The MAPS-LED GIS

MAPS-LED First Mid-term Meeting
06/07.06.2016
Northeastern University, Boston, MA, USA

PAU UNIT

Methodological Description of WP1 and WP2 activities – PAU Unit

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Outline

1. Objective

2. Concept

3. Methodology

   A. Cluster Morphology at County level

   B. Cluster Identification at Urban level

   C. MAPS-LED GIS Cluster Mapping: Cluster Spatialization at Urban level

Objective

Main goals of the WP2

Main aim of this activity

To build an evidence-based methodology that investigate the spatial planning and governance-oriented features of cluster approach
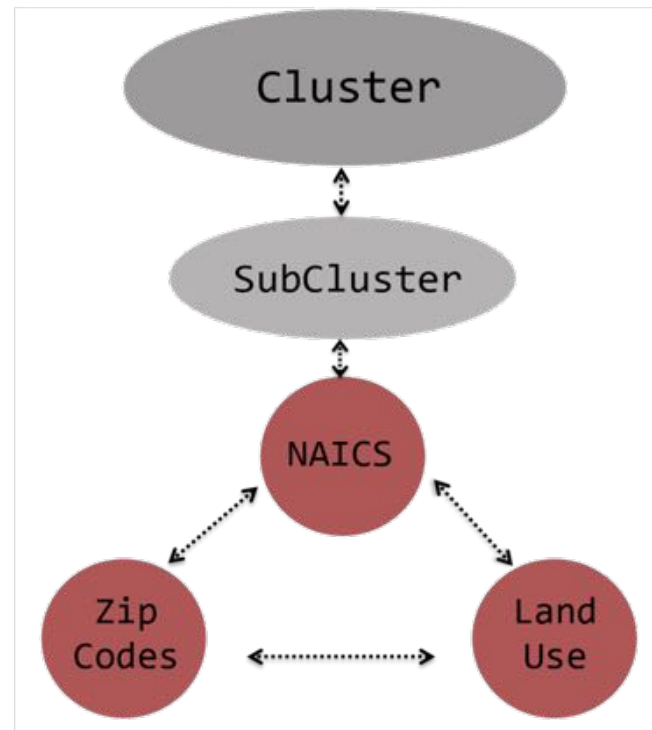
To highlight and analyze the relationship between cluster-oriented policies and spatial planning policies and the cluster policy effects/impacts on the urban fabric, using the lens defined during the WP1 of the project.

Cluster Spatialization

Concept

Explaining Clusters through Mapping Test Methodology

Methodology

Gathering of Worksheet Shapefiles.

GIS Map Building of GIS map of the Boston and San Diego Metropolitan Statistical Areas with the identification of counties and Boston city boundaries: after having downloaded shape files and metadata from official online sources, shape files have been added to the map's data frame.

Spatial configuration of the Boston and San Diego Metropolitan Statistical Areas (MSA).
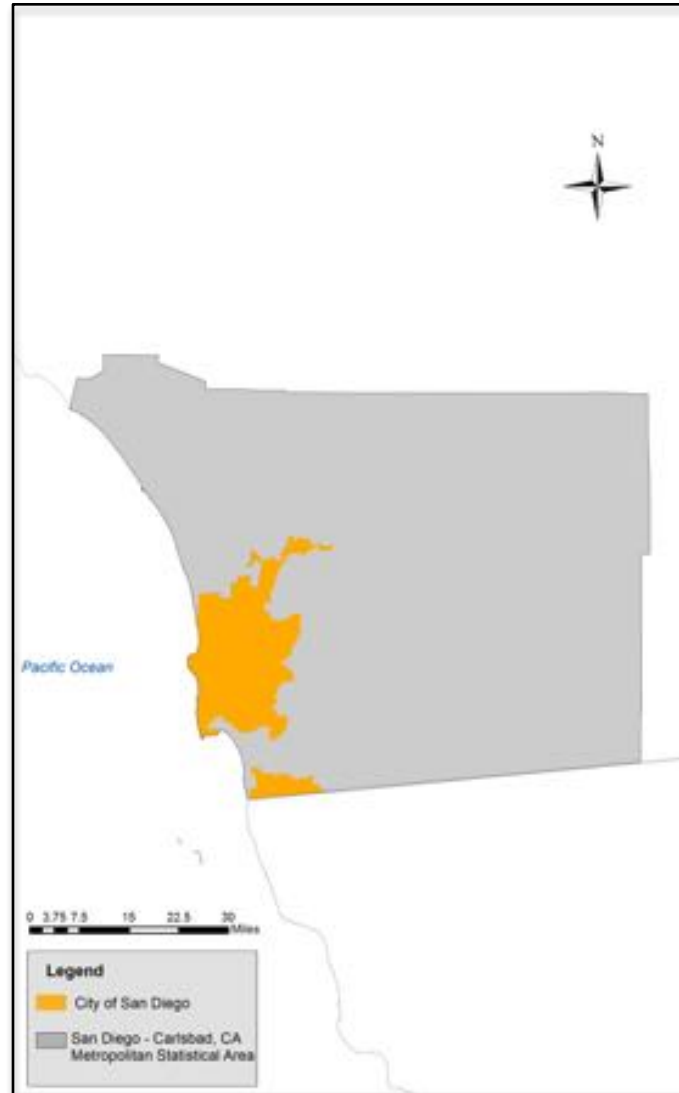
*Authors'
Elaboration*

Methodology

NAICS Localization|Combining Zip Code and NAICS 2007
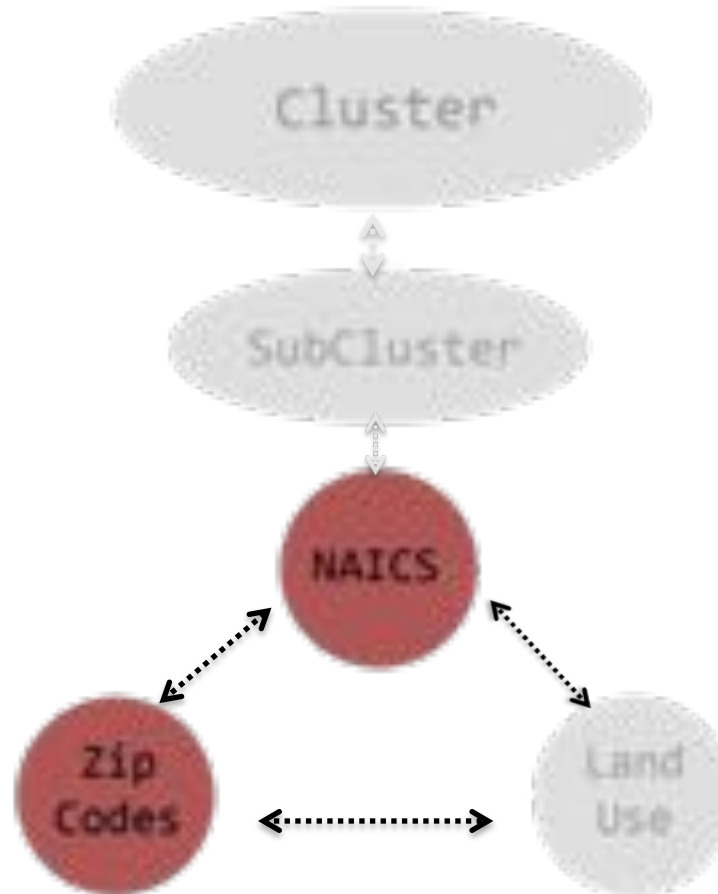
- Zip codes mapping of the selected counties within the MSA

Legend
- Middlesex County
- Suffolk County
- Boston-Cambridge-Newton MA-NH Metropolitan Statistical Area
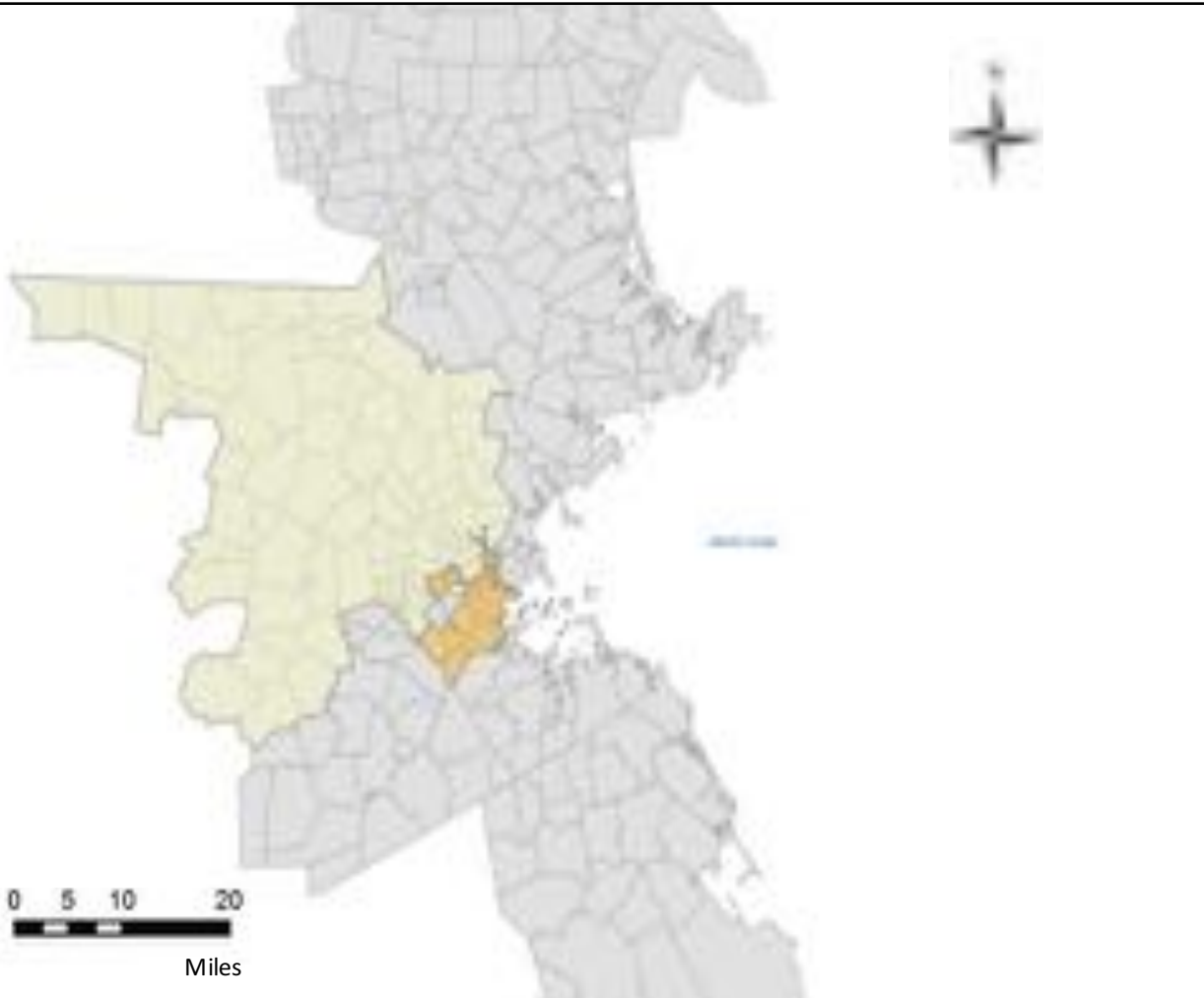
Middlesex county: 83 zip codes
Suffolk county : 27 zip codes

Main Data Sources :
US Clustermapping (http://www.clustermapping.us)
US Census Bureau (https://www.census.gov/)

Authors' Elaboration on GIS

Methodology

County level

Zip Code level ——— NAICS

Zip code
- *Minimum territorial unit* within the analysis;
- Spatialization of establishments;

NAICS 2007 (*North American Industry Classification System*)
- "Standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing and publishing statistical data related to the US business economy".

(Sources : United States Census Bureau - http://www.census.gov)

Zip Code Business Statistics worksheets
(Source: US Census Bureau - Fact Finder sample charts)

6-digit **NAICS** code (*North American Industry Classification System*) have been collected for the year 2013, 2011 and 2008, providing:
- association of economic activities with specific territorial areas (Zip code areas);
- Number of establishments for every NAICS in each Zip Code;
- Meaning of the number of employees for Zip code (size of establishments);
- The match of spatial and economic data allows to identify either the presence or absence of economic activities (subcluster) in specific areas (Zip Code).

Establishments | A single physical location where business is conducted or where services or industrial operations are performed.
(Source: US Census Bureau)

Cluster Morphology at County Level

Cluster Morphology at Urban Level

From Regional to Local dimension

Why? In order to fully understand and analyze the relationship Cluster Policy /Spatial Planning
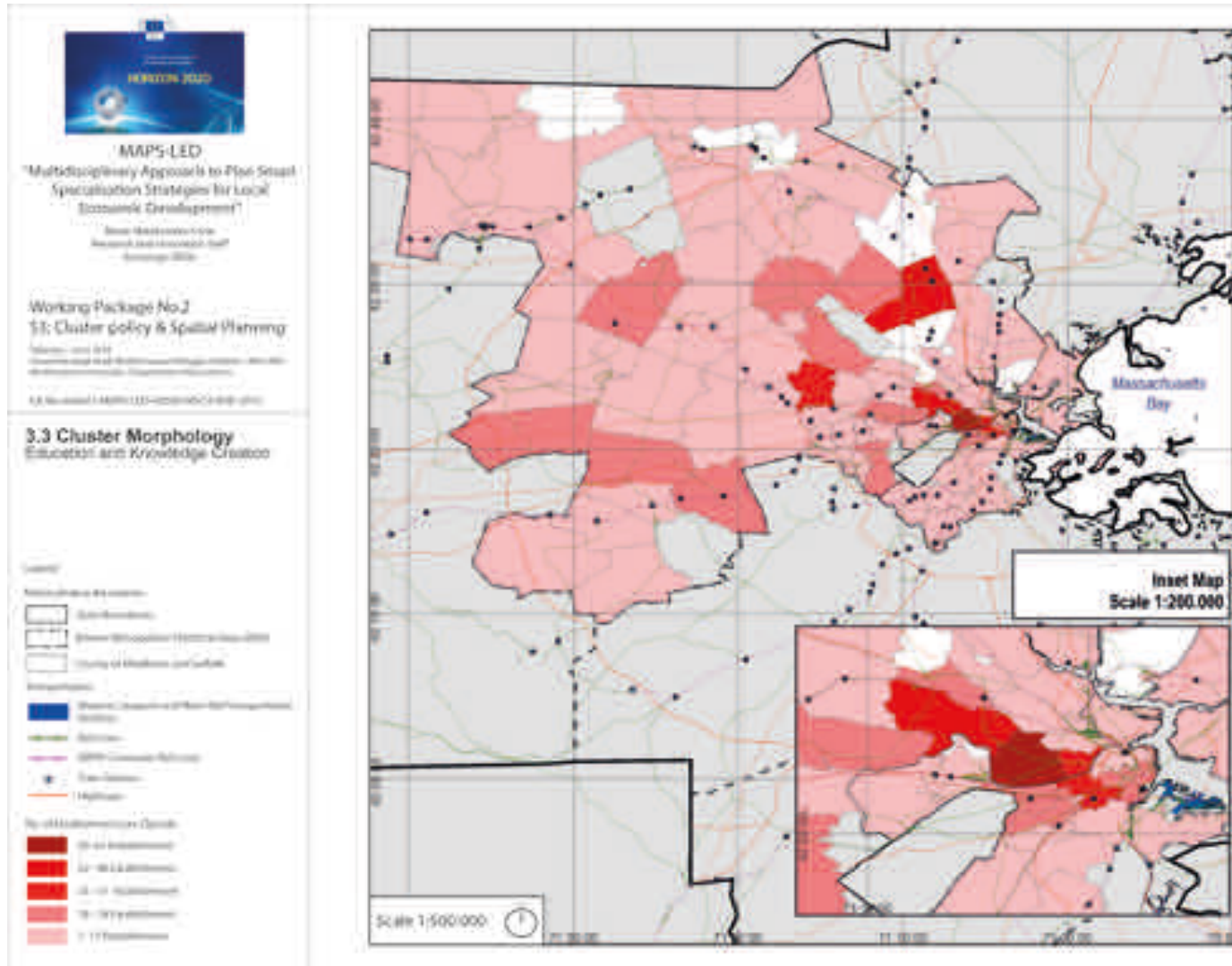
MAPS-LED GIS Cluster Mapping: Cluster Spatialization at Urban level

Merge of Zip Codes, NAICS 2007 and Land Use
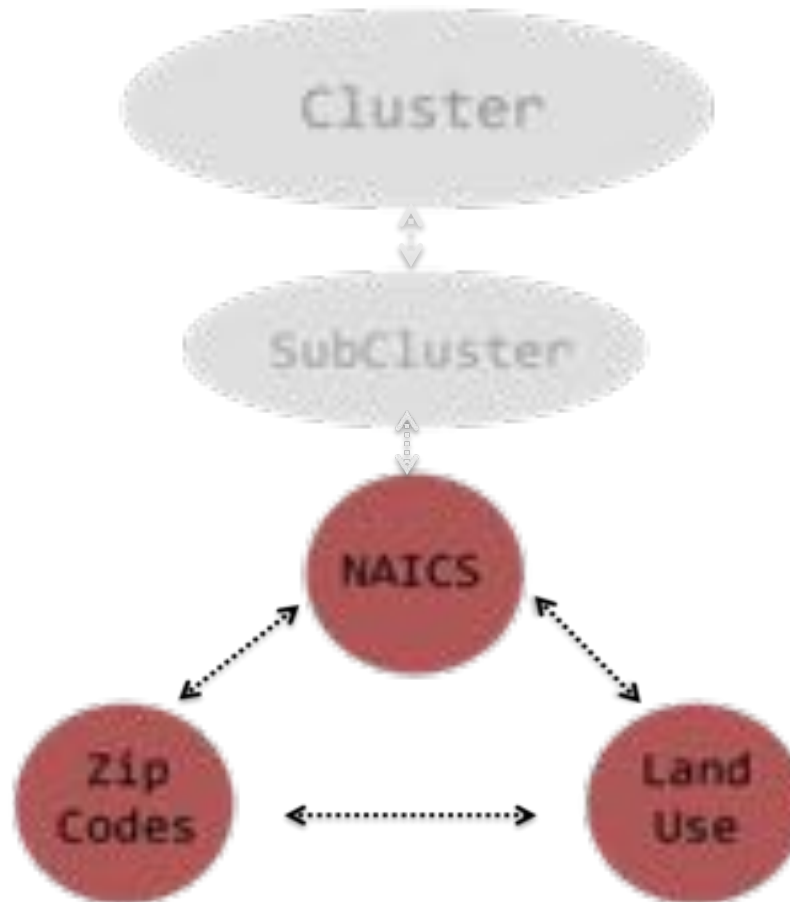
MAPS-LED GIS Cluster Mapping: Cluster Spatialization at Urban level

Main sources for comparing NAICS 2007 with Land Use:
- American Planning Association (2005), *Practice Land-Use Classification.* Zoning Practice. 9, p. 1-12.
- Land Development Code Commerce City, Colorado (2015), Article V. Uses and Accessory Structures. P. 1-111.
- Horning, J., Geneidy, A., Krizek, K. (2008), Access to Destinations – Parcel Level Land Use Data Acquisition and Analysis for Measuring Non Auto-Accessibility. 6, p. 1-43.

Destination Category	Reclassified Specific Destination	Original NAICS Code & Classification	
Financial Services	522000 – Banking	522110	Commercial Banking
		522120	Savings Institutions
		522130	Credit Unions
		522190	Other Depository Credit Intermediation
	521000 – Other Financial/Insurance	*All other Financial and Insurance (520000) classifications*	

Source: Technical Report: Access to Destinations – Parcel Level Land Use Data Acquisition and Analysis for Measuring Non Auto-Accessibility, July 2008.

MAPS-LED GIS Cluster Mapping: Cluster Spatialization at Urban level

The data set derives from several sources, like the VISION assessing data system.

In an effort to clarify land use type the data has been cleaned and subdivided to break the original use code into several different fields. Land use status is up to date as of July 1, 2014.

Land Use map reflects the land resources and types of land use in the national economy.

Source: Nikolaevskaia, E. M. *Karty*, 1970.

The following table lists a sample of land use codes found in the data layer:

| Land Use Code	Land Use Description	Category
101	MXD SNGL-FAM-RE	Mixed Use Residential
104	MXD TWO-FAM-RES	Mixed Use Residential
105	MXD THREE-FM-RE	Mixed Use Residential
111	MXD 4-8-UNIT-AP	Mixed Use Residential
112	MXD >8-UNIT-APT	Mixed Use Residential
121	MXD BOARDING-HS	Mixed Use Residential
13	MULTIUSE-RES	Mixed Use Residential
31	MULTIUSE-COM	Mixed Use Commercial
41	MULTIUSE-IND	Mixed Use Industrial

Source: www.cambridgema.gov

Land Use of the City of Cambridge, MA

Zip Code 02138
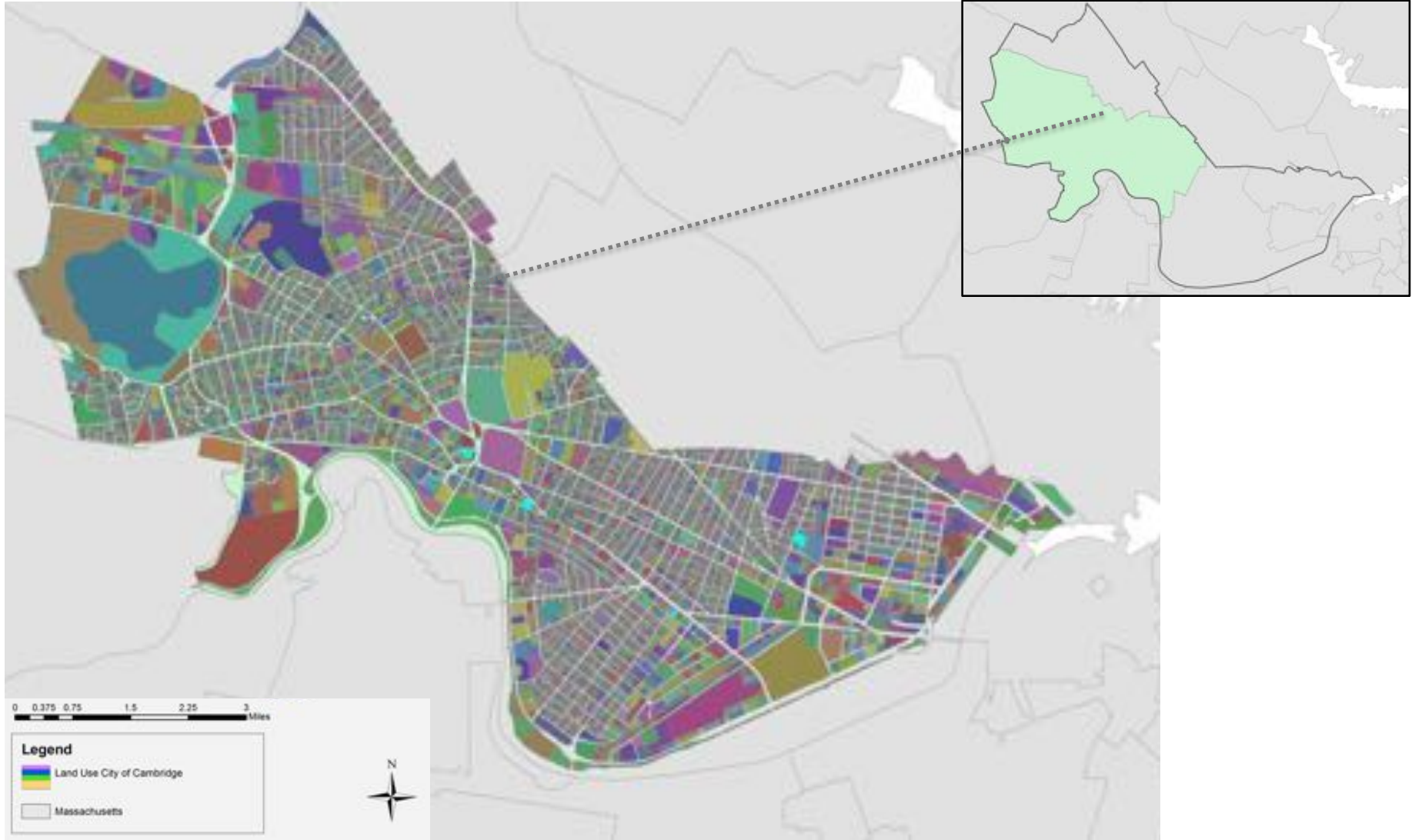
Authors' Elaboration

Land Use of the City of Boston, MA
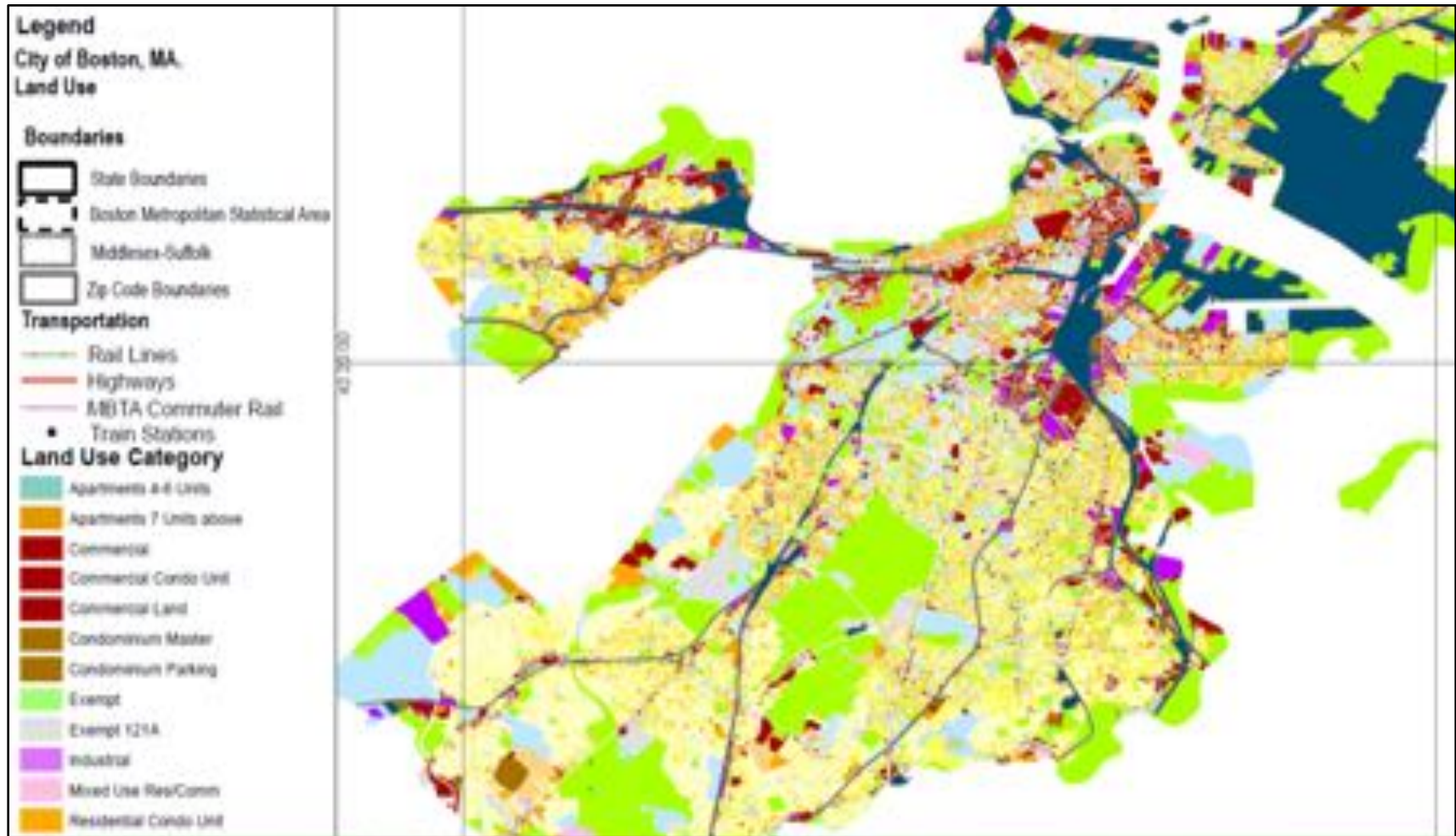
Authors' Elaboration

Massachusetts Government — Cambridge, Middlesex, MA — LAND USE to NAICS 2007 association/per Cluster

Land Use Code 1st digit level	Land Use Code 2nd digit level	Land Use 3rd digit level	Land Use Code	Land Use Category	Land Use Description	2007 NAICS code	Meaning of 2007 NAICS code	SubCluster	Cluster
Code Description ...	...	...	...						
9 Exempt Property	94 Educ. Private	941 Secondary Level	941	Private Secondary Education School		611210	Junior Colleges	Colleges, Universities, and Professional Schools	Education and Knowledge Creation
						611310	Colleges, Universities, and Professional Schools	Colleges, Universities, and Professional Schools	Education and Knowledge Creation

Authors' Elaboration

MAPS-LED GIS Cluster Mapping: Cluster Spatialization at Urban level

Subcluster Spatialization:
Matching NAICS 2007 and Porter's Cluster Definition
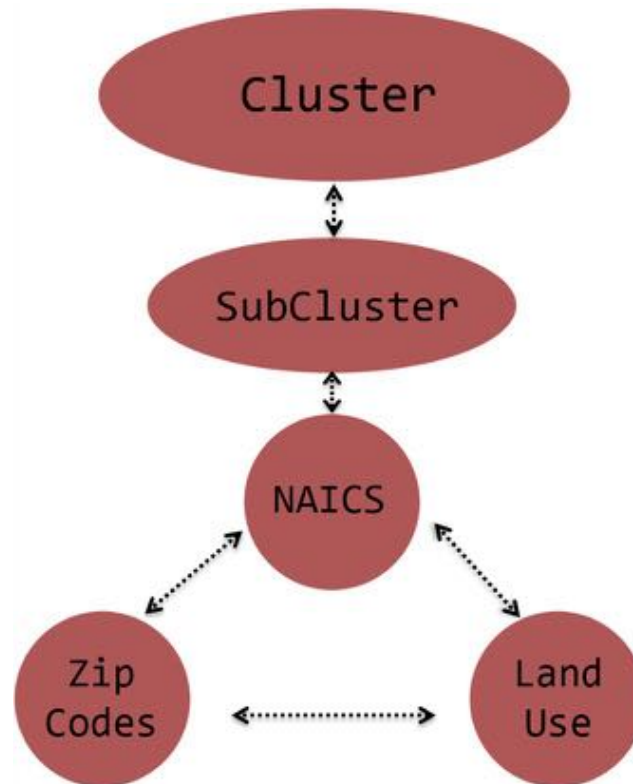
Marie Sklodowska- Curie RISE
MAPS-LED
Multidisciplinary Approach to Plan Smart Specialisation Strategies
for Local Economic Development

European Commission | HORIZON 2020 | MAPS-LED 2015 - 2019
Multidisciplinary Approach to Plan Smart Specialisation Strategies for Local Economic Development

Cluster Name: Education and Knowledge Creation
**Cluster Code:** 13
Description: This cluster contains all educational and training institutions, as well as related supporting establishments. It also includes research and development institutions in biotechnology, physical sciences, engineering, life sciences, and social sciences.

| | Number of Industries | 15 |

NAICS	NAICS Name	Subcluster Name
611410	Business and Secretarial Schools	Training Programs
611420	Computer Training	Training Programs
611430	Professional and Management Development Training	Training Programs
611512	Flight Training	Training Programs
611513	Apprenticeship Training	Training Programs
611630	Language Schools	Training Programs
611691	Exam Preparation and Tutoring	Training Programs
611699	All Other Miscellaneous Schools and Instruction	Training Programs
611210	Junior Colleges	Colleges, Universities, and Professional Schools
611310	Colleges, Universities, and Professional Schools	Colleges, Universities, and Professional Schools
611710	Educational Support Services	Educational Support Services
541711	Research and Development in Biotechnology	Research Organizations
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	Research Organizations
541720	Research and Development in the Social Sciences and Humanities	Research Organizations
813920	Professional Organizations	Professional Organizations

Source:
http://www.clustermapping.us/sites/default/files/files/page/Traded%20
Clusters%20Appendix.pdf [accessed 08/10/2015]

"Clusters are geographic concentrations of industries related by knowledge, skills, inputs, demand, and/or other linkages." (Porter, 2014)

Subcluster: "Conceptual subcategories that help to describe the content of each cluster. These subclusters are based mainly on industry definitions". (Porter, 2014)
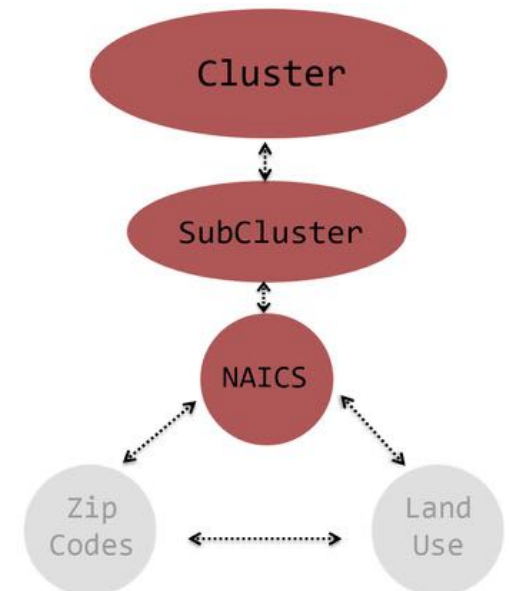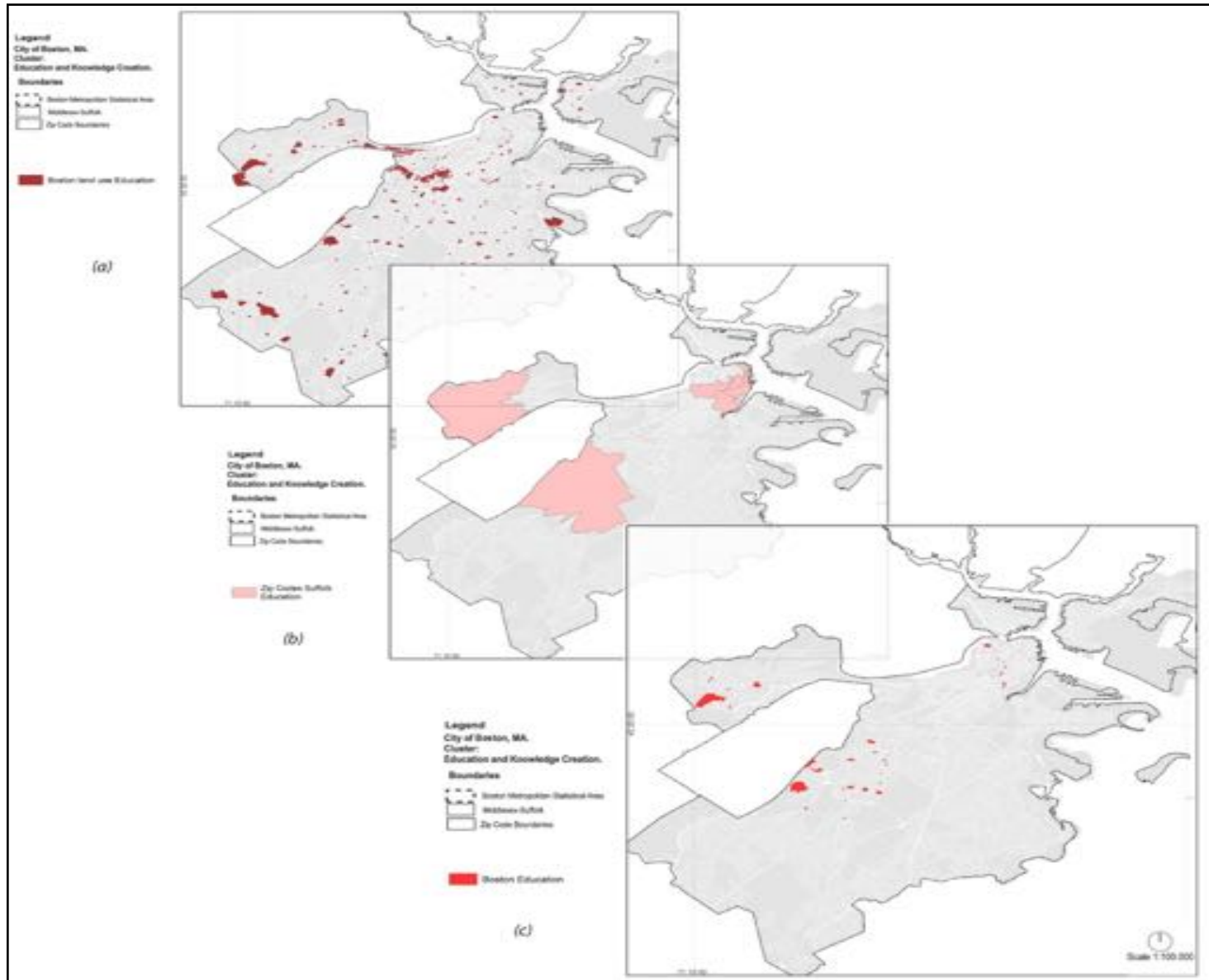
MAPS-LED GIS Cluster Mapping: Cluster Spatialization at Urban level

NAICS-LAND USE Association to Spatialize Clusters at the Urban Level (city of Boston)

Authors' Elaboration

MAPS-LED GIS Cluster Spatialization: Updated Methodology

Thank you ! ! !
for your attention

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