

## European cities - territorial impact assessment of change

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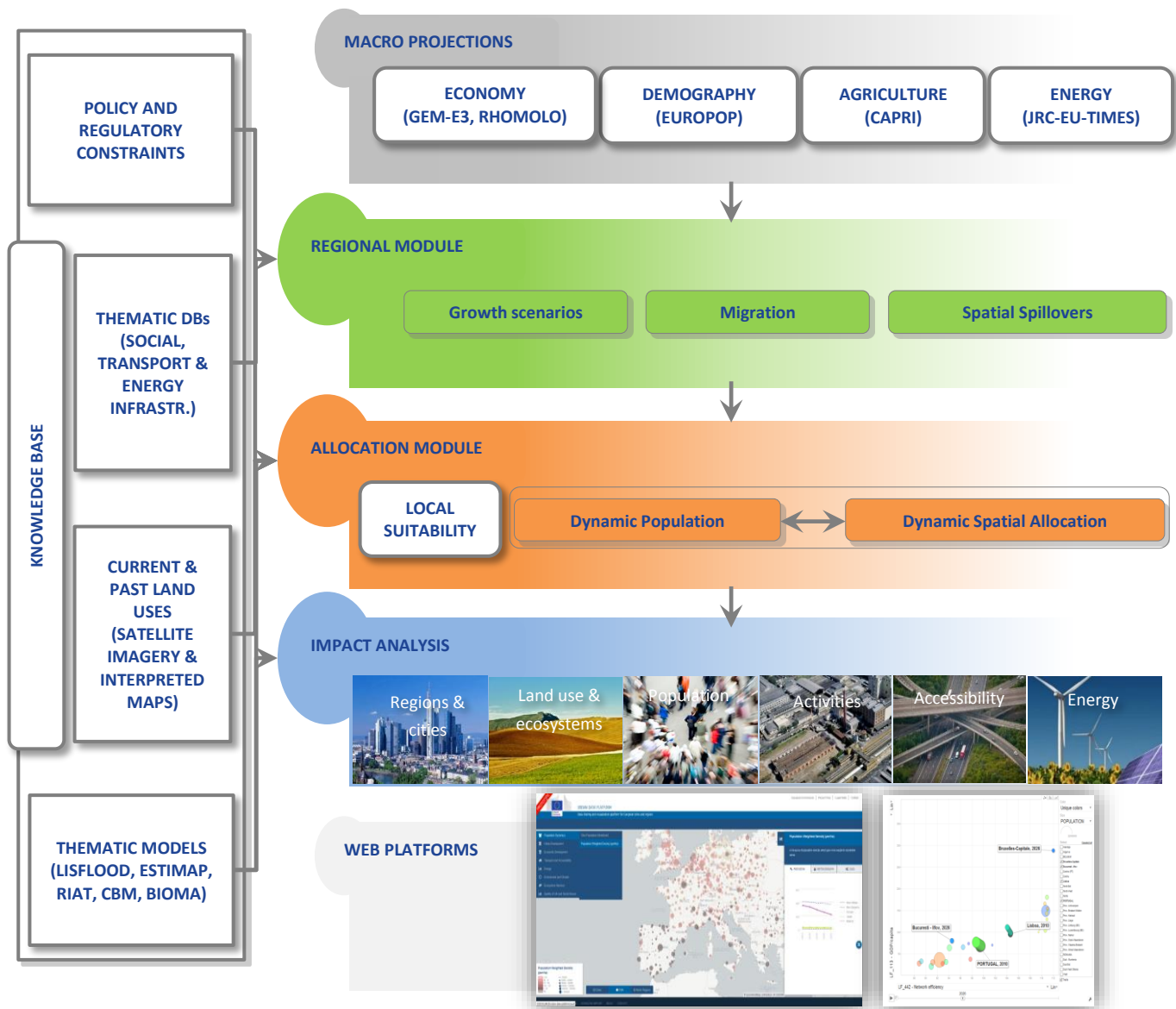
### Abstract

Today, the cities of Europe are more productive than they were in the past. They lead economic growth and innovation and host the majority of the population providing it with better opportunities for employment. Most of the specialized services, social and cultural activities also take place in cities. At the same time, cities are confronted with serious environmental, social and economic problems. Air pollution, flooding, congestion, poverty, unemployment, unaffordable housing, inadequate social services and infrastructure are among the most important. Parts of the population in cities are more exposed than others to these problems and are more vulnerable. This issue is increasingly being raised and the real inclusivity of cities is now the object of numerous discussions. The new urban agenda for the EU set policies towards creating inclusive cities and achieving inclusive economic growth. It includes several objectives under key thematic fields such as urban poverty, housing, circular economy and inclusion of migrants and refugees. Together with the policies that support the sustainable development of cities and urban areas, these policies aim at maintaining economic productivity and innovation in cities, improving the quality of life, addressing the main environmental challenges and providing solutions to social and physical problems of citizens. Therefore, ex-ante or ex-post evaluation of the potential implication of such policies at the level of cities is becoming increasingly important in Europe. How cities are likely to evolve in a longer perspective with the implementation of some specific policies is one of the main questions many policy analysts want answered. This study aims to contribute to this effort by introducing a set of spatial indicators in various thematic fields to assess the current state of European cities and their possible future development. In particular, it explores the territorial dimension of likely changes in urban areas and tries to establish clear links with productivity and inclusiveness in European cities. It follows a common baseline and a reference scenario for the future developed within the LUISA Territorial Modelling Platform.

The LUISA Territorial Modelling Platform is designed for the evaluation of EC policies with direct or indirect territorial impacts (Lavalle et al., 2011; 2013). It provides a comprehensive, harmonised and consistent spatial analysis of environmental and socio-economic changes in Europe. LUISA is based on the concept of ‘land functions’ for cross-sector

integration with an endogenous dynamic process of population, services and activities allocation. It has coherent linkages with other Europe-wide macroeconomic and biophysical models (e.g., RHOMOLO and CAPRI models) and projections (e.g., EUROSTAT and ECFIN projections) which derives information from several European thematic databases and scenarios. LUISA produces territorial assessment indicators that can be grouped together according to the ‘function’ of interest and/or the sector under assessment (LUISA, 2017).

**Figure 1: The Structure of LUISA Territorial Modelling Platform**



The core of LUISA is a computationally dynamic spatial model that allocates population and activities based on biophysical and socio-economic drivers (Figure 1). It generates three primary outputs at 100 meters spatial resolution: (1) land use/cover, (2) population and (3) accessibility. Several other spatial indicators are derived from these three main outputs to assess policy effects on various themes such as resource efficiency, environmental impact assessment

or urban and regional development. Given its approach developed for territorial modelling, and its high-resolution land use and population outputs data, LUISA provides the means to measure the performance of European cities and explore key spatial parameters that shape urban areas. Other existing territorial impact assessment practices had difficulties in measuring the EU-wide performance of cities and urban areas against specific policies. Europe-wide spatial models are generally designed to produce projections at the country level and/or for NUTS2 and NUTS3 regions. Moreover, other more fine-resolution spatial analyses cover only a limited number of cities or urban regions, implying intrinsic difficulties in making comparisons between different regions and in monitoring EU-wide impacts of urban policies. At this point, the approach developed by LUISA creates an important opportunity to fill this gap in territorial impact assessment practice. The high-resolution land use, population data and resulting spatial functions of LUISA provide useful complementary indicators to measure the performance of European cities and to explore the key spatial parameters that shape urban areas in Europe (Batista et al., 2013; Baranzelli et al., 2014b, Kompil et al., 2015).

Lately, LUISA investigated the present and future state of European cities and regions to contribute to the ‘The State of European Cities 2016’ report of the European Commission (2016). It applied several urban indicators that analyse the main dynamics of urbanization and urban development through changes in land use / land cover, population growth, recreation potential, green infrastructure, air quality, flood risk and accessibility in Europe. The results were presented in detail for a number of thematic fields at the spatial extent of the entire EU (Kompil et al., 2015) and constituted the base for the The Urban Data Platform<sup>1</sup> – an EU-wide data sharing and visualization platform for urban areas and cities – jointly developed by DG JRC and DG REGIO in 2016.

The current study will focus on the changes and trends in urbanisation, urban development, urban demographics, economic activity and productivity, provision of urban services and accessibility. It will demonstrate results of the analyses based on the Territorial Reference Scenario 2017, which is being set up by DG JRC and DG REGIO primarily for the production of thematic information for the upcoming 7<sup>th</sup> Cohesion Report. It is going to be used in the frame of the ex-ante impact assessment of the Multiannual Financial Framework (MFF) post-2020. With this study, territorial and temporal dimensions of future changes in urban areas will be explored with this new baseline and linked to the discussions on the productivity and inclusiveness of European cities. The results will cover the period from 2015 to 2050 for the entire EU and include analyses at various spatial levels such as cities/greater cities, functional urban areas, metropolitan regions and degree of urbanisation.

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<sup>1</sup> The Urban Data Platform (<http://urban.jrc.ec.europa.eu>) is a joint initiative of the Directorate General Joint Research Centre (DG JRC) and the Directorate General for Regional and Urban Policy (DG REGIO) of the European Commission. It aims to provide access to information on the status and trends of European cities and their surrounding regions. The design and implementation of the Urban Data Platform has been developed by the LUISA Territorial Modelling Platform and DG REGIO.

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