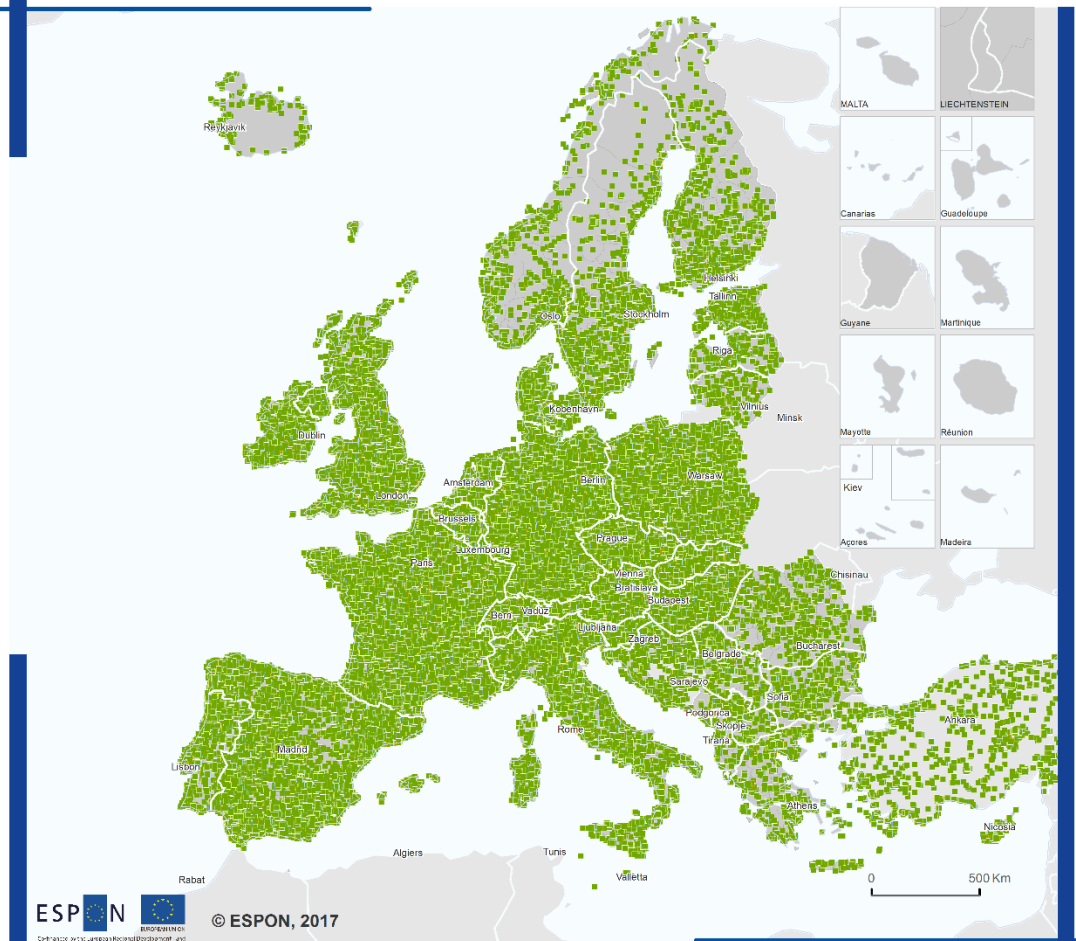
Note:  
 Outmost regions excluded from analysis.

**School types:**

Focus was given on compiling a database on primary and secondary schools. Pre-schools have not been considered.

Map 1.25: Primary schools in Europe.

### Services-of-general interest (SGIs): Primary schools



#### Primary schools in Europe

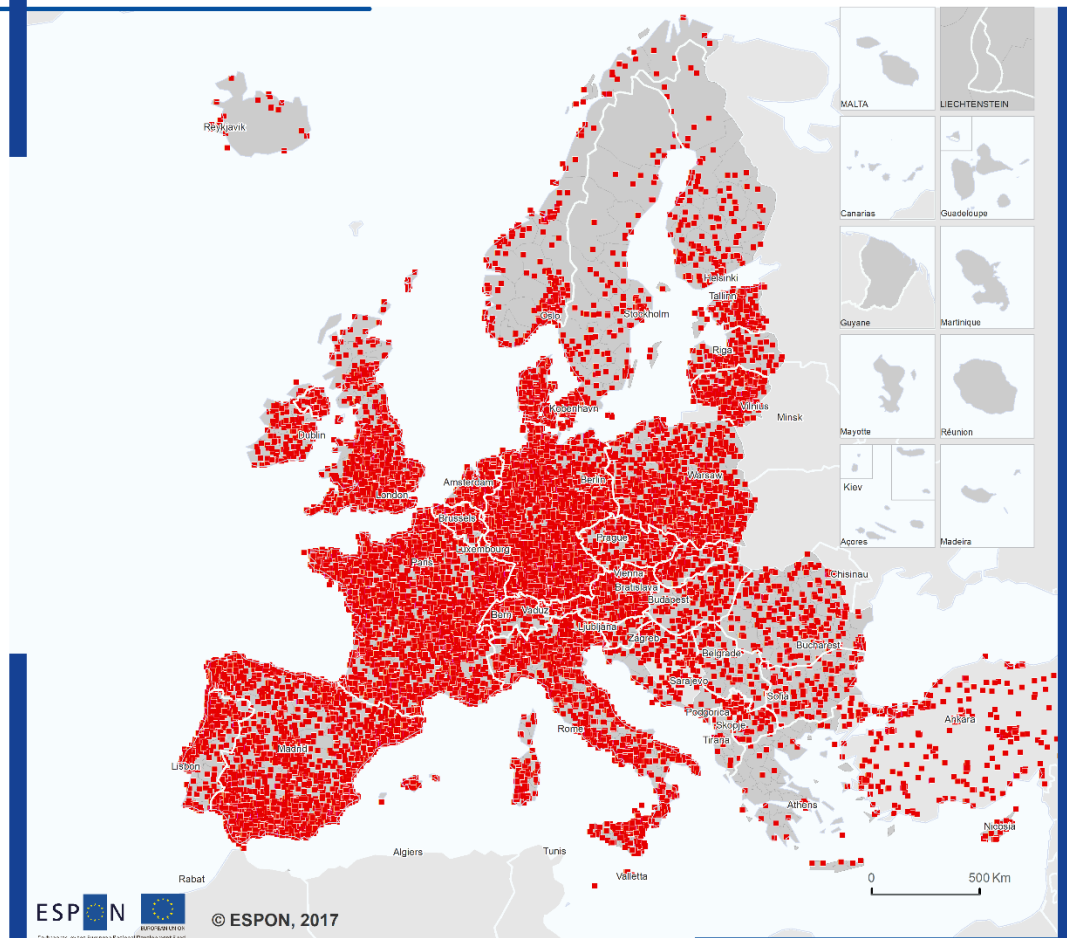
- Primary school

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016;  
 Registro Estatal de Centros Docentes No  
 Universitarios, 2017; Bulgarian Ministry of Education  
 and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.  
 Pre-schools are not included.

Map 1.26: Secondary schools in Europe.

**Services-of-general interest (SGIs): Secondary schools**



**Secondary schools in Europe**

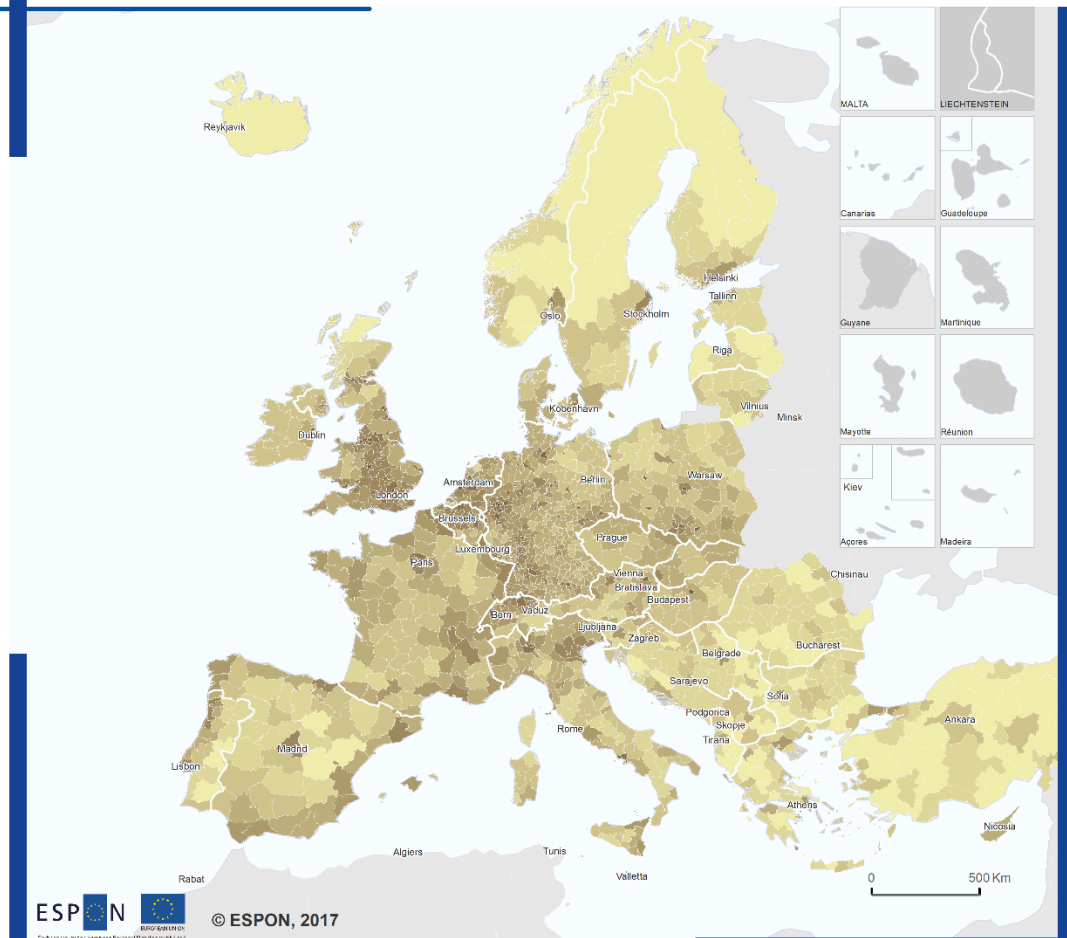
- Secondary school

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016;  
 Registro Estatal de Centros Docentes No  
 Universitarios, 2017; Bulgarian Ministry of Education  
 and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE for administrative boundaries

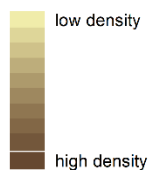
Note:  
 Outmost regions excluded from analysis.

Map 1.27: Density of primary and secondary schools per sqkm.

**Services-of-general interest (SGIs): Schools**



**Density of primary and secondary schools in Europe  
(number of schools per sqkm)**

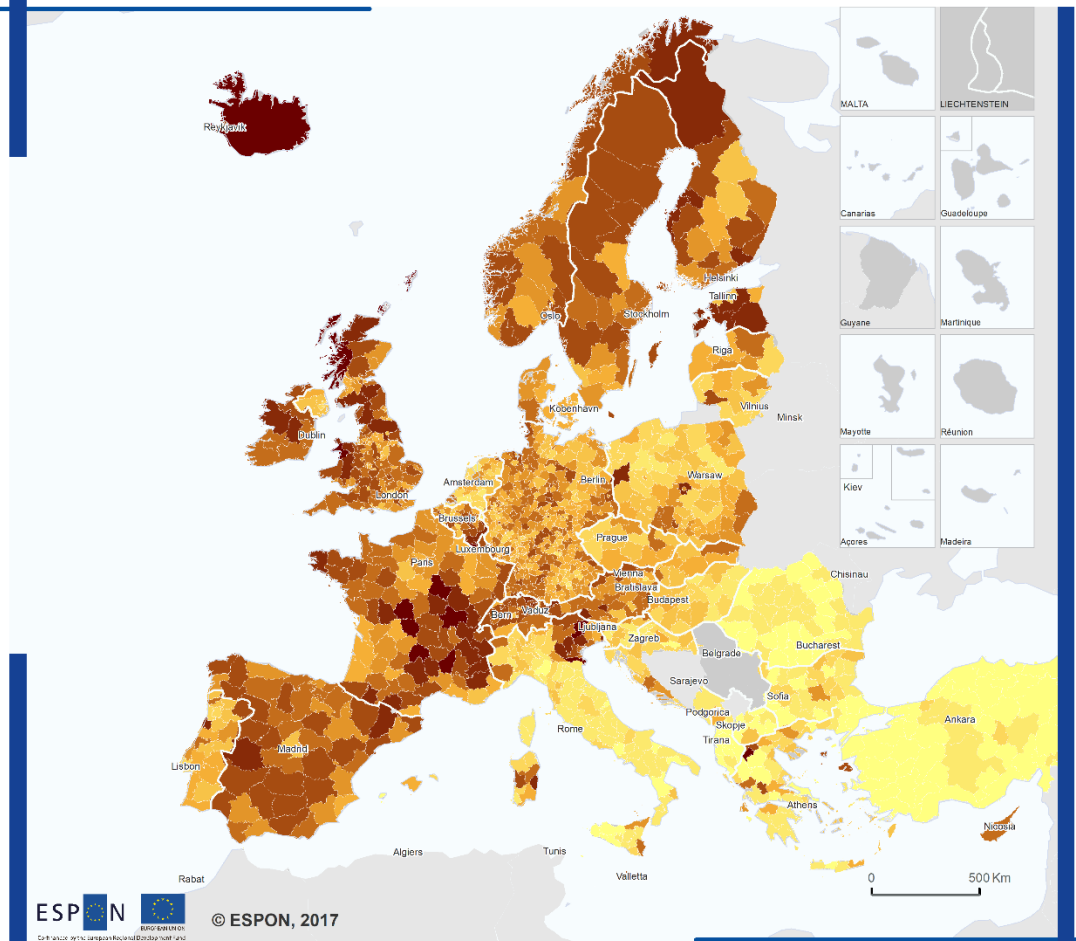


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Registro Estatal de Centros Docentes No  
 Universitarios, 2017; Bulgarian Ministry of Education  
 and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE and RRG for  
 administrative boundaries

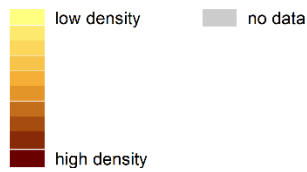
**Note:**  
 Outermost regions excluded from analysis.  
 Pre-schools not considered.

Map 1.28: Density of primary and secondary schools per inhabitant.

**Services-of-general interest (SGIs): Schools**



**Density of primary and secondary schools in Europe (number of schools per inhabitant)**

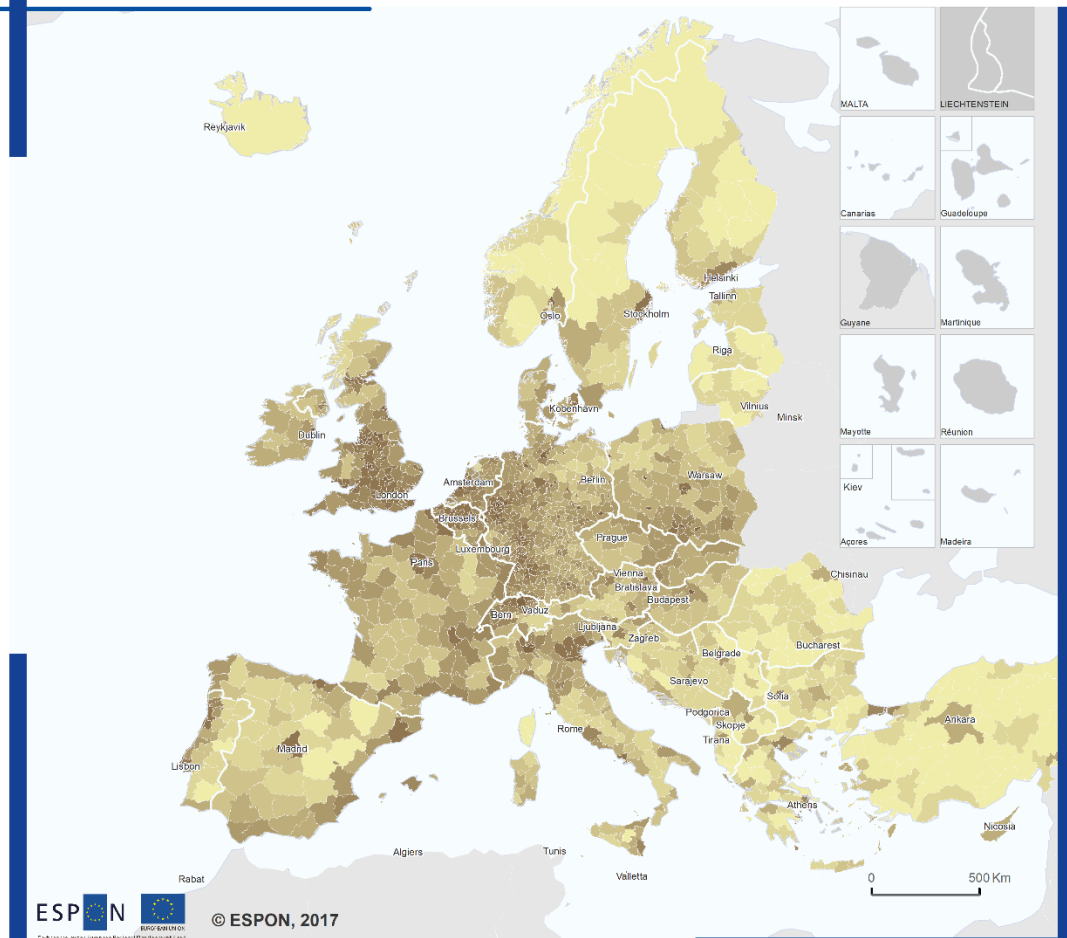


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Registro Estatal de Centros Docentes No  
 Universitarios, 2017; Bulgarian Ministry of Education  
 and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE and RRG for  
 administrative boundaries

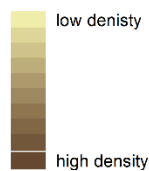
Note:  
 Outermost regions excluded from analysis.  
 Pre-schools not considered.

Map 1.29: Density of primary schools per sqkm.

**Services-of-general interest (SGIs): Schools**



**Density of primary schools in Europe  
(number of schools per sqkm)**

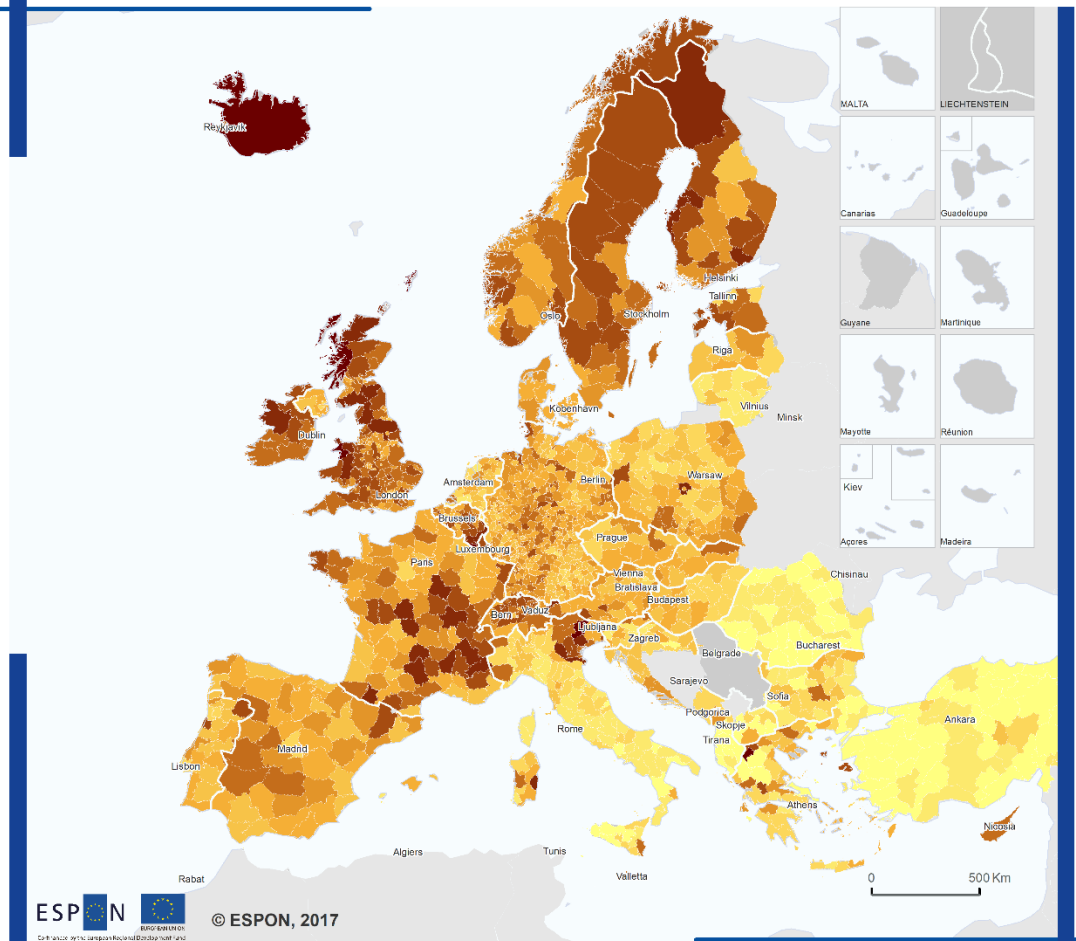


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Registro Estatal de  
 Centros Docentes No Universitarios, 2017; Bulgarian Ministry of  
 Education and Science, 2017; Government d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE and RRG for administrative boundaries

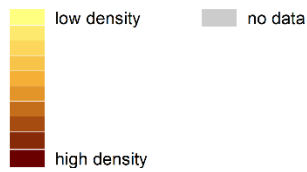
Note:  
 Outermost regions excluded from analysis.  
 Pre-schools not considered.

Map 1.30: Density of primary schools per inhabitant.

**Services-of-general interest (SGIs): Schools**



**Density of primary schools in Europe  
(number of schools per inhabitant)**



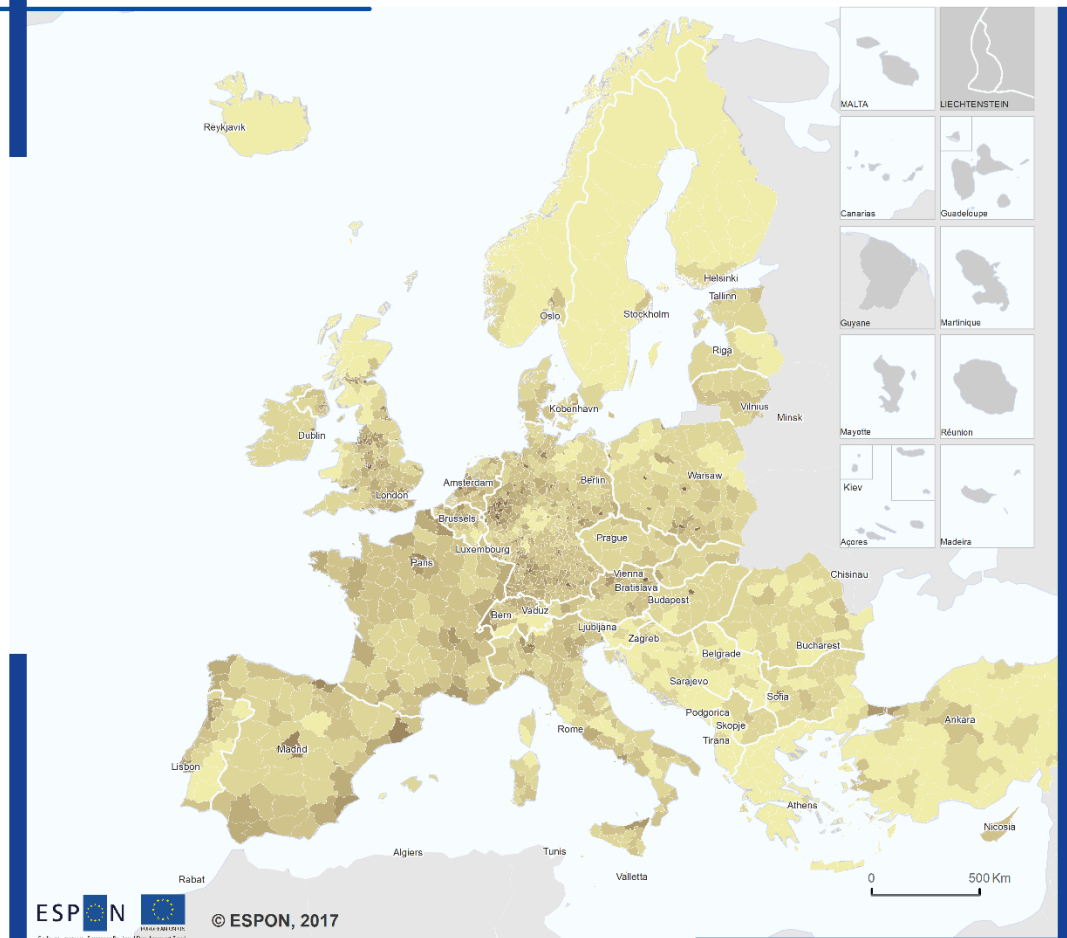
Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Registro Estatal de Centros  
 Docentes No Universitarios, 2017; Bulgarian Ministry of  
 Education and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE and RRG for administrative boundaries

Note:  
 Outermost regions excluded from analysis.  
 Pre-schools not considered.

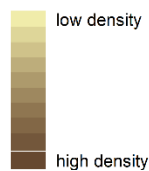


Map 1.31: Density of secondary schools per sqkm.

**Services-of-general interest (SGIs): Schools**



**Density of secondary schools in Europe  
(number of schools per sqkm)**

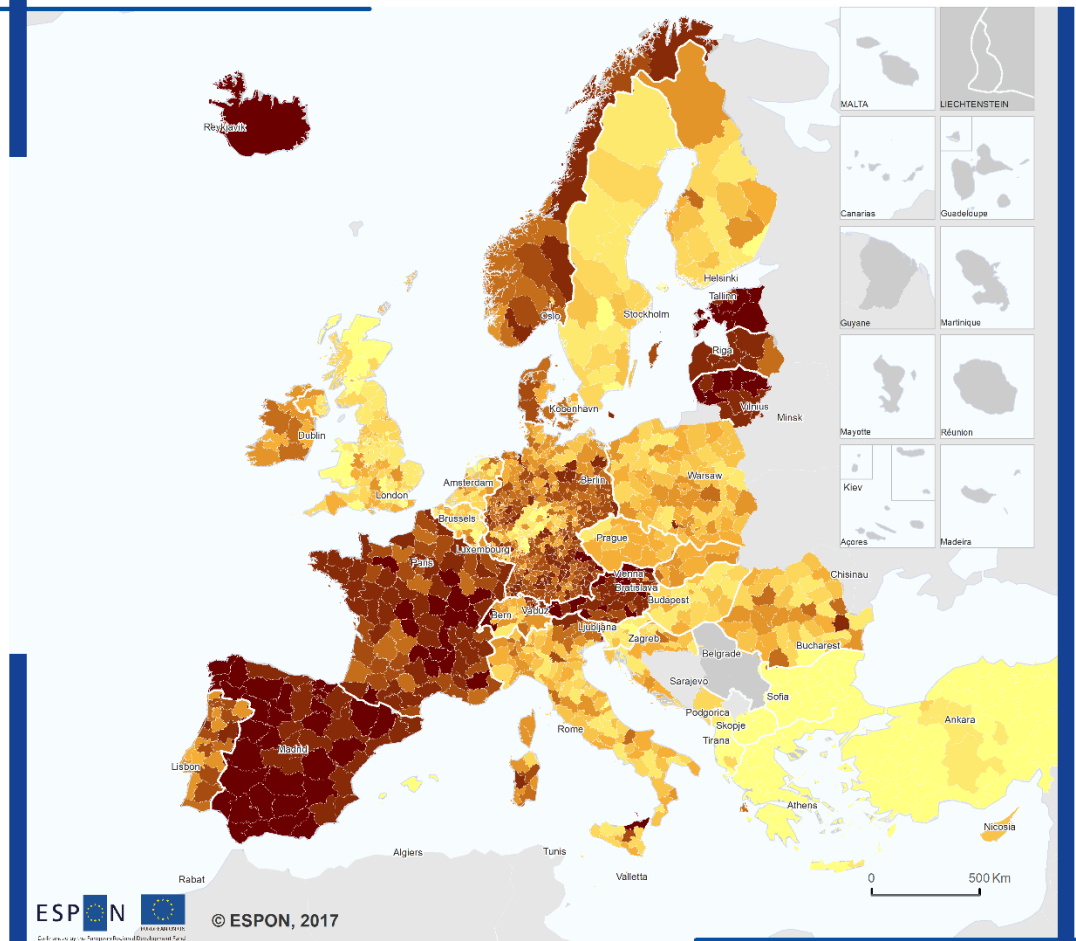


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Registro Estatal de Centros  
 Docentes No Universitarios, 2017; Bulgarian Ministry of  
 Education and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE and RRF for administrative boundaries

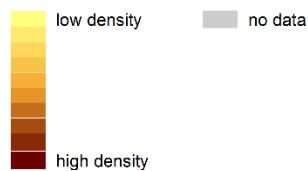
Note:  
 Outermost regions excluded from analysis.

Map 1.32: Density of secondary schools per inhabitant.

**Services-of-general interest (SGIs): Schools**



**Density of secondary schools in Europe  
(number of schools per inhabitant)**

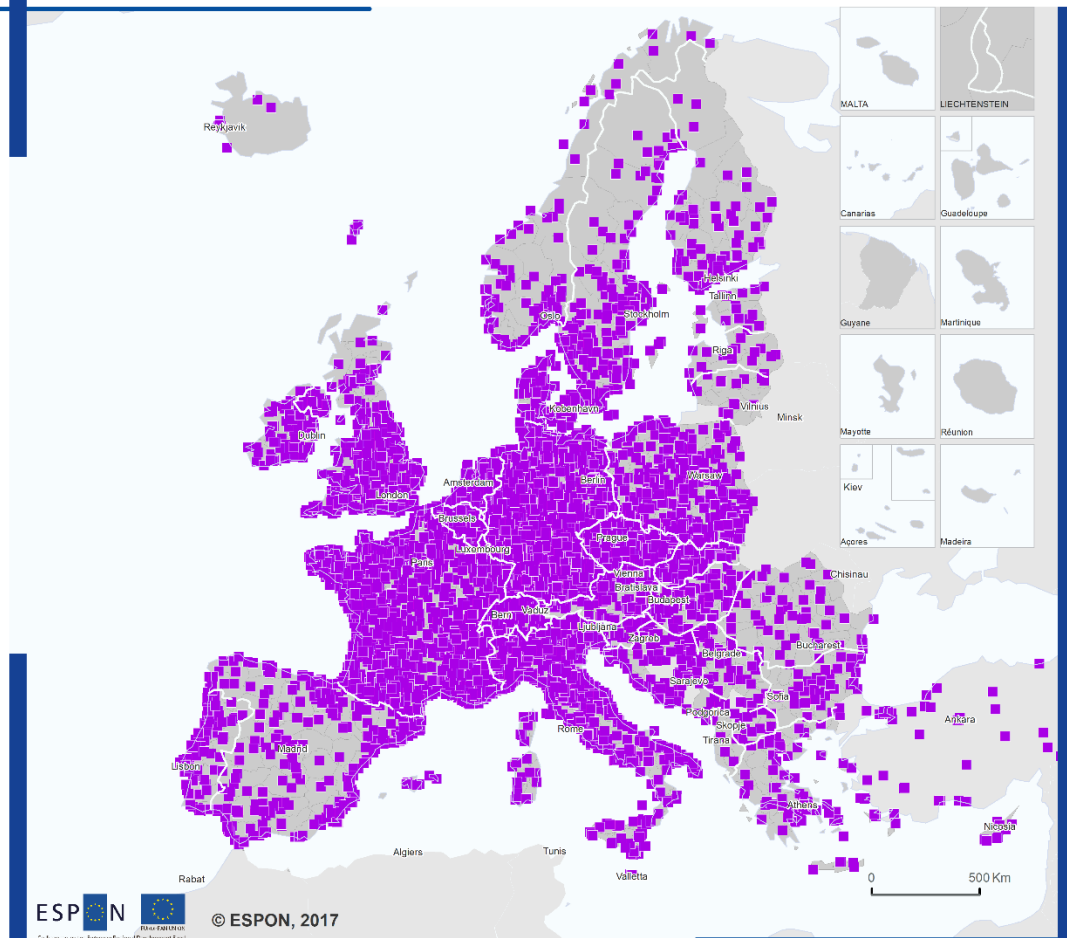


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016; Registro Estatal de Centros  
 Docentes No Universitarios, 2017; Bulgarian Ministry of  
 Education and Science, 2017; Govern d'Andorra - Educació,  
 2017; Government of Macedonia, 2017;  
 Euroguidance Österreich, 2017  
 CC - UMS RIATE and RRG for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.33: Cinemas in Europe.

### Services-of-general interest (SGIs): Cinemas



#### Cinemas in Europe

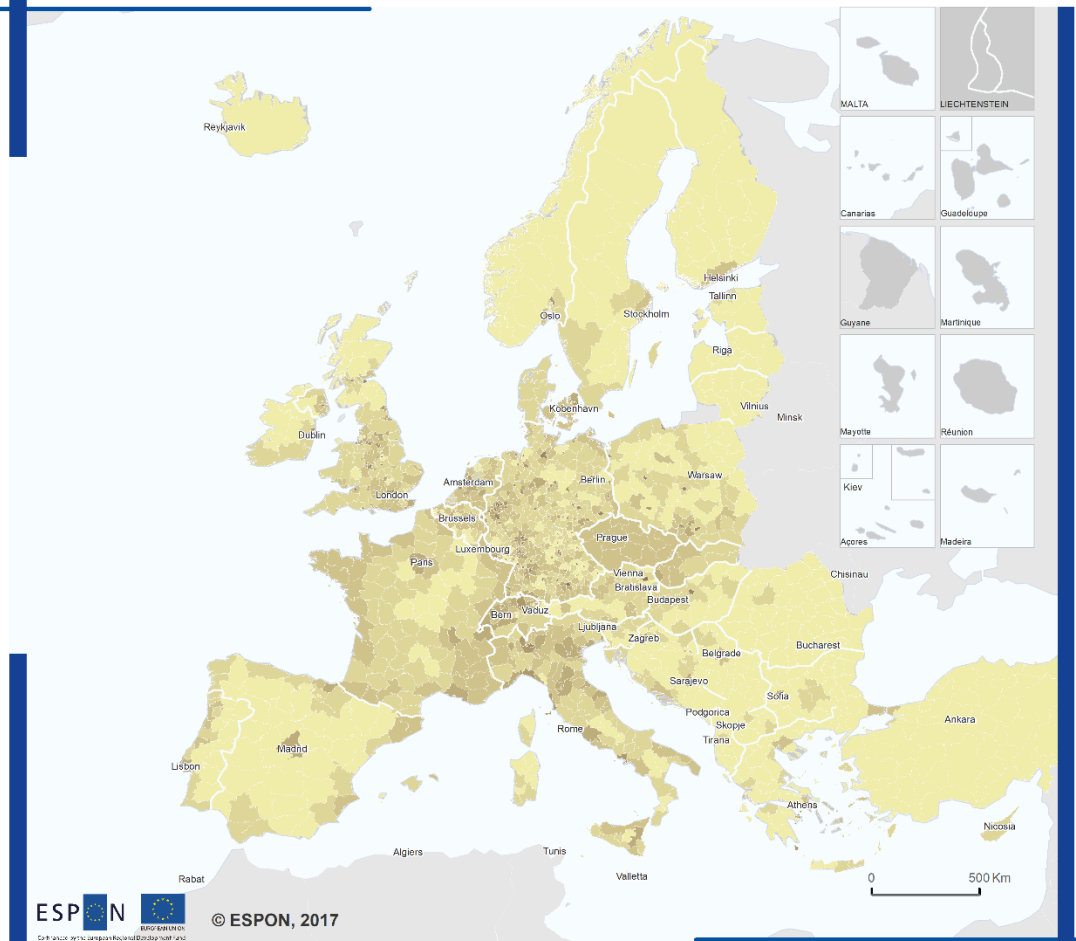
■ Cinema

Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
OpenStreetMap (OSM), 2016  
CC - UMS RIATE for administrative boundaries

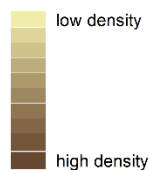
Note:  
Outermost regions excluded from analysis.

Map 1.34: Density of cinemas per sqkm.

**Services-of-general interest (SGIs): Cinemas**



**Density of cinemas  
(number of facilities per sqkm)**

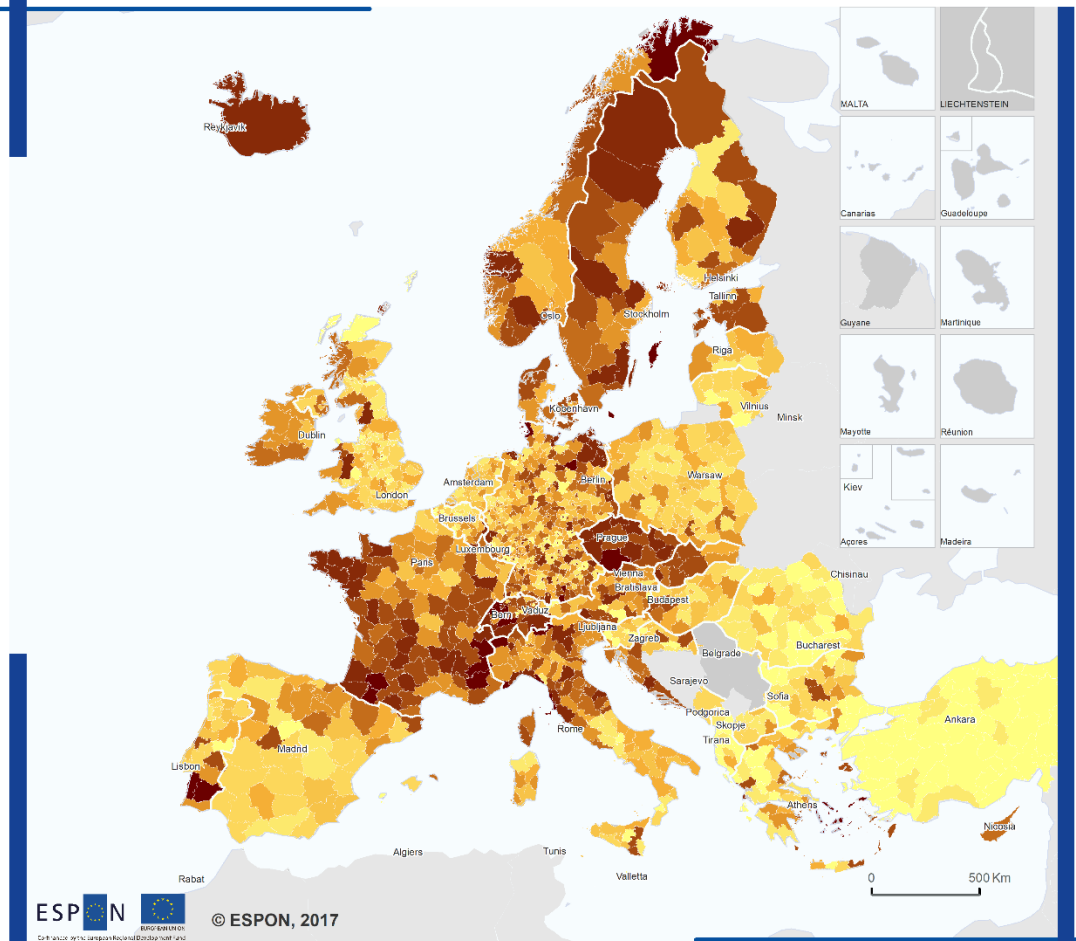


Levwl: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

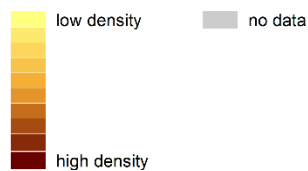
Note:  
 Outermost regions excluded from analysis.

Map 1.35: Density of cinemas per inhabitant.

**Services-of-general interest (SGIs): Cinemas**



**Density of cinemas  
(number of facilities per inhabitant)**

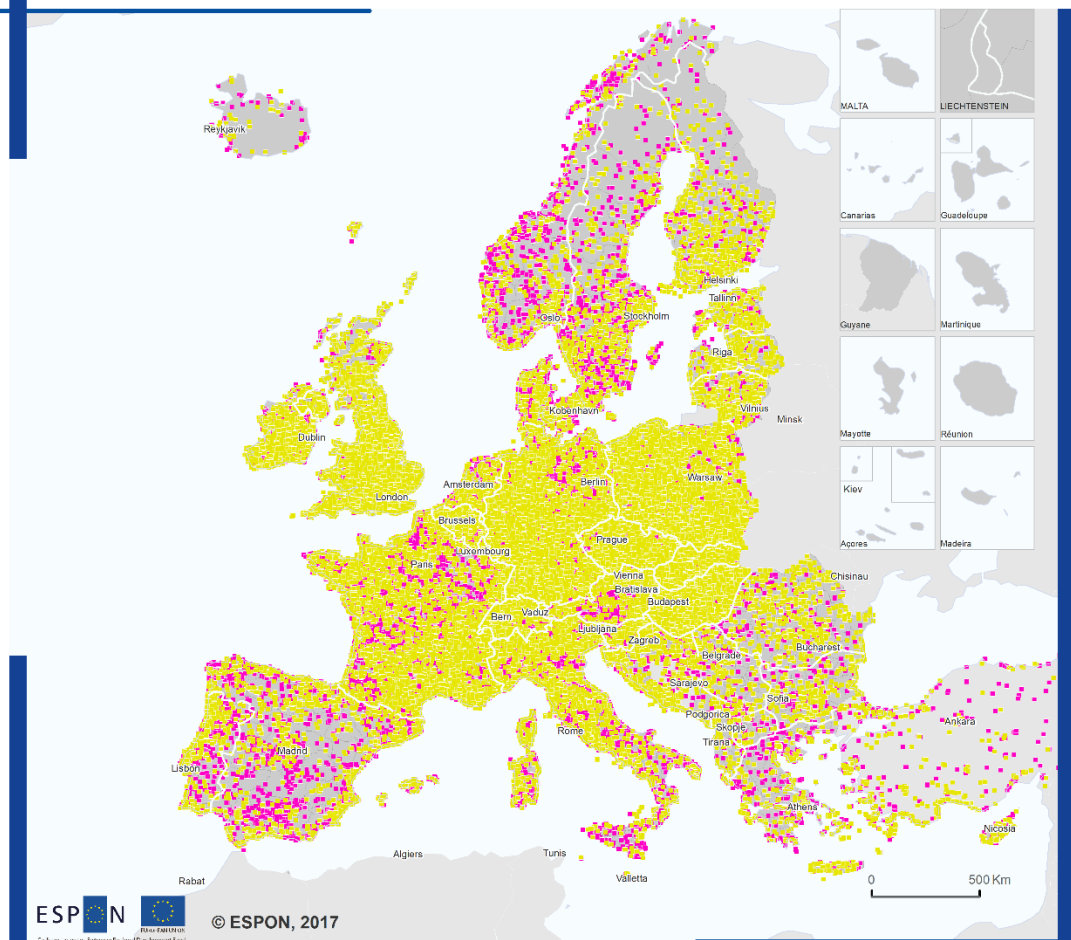


Levwl: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.36: Supermarkets and convenient stores in Europe.

## Services-of-general interest (SGIs): Retailing



### Supermarkets and convenient stores in Europe

- Convenient store
- Supermarket

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

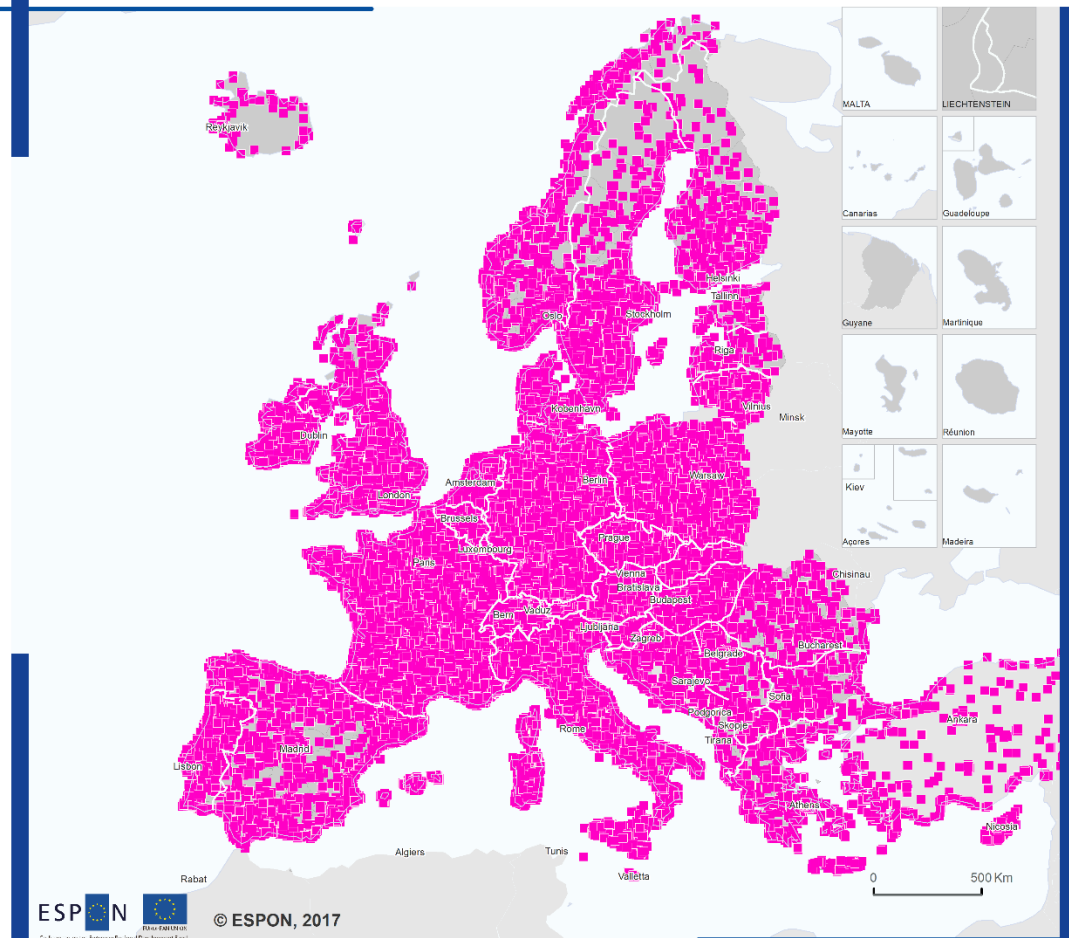
### Types of retail facilities:

Data on both supermarkets and convenient stores have been collected from OSM; from the point of view of daily goods supply, both are deemed relevant. In some countries, convenient stores have a larger share (like Poland, Baltic States), in other countries (e.g. Spain, Italy) supermarkets are the dominant shop type. Sometimes, however, the distinction between convenient stores and supermarkets is not clear from the OSM database.

Shopping malls, however, have been excluded because this type of retail facility usually is not meant for daily supply of goods, but for medium to long-term supply, and usually can only be found in larger cities.

Map 1.37: Supermarkets in Europe.

**Services-of-general interest (SGIs): Retailing**



**Supermarkets in Europe**

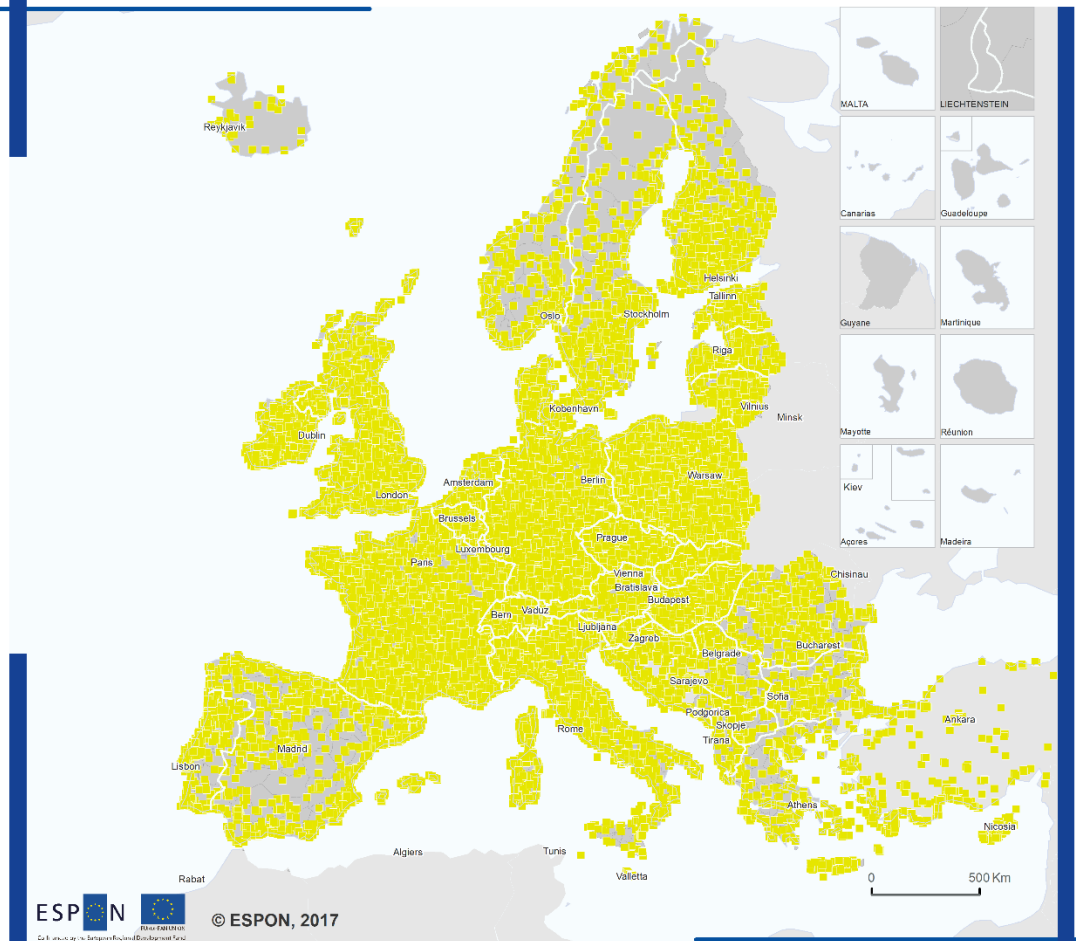
- Supermarket

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.38: Convenient stores in Europe.

**Services-of-general interest (SGIs): Retailing**



**Convenient stores in Europe**

- Convenient store

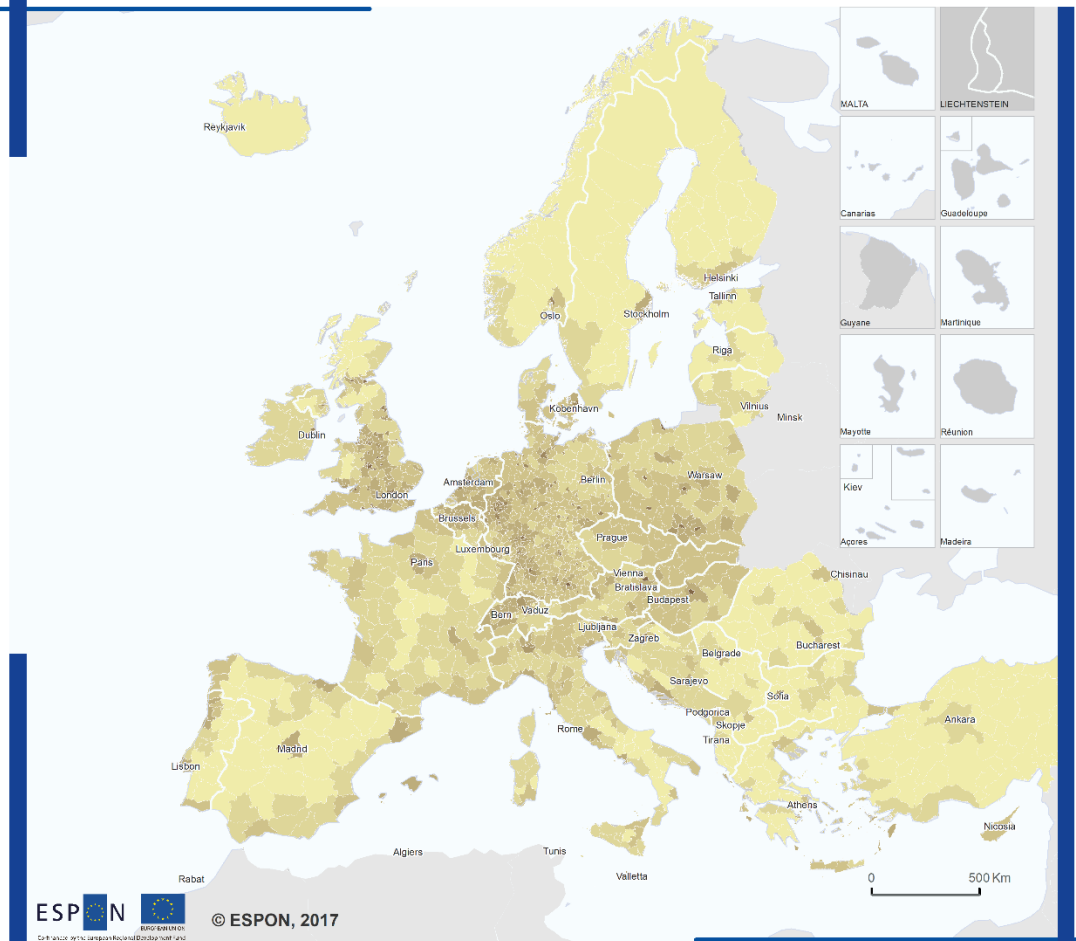
Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE for administrative boundaries

Note:  
 Outermost regions excluded from analysis.

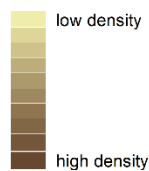


Map 1.39: Density of retail facilities (combined supermarkets and convenient stores) per sqkm.

**Services-of-general interest (SGIs): Retailing**



**Density of supermarkets and convenient stores  
(number of stores per sqkm)**

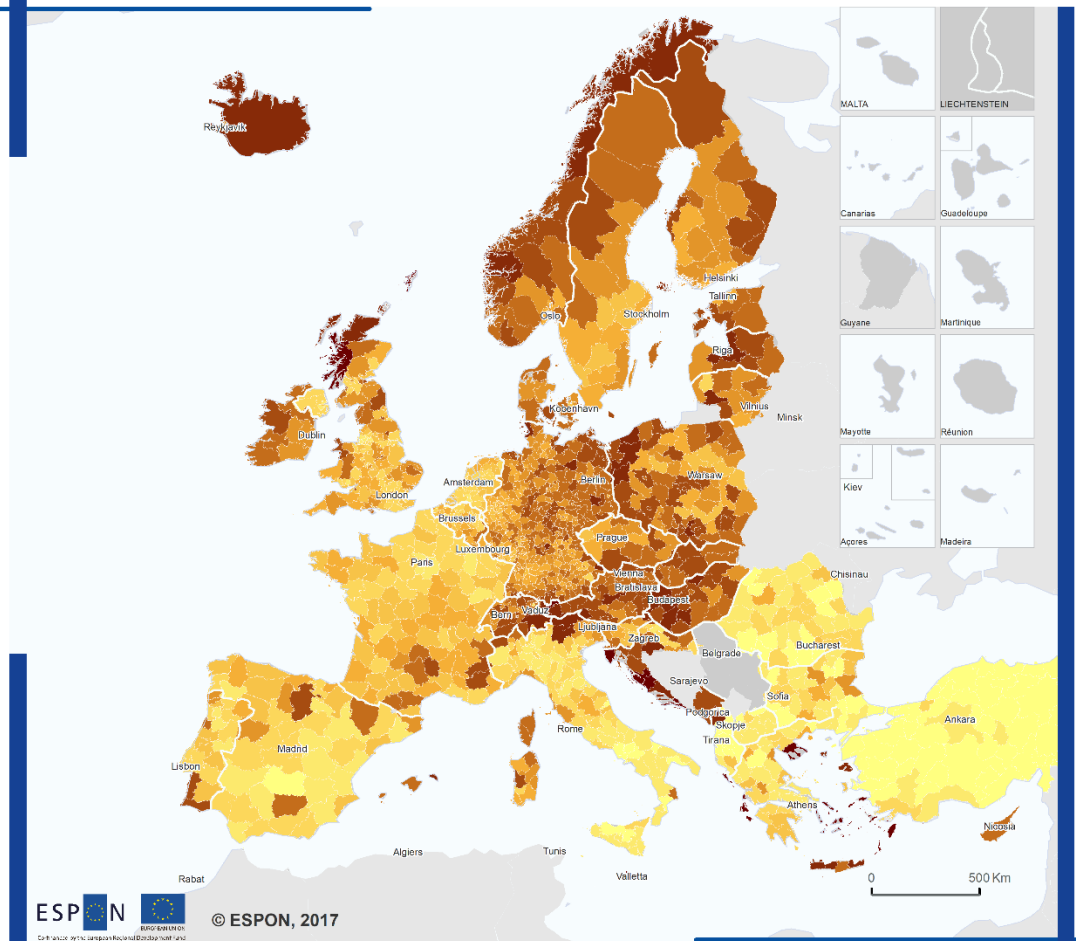


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
own calculation based upon  
OpenStreetMap (OSM), 2016  
CC - UMS RIATE and RRG for  
administrative boundaries

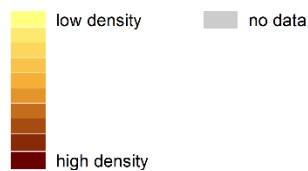
Note:  
Outermost regions excluded from analysis.

Map 1.40: Density of retail facilities (combined supermarkets and convenient stores) per inhabitant.

**Services-of-general interest (SGIs): Retailing**



**Density of supermarkets and convenient stores  
(number of stores per inhabitant)**

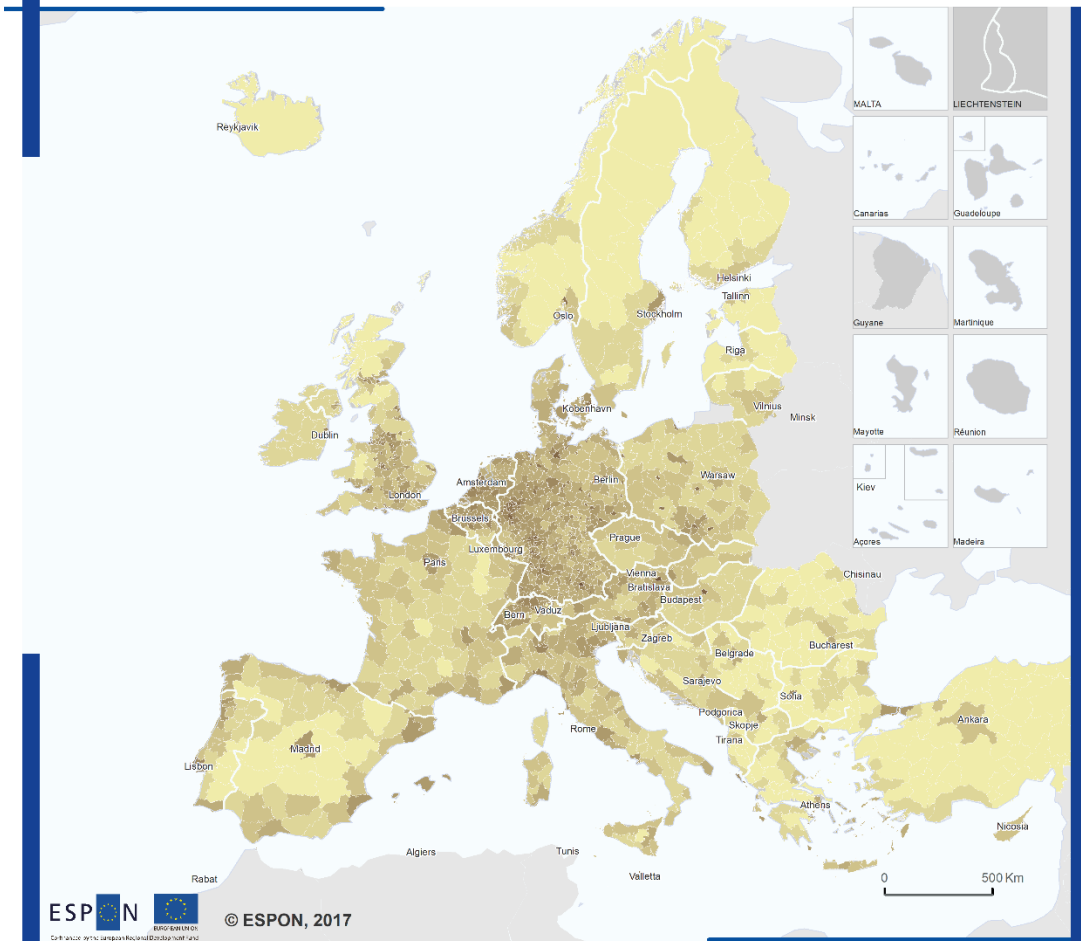


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
own calculation based upon  
OpenStreetMap (OSM), 2016  
CC - UMS RIATE and RRG for  
administrative boundaries

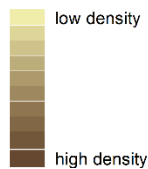
Note:  
Outermost regions excluded from analysis.

Map 1.41: Density of supermarkets per sqkm.

**Services-of-general interest (SGIs): Retailing**



**Density of supermarkets  
(number of markets per sqkm)**

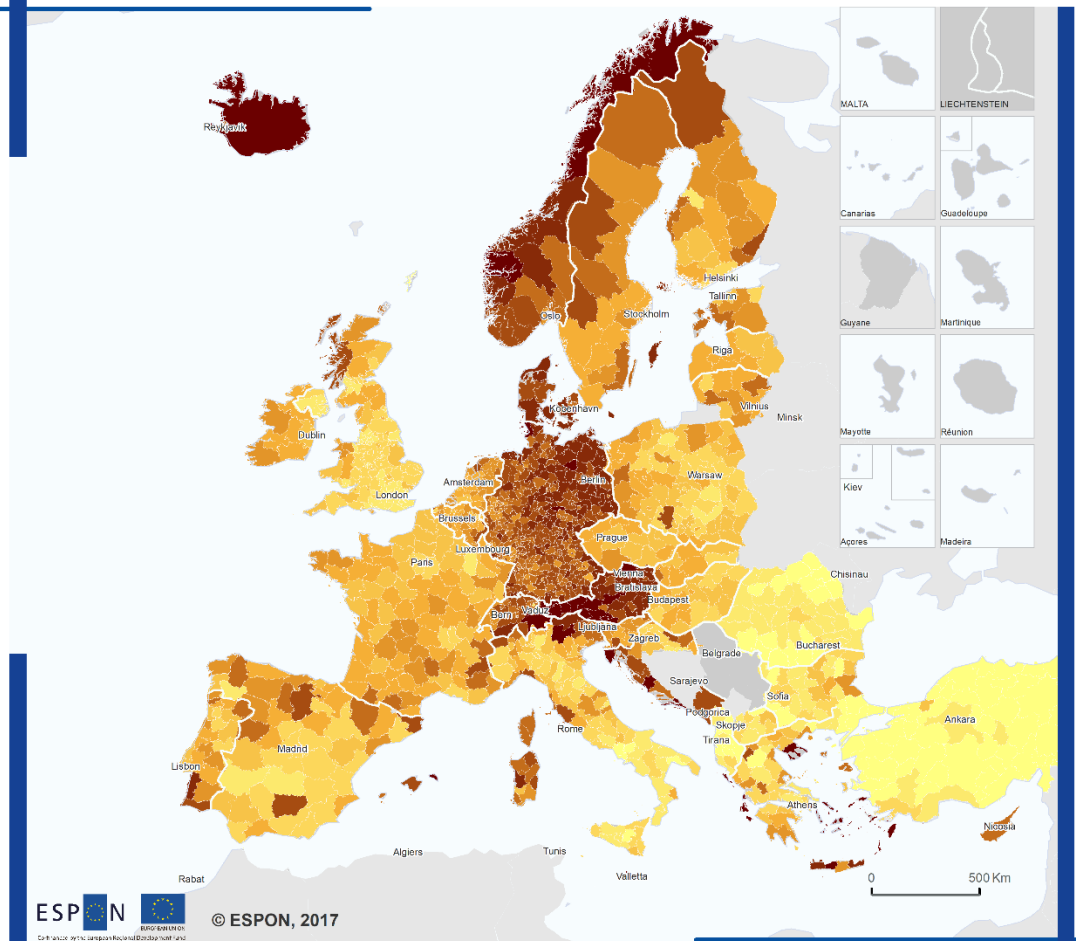


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

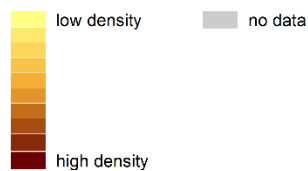
Note:  
 Outermost regions excluded from analysis.

Map 1.42: Density of supermarkets per inhabitant.

**Services-of-general-interest (SGIs): Retailing**



**Density of supermarkets  
(number of markets per inhabitants)**

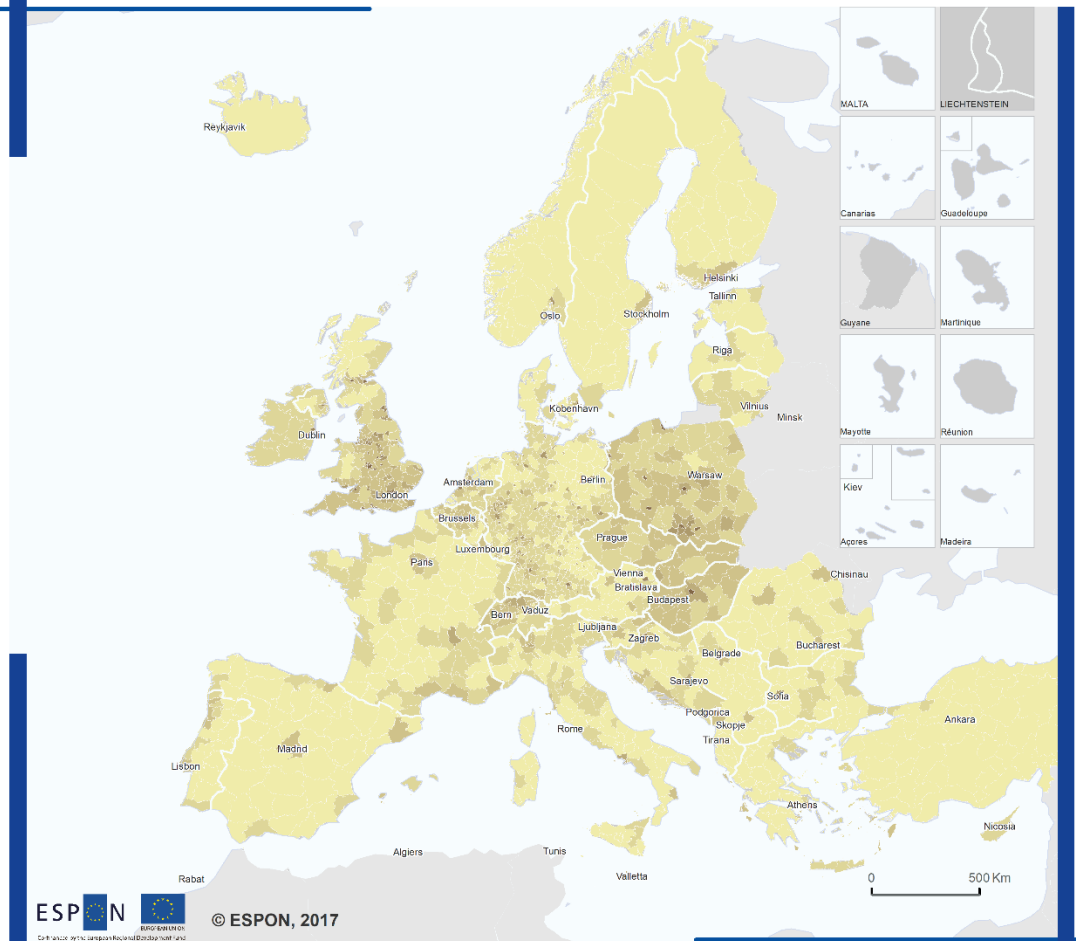


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

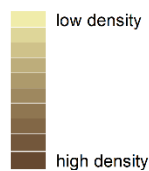
Note:  
 Outermost regions excluded from analysis.

Map 1.43: Density of convenient stores per sqkm

**Services-of-general interest (SGIs): Retailing**



**Density of convenient stores  
(number of stores per sqkm)**

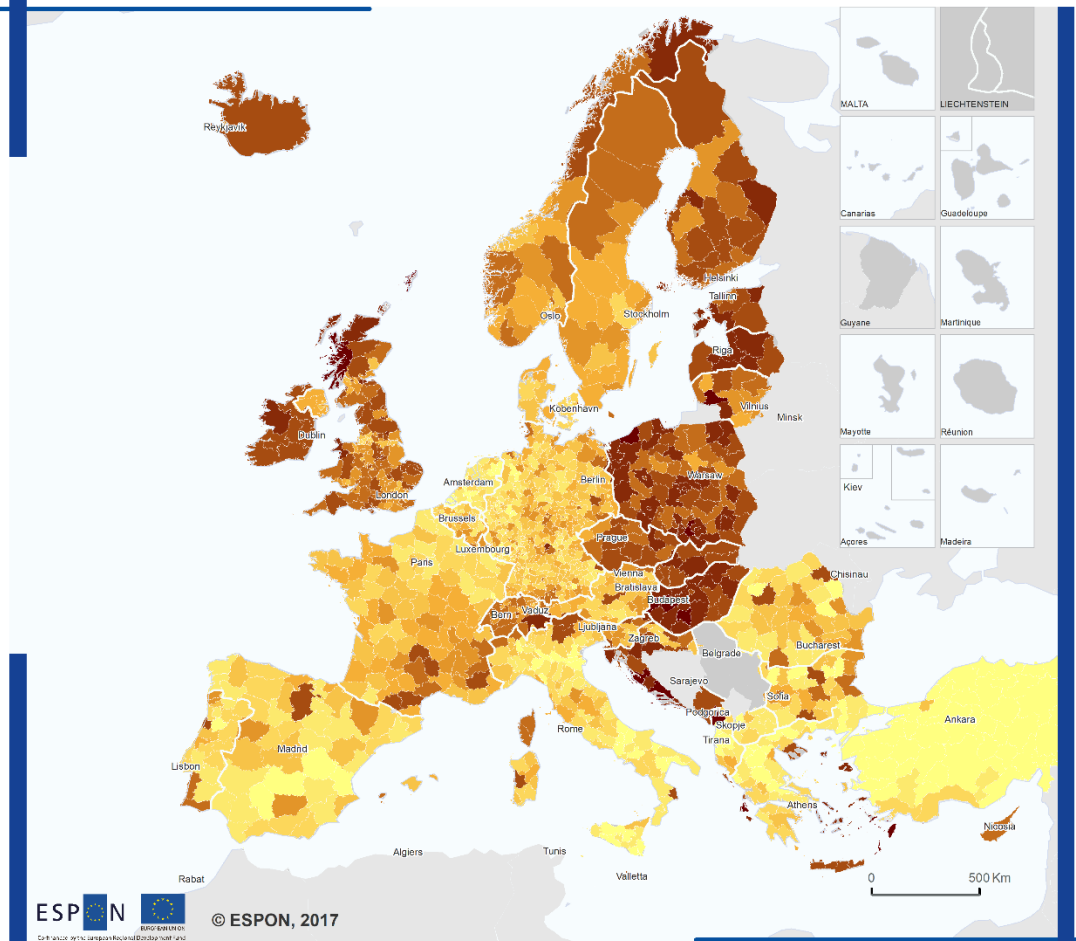


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
own calculation based upon  
OpenStreetMap (OSM), 2016  
CC - UMS RIATE and RRG for  
administrative boundaries

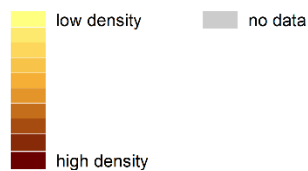
Note:  
Outermost regions excluded from analysis.

Map 1.44: Density of convenient stores per inhabitant.

**Services-of-general interest (SGIs): Retailing**



**Density of convenient stores  
(number of stores per inhabitant)**

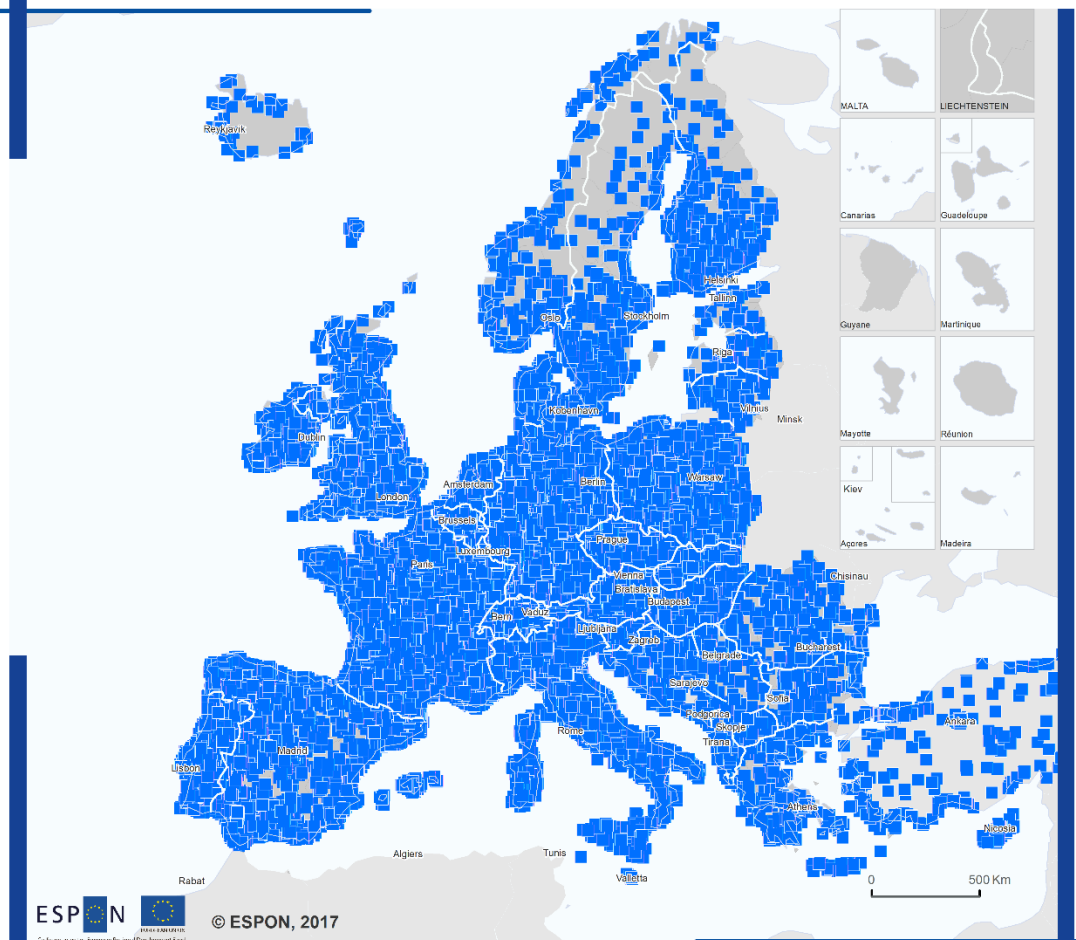


Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
own calculation based upon  
OpenStreetMap (OSM), 2016  
CC - UMS RIATE and RRG for  
administrative boundaries

Note:  
Outermost regions excluded from analysis.

Map 1.45: Bank offices in Europe.

### Services-of-general interest (SGIs): Banks



#### Bank offices in Europe

- Banks

Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE for administrative boundaries

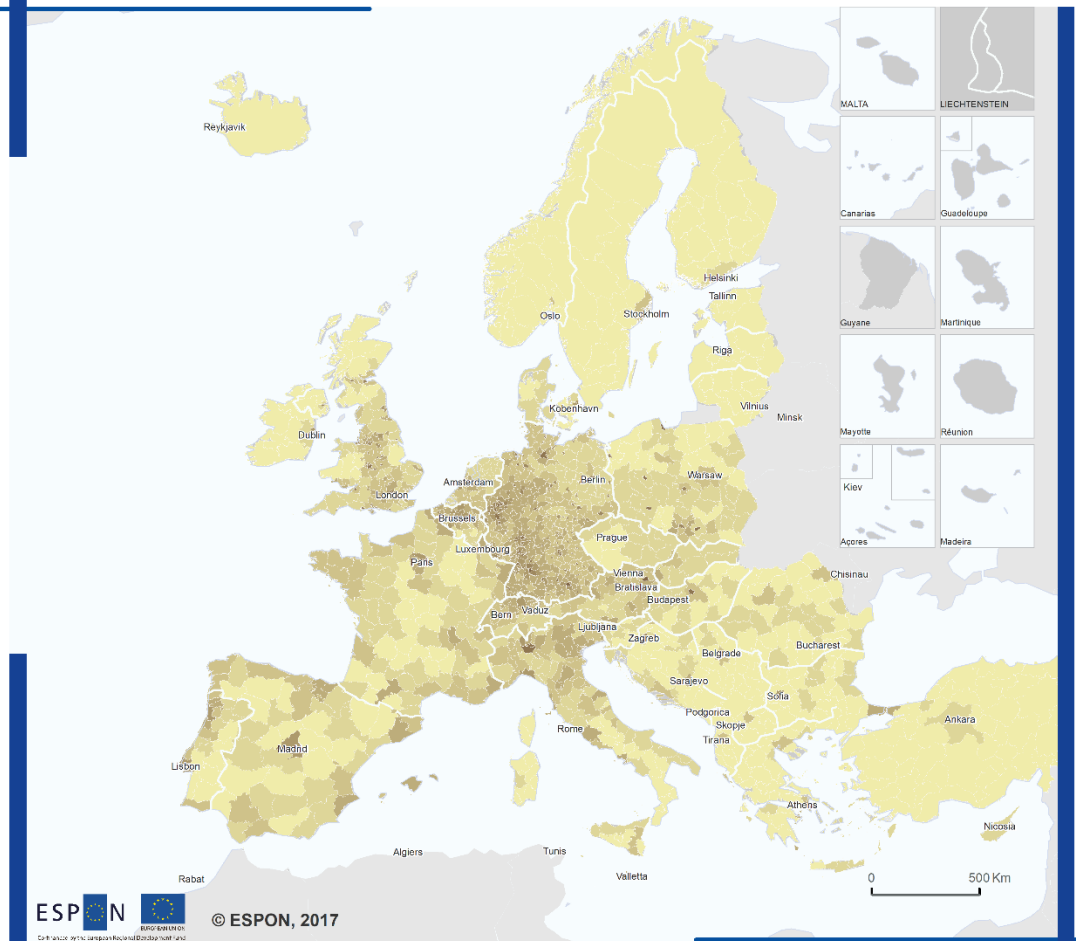
Note:  
 Outermost regions excluded from analysis.  
 Only bank offices considered; cash machines excluded.

#### Bank offices and cash machines:

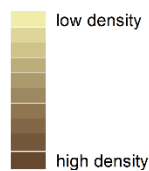
The compiled dataset covers bank offices only; locations of cash machines were excluded.

Map 1.46: Density of bank offices per sqkm.

**Services-of-general interest (SGIs): Banks**



**Density of bank offices  
(number of offices per sqkm)**



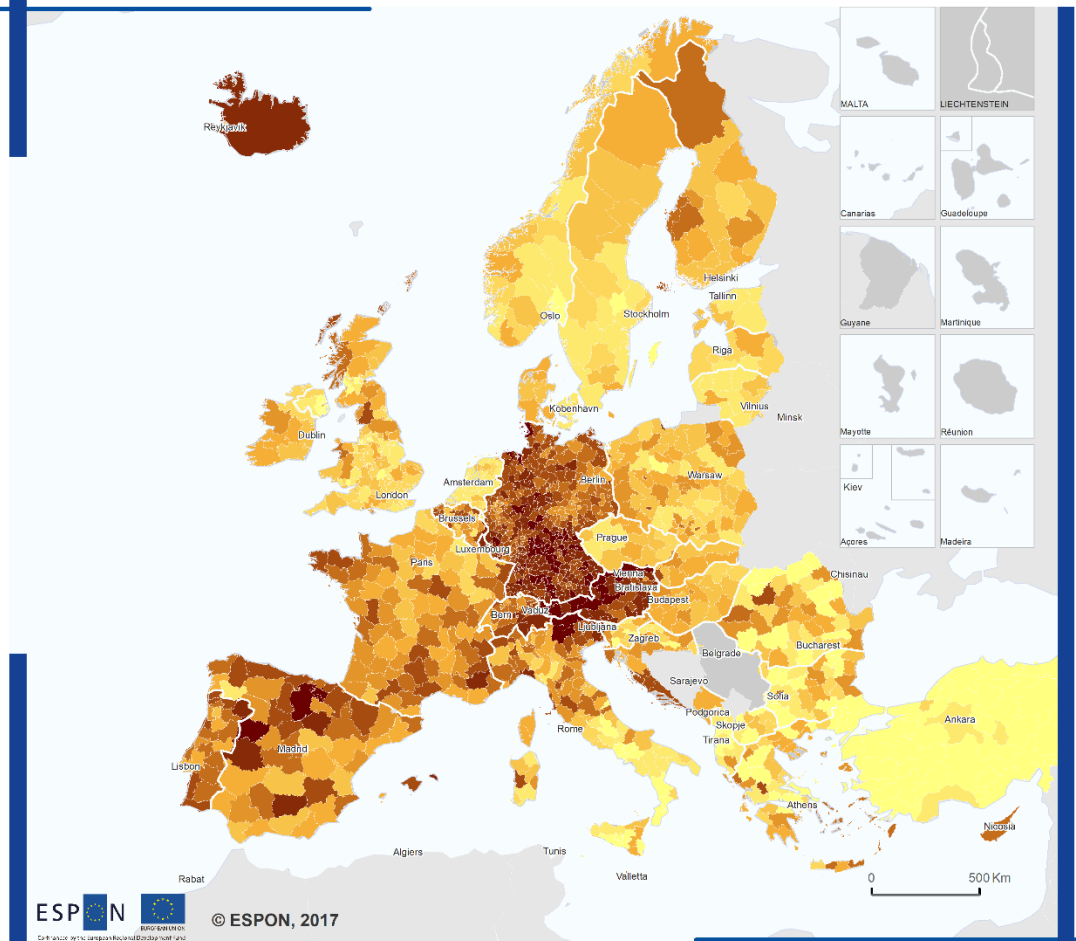
Level: NUTS-3 (2013)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
own calculation based upon  
OpenStreetMap (OSM), 2016  
CC - UMS RIATE and RRG for  
administrative boundaries

Note:  
Outermost regions excluded from analysis.  
Only bank offices considered; cash machines  
were excluded.

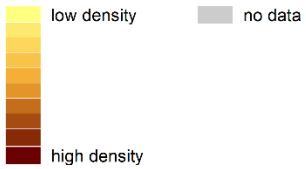


Map 1.47: Density of bank offices per inhabitant.

**Services-of-general interest (SGIs): Banks**



**Density of bank offices  
(number of offices per inhabitant)**

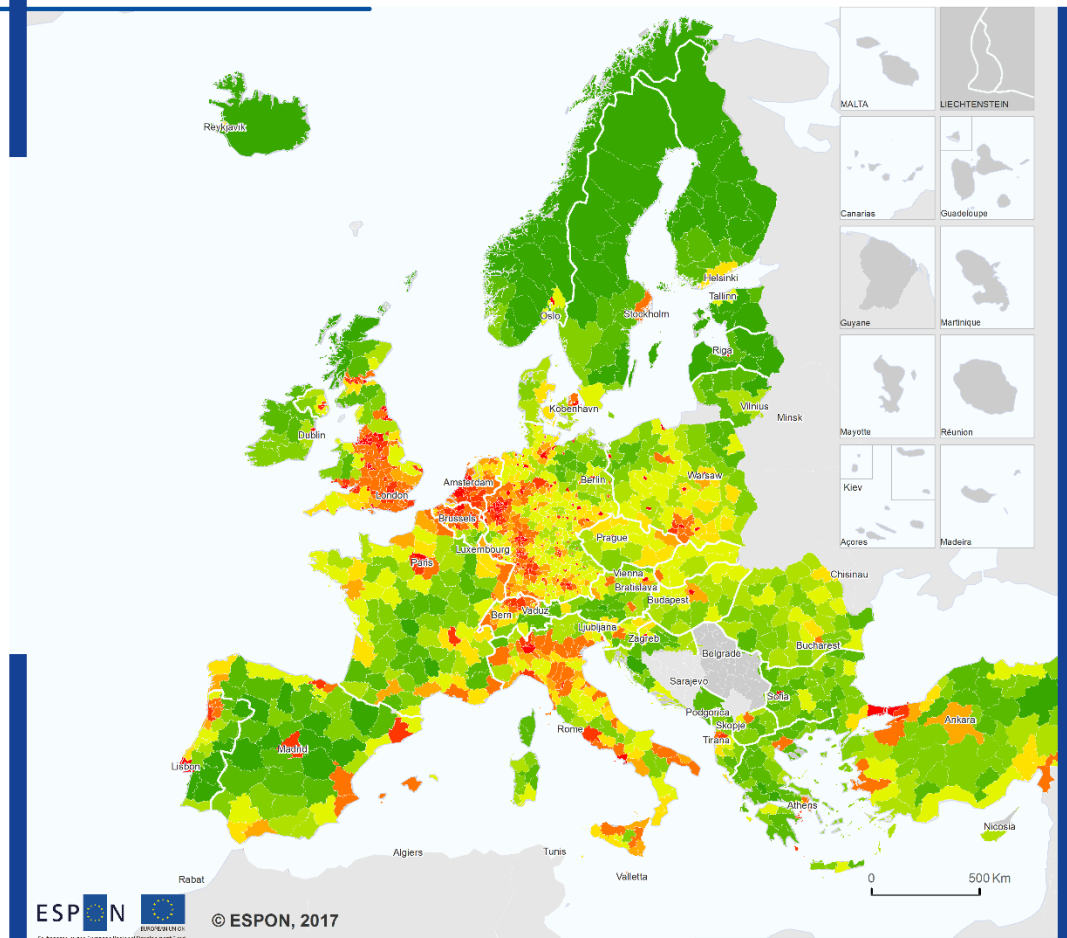


Level: NUTS-3 (2013)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based upon  
 OpenStreetMap (OSM), 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

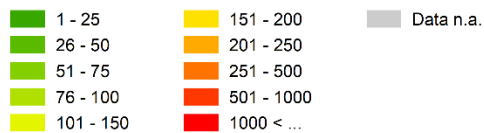
Note:  
 Outermost regions excluded from analysis.  
 Only bank offices considered; cash machines  
 were excluded.

Map 1.48: Population density 2015 (NUTS-3).

## Population density 2015



### Population density 2015 (inhabitants per sqkm)

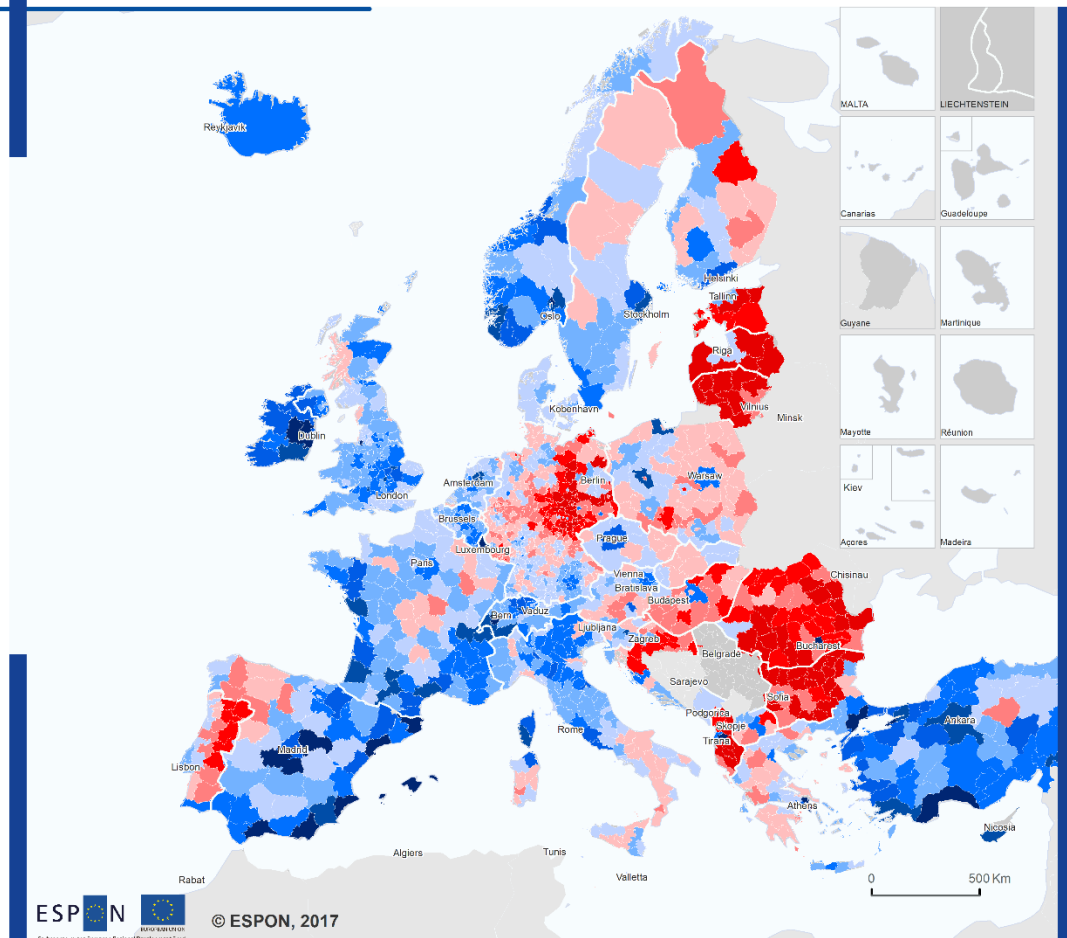


Level: NUTS-3 (2013 classification)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based on Eurostat, 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

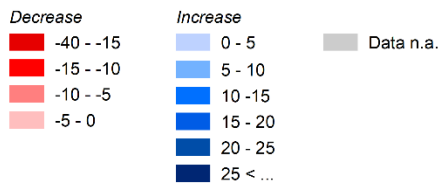
Note:  
 Outermost regions excluded from analysis.

Map 1.49: Population change 2001-2015.

## Population change 2001-2015



### Population change 2001-2015 (in % of 2001)

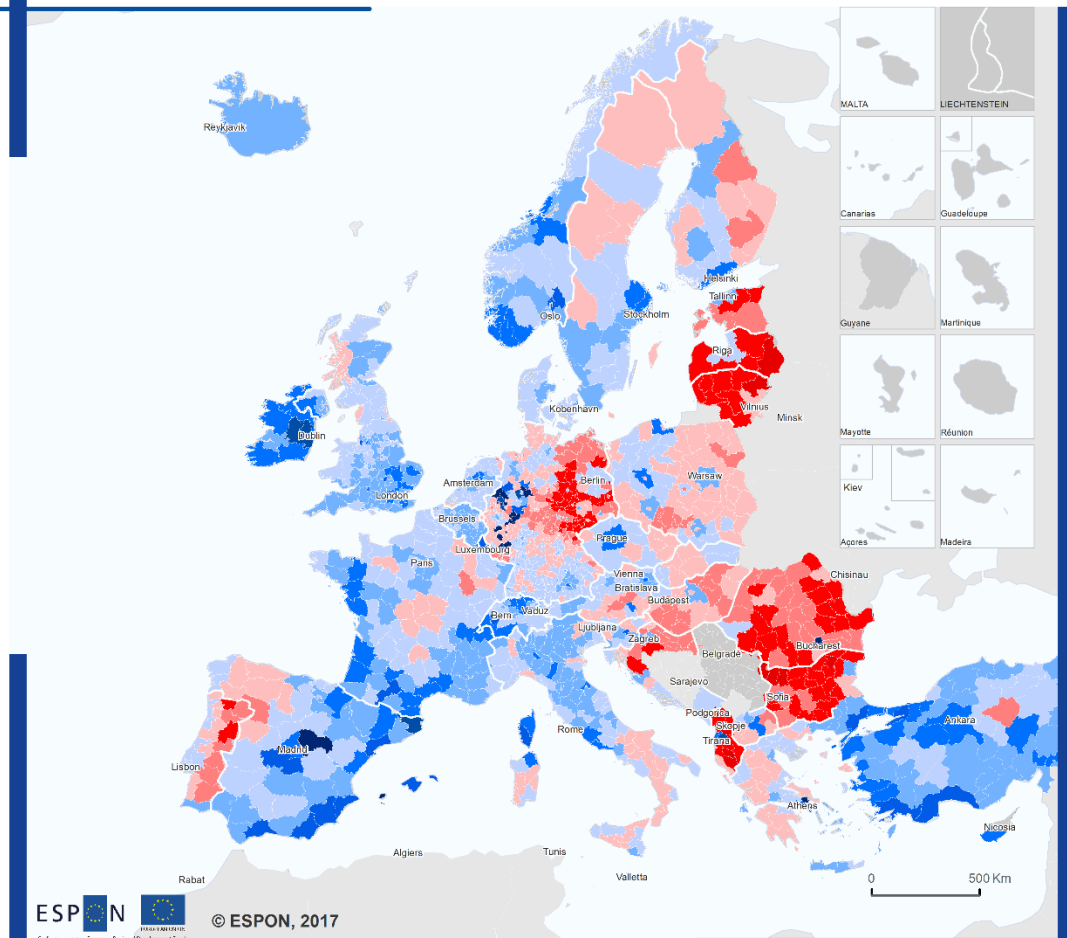


Level: NUTS-3 (2013 classification)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2013;  
 own calculation based on Eurostat, 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

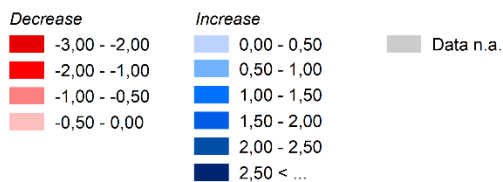
Note:  
 Outermost regions excluded from analysis.

Map 1.50: Average annual population change, 2001-2015 (average annual change rates).

## Population change 2001-2015



### Average annual population change 2001-2015 (average change rates)

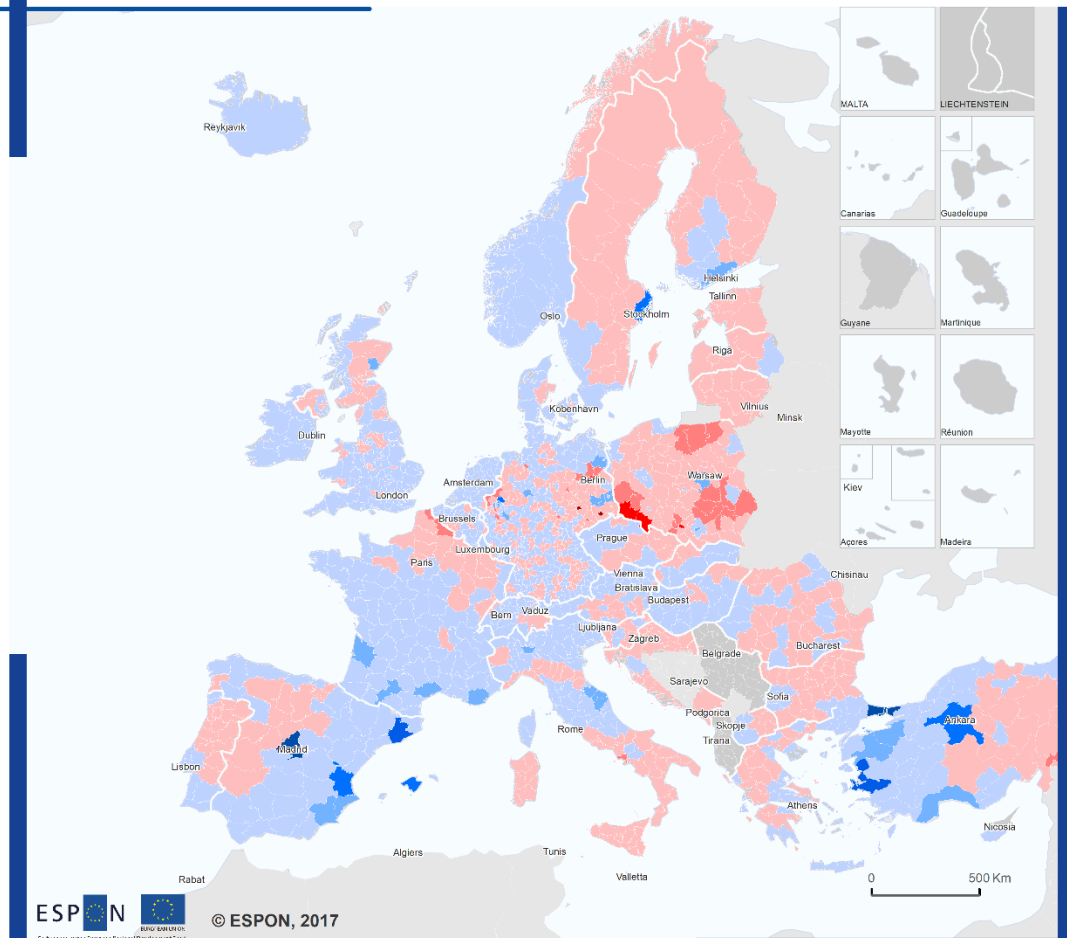


Level: NUTS-3 (2013 classification)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based on Eurostat, 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

Map 1.51: Net migration 2014/2015.

## Net migration 2014/2015



### Net migration in 2014 and 2015 (total numbers)

Population losses  
(out-migration)

- -90000 - -50000
- -50000 - -30000
- -30000 - -20000
- -20000 - -10000
- -10000 - 0

Population gains  
(in-migration)

- 0 - 10000
- 10000 - 20000
- 20000 - 30000
- 30000 - 50000
- 50000 - 90000

■ Data n.a.

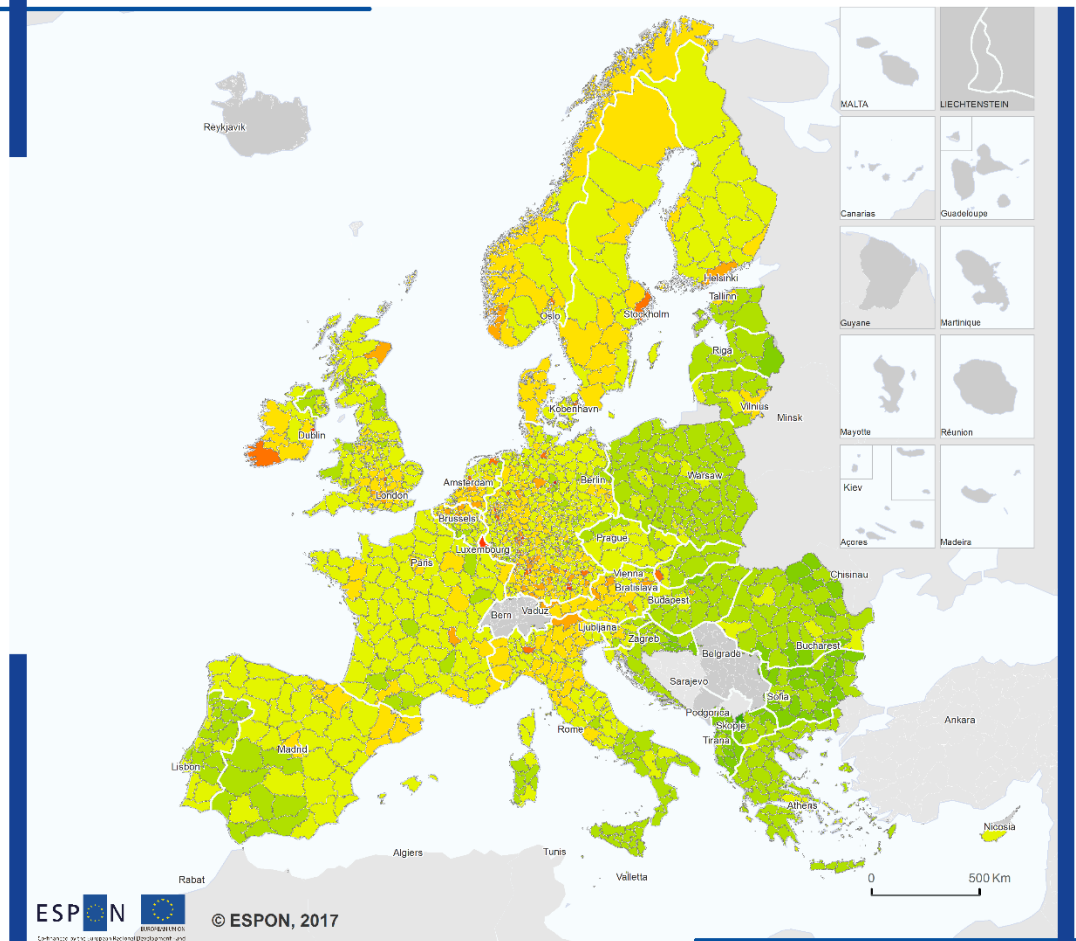
Level: NUTS-3 (2013 classification)  
Source: ESPON Profecy  
Origin of data: TCP International, 2017;  
Eurostat, 2016  
CC - UMS RIATE and RRG for  
administrative boundaries

Note:  
Outermost regions excluded from analysis.

Net migration for 2015, except for  
DE8 (Mecklenburg-Vorpommern),  
Greece, Poland, Portugal, Slovenia,  
UKD (Greater Manchester), UKH (East of England),  
UKI (London), UKJ2 (Surrey) for which  
2014 data are displayed.

Map 1.52: GDP per capita 2015.

## GDP per capita 2015



ESPON © ESPON, 2017

### GDP per capita 2015 (in PPS)

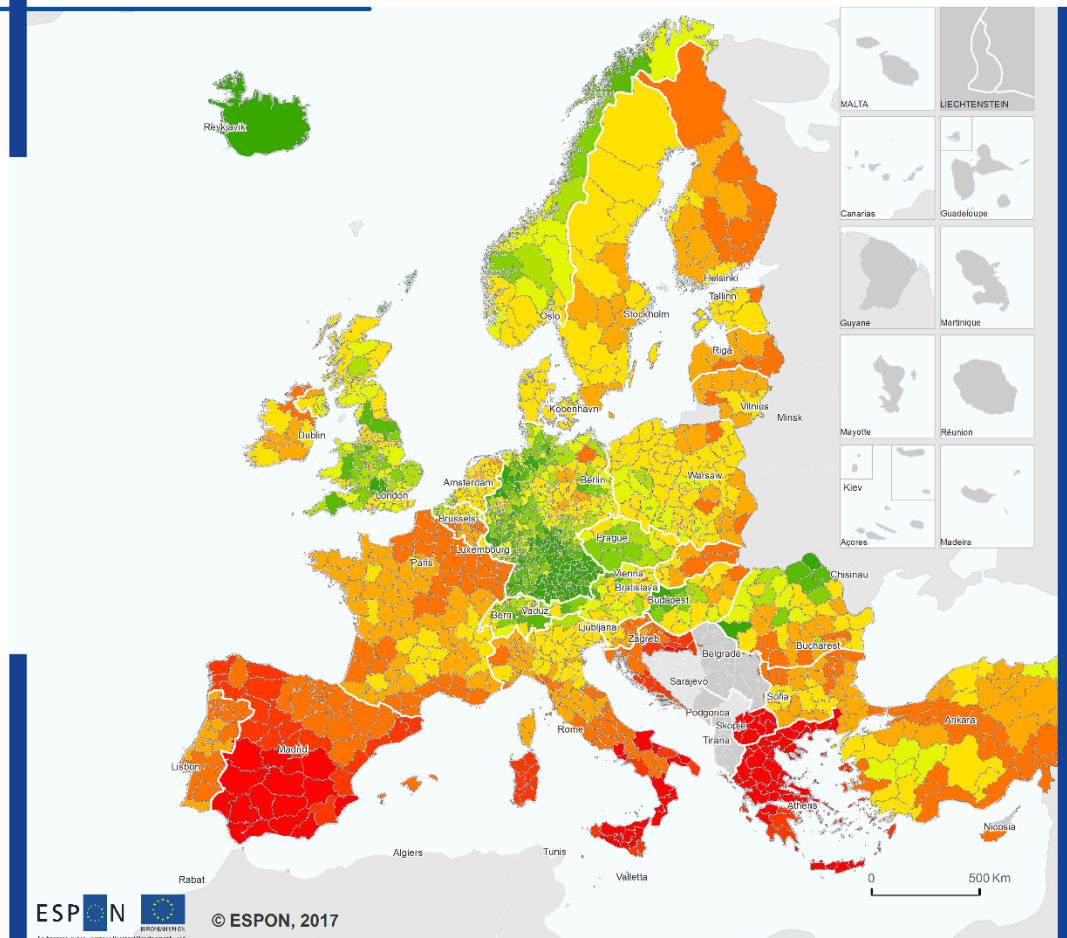
4830	30001 - 40000	Data n.a.
4831 - 5000	40001 - 50000	
5001 - 10000	50001 - 75000	
10001 - 20000	75001 - 100000	
20001 - 30000	100001 - 359485	

Level: NUTS-3 (2013 classification)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based on Eurostat, 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

Note:  
 Outermost regions excluded from analysis.

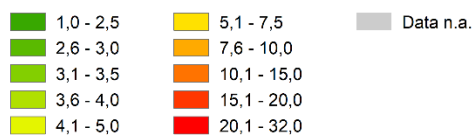
Map 1.53: Unemployment rate 2016.

## Unemployment rate 2016



ESPON © ESPON, 2017

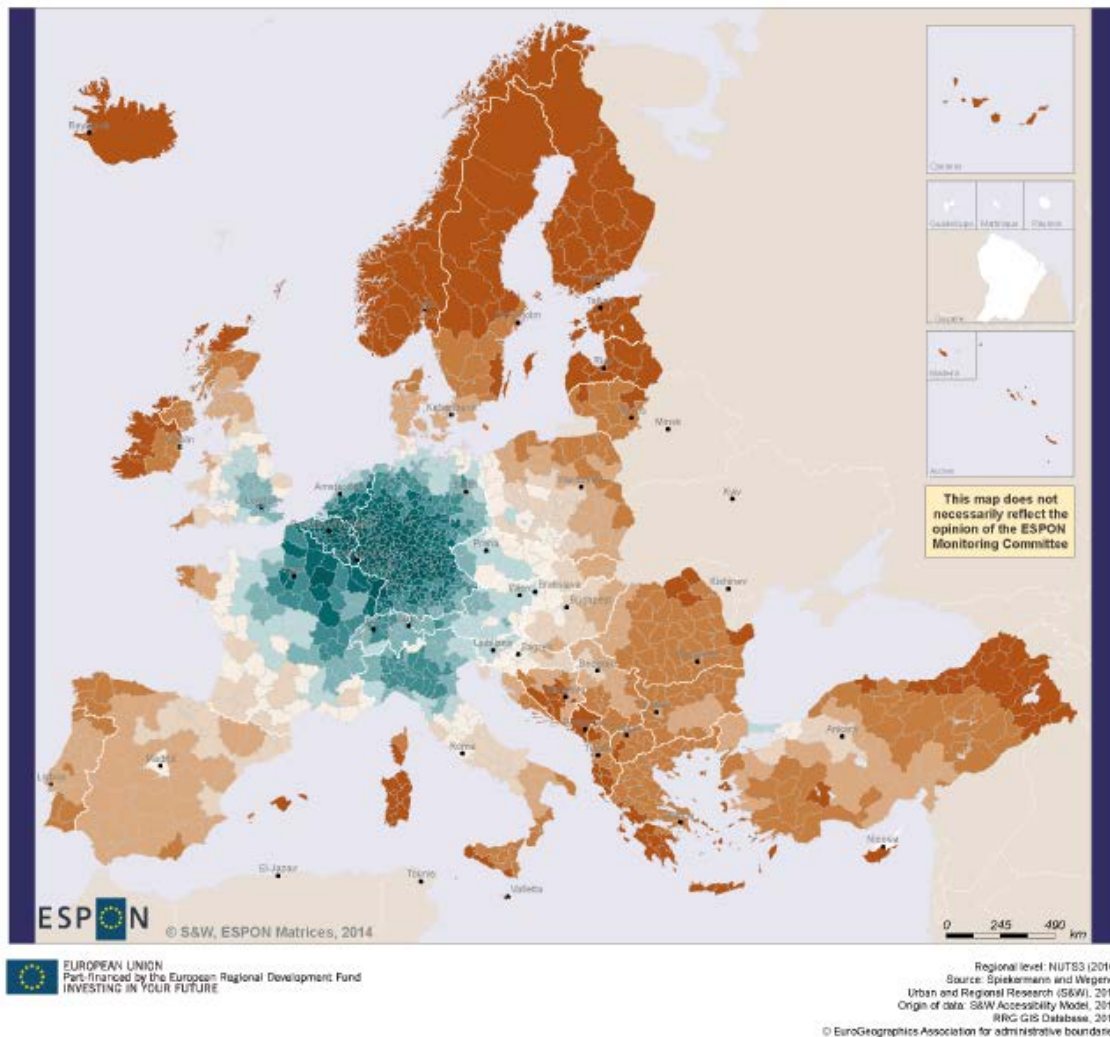
### Unemployment rate 2016 (%)



Level: NUTS-3 (2013 classification)  
 Source: ESPON Profecy  
 Origin of data: TCP International, 2017;  
 own calculation based on Eurostat, 2016  
 CC - UMS RIATE and RRG for  
 administrative boundaries

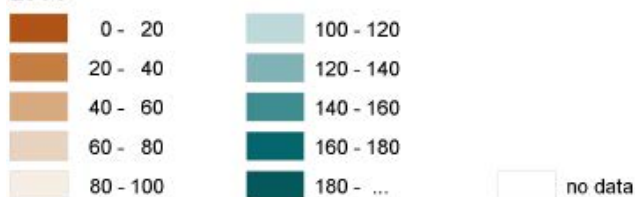
Note:  
 Outermost regions excluded from analysis.

Map 1.54: Accessibility potential road, 2014 (ESPON Matrices).



**Accessibility potential, road (ESPON = 100)**

**2014**

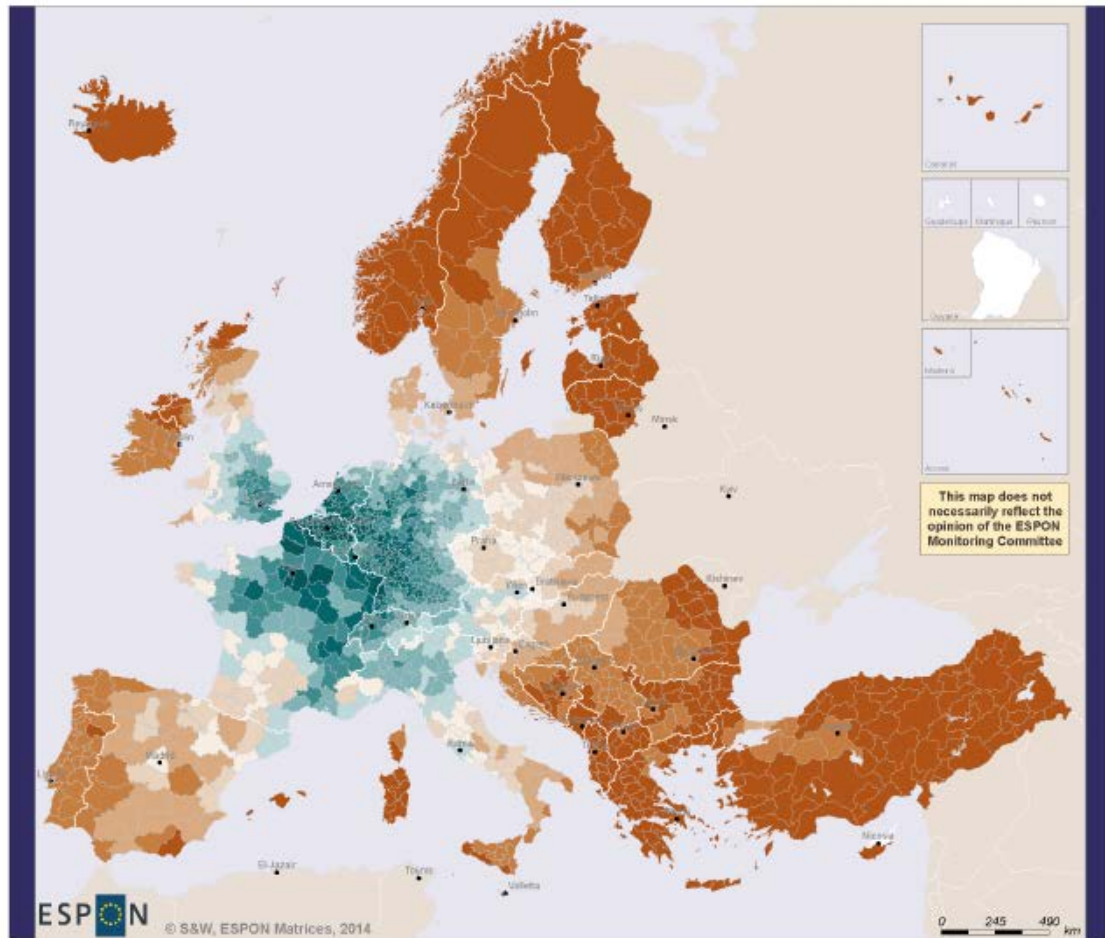


**Potential accesibility indicators:**

Although the maps in the map gallery show the standardized potential accessibility indices, we use the unstandardized raw indicator numbers for the delineation of inner peripheries in Delineation 2, since we need to re-standardize the numbers to the average of the NUTS-3 region neighbours.



Map 1.55: Accessibility potential rail, 2014 (ESPON Matrices).

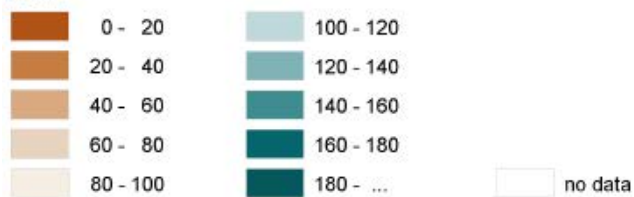


ESPON  
© S&W, ESPON Matrices, 2014

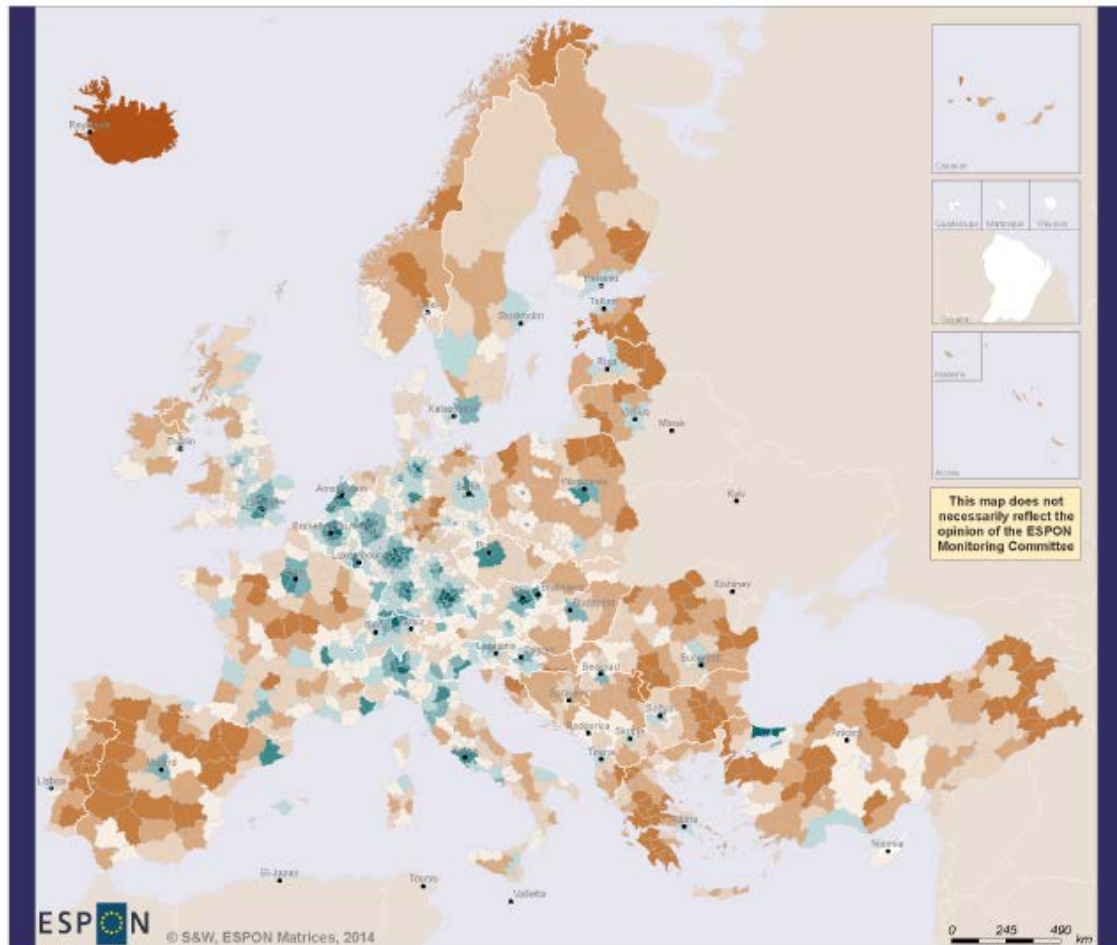
EUROPEAN UNION  
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INVESTING IN YOUR FUTURE

Regional level: NUTS3 (2010)  
Source: Spiekermann and Wegener  
Urban and Regional Research (S&W), 2014  
Origin of data: S&W Accessibility Model, 2014  
RRG GIS Database, 2014  
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**Accessibility potential, rail (ESPON = 100)  
2014**



Map 1.56: Accessibility potential air, 2014 (ESPON Matrices).



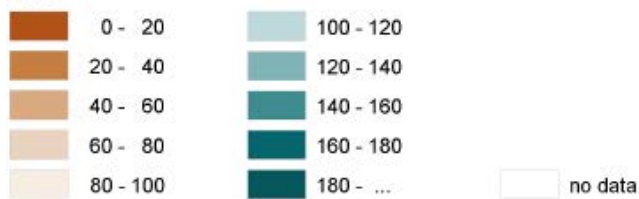
ESPON  
 © S&W, ESPON Matrices, 2014

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 Part-financed by the European Regional Development Fund  
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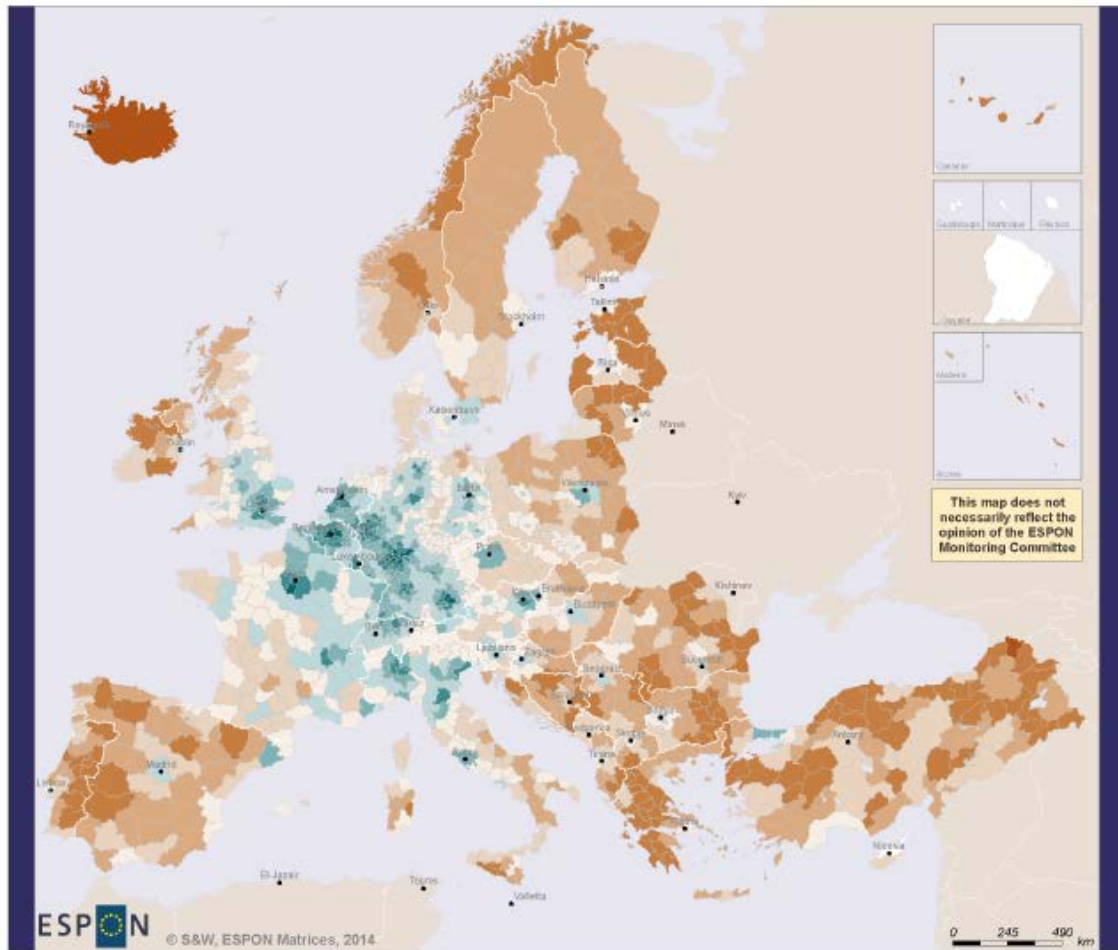
Regional level: NUTS3 (2010)  
 Source: Speckermann and Wegener  
 Urban and Regional Research (S&W), 2014  
 Origin of data: S&W Accessibility Model, 2014  
 RRG GIS Database, 2014  
 S&W Flight Network Database, 2014  
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**Accessibility potential, air (ESPON = 100)**

**2014**



Map 1.57: Accessibility potential multimodal, 2014 (ESPON Matrices).



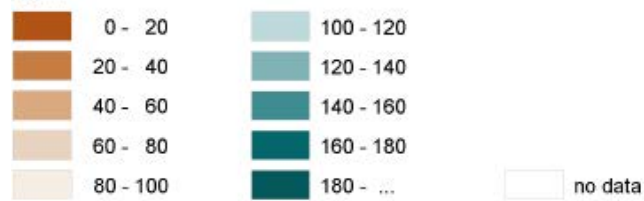
ESPON © S&W, ESPON Matrices, 2014

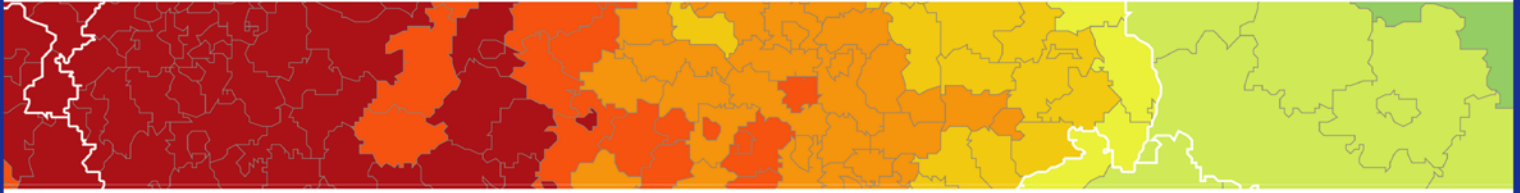
EUROPEAN UNION  
Part-financed by the European Regional Development Fund  
INVESTING IN YOUR FUTURE

Regional level: NUTS (2010)  
Source: Speckermann and Wegener  
Urban and Regional Research (S&W), 2014  
Origin of data: S&W Accessibility Model, 2014  
IRRG GIS Database, 2014  
S&W Flight Network Database, 2014  
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**Accessibility potential, multimodal (ESPON = 100)**

**2014**





### **ESPON 2020 – More information**

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