ESPON

TOWN
Small and medium sized towns in their functional territorial context

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This report presents a more detailed overview of the analytical approach to be applied by the project. This Applied Research Project is conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

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This basic report exists only in an electronic version.

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1. Project aims and objectives

The context for this project is the increasing recognition that Small and Medium Sized Towns (SMSTs) have an important role to play in Europe's development and the achievement of economic, social and territorial cohesion. However, it is also widely acknowledged that relatively little is known, at both European and national levels, about SMSTs and that policies reflect this 'knowledge deficit'. Moreover, SMSTs sit astride a number of different thematic policy domains (e.g. spatial policy, regional policy, rural development policy) and sectoral policies that are rarely related to one another let alone integrated.

Based on the first research evidences, it is possible to estimate that there are about 8.000 small to medium-sized towns across the 27 member-states of the European Union. These settlements are likely to be playing a complicated set of roles and functions that will vary in line with the diversity of regional contexts in which they are located that are very difficult from Christaller's imagined flat and featureless plain (1933).

The identification and description of smaller towns has been carried out at national level in a number of countries most often in the context of understanding urban-rural interactions in 'rural regions' (see INSEE 2003, Sýkora and Muliček 2009). The ESPON 2006 programme commissioned work on SMSTs that scoped some of the issues surrounding the identification of smaller towns across Europe (Österreichisches Institut für Raumplanung 2005) but it was more concerned about the framing the limits and the potentialities of a research agenda focused on SMSTs, while the bulk of the work in this report was mainly based on case studies.

Given this the project, reflecting the key policy questions identified in the Call, aims to identify the functions and roles of SMSTs in their different territorial contexts, their potentials for development and associated barriers and the governance arrangements that currently exist and are required for the future. This is to be done whilst recognising the importance of territorial context and at the same time generating results that take into account the wider European and global factors affecting SMSTs and how they articulate with this wider context. Thus the project seeks to investigate the added value that SMSTs can bring to both their local and regional territorial context and to the Europe 2020 strategy for smart, sustainable and inclusive growth. By doing this it will produce results that are scientifically sound, evidence based and relevant to policy communities at European, National and regional/local levels, stressing the importance of articulating the different policy communities both horizontally and vertically as part of the necessary integration of territorial and sectoral policies needed to support a place-based approach to SMSTs and the realisation of their potentials.

In order to achieve these overarching aims the project's main objectives are:

- The systematic identification and mapping of SMSTs across at least 31 countries;
- Analysis of social, economic, environmental and institutional characteristics, 'performance' and 'development potential' of SMSTs;
- Understanding the function and relational characteristics of these towns within their broader localities; and,
- Analysis and recommendation of policies deployed to support the economic, social and environmental assets of SMSTs and their polycentric networks.

2. Overview of the conceptual approach

This section overviews the research activities aimed to fulfil four principle research areas:

- Identification and mapping of SMSTs across at least 31 countries;
- Europe-wide quantitative analysis of SMSTs and the creation of SMSTs and regional context typologies (in which small towns are located);
- In depth case study analyses bringing together three nested territorial levels (state, region and town) and three analytical frameworks (geomatic, quantitative and policy analysis).
- The policy analysis focused on EU, regional and local levels in order to analyse successful policy approaches and offering possible policy recommendations in order to achieve regional and EU territorial aims.

The project is structured in Research Activities (RAs) as illustrated in Figure 1. In the scheme, there are two broad methodological frames: a geomatic and quantitative component complemented with a policy-analysis methodology. They both are integrated in the Case study phase.

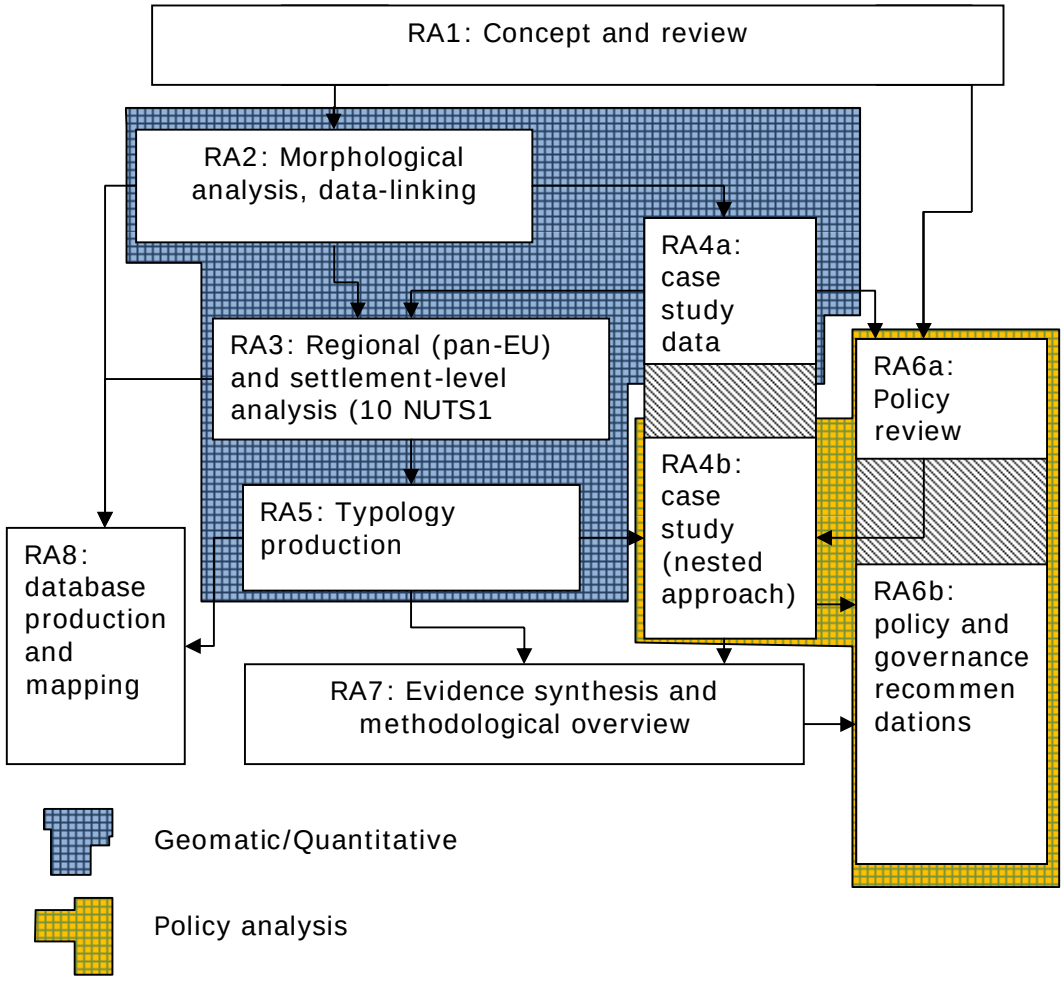


Figure 1 Structure of WP2 in Research Activities

RA1: Setting the scene: concept and review

In this first stage, the TPG will further discuss and operationalise the concept of 'SMST' with reference to the policy objectives set forward by ESPON, focusing on datasets and indicators that will be used in the analysis, as already present in the ESPON database or to be integrated with different sources. The diverse questions set by the conceptualization of the SMSTs will provide a general analytical framework that will allow the project to investigate the role, the performances, and the social, economic, environmental and governance dimensions in the case studies (RA4).
One research priority, thus, is to use the existing literature on scale, place and uneven development to study the globalisation–urbanisation nexus through a diverse range of cities. The concept of SMSTs in academic literature and among stakeholders (and the difference in different national contexts), the relevant territorial roles of SMSTs as addressed in different literatures and the significant inputs to this regards coming from ESPON projects are at stake in this RA1. Accordingly, building on the foundations of the earlier ESPON SMESTO project, this RA produces a detailed analytical and methodological framework to guide the project's activities, explores data availability and yield the research targets and related detailed work plan. While the general overview of the work plan is provided by the present Inception Report, the outcome of the literature overview will be included in the Interim Report.

RA2: Morphological analysis and data-linking

The main purpose of this RA is to generate a database of SMSTs in Europe firstly through the construction of a set of settlement polygons (with a limited set of mainly geomatic attributes after Bibby and Shepherd 2004 – see also section 2 'geomatic approach') and secondly by linking these settlement polygons to the LAU2 geography of Europe (through the generation of 'look-up' tables taking into account changes in coding for the period 2001-11). The SMST polygons are to be identified in their spatial extent on the basis of the 1km^2 population density grids using criteria of density, contiguity and population size. The construction of the SMST polygon set and the 'look-up' tables to LAU2 level data are fundamental building blocks for this research project. In particular the construction of SMST polygons underpins the construction of contextual variables through GIS analytic tools to obtain other thematic and spatial information of interest for this project (such as measures of accessibility to other settlements, location within the settlement hierarchy).

RA3: Regional and Settlement-level analysis

Based on testing propositions developed in RA1, the RA3 team will operationalise concepts outlined in the existing literature relating to the character and functions of SMSTs based on available secondary data-sets. The scope and extent of the analysis will depend upon the data resources that can be made available to the TPG from the ESPON CU (principally the LAU2 polygon geography, the SIRE database and data from the SEGI project). The aim of RA2 is:

- firstly to do the initial descriptive statistics of the SMSTs data-set;
- secondly to construct indicators of 'outcome' and 'context' for SMSTs;
- thirdly to direct the data collection of work by case study teams and subsequently analyse case study area indicators (a greater details of 'outcome' and 'context' such as the construction of labour market accounts for each SMST in case study regions).

The principal statistical techniques employed will be forms of regression analysis (multi-variate and logistic) using both changes in key characteristics (such as changes in labour market characteristics, demography and level of service provision located in SMSTs) as the dependent variable for analysis. As well as analysing the substantive characteristics of the SMSTs, the RA3 team will assist in constructing 'goodness of fit' indicators for the geomatic polygon construction carried out in RA2.

RA4: Case Study analysis

RA4 is the research activity through which the different research approaches will be combined to provide new insights at EU level about the character and function of SMSTs across Europe articulating the geomatic, quantitative and policy analysis approaches of the project as a whole (see Section 2 for more details). RA4 has the following aims:

- validating the work of RA2;
- putting together detailed data (from 'local' data sources) relating to a sample of SMSTs in different contexts required for RA3 and RA5; and,
- gathering evidence about the opportunity structure for spatial policy to underpin regional development through SMSTs in RA6.

The success of RA4 is pivotal to the success of the whole project. Case study regions will be selected in order to provide insights into the key research propositions. The TPG has already proposed a multi-level case study structure (see Chapter 2) in which 10 case study NUTS1 regions are proposed (subject to approval by ESPON CU) based on the notion of testing the importance of national governance characteristics (state structure and local government unit size) and regional development context (at NUTS2/3 level) in shaping both the 'health' of SMSTs and the scope for place-based action around them.

The means of implementing the case study work will be through a specific case study protocol defined through an interactive dialogue between all the PPs to be uniformly implemented across the 10 regions. The protocol must ensure that case study teams can achieve the following targets:

- validate the work of RA2 (i.e. do the polygons make sense in the case study region);
- provide data as directed by the RA3 team (especially around the construction of labour market accounts, service provision and the construction of 'hinterlands');
- challenge and/or support the propositions outlined in the existing literature on SMSTs (from RA1); and,
- offer the evidence required for the successful completion of policy analysis in RA6 (who needs to be interviewed, which policy documents need to be read and which territorial levels/policy sectors at which to engage).

RA5: Typology production

While RA3 explores the statistical relationships between the social, economic and environment attributes of SMSTs and 'outcomes' related to SMSTs, RA5 will make sense of the data through the construction of typologies (both typologies of SMSTs and of the regional contexts in which they are located). The construction of such typologies is the conclusion of the work in RA1 (literature review), the statistical work both carried out within but also co-ordinated by RA3 and the more detailed evidence on SMSTs provided by the case study work (RA4). The typology work of RA5 establishes which SMSTs/regional contexts are 'most alike'. Thus the typology work underpins the policy work of RA6 by assessing which SMSTs and regions with them are 'most likely' to be able to learn from SMSTs/regions that

are most like themselves. RA5 builds on the project's database of SMSTs constructed from secondary data (either constructed across the 10 case study regions or across the EU on a more limited palette of variables) and will perform a cluster analysis of territorial functions and performances for SMSTs in order to specify typology of regions in relation to regional settlement pattern/functions.

RA6: Policy analysis

In this module we reconnect our analysis to current policy debates and instruments in order to define a pathway to integrate the issue of SMSTs into the wider EU policy debate (considering also that it will be framed by the new Cohesion policy – at that stage already broadly defined) and into national and regional spatial contexts. Moreover, this module tackles issues such as the ways of addressing multilevel governance approaches, and the strategic spatial capacities to mobilise territorial capital assets in order to promote smart, inclusive and sustainable growth.
This module begins before RA7, with the analysis of policy discourses, documents and programmes in the EU, but it finishes later, basing its outcomes on the RA7 findings. It aims to provide policy recommendations and frames the policy handbook for local and regional stakeholders (outcome of the case study analysis).

RA7: Evidence synthesis & methodological overview

This module has a crucial role in bringing together the multi-level findings: the pan-EU analysis, the verification/implementation/analysis of the SMST database at NUTS1 and the case studies from the different NUTS. It brings together these findings into a consistent argument on policy instruments at local national and EU level, having mutual feedbacks with RA6 tasks on policy analysis. Moreover, the module brings together the different methodological approaches in a handbook for stakeholders and analysts concerned with SMSTs in their particular contexts.

RA8: Database production and mapping

This module deals with the production and implementation of the databases, and it is the direct sequel to RA2 – 3 and 5. Its main tasks concern the final design of the SMST database and the harmonization of it with the ESPON databases. Moreover, it assists in the concluding steps of the project by providing all the required cartographic resources and visual supports. In synthesis, this research module prepares and delivers the information platform for this project in a user-friendly format.

3. Methodology

This section overviews the methodological approach described in terms of research activity components above in relation to four research 'problems':

- A consistent and validated geomatic approach to the identification and mapping of SMSTs and geographic attribute association across at least 31 countries;
- Carrying out Europe-wide quantitative analysis including the construction of insightful SMST typologies (relating to characteristics and to function) and the creation of regional context typologies (in which SMSTs are located);
- Organising and structuring case study analysis bringing together three nested territorial levels and three analytical frameworks (geomatic, quantitative and policy analysis).
- The policy analysis focused on EU, regional and local levels in order to analyse successful policy approaches and indicating possible policy recommendations in order to achieve regional and EU territorial aims.

Geomatic approach

The method used to identify SMST follows the procedure implemented by DG Regio in the document 'The New Degree of Urbanisation'[1], which uses as a spatial base unit the grid cells of 1 km^2 and the associated population and density data as the criteria for the interpretation of the degree of urbanization classification, as approved by Eurostat Labour Market Working Group in 2011. Nearly 2 million cells are included in this database, covering all population settlements across the EU. Elaborating population data and density of inhabitants in contiguous cells, three "degrees of urbanization" have been identified by DG Regio:

- High-density cluster (city or large urban area): contiguous grid cells of 1 km^2 with a density of at least 1,500 inhabitants per sq km and a minimum population of 50,000.
- Intermediate density area (towns and suburbs or small urban area): clusters of contiguous grid cells of 1 km^2 with a density of at least 300 inhabitants per km^2 and a minimum population of 5,000.
- thinly populated area (rural area): grid cells outside urban clusters.

In this project, we identify SMSTs with the urban clusters that DG Regio's work addresses as intermediate density area. On the basis of this classification, our first basic typology of SMST includes 8,350 SMT clusters of grid cells sharing borders and having a density of more than 300 km^2. In order to include also some of the complex urban configurations that may characterise some SMSTs and that the sharp definition of the intermediate density cluster would have missed, the TPG have decided to expand the group of SMSTs using the following characteristics:

a. Polygons with a total density (average density of all cells included) between 300 and 1500 inh/km2 and a population between 5,000 and 50,000 inhabitants;
b. Polygons with a total density of more than 1,500 inh/km2 but a total population of less than 50,000
c. Polygons with a total population of more than 50,000 inhabitants but a total density of less than 1,500 inh/km2.

[1] http://ec.europa.eu/eurostat/ramon/miscellaneous/index.cfm?TargetUrl=DSP_DEGURBA

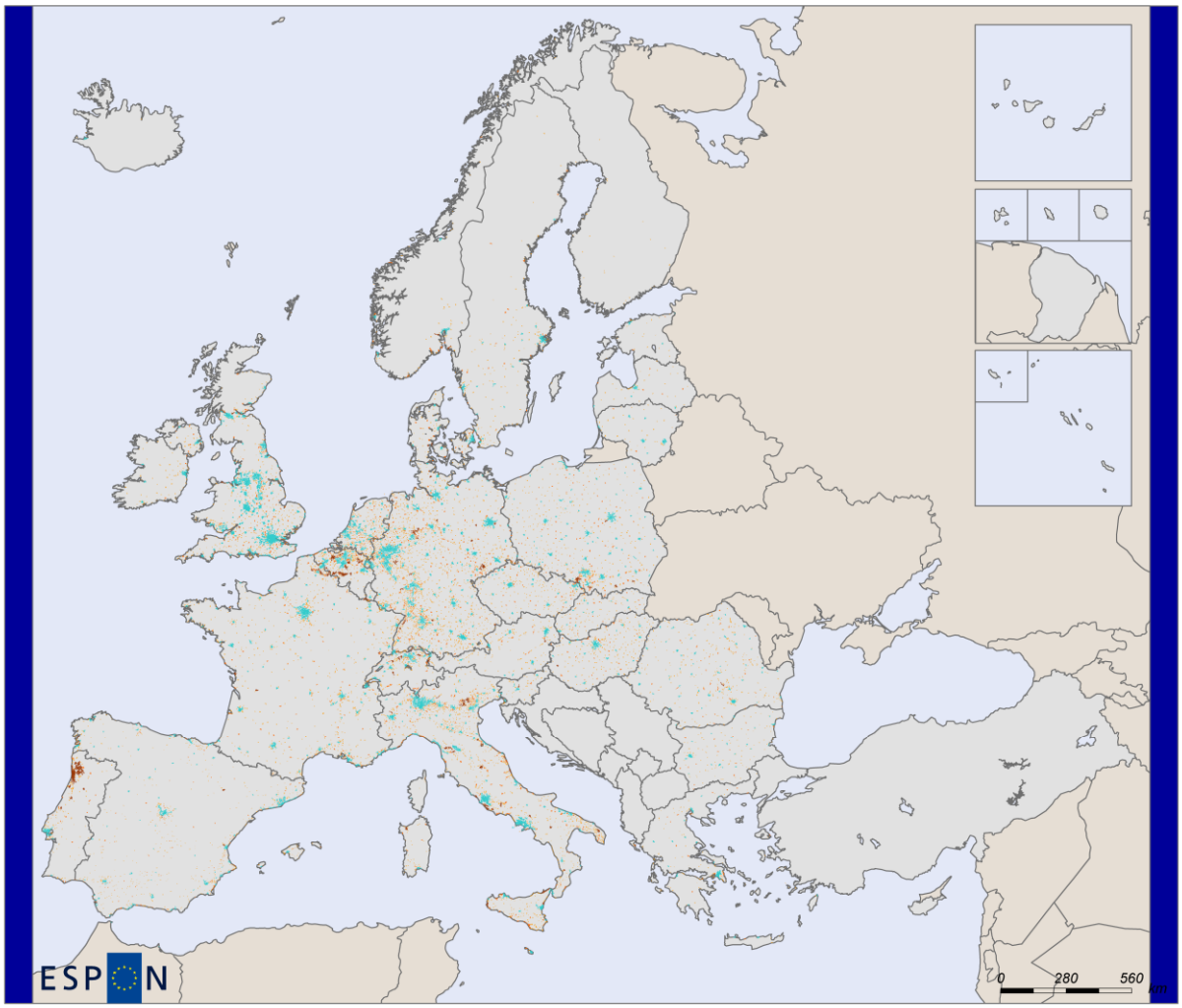
It must be noted however that the population estimation method at grid cell level in DEGURBA has proven a certain degree of inaccuracy which yields problematic definitions of SMST populations especially in the case of sprawling low-density suburban areas, calling for verification and correction at a later stage.
The identification of given structures of SMST across regions of Europe also needs further elaboration in order to bring us closer to the analysis to be conducted in RA3-4. In the Technical Annex to this report (Annex A), we provide the details of these refinements and we provide a first visual analysis of the resulting maps.
As the specifications for this project explicitly mentioned a population range for urban areas between 5,000 and 50,000 inhabitants as identifier of small and medium towns, a first method of classification of SMSTs introduces different population thresholds and corresponding classes of SMSTs, and is illustrated in Table 1.

		DENSITY (inh. / kmq)		
		< 300	***> 300 and < 1.500***	***> 1.500***
POPULATION (inh.)	***< 5.000***	very small town	very small town	very small town
	> 5.000 < 25.000	sprawling urban region	**small town**	**small town**
	> 25.000 < 50.000	sprawling urban region	**medium town**	**medium town**
	> 50.000	sprawling urban region	**large town**	City or large urban area

Table 1 SMST typologies based on 3 population classes

Applying this classification method on the global SMST polygons, we obtain:
a) 7,301 small town, with a population density of more than 300 inh/km2 and a population of less than 25,000;
b) 953 medium town, with a population density of more than 300 inh/km2 and a population between 25,000 and 50,000,
c) 96 large town, with a population density of more than 300 inh/km2 (but smaller than 1,500 inh/km2) and a population of more than 50,000.

The correspondent classification is mapped out in Map 1, including 'cities or Large urban areas'.



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Regional level: NUTS 2
Source: Own elaboration on EUROSTAT/LFS data
Origin of data: EUROSTAT/LFS data
Authors: A.P. Russo,
© EuroGeographics Association for administrative boundaries

High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)

Small SMT: Density >300 (inh./Kmq)
Total population >5000 <25000 (inh.)

Medium SMT: Density >300 (inh./Kmq)
Total population >25000 <50000

Large: Density >300 <1500 (inh./Kmq)
Total population >50000 (inh.)

Map 1 Typology of urban regions including three categories of SMTs by population ranges and high density urban clusters.

A second typology of SMST (Table 2) introduces an intermediate density threshold of 1,000 inh/km2 and identifies:

a) 1,690 low-density town, with a population of more than 5,000 and a population density between 300 and 1,000 inh/km^2;
b) 6,760 high-density town, with a population of more than 5,000 and population density of more than 1,000 inh/km^2 (but less than 1,500 inh/km^2 for polygons of more than 50,000 inhabitants).

		DENSITY (inh. / kmq)			
		< 300	***> 300 and < 1000***	***> 1000 and < 1500***	***> 1500***
POPULATION (inh.)	***< 5000***	very small town	very small town	very small town	very small town
	> 5000 and < 50000	sprawling urban region	**low density town**	**high density town**	**high density town**
	> 50000	sprawling urban region	**low density town**	**high density town**	City or large urban area

Table 2 Modified SMST typologies based on 3 density classes

Finally, we have included in our cartographic representation of SMSTs a detail of what could be considered the "centres" of SMST clusters, picking raster cells within SMST polygons with, respectively, a density of between 5,000 and 10,000 inh/km2 (high density cores) and more than 10,000 inh/km^2 (very high density cores). This procedure allows a clearer visual approach to the structure of SMSTs especially in the case of large agglomerations.

In the development of this RA, the geo-statistical elaboration will be completed by the following steps:

1) Revise the population estimation procedure for SMSTs;
2) Revise the identification procedure of SMST (for instance, filling the "gaps" in the polygon delimitations) and classification criteria, and 'separating' what now look like undistinguished agglomerations of SMT according to administrative or geo-analytic criteria;
3) Associate the TPG typologies with territorial features such as NUTS3 and LAU2 delimitations and their attributes, in order to obtain a dataset at the most convenient territorial unit that will provide information about:
   a. N. of SMST in different classes included or intersecting territorial units (LAU2 and/or NUTS3)
   b. Share of territory in LAU2 and/or NUTS3 covered by SMSTs.
   c. Share of population in territorial units (LAU2 and/or NUTS3) living in SMSTs of different classes
4) Carry out geo-analytic tests in order to classify SMST according to their relative position and hierarchical configuration.

The overall outcome of the RA2-geomatic research activity will provide the fundamental inputs for the following analytic research tasks.

Pan EU analysis

The quantitative component of the project spans RA3 (statistical analysis) and RA5 (typology building). The scope of the quantitative work is dependent upon data sources that can be supplied to the research team. Table 3 sets out how the typological element of this work can run at two possible geographic extents depending upon the degree resources are made available to the project team to implement Europe-wide data association between the municipal geography (LAU2) and the geography of small built up areas in RA2. The implications of the availability of a EU-wide LAU2 geography (with coding for data linkage), the SIRE database are outlined in Section 8.

At the level of case study NUTS1 regions it is likely that sufficient data can be generated in order to explore the relationship between the social, economic and environmental characteristics of SMSTs can be correlated against economic and social outcomes (such as population or employment change) for SMSTs. The TPG team estimates that regression analysis at the level of NUTS 1 regions will generate a sample of up to 800 SMSTs in a range of different regional contexts across Europe. It is unlikely that suitable data can be made available to assess the social and economic outcomes for SMSTs across the whole ESPON space. The TPG will be able to compare regional economic performance (at NUTS3 level) comparing regions with differing proportion of SMSTs in them to other types of NUTS3 region (ones dominated by metropolitan centres or secondary cities for example).

		Extent of data resource availability	
		Case Study regions	EU dataset (eg SIRE)
Scale of analysis	Towns in hinterland	Typology of functional zones relating to SMSTs	Typology of NUTS2/3 regions with SMSTs in them
	Town level	Typology of town characteristics – proof of concept	Typology of town characteristics – ESPON wide

Table 3 Scope and scale opportunity structure for quantitative analysis.

There is a greater chance of a complete data-set for at least one point in time (either the 2001 or 2011 Census of Population) that will allow typology construction around the social, economic and environmental characteristics of SMSTs. However data regulations indicate that only a handful of variables (mainly relating to demography and labour market issues) would be consistently available (from the various Census of Population) across Europe as a whole. GIS-based techniques will also allow the team to generate additional variables (such as accessibility scores to major centres of population).

The aim of statistical work in the project is to offer an overview of the importance of SMSTs across Europe as a whole. In particular it will consider what relationships exist between territorial assets (of SMSTs or of regions whose urban structure is based on SMSTs) and territorial performance (generally but not exclusively measures of change in the stock of

assets). In this proposal the statistical analysis will take the form of a cross-sectional analysis (the relationship between assets and performance for a single time period).

Building typologies of spatial units (such as regions or settlements) depends upon techniques of statistical clustering: hierarchical or k-means clustering (see I2SARE, 2010, del Campo and Monteiro 2008, Lupton et al 2011). The key issue of constructing typologies is that they need to reflect some aspect of reality that is recognisable by the agencies and actors that might use the typologies. Thus the typologies need to be validated with a potential 'user community'. It is proposed that any typology developed will be validated as part of the case study work, involving also European stakeholders, such as DG Regio and organisations such as ENRD and ECOVAST.

Case studies

As set out in the description of RA4 above, the case study work of RA4 is central to the success of the project as a whole as this work will allow the TPG will be able to: validate our settlement polygons; ensure the construction of a data-set for a sample of SMSTs; and, to be able to integrate the quantitative assessment of SMSTs (and their regional contexts) through a deeper, contextualised, understanding of the development trajectories and the potential for policy action in SMSTs.

The role of the case studies is to:

- Verify and validate the processes of identifying SMSTs and linking attribute data to SMSTs (carried out in RA2);
- Explore the economic, social and environmental relationship SMSTs and their functional spaces through the construction of a data-set for a sample of SMSTs (deepening our understanding of the work carried out in RA3)
- Identify good governance practice and examples of effective policy instruments (either individually or as bundles) integrating the quantitative assessment of SMSTs and their regional contexts (see the following section) through a deeper situated understanding of the development trajectories and the potential for policy action in SMSTs.

The proposed research will consequently deploy a significant proportion of its resources on the case study work. Flyvbjerg (2011) clearly makes the argument for the importance of the case study strategy in combining conceptual validity, an in-depth understanding of context and linking with statistical methods on a sample of SMSTs that can offer important insights into a population (of SMSTs) as a whole. Since the TPG expects SMSTs to demonstrate a diverse set of characteristics, contexts and functions, the problematic of the case study work is to ensure that a sufficiency of the small town experience in captured within the case study areas. For this work the key units of analysis (see Flyvbjerg 2011) are 'SMSTs'; the immediate 'functional areas' of SMSTs; and the regional contexts (as settlement systems within NUTS2/3 regions) in which SMSTs are located. Thus the 'research problem' is to select an appropriate number and scope of SMSTs (both as settlements and as functional areas) and of regional contexts.

The TPG proposes the notion of the territorial 'nested' case study in order to address the three basic requirements of the research outlined above. The three 'key' territorial levels for nesting are outlined in Table 4.

10 NUTS1 case study regions to ensure:

- a mix of national urban systems in smaller member-states and sub-national regional urban systems in larger member-states
- appropriate coverage of SMSTs (at least 10%) across Europe in order to carry out a valid analysis of the discrepancies between morphological, functional and administrative dimensions

Main aims

- To validate the RA2 findings (polygons with 5-50.000 inh)
- To validate / implement the names attributed to the polygons of SMSTS
- To provide data-sets at SMST level as directed by RA3 team (after collective review of key attributes) especially related to labour market accounts and service provision

Moreover:

- Review of local national literature about SMST.
- Identification of (one of more) towns and their territorial context for in-deep analyses (meso and micro levels).

NUTS3 regions within the NUTS1 area to ensure:

- Appropriate coverage by the ESPON territorial typologies (in a simplified form around rurality, urban-ness and issues related to being close to borders, being mountainous or coastal). Given that the underlying hypothesis is that the role and function of SMSTs will vary depending upon the context in which they are operating. Specific focus on NUTS2/3 level depends upon the structure of regional governance in case study countries.

Main aims:

a) to analyse the regional characteristics of SMSTs,
b) to highlight socio-economic and territorial trends
c) to identify typologies (and/or to validate them: to extend or to do the job of RA3).
d) To explore the (multi-scalar) governance structures and
e) To analyse the (multi-scalar) spatial strategies and how they relate to the general territorial structure

Individual settlements within the chosen NUTS3 regions to ensure:

- A study of appropriate types of settlements playing different functional roles
- A concentration on 'good practice' and policy interventions directed at impacting on real life situations
- An investigation of the functional spaces associated with SMSTs
- explore the role of SMSTs according to the EU 2020 aims (in regional competitiveness / smart growth, in providing social cohesion in different regional contexts and in achieving sustainable development),
- identify possible horizontal and vertical strategic governance processes in order to deploy innovative territorial policy as well as identifying regional policies underpinning the development trajectories of SMSTs

Main aims:

a) To further explore the (multi-scalar) governance structures and
b) the (multi-scalar) spatial strategies of 30-50 SMSTs (3-5 per case study NUTS1 region)
c) and how they relate to the general territorial structure.
d) To identify criticalities and good practices (in policy and governance) that can be shared

Table 4 Territorial nesting for case study work.

The TPG proposes also 10 case studies for which the macro level (NUTS1) and the meso level (mostly NUTS2-3) of the nested approach is already indicated (Table 5).

State	First level Potential NUTS1 case	n. of NUTS3	Second Level Potential NUTS 2 -3	n. of NUTS3
In-house case studies				
Belgium	Flanders (BE2)	22	Flanders	22
United Kingdom	Wales (UKL)	12	Wales	12
Spain	East (ES5)	10	Catalonia	4
Czech Republic	Czech Republic (CZ0)	14	North-western regions	7
France	Parisian basin (FR2)	22	Centre	6
Subcontracted case studies				
Italy	North West (ITC)	21	Piemonte	8
Sweden	North Sweden (SE3)	7	North Sweden	7
Cyprus	Cyprus (CY0)	1	Cyprus	1
Slovenia	Slovenia (SI0)	12	Slovenia	12
Poland	North Region (PL6)	10	North Region	10

Table 5 Proposed case study regions (subject to confirmation by ESPON CU).

The selection has been done not only considering an appropriate coverage of the EU territory, but also:

- the government structure of the member-state (federal/unitary/decentralised);
- the size of member-state (smaller/larger) and of the local government units within member state (larger/smaller LAU2 units);
- coverage of ESPON typologies relating to NUTS3 measures of urban-ness/rurality, border areas, mountains and coastal areas;
- The spatial patterns of the SMSTs and the socio-economic characterization of the regional context.

A preliminary overview of these items per each case study can be found in the Annex B.

Policy analysis

The policy analysis will take as a starting point the fact that the many complexities and uncertainties facing EU SMSTs calls for a coordinated approach between multiple players and levels of governance. The policy analysis will also consider the fact that, even though the position of SMSTs is not addressed in the *Europe 2020 Strategy* nor in other official EU documents supranational policy making has major implications for SMSTs. Many concrete projects and programmes within various DGs of the European Commission, such as *Cities of Tomorrow* and *CityStars* (DG Regio), *Smart Cities and Communities Initiative* (DG Energy), *European Green Capital* (DG Environment), have implications for SMSTs. Arguably, one of the most important documents that might influence SMSTs in the period up to 2020 is the Proposal of the European Commission on the financing of and future regulations governing

Cohesion policy. Moreover, the role of policies developed by DG Agriculture and Rural Development, in particular rural development policy, the second pillar of CAP has to be taken in consideration.

The project needs to explore the degree to which the policy interventions and prescriptions outlined for European cities are appropriate for SMSTs some of whom may lack the agglomeration economies of scale of metropolitan areas (from an economic perspective) and where local economies (and the actors within them) may be working with a different balance of social, economic and environmental objectives related to their particular local situations. At the regional and local level, particular attention will be given to (urban and urban-rural) governance and networks, existing or possible instruments and policies. Here, policy analysis work will be based on the evidence gained from interviews with key respondents in case study locations and the analysis of policy documents associated with case study locations. The analysis will consider the role of strategic planning, as it may assist local decision-makers in developing a vision of SMSTs' futures. Also, as experts agree, in order to be successful city development should seek to develop forms of integrated urban governance; the analysis will investigate whether or not the models of activity currently present in SMSTs are innovative or based on outdated, exclusionary and sectoral variables.

In order to further clarify the meaning, effects and implications of integrated governance and development models for SMSTs, the following questions are relevant:

- What is the role of strategic planning and foresight (e.g. elaboration of strategic visions)?
- What good examples of partnerships are there in SMST contexts? Can these be generalised?
- Are there effective multi-level governance (top/bottom and bottom/up) approaches in relation to regional, national or EU policies and priorities?
- How could successful platforms for exchange of good practices and applied urban research be built nationally and internationally?

As such our approach is to focus the analysis on the three components of territorial governance outlined by Davoudi et al (2008, p37):

- Understanding the context of territorial governance (in terms of institutional thickness, the presence of innovative milieu and the presence of territorial capital) through asking about who is involved in policy-making in SMSTs;
- Identifying the policies (for institutional frameworks, territorial policy instruments and governance procedures) for supporting territorial governance through identifying what policy interventions are being proposed for SMSTs; and,
- Exploring the actions of territorial governance (the 'experiences', projects and programmes put in place by territorial governance networks) through asking about how policy-makers are implementing policy interventions in SMSTs.

However it is also clear that the governance framework for SMSTs, as with any form of spatial development across Europe, is multilevel: from the European, the national, the regional and the (sometimes very) local. In considering the governance of policy and planning for SMSTs the project team will investigate the importance of both horizontal and vertical linkages (including networks) within their contexts alongside the policies and actions of territorial governance. The approach to analysing spatial development policies for SMSTs requires that we address these questions to policy makers working at the different spatial scales. As SMSTs have an important role both within the European urban system as well as

within perspectives on integrated rural development, the policy analysis will need to move back and forth from the local to the European level.

In operative terms, the policy analysis is built on two main phases. The first phase of policy analysis work will be the identification of specific policy interventions that operate at different territorial scales that we might expect to impact on the development of SMSTs. In particular this pre-case study scoping work (RA6a) will consider the impact of European examples such as:

- LEADER (1994-99) and LEADER+ (2000-06) initiatives within the EU15 member-states and where applicable to new member states. While the initiative was directed at rural development one of its key aims was to enhance urban-rural linkages, mainly involving SMSTs. Interventions under this community initiative were partially directed toward supporting the development of particular forms of partnership-based governance structures and rural networks.
- Consideration of work carried out in specific regions supported by EU programmes such as in the Baltic Sea Region through the Interreg IIIB initiative. This type of work, for instance, provided detailed analysis, within particular contexts, of the roles and activities of SMSTs and how they are adapting to changing circumstances through the identification of what we term territorial capital and the mobilisation of such assets.
- Consideration of other European initiatives independently created by groups of towns and cities. Examples of this would be CENTROPE and the EuRegio Salzburg – Berchtesgadener Land – Traunstein. Examination of such examples will allow us consider attempts to establish cross-border city regional governance and their effectiveness in relation to our project.

The second phase, which will deployed mainly during the case study analysis and then will be focus mainly at the regional and local level, will give particular attention to three main perspectives:

- The nature of local horizontal and vertical governance relations (taking into account the territorial dimension, i.e. not limited to administrative units) and the articulation of such local governance systems with wider multi-level systems of governance (regional, national and European).
- The presence, or otherwise, of territorial visions and strategies as contained in policy documents but also their realisation in practice, as well as the identification of networks which are expression of local production systems and functional interrelations that constitute a 'local system' of production, and the policies designed to support their development.
- The evaluation of the territorial capital present, the extent to which such assets are recognised and the ways through which they have been mobilised (or not).

The intention here is to systematically investigate these issues through a range of sources utilising desk based research, analysis of policy documents and interviews with key participants supplemented by observations developed by the case study teams based on the integration of the various information sources produced during the research. In order to ensure consistency, and comparability, between case studies a clear common research methodology with be elaborated by the project team including the specification of issues to be investigated, types of actors to be interviewed and a common reporting template. However, sufficient flexibility will need to be retained in order to allow case study teams to investigate the specificities of each local case study situation whilst bearing in mind the wider objectives of the project.

4. General structure, deliveries and outputs

The various stages of the project are regulated by a planning framework specifying a clear subdivision of tasks between partners, which will be formalized in the partnership agreement. In the following sections, we highlight the main tasks and the various deliverables and expected outputs per work-package.

Work-package 1 (project coordination)

WP1 includes all the management activities of the TOWN project. It is organised in a hierarchical way, with the LP ensuring that all PPs comply with the project requirements as stipulated by the Subsidy Contract and Partnership Agreement, especially as far as reporting is concerned.
The deliverable directly related to WP1 are the Progress Reports, including Financial Reports validated through the FLFC system, which will be submitted by the LP within four months from the end of each financial period of which the project life consists. The progress reports will thus be submitted by the 30/11/2012, 31/05/2013, 30/11/2013, 31/05/2014, 30/11/2014 and 31/07/2015 at the latest.

Work-package 2 (research activities)

WP2 involves all the research activities presented in the previous chapters. The coordination of research activities is shared between the five project partners through a steering committee, and each partner is then involved in the execution of a certain number of research tasks (as stipulated in the Partnership Agreement).
The main deliverables for WP2 are the official ESPON TOWN reports, organised in Inception Report, Interim Report (submission deadline 31/12/2012), a Draft Final Report (submission deadline 31/12/2013) and Revised Final Report (due 30/06/2012).

The reports will provide coherence and a general framework for the different outcomes of the RAs. As discussed in Chapters. 1-2, WP2 is organised in series of 8 Research Activities, which will produces a number of outputs, including:

- scientific texts detailing the various stages of the research (from the introduction of theoretical concepts to the illustration of analysis and estimations performed, and the comments and illustration of results);
- data series (raw variables, indicators or class typologies);
- cartographic output describing and analysing the regional distribution of variables, indicators and typologies in space, also with regard to existing ESPON typologies and other important geographical aspects, or being used to create brand new regional typologies through cartographic techniques.

These results and outputs will be wrapped up in form of working paper at the end of each research activity.

Moreover, these outputs are also presented and discussed at TPG meetings (which are conveniently timed to take place at crucial stages of the project lifecycle). TPG meetings will be the main venues for integrating results from different research streams and tasks into coherent pieces of works.
Two of those TPG meetings (one in 2012 and one in 2013) will also include a TOWN International Workshop where the project intermediate and final results will be presented

and discussed with invited members of the ESPON community and other key scholars in the field. These meetings are per se an important delivery of our project beyond their dissemination value and details of the debate that will take place in those occasions will be incorporated in reports.

In terms of final outputs of WP2, there are three types of outputs:

- Databases (the database of places, and the implementation of the ESPON database)
- Policy analysis / recommendations (both at EU and lower levels)
- Handbooks (methodological and policy oriented).

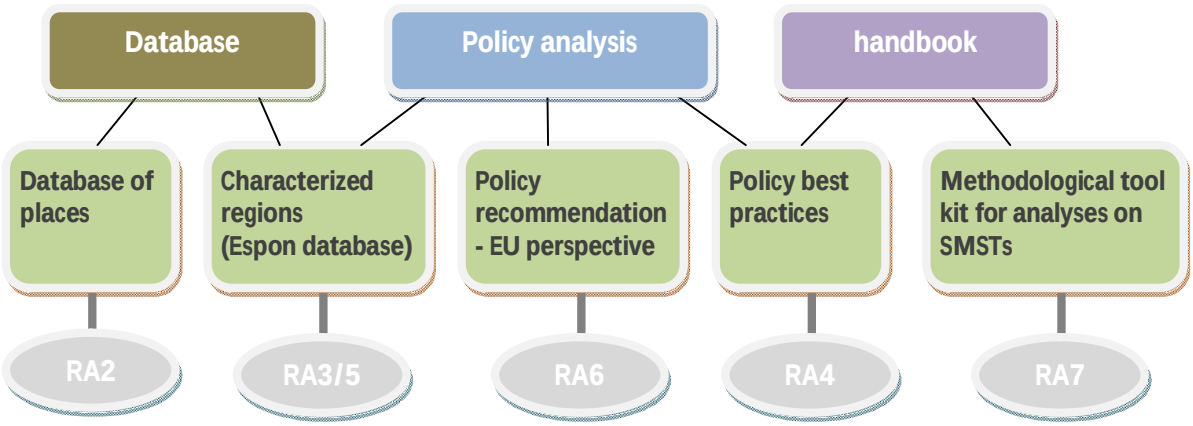

Figure 2 Outcomes of the project.

Figure 2 correlates the three different types of outputs and the research activities:

- The database of places (outcome of the Geomatic part) and the implementation of the ESPON database will be the outcomes of RA2 and RA3 / 5, although the finalisation of both will take place in RA8.
- The policy analysis at EU level will be articulated in three parts: 1) a reflection on the evidences of the pan-EU qualitative analysis (RA 5); the investigation of EU policies and programmes (RA6); and the conclusion drawn on the case study analysis (RA4).
- Finally, two handbooks: the first one dedicated to the case studies, and the collection of experiences and possible positive practices / recommendations (RA4); the second one that will provide some general methodological recommendations for the analyses on SMST deduced from the experience of the project (RA 7).

WP3: Dissemination

WP3 is about the dissemination of the project results and it is supervised by the LP albeit dissemination activities are distributed between all partners.
As far as the diffusion of the preliminary and final results of the research is concerned, the two principal target groups are:

- the scientific community, both inside and outside ESPON; and
- the relevant policy communities at different levels across Europe.

The ESPON community and the wider scientific community will be reached through relatively traditional means:

- Seminars within or outside thematic workshops, participation to conferences, dedicated sessions in important meetings;
- Publications such as working papers, articles in scientific journals, and edited books;

Moreover, through the membership of individual TPG partners, links will be established between the major networks (European Regional Science Association, Regional Science Association International, International Geographical Union, The Association of European Schools of Planning, the European Sociology Association, etc.) which may enhance the impact of the research programme on other scientific research.

Nevertheless, the main objective of the dissemination strategy remains the target group of policymakers, for which a variety of different means and channels will be used.
In particular, the TPG will produce short and readable summaries of our key research findings that can be disseminated through policy networks and other appropriate web sites. These will be supplemented by short reports summarising the policy implications of our work. The detailed overview of the dissemination activities is presented in the Annex C.

In this perspective it is important the identification of the following key target groups for which will be necessary to specify dedicated dissemination strategies:

- *Policy makers and Politicians at European Level*:
    - the European Commission (particularly DG Regional Policy but also other relevant DGs including DG for Agriculture and Rural Development, DG Environment);
    - the European Parliament – particularly Committees such as that Committee of the Regions, Economic and Social Committee.

  The TPG will send copies of short reports to these (as well as longer reports) and attend events organised by them where relevant.
- *European organisations:*
    - those responsible for dissemination of knowledge such as EUKN; and
    - representative organisations such as EUROCITIES, ECOVAST, URBACT, ENRD, the Council of European Municipalities and Regions (CEMR), the Council of Europe's Congress of Local and Regional Authorities, and the Urban Land Institute.

  These will be sent copies of the short reports. Where possible we would include National Policy Makers and Politicians (assuming we can identify the relevant ones across Europe);
- *The national representatives of local government and regions,*
  preferably using some EU representative organisations of national associations. In addition the PPs will disseminate within their own countries (alongside and in association with the ESPON National Contact Points).

As a first achievement, and despite the fact that dissemination activities will increase toward the end of the project, it is already possible to mention as first dissemination activity the publication of a TOWN project description in the next ECOVAST newsletter.

5. Work plan towards the Interim report

The 1st TPG meeting and the following month up to the delivery of this Inception Report have been mainly focussed on the discussion of the structure of the project, the elaboration of an analytic framework, the discussion of methods to be deployed at each stage, and the development of RA1 and RA2 activities.
After the delivery of the Inception Report, the next important steps will be the convergences of the contributions coming from the literature overview, the geomatic analysis and the SMST identification/classification, and the first territorial analyses, both at EU and case study level. The work-plan toward the Interim Report is summarised in Table 6.

Research Activity	Contents of the Interim Report
RA1 Setting the scene: concept and review	- Literature overview, focusing on the three stream of analysis identified in chapter 3: Functional/territorial role, Socio-Economic characteristic, and Policy approach. - Synergies with and possible contributions by other ESPON projects. - Working paper on the conceptualization of SMST and different streams of analysis.
RA2 Morphological analysis and data-linking	- Identification and classification of SMSTs using urban cluster and population grid methodology. - Assessment of the different variables (density, population, contiguity of the grid cells) that may influence the identification and classification of SMSTs. - Working paper / technical report detailing the various aspects of the analysis.
RA3 Regional and Settlement-level analysis	- Validation of the RA2 findings in 10 NUTS 1 in which the case studies are located. - First attempt of SMST typologies. The achievement of this task is much depending on the availability of data at LAU2 and the possible coverage of the EU territory. - Definition of NUTS3-regional typologies based on the presence of SMSTs.
RA4 Case study analysis	- The final list of the case studies (both 'in house' and subcontracted) - Definition of the focus per each case study.

Table 6 Work-plan toward the Interim Report.

Important steps for the research activities in the next phase are represented by:

- the feedbacks on this work that we will receive from the ESPON MC and the Sounding Board, and
- the preparation of the next TPG meeting around mid November, that will also include the First TOWN Workshop, in which invited experts will be carefully selected from within and outside the ESPON community so as to bring in relevant discussion points on the work done until that moment and open perspectives for future work.

The period between the Inception and the Interim Report will also see the consolidation of the management structure of the network, the key test being the submission of the First Progress Report (including the first round of FLF Controls).

6. Barriers to the project implementation

Data issues are always problematic for projects that intend to include at least 31 national statistical agencies. Within any research there is also a trade off between the geographic detail required and the conceptual complexity required. The smaller the spatial scale, the less that is known in detail about those areas. Given that a focus on SMSTs requires a fine spatial focus, it is inevitable that the amount of statistical detail available is likely to be curtailed.

The typical problems for such a project would include:

- Data gaps – where data values are missing for particular geographic units or particular time periods within an otherwise complete data-set
- Non or limited availability of data – where there is an absence of data because the theme under consideration is not collected
- Data harmonisation issues – where data is collected for the right times and the appropriate areal units by national or local statistical agencies but the data is not collected to a common standard across all member-states
- Data currency issues – where there is a significant time lag in publishing data

However, a first incognita at the times of submitting the bid, which was the availability of raster population data for the whole of the ESPON space, is already cleared out at the time of writing this Inception Report.
Indeed, not only the 1 km^2 grid population data for 2006 have been collected already, but also the method to use this information in order to generate polygons of SMST has already gone through its first trial application. However, this grid data cover is complete for the ESPON space with the only exception of Cyprus, while the Candidate Countries are not covered as well.

At the stage of the project inception, the attempt of associating the SMST cartography with the NUTS3 attributes has highlighted discrepancies between data distribution in the cluster database and the NUTS3 population. It is an issue that will be further explored in the next research steps.

Finally, what we still have not explored is the association with LAU2 attributes. Apart from the availability of the LAU2 cartographic files, the TPG has to evaluate which version of the LAU2 classification is most useful to match with our generated SMTs cartography, the time of availability of SIRE data at LAU2 detail from the 2011 census, and the practical possibility to acquire this dataset within the lifespan of the project. Obviously, an analytic work that uses municipal data and matches them with SMT polygons has greater chances to yield precise and useful and information (for instance, in the way on "naming" SMTs and addressing issues of SMT systems development in time) than working at NUTS3 level.

From the purely technical-cartographic point of view at the general European scale, the above sum up all the problems that we are likely to encounter. However at case study level a great diversity of situations might be revealed in terms of existing (especially looking at the time dimension and at the accuracy of geomatic representations of the territory) and accessible additional information.

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ANNEXES

ANNEX A – Geomatic analysis – Methodological notes and Maps
ANNEX B – Case study list and overview of items
ANNEX C – policy-oriented dissemination deliverables

ANNEX A – Geomatic analysis – Methodological notes and Maps

Part 1 - Geo-statistical and cartographic elaboration

The method used to identify SMST follows the procedure implemented by DG Regio in the document 'The New Degree of Urbanisation'[2], which uses as a spatial base unit the grid cells of 1 kmq[3] and the associated population and density data as the criteria for the identification of high density urban clusters by agglomeration of contiguous cells. Nearly 2,000,000 cells are included, covering all population settlements across the EU. Elaborating population data and density of inhabitants in contiguous cells, three "degrees of urbanization" have been identified by DG Regio:

- High-density cluster (or city centres): contiguous grid cells of 1 kmq with a density of at least 1,500 inhabitants per km^2 and a minimum population of 50,000.
- Urban clusters: clusters of contiguous grid cells of 1 kmq with a density of at least 300 inhabitants per km^2 and a minimum population of 5,000.
- Rural grid cells: grid cells outside urban clusters

In this project, we identify Small and Medium Towns with DG Regio's "urban clusters". SMT have been therefore identified with the following procedure:
a) selection of contiguous cells of at least 300 inh./kmq and creation of polygons
b) from those polygons, cells with at least 5,000 inhabitants have been retained
c) from the resulting selection, high-density clusters have been removed

The procedure may be modified through additional geomatic manipulations:
- contiguity at diagonal level could be considered; in this case, a larger number of grid cells could fall within SMTs and so larger SMT could be created
- empty gaps inside the polygons could be filled; they may identify empty spaces which nevertheless represents element of urban continuity (a lake, a large park, etc.), and including them in the SMT polygons that surround them would seem appropriate, but from a merely geo-statistical point of view it is better at this stage to leave them out.

For the moment, our database of SMT does not involve these procedures, but they may be considered at a later stage of the project implementation.
Thus, our first basic typology of SMST involves:
a. Polygons with a total density (average density of all cells included) between 300 and 1500 inh./kmq and a population between 5,000 and 50,000 inhabitants;
b. Polygons with a total density of more than 1,500 inh./kmq but a total population of less than 50,000
c. Polygons with a total population of more than 50,000 but a total density of less than 1,500 inh./kmq.

These do not include polygons formed by only one pixel. By elimination, we also identify non-SMT urban areas, either those that are too small in population terms (rural grid cells), or those that are too sparse, and those that are too large and dense to be considered SMT.

[2] http://ec.europa.eu/eurostat/ramon/miscellaneous/index.cfm?TargetUrl=DSP_DEGURBA
[3] http://epp.eurostat.ec.europa.eu/portal/page/portal/gisco_Geographical_information_maps/geodata/reference

Table 1 illustrate this basic Typology of SMT, with nomenclatures and colours corresponding to the maps that will be introduced below.

		DENSITY (inh. / kmq)		
		< 300	*> 300 and < 1500*	*> 1500*
POPULATION (inh.)	*< 5000*	very small town	very small town	very small town
	> 5000 and < 50000	sprawling urban region	**SMT**	**SMT**
	> 50000	sprawling urban region	**SMT**	high-density urban clusters (DG Regio)

Table 1. Basic SMT typology

It must be noted however that the population estimation method at grid cell level in DEGURBA has a certain degree of inaccuracy which yields problematic definitions of SMT populations especially in the case of sprawling low-density suburban areas, calling for verification and correction at a later stage.
This procedure yields 8,354 SMT polygons across Europe. In Figure 1 these are mapped out using a Google Earth cartographic layer.

At a first glance, SMTs polygons can barely be distinguished within the wider scale of the ESPON space, and the identification of given structures of SMT across regions of Europe need further elaboration. However, a number of phenomena are already visible:

- the richness of SMTs on a sector that goes from the south of England throughout the Benelux and the West of Germany to Italy, with other "clusters" in the industrial belt of South-Eastern Germany and Poland, Northern Portugal, and along the whole Western Mediterranean arc from Spain to Italy;
- The relative sparseness of SMTs in the interior of Spain and France.

Figure 2 illustrates the distribution of population across SMTs by population classes. The distribution is highly skewed towards small population sizes (with a median value of 9,395.5 inhabitants); the first half of SMT ordered by size only has the 23% of the total population in SMTs, while the top 5% have the 22% of the population. Having "cut" population size minimums at 5,000 inhabitants, we note that there exist SMT of more than 250,000 inhabitants, thus the size of a large city, though not having a sufficient population density to be considered as such.

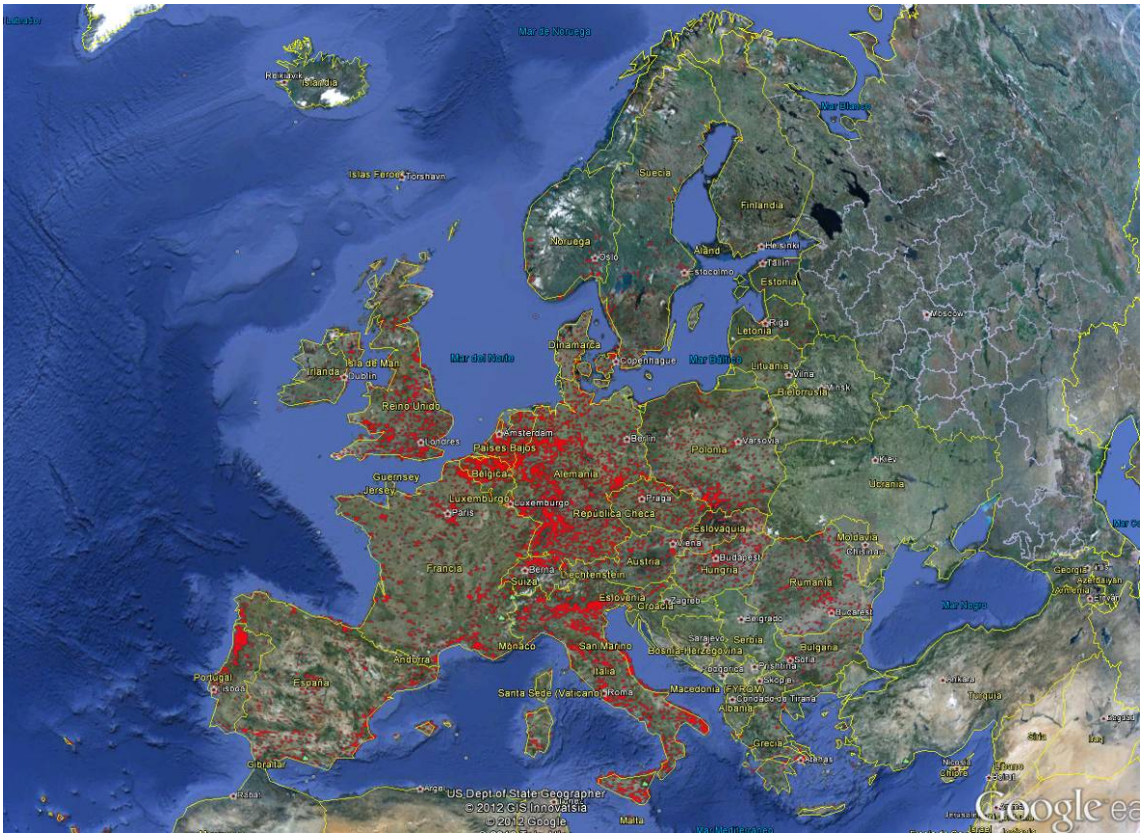


Figure 1. Basic SMT polygons in Europe.

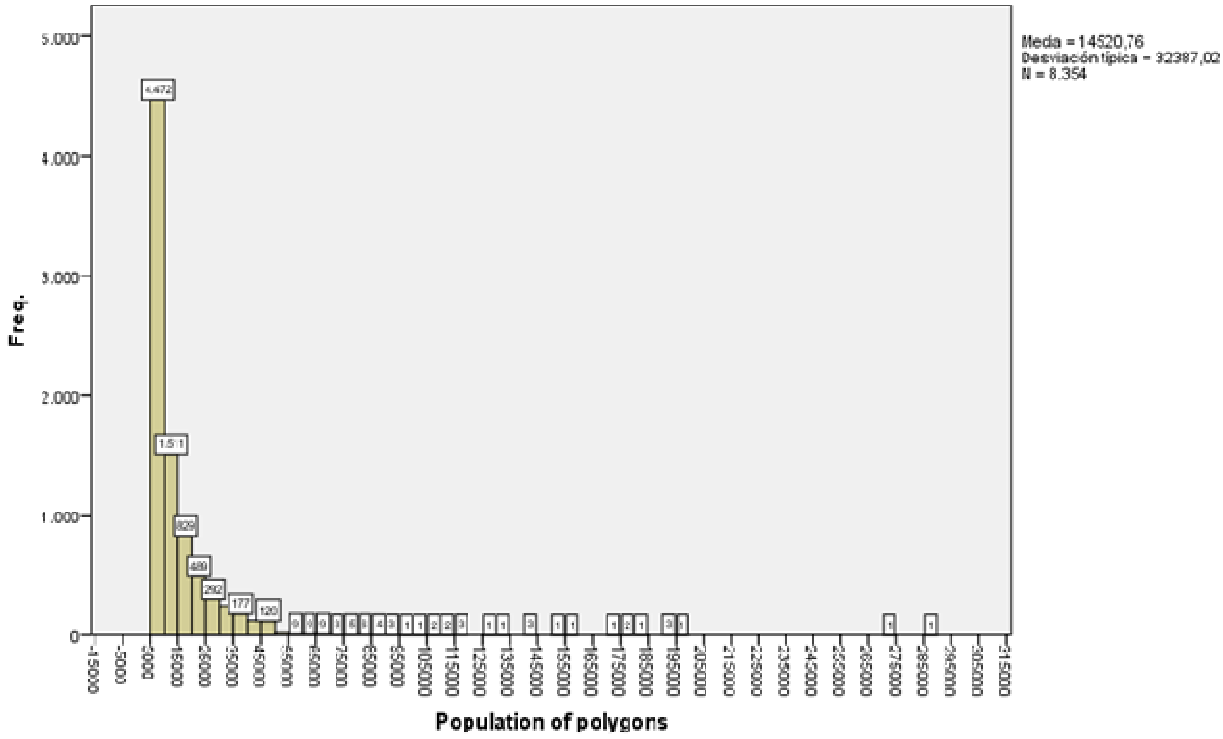


Figure 2. Populations of SMT polygons by population classes

Figure 3 illustrates the distribution by density classes. This distribution is slightly less skewed than that of population. We note that in spite of having a minimum of 300 inh./kmq as a

defining factor for SMT, none of our polygons has a density value less than 463.2 inh./kmq, while maximum value reach 14,804.5 inh./kmq, a "metropolitan" class of urban density (though population size is now the binding constraint for SMTs). Overall, the top 5% SMTs in order of density have densities that are superior to 2,865.3 inh./kmq.

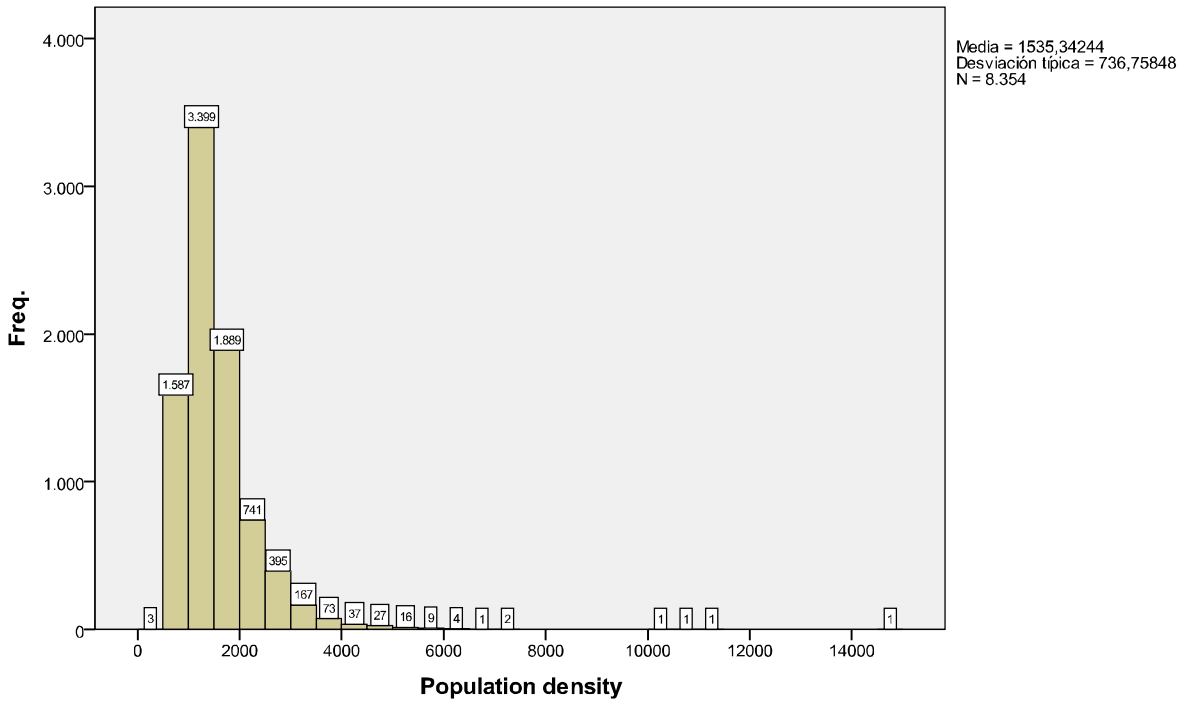


Figure 3. Populations of SMT polygons by density classes

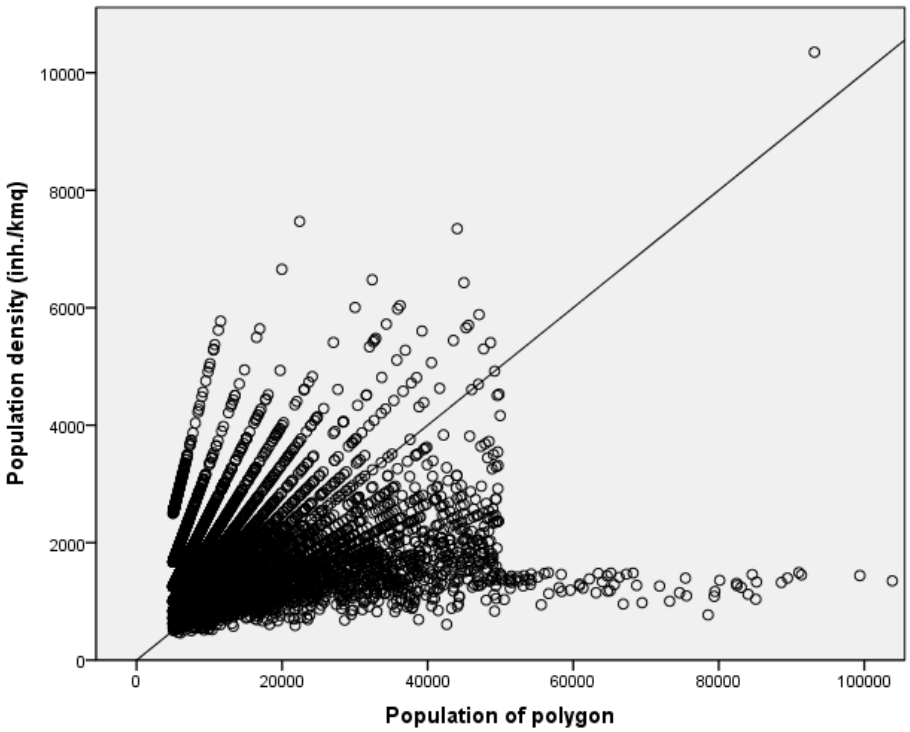


Figure 4. Cross-plot of populations and population densities of basic SMT polygons

Finally, Figure 4 cross-plots populations and population densities of the SMTs. The peculiar "wind fan" structure of the figure is determined by the discrete (and limited) number of pixels in each polygon, producing discontinuities in the distributions of density-population couplets.

Basic SMT polygons may then be further classified, considering different values of population and density of inhabitants, always within the values indicated for urban clusters. Indeed, it should be noted that this basic typology includes among SMTs also urban area that have more than 50,000 inhabitants. As the specs for this project explicitly mentions a population range for urban areas between 5,000 and 50,000 inhabitants as identifier of small and medium towns, a first enhancement oriented at a better understanding of population settlements introduces the subcategory of "large SMT" as those SMTs that have more than 50,000 inhabitants, though having a total population density below the 1,500 inh./kmq threshold of large urban areas (see Table 2).

		DENSITY (inh. / kmq)		
		< 300	***> 300 and < 1500***	***> 1500***
POPULATION (inh.)	***< 5000***	very small town	very small town	very small town
	> 5000 and < 50000	sprawling urban region	**SMT**	**SMT**
	> 50000	sprawling urban region	**large SMT**	high-density urban clusters (DG Regio)

Table 2. Modified SMT typology including large SMT.

This procedure subdivides SMTs into a class of 8254 "normal" and 96 "large" SMT polygons across Europe. The latter correspond to a number of sprawling medium-density regions across Europe.

In Figure 5 we have mapped this modified basic typology against the familiar NUTS3 subdivision, and also including "high density urban clusters" as identified by DG Regio. With respect to Figure 1, we now have a better visual perspective of spatial relations between different cities by "degree of urbanisation". Some further elements that stand out:

- A certain balance in urban systems with a smooth hierarchical structure of high density clusters, large SMT and normal SMT in Italy, Belgium, Germany, as compared with a strongly hierarchical structure in France, Great Britain, Span, and most south eastern Europe, which almost eliminated the intermediate "large SMT" level.
- The presence of clusters of large SMTs in northern Portugal and north-eastern Italy.

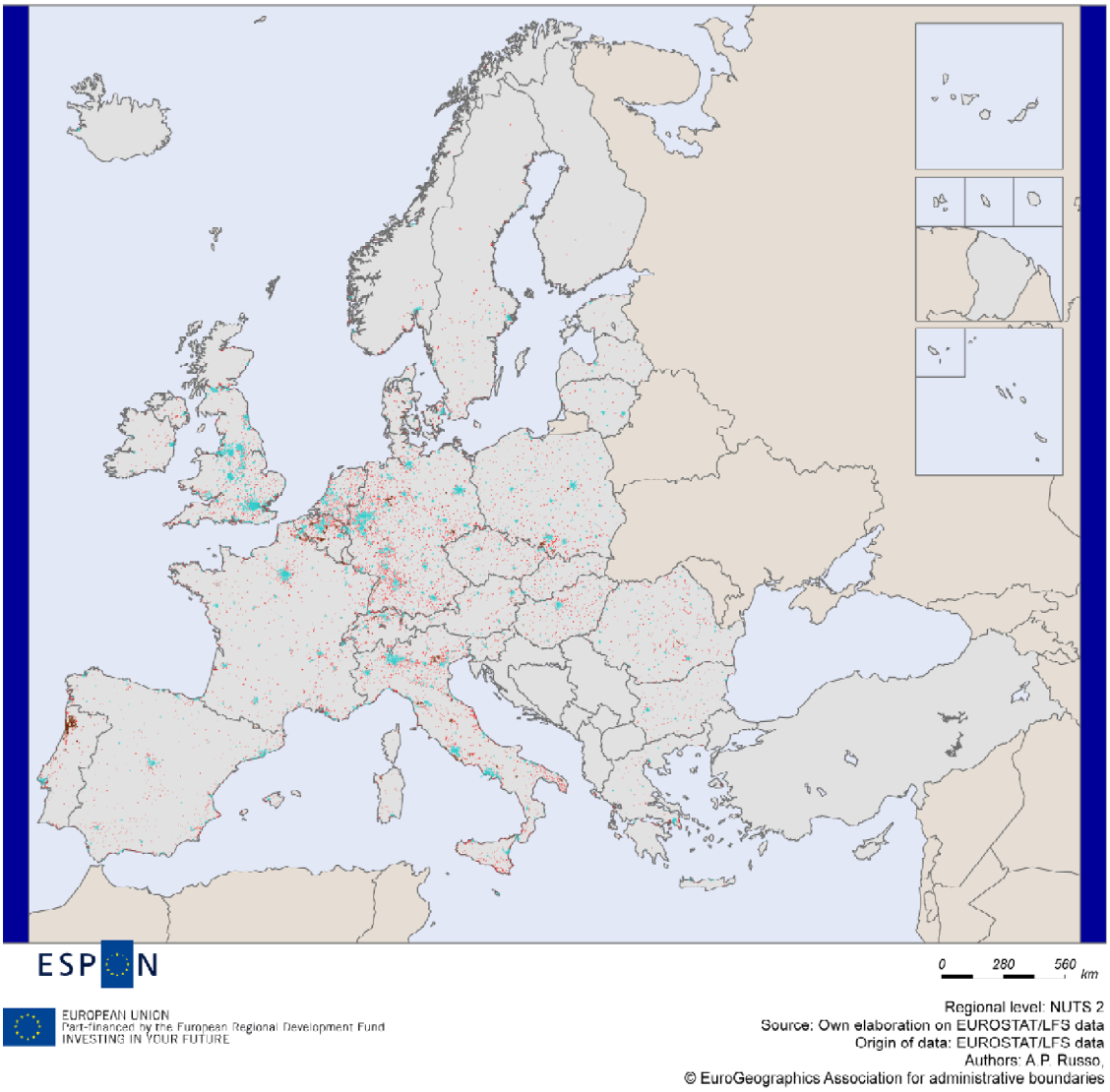


Figure 5. - Basic typology of urban regions within a NUTS3 backdrop, including SMTs, large SMTs and high density urban clusters.

A more sophisticated refinement of the basic SMT typology subdivides them further also including "small SMT" as SMT with a population below 25,000. As a result (See table 3), we now include among SMT:

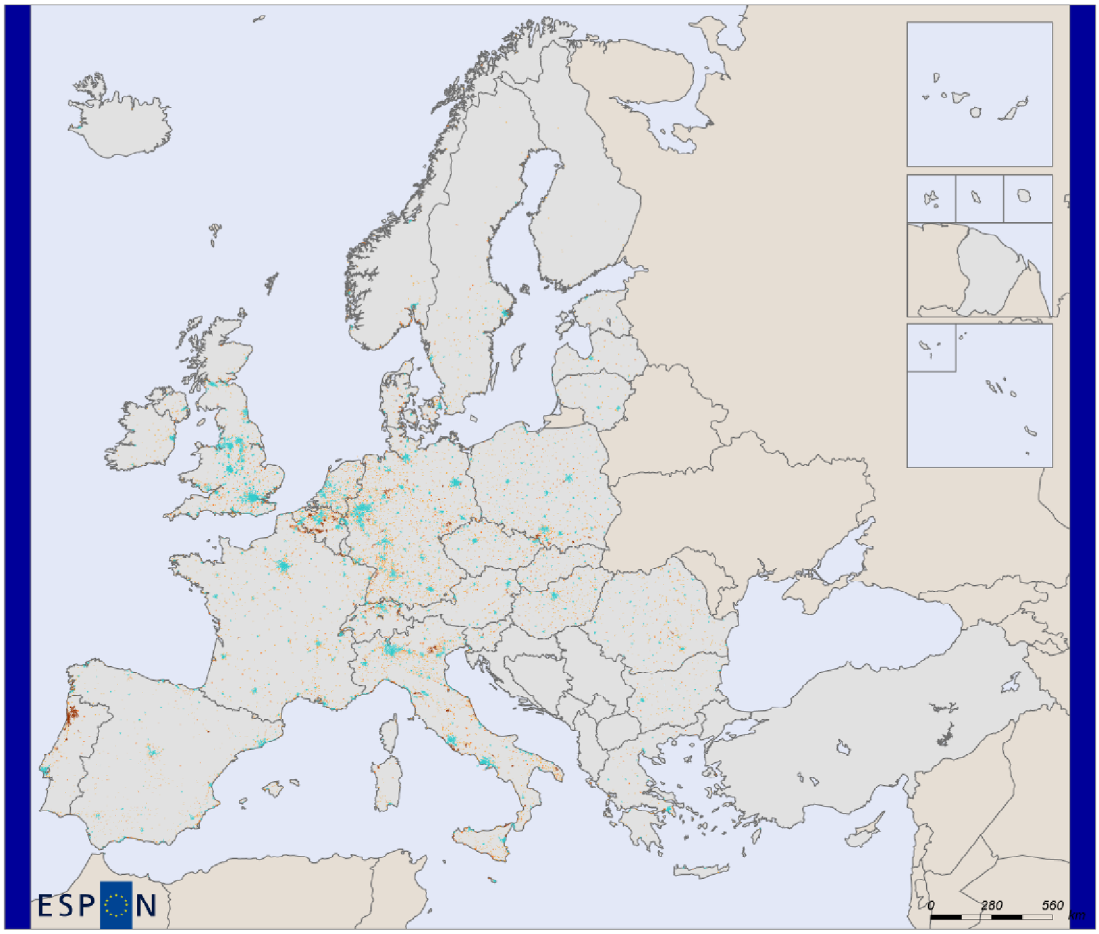
a) **7,301 small SMT**, with a population density of more than 300 inh./kmq and a population of less than 25,000;
b) **953 medium SMT**, with a population density of more than 300 inh./kmq and a population between 25,000 and 50,000,

c) **96 large SMT** as before, with a population density of more than 300 inh./kmq (but smaller than 1,500 inh./kmq) and a population of more than 50,000.

		DENSITY (inh. / kmq)		
		< 300	***> 300 and < 1500***	***> 1500***
POPULATION (inh.)	***< 5000***	very small town	very small town	very small town
	> 5000 and < 25000	sprawling urban region	**small SMT**	**small SMT**
	> 25000 < 50000	sprawling urban region	**medium SMT**	**medium SMT**
	> 50000	sprawling urban region	**large SMT**	large urban areas

Table 3. Modified SMT typology based on 3 population classes

The correspondent classification is mapped out in Figure 6, while Figure 7 cross-plots the values of population and density of the three SMT classes so obtained. In Figures 1.A-E in the Appendix, for a better visualisation of these results, we map SMT classes so obtained as well as high density clusters in five NUTS 1 areas chosen among the case studies in our project.



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Origin of data: EUROSTAT/LFS data
Authors: A.P. Russo,
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High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)

Small SMT: Density >300 (inh./Kmq)
Total population >5000 <25000 (inh.)

Medium SMT: Density >300 (inh./Kmq)
Total population >25000 <50000

Large: Density >300 <1500 (inh./Kmq)
Total population >50000 (inh.)

Figure 6. Typology of urban regions including three categories of SMTs by population ranges and high density urban clusters

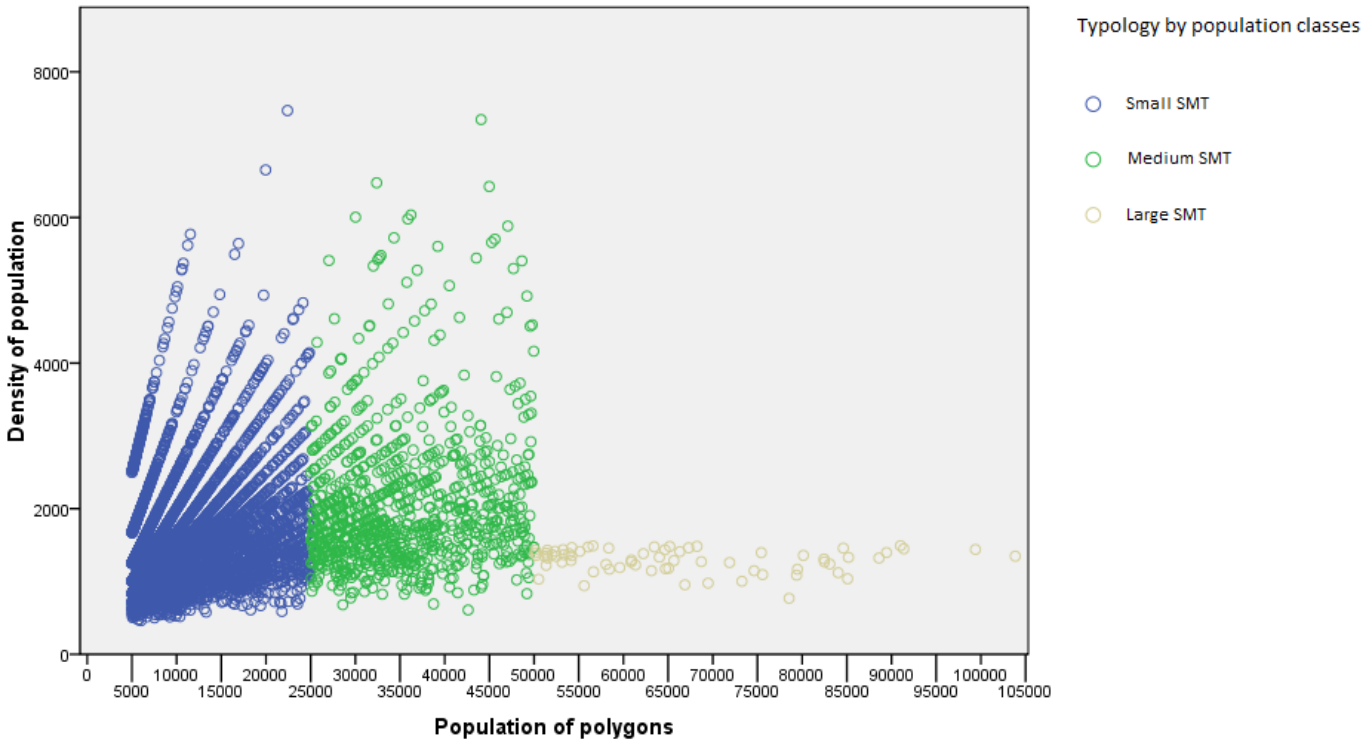


Figure 7. Cross-plot of populations and densities of SMT typology by population classes

A third typology of SMT (Table 4) introduces an intermediate density threshold of 1,000 inh./kmq and identifies:

a) **1,690 low-density SMT**, with a population of more than 5,000 and a population density between 300 and 1,000 inh./kmq;
b) **6,760 high-density SMT**, with a population of more than 5,000 and population density of more than 1,000 inh./kmq (but less than 1,500 inh./kmq for polygons of more than 50,000 inhabitants).

		DENSITY (inh. / kmq)			
		< 300	***> 300 and < 1000***	***> 1000 and < 1500***	***> 1500***
POPULATION (inh.)	***< 5000***	very small town	very small town	very small town	very small town
	> 5000 and < 50000	sprawling urban region	**low density SMT**	**high density SMT**	**high density SMT**
	> 50000	sprawling urban region	**low density SMT**	**high density SMT**	large urban areas

Table 4. Modified SMT typology based on 3 density classes

The correspondent classification is mapped out in Figure 8, while Figure 9 cross-plots the values of population and density of the three SMT classes so obtained. Maps zooming in

case study regions according to this typology are provided in Figures 1-3 (A-E) in the second part of the document.

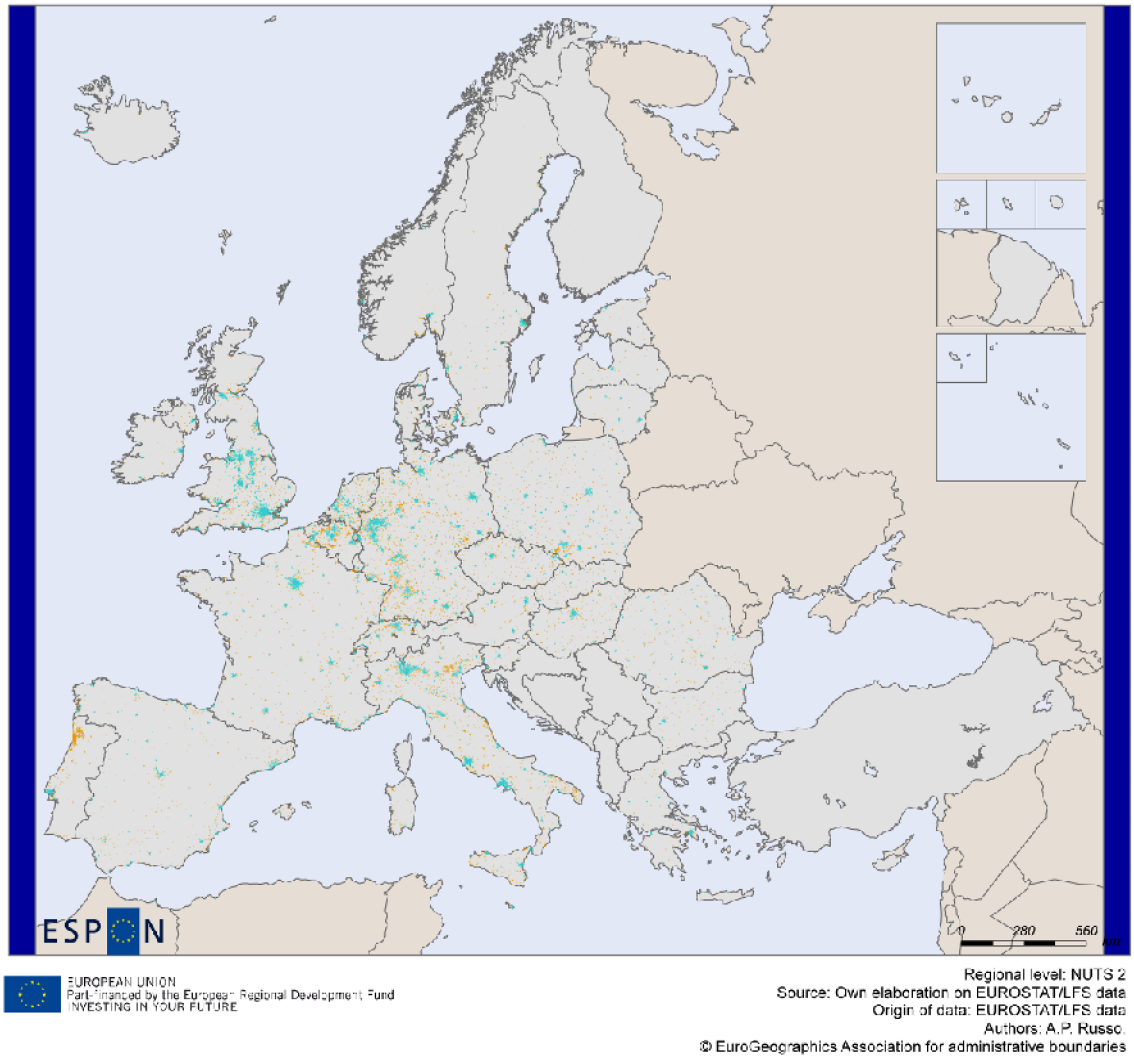


Figure 8. - Typology of urban regions including two categories of SMTs by population density ranges and high density urban clusters

The majority of SMT in most countries belong to the higher density class, coinciding with traditional market towns and secondary poles in metropolitan regions, but we can also devise the presence of low-density SMT clusters around large metropolitan areas like Paris, Athens or Rome, and more diffused low-density SMT networks in industrial areas in the Flanders, Northeast Italy, and Southern Poland, as well as on Italian coasts and along the main communication arteries in the European core.

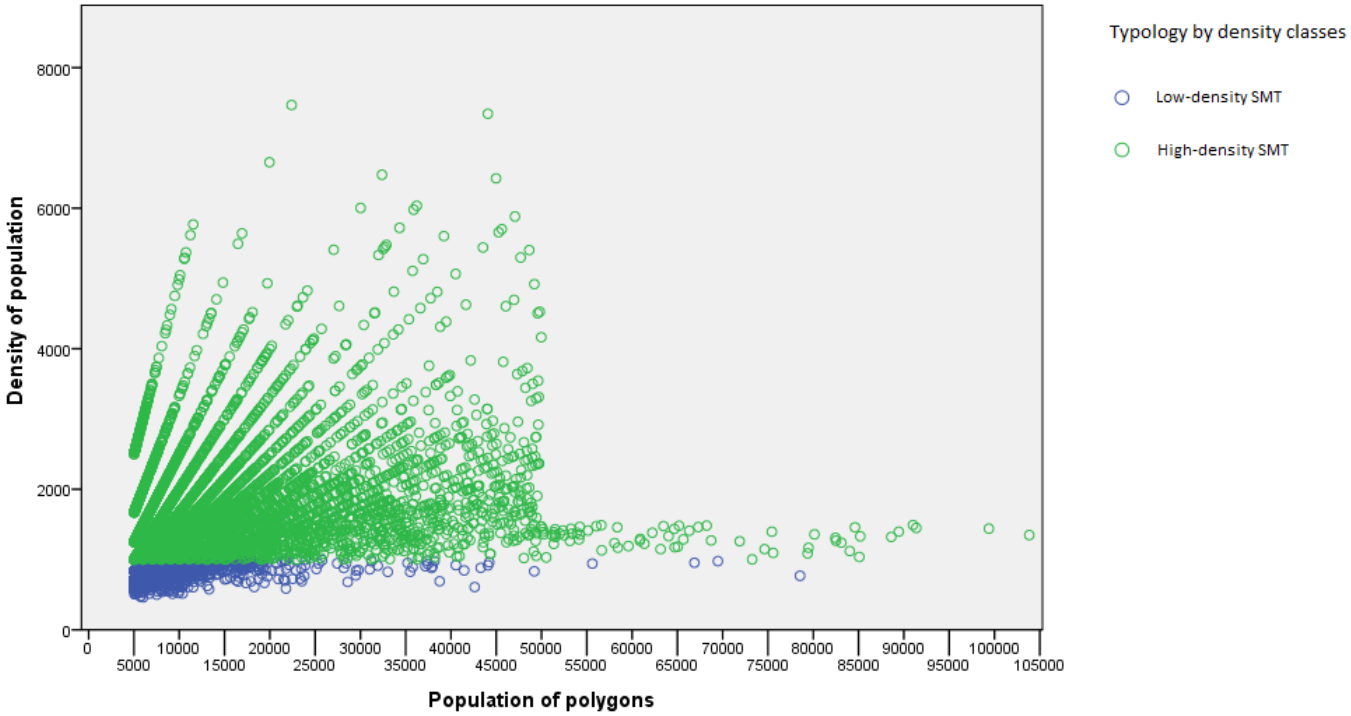


Figure 9. Cross-plot of populations and densities of SMT typology by density classes

Finally, we have included in our cartographic representation of SMT a detail of what could be considered the "urban centres", picking raster cells within basic SMT polygons with, respectively, a density of between 5,000 and 10,000 inh / kmq (high density SMT cores) and more than 10,000 inh./kmq (very high density SMT cores).

This procedure yields a clearer structure of SMTs especially in the case of large agglomerations. Visualisation of this structure at the European scale is virtually impossible, but by way of example, we include here (Figure 10) a fine-scale representation of the zone of Oporto, in the North of Portugal, a large SMT agglomeration in which this refinement allows to distinguish a polycentric structure. Besides, in the Appendix (Figures 3.A-E) we replicate these regional "zooms" for the main urban areas of our case study selection. However it must be noted that this sprawling urban area is among those that are under "suspect" of inaccurate basic grid cell population data, and will need revision.

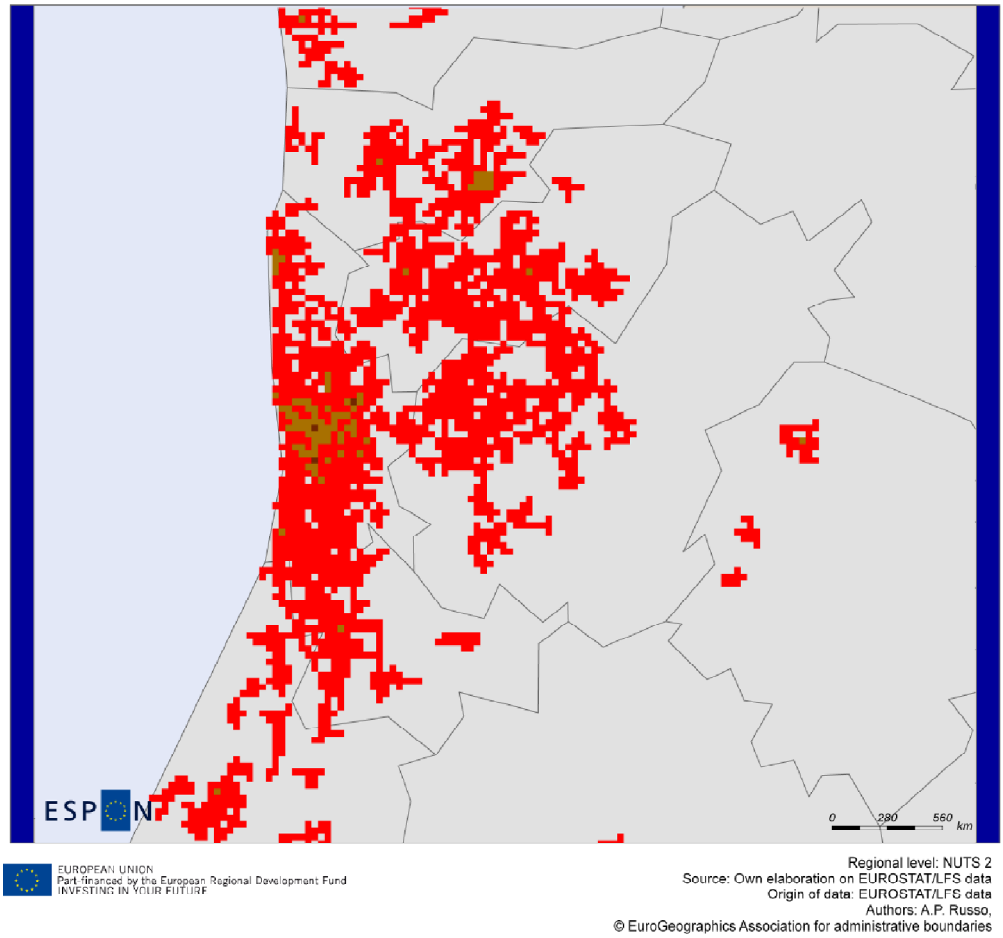


Figure 10. High-density nuclei within a SMT – case of Oporto, Portugal

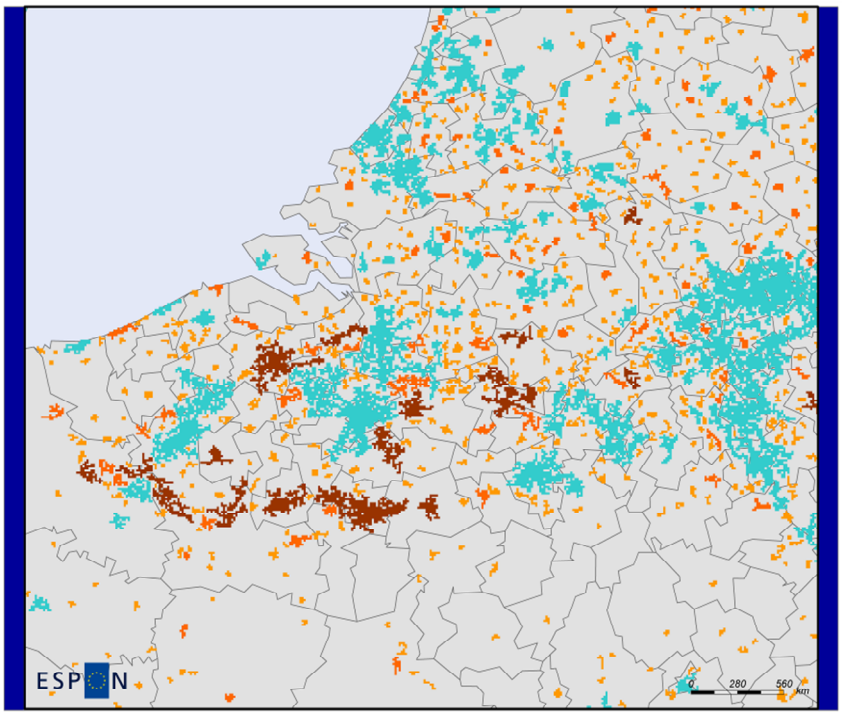
As next steps in this geo-statistical elaboration, in order to provide an input for the analytic research tasks, we will:

1) Revise the population estimation procedure for SMT;
2) Revise the identification procedure of SMT (for instance, filling the "gaps" in the polygon delimitations) and classification criteria, and "separating" what now look like undistinguished agglomerations of SMT according to administrative or geo-analytic criteria;
3) Associate the TPG typologies with territorial features such as NUTS3 and LAU2 delimitations and their attributes, in order to obtain a dataset at the most convenient territorial unit providing information about:
   a. N. of SMT in different classes included or intersecting territorial units (LAU2 and/or NUTS3)
   b. Share of territory in LAU2 and/or NUTS3 covered by SMT.
   c. Share of population in territorial units (LAU2 and/or NUTS3) living in SMT of different classes
4) Carry out geo-analytic tests in order to classify SMT according to their relative position and hierarchical configuration.

PART 2 – Exemplification of SMT typologies

Figure 1 A-E SMT typology by population classes in a selection of TOWN case studies

1.A - Flanders (BE2)



High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)
Small SMT: Density >300 (inh./Kmq)
Total population >5000 <25000 (inh.)
Medium SMT: Density >300 (inh./Kmq)
Total population >25000 <50000
Large: Density >300 <1500 (inh./Kmq)
Total population >50000 (inh.)

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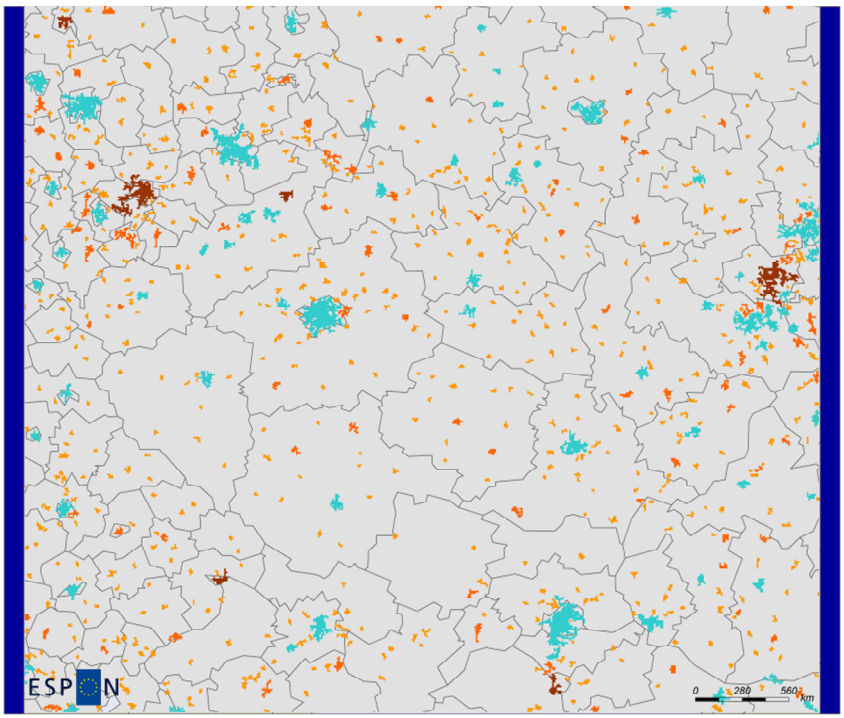
1.B - Czech Republic (CZ0)



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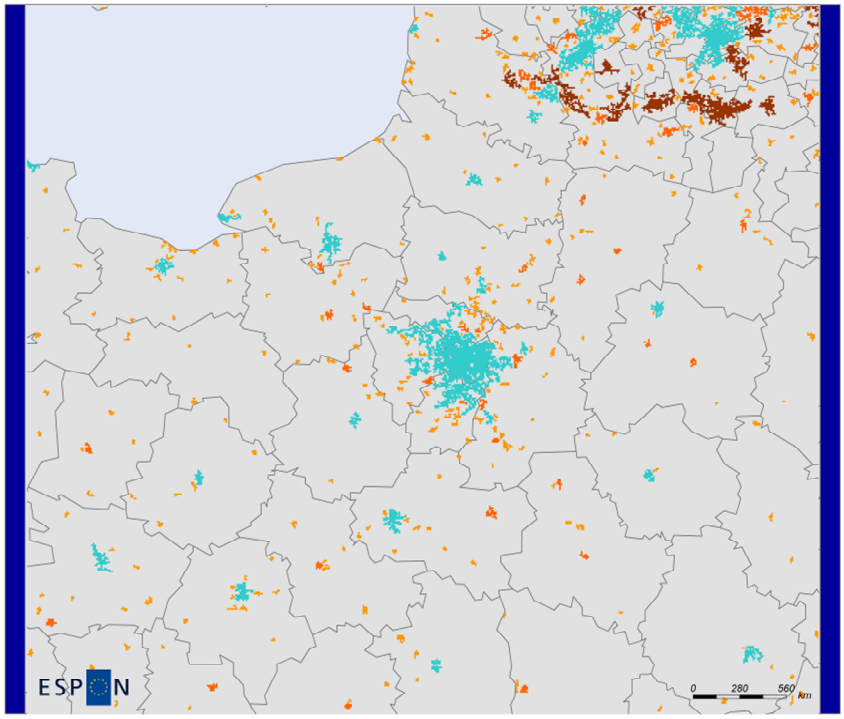
1.C - Île de France (FR1)



High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)

Small SMT: Density >300 (inh./Kmq)
Total population >5000 <25000 (inh.)

Medium SMT: Density >300 (inh./Kmq)
Total population >25000 <50000

Large: Density >300 <1500 (inh./Kmq)
Total population >50000 (inh.)

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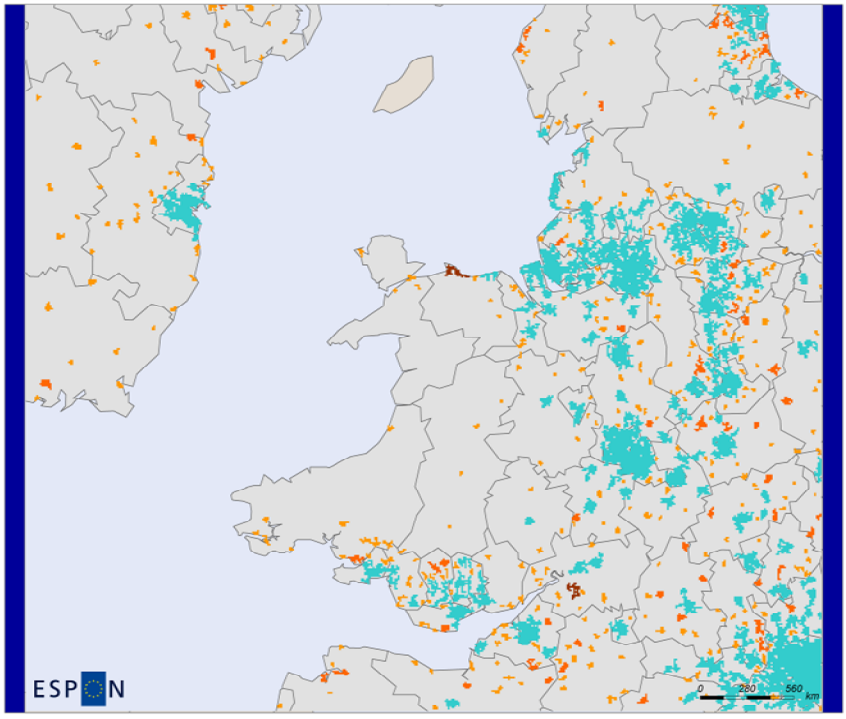
1.D - Wales (UKL)



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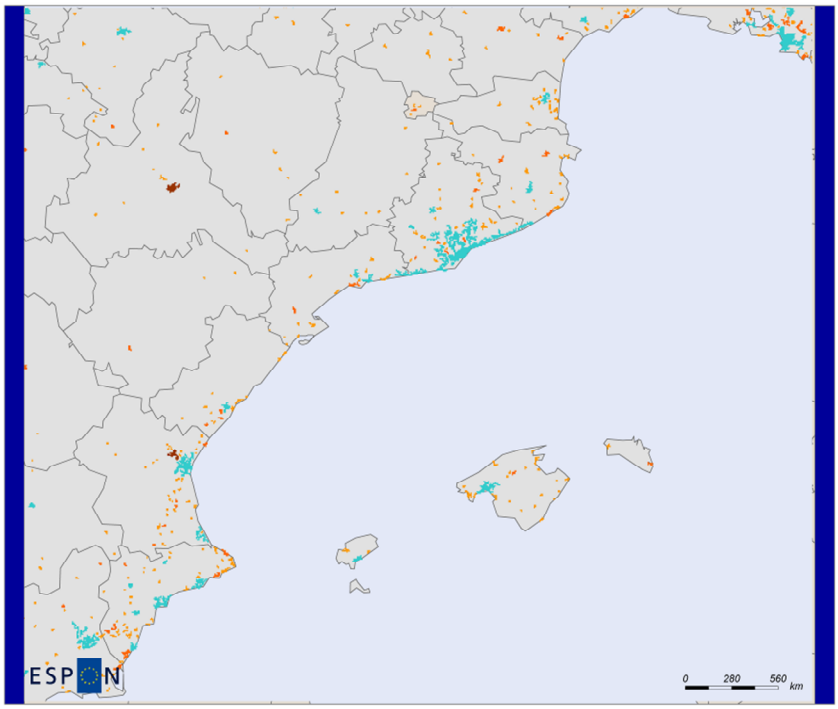
1.E - East of Spain (ES5)



High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)

Small SMT: Density >300 (inh./Kmq)
Total population >5000 <25000 (inh.)

Medium SMT: Density >300 (inh./Kmq)
Total population >25000 <50000

Large: Density >300 <1500 (inh./Kmq)
Total population >50000 (inh.)

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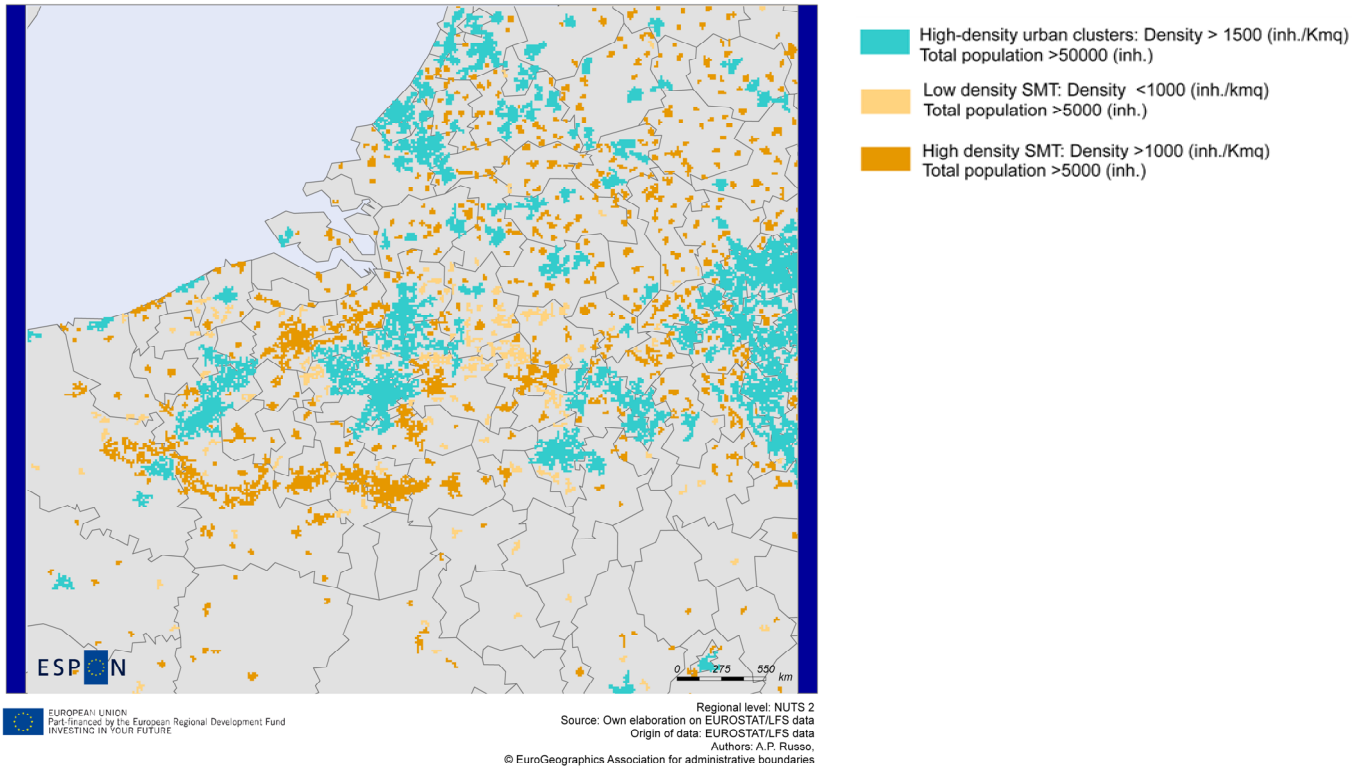
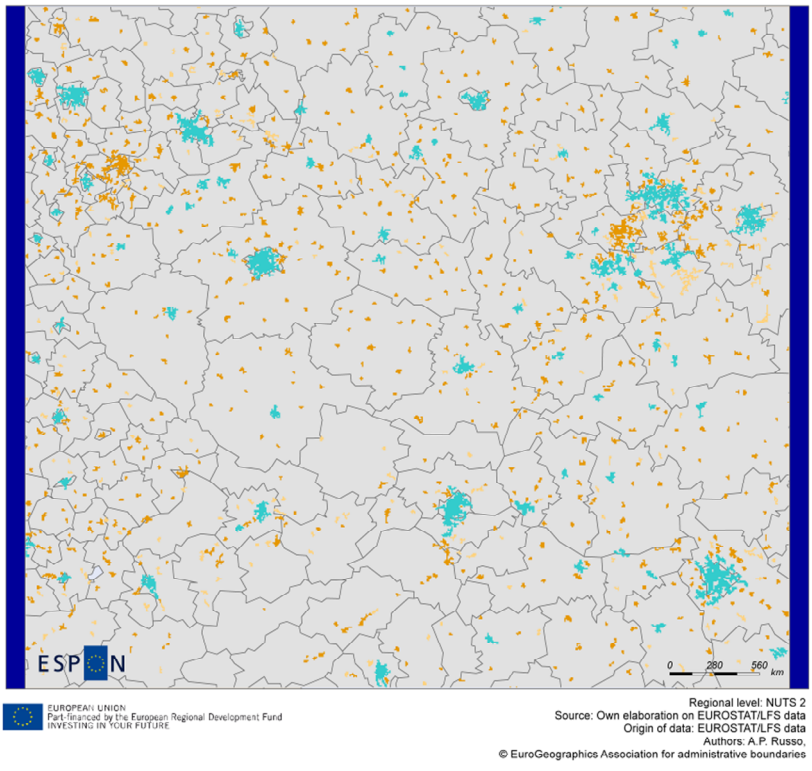
Figure 2 A-E SMT typology by population density classes in a selection of TOWN case studies

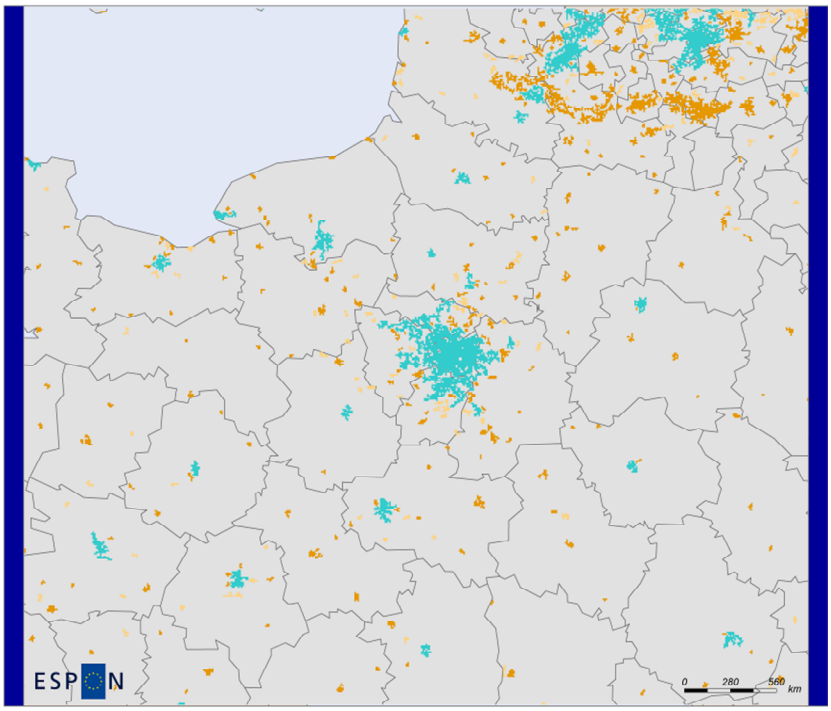
2.A - Flanders (BE2)



2.B - Czech Republic (CZ0)



2.C - Île de France (FR1)



High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)

Low density SMT: Density <1000 (inh./kmq)
Total population >5000 (inh.)

High density SMT: Density >1000 (inh./Kmq)
Total population >5000 (inh.)

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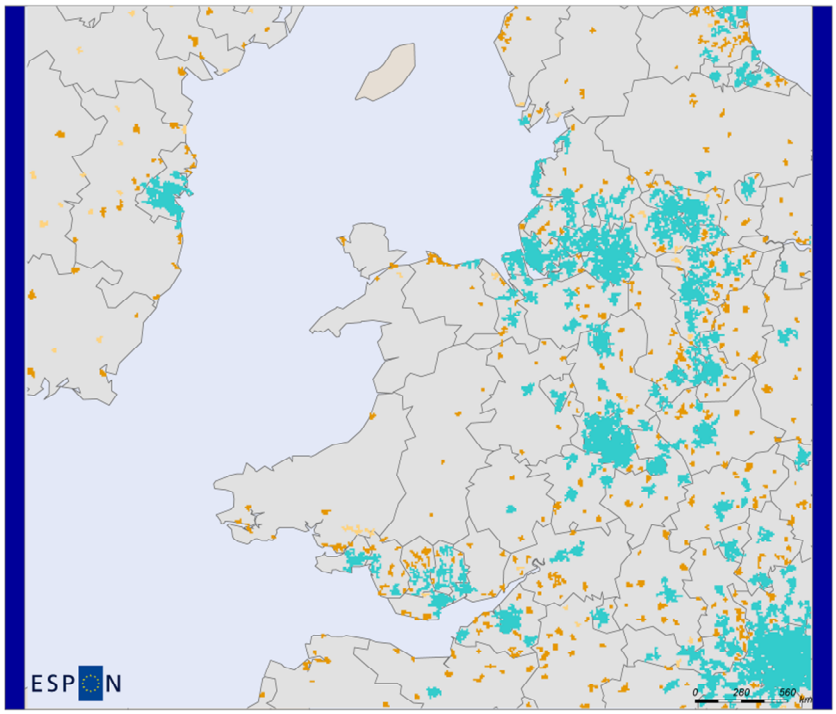
2.D - Wales (UKL)



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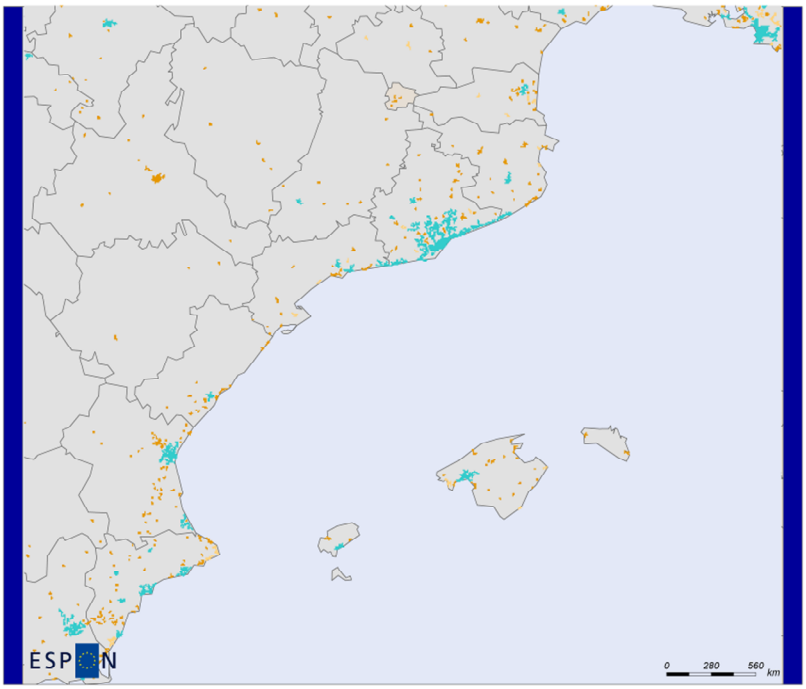
2.E - East of Spain (ES5)



High-density urban clusters: Density > 1500 (inh./Kmq)
Total population >50000 (inh.)

Low density SMT: Density <1000 (inh./kmq)
Total population >5000 (inh.)

High density SMT: Density >1000 (inh./Kmq)
Total population >5000 (inh.)

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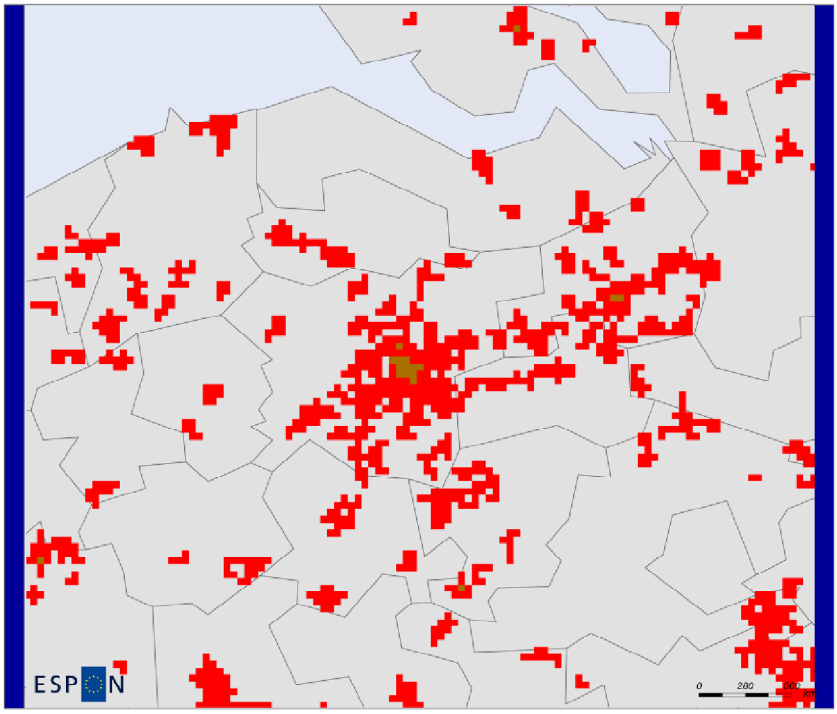
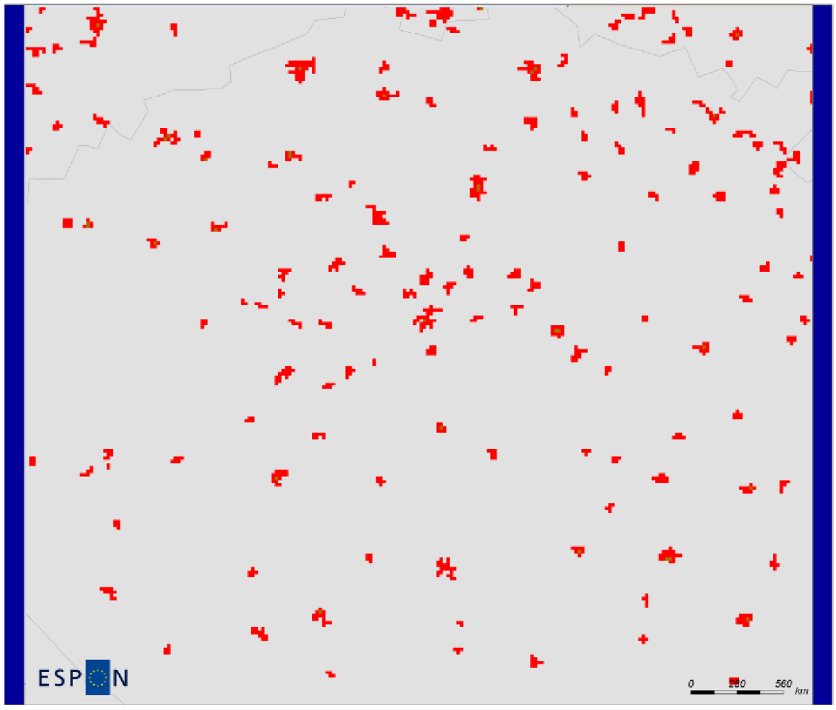
Figure 3 A-E High-density nuclei within a SMT

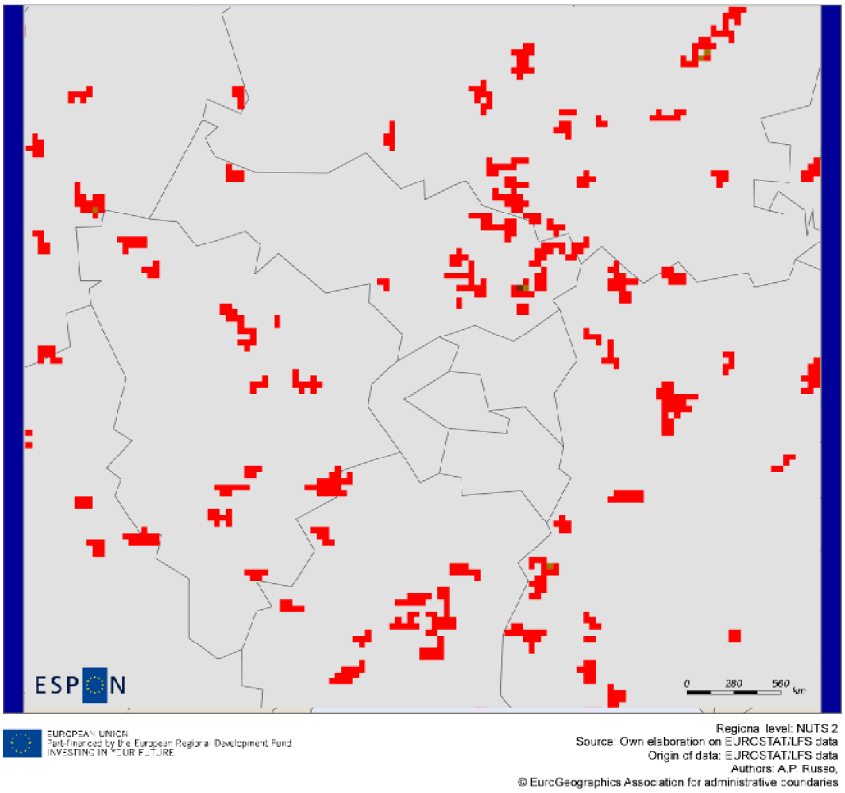
3.A - Area of Gent, Flanders



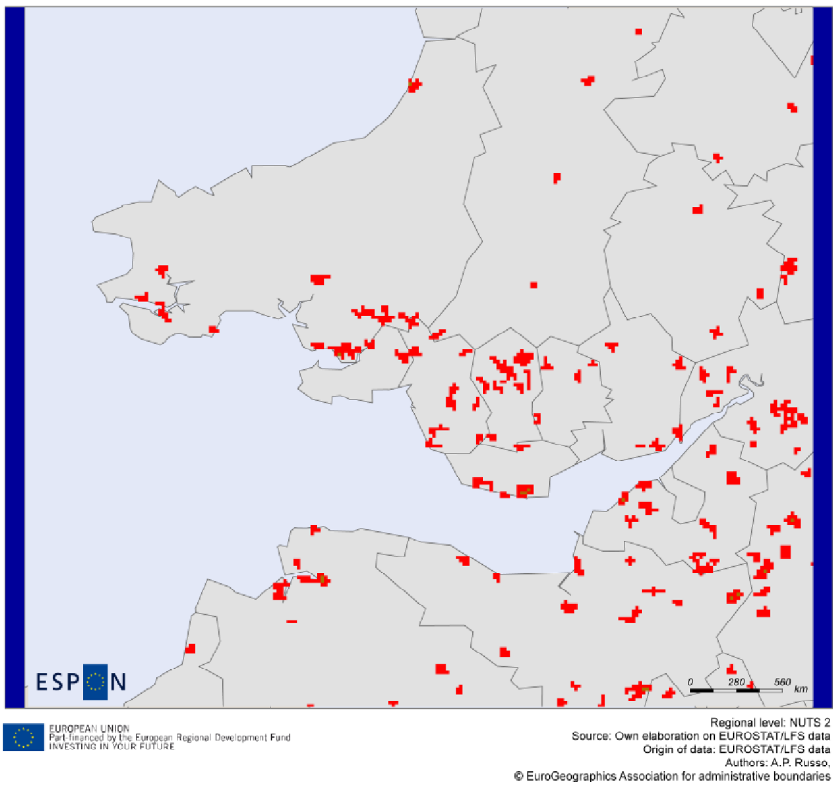
3.B - Area of Prague, Czech Republic



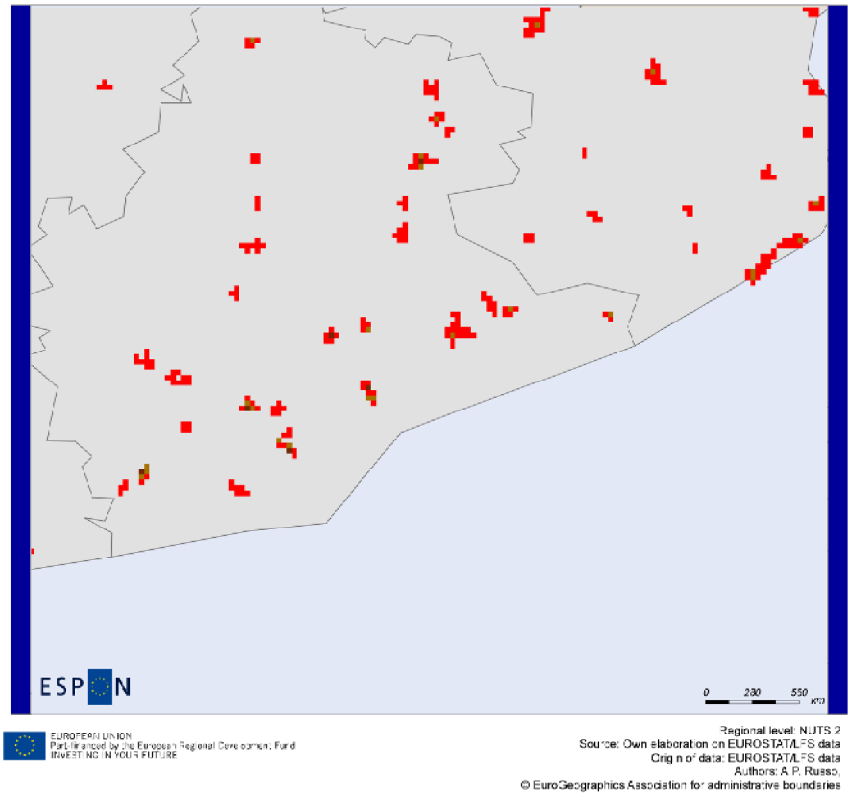
(C) Area of Paris, Île de France



(D) Area of Cardiff and Swansea, Wales



(E) Area of Barcelona, East of Spain



SMT: all SMT (1*1 km cells in SMTs)

high density SMT centres (all 1*1 kmq cells within SMT with density > 5000 < 10000)

very high density SMT centres (all 1*1 km cells within SMT with density > 10000)

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ANNEX B – Case study list and overview of items

State	Second Level **Potential** NUTS 2 -3 (appropriate level of regional governance)
In-house case studies	
Belgium	Flanders
• Federal (smaller) State with larger LAU units • Function of smaller towns in dense urban region based on networked smaller towns • Coastal area	
United Kingdom	Wales
• Unitary (larger) state (but within decentralised 'nation' within unitary state) within context of larger LAU units • Remote rural context (central Wales), within de-industrialising area (the Valleys) and within metropolitan network (Cardiff) • Coastal and mountainous context	
Spain	Catalonia
• Decentralised larger state with smaller LAU units • Polycentric metropolitan regions (Barcelona) with secondary poles • Tourism-related development • Sparsely development rural and mountainous area • Internal EU border (Spain-France)	
Czech Republic	North-western regions
• Unitary smaller state with small LAU units in accession state (2004) • Self standing towns in rural regions, small and medium sized towns integrated in metropolitan regions (Prague) and polycentric networks of small and medium sized towns in urbanised regions outside main metropolitan areas • Internal EU borders (Germany-Poland)	
France	Centre
• Unitary larger state with small LAU units • Independent urban networks and • smaller towns within influence of metropolitan Ile de France (commuting 'exurbs')	
Subcontracted case studies	
Italy	North – West Piemonte
• Unitary larger state with smaller LAU units • Various typologies: Mountainous areas, area within influence of metropolitan area (Torino), internal EU border (Italy-France) • Various economic profiles: Industrial, rural, tourism economy	
Sweden	North Sweden – to be confirmed
• Northern unitary state with large LAU units • Sparse and isolated regions – with internal EU border to Finland, EFTA border to Norway	
Cyprus	Cyprus
• Unitary smaller state with small LAU units in accession state (2004) • Island state, (problematic) border with non-EU area • Tourism-related development	
Slovenia	Slovenia – to be confirmed
• Unitary small state and smaller LAU units in accession state (2004) • Small towns integrated in metropolitan region (Ljublana), towns at coastal area (Adriatic Sea), towns in mountainous areas (borders to EU (Hungary/Italy/Austria) and non-EU countries (Croatia)	
Poland	North Region – to be confirmed
• Unitary larger state with larger LAU units in accession state (2004) • Coastal areas and in regions with internal EU border (Poland-Germany)	

ANNEX C – policy-oriented dissemination deliverables

Item #	Content and format	Targets	Time of delivery
1. policy oriented report based on findings from RA5-6 [REGIONAL TYPOLOGIES]	Production and dissemination of a max 10-page report, including a 1-page summary, introducing our research objectives and presenting the main intermediate results	ESPON MC, ESPON CPs, other policy networks (mailing, using e-channels); download from PPs' websites (to be promoted)	July 2013
2. policy oriented report based on findings from RA4 [CASE STUDIES]	Production and dissemination of a max 10-page report, including a 1-page summary, illustrating the main results from case studies and discussing their potential general relevance	Policy stakeholders from case studies regions (through direct contacts established during RA4); ESPON MC, ESPON CPs, other policy networks (mailing, using e-channels); download from project website (to be promoted)	September 2013
3. policy oriented report based on overall project results	Production and dissemination of a max 10-page report, including a 1-page summary, illustrating the main general results from the project and especially the policy analysis developed in RA6	ESPON MC, ESPON CPs, other policy networks (mailing, using e-channels); download from PPs' websites (to be promoted)	January 2014
4. SMST international Workshop	Presentation and discussion of the case study results with selected stakeholders and policymakers from case study regions	Workshop to be held Dic 2013, with invited participants from case study regions	December 2013
7. SMST policy seminar	Presentation and discussion of the project results with ESPON stakeholders and policy networks	Workshop to be held in Brussels with a open call for participation through the ESPON network and selected invited participants	March 2014

Table 4.1.: policy-oriented dissemination deliverables

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