Evaluating Spatial Planning Practices with Digital Plan Data

Inception Report

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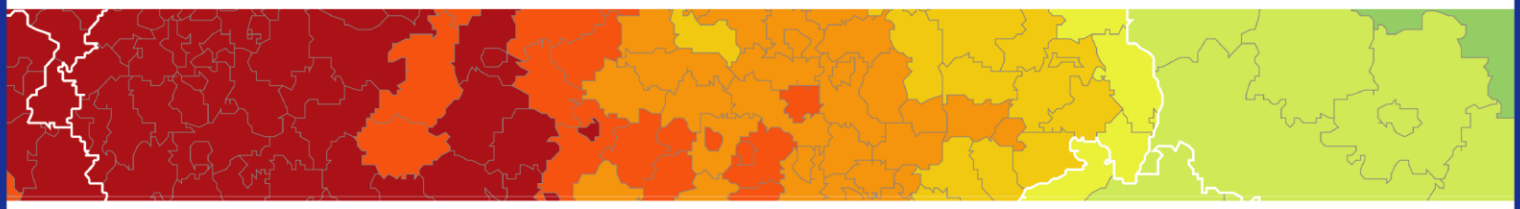
Publication date:
2020

Document Version
Publisher's PDF, also known as Version of record

ESPON

EUROPEAN UNION

Co-financed by the European Regional Development Fund



DIGIPLAN – Evaluating Spatial Planning Practices with Digital Plan Data

Targeted Analysis

Inception Report

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This targeted analysis activity is conducted within the framework of the ESPON 2020 Cooperation Programme.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

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

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Version 15/04/2020

Disclaimer:
This document is an inception report.

The information contained herein is subject to change and does not commit the ESPON EGTC and the countries participating in the ESPON 2020 Cooperation Programme.

The final version of the report will be published as soon as approved.

Table of contents

List of Figures

List of Tables

1 Introduction and objectives

In the past decade, many European countries have taken significant steps to set up digital plan registers and the digitalization of spatial planning processes. Digital plan data opens a range of new possibilities to get insights into planning practice and the role of planning for spatial change over time. However, evidence on the possibilities offered by digital plan data and their actual use is missing. At the same time, digitalization of plan data can be assumed to have considerable impact on planning practice.

The topic of digitalization of plan data is therefore twofold: (1) a provision/production side, meaning how are plans digitally represented, and (2) a user/consumption side, meaning how are plan data used and influencing planning practice. Digitalization of plans can therefore not be seen isolated from planning practice. The digitalization is based on practice, because that is what it should represent, and practice is influenced by digitalization, because it redefines, changes or introduces terms, standards, procedures, and relevance.

ESPON DIGIPLAN will analyse approaches across different, national planning systems including methods for evaluation with plan data and how planning is actually represented in such data. Based on case studies, the overall objective of this activity is to analyse and compare:

- the scope of digitalisation of plan data - what is digitized and what is it digitized for?
- the organisation and financing of the digitalisation - how is it digitized?
- the current and potential future uses of digital plan data - how is it/can it be used?

More concretely, the objective is to provide both an overview and in depth, practice-oriented knowledge and recommendations on these matters, and to respond to stakeholders' knowledge needs.

ESPON DIGIPLAN will provide an overview on digitalization of plan data in 15 ESPON countries (Task 1) and insight information from case studies in 6 countries (Task 2), including the stakeholder countries of this analysis: Denmark, Norway, and Switzerland.

In this inception report, we present key concepts and selected findings from literature. We present the rational, data collection approach, the selection of cases for Task 1 and Task 2, and present some ideas for the thematic papers (Task 3).

The inception report was discussed at the steering committee meeting in Copenhagen on 18 February 2020 and a written response by ESPON and the stakeholders was given .

2 Concepts and research background

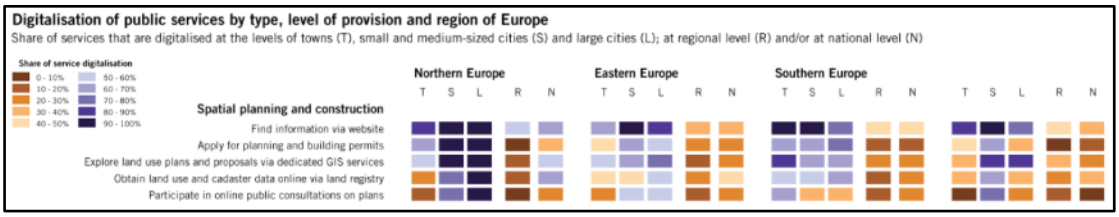
A first overview of literature and useful concepts follows. The research team will continuously elaborate that based on a more extensive review of literature (see also Annex 1).

2.1 Digitalization

Digitalization of workflows and datasets produced both in the private and public sectors has gained momentum. The Nordic countries lead the digitalization process in Europe (EC, 2017) which is driven by ideas of efficiency, expressed for example in the ideals of “smart cities” and “digital governance”, ideas of participation, where key aims include the establishment of “open governments” and “open data”, and a hope for new economic growth based on this data (UN, 2017). International policies as EU’s INSPIRE directive from 2007, EU’s strategy for a digital single market or also the Arctic SDI Strategy from 2015 are driving this digitalization process. Regarding spatial planning, the Aarhus Convention (UNECE, 1998) constituted more than 20 years ago an overarching reason for improving public accessibility to planning information relevant to the state or development of the environment.

ESPON’s recent policy brief on the digital transition (Martino et al., 2018) provides some hints on the current state of digitalisation in spatial planning (Figure 2.1). Many cities provide various services around planning, including exploring land use plans with GIS servers and obtaining data online via land registry. On the national level though, the study identifies only few services digitized. However, as shown in section 3.1 and Annex 2, several countries have digital plan registers or are in the making of it. In federal or regionalised countries, many regions have built up similar systems.

Figure 2.1 Digitalisation of spatial planning in European cities (Martino et al. 2018)



Digitalization of plan data is not new. Its first boost came with the availability of GIS software with graphical user interfaces in the 1990s. However, registers such as in Denmark, Switzerland or Norway, all stakeholders in this targeted analysis, take existing digitalization efforts to a new level. In this context production, sharing and transdisciplinary use of digital data is becoming embedded within established planning practices, meaning that the character of planning itself may be changing with the new technology, while at the same time it is being documented in numerous new ways.

2.2 Representation of space

Geodata and plan data are different types of spatial information; "maps" and "plans" are produced and consumed on the basis of different concerns with space, yet they rely on each other and share data. Both regulate the relationship between citizenship and space. An essential difference between them resides in their concern with time and their attribution of rights to the uses of space. Today geodata and plan data blend together through the information flow of increasingly integrated digital systems of data production and consumption. In the widest sense, a spatial plan is the association of a spatial grid with norms and regulations for the attribution and uses of rights (Mazza, 2010). A question, then, is how digital information facilitates the attribution and uses of rights in different national contexts, according to their institutional planning systems, the level of digitalization of public services and plan data, and the culture of spatial planning practice in each case.

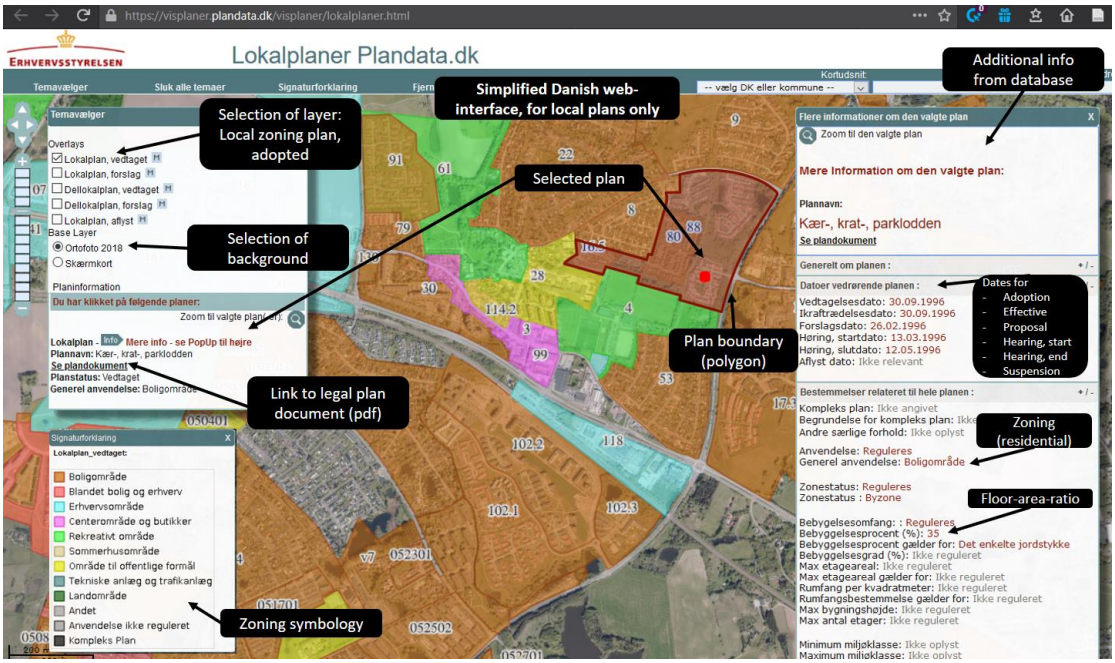
In the field of spatial planning the national "owner" of the institutional planning system (often represented by ministerial authorities) seems to be motivated by the possibility of an apparatus capable of aggregating and communicating everything. This aspiration implies a potential conflict of interests regarding the system's performativity. While digitalization may improve the efficiency of production and consumption of data through planning activities, a plan is, nonetheless, an image; a symbolic form, subject to individual and collective decoding and interpretation (Gabellini, 1996).

The relationship between public sector digitalization agendas (or private developers agendas in some cases, as digital technology providers with public sector clients) and the formation of public awareness of spatial phenomena and processes may then be an issue of concern. Integration of geodata and plan data into common systems of information requires a significant degree of standardization of data and regulation of the information flow, possibly enhancing data accessibility at the expense of the cognitive and structuring role of plans. At stake is an appropriate representation of space in planning and decision-making processes, and the balance between relevant and excessive information. Assessment of the balance between the efficiency of digital plan data and good spatial planning practices requires conceptual clarity on types of spatial information and the regulation of the relation between citizenship and space.

2.3 Digital plan data

In a narrow sense, plan data can be defined as geodata reflecting planning regulations. Polygons representing a discrete zoning map done by the local planning authority are an example (see Figure 2.2). The data represents e.g. specific usage rights or building restrictions for a specific area, binding for more detailed plans or landowners directly.

Figure 2.2 Example of digital plan data in one of the Danish web-interfaces



On the other side of the scale, we have more visionary and strategic spatial plans, often with fuzzy boundaries and only indications for intended spatial changes. Plan data must then be assessed as strategic representations of spatial development, often in the form of spatial grids or diagrammes indicating courses of action, anticipating the making of zoning and regulation. Strategic spatial plans can also be digitized, but either only with very basic information or with more details but not standardized across different plans. As planning becomes more strategic at all levels and planning tools more adaptable, it is important to analyse the digitalisation of these types of plans in particular. However, regulatory plans have not disappeared and get new attention with digitalisation.

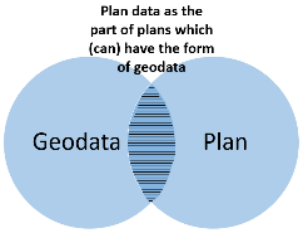
Both types of plan data can be provided at different spatial/policy scales, e.g. on the national, sub-national and the municipal/local level. The ESPON Compass classification of planning instruments can be used as a lens to look at the digital plan data in different planning types. In Task 2 we have the possibility to describe and analyse the different types of plans getting digitized or rather (if advanced) how planning processes and regulations are conducted in a digital environment from the beginning.

Finally, knowing the purpose, intentions, and not least the history behind the digitalisation is important to interpret the data correctly. One of the big advantages of digital plan data, being flexible to use, is at the same time its greatest challenge as it can easily be taken out of context or used in contexts not intended to. That means there are high requirements to the data quality, but at the same time, the (future) requirements might be unclear when plans are digitized.

Figure 2.3 Different perspectives on digital plan data

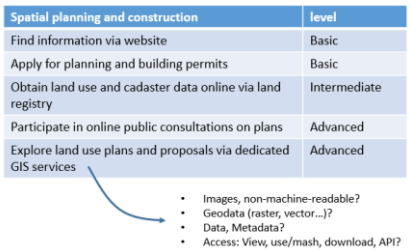
Digital plan data as a special form of geodata

Digital plan data can be understood as a special form of geodata. It covers a specific area with some attributes. Special about plan data is the explicit character of showing intentions and regulations, not a current state, although the difference in practice will be less clear. Furthermore, a plan consists also of many other elements which might not be geolocated other than, for example, covering the whole municipality (e.g. a certain goal or vision formulated in the plan).



'Digitalisation grade' of plan data

In practice, the digital version of e.g. a zoning map could be a scanned image/not machine-readable or it could be raster or vector data (e.g. polygons) with metadata included. Also the accessibility of the data can be different, e.g. only viewing, including tools to use, download as geodata or accessible via an API as well as openly/publicly or limited accessible. The ESPON Policy Brief on the Digital Transition of Public Services outlines different levels of services which could be digital - within these services (as illustrated to the right) we can also find different grades of digitalisation.



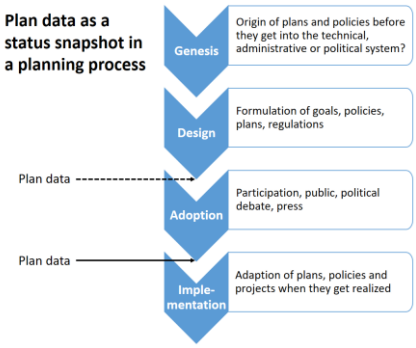
Spatial planning and construction	level
Find information via website	Basic
Apply for planning and building permits	Basic
Obtain land use and cadaster data online via land registry	Intermediate
Participate in online public consultations on plans	Advanced
Explore land use plans and proposals via dedicated GIS services	Advanced

- Images, non-machine-readable?
- Geodata (raster, vector…)?
- Data, Metadata?
- Access: View, use/mash, download, API?

Plan data in the planning process

Planning involves a process and only parts of such a process is covered in a plan proposal, plan or similar. We can assume that standardized plan data is rather limited in relation to such a process, only representing a snapshot. Especially the early phases of a plan process might not be represented in plan data. Other information might be digitized, but not in a standardized format. Using plan data must critically reflect this limitation of representation of the planning process.

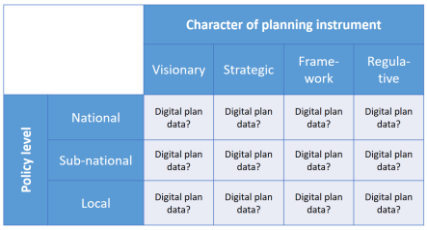
Another perspective is the legal status of the plan data - is it actually a digital plan or is the digital representation only for information purposes.



Planning phases based on (Flyvbjerg, 1992)

Plan data from different plans and policy levels

The ESPON COMPASS project (Nadin et al., 2018) showed the wide variety of plans and policy levels involved in spatial planning in Europe. Digital plan data, if existing, will have a very different form of representation depending on the character of the planning instrument and the policy level.



		Character of planning instrument			
		Visionary	Strategic	Frame-work	Regula-tive
Policy level	National	Digital plan data?	Digital plan data?	Digital plan data?	Digital plan data?
	Sub-national	Digital plan data?	Digital plan data?	Digital plan data?	Digital plan data?
	Local	Digital plan data?	Digital plan data?	Digital plan data?	Digital plan data?

The purpose of digitizing plan data

To understand the logic, format and content of plan data, we need to know the reasons for its digitalisation, the motivation and purpose. It could be framed in a general digitalisation agenda in the public sector with overall goals about efficiency, open governance and new growth based on data. It could also be part of more specific, planning related goals as allowing for digital participation and hearings, digital planning permit processes and easier cooperation among departments or different authorities.

To summarize, digital plan data can be characterised by:

- Geographical – thematic – judicial – performative
- Intentions and regulations on current and future land use as well as infrastructure
- Different 'grades of digitalisation' (digital plan data vs. legally binding plan)
- Representing snapshots or evolution in the planning process

- Varies with planning instrument and policy level
- Made for a specific purpose(s) – but certainly used beyond
- Covering a whole planning system (e.g. of a country)

The latter is important as it mirrors the scope of digitalisation, which is significantly different from earlier approaches.

2.4 Spatial planning systems, practice and digitalization

Comparative analysis requires an understanding of institutional spatial planning systems. This might be a record of how governance is organized in each case, but also, more specifically, the functions that characterize planning, and the existence of instruments allowing the system to perform accordingly. Constants one should be looking for are 1) instruments that structure decision-making, endowing plans with a functional programme (strategy), 2) instruments performing implementation and change (policy, design), and 3) juridical provisions (regulation, guidelines). (Mazza 1996) On this backdrop one can observe how governance systems structure the flow of information relating to the functions and instruments of spatial planning, and assess the role played by digital plan data.

The digitalization of planning has a number of likely but still unknown effects. It is likely for example that digitalization, which itself entails a degree of geometrical, thematically, and technical standardization of workflows to be practically feasible, will lead to more standardization of how to plan – i.e. a standardization of visions for future land use formulated by communities and institutions.

It is also likely that digitally facilitated processes of public participation as well as the presence of wider, online domains for dissemination- and accessibility-processes mean that plans attain new performative roles. Plans may be used outside the expert community where it is produced and that in turn can influence how planners work.

There has been an interest of using digital plan data in the context of Geodesign, defined as a set of concepts and methods used to involve all stakeholders and various professions in collaboratively designing and realizing the optimal solution for spatial challenges in the built and natural environments, utilizing all available techniques and data in an integrated process (Steinitz, 2012).

3 Task 1 – Overview of 15 countries

The overview of the digitalisation of plan data in 15 European countries (Task 1) includes a desk research and follow-up phone interview. The task mainly covers the scope of the digitalisation of plan data (e.g. what kind of plan data has been digitalised in what period of time?) and the current uses of digital plan data (e.g. who has access to the digitalized data?). Its main output is a synthetic and up-to-date overview on the digitalisation of plan data in the 15 selected European countries, including tables, visualisations and maps. Findings of Task 1 will serve as background information for Task 2, which focuses on the consequences of the digitalisation of plan data on planning practices.

3.1 Selection of 12 additional countries

Besides Denmark, Norway, and Switzerland, which are selected by default since they are DIGIPLAN stakeholders, the research team selected 12 additional ESPON countries for Task 1. Three of them also for Task 2. The selection is based on the following criteria:

- The country must have an up and running digital platform containing plan data. The research team has done an online search on national (or regional) platforms. The most advanced platforms, i.e. containing a diversity of plan data and offering a number of interactive possibilities for the users, were selected since they are considered as the most interesting cases. Examples can be seein in Annex 2.
- The selected countries should represent countries having diverse territorial administration (different types of unitary countries as well as federal countries). The digital platform reflects the differences between countries, i.e. a federal country having a digital platform at the provincial/regional level whereas it would cover the entire national territory in a unitary country.
- The selected countries should have a diversity of administrative levels. The number of administrative levels could have an incidence on the complexity of the digital platform to develop.
- Last but not least, the language skills within the research team are an important criterion since some of the digital platforms and related documents to be investigated are only available in their national languages; so are most of the legislation that would also be analysed. Finally, it would contribute to get more precise information out of the interviews.
- For the in-depth cases in Task 2, it is furthermore important to have sufficient knowledge of the cases' planning systems within the team (see section 4).

Table 3.1 lists the case study countries selected in the ESPON DIGIPLAN project. The geographical balance was not a criteria. In that sense, the list has a under-representation of countries from the eastern part of Europe, which is explained by the lack of digital plan data

platforms (or only in a very basic form), and the team's insight (language and planning) in these countries.

Table 3.1 Selected countries in Task 1 & 2

	Country name	Territorial administration	Gov. levels	(examples of) Digital platform (URL)
Stakeholder countries	Denmark	Federal	2	kort.plandata.dk
	Norway	Decentralised	3	kart.geonorge.no/seplan
	Switzerland	Decentralised	3	map.geo.admin.ch
Task 1+2	Austria	Federal	3	maps.tirol.gv.at
	France	Decentralised	3	geoportail-urbanisme.gouv.fr/map
	Germany	Federal	4	geoportal.bayern.de/bayernatlas
Task 1 only	Belgium	Federal	3	geoportail.wallonie.be/walonmap
	Ireland	Centralised	4	https://viewer.myplan.ie/
	Italy	Regionalised	4	servizimoka.regione.emilia-romagna.it/appFlex/PSC_Flex.html; sardegnageoportale.it/webgis2/sardegnamappe/?map=monitoraggio_strumenti_urbanistici; idt2.regione.veneto.it/idt/webgis/viewer?webgisId=62
	Lithuania	Centralised	2	map.tpdr.lt/tpdr-gis/index.jsp?action=tpdrPortal
	Luxembourg	Decentralised	2	map.geoportail.lu
	Malta	Centralised	2	geoserver.pa.org.mt/publicgeoserver
	Portugal	Centralised	5	portalsnit.dgterritorio.pt/portalsdisnit/full.aspx
	Slovenia	Decentralised	2	storitve.pis.gov.si/pis-jv/informativni_vpogled.html
	The Netherlands	Decentralised	3	ruimtelijkeplannen.nl/viewer

Source: Levels of governance relevant for spatial planning (Nadin et al., 2018); Territorial administration (Magone, 2011)

The first three countries listed correspond to the stakeholder countries that are default cases for both tasks 1 and 2. The following three countries, namely Austria, France and Germany, correspond to countries with an up and running digital platform that contains plan data.

Interesting aspects include, for instance, the digital platform of Bavaria[1] (Germany) which has specific layer for the green areas that is included in the regional planning document or the platform for Tyrol (Austria), which includes the maximum possible extent of ski areas defined by the regional spatial planning program[2]. The "geoportal" of France highlights the territories covered by "territorial coherence programme" (Schéma de cohérence territoriale) and allows an access to the relevant planning documents[3]. Equally important here are the team's language skills in these cases (native or fluent), enhance a good collection of information through the desk study and interviews. Furthermore, the research team has experience and knowledge in the planning context of these three selected cases, which is crucial for Task 2.

The next nine countries correspond to countries with an up and running digital platform that contains plan data and for which the team of researchers have language skills (native or fluent) to enhance a good collection of information through the desk study and interviews. Native level in the French language contributes to analyse the rather advanced digital platform in Belgium (Wallonie) and Luxembourg that contains a variety of plan data, such as local and mobilities plans in Wallonia and sectoral plan for transport in Luxembourg. Similarly, fluent level in Italian and Portuguese enable the analysis of a regional digital platform in Italy such as in Sardinia or Emilia-Romagna, and the nation-wide platform in Portugal that contains plan data at several governance levels. Finally, the use of English is the working-language for the analysis of the digital platform in Ireland, Lithuania, Malta, Slovenia and the Netherlands. For instance, the digital platform in Malta includes a number of plan data layers such as urban conservation areas and areas of containment, among others. The digital platform in Ireland is of interest due to its inclusion of historical plan data, among others. The case of Lithuania is interesting, among others, because since 2014 all plans have to be registered in the online platform in order to become valid. The digital platform in Slovenia contains plan data at both national and municipal level, but also goes down to the level of building permits.. Finally, the case of the Netherlands is of interest thanks to its possibility to search plan data by type of planning documents.

3.2 Scope of digitalisation of plan data: an overview

Getting an up-to-date overview of the scope of digitalisation of plan data in the selected 15 European countries will provide insight to interest stakeholders on what kind of plan data can be found on different online platforms. This overview would highlight key similarities and differences in the digitalisation process and outcome. The information is going to be collected in two steps:

[1] https://geoportal.bayern.de/bayernatlas

[2] https://maps.tirol.gv.at/synserver?user=guest&project=tmap_master

[3]https://www.geoportail-urbanisme.gouv.fr/map

Firstly, relevant literature containing information on spatial planning systems and spatial planning instruments across Europe will be selected and investigated to provide contextual elements to this analysis of digital plan data. The main source of information is going to be reports of the ESPON Compass project (Nadin et al., 2018). Findings of that project does, among others, list spatial planning instruments and actors in a number of selected countries. For instance, the list of spatial planning instruments will be used to highlight which of the mentioned spatial planning instruments have been digitized in the 15 selected countries.

Secondly, a close investigation of the actual digital platform containing digital plan data would allow to provide information on the type of plan data that has been digitalised.

Templates will be created to ensure that each project partner collect similar pieces of information that are of relevance for Task 1, and to ensure the reflection of the policy questions defined in the DIGIPLAN Terms of Reference. Table 3.2 gives a first indication on how findings on the scope of digitalisation of plan data would be presented by each project partner.

Table 3.2 Overview of digital plan data for different planning instruments. Case of Luxembourg (draft example)

			Geoportal of Luxembourg					
	Name of planning instruments in Luxembourg	**Adopted by/ responsible stakeholder(s)?**	**Planning instruments included on map.geoportail.lu?**	**Digital plan data prepared by? Standardised data?**	**Legally binding digital data?**	**Version of plan data included (e.g. current; historic; decided only?)**	**Frequency of the update?**	**Link to other format or documents (e.g. PDF document)?**
National level	Directive Programme for Urban and Regional Planning							
	Integrated Transport and Spatial Planning Development Concept							
	Land Use Plans							
	Convention areas							
Sub-national level	n/a							
Local level	Municipal land-use plan							
	Partial land-use plan							
	Communal development plan							
	Inter-municipal syndicates							

A second table would also be completed to gain further insight on the scope of digitalisation of plan data (Table 3.3). Information for this table will be collected through interviews with

authorities which have the competence to enforce the development of a digital portal containing plan data in the different 15 case study countries across Europe. Additional interviews with the experts in charge of developing the interface might also be needed to answer more technical questions.

Table 3.3 Overview of the drivers and the process of the digitization of plan data. Case of Luxembourg (draft example)

	Reasons for digitalising plan data?	**Main added values of the digital plan data?**	**What is the point of departure ?**	**Length of the project (in years)?**	**Current stage of the process?**	**Plans to add additional data?**	**Legal obstacles ?**	**Technical obstacles ?**
National level								
Sub-national level	n/a							
Local level								

3.3 Current uses of digital plan data: an overview

The investigation of the current used of digital plan data is going to be performed through interviews with experts in authorities which have the competence to enforce the development of a digital portal containing plan data.

The questions to be asked are a set of open questions intended to uncover what the interviewee thinks are the most important types of data-use workflows, and what other uses he/she is aware of. The intention is to get the interviewee to define the primary contexts of data use. Sub-questions are intended to provide an explicit differentiation of the group of users, soliciting the interviewee to define users relative to each other.

Table 3.4 Overview of the uses of digital plan data (draft template)

	Questions	**Main intention**
1.	How is the digital plan data used? [Make the interviewee explain what he/she considers data use, before proceeding. This may vary a lot in various contexts] Sub-questions: - How do you monitor the use of digital plan data? What kind of information do you get from this monitoring? - How many visitors/users do you have (each month)? - For what purposes is it used? [to solve what tasks specifically?] - What professional groups are using it? - Are there differences in the way it is used? - Where do the people using the data work? - Do they have other options for doing their work, if they do not want to use digital plan data?	The intention is to get the interviewee to define the primary contexts of data use. Sub-questions are intended to provide an explicit differentiation of the group of users, soliciting the interviewee to define users relative to each other.

2	<u>Illustrate a typical case of planning workflows involving the use of digital plan data?</u> [Have the interviewee make a list of use-workflows mentioned by the interviewer him/herself where digital plan data is digitized and used]	

3	<u>What other cases of planning workflows involve the use of digital plan data?</u>
	
	[Extend the list of digitalized planning workflows / tasks, by asking about:
	- The spatial planning instruments identified as having digitized plan data on the digital portal of the specific country (Table 1)
	- Type of planning workflow [Extend the list of digitalized planning workflows / tasks, by asking about the ones below, one at a time, gradually expanding the scope of the conversation]:
	  - Urban planning
	  - Rural planning / rural development
	  - Environmental impact assessment
	  - Zoning
	  - Transport planning / modelling
	  - Regional/Economic development
	  - Energy planning / production
	  - Infrastructure development
	  - Resource extraction permits (groundwater, minerals etc.)
	  - Building permits
	  - Recreational planning
	  - Heritage conservation
	  - Nature conservation
	  - Green infrastructure
	  - Land consolidation
	  - Climate adaptation and/or mitigation
	  - Tax-collection
	  - Etc. [we need to extend this list with all relevant / possible categories]
		This set of questions is intended to solicit the interviewee to make a commented / annotated list of specific workflows and tasks where digital plan data is used.
		
		Follow up questions:
		
		<u>For each item in the list / each planning task mentioned, ask:</u>
		- What digital datasets are used for this?
		- Why?
		- What are the alternatives?
		- Since when were the datasets available?
		- What did people do before?
		- How did digitalization change this workflow?
		- Why?

4	<u>Do the users of digital plan data contribute to production and/or maintenance of the data?</u> - Do the users edit or add geometrical elements to the data? - Do they add or refine or consult on categories or descriptions used to organize the data? - Do the data users contribute to the formulation of guidelines or frameworks for data production and/or use?	These questions are intended to uncover to what extent the data use process is interactive / co-productive / co-creative.

4 Task 2 – Six in-depth case studies

4.1 Case study approach

To get in depth with the case studies, we will provide an overview of trajectories of digitalization within national spatial governance systems, through a survey on three levels: in spatial plans (refering to the **scope**), in public policies (the **organisation**), and in procedures and practices of public, private, and third sector interaction in relation to spatial issues (the **use**). Typical material to be investigated here are national plans and map regulations, product specifications for spatial plans, software graphics, definitions of land-use classes and location-based information in national/regional planning acts and municipal bylaws.

A tracing on the level of spatial plans will show how digitalization is reflected in maps and documents used in planning, the impact it has on spatial representation, on the availability of information related to plans, and on the purpose of information sharing, as well as on the production process of planning documents themselves and the actors involved in it. We will mainly focus on municipal and more local spatial plans with varying purpose (strategic, land-use/zoning). Beyond policies and plans, one can also trace the impact of digitalization at the level of interaction in deliberative processes of spatial planning; on the procedures and practices of participation and information sharing, but also the coordination of production, gathering, and distribution of location-based information in network governance situations. When collected for each case, these timelines provide a powerful mapping of how digitalisation is anchored in regulations and legislation.

For each case study we will collect data for simple indicators, based on digital plan data. The indicators need to be kept rather general and flexible to account for the significant differences in the planning systems and the digitalisation approach. They will enhance a joint discussion and reflection across the different cases. Table 4.1 lists potential indicators.

Table 4.1 Potential indicators from digital plan data

Potential indicator	Reflection
% of local authorities providing digital plans to a national digital register	How comprehensive is the digitalisation in terms of geographical coverage or types of territory?
Share of plans by plan type	What kind of plans are digitized? (e.g. following the ESPON COMPASS typology)
Share of different zoning categories per county/local authorities	Which zoning categories are more prominent than others? Where are certain zoning categories more prominent?
Age of plans, number of plans per year	How often are new plans made, old plans changed, updated etc.?
Population and zoning	Simple efficiency ratios, e.g. zoned land per inhabitant, could be calculated.

5-6 interviews with key stakeholders will be conducted for each Task 2 case, supporting the two previous steps and providing valuable perspectives and insights. The interviews will be guided by the general case study framework which will be developed by the team, building further on the questions defined for Task 1, but also allow for insights into case specific topics.

4.2 Digital plan data and planning practice in Switzerland

The Swiss spatial planning system is shaped by the country's federalist government structure, where power is distributed between the federal state, 26 cantons, and more than 2000 municipalities. These three institutional levels are jointly responsible for spatial planning but have distinct areas of responsibility. Furthermore, there are intermediate organisations for planning in agglomerations and city-regions. The federal government specifies the framework legislation and coordinates the spatial planning activities of the cantons, among others with sectoral plans. The cantons are in charge of spatial planning on their territory. They enact cantonal laws on spatial planning and comprehensive/strategic plans (Richtplan) to steer future spatial development. Most cantons delegate the responsibility of specifying land-use regulations and zoning to the municipalities.

In line with the federal government structure, digital plan data is found on different levels. Digital plan data for municipal land-use planning is collected in the cadaster with public-law restrictions (PLR-cadaster). As one of the first countries worldwide Switzerland began to establish an online cadaster in which the public-law restrictions on ownership, including the legally binding land-use planning (zoning) are systematically and centrally documented and published. The cadastre will be complete nationwide in 2020 and portrays the current legal status. Cantons have their own geoportals where they display the digital Cantonal strategic plan. The federal sectoral plans are available in the dedicated web-GIS "Federal sectoral plans". Several other data as e.g. a national harmonized building-zone layer is provided for information purposes.

Since Swiss planning is strongly focused on forward-looking coordination, and taking into consideration, that planning for large infrastructure extends over many years, there is a need for digital plan data on plans that have not yet been approved and plans that are pending. How can we ensure that this planning information is digitalised and accessible, even though there is still a lot of uncertainty? How accurate and secure should the information be that it is published? How can it enhance transparency around planning processes? These questions should be addressed in the case study. In turn, the high standard in digitalisation of municipal plan data can (and might have already) alter planning practice in the municipalities and the cantons.

Key stakeholders are the Federal Office of Spatial Development in Bern and specifically the specifically the subsection "Fundamental Policy questions". Further stakeholders are located in Cantonal and municipal planning departments as well as in the Directorate of Cadastral Surveying.

4.3 Digital plan data and planning practice in Norway

Structural features of Norwegian planning can be explained through the historical evolution of the planning system. Three structuring instances may be considered particularly significant. The first is the introduction of statutory plan symbols and data in the 1970s (kart- og planforskriften). Standardization of plan data may be explained by the need for conformity between plans in an integral and holistic planning system with different types of statutory plans

at different scales and levels of governance. A second instance springs out of a coincidence in time between the liberal turn in Norwegian planning in the 1980s and an emergent awareness of environmental issues and self-inflicted risk in development processes. This introduces environmental impact assessments as a feature in spatial planning, requiring the immediate accessibility of geodata in decision-making processes, leading to an unprecedented integration of geodata with plan data. A third decisive instance is the inception of digitalization of governance around year 2000, with the purpose of making public services more flexible and available on an online basis, making public agencies less reliable on restricting opening hours and staffed counters.

Based on this outline there are three main topics to observe more closely, in order to consider good practices of spatial planning with digital plan data within the Norwegian context. Firstly, Norway has reached an advanced state in the digitization of public services. Yet, we do not know how far the country has reached in the realization of a common, nation encompassing digital plan register, a responsibility which is delegated to the municipalities. An overview could give important information about whether the development meets the expectancies and the ambitions of digital governance, and whether the country as such is ready for some of the more recent advances made possible by digitalization of public services, geodata, and plan data.

A second topic to look into has to do with how the technological possibilities of a digitalized governance system are exploited: what technological potentials are being tested and used, to what extent, and whether the level of development is equally distributed, allowing all localities and administrations to benefit of them. The particular Norwegian principle of free planning initiative, with an extensive practice of private plan proposals, makes the Norwegian planning system particularly dependent on efficient municipal processing in the release of planning and building permits, at the cost of being development obstructive. Digitalization strategies are contemplating land-use plans where juridical provisions are directly embedded in the zoning polygons, possibly supported by 3D information, as well as a close to automatized processing of building permits through digital data conformity between projects and plans.

A third topic has to do with the relationship between formal and informal plan data. On the one hand spatial planning practice involves a statutory use plan data, meaning standardized digital data and the regulated, mandatory use of it. For a nation-wide digitalization to be implemented, state authorities are contemplating a more extensive, mandatory use of digital plan data. On the other hand, in real life spatial development processes one makes extensive use of spatial information in the decision making processes (hand-drawn or computer generated representations of development projects used in the media, in charrettes, in public meetings, in sales prospects and so forth) also circulating in the information loops of formal spatial planning activities. The particular uses of formal and informal plan data may vary greatly depending on what kind of devopment is being governed by planning: urban transformation, extensive housing development, water management, business development etc. This last topic might give us important information about the use of digital plan data in practice, possibly

indicating intelligent and appropriate uses of spatial information enhancing the legitimacy and possible proficiency of digitalization agendas related to spatial planning. Key stakeholders are the Norwegian Mapping Authority, the Ministry of Local Government and Modernisation as well as counties and municipalities.

4.4 Digital plan data and planning practice in Denmark

The Danish planning system has significantly changed in 2007, when spatial planning instruments at the sub-national level were abolished. Today, all spatial planning is done by the 98 municipalities, while the national level is responsible for national legislation (e.g. “planning act”) and for spatial planning policies in specific topics, e.g. coastal protection, but also the Fingerplan, Copenhagen’s regional land use plan.

All plans done in the framework of the planning act have to be registered in the publicly available digital plan register “plandata.dk”. It includes all 98 municipal plans with a range of separate topics (e.g. more than 50,000 municipal plan zones or more than 140,000 existing and potential protected nature polygons), more than 30,000 local development plans, and 15,000 rural development permits (2018).

The nation-wide digitalisation of plan data has sped up in the past 10 years with new legislation and data systems. Most recent changes (2017) in legislation include the required digital registration of existing and protected nature (“Green map of Denmark”) and the use of data by the tax authority (“property tax valuation”). The latter required a (re)digitalisation effort of all local development plans by the state to increase quality and ensure full coverage (Larsen, 2018).

How much these developments actually have led to digitized plans and planning will be at the core of the Danish case. The legally binding plan is still the pdf-version, not the geodata. And while the systems are rather advanced, standardization has not been actively pushed, resulting in very diverse data entries. This however might change with integration and new uses of the data. In turn, this digitalisation can (and might already have) alter planning.

Key stakeholders are the Business Authority, the national agency in the field of spatial planning, as well as other national agencies such as the Environmental Protection Agency, the Agency for Data Supply and Efficiency, the Property Assessment Agency, and the IT and Development Agency. In the municipalities, the municipal and local planner’s practice is related to production and consumption of digital plan data. Besides municipalities themselves, Local Government Denmark (KL), the interest organisation of the municipalities, can provide insights on the local perspectives and challenges.

4.5 Perspectives on German case

The German planning system is shaped by the federal government structure and includes federal spatial planning, state spatial planning, regional planning and local land-use planning. Digitalisation of plan data differs greatly between the states. Even though states provide geo-portals with digital plan data on the municipal to state level, many datasets are incomplete. An

interesting case is the spatial planning monitor ROPLAMO, a nationwide planning information system in which graphic and textual specifications of the state and regional planning are recorded since 2006.

Germany presents an interesting case and especially shares characteristics and challenges with the other federalist countries. Specifically the large variations of the state and representation of digital plan data and issues with harmonization of data are interesting issues for comparative approaches with other countries. Key stakeholders are state agencies and municipalities.

4.6 Perspectives on French case

The French tradition distinguishes from other European planning practices in several points. First of all conceptually, more focused on denoting the substance of planning rather than the processes, with terminology like the *aménagement du territoire* and or the *Schéma de Cohérence Territoriale* (SCoT) rather than planning and spatial strategies. A second point of interest is the cultural particularities of the French juridical system and its practice and culture. It is characterized by a strong protection of citizens against the exercize of state authority, with a maximization of predictability and a reduction of discretion concerning decision-making in the frame of plans (Booth 1997). Nordic juridical traditions are more based on process control and discretionary agency. This relationship between the conceptual framework of planning and juridical culture possibly generates different logics of spatial representation and needs of plan data in decision-making processes.

4.7 Perspectives on Austrian case

In Austria, legislation and implementation of spatial planning is done by the nine states (Bundesland). Each state has its own spatial planning law. The municipalities are the local planning authorities, under supervision of the respective state. Digitalisation of plan data is different between the states. In Lower Austria, for example, zoning data from municipalities can be download from the state's geodata portal, but are not further presented. In Tyrol, approval of planning zones has been carried our electronically since 2013 and plan process information saved in a register. The development of a fully electronically and binding municipal land use plan is in development (Hollmann, 2019).

Austria is interesting in regards of varieties of digitalization and representation of plan data, the legal aspects of digital plan data as well as the role of private consultancies for digital planning, especially for many of the smaller municipalities. Key stakeholders are state agencies, municipalities or municipal associations as well as private planning offices, which often assist considerably in the planning processes.

5 Task 3 – Outlook on Thematic Papers

The thematic papers will be based on material and findings from the 15 countries overview and the 6 in-depth case studies. The scope of each thematic paper will be discussed continuously with the steering committee. Potential themes could be:

- **What is digital plan data**: illustrate the range of digital plan data and the associated potentials and limitations
- The representation of **plans in plan data** – what information of a plan is actually digitized in plan data.
- The relationships between the instrumental **content of plans, standards of digital plan data and the representation of space**, and good practices related to the uses of digital plan data in spatial planning within different institutional contexts.
- **Accessibility and use of plan data**: prerequisites and potentials of different forms of accessibility for diverse user categories
- **Evaluating** planning-effectiveness of planning **with digital plan data**: What are the potentials? Describe first approaches we can see in some countries; What can be expected? Where are the pitfalls? This should be evaluated in the context of diverse expectations towards plan implementation.
- **Standardization**/harmonization of plan data combined with **flexibility** in planning
- **Change in planning practice** through digital plan data in the whole range of institutions and stakeholders. Diverse changes can be expected and might already be observed: Does digital plan data enhance transparency in the planning process for involved actors and the public? Does it enable NGO's to act as watchdogs? Do digital plan data contribute to a loss of creativity? Under which conditions can the positive changes be reached? How to prevent negative changes?
- **Enabling Geodesign** with digital plan data (Steinitz, 2012) – the future perspectives on digital planning and the role of plan data in that.
- The role of **education** for shaping future parctices with digital plan data.

6 Conclusions and next steps

This inception report outlined our approach to this targeted analysis. The conceptual background and the comparative tables are the basis for the work on Task 1. The report also lists and argues for the countries for analysis in Task 1 and the in-depth case studies in Task 2.

The project work is in a very early stage with need to further explore the field and refine the approaches. Empirical work has though already started, e.g. the dialogue with the stakeholders as well as reviews of digital plan data platforms and first materials collected for Task 1 and Task 2 cases. This work will continously inform our approach and conceptualisation of the topic. Communication and exchange of our findings within the research team and the steering committee is crucial in this explorative phase. Regular contacts between the stakeholder and the local research partner can be expected, for pratical help (e.g. regarding interviewees) and discussion of preliminary findings.

However, to ensure exchange between in the steering committee in the phase of no meeting (between 18 February and 3 September), we will prepare regular but informal newsletters from the project team to the steering committee. This will enhance early discussions in the group, not least regarding the Task 3, the thematic papers.

6.1 Changes following the current COVID-19 pandemic

The research team had planned a meeting in Zürich beginning of April, but, due to current travel restrictions in Europe following the COVID-19 pandemic, all physical meetings have been cancelled. Instead, shorter but more regular online meetings are scheduled and have already taken place.

Task 1 is less affected, as it is based on desk reseach and telephone/online interviews. Implications for Task 2 have to be discussed, following the general development in the case countries. The 5-6 interviews per case might be difficult to implement online in the currently intended form as in-depth discussions sometimes with more persons as the same time.

It might also be desireable to change deadlines due to reduced work capabitlities (e.g. because of child care duties, longer sickness, limited home office possibilities). If necessary, this will be communicated to the steering committee as quickly as possible.

References

EC. (2017). *How digital is your country? Europe improves but still needs to close digital gap* [Press release]. http://europa.eu/rapid/press-release_IP-17-347_en.htm

Flyvbjerg, B. (1992). Magt og rationalitet. Forelæsning ved forsvaret af doktorafhandlingen "Rationalitet og magt", Aalborg Universitetscenter, fredag den 1. November 1991. *Samfundsøkonomen*, *1992*(2), 37–43.

Gabellini, P. (1996). *Il disegno urbanistico*. Carocci editore.

Hollmann, P. (2019, marts 7). *Aktuelle Entwicklungen in Bau- und Raumordnung*. 9. Baurechtstag, Innsbruck.

Larsen, H. (2018). Nye plandata—Nye muligheder [New plan data—New possibilities]. *Geoforum*, *190*, 4–10.

Magone, J. M. (2011). Regional and local government in multilevel Europe. I *Contemporary European Politics: A Comparative Introduction* (s. 305–340). Routledge.

Martino, P., Duprel, C., Arkush, A. C., Venter, J., & Boura, M. E. (2018). *Territorial and urban dimensions of digital transition in Europe* (ESPON Working Paper). ESPON EGTC.

Mazza, L. (2010). Limiti e capacità della pianificazione dello spazio. *Territorio*, *52*, 7–24.

Nadin, V., Fernández Maldonado, A. M., Zonneveld, W., Stead, D., Dabrowski, M., Piskorek, K., Sarkar, A., Schmitt, P., Smas, L., Cotella, G., & et al. (2018). *COMPASS - Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe. Final Report*. ESPON EGTC.

Steinitz, C. (2012). *A framework for geodesign: Changing geography by design*. ESRI.

UN. (2017). *New Urban Agenda* (s. 66). United Nations Habitat III Secretariat. http://habitat3.org/the-new-urban-agenda

UNECE. (1998). *Convention on access to information, public participation in decision-making and access to justice in environmental matters*. United Nations Economic Commission for Europe. http://ec.europa.eu/environment/aarhus/

Annex 1: List of potential literature for further review

The following list includes literature for further review, broadly structured by four themes, also used in the concept section of the Inception report. Some of it has been cited in the inception report.

SECTION 1 | **Digitalization**

Digitalization and society

EC. (2017). How digital is your country? Europe improves but still needs to close digital gap [Press release]. http://europa.eu/rapid/press-release_IP-17-347_en.htm

Gartenberg, C. (2018). ”Google Maps is getting augmented reality directions and recommendation features.” Retrieved 16.12.2018, 2018.

González, A., Kelly, C., Rymszewicz, A., 2019. Advancements in web-mapping tools for land use and marine spatial planning. Transactions in GIS. https://doi.org/10.1111/tgis.12603

Leszczynski, A. (2019), "Digital methods III: The digital mundane", in *Progress in Human Geography*, December 2019 https://doi.org/10.1177%2F0309132519888687

Digital governance and digitalization of public services

Balogun, A.-L., Marks, D., Sharma, R., Shekhar, H., Balmes, C., Maheng, D., Arshad, A., Salehi, P., 2020. Assessing the Potentials of Digitalization as a Tool for Climate Change Adaptation and Sustainable Development in Urban Centres. Sustainable Cities and Society 53, 101888. https://doi.org/10.1016/j.scs.2019.101888

Gibbons, S. (2017, 29.07.17). ”Service Design 101.” Retrieved 29.08, 2018.

Martino, P., Duprel, C., Arkush, A. C., Venter, J., & Boura, M. E. (2018). Territorial and urban dimensions of digital transition in Europe (*ESPON Working Paper*). ESPON EGTC.

Stickdorn, M., et al. (2011). This is service design thinking: Basics, tools, cases, Wiley Hoboken, NJ.

Policies of digitalization

Gauk, M et al. (eds. 2019), *POLICY BRIEF: Digital innovation in urban environments – Solutions for sustainable and fluently working cities*, Luxenburg: ESPON.

Kart- og planforskriften. (2007). Forskrift om kart, stedfestet informasjon, arealformål og kommunalt planregister . (FOR-2009-06-26-861.

Martino, P., Duprel, C., Arkush, A. C., Venter, J., & Boura, M. E. (2018). Territorial and urban dimensions of digital transition in Europe. ESPON Policy Brief. Luxembourg: ESPON EGTC.

SECTION 2 | **Representation of space**

Spatial analysis (scope and methods)

Bavoux, J-J (2010), *Initiation à l'analyse spatiale*, Paris: Armand Colin.

Pumain, D & Saint-Julien, T (2010 2ed), *Analyse spatiale – les localisations*, Paris: Armand Colin.

Warf, B., Arias, S. (Eds.), 2009. The spatial turn: interdisciplinary perspectives, Routledge studies in human geography. Routledge, London ; New York.

Socio-cultural analysis

n/a

The cognitive and organizational dimension of maps

Issues raised by the digitization of data and their use in spatial planning instruments in relation to issues of drafting and representation in plans.

Corboz, A (1983), *The Land as Palimpsest,* Diogenes, 31 (121), pp.12–34.

Davoudi, S., & Strange, I. (2008). *Conceptions of space and place in strategic spatial planning*: Routledge.

Dühr, S. (2007). *The visual language of spatial planning: exploring cartographic representations for spatial planning in Europe*: Routledge.

Dühr, S., & Müller, A. (2012). "The role of spatial data and spatial information in strategic spatial planning". *Regional Studies*, 46(4), 423-428.

Gabellini, P. 1996. *Il disegno urbanistico*. Rome: Carocci editore.

Galland, D. & Grønning, M. (2019), "Spatial consciousness", in *Wiley-Blackwell Encyclopedia of Urban and Regional Studies*, Hoboken NJ: Wiley-Blackwell Publishing.

Harley, J.B., 1989. Deconstructing the map. Cartographica: The International Journal for Geographic Information and Geovisualization 26, 1–20. https://doi.org/10.3138/E635-7827-1757-9T53

Harley, J.B., Laxton, P., 2001. The new nature of maps: essays in the history of cartography. Johns Hopkins University Press, Baltimore, Md.

Hassan, R. (2014). ”Mot et digitalt 3D visualiseringsverktøy for kommunikasjon og samarbeide innen planlegging og design.” KART OG PLAN 4: 300-308.

Moroni, S., & Lorini, G. (2017). Graphic rules in planning: A critical exploration of normative drawings starting from zoning maps and form-based codes. Planning Theory, 16(3), 318-338.

Palka, G., Grădinaru, S. R., Jørgensen, G., & Hersperger, A. M. (2018). Visualizing Planning Intentions: From Heterogeneous Information to Maps. Journal of Geovisualization and Spatial Analysis, 2(2), 16.

Pickles, J., 2004. A history of spaces: cartographic reason, mapping, and the geo-coded world. Routledge, London ; New York.

Viganò, P (2017), "Maps: the material and conceptual dimensions of the territory", in *Planum* Special Issue No 35, Vol II/2017, pp. 83-90.

SECTION 3 | **Digital plan data**

Geodata and digitalization of geodata

Ash, J, Kitchin, R & Leszczynski, A (2018), "Digital turn, digital geographies?", in *Progress in Human Geography*, 42(1) 25–43

Maguire, D. J., & Longley, P. A. (2005). The emergence of geoportals and their role in spatial data infrastructures. Computers, Environment and Urban Systems, 29(1), 3-14.

Maurya, A. (2012). Running lean: iterate from plan A to a plan that works, ” O’Reilly Media, Inc.

Mitasova, H., et al. (2006). ”Real-time landscape model interaction using a tangible geospatial modeling environment.” IEEE computer graphics and applications 26(4): 55-63.

Norkart. ”CityPlanners funksjoner.” Retrieved 15.12.18, 2018.

Norkart. ”Enklere tilgang til offentlig informasjon.” Retrieved 15.12.2018, 2018.

Olfat, H., Jani, A., Shojaei, D., Darvill, A., Briffa, M., Rajabifard, A., Badiee, F., 2019. Tackling the challenges of visualising digital cadastral plans: The Victorian cadastre experience. Land Use Policy 83, 84–94. https://doi.org/10.1016/j.landusepol.2019.01.037

Pickles, J., 2008. Representations in an Electronic Age: Geography, GIS, and Democracy, in: Bauder, H., Engel-Di Mauro, S. (Eds.), Critical Geographies a Collection of Readings. Praxis (e)Press, Kelowna, B.C., pp. 637–663.

Plan data and digitalization of plan data

Fertner, C., Aagaard Christensen, A., Andersen, P. S., Olafsson, A. S., Præstholm, S., Caspersen, O. H., & Grunfelder, J. (2019). Emerging digital plan data – new research perspectives on planning practice and evaluation. Geografisk Tidsskrift-Danish Journal of Geography, 119(1), 6–16. https://doi.org/10.1080/00167223.2018.1528555

Harley, J.B., Woodward, D., Monmonier, M.S. (Eds.), 2015. Planning, Urban and Regional, in: The History of Cartography, Volume Six. University of Chicago Press, Chicago, pp. 1157–1165.

Hopkins, L. D., Kaza, N., & Pallathucheril, V. G. (2005). Representing urban development plans and regulations as data: A planning data model. Environment and Planning B: Planning and Design, 32(4), 597-615.

Levin, G., Svenningsen, S.R., 2019. Digital transdisciplinarity in land change science – integrating multiple types of digital data. Geografisk Tidsskrift-Danish Journal of Geography 119, 1–5. https://doi.org/10.1080/00167223.2019.1585893

Lin, Y., Geertman, S., 2019. Can Social Media Play a Role in Urban Planning? A Literature Review, in: Geertman, S., Zhan, Q., Allan, A., Pettit, C. (Eds.), Computational Urban Planning and Management for Smart Cities. Springer International Publishing, Cham, pp. 69–84. https://doi.org/10.1007/978-3-030-19424-6_5

Rutledal, B & Grønning, M (2018), "Plankart og tegneregler – prinsipper, praksis og problemstillinger", in Gro Sandkjær Hanssen & Nils Aarsæther (red.), *Plan- og bygningsloven – fungerer loven etter intensjonene?*, Oslo: Universitetsforlaget.

The legal status of digital plan data

Baaner, L., Anker, H. T., & Hvingel, L. (2016). "Nye perspektiver på dansk areallovgivning – om geodata og digitalisering" [New perspectives on Danish zoning regulation—On geodata and digitalisation]. *Nordisk Administrativt Tidsskrift*, 93(3), 81–98.

Kitsakis, D., Kalantari, M., Rajabifard, A., Atazadeh, B., Dimopoulou, E., 2019. Exploring the 3rd dimension within public law restrictions: A case study of Victoria, Australia. Land Use Policy 85, 195–206. https://doi.org/10.1016/j.landusepol.2019.03.024

SECTION 4 | **Spatial planning**

Spatial planning systems

Belalcazar, D S & Grønning, M (2018), "Hensynssoner – det flerfunksjonelle og tvetydige planverktøyet", in Gro Sandkjær Hanssen & Nils Aarsæther (red.), *Plan- og bygningsloven – fungerer loven etter intensjonene?*, Oslo: Universitetsforlaget.

Galland, D (2020), "Governance Rescaling in Danish Spatial Planning – State Spaces Between Fixity and Fluidity", in Lingua & Valz (eds.), *Shaping Regional Futures*, Cham: Springer.

Knieling, J., & Othengrafen, F. (2015). Planning culture—a concept to explain the evolution of planning policies and processes in Europe? European Planning Studies, 23(11), 2133–2147.

Mazza, L (1996), "Funzioni e sistemi di pianificazione degli usi del suolo", *Urbanistica* 106, pp. 104–107.

Nadin, V., Fernández Maldonado, A. M., Zonneveld, W., Stead, D., Dabrowski, M., Piskorek, K., … et al. (2018). COMPASS - Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe. Final Report. Luxembourg: ESPON EGTC.

UN. (2017). New Urban Agenda (s. 66). United Nations Habitat III Secretariat. http://habitat3.org/the-new-urban-agenda

Spatial planning practices

Borsi, K. (2015). ”Drawing the region: Hermann Jansen’s vision of Greater Berlin in 1910.” in *The Journal of Architecture* 20(1), pp. 47-72.

Børrud, E & Grønning, M (2018), "Metoder i planlegging – et spørsmål om kompetanse", in Aarsæther et al. (eds.), *Plan og samfunn – system, praksis, teori*, Oslo: Cappelen Damm Akademisk.

Elinbaum, P., & Galland, D. (2016). *Analysing contemporary metropolitan spatial plans in Europe through their institutional context, instrumental content and planning process*. European Planning Studies, 24(1), 181-206.

Flyvbjerg, B. (1992). Magt og rationalitet. Forelæsning ved forsvaret af doktorafhandlingen "Rationalitet og magt", Aalborg Universitetscenter, fredag den 1. November 1991. *Samfundsøkonomen*, 1992(2), 37–43.

Hersperger, A. M., Grădinaru, S. R., Oliveira, E., Pagliarin, S., & Palka, G. (2019). "Understanding Strategic Spatial Planning to Effectively Guide Development of Urban Regions". *Cities*, 94, 96 - 105.

McCosker, A., & Searle, G. (2016). Toward a classification of world metropolitan spatial strategies: a comparative analysis of ten plans. Town planning review, 87(6), 655-680.

Reade, E. (1983). "If planning is anything, maybe it can be identified." *Urban Studies* 20(2): 159-171.

Planning evaluation

Alfasi, N., Almagor, J., & Benenson, I. (2012). The actual impact of comprehensive land-use plans: Insights from high resolution observations. Land Use Policy, 29(4), 862–877.

Carmona, M., & Sieh, L. (2008). Performance Measurement in Planning—Towards a Holistic View. Environment and Planning C: Government and Policy, 26(2), 428–454. https://doi.org/10.1068/c62m

Cortinovis, C., Haase, D., Zanon, B., & Geneletti, D. (2019). Is urban spatial development on the right track? Comparing strategies and trends in the European Union. Landscape and Urban Planning, 181, 22-37.

Edvardsen, M. (2011). Evaluations of local planning efforts: A simple test of policy implementation and corresponding results?. In A. Hull, E. R. Alexander, A. Khakee, & J. Woltjer (Eds.), Evaluation for Participation and Sustainability in Planning (pp. 47–66). London: Routledge.

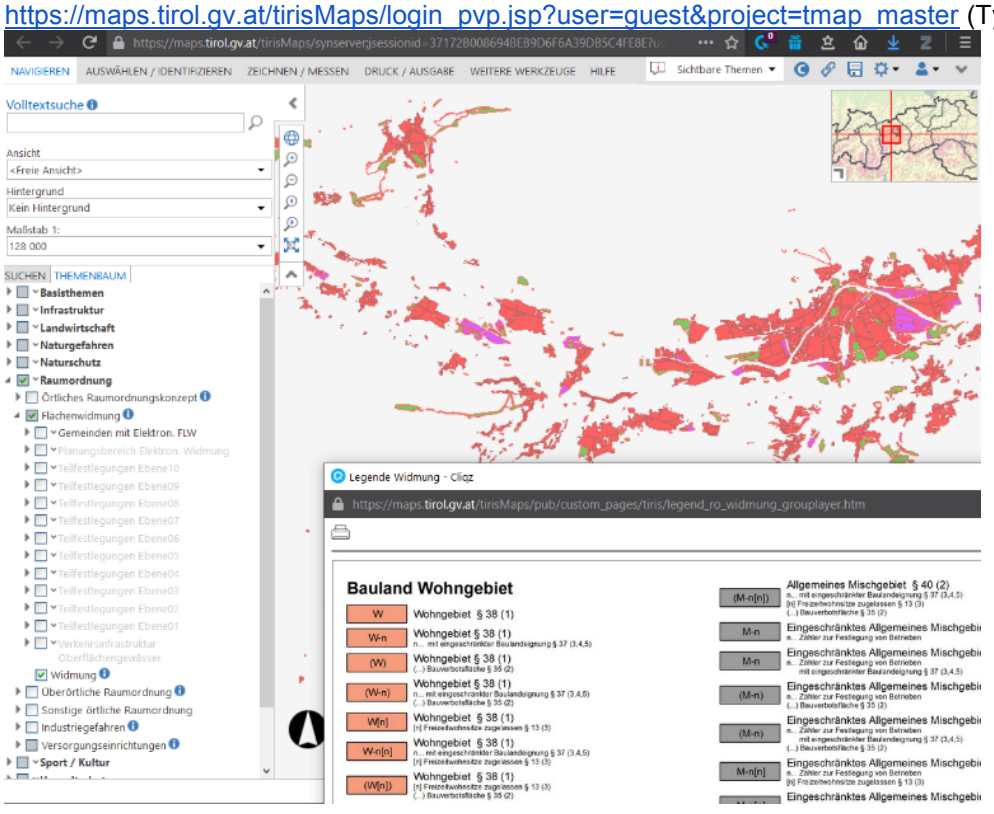
Grădinaru, S. R., Iojă, C. I., Pătru-Stupariu, I., & Hersperger, A. M. (2017). Are spatial planning objectives reflected in the evolution of urban landscape patterns? A framework for the evaluation of spatial planning outcomes. Sustainability, 9(8), 1279.

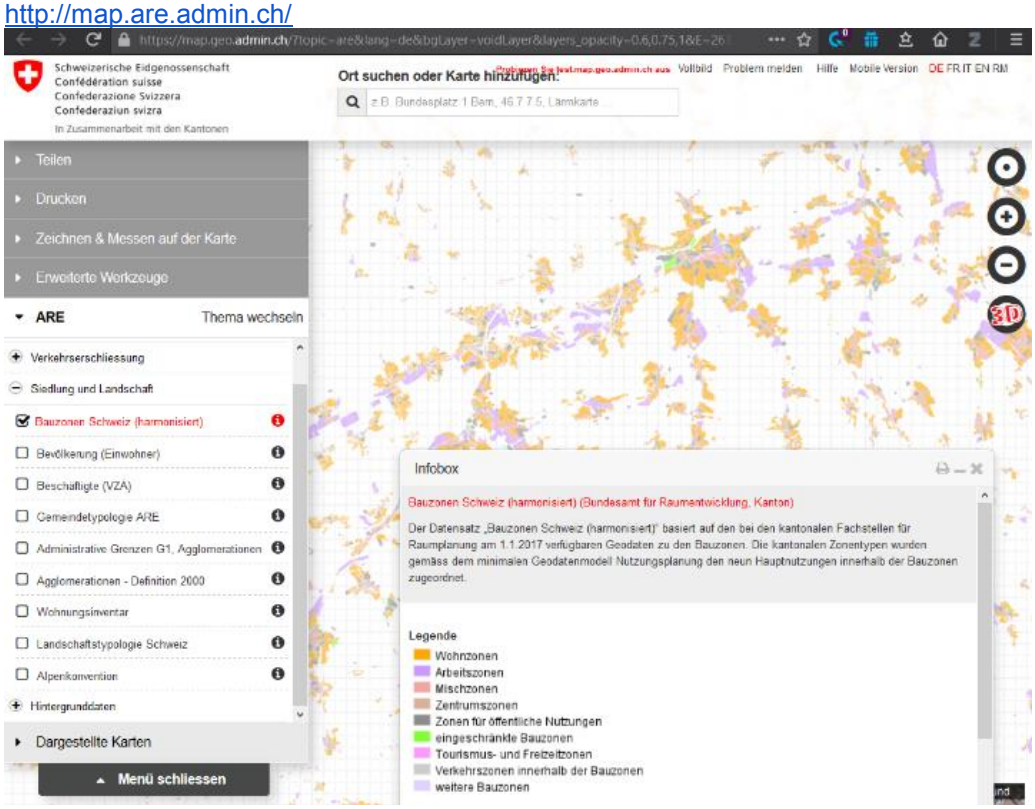
Annex 2: Digital plan data platforms in ESPON countries

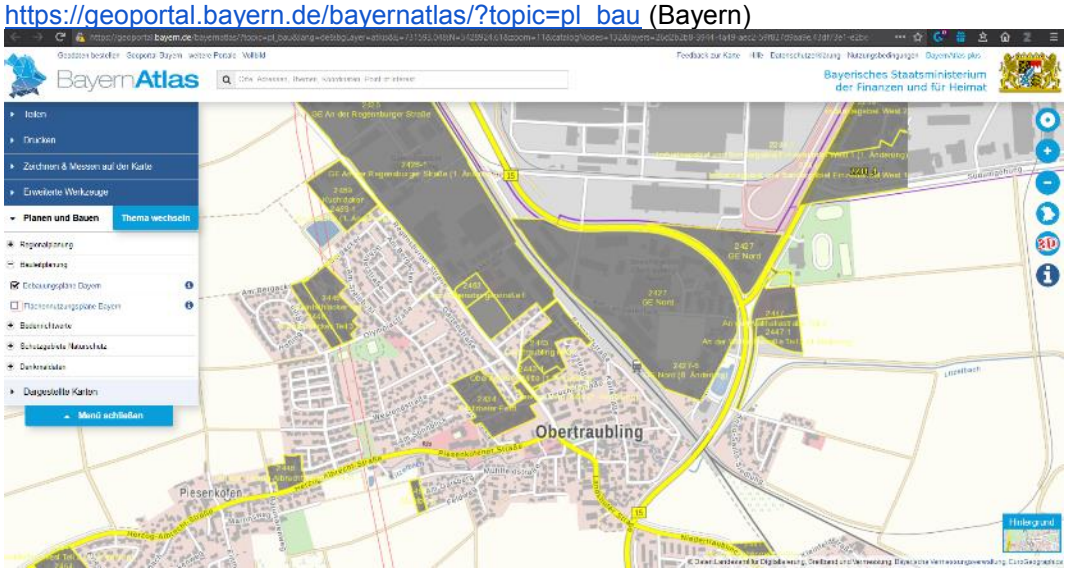
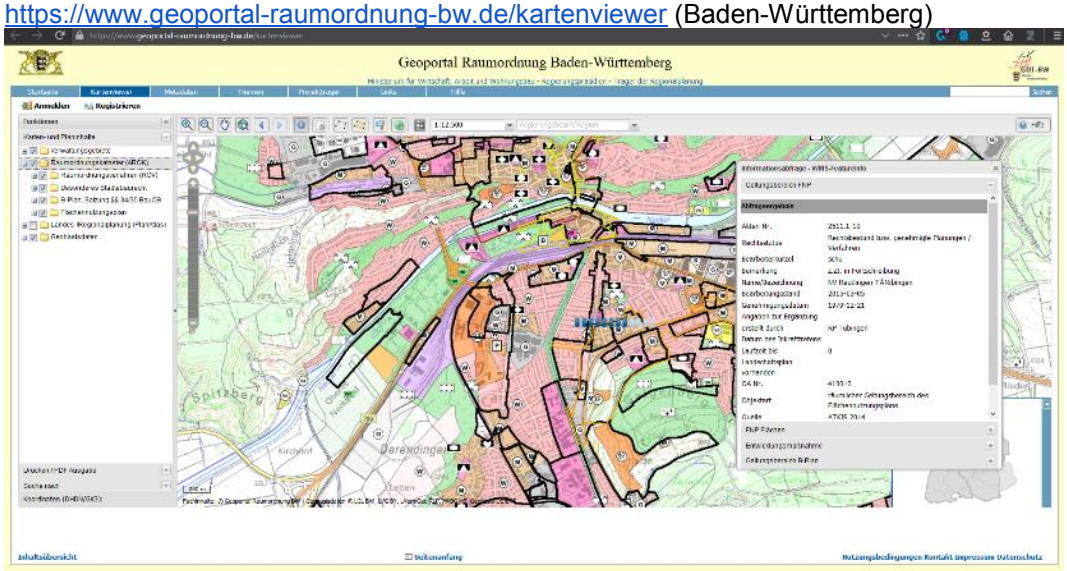
This Annex shows examples of digital plan data online platforms with information on local/municipal planning in several ESPON countries. The table, which includes a link and a screenshot, is the result of a limited desk research. **Not all ESPON countries were investigated**. In some countries, regional examples are shown in lack of national platforms. However, **the table shows the diversity of portals available today**.

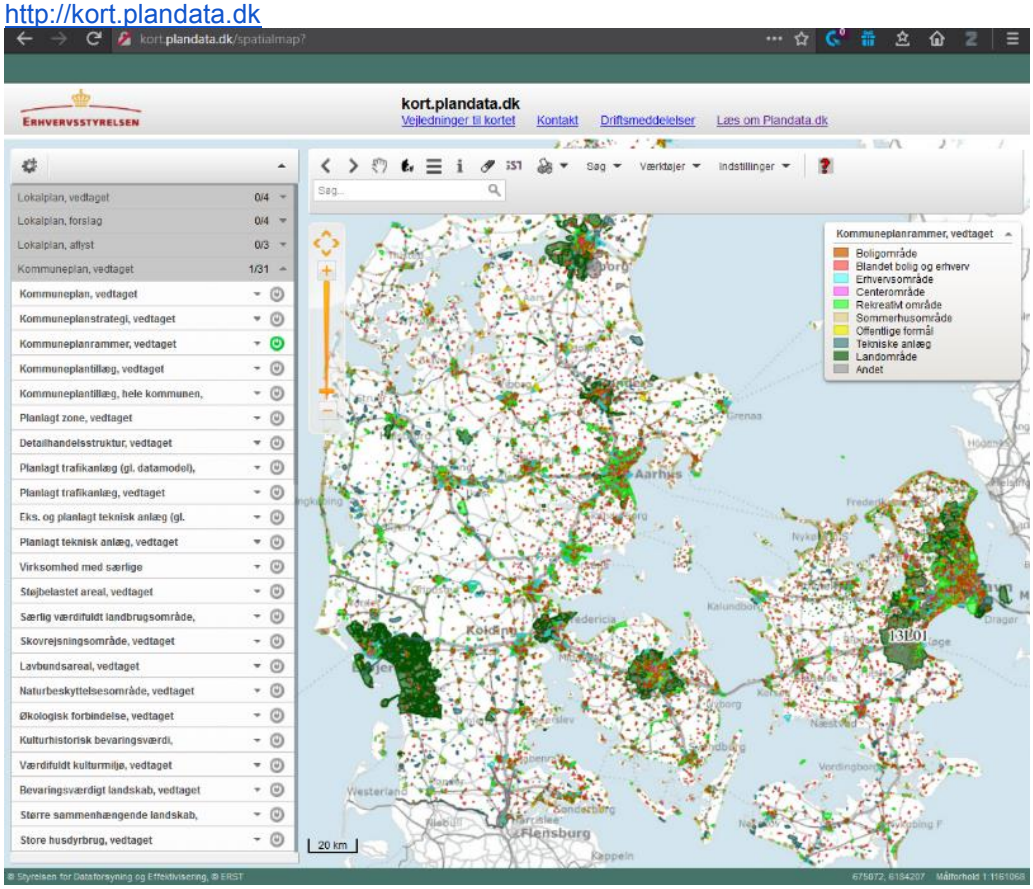
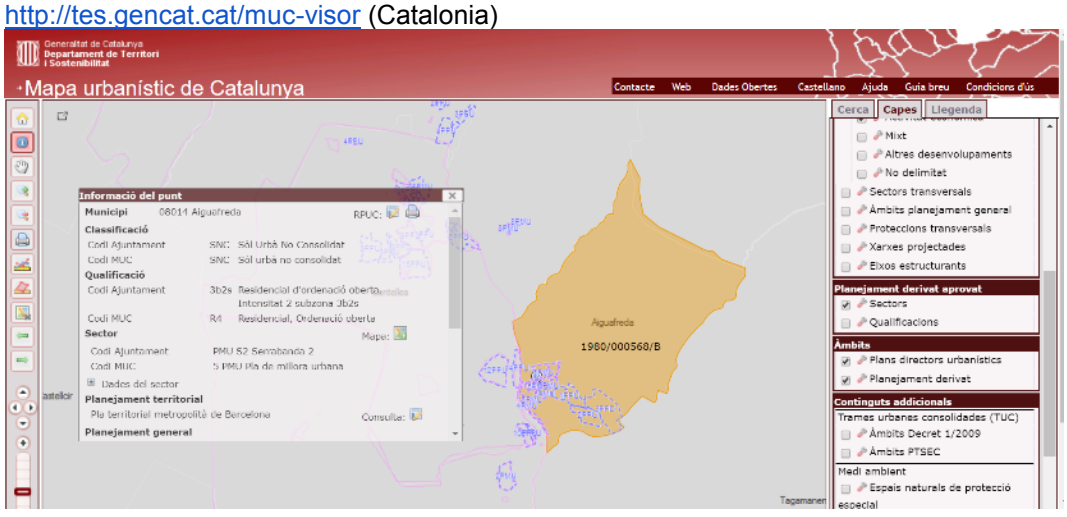
Countries are sorted alphabetically by country code (CC).

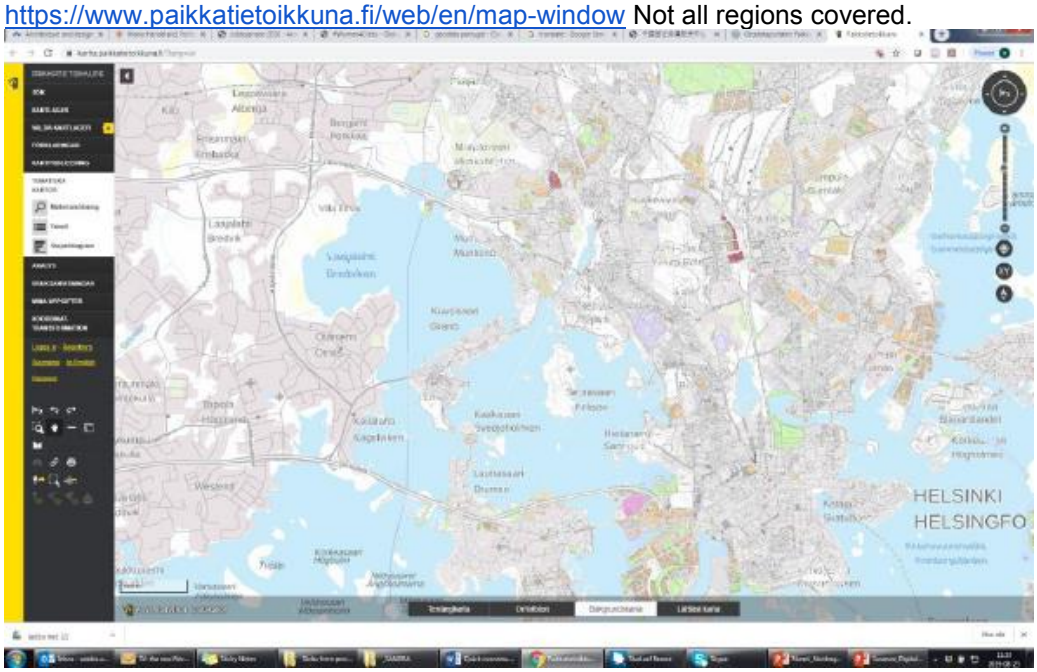
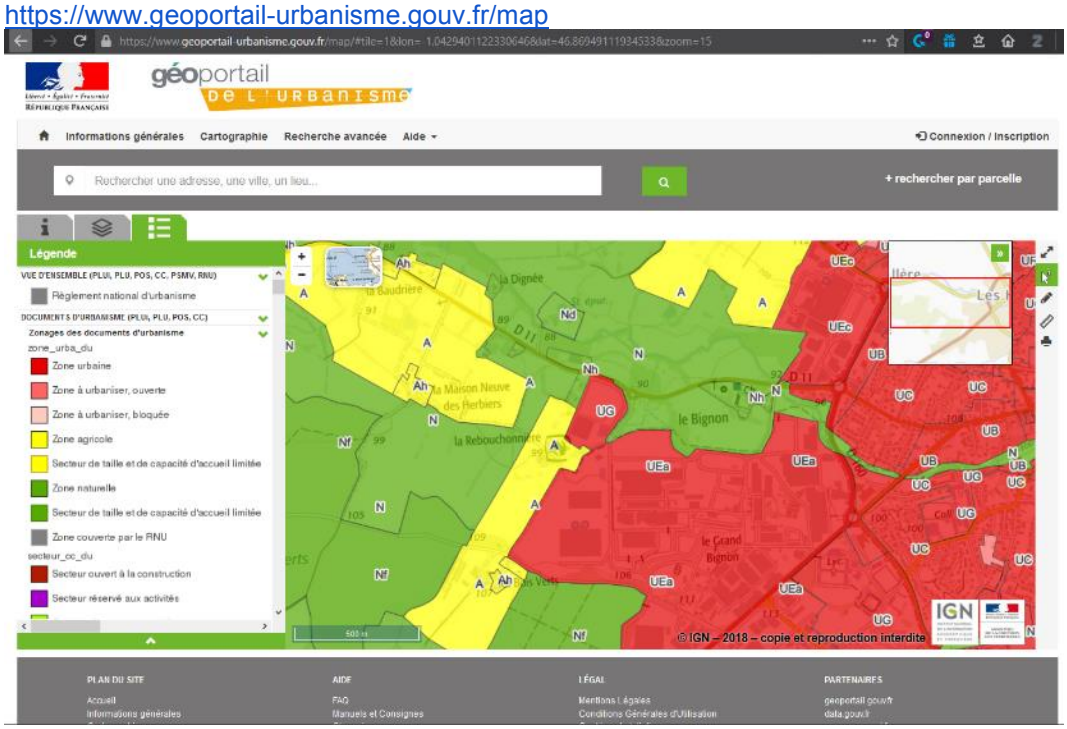
Several webpages were translated with Google translate for the screenshot.

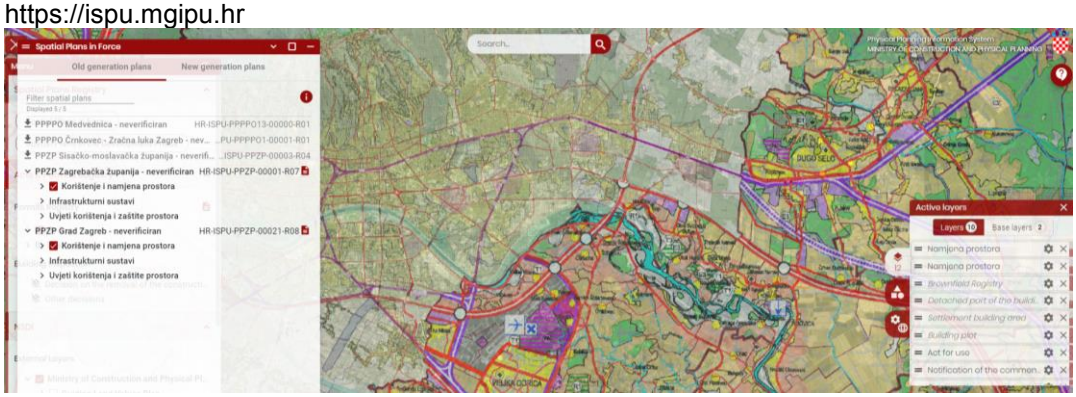
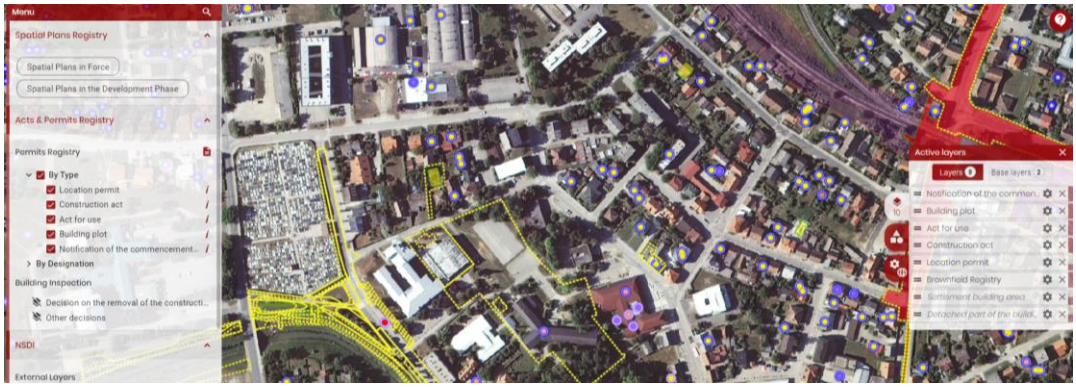
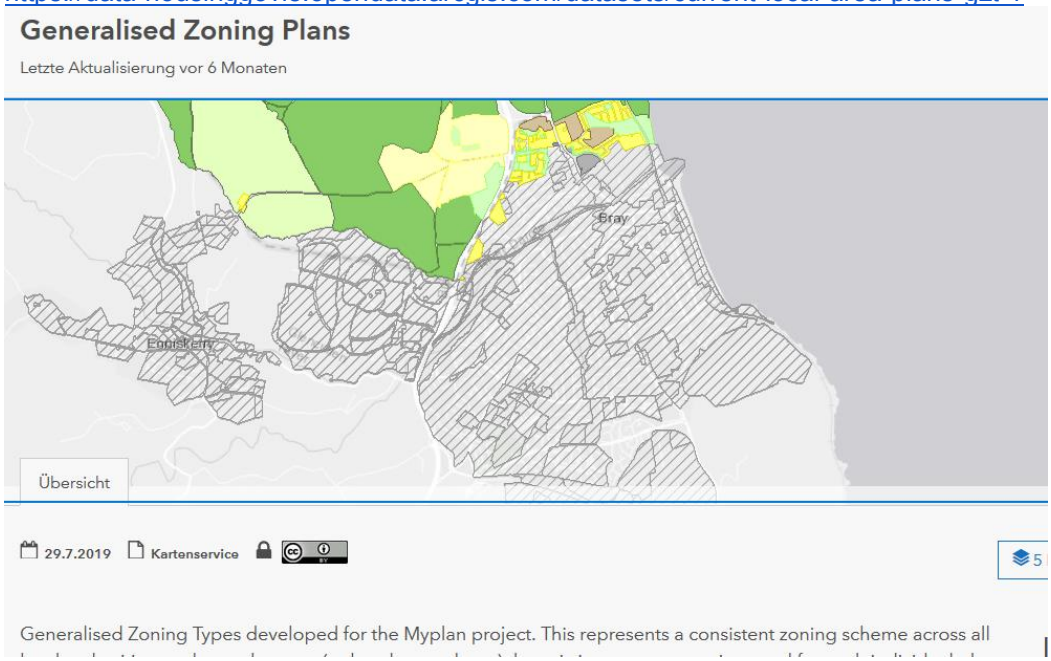
CC	Country-wide digital plan data platforms (alternatively regional example)
AT	https://maps.tirol.gv.at/tirisMaps/login_pvp.jsp?user=guest&project=tmap_master (Tyrol) 

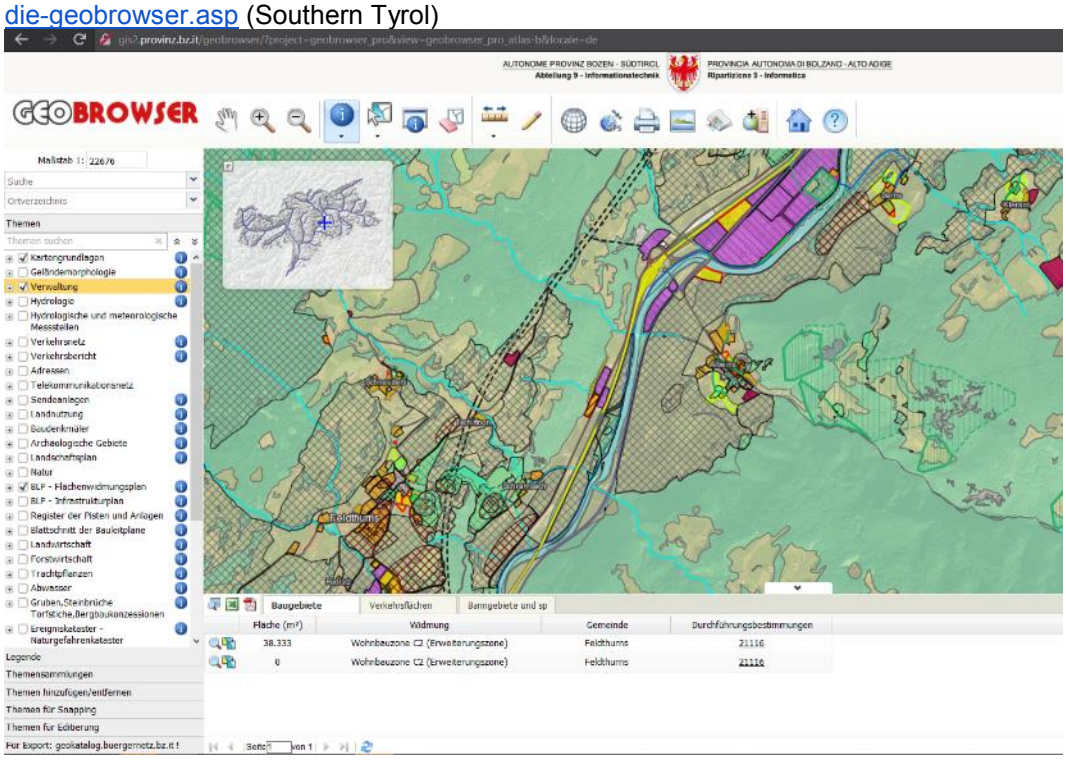
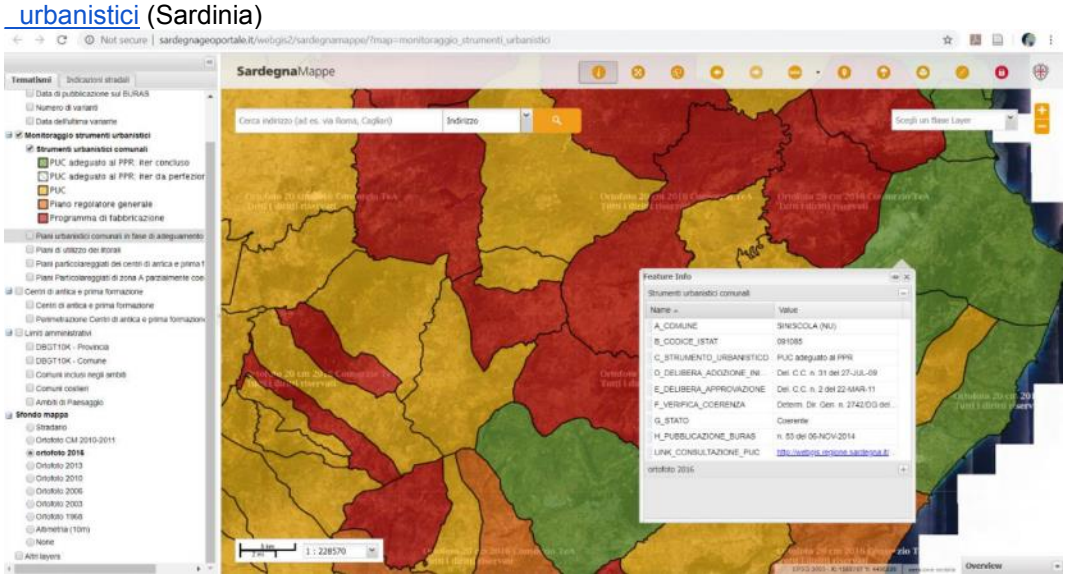
CC	Country-wide digital plan data platforms (alternatively regional example)
BE	https://geoportail.wallonie.be/walonmap (Wallonia)  www.geopunt.be (Flanders) https://mybrugis.irisnet.be/brugis/#/ (Brussels)
BG	(Not investigated)
CH	http://map.are.admin.ch/ 

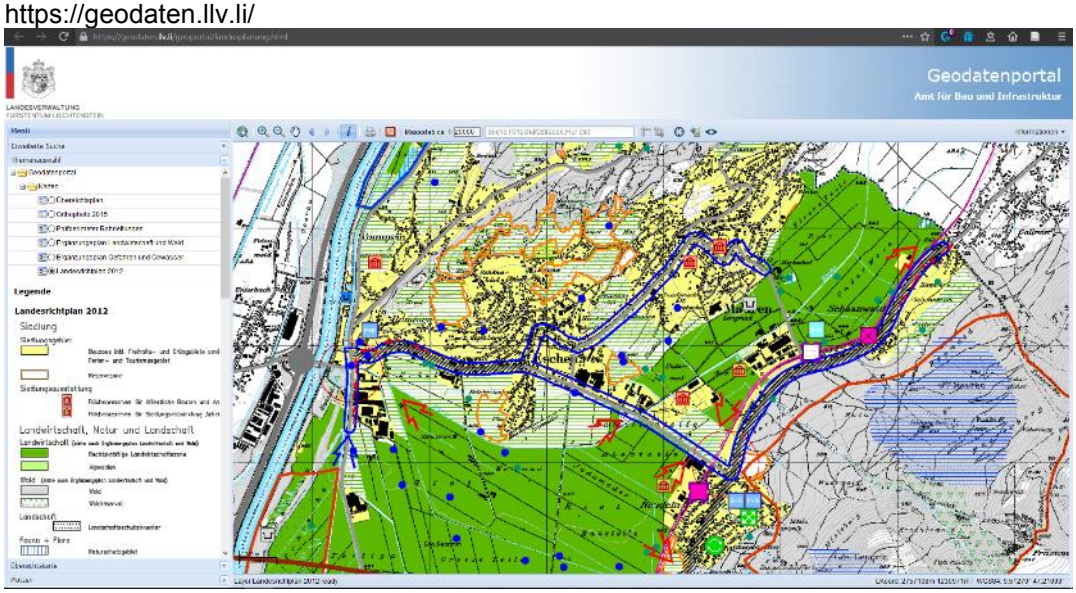
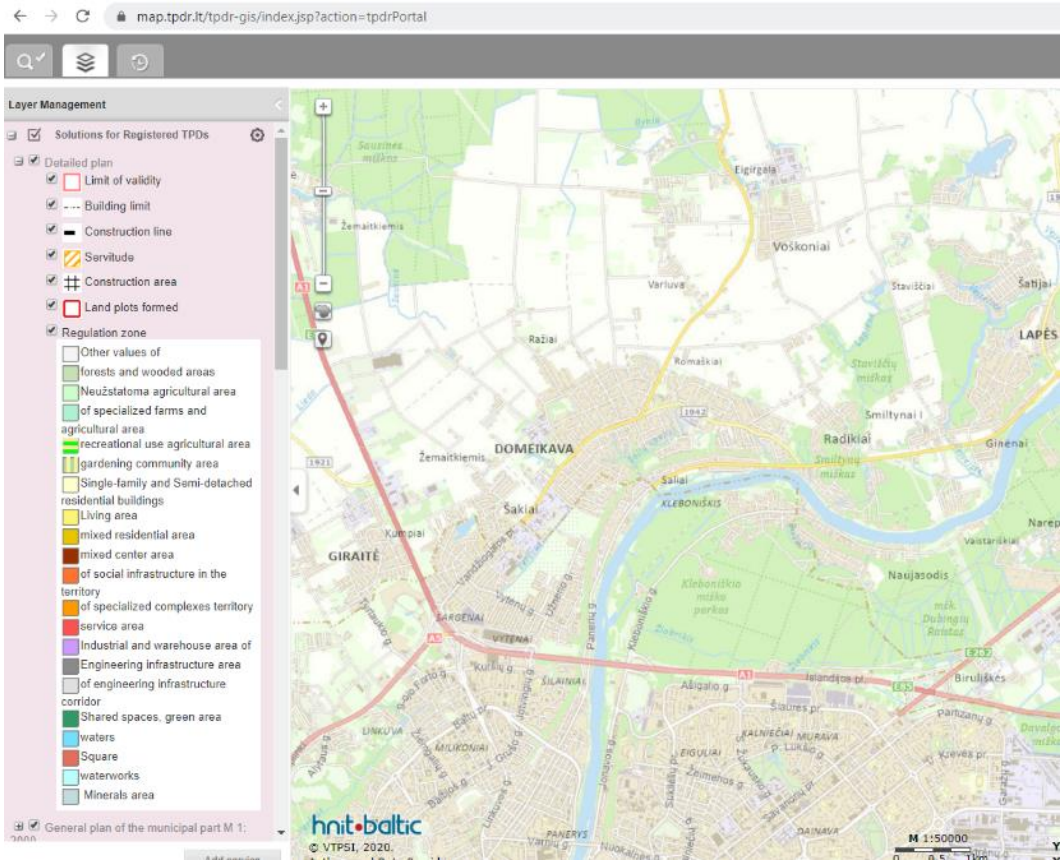
CC	Country-wide digital plan data platforms (alternatively regional example)
CY	(Not investigated)
CZ	(Nothing found)
DE 1	https://geoportal.bayern.de/bayernatlas/?topic=pl_bau (Bayern) 
DE 2	https://www.geoportal-raumordnung-bw.de/kartenviewer (Baden-Württemberg) 

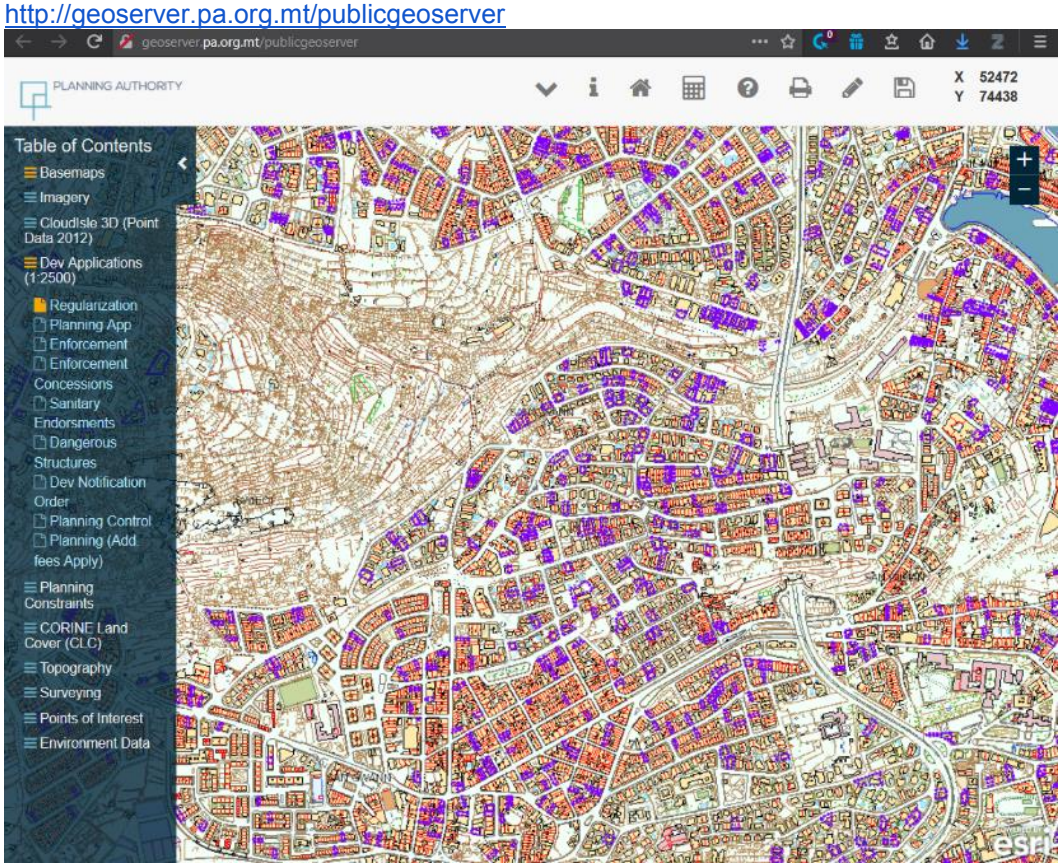
CC	Country-wide digital plan data platforms (alternatively regional example)
DK	http://kort.plandata.dk 
EE	No national platform yet.
EL	(Not investigated)
ES	http://tes.gencat.cat/muc-visor (Catalonia) 

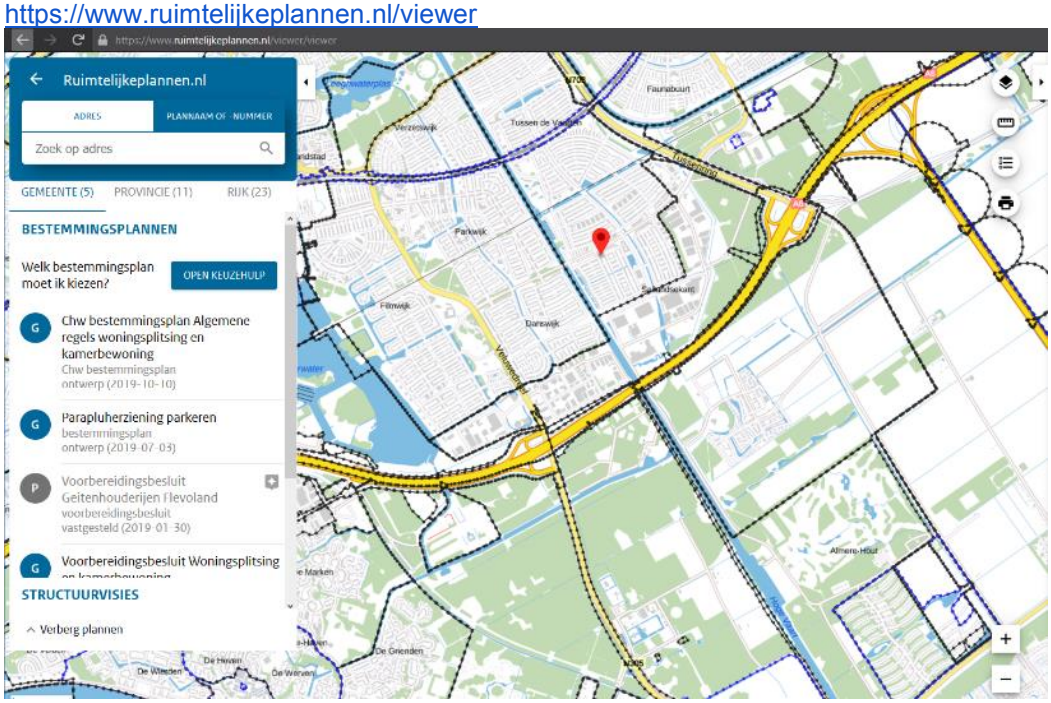
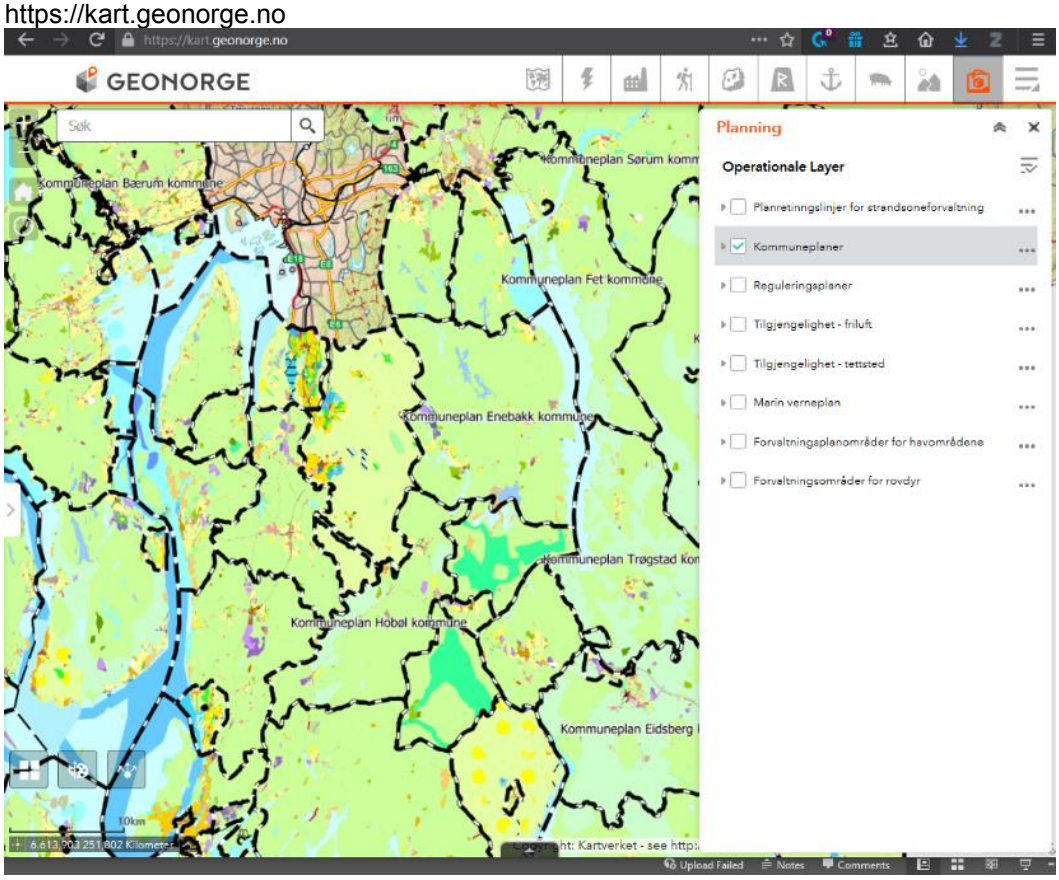
CC	Country-wide digital plan data platforms (alternatively regional example)
FI	https://www.paikkatietoikkuna.fi/web/en/map-window Not all regions covered.  Example of regional register: https://karttapalvelu.lounaistieto.fi/ (South West Finland)
FR	https://www.geoportail-urbanisme.gouv.fr/map 

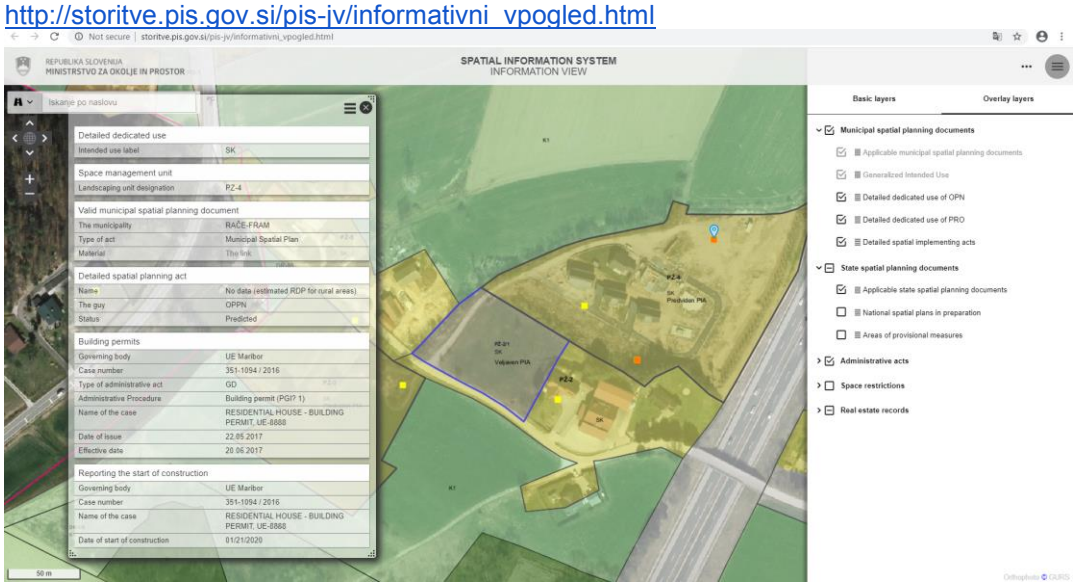
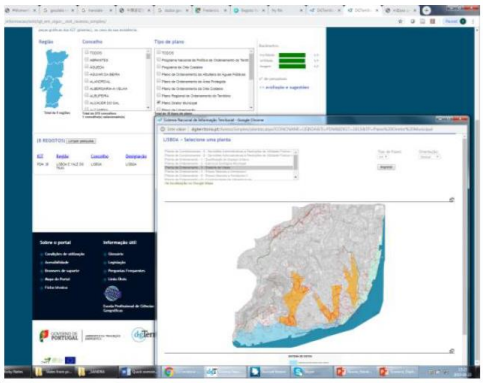
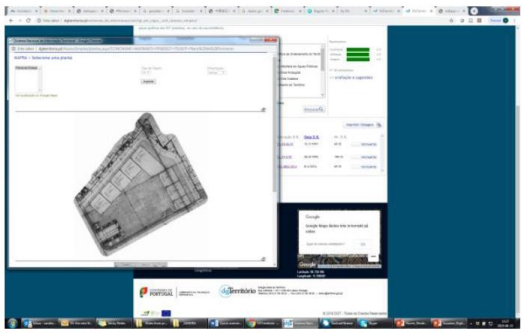
CC	Country-wide digital plan data platforms (alternatively regional example)
HR	https://ispu.mgipu.hr   Example for county register: http://ensmartportal.gdi.net:81/visios/zagzup (Zagreb County)
HU	(Not investigated)
IE	https://viewer.myplan.ie/ https://data-housinggovie.opendata.arcgis.com/datasets/current-local-area-plans-gzt-1 

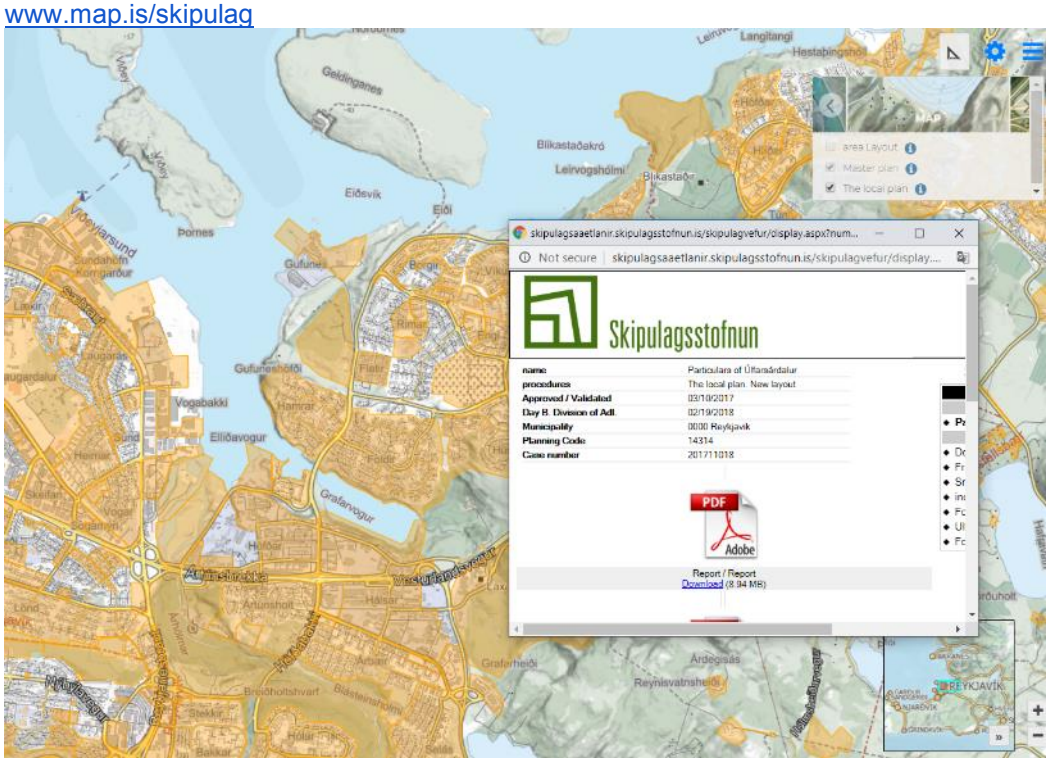
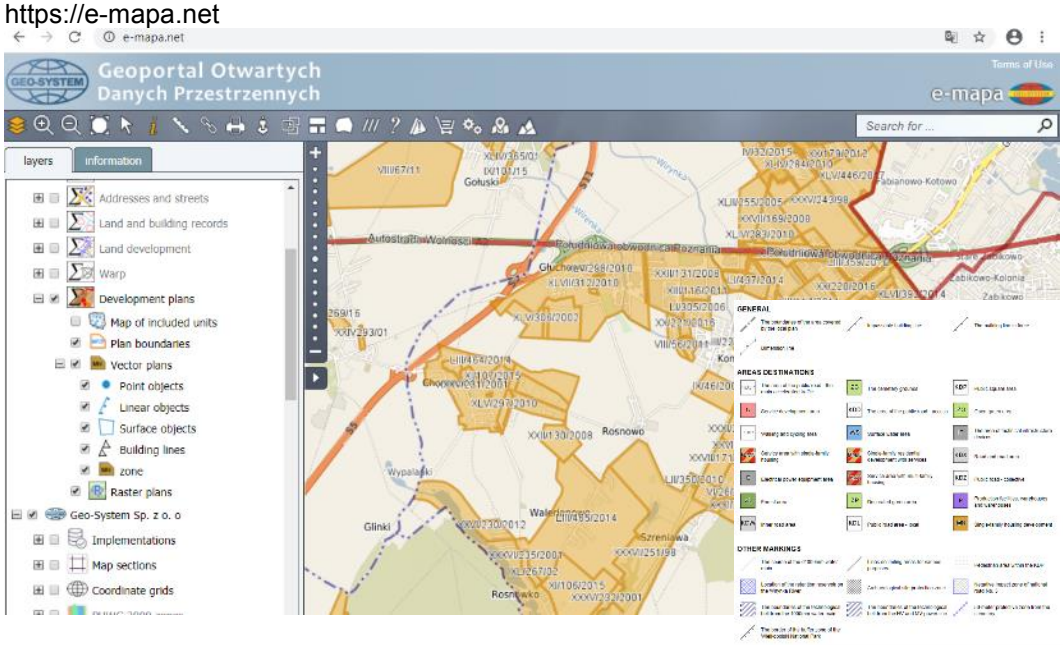
CC	Country-wide digital plan data platforms (alternatively regional example)
IT 1	http://www.provinz.bz.it/informatik-digitalisierung/digitalisierung/open-data/maps-e-webgis-die-geobrowser.asp (Southern Tyrol) 
IT2	http://www.sardegnageoportale.it/webgis2/sardegnamappe/?map=monitoraggio_strumenti_urbanistici (Sardinia) 

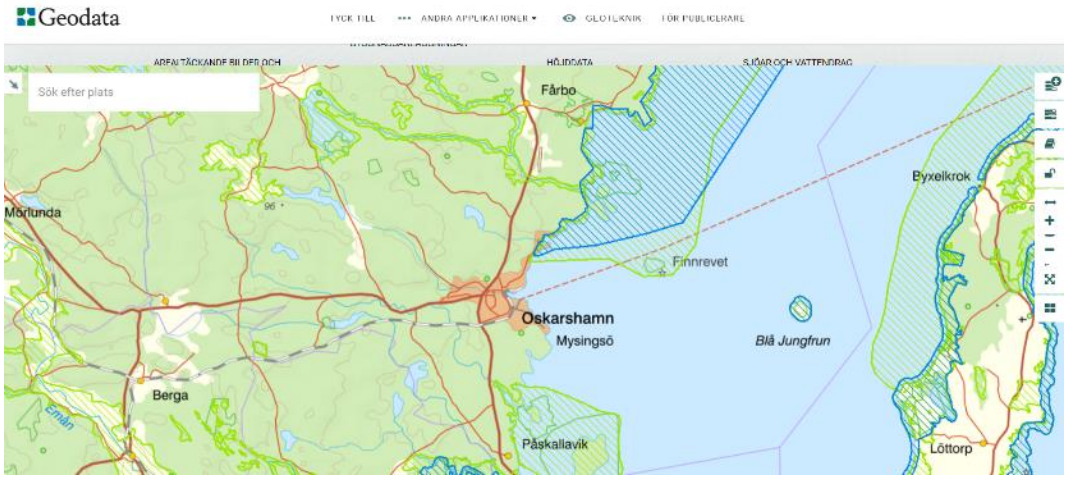
CC	Country-wide digital plan data platforms (alternatively regional example)
LI	https://geodaten.llv.li/ 
LT	https://map.tpdr.lt/tpdr-gis/index.jsp?action=tpdrPortal 
LV	(Not investigated)

CC	Country-wide digital plan data platforms (alternatively regional example)
LU	https://map.geoportail.lu 
MT	http://geoserver.pa.org.mt/publicgeoserver 

CC	Country-wide digital plan data platforms (alternatively regional example)
NL	https://www.ruimtelijkeplannen.nl/viewer 
NO	https://kart.geonorge.no 

CC	Country-wide digital plan data platforms (alternatively regional example)
SI	http://storitve.pis.gov.si/pis-jv/informativni_vpogled.html 
PT	http://portalsnit.dgterritorio.pt/portalsdisnit/full.aspx  

CC	Country-wide digital plan data platforms (alternatively regional example)
IS	www.map.is/skipulag 
PL	Mapviewer by a private company, offering Polish municipalities their services. Possible to see development plan areas and download the pdfs. Not all of Poland is covered. https://e-mapa.net 
RO	No national platform found.

CC	Country-wide digital plan data platforms (alternatively regional example)
SE	No plan data platform at national level yet, but central geodata portal. https://www.geodata.se/geodataportalen 
SK	http://www.uzemneplany.sk/clanok/uzemne-plany-obci-miest-a-vuc-najdete-aj-na-internete (in construction, private sector driven) 
UK	Notthing found for England. (Not investigated for Scotland, Wales, Northern Ireland)

ESPON 2020 – More information

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The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.