

Location dynamics of cluster formation and public sector response - can planning influence the process?

Findings from selected Metrex Metropolitan areas :
Paris, Helsinki, Lombardy, Madrid, Oslo, Stockholm, Szczecin



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Editors: Thierry Petit and Douglas Gordon

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Graphic layout: Thierry Petit and Douglas Gordon

Front cover design: Pascale Guery

ISBN 978 2 7371 1946 0

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Introduction

Since 2009, a group led by the IAU-idf, the Paris region urban planning agency, has been formed among the members of Metrex to address specific questions about planning regarding economic development, this group is called **Econometrex**.

Economy and economic development is a central issue in our advanced European societies and has a pregnant role on urban development (either by the way cities are developed in a strong interaction with the private sector or the physical way they evolve thanks to the economic activities location).

It is well known, but not always accepted, that planning cannot decide where economic activities will locate. But it is possible to influence its location, especially by planning, the question is how far?

The aim of this group is to bring elements of knowledge and understanding about the tendencies underway concerning the localization of economic activities among the respective metropolitan areas represented. It is also to share practices in terms of analysis or concerning the conception of strategies, planning and policies concerning economic development.

The Econometrex group¹ has chosen to focus its present work on the actions of public authorities to foster the creation and development of clusters, especially concerning the planning issues.

This work is based on two approaches: the exchange of experiences based on existing works on this issue conducted by the various members but which are very heterogeneous, and the result of firms interviews based on a common methodology for Paris and Helsinki (see annex).

The first part of the study will present the main elements concerning the cluster theory,

The second part is formed by the various elements brought by the members involved in the Econometrex group presented through case studies.

The third part will present the findings of the Econometrex group on clusters.

¹ See chapter participants

Thanks

We warmly thank all the participants of the economic group for their (free) commitment in this long lasting but passionate work, with lots of debates, sometimes leading us to unexpected but interesting issues.

We also would like to thank all the various attendants to the meetings who were not able to fully participate to the works but brought their ideas to the group.

I would particularly like to thank Douglas Gordon who was very active in the Group and very stimulating for all of us and made this work possible.

Thierry Petit, leader of the Econometrex group

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Part I:

Elements on cluster theories

1. Elements on cluster theories²

1.1 The concept and its formalization

Traditionally, economic development was mainly perceived as an external process where local actors had but little proactive mean of action. This vision began to change by the emerging 1970's new theories about "innovative environments", "learning regions" or "clusters". Since then the local scale gains value in a growing world economic competition.

The theories about cluster can be traced since Alfred Marshall's works who first mentioned the industrial districts (1890) as being a benefit for the economic actors due to their proximity and geographic concentration, generating externalities.

Nearly a century later in 1979, the Italian economist Gioacomo Becattini followed by several other Italian economists applied this concept of industrial district to the northern Italy industry, with a holistic view. He improved the theory by putting his analysis at the whole districts level, considering it an entity, instead of analyzing each firm composing the cluster.

In 1990, the American economist Michael Porter of the Harvard business school introduced the notion of "clusters" which he defines as follows : ***"Geographic concentrations of interconnected companies, specialized suppliers, service suppliers, firms in related industries firms, and associated institutions (universities, standard agencies, and trade associations) in particular fields that compete but also cooperate."***³

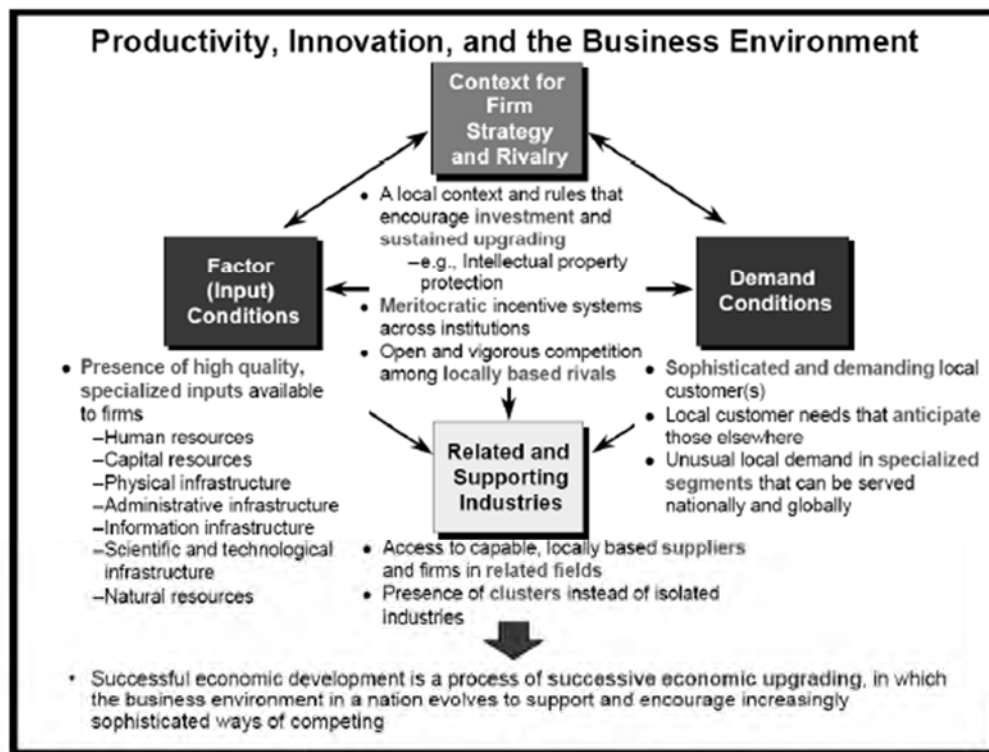
Porter who firstly analyzed the cluster phenomenon at country level recognizes that a cluster can be of various type and size: urban, rural, city to nationwide, depending on the type of activity concerned on the type of competition between firms and their strategy.

Porter's contribution mostly laid on a better formalization of the concept and a broader view, especially with the diamond diagram, explaining how countries (extended to regions) gain competitive advantage through clusters.

² This part is largely inspired by the study : *"Clusters mondiaux : regards croisés sur la théorie et la réalité des clusters"* Sylvie Lartigue et Odile Soulard, IAURIF, janvier 2008.

³ *"The Competitive Advantage of Nations"*, Michael Porter, 1990.

Porter's diamond and the competitive advantage.



Source: Diamond of competitive advantage, Michael E. Porter (2004)

Clusters, through proximity, bring a competitive advantage as it develops and intensifies interactions between 4 complementary factors that participate to the national/regional competitiveness and synthesized by the diamond (see diagram upper).

These factors are:

The factor (inputs) conditions which include the production factors of the firms of the cluster: workforce, scientific research, capital, infrastructures, natural resources.

The context for firm, strategy and rivalry. The political, legislative and economic environment of the firms must be healthy, stable and business friendly, encouraging investment innovation and competition.

Demand conditions. A local market that should be of good quality and larger enough with customers that have sophisticated demands and anticipate the future fashion trends, challenging local firms to be more innovative in their offer and of high quality.

Related and supporting industries. A rich locally based network of suppliers of high standard, in the related fields of activity.

1.2. A concept that is difficult to define in a single way

Since Porter, many works have been conducted about clusters with various use of the word, leading to a variety of concepts.

One can at least identify 3 families of concept for “clusters” which are not exclusive from one another:

- The first, more economic oriented, stresses the fact that clusters are firstly groups of companies from related economic sectors linked by a value chain, by technologies, clients, employees or distribution networks.

- The second puts the accent on relationship between actors where geographic proximity can be very relative.

- The third, more territorial, considers clusters first as a pole with a critical mass where the concentration of actors such as companies, Higher education and research bodies, operating in the same field, alongside with capital risk actors, the state and the local actors, aim at international excellence.

The word cluster is used in many ways by a wide variety of actors (developers, politicians, economists, geographers) for different aims and audience: organize the local economic development, analyze the economy of regions and develop theories on employment, growth and productivity.

Clusters can have various dimensions such as geographic area (national scale, regional scale or even neighborhood, social links, type of relations and of actors, technological level, life cycle, etc.

Therefore it is very difficult to agree on one single definition that applies on every situation.

1.3. The limits and criticism addressed to porter's cluster vision

It has been previously evoked that the concept of cluster has various perceptions according to the actors using it and their purpose.

The theory itself leaves behind some unanswered questions:

Geographic limits: At which geographic scale does the knowledge transfer, business networks, links between firms occur? Is there a geographic optimum for density to trigger the networking process? Is there a minimum geographic threshold?

Industrial limits: at which aggregation scale should a cluster be considered and according to which classification? to which level of specialization a firm concentration can be qualified as cluster? which are exactly the public the actors and the activities that must be associated with the clusters ? Is there a minimum number of actors (critical mass) to declare a cluster?

Links: What intensity should be considered, how to evaluate them? How can we measure the tacit knowledge?

How can so diverse actors with different expectations, rationalities and time scale have common objective on developing clusters and the territory?

Isn't there a risk to identify as a cluster every firm concentration?

The results of the mappings of clusters can be very different according to the variable taken into account. Clusters can then be "*in the eyes of who want to see them*". Michael Porter identified 60 clusters in the USA, the OECD 380 in 2001.

The cluster approach also generates a risk of isolating the object cluster from the regional system it belongs to, with other clusters too, and with which it necessarily interacts.

The cluster isolation is also pointed out for some clusters as a risk of "inbreeding" among the members which can tend to copy-paste between each other, leading to a reduced collective vision and less capacity of innovation and adaptation to its environment.

The social factors are also often under estimated and the emergence of clusters is also largely due to a local context regarding the social practices, law and politic systems.

The most recent researches on cluster deepen the analysis and question the regional policies on cluster.

For example, the positive effect of clustering on job creation mostly concerns the "*related industries within the cluster that are still relatively less developed*" and not the core industry already highly specialized (Delgado et al. 2012). The benefits of clustering are obvious for the firms member but they also concern the workers of the cluster whom wage rises and the land owners who benefit from the rise of land price.

The urban economists stress the fact that general density of economic activity matters, whether it is done through specialization or not. However, for some of them, spatial economic specialization can even have a negative impact on economic development (Gleaser, 2011).

There has been debates on whether the regional economic policies should be focused at improving the regions assets or focus on individuals (for ex. Barca et al. 2012). The regional policies are often criticized as being only designed to create density (Duranton 2011, Ketels 2013), they are also questioned about their final objective: should they only aim at supporting lagging regions? An OECD study (OECD 2010, 2011) says regional policies should help all regions. Other studies show that in practice public money is rather spent where there are the most urgent needs and not where the economic returns are the highest (Walburn and Saublen 2011).

1.4. What are the advantages of the clustering process ?

1.4.1. According to the theories, the cluster is supposed to bring advantages to the member companies

- 1) It gives access to a competent job pool: The local concentration of actors in specific activities creates and attracts particular talents that are then locally easily available to hire, making the location even more attractive for these activities.
- 2) Suppliers tend to become more specialized: The concentration of firms addressing the same market is source of competition but also offers a larger market that pushes suppliers to more specialization but also more coordination to lower the transaction costs. The “coopetition” process is emphasized, leading companies to move upmarket, especially the SME's.
- 3) It emphasizes the knowledge spillovers: The geographic proximity facilitates the formal and informal knowledge transfer, especially thanks to the workers mobility who bring their know-how (informal knowledge) to their new employer.
- 4) Productivity of firms member is increased thanks to an adapted job pool, the accumulation of knowledge, a better transfer of information, complementarity between actors and scale economies
- 5) Innovation capacity is also improved, firms perceive more easily the markets need and are more reactive to respond to it with limited cost and risk, thanks to their environment and the “coopetition” that takes places among the members.
- 6) Entrepreneurship is enhanced: ideas and person circulate easily, new concepts can be put into market more easily thanks to the presence of partners, mentors and capital. The cluster also attracts companies that wish to benefit from its advantages. Larger firms use the cluster as an incubator for young subsidiaries created to exploit new ideas in a more stimulating environment than within the firm.

1.4.2. For a geographic area there are at least 4 reasons to foster a clustering process⁴

- 1) It reinforces the visibility of the activities labeled “cluster”
- 2) It increases the cooperation between the cluster members who have a better knowledge of their business but also academic and research environment, that makes them more competitive.
- 3) Promoting a cluster brings cities and public bodies to create infrastructures and equipments dedicated to these clusters: incubators, real estate, activity parks, design of new urban areas supposed to enhance innovation and business cooperation...
- 4) It has a positive impact on jobs creation but uneasy to measure. It more surely improves the jobs qualifications of the clusters employees because of the upmarket moving process of the member companies.

⁴ Source « Villes et clusters en Europe -les actions des villes dans le soutien des clusters», Agence d'urbanisme pour le développement de l'agglomération Lyonnaise, décembre 2008.

1.4.3. The various works since Porter put the stress on the human factor in the success of a cluster.

Social relations within a territory and the notion of community are key in this matter.

A common culture, the share of common values, the intensity of connections creates trust that eases the risk-taking behavior, cooperation, the share of information. It also creates more cohesion and solidarity among members that is a factor of evolution and resilience. This cohesion goes beyond the firm members to reach public actors like administrations, local actors, public research and higher education.

Many studies have tried to verify the reality of these advantages in a quantitative way, the results are very diverse and it is difficult to draw definitive conclusions from them, especially because of the variability of the concept (see B) and thus the non-comparability of the various objects. Another way of analyzing the impact of cluster is to survey the members like the European study named Innbarometer on clusters conducted in 2006.

1.4.4. The reality of these advantages according to the study Innbarometer on clusters

The study Innbarometer on clusters 2006 (latest available) shows that the benefits are real but not that strong as described in the theory.

Concerning the gains in productivity through a better access to specialized suppliers and workforce a better information and more demanding customers, the access to a better qualified workforce (64%) comes first just in front of a better access to information (62%). The access to more demanding customers is only confirmed by half of the interviewed, but a large majority of firms consider that belonging to a cluster gives better access to the market being local or regional (69% and 65%).

Innovation is effectively more intense than for non-clustered companies (78% introduced a totally new or improved product on the market against 74% of all the firms considered as innovative). Companies also more frequently tend to patent their innovation. Managers also consider that clusters stimulate entrepreneurship.

Clusters are supposed to develop competition and cooperation among its members, in reality only 44% of the members of clusters consider their environment more competitive, but a majority (53%) consider that being in a cluster facilitates their development.

1.5. Why do firms cluster at specific places?

Firms when engaged in a cluster search for:

- Proximity to their competitors, the workforce, the infrastructures, the institutions, the research
- Diversity of know-how, competencies, activities that can be complementary to theirs and that opens many possibilities

-Accessibility with the capacity to easily exchange ideas, learn, communicate. Transportation and communication networks are very important in this matter and help create a good climate among the various actors.

But other elements can influence and contribute to a clustering process.

The entrepreneurs: Schumpeter (1934) underlined the role of the entrepreneurs in the cluster creation. The entrepreneurs by setting-up activities attract other firms or generate spin-off that participate to the cluster creation process.

The demand: A local demand on particular products or with specific requirements can push the local firms to design more sophisticated products and services that will give them a comparative advantage on their international competitors.

Knowledge and qualified intensive industries tend to more frequently form cluster to benefit from public research and the other industrial firms research (Audrech and Feldman 1996).

Random can also play a role at the very beginning of the process with a cumulative effect that finally brings to the emergence of a cluster (Krugman 1991)

1.6. When is a public cluster policy the most legitimate? ⁵

According to the EU⁶ : « Cluster initiatives can be understood as organized efforts to increase growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community”.

The literature about clusters though very dense is much poorer regarding the justification of public intervention regarding the clustering process.

Among the main obstacles identified is the difficulty to evaluate the cluster policies because of the variety of the concept and the lack of indicators. But what legitimates the most public action in this field and in a time of public restriction is its efficiency and its effective ability to foster cluster development.

Among all the works conducted in this specific field one can identify three main streams that correspond to various levels of public intervention:

An evolutionist perspective that consider that cluster is a “spontaneous and natural” process based on private initiative and on common interests, where public intervention can at best useless, inefficient and even hinder its development. The tenants of such theories admit that a public intervention can eventually correct large imperfections in the market or bring specific and vital elements for the development of the cluster but only on a short period. A long lasting action of the public actors can be counter-productive by preventing the cluster to adapt to its environment. The public actors can also waste the public money on supporting the wrong cluster.

⁵ Based on the paper of Favoreu Christophe et al., « Légimité des politiques publiques en faveur des clusters », *Revue française de gestion*, 2008/3 n° 183, p. 157-178.

⁶ “The concept of clusters and cluster policies and their role for competitiveness and innovation, main statistical results and lessons learned”, Europe INNOVA / PRO INNO Europe paper n°9, Commission staff working document SEC (2008) 2637.
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A constructivist perspective on its side considers that regarding the market imperfections, the public action is legitimate in the process of emergence and development of a cluster. These authors point out the fact that public action did lead to the creation of clusters in a relative short period of time in focusing on building infrastructures or equipments that favours geographic proximity between actors (firms, research, universities) and help build and strengthen links between these actors.

A “reengineering” prospective can be placed in between the two previous, where the private action is dominant but where public action has its place in some specific moments. The public action is the more indirect and mostly aimed at creating and monitoring a collective action framework by enabling and monitoring the relations between actors and also organize the innovation system.

A study⁴ focused on defining when is the public action the most efficient regarding the cluster dynamic through time used a network approach on case studies. The study analysed the cluster in a life cycle perspective showing that the need of the cluster were different through time and that justified public action in very specific cases. The main outcome is that public action is the most efficient when the cluster is already existing and in a growing and structuring phase, when at the first stages the public action is not useful or even negative on the process. The table below gives a synthetic view of these results.

Synthesis of the public action in regard to the life cycle of the cluster

Development phases of the cluster	Embryonic	Emerging	Growing and structuration	Mature and declining
Basic needs of the cluster and development factors	Development and appropriation of technologies that offer commercial prospect	Physical needs in basic infrastructures	Social and relational needs. Capacity to elaborate a collective strategy.	Need for openness, technological and commercial regeneration
Form of public intervention	Limited, as it is difficult to identify these clusters	Development sites and structures. Financial assistance, specialized services. Support in prospection and market tests	Networking methods and platforms. Collective identity building strategy. Promoting actions within and outside the cluster. Innovation supports. Partnership building between R&D, industry and higher education.	Training and reorientation of the local workforce potential. International opening. Ease the emergence of new technologies.
Efficiency of public action	Null	Moderate, can be negative	Strong	Weak

Source : Favoreu Christophe et al.2008

Thierry Petit, Paris 2014

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Revue française de gestion, 2008/3 n° 183, p. 157-178.

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Part II:

Case studies

Cluster support policies in the Ile-de-France region



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Forewords

The *Ile-de-France* Region, or Paris region, covers the city of Paris and its surrounding areas. The French capital region concentrates a strong proportion of the nation's economic and innovation potential. It is also one of the key economic regions in Europe and in the world. As the capital region of France and also because of its specific role within the country as the only world class metropolitan region, the economic development and especially the cluster development policy is conducted by the State alongside with all the layers of the local actors: the Regional council, the "*Departements*", the urban communities or the cities. In this configuration, the role of the regional council is more to accompany the national policy and to give coherence to the local actions within the Region.

IAU-îdf is the Regional institute for urbanism and is affiliated to the Ile de France Regional Council. It is the IAU-îdf which makes the Paris Regional Structure Plan.

Introduction/context - The Paris region: a French and European economic leader

The Paris region is the smallest of the French regions in size but is by far the number one French region in many domains. The history of France and its centralized power tradition is of course the first reason for this situation. As a consequence, the region is the first place for finance, R&D and high valued activities in general from which headquarters, creative industries etc...

The capital region also hosts several industries which still form the heart of their respective national sectors such as automotive, air and space, electronics, food industry, chemical (pharmaceuticals).

For 40 years the other regions of France have also developed their own attractiveness with cities that entered a strong and rapid metropolisation process especially during the last 25 years, but the Paris region still comes first with a significant weight for the most qualified and valued activities.

In Europe, the Paris region comes first or second in a close competition with London and is one of the European leaders in innovation (see table 1 below) with 5.5% of the European patents and world n°1 in the 3 following research domains : image, media and numeric content; software and complex systems; Biotech, health and medication.

The Paris Region is also the first French region for foreign investment (47% of the foreign investments in France), the second in Europe after London and the 4th at the world level during the 2007-2011 period.

As the seat of the state government and as the economic capital of France, the Paris region hosts most of the international headquarters based in France.

A recent study conducted by the IAU-îdF shows that the Paris region hosts 15,000 foreign company headquarters and is by far the main national gateway to the rest of the world. The same study shows that the Paris region plays a major role in Europe as the first European go-between and gateway for other European metropolises and worldwide. In the world network of international companies the Paris region is one of the world top 3 world class metropolises behind London and side by side with New-York. The Paris region is also the first go-between for the African continent metropolises to the rest of the world, including the largest non-French speaking ones like Cairo, Cape-town etc.

Tab. 1 Basic economic facts 2011

	Paris region 2011	Share of France 2011	Share of EU 28
Surface	12,000 km sq	2%	0.25% (2013)
Inhabitants	12 million	19%	2.4% (2013)
Pop. density	987 inhab./sq km	115 inhab./sq km	116 inhab./sq km (2012)
Employment	6 million	22%	NA
GDP current €	607 440 million €	31%	4.9%
Share of services	88%	79.4%	NA
Gross available income per household	23 990 €	19 170 €	NA
R&D personnel	150,400	38%	NA
R&D expenses	18,390 million €	41%	NA
Share of R&D expenses/GDP	3%	2.3%	2.1% (2012)

Sources: INSEE/MESR/Eurostat

In spite of its assets, the Paris region suffers from growing weaknesses:

-The economic growth of the region does not reflect its potential: in this matter the region appears to be poorly positioned on the emerging high-tech sectors; the powerful R&D activities within the region do not generate the amount of activities one should expect. Moreover, the Paris region, which has a strong industrial tradition with a large productive base, experienced one of the most dramatic losses in France with 44% less employment than 20 years ago in this sector.

-With 4 billion commuting travels per year, the huge but efficient public transport network comes to its limits in its actual radially conceived configuration. For example, the east-west rapid line (RER A) transports 1 million travellers per day. The lack of structuring tangential (cross-town) lines is now a matter of great concern.

-Another great challenge for the Paris region is the dramatic need for new housing. This shortage creates tensions on the real estate market and the land value for activity. As a consequence, among others, nearly 200,000 households with children choose to migrate out of the region. It is also becoming difficult for low and average income households to find a proper accommodation close to the main public transport infrastructures. Regarding the actual needs and those generated by the strong population growth and the de-cohabitation trend, there is an identified need for 1.5 million new residential units by 2030. This corresponds to a need for 70,000 new residential units⁷ per year, when the last years trend was only 40,000/year.

All these elements made it necessary to have a special ambition for the Paris region and also to make it a “special object” for the French State which has a tradition of strong vision and active actions within the regional boundaries. This tradition is so strong and anchored in the traditions of State centrality that the Regional Council was only able to make its own regional master plan from 2008 onwards.

Despite this recent evolution, the state still has a strong action within the region, especially when it comes to planning and economic development. In this matter, the cluster policy which is at the crossroad of these two policies is considered a key driver, driven and financed by the State.

⁷ The reference period is 2008.

1. The public action to develop and foster cluster development in the *Ile-de-France* Region.

Many public actors take part in the process dedicated to cluster development. These actions are conceived in interlock logic but the result is a lack of visibility and of coordination.

1.1. The French State strategy, policies and tools for the cluster development in the Paris region

As previously indicated, the State has a long tradition of intervention within the Paris region planning and economic development. The latest strategies and tools used by the French State to serve its policy regarding the capital region range from nationwide strategies, localized actions but not specifically dedicated to clusters. The nationwide actions are: support innovation and economic sectors, strategy to reorganize and concentrate the universities (le plan campus). The localized actions are: strategic planning with the national interest operation (OIN in French) and more recently the *Grand Paris* and its clusters materialized by the territorial development contracts (CDT in French). The policies directly targeted to develop and organize clusters are the competitiveness clusters and the “*grappes d’entreprises*”. All these strategies, plans and actions, contribute indirectly or directly to a state cluster policy within the Paris region.

1.1.1 Background: The national policies aimed at strengthening innovation

The national policy devoted to improve the competitiveness of the country, the economic growth and especially the cluster development, **is largely based on the primacy to higher education, research and innovation which constitute the first stone of the cluster formation.**

« A competitiveness policy lays on the excellence of the higher education and research system and addresses the question of the territorial scale of this excellence », DATAR website⁸.

« What’s a Silicon Valley ? Its first a powerful university, research labs, industries that begin to work together » Prime Minister of France 24 Sept. 2008, adding that the role of the state is to facilitate this synergy.⁹

For this reason, and under the European impulse (the Lisbon strategy), the French state has initiated several actions dedicated to this ambition.

☞ 2005 creation of the national research agency (ANR):

Created from the merging of several agencies, the ANR aims at organizing and evaluating the national research by financing research or technological projects through open calls for tenders. These projects proposed by one or several research teams involving public and

⁸ « Toute politique de compétitivité repose sur l’excellence du système d’enseignement supérieur et de recherche et pose la question des échelles territoriales auxquelles se joue l’excellence. ». www.datar.gouv.fr

⁹ « Au fond, qu’est-ce qu’une Silicon Valley ? C’est d’abord une université puissante, ce sont des laboratoires de recherche, et ce sont des industries qui se mettent à travailler ensemble » résumait le Premier ministre, le 24 septembre 2008 en ajoutant aussitôt que le rôle des pouvoirs publics était de faciliter cette synergie.

private actors run for a medium duration of 3 years. The ANR also finances technological transfer structures such as the Carnot institutes and industrial chairs.

The ANR calls for tender are based on research fields considered by the national state as strategic: Eco technologies; ICT and nanotechnologies; health, food, well-being and biotechnologies.

If these calls for tender do not target specific geographic areas, they aim at boosting research and innovation in the identified fields of research and create innovation ecosystems by enhancing collaboration.

☞ The national strategy for innovation and research

The national strategy for innovation and research aims for a 5 years duration at giving a national framework to the research. It targets the scientific and technological priorities identified by the national scientific council.

Its role is also to place the state as the strategic leader for the research in France by enhancing cooperation between public and private actors and promote fundamental research as the basis of a high level science. It also aims at being in accordance with the EU Horizon 2020 program.

Among its outcomes, the strategy aims at stimulating cooperation between actors.

Since 2006, it made possible for research labs, competitiveness poles and universities to regroup and form research and higher education poles (PRES). The aim is to gain visibility and efficiency and avoid territorial spreading, 15 have been created. These actors can also choose to organize themselves in advanced thematic research networks (RTRA) based on one or several thematic in order to optimize synergies.

☞ 2008 The Campus plan:

The Campus plan goes further by initially targeting 10 major projects in France which are to receive an exceptional budget effort. The Campus plan consists in a vast plan to renew, reorganize, and spatially concentrate universities mostly through real estate investments. The idea is to bring the existing poles to a higher level that will make them internationally visible and attractive by creating urban campuses or city campuses. After a long pause due to budget shortage, this plan has been reactivated in 2013 thanks to the backing of the European investment bank (EIB). The EIB will finance 1/3 of the total budget via low interest loans.

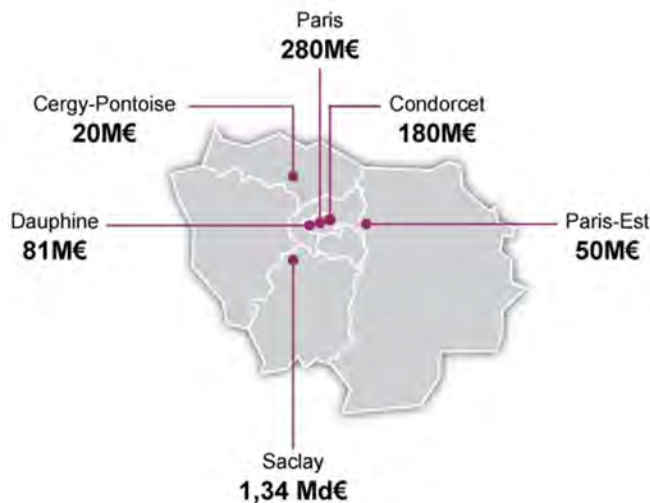
The total state public budget is 3.7 billion € for 20 operations, from which the Paris region represent 54% of the budget (2 billion €) for 6 operations.

The projects for the Paris region are (see map 1):

- Cergy Pontoise	20 M€
- Paris campus Condorcet	
- Paris centre	540 M€
- Paris Dauphine	
- Paris est (Marne-la-Vallée)	50 M€
- Saclay	1,340 M€

As a national priority, the Saclay project alone absorbs 2/3 of the funding allocated to the region.

Map 1: The campus Plan in the Paris region



Source : IAU-Îdf

2010 The investment plan for the future (*Plan investissements d'avenir*)

Created in 2010 by the previous government to boost the national investment on strategic issues, this 35 billion € national investment plan is financed by the market. The plan mostly targets research and universities (11 billion €), competitiveness clusters (5 billion €) and high-tech or emerging sectors (9.5 billion €). It also allocates 1.3 billion € to the campus plan.

A second plan has been launched in July 2013 with 12 more billion €, from which 3.6 billion to research and universities and 3.8 billion to high tech and emerging sectors such as defense, air and space, green energies, numerical, health.

From this plan thanks to several calls for tender, a network of new technological and research institutes has been or will be created. These are Institutes for the ecological transition (ITE), technological research institutes (IRT) and technological transfer accelerator societies (SATT). These new equipments will be added to 315 existing research units which will receive new excellence research equipment. The new ITE and IRT were and will be created through open calls for tender process which associate the public and the private actors. So far, a total of 11 billion € has been devoted to these investments.

These structures founded on public/private partnership are due to become the backbone of new competitive economic sectors in coherence with the competitiveness poles; they are supposed to attract and concentrate on a small geographical perimeter for each ecosystem of these new economic sectors from fundamental research to the applied research and the economic valorisation. Therefore there will be a limited number of these: 10 ITE, 6 IRT, 14 SATT.

The Paris region will host Two ITE, the first dealing with thin-film PV technologies and located on the Saclay area, the second with decarbonized vehicles located between Saclay and Versailles. It will also host three SATT, two for the Paris universities and one dedicated to the Saclay project.

1.1.2. Strategic planning and strategic planning tools

The national government develops policies aimed at rebalancing the development among the French regions. The Inter ministerial delegation for planning and territorial attractiveness (DATAR) is the national agency devoted to this target. Its role is to prepare, impulse and coordinate the government policies for national and territorial development. The State also impulses the emergence and reinforcement of high standard and attractive zones, the OIN¹⁰ is the main strategic tool for this purpose.

The OIN: targeting strategic areas

For the most strategic areas of France (areas that either need a strong action for conversion and/or have a strong potential for the future in terms of development) the State has decided to create OIN where there will be a strong action from the State level. In reality, despite the fact that the State has all the planning tools in hands it has to negotiate with local actors to enforce its view on these areas.

At this date there are 19 OIN in France from which 9 are located in the Paris region. Concerning the economic development issues, the OIN are due to structure the region's economy by emphasizing their economic specialization on one or several domains:

- The newtowns of Marne-la-Vallée (leisure, culture and R&D) and Sénart (excellence in logistics, university and research).
- *La Défense* (business district) completed with The Seine-Arche operation which extends the *La Défense* perimeter.
- The Parisian airports areas: *Roissy-Charles de Gaulle*, *Le Bourget* for jets, coordinated by the Plaine de France public establishment for development (aeronautics and logistics).
- The *Seine aval* area (mechatronics and green-tech)
- The *Orly-Rungis-Seine Amont* (ORSA) including the Orly airport (Biotechnologies, food industry and logistics), and the international food market Rungis
- The *Massy Palaiseau, Saclay, Versailles Saint-Quentin en Yvelines* operation (R&D and health)

All these OIN have been incorporated to the Regional master plan as strategic areas or « *territoires stratégiques* » (see further map 3 p31).

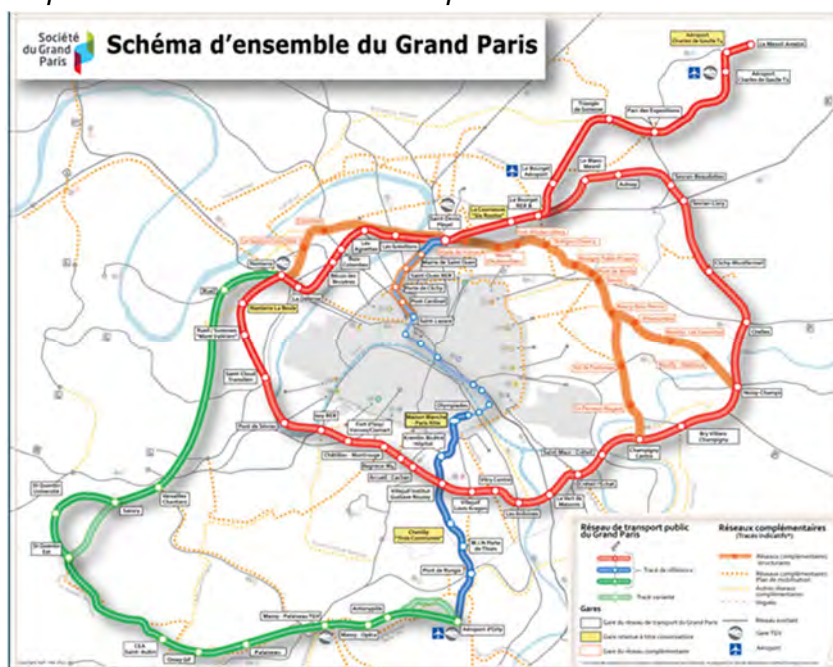
¹⁰ Def: An OIN (National interest Operation) is in France an urban action ruled by a specific law regime because of its major interest. In those operations, the French state keeps all the power and tools of the planning policy.

☞ The Grand Paris law (June 2010)

The State launched from 1982 a series of decentralizing laws, assessing a strong need to reduce the national scattered local administration (36,000 communes). Among its objectives the State wished to encourage cities to cooperate closely by forming agglomeration authorities. They would be given several competencies that were before devoted to the cities in exchange of more money from the State. Most of the largest French cities have engaged in such process, except Paris. The situation was leading to a lack of coordinated development and hindering the development potentials of the region. As there was no spontaneous step toward more cooperation between the core city of the region (Paris) and its surrounding neighbours, the French state decided in 2010 to force the local actors to create such agglomeration through a specific law called the *Grand Paris* law.

This *Grand Paris* law was also grounded on the assessment from the government point of view of a lack of ambition from the Region through its recently approved master plan (SDRIF). The criticism laid on the argument that the proposed development was not ambitious enough in particular regarding housing, economic development and transports, for a region that was the national economic engine, the first European region and one of the world leaders. The government particularly identified a need for a stronger public transport reinforcement than projected by the SDRIF. After an international architect contest it proposed the creation of a large 200 km and 72 new stations network that would link together a series of 10 areas of new economic development among which 3 were due to become the place of the emergence of new economic clusters.

Map 2 The Grand Paris new transport network

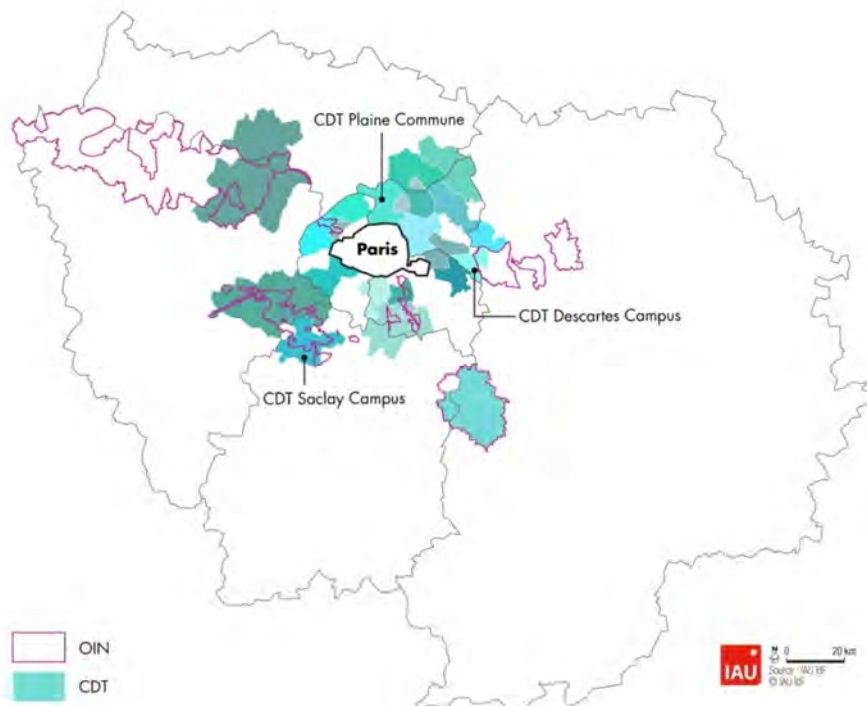


Source : SGP (Société du Grand Paris)

Therefore, the recently approved master plan (2008) had to be revised and include these new elements that led to a new master plan adopted by the regional council and approved by the State in 2013.

To put this vision in action a call for tender to the relevant local actors was launched and led to the creation of 22 territorial development contracts (CDT) concentrated on the core area (see map 3).

Map 3 The CDTs of the Grand Paris



The CDTs are 15 year contracts between the State and groups of municipalities. They are aimed at financing the projects that will permit these groups to fulfil their engagements towards the State. These contracts also include the ambition of the CDTs regarding economic development and the economic cluster they wish to develop. To be coherent, the CDTs encompass the OIN perimeter in broader areas of project.

The reality of these contracts shows that the initial aim to develop economic clusters has mostly disappeared or become very scarce. Most of the contracts do not even mention the word “cluster” and those who do mention it are more marketing oriented than strongly argued projects.

There has been a lot of discussions about these large scale cluster projects. One of the most frequent topics raised was the fact that the concerned areas hosted a large variety of activities and were far from being specialized, and moreover for some of them, the lack of reality of any existing potential for such clusters.

Finally from the 22 CDT signed, only three (named on the map) can be considered to have such ambitions and have the potential to realize it.

- Saclay for an international level R&D cluster

- Plaine commune (north of Paris) with the creative cluster

- The Descartes campus (new town of *Marne la Vallée*, east of Paris) on the sustainable development.

1.1.3. The policies aimed at strengthening and developing clusters

The competitiveness clusters

Since 20 years ago, France has experienced a constant de-industrialization process which massively touched the oldest industrialized regions and the more densely populated areas. The Paris region was one of the most concerned by this phenomenon. This situation occurred despite a cluster development policy initiated by the DATAR¹¹ since 1998, after the northern Italian model.

This strong deindustrialization process became preoccupying for the French national authorities in a more and more competitive world, especially compared to other western European countries who were more successful, first of which Germany. The awareness of the situation in the mid 2000's was one of the main drivers for the launch of a national initiative in favour of innovation and of the development of clusters based on Porter's works and which gave birth to the "*poles de compétitivité*" or "competitiveness clusters" in English.

Created in 2004, the competitiveness clusters are due to mobilize the key factors for competitiveness, first of which innovation, and generate growth and employment on the most promising economic sectors.

A call for tender launched by the state Ministry of economy led to the identification and label of 71 competitive clusters in France. The territories were strongly mobilized to identify the clusters they wanted to support among the existing ones and present their candidacy. Each competitive cluster was defined from an economic activity or technological specialty and a limited geographic area where the state funding would be mobilized.

From these 71, seven are located in the Paris region, and 4 more whose core are not located within the regional administrative boundaries but encompass a wider area including part of the Paris region. (see details below)

The French State intervention aims to sustain the competitiveness cluster range through direct action by partly financing the governance structure, bring financial support to some remarkable R&D projects through call for tender or to thematic actions initiated by the clusters. It also indirectly intervenes through its agencies: national research agency (ANR), Bpifrance, *Caisse des dépôts et consignations* (CDC). Initially the central State created the competitiveness poles as "factories for technological projects". The Regions added a new dimension by also using them as tool to strengthen their related ecosystem.

The other cluster policies

In 2009, following the recommendations of the EU (DG enterprises) to put clusters at the heart of the competitiveness policies, the DATAR strengthened its action and launched a 24M€ national wide initiative to support the structuration of local productive systems. This initiative called "grappes d'entreprises" was based on calls for tenders to label grappes mostly formed by small and medium firms that have spontaneously put their candidacy from a bottom-up process. The aim was not to label all the existing clusters but just a selection of them. The selection criteria were that they had to be complementary with the existing competitive clusters (especially in R&D) or to cover economic activities that were not covered by the competitive clusters. The applying clusters would have to be geographically

¹¹ DATAR (delegation for national planning and regional attractiveness)

concentrated to gain from some proximity effect and cooperate with public actors from the education and the research. The selected grappes received subsidies (an average of 200,000 € per grappe for 3 years) to help them to create a governance and animation structure and in most of the cases, the local authorities among which the regional councils, also contributed to the funding of these structures. The initiative was renewed for another 3 year period after which the governance structures will have to find economic models to finance their action.

A total of 126 grappes have been labelled since 2009 from which 10 are located in the Paris region (see details further).

1.1.4 Implementation of the national policies on the territories

☞ The “plan contract” between the State and the region

The plan contract (contrat de plan) is a document through which the State and a Region take a common engagement on programming, financing and implementing large scale projects such as transport, infrastructures and the support to innovative economic sectors. This engagement is taken by the two partners for a 7 year duration, each French region sets simultaneously these contracts with the State. The chosen projects are mostly a declination of the previously described national strategies and plans. The running contract project gives a high priority to higher education and research. At the national level, the 2.9 billion euros from the state for 2007-2013 (extended to 2014) is the second highest budget after the one for transports.

In the Paris region, the “project contract” engaging the Region and the French State for the 2007-2013 period has a total of 5.5 Billion € budget for the period (37% State and 63% region). Transports (3 Billion €) and the higher education (1.2 billion €) are the main targets followed by national and regional interest areas (370 million €) and the R&D policy (200 million €). The national interest areas targeted by the project contract which correspond with the OIN set by the state are one of the main actions aimed at supporting the creation of clusters.

1.2. The role of the regional council: planning, define a regional strategy, co-financing and supporting local initiatives

The Regional Council is the administrative level that has the leadership concerning the economic development. This means that it sets the framework for regional economic development and harmonizes the local policies. However, the regional action is mainly under the influence of the State action and mostly supports local actions. Concerning the cluster development the regions mainly act in three ways:

- 1) By setting up the background for cluster development in targeted areas through allowing their future development or densification whatever the type (housing, economic development etc...)
- 2) By supporting promising economic sectors and innovation
- 3) By financing investments directly aimed at anchoring the development in very specific areas.

Like the State, the region acts through strategic tools and through operational tools and actions.

1.2.1 The strategic tools for setting-up the background

☞ The regional masterplan « SDRIF »

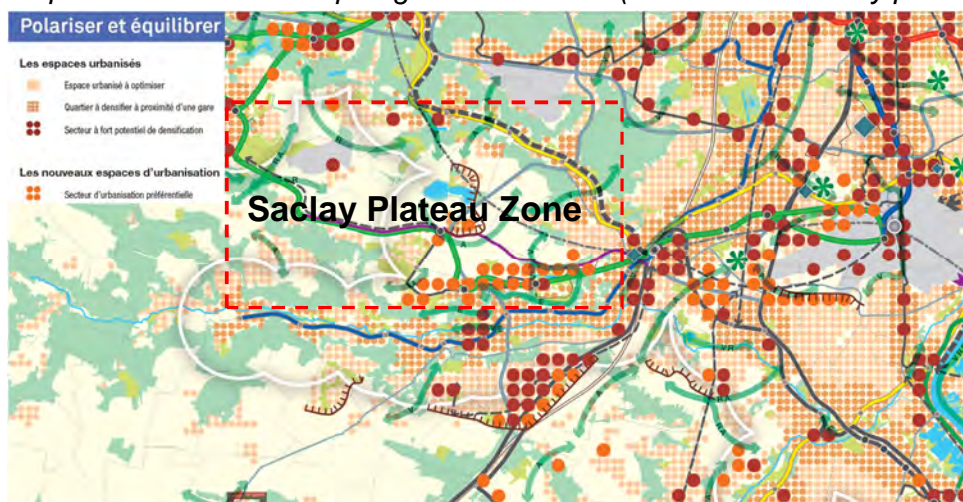
In the French law, the region is responsible for setting up the framework for planning and land use. The Regional masterplan is the tool to achieve this goal. The regional masterplan never mentions the word “cluster” as it is not its attribution. The main objectives of the Regional masterplan are rebalancing the economic development between the various parts of the region, which tends to mean more polycentrism in practice.

Nevertheless, since the “map of general land use” only gives elements of rights for urbanization through coloured dots (brown for densification, orange for new urbanization, see map 4), the text advocates the creation of poles of excellence close to the universities and research, and following the national plan campus (see before) aims at modernizing and regrouping the universities. The SDRIF especially targets the Areas concerned by an OIN (see before) alongside with other areas which are devoted to become major areas for research and economic development.

In the Regional masterplan the possibilities of creating or reinforcing a clustering process in selected areas is made by the combination of three actions:

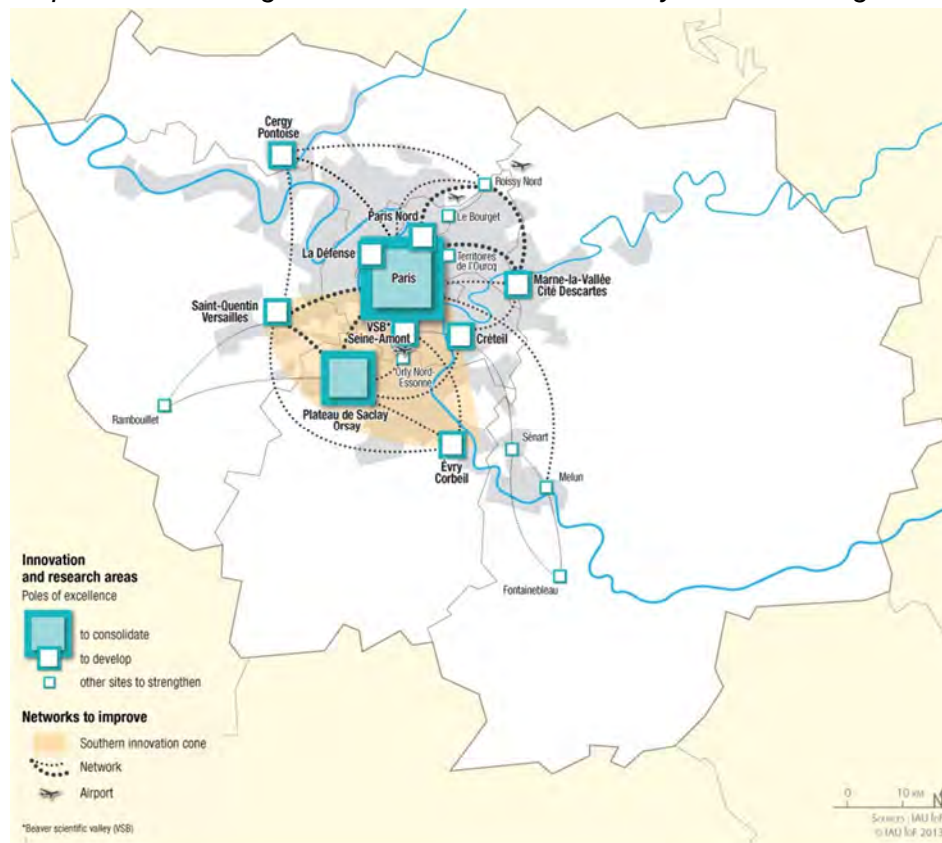
- Planning new areas for development by giving them capacities of development but without any precision concerning the final destination of these developments (see example below).
- Reinforce the research and innovation system of the Paris region (see map below)
- Planning new transportation infrastructures, from which the *Grand Paris express*, and the renovation of the existing one (see map above p7 for the *Grand Paris* public transport network).

Map 4 Abstract of the map of general land use (zoom on the Saclay plateau area)



Source : IAU-Îdf

Map 5 The Paris region research and innovation system in the regional masterplan



From this regional masterplan the communities of agglomeration or the cities elaborate their own planning document that identify more precisely the areas concerned and the type of the development.

☞ The regional strategy for higher education and research

Following the EU recommendations from the Lisbon strategy, the Regional Council of *Ile-de-France* Region has launched since 2010 a new strategy for higher education and research. Among its main actions, 14 major interest domains of research (DIM) have been identified on which the regional action is focused. These DIM are in line with the priority economic sectors identified by the Region and the competitive clusters (see further).

In this matter, the Region finances scientific projects and also the creation of equipments that favour interdisciplinary research and major research equipments linked to the identified DIM. These equipments are to be integrated into a larger scheme initiated by the local actors aimed at developing economic activity through the construction of incubators and the development of technological activity zones. This policy previously gave birth in 2002 to the successful Genopôle in Evry and its economic ecosystem, or more recently the synchrotron in Saclay (2006), and will conduct to the creation of the Brain and Marrow institute in Paris and other new institutes.

☞ The regional strategy for economic development and innovation

After a first experiment with the regional scheme for economic development (2006-2011), the French state asked each region to build a regional strategy for economic development and innovation (SRDEI) for the 2011-2016 period.

Among the main elements of the strategy, the regional Council and the regional actors choose to target 6 strategic economic sectors: Software and complex systems, life sciences, automotive, air and space, creative industries and green economy.

These strategic economic sectors roughly correspond to the competitive clusters of the region.

1.2.2 Operational tools that contribute to the cluster development

The 6 strategic economic sectors are given a priority through special **action plans for a 5 years period** to which a 28M€ budget from the Region is dedicated. These plans are mainly based on “soft” actions among which the identification of the existing firms, the stimulation of the collaboration between these firms and the funding of the governance structures dedicated to the cluster. These action plans complete other actions dedicated to boost firms networks based on various themes such as metrology.

The action of the region for cluster development is based on the will to tend to a network of structures that should cover the whole region with various scale of action: from the competitive clusters that are more research and innovation oriented and which encompass the whole region, to the incubators which are local facilities, through the “grappes” which are more oriented to strengthening cohesion by common action.

The regional support to these structures is threefold:

- Participate to the funding of the governance and animation structures (3M€)
- Participate to the funding of the research project of the competitive clusters (26M€)
- Participate to the funding of the creation of innovation and firms creation equipments such as incubators. (Around 10M€¹²)

The process for these actions is not pro-active but rather follows local initiatives. The regional Council chooses or not to support a “grappe” or the creation of an incubator regarding their capacity of fulfilling the regional Council vision.

As a consequence there is a lack of coordination between the funding of the equipments and the one dedicated to research projects and to governance structures.

¹² According to the various particular contract plans between the Region and the departments for the 2009-2014 period

1.3.The role of the other local actors

1.3.1 The Departments: Co-financing and supporting local initiatives

The “**Departments**” created during the French revolution are the administrative level between the cities and the regions. There are 8 departments in the Paris Region.

The *Departments* have the ability to participate to the economic development.

Practically they have limited and decreasing means of action concerning this issue, their role mainly consist in co-financing projects such as incubators and research institutes, with also some funding for the competitiveness clusters.

One can trace the action of the *Departments* to develop clusters through the Contracts concluded between the Region and the 8 *Departments* for the 2009-2014 period.

If all of them have a strong action on transports and accessibility, only two *Departments* (Paris and the *Seine et Marne*) finance the creation of technological and research institutes for 36 M€ Euros and of incubators for 42M€ for the 6 years period.

1.3.2 The urban communities and the cities: the base of the cluster development

The urban communities have received from the cities part of their economic development competencies. They have the power to decide the creation of larger economic activity zones, of incubators and even financed-supported governance structures of clusters. **They are the largest funding contributors to the incubators.** Some of them also work out economic development strategic plans and participate to the funding of the creation of research institutes alongside with the other levels of public actors.

They also are responsible for the creation of a planning document named “SCOT” which has to be in compliance with the regional master plan. This document targets more precisely the future areas that among other destinations will be devoted to economic development.

As we have seen before, the *Grand Paris* initiative with the major transport infrastructure and the CDT that followed were initially conceived to boost or initiate new clusters within the metropolitan area. The CDTs were elaborated by groups of cities, some of them already being urban communities.

The cities when not part of an urban community also act like the urban communities regarding the creations of economic zones, incubators and participation to the funding of research equipments. The city of Paris is very active in this field with by far the largest budget of all the Paris region cities and even of most of urban communities and is supporting private initiatives like the recent *Halle Freyssinet*, a 1,000 start-up capacity public/private project located in a reconverted urban logistic building or the Numa incubator both dedicated to the ICT start-up.

The fast growing number of incubators in the region shows how much this has become very “fashionable” and considered as one of the main drivers to develop start-up that will constitute new clusters as most of them are specialized. The city also has the power to decide precisely where to make the economic development happen and the nature of this development. The power of the city lays in the fact that **it is the unique actor to have the power to give the building permit.**

The NUMA incubator and coworking place in Paris



Crédits photo : Alexandre Coia

The Freyssinet Halle mega incubator project for 1,000 start-up, Paris



Crédits photo : Wilmotte & Associés SA

2. The official clusters of the Paris region

2.1. Competitive clusters and other grappes

As previously mentioned the Paris region hosts 7 of the 71 French “competitiveness clusters” and is part of 4 other, which core is not located within the region. We also have identified 15 other clusters or companies associations (see chart in appendix 1).

The Paris region competitiveness clusters are:

- Advancity: green tech and green city
- Astech: aeronautics and space
- Cap digital: digital contents
- Mov'eo: automotive (between Normandy and *Ile-de-France*)
- Medicen: biotech and health
- Paris Finance Innovation
- System@tic: software and complex systems

The other 4 competitiveness clusters that include part of the region are:

- Cosmetic valley (between Normandy, *Ile-de-France* and Center regions)
- Novalog: innovative logistics and supply chain (between Normandy and *Ile-de-France*)
- Vitagora: food and agriculture (between Burgundy, *Franche Comté* and *Ile-de-France*)
- Elastopôle: new materials, polymers, nanomaterial (Auvergne, Centre, Pays de la Loire, *Ile-de-France*)

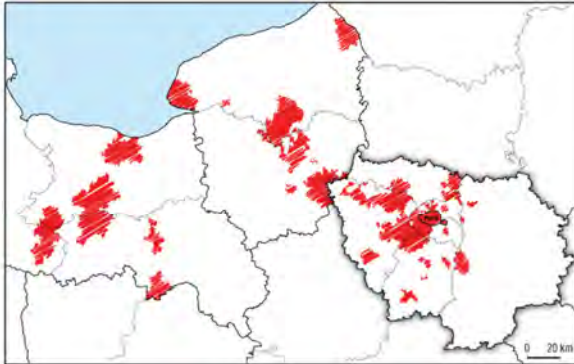
The 15 other clusters which are detailed in appendix 1 are either labelled “grappes” (10 of them) or just agglomeration of firms belonging to a same activity and linked by a business network.

From the maps (see following page) we can see that clusters are not necessarily spatially concentrated, even if we can identify cores in more restricted areas. The most concentrated clusters are those relative to the creative industries which are very limited to the core area, where the public transport and urban quality is the best and correspond to where the Richard Florida's creative class like to live. On the other side we can see that the other clusters, especially the industrial ones (automotive, optics) are much more scattered within the region and not especially restricted to the urban and accessible areas of the region.

As a matter of fact, these maps confirm the lack of precision of the Porter theory concerning the geographic dimension and the size of a cluster, which can be very diverse concerning the activity sector and the kind of jobs concerned. On its side, the Regional council considers that the whole region is the right scale when considering clusters, even if it recognizes the need for anchoring these clusters by creating specific infrastructures such as incubators, technological platforms and R&D labs and by linking the firms together through dedicated cooperative networks.

Map 6: Four competitiveness clusters official maps and two Paris region clusters mapping: various scale, various concentration.

► MOV'EO



► SYSTEM@TIC Paris Region



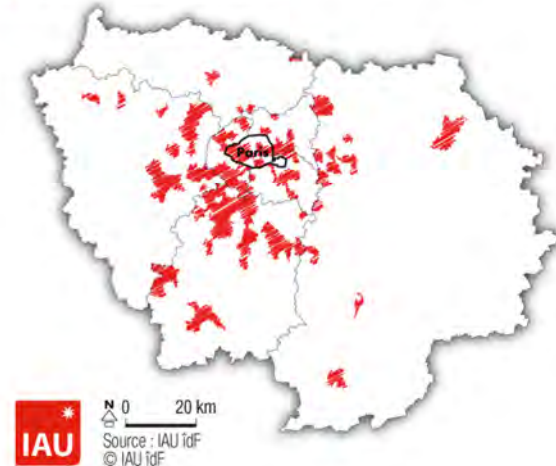
► Advancity (Ville et Mobilité Durables)



► Cap Digital Paris Region



► Optics Valley cluster



► Creatives industries cluster



2.2 The Saclay urban campus: an emblematic project for the Paris region

The Saclay campus project aims at creating a world class urban campus dedicated to engineering sciences.

From the existing research and higher education institutions (national nuclear research centre (CEA) with 7,000 jobs; national agronomic research institute (INRA), 1,400 researchers; national scientific research centre (CNRS); the technical engineers high schools like Polytechnics or SUPELEC; and the larger scientific equipment Synchrotron. The project aims at moving, hosting and put into synergies 11 new high schools and 2 universities for a total of 12,000 researchers and 31,000 students. Multidisciplinary, this new research cluster will address and put into synergy 12 research domains articulated in 3 main axes: Environment, health, information-Communication and nanotechnologies.

Private research institutes are also expected to join like the EDF main research centre which will be moved to Saclay with its 1,000 jobs, but also Danone, Thales, and Horiba. The campus is also expected to offer accommodations for students, host new inhabitants and also services for this new population.

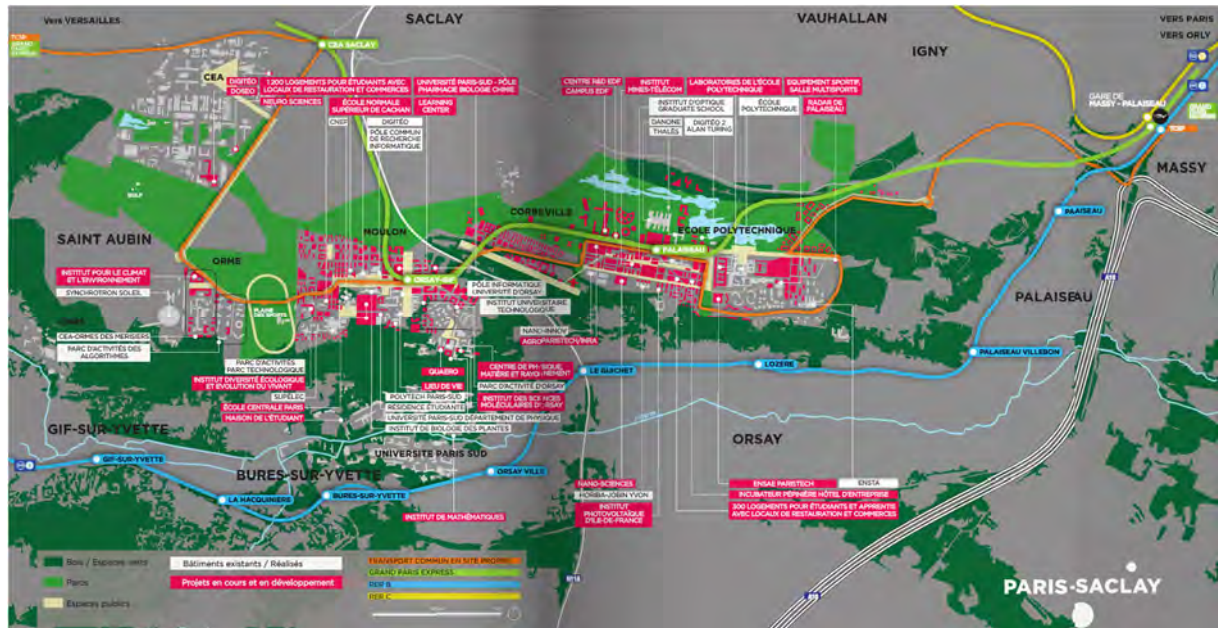
This 2.5 billion € project implies the construction over a 20 year period of 1.7 million sqm of premises equally divided into housing (10,000 new accommodations), scientific premises, and economic activities either related to the scientific activities or to the population needs (see map 7 the red dots represent new constructions, map 8 shows the final project by destination). The Paris-Saclay Public establishment (EPPS) is the public body in charge of the implementation of the project.

One of the major planning stakes for this future 9 sqkm urban campus is to create relevant public transports where the offer is actually very scarce.

The projected *Grand Paris* express line (in green on map 5, which will be the future line n°18) with two stations on the site will link the area to the other parts of the metropolitan region and will be interconnected with the existing RER C in yellow and RER B in blue. The construction of such infrastructure is not predicted before the year 2025 for the part linking the City of Massy (upper right on the map 7) and the Saclay plateau.

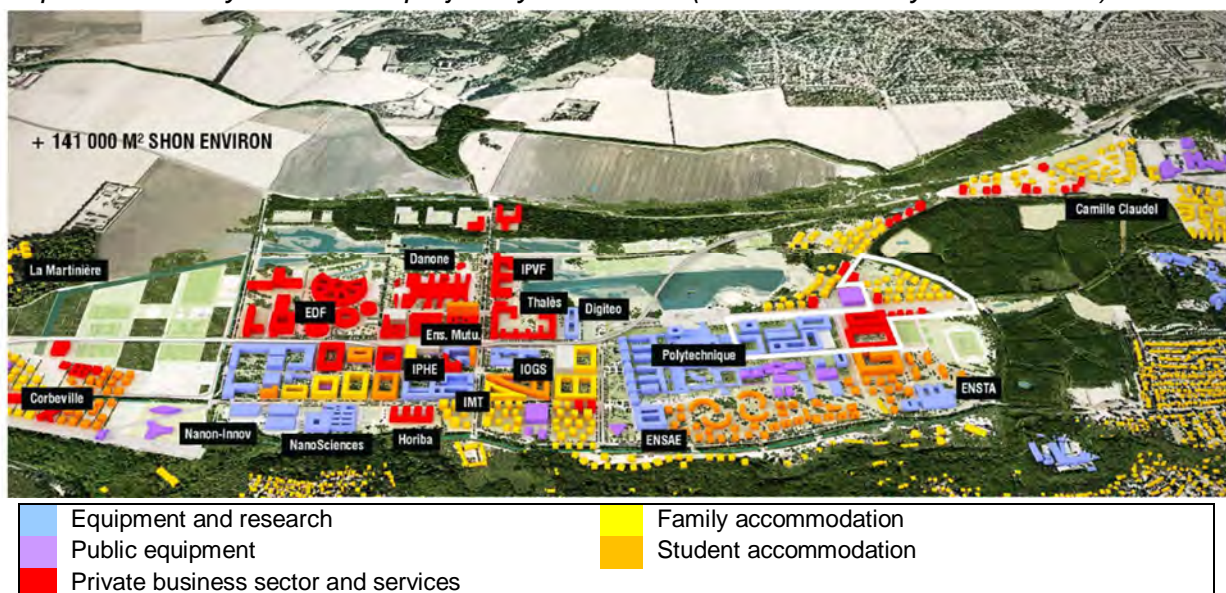
The French State which is the main financial contributor initiated the project through the OIN, the campus plan, and more recently the *Grand Paris* law (despite the fact that this cluster will not be included within the administrative boundaries of the future *Grand Paris*). The Paris region and the communities of agglomeration are also part of the project.

Map 7: The Saclay cluster: 2 million sqm to be constructed on a 9 sqkm area



Source : EPPS (Paris Saclay public establishment). In white existing buildings, in red new constructions forecasted

Map 8: The saclay cluster final project by destination (focus on the Polytechnics area)



Source : Source : EPPS (Paris Saclay public establishment)

3. The cluster making process and spatial planning

3.1 Non exhaustive findings from some studies

This chapter brings some elements about the cluster making process from studies and articles conducted by IAU-idf and other recent studies about clusters in the Paris region.

The clustering process can be of various forms regarding the activity sector, the level of innovation and the types of jobs concerned, **how does spatial planning impact upon this process?** The most recent developments in urban planning tend toward the creation of innovative clusters through the development of “science cities” (1), whatever the type of cluster, what comes first is planning, which will create the conditions of agglomeration and the existence of a market but cluster policies and densification also have drawbacks for the clustering process that need to be reduced (2). When dealing with clusters, one can observe that the word “cluster” has become very fashionable and used for various configurations of firms agglomeration, being clusters or not in the sense of Mickael Porter’s definition (see introduction). An analysis of the *Grand Paris* projected clusters questions the reality of these and proposes that the clusters could rather be objects used for marketing and governance purposes rather than for economic development (3).

3.1.1. New urban models for innovation and clusters: the science city

A study conducted in 2010 about the emerging concept of science cities analyses a series of realizations in Europe and throughout the world and gives elements on conditions of success.

This new concept is based on the idea that an harmonious settlement of institutions producing and spreading knowledge and innovation alongside with high-tech companies and their ecosystem, including start-ups, favours the emergence of clusters. This will be fully effective if integrated within larger urban projects that include public spaces, equipment, housing, local services activities like retail... and public transports.

The aim is to create the physical conditions for transferring knowledge from the knowledge institutions (universities, public research) to the neighbouring companies, especially start-up. In giving to these places a user friendly urban aspect, supposed to generate and maximise serendipity (non-forecasted encounters leading to innovation), the public authorities expect to generate more innovation and activities.

Among the identified keys of success one can note the presence of national research institutions adjacent to good quality academic centres which succeeded in spontaneously attracting firms' leaders on their market that compete but cooperate on the same time and being the engines of the cluster. The creation of firms takes place very close to the academic and research campus, taking benefit of its amenities and of the presence of public and private firm creation facilitators (incubators, business angels...). The trust among the cluster is a key factor.

One of the positive effects of a cluster is its capacity to auto regenerate and mutate toward other activities thanks to the concentration of competencies being technological, scientific and the amount of capital.

One can often trace the origin of clusters with the existence of several simultaneous circumstances: the existence of land and real estate availabilities, a critical mass of scientific, academic, technological and high level graduated workforce linked to the cluster domain, all together with structures dedicated to firm creation. The cluster formation is a long term process which can last up to tens of years and which can happen in places that offer a critical mass and large diversity that means essentially among metropolitan areas.

This process is still rather spontaneous as public actors cannot force private companies to locate there, that makes the planning process uncertain to the outcomes. Nevertheless, it seems that what makes the strength of a cluster beyond its fundamental assets is its capacity to strongly interact with its environment and its resources among which the capacity of governance is of most importance.

3.1.2. Cluster policies can also have drawbacks that need to be reduced

Creating a cluster implies as a minimum the creation of new spaces of high urban quality or the regeneration and densification of old ones with good public transport infrastructures. If these evolutions are a necessity for the metropolis, they also create the conditions for the eviction of other activities or people who cannot afford the price for centrality and dense areas but which also participate to the clusters ecosystem. A geographic cluster and its components concentration can even trigger its own eviction process by fostering urban generation where it emerged and then attract other activities and population that will finally push them away. That process is well described for the creative class and creative activities known to act as “scouts” in the city regeneration process.

This relocation process is particularly strong for industrial activities, either directly for those who are located in the more densely built areas or indirectly for the others who have growing difficulties to find workforce that on their side encounter ever increasing trouble to find an affordable accommodation in the best public transport connected areas. This relocation phenomenon also concerns services activities like wholesales or even headquarters. A cluster policy should then also integrate actions aimed at giving the possibility to these activities and people to relocate in an acceptable way so that they still can be of benefit to the cluster. The following elements taken from studies illustrate this relocation process in progress.

The industrial companies are located in economic zones but also for a large fraction among the densely urbanized area. A series of interviews of industrial companies that have a manufacturing process show that those located in the most densely urbanized areas are relatively old (more than 20 years) and own their land and premises which is a stability factor for them and explains why they have been catch-up by urban growth.

These companies are all innovative, which is a condition for them to remain competitive, whereas the SME's tend to specialize and address niche markets. For all these firms, the market and its access are essential and that explains their location within the region and their address. Reactivity is often quoted as an added value against competitors located outside of the region or abroad. For this reason these companies do not wish to locate too far from the core city and might be endangered if forced to move.

The most technological or creative firms stress the necessity for them to keep close or within the metropolitan core in order to keep and attract the most talented workforce they need.

They also underline the fact that they need proximity to their research partners being private or public, and to their competitors, in this respect some do not hesitate to relocate in order to search for a cluster effect. This is particularly true for the youngest ones, start-ups, being sometimes a spin off from these research entities. These companies are also those who are the most involved in firms' networks and clusters. For example, interviews with firms from the optic electronic cluster show that they are particularly sensitive to their environment when looking for a location, which explains that we can observe a relative concentration of the cluster around the Saclay plateau and inside Paris, where we also can find a concentration of labs specialized in optics, electronics and software.

When it comes to location or relocation, taken in account the former mentioned constraints, the availability and price of land and premises is central, especially because there is a cruel lack of offer for adapted industrial premises. Some industrial companies, especially the young ones deliberately choose to locate in second choice areas not too far from their partners but in less accessible areas, where the urban quality is lower, in order to benefit from reduced real estate costs.

The interviews also reveal that large urban operations put the industrial firms at risk, especially those located in the dense urbanized areas. These firms are either directly pushed away (rent rise sharply or lease is not renewed, expropriation) or have difficulties to conduct their activity that finally pushes them away (problems for supply from trucks, disappearance of local suppliers or clients, NIMBY phenomenon from newly arrived population or activities...).

Moreover, these firms often do not have acceptable relocation solutions either in terms of cost or distance to their previous location, or both, with the risk of jeopardizing their activity by losing capacity of reaction, but also part of their workforce that did not wish to follow and which is difficult to replace. As mentioned before, even the industrial firms located in less densely urbanized areas can experience difficulties to find a premise as the production of such products is far too low within the region compared to the potential demand, with the consequence for them to take a non-satisfying second choice solution, or even leave the region.

The city of *Ivry sur Seine*, just across the Paris city border, decided to try to contain this industrial relocation process by ordering to the developers to propose adapted premises devoted to small industrial activities at the ground and first floors of their new programs built in former industrial zones. For this, the city designed the specifications of the premises and financed the land charge differential with pure office or dwelling programs.

One can notice here how much the public action and planning can change minds by acting as scouts and making the "proof of concept" towards private developers that have a strong risk aversion when it comes to programs that they are not used to develop and in which they have no experience.

Another study about the **textile wholesale activities** shows that there is a strong and historical concentration within the city of Paris, traditionally from the Jewish community, with high costs of occupancy that participates to the eviction of other activities and population, and thus creating mono-functional and mono-activity zones within the city.

To attract purchasers from the whole of France and Europe (especially northern Europe), these activities need to be clusterized in the same area in order to create a “showcase” effect and offer a greater variety of products in a very short distance.

A reconfiguration movement in progress since ten years recently accelerated with several multilevel fashion centers real estate programs comparable to those already existing in the Netherlands or Germany. These programs give the possibility to reduce the real estate costs by optimizing the occupied space and relocating the showrooms and stocks in less valued areas, while keeping the necessary spatial integration. These new premises are located at the northern fringe of the Paris city, where the textile wholesale activities began to move from the central Paris, taking advantage of underused or abandoned industrial spaces but with poor occupancy conditions. This new textile wholesale cluster hub, with a strong Chinese community component (5,000 workers), now benefits from reduced real estate costs in more adapted premises, which also enhances cooperation between firms, and enjoys better accessibility to the Havre port, from where arrive most of the supply in containers from China. The accessibility to northern Europe by road or to the Charles-de-Gaulle airport from where arrive most of the international purchasers is also improved.

The large firms' headquarters also tend to optimize their occupancy costs by only keeping at the most valued and prestigious places the managing teams while sending the other teams from functional directions (Human resources, finance, IT, R&D department, accountancy...) in other parts of the region or even to other cities of France.

For these large headquarters, the cost of occupancy comes second just behind employees wages. If the necessity to reduce costs has been the trigger to such relocation strategies, the availability of adapted and modern large size premises located close to public transports, enabling for some cases the regrouping of several scattered establishments, has been a key element in the final relocation choice.

However, this spatial recomposing process is various according to the activity sector concerned.

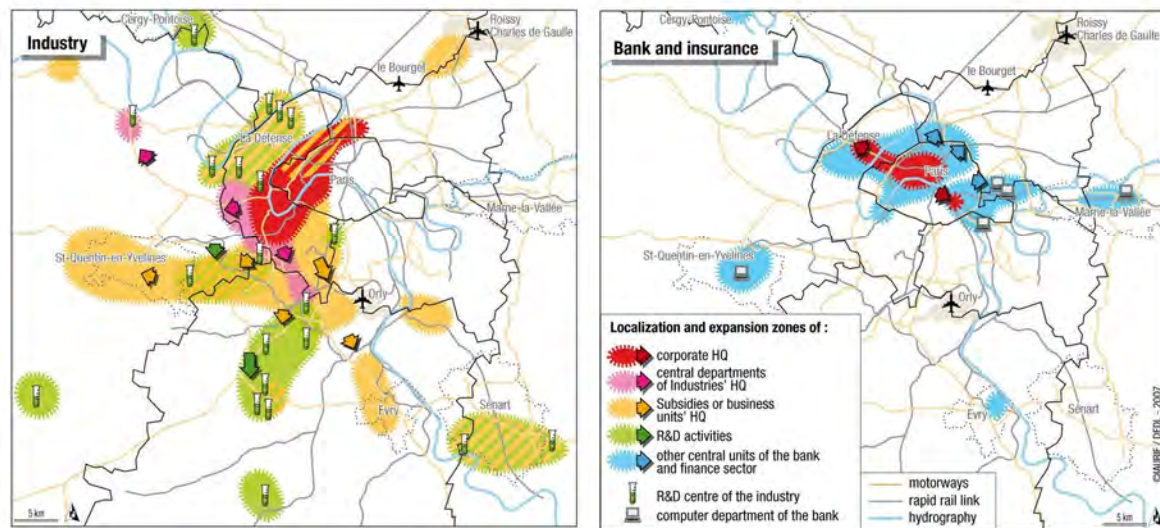
The study shows that the various elements of the **bank and finance** headquarters, formerly located in Paris, relocated within a limited perimeter in the immediate proximity to the Paris city where the prime office market was expanding. These relocations took place in *La Défense* business district for some majors but also in areas where the urban regeneration process was largely advanced towards more business oriented districts (*Plaine St Denis* in the North, the new national library area within Paris on its eastern side extended to Charenton further east), taking advantage of the new heavy public transportation lines. The only exceptions to these movements are those concerning the servers relocated to more remote places within the newtowns of *St Quentin en Yvelines* westwards and *Marne-la-Vallée* eastwards but which are still connected to the core area by the RER.

On the other side, the **headquarters of industrial firms** tend to partly relocate on a broader scale, towards secondary service oriented business zones located in much less densely built areas (*Poissy, Le Plessis Robinson, Vélizy...*).

Whatever the economic sector and the type of activity, this spatial redistribution of headquarters jointly follows two main logics, with the need to locate in coherence with the

other locations of the firm and the need to remain below a certain distance/time limit for the employees that have been moved.

Localization and expansion trends of the HQ and their related units
(from the interview of 19 groups)



3.1.3. Cluster, a state of mind in the mind of the State: Clusters as marketing and governance objects?

A study¹³ questions the reality of the forecasted *Grand Paris* clusters and proposes the idea that the real objective of the *Grand Paris* clusters is not so much the economic development but rather used as territorial governance tools by the State who largely initiated them.

A mistaken spatial specialization that can be counter-productive:

According to the authors of the study, the naming of the *Grand Paris* clusters is unclear and unstable. They are sometimes designated from economic sectors (air and space, automotive), from economic functions (finance, R&D...) or current economic challenges (creation, knowledge, sustainable development...).

The described spatial specialization of the *Grand Paris* clusters areas is not a reality, these areas are in fact economically very diverse.

The authors also point out a contradiction among the wishes of the various actors. Specialized clusters localized in mixed urban areas as described in the *Grand Paris* project do not correspond to the real estate actors' vision. They prefer large and functionally specialized areas (activity, office) in order to be visible, and economically diverse in order to potentially host a maximum of firms and rather prefer the notion of business districts. However, as firms refocused their activities on their heart activity, they do not have all the internal resources to conduct their business and therefore are more dependent on diversified external resources.

Finally, according to the authors, the territory, rather than specialize should offer an economic diversity to the firms and organize this ecosystem.

¹³ « Le mythe des clusters du Grand Paris. La spécialisation comme régulation métropolitaine », See bibliography annex II
Location dynamics of cluster formation and public sector response –can planning influence the process?

Clusters as governance tools

Specialized clusters seem to be used in many cases as marketing tools in order to give visibility to the economic geography of the various Paris region areas.

They also seem to be used by the French State as regulators of the territorial competition. The so called specialized territories are therefore complementary and have no reason to compete anymore with each other. The forecasted public transportation network is supposed to reinforce these synergies between territories. The territorial competition then moves to an international scale which also reinforces the status of the future *Grand Paris* clusters

The study also identifies the role for the clusters to act as mobilizing myth for larger urban projects and planning projects in general. They help mobilizing public and private funding on a common object. This is particularly true for the developers who can legitimate their action and the need to mobilize land sometimes against resisting communities that do not wish to develop. This is also the case for the mayors of the cities directly concerned by the cluster who support the project and which can advertise a strong and positive economic identity and therefore hope to attract high level workforce and the best companies of the targeted economic sectors. For the economic development agencies, spatial economic specialization legitimates their claim of being the place to be and eases the international prospection by giving more visibility to the territory.

4. Conclusion

In the *Ile-de-France* region, a large number of actions contribute to the cluster development, either being generic such as strategic planning, aimed at enhancing higher education and research and innovation or more specific like urban planning, incubator building or network building and monitoring. **The actions dedicated to the creation and the development of the clusters are a mix of « hard » (planning, building) and « soft » (network creation and monitoring, research projects funding and administrating) which cannot be dissociated.**

Many public actors take part in the process in interlock logic but with a risk of a lack of visibility and coordination. In the process the French state is central by its strong ambition and its budget capacities. The local communities are also very active in the process but with various budget capacities, some of them having large capacity of action like the city of Paris. The Regional council with a relative limited budget regarding of the size the area it has to cover has to submit to the state policy and at the same time organize the development from the communities. Therefore regarding clusters, the Region seems to act as a follower with actions mostly based on co-financing.

Moreover, the regional objectives, as seen through planning with the regional 2014 masterplan, are mostly aimed at rebalancing the economic development among the various areas of the region in order to tend to a territorial equity. However, mostly following the will of the State, this document also designates strategic areas where the development should be emphasized and which roughly correspond with the future *Grand Paris* clusters.

From the 7 competitive clusters hosted by the region and the other 15 clusters officially advertised by the region (and financially supported by it), one can observe that clusters can be of various scales regarding the activity. This can be a difficulty when building a policy aimed at anchoring and advertising clusters within the region. It seems that the need for strong territorial concentration is diverse regarding the considered clusters.

The most recent trends in cluster building lead to the concept of science-cities that wish to build education and research campuses opened to the city and creating the largest possibilities of serendipity. In these policies, planning plays a central role. Nevertheless, building clusters and the density that goes with can also generate drawbacks that can in return endanger the cluster building by excluding the weakest parts of the cluster ecosystem and make them relocate to more remote areas or even out of the region (see the problems in the Silicon Valley). This phenomenon which primarily concerns industrial activities now affects services and even headquarters of larger firms.

A recent research about the forecasted *Grand Paris* clusters questions the real role of these as elements of economic development and propose that they seem to be more used as elements of international and territorial marketing, regulation tools for metropolitan competition, mobilizing tools for larger urban projects to help launch a dynamic and also mobilize funding.

Annex I : Official clusters of the Paris region (as to Nov. 2014)

Name of cluster if any	Date of creation (if any) official national validation as a cluster (red)	Economic sector(s)	Number of firms (establishments)	Number of jobs in the cluster	Number of public research bodies involved	Number of jobs in the economic sector at the regional level	private/public initiative	Level of organization of the cluster					Existing governance structure	related regional economic sector strategic action plan
								Organization in progress	network	association	grappe (red = official label)	competitiveness cluster		
Astech	2007	Air and space/ electronics on board	250	70 000		100 000	Pub					x	x	air and space
System@tic	2006	Complex systems (electronics/software)	642	62 684		180 000	Pub					x	x	optics and complex systems
Medicen	2005	High technologies for health and new therapies	155	11 623		45 000	Pub					x	x	biotechnologies and health
Advancity	2005	Greentech - Technologies for a sustainable city	94	24 487		97 000	Pub					x	x	eco-activités
Finance innovation	2007	Innovation in finance	160	54 096		290 000	Pub					x	x	support for industries
Cap digital	2006	business cluster for digital contents	500	14 951		160 000	Pub					x	x	digital contents/creative
Mov'eo	2006	automotive	232	15 811		156 000	Pub					x	x	automotive
RAVY/RAVI (automotive)	2005	automotive	120	22 000		156 000	priv				x		x	automotive
Optics Valley	1999 (2010)	Opto-electronic and software network	150			1 200 firms	priv				x		x	optics and complex systems
Mecatronique Seine amont	2000 (2011)	electronics/mechanics industry	25								x			mechanics
Comité mécanique	2001	mechanics industry	4849			75 000			x					mechanics
Durapôle	2009	Greentech - Sustainable development	40				priv			x			x	eco-activités
Paris Mix	2009 (2010)	Creative industry : World music	400			1 000					x			creative industries
Silicon Sentier	2000 (2010)	open source technologies, network, Web and mobility solutions	60			1 800					x			digital contents
MIREM (Industrial and robotic maintenance)	2006	automation	20								x			automation
Réseau Mesure val d'Oise	2002 (2010)	Metrology	59			8 000	priv				x			
Le réseau de l'image (the picture network)	2008 (2011)	Creative industry : numeric content, multimedia, graphic design, photography, sound					priv (chamber of commerce)				x			digital contents/creative
Pôle média du grand Paris (the northern Paris movies and multimedia cluster)	(2011)	Creative industry : cinema	60				priv				x			digital contents/creative
Capital games	2003 / (2011)	Creative industry : numeric content, videogames	60			3 000					x		x	digital contents
Le vivant et la ville (the living and the city)	(2011)	environmental designed buildings	25				priv				x			eco-activités
Soliage : (innovative solutions for autonomy and elderly technologies)	(2011)	innovative technologies for disabled and elderly people	28								x		x	biotechnologies and health
Biomis G3	2012	Greentech : biomaterials for construction, industry and energy	6				public (local)	x						eco-activités
REI le réseau des éco-industries Val d'Oise-Yvelines	2004	Greentech : eco-industry network	200			97 000	priv (chamber of commerce)		x					eco-activités
cosmetics valley (28-76)		Cosmetics										x	x	associated competitiveness cluster
Elastopôle (Centre, Auvergne, Pays de la Loire)		new polymer material				31000 (France)						x	x	associated competitiveness cluster
Vitragora ((IDF, Bourgogne Franche Comté)		Agriculture and food										x	x	associated competitiveness cluster
Novalog (IDF, Ndie)		Logistics, supply chain										x	x	associated competitiveness cluster
Pole pharma (28)		Pharmacy										x	x	associated competitiveness cluster

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Clusters, Innovation and Location Dynamics in Helsinki in relation to the Spatial Planning Process



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Introduction

This report describes innovation in Finland and Helsinki, with particular reference to the dynamics of business concentrations. It is divided into two sections. The first section deals with economic development strategy set within the Helsinki city-region, whilst the second part refers to research undertaken for Helsinki's forthcoming City Plan 2050 and the Metrex expert group on location dynamics.

Section 1: Innovation, spatial planning, and City of Helsinki as 'driver of change'.

Helsinki is on the periphery of the European Union, not at the intersection point, where interactions and networking develop more easily. The core region of the EU has better advantages when it comes to competitiveness and creates two-thirds of added value. In order to stay competitive, Helsinki as a City needs to play an active role. In other words, Helsinki must maintain and develop the qualities that act as a 'pulling force' to attract companies and investments to the city and its region. By doing so, this in turn attracts the necessary skilful human capital which is required in order to reinforce competitiveness. Equally, by maintaining a highly regulatory plan-led spatial planning system, Helsinki has been able to achieve a high-quality environment and life-style that makes a city attractive domestically and internationally.

Economic development is explained in terms of spatial planning and real estate development processes and how these in turn act as the 'driver of change' in creating public-sector driven 'organised' concentrations of innovation and their relationship to where business-led firms locate. Businesses play a special role in the city-region and the dynamics of 'creative quarters' provide a clear relationship to spatial planning policies for the future and how future investment in rail-connectivity may assist new clusters spatially as to where and how they develop.

Finnish Competitiveness & Innovation

Finland has been one of the world's topmost competitive countries, yet it sits on the economic and geographical periphery of the European Union. The driving force has been Helsinki which occupies a major part in the success of Finland by concentrating almost half of GDP, around 17 % of jobs, 11 % of population and 15 % of companies.

Know-how has become one of the most important factors in development and Helsinki needs to continue to both attract and create know-how to stay in the top rank of competitiveness in the world. In a government publication (20/2004) Finnish and foreign companies' business leaders considered Finland's strengths were in terms of entrepreneurship, infrastructure, technological expertise, social stability and functionality, as well as educational attainment. Cooperation between universities, research institutions and companies was classified as a rather remarkable achievement which needs to be fostered.

According to the OECD's annual Global Competitiveness Report 2008-2009 and the World Economic Forum Global Competitiveness latest Report 2013, Finland was ranked 6th in competitiveness from 134 and 131 countries respectively. The strengths of Finland according to these reports were the quality of the educational system, of maths and sciences, local availability of research and training services, availability of latest technologies, university-industrial research collaboration and availability of scientists and engineers. In innovation, Finland occupied second highest, with first place in health and primary education and higher education and training according to the OECD.

Competitiveness, innovation and attractiveness are the key words for territorial development. These concepts are the most important in the context of globalization. To be competitive, a territory needs to offer a suitable environment for companies and human capital, to have a healthy financial set-up and create the possibility for actors to interact innovatively. The challenge is to draw human capital and resources to make companies stay and create the conditions for further growth.

Helsinki achieves a high-level of competitiveness through a combined mixture of public-private innovative initiatives. Its attractiveness is founded upon the creation of high-quality infrastructures, a blue/green environment, a safe and secure urban milieu and pleasant living conditions. Innovation, research and development and networking are key aspects of business today. Finland has one of the highest R&D investment programs in the EU.

Helsinki has built its city concentrating on domestic internal investment. There are approximately 400,000 jobs within Helsinki's boundary and nearly 750,000 within the city-region. Helsinki's growth has largely been about Finns coming from other parts of the country. This is now changing. Some 10% of residents are from outside Finland.

All these material factors are brought together by a well-developed spatial planning system. This spatial process influences the region's competitiveness by creating an urban structure which provides a framework for companies to interact with public/private actors in the city-region.

Innovation in Helsinki City

The City of Helsinki, together with the State, own some 80 per cent of land within the Helsinki boundaries. The City employs a coordinated and integrated real estate strategy with the spatial planning process. By having land in public ownership, the major development areas become the drivers of innovation and can be managed through the City Plan. It is the **City of Helsinki that acts as the 'Driver of Change'**.

This 'driver of change' ensures that there is sufficient land available for workplaces in all of the new development areas, of which there are 15 at present, the smallest being Arabiaranta waterfront for 7,000 residents and the same amount of jobs, and Vuosaari, some 14 kilometres to the east, where a new town district of 40,000 is near completion, including a new high-tech goods harbour. In this respect, Helsinki is going through major structural changes, the largest for 200 years.

Helsinki has a strong and diversified economy and knowledge base. It has high educational value, the highest in the EU. Helsinki has nine universities that offer a variety of disciplines. They are easily accessible within the region. They are also connected to each other and to other faculties through different ICT networks and public transport systems, primarily metro, tram and rail.

Cooperation with different companies, public and private institutions is a key tool. Many of Helsinki's creative industries are developed around universities and other faculties in highly **'organised' public-led** campuses, whilst the private sector through their own initiatives, have set up new 'garage' style business concentrations of innovation geared to rental values. Some 80% of jobs are in the service sector, and of these, 80% of jobs are in firms with four people or less.

The determining factor for companies is less 'location' and more about 'substance', i.e., knowledge and know-how. Face to face contact is still important. Business concentrations are located in accessible locations where the connections to the centre, universities and faculties and to other business concentrations are good.

The key to innovation is that the City creates the opportunities for the private sector to develop and grow. The development areas are a prime example of public-private innovation working in tandem to create a successful economy and a high quality lifestyle for its residents. In almost all of the new development areas currently under construction or being planned, a high percentage have workplaces. For example, in the Eco-Viikki Business Science park, some 16,000 residents will live next to the bio-med campus and food technology research institute which will cater for up to 8,000 jobs and as many students. The Fish-Harbour (Kalasatama) downtown development will aim for 18,000 residents and 12,000 jobs. The Western Harbour (Jätkäsaari) is even larger with the aim to accomplish 30,000 new residents and 24,000 workplaces. Arabianranta waterfront development area holds the Aalto University Media Lab and Applied Arts base. The Medical campus is home to the University Central Hospital with med labs and incubators and Myllypuro will soon be a campus for social and health care Metropole University.

This demonstrates that the highly regulatory style of spatial planning in Helsinki controls development and creates the necessary conditions for the private sector to succeed.

Spatial Location in the City-region

In terms of the Helsinki experience, 'clusters' (see section 2) in general can be concentrations of different functions that exploit the benefits spatially. Distances between clients and services may be shorter when firms are brought together spatially within close proximity. Firms may then experience greater opportunity for economic development due to agglomeration benefits. However, it should be noted that the significance of spatiality has become less important due to more reliance on electronic networking. Nevertheless, it has not replaced the need for face to face contact.

"Nations succeed not in isolated industries, however, but in clusters of industries connected through specialized vertical and horizontal relationships" (Porter, 1990)(1). In this respect, Porter considers clusters as a panacea for competitiveness.

The existence of a business concentration or a collaborative environment, which develops and recurs, may have a positive impact on the attractiveness of the city. They influence the local economy. Business networks (see *section 2*) and the dynamics of location, whether they are public sector driven or business-led are drivers of job creation. They create new innovations that provide a return on investment to the Helsinki city-region that offers services for the needs of residents, the workforce and companies generally. Business networks appear to positively assist in the urban regeneration of the city and city-region. Business networks are also a powerful tool to promote economic development and are the main platforms in the cooperation between cities, organizations and businesses.

One of Helsinki's strengths is the multiple concentrations of firms. They are formed of businesses where mutual interactions and positive externalities generate competitive advantages. Businesses competitiveness is based on advantages of specialization, interactions and networking over corporate and industries boundaries **(2)**. They give the tools to promote Helsinki's economic growth. In turn, location dynamics attract different flows to these areas that strengthen business success. The system works horizontally where one core strengthens another core. This is a crucial point to the territory if it wants to be competitive in the global markets.

The location of companies varies by their economic sector and by the space they need for their businesses. Companies that use space more efficiently and are in need of a specific kind of educated workforce tend to locate in or around the city-centre. The holding costs there are high. Those companies that are able to take advantage of urban productivity reside there. Location dynamics, generally, tends to generate agglomeration economies of scale, and in such instances, can contribute to a reduction of production or services costs. It also creates a positive spiral of economic growth **(3)**. However, for many firms, city-centre location is too costly. In such circumstances many of the smaller 'garage' style firms have spatial concentrations outside the CBD. The second concentration cores are much more sparsely defined spatially and tend to be spread out between the city centre and the Ring Road 1 (see *section 2*).

Economic Development Strategy in the Helsinki City-region

Public authorities and other institutions are much to the fore when it comes to development and competitiveness of the Helsinki city-region. The City of Helsinki has made an Economic Development Strategy which has five major focuses. The goal is

- To develop Helsinki region as a world class business and innovation centre.
- to reinforce the attractiveness of the urban environment and to guarantee the functioning of the traffic
- to promote the growth in service industries
- to guarantee availability of workforce
- to create a positive attitude for business in the City administration

In addition to the Economic Development Strategy, Helsinki, Vantaa, Espoo and Kauniainen, the four neighboring cities that make up the Helsinki Metropolitan area, have made a competitiveness strategy which has four focuses:

- The reinforcement of top level education and skills
- The construction of a safe and comfortable living environment as well as a high quality of life
- The strengthening of user-driven innovation environments and the development of public procurement
- Internationalisation of the metropolitan area and switching onto global networks.

In order to achieve these ambitions there exist several organisations and institutions that have programmes to develop Helsinki's fields of expertise as well as support the job creation and city's development, as well as execute the strategies. Culminatum Innovation is a development company owned by the Uusimaa Regional Council, together with the cities of Helsinki, Espoo and Vantaa, and the universities, polytechnics, research institutes and business community of Helsinki region (www.culminatum.fi/en/).

Its priority is to manage nine 'cluster' **(4)** fields in Helsinki's region, namely:

- Living Cluster
- Digibusiness Cluster
- Food Processing Development Cluster
- HealthBio - Health Cluster
- Well-being Cluster
- Ubiquitous Computing
- Tourism and Experience Management Cluster
- Nanotechnology Competence Cluster
- Environmental Technology Cluster

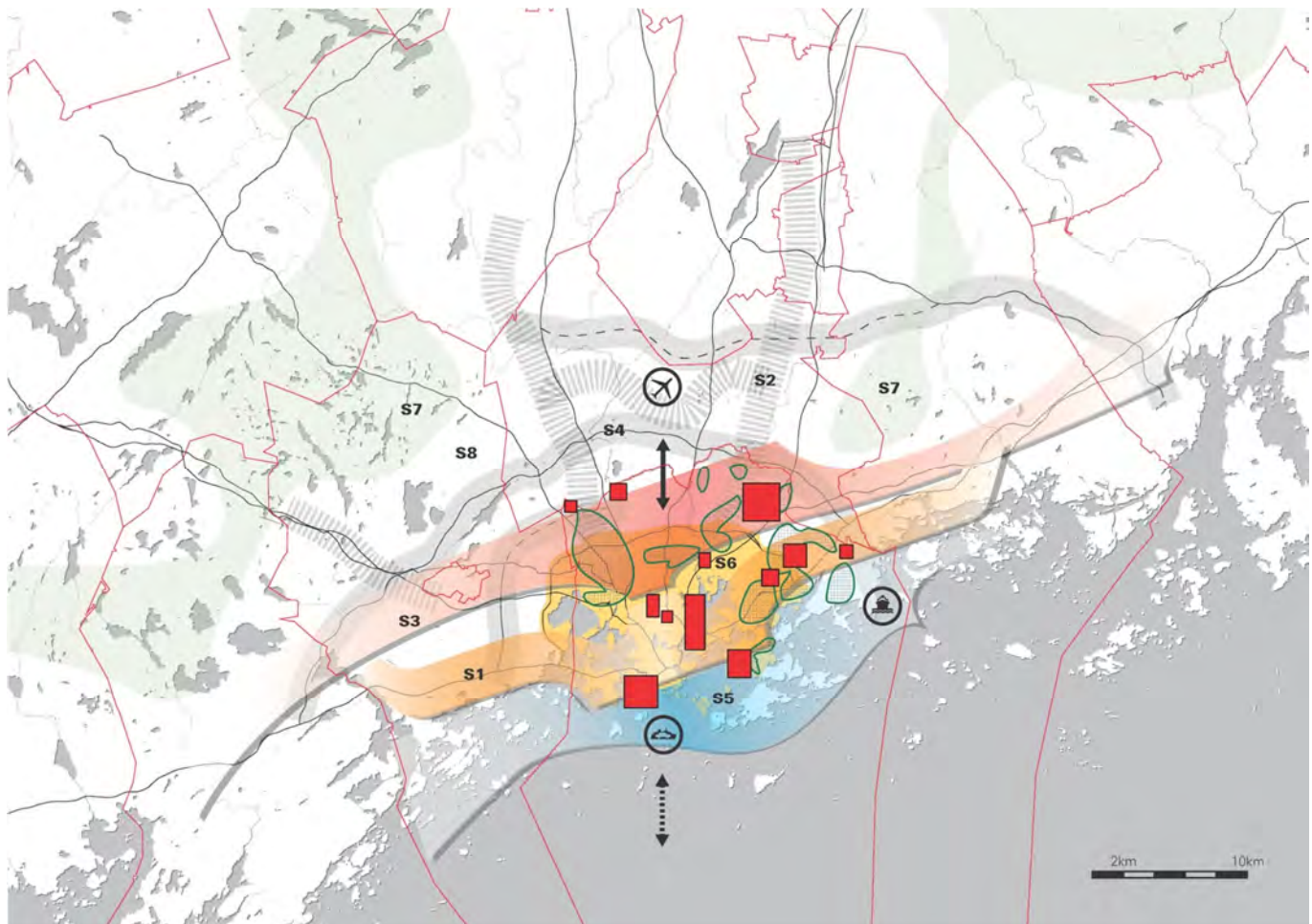
"The Centre of Expertise Program (OSKE) supports the clusters mentioned above nationally so that Finland will be internationally renowned for its attractive environments and excellence " **(5)**.

City of Helsinki: Strategic Tools in Spatial Planning

Helsinki has a number of spatial planning tools to manage change operating within a growth scenario.

The City of Helsinki's **Strategic Spatial Plan (6)** was approved in 2008. It is a spatial development strategy for the city-region and consists of a set of development policies and a spatial planning framework. It is prepared once per Council term, i.e. once every four years. The spatial plan analyses the future of the city-region and its development needs and presents a **Vision** of the city-region's future principles for spatial development over the next three decades.

The City development plan, or as it is referred to, Helsinki **Master Plan**, was approved in 2003.



Helsinki Strategic Spatial Plan 2008

The City Council approves the master plan as the basis for how the City will manage its development in the future and where new investment will be located. In Helsinki, the practice has been to prepare a new master plan about once every ten years. The changes occurring in the community are fast and have an impact on the vitality and land use of the city. Therefore, the master plan must be ready to react to the changes in order to maintain the vitality and competitiveness of the city in a quicker way.

The Strategic Spatial Plan guides the implementation of the Master Plan 2002. Furthermore, it is important that the City Council is able to assess, once per Council term, the modernity of the Spatial Plan and whether or not the Master Plan needs to be revised. The Strategic Spatial Plan and the Master Plan form a part of the overall City's development strategy. The strategic element acts as a broad guide and spatial framework for the Master Plan, which is a more detailed land-use development plan.

The **Key strategic issues** revolve around the integration of the city-region, strengthening of the city centre, maintaining social unity and safe neighbourhoods, viewing the growth in urbanity - the compact city - as assisting in the improving of the environment, and by building the region along the east-west coastal corridor it aims to improve the regional structure and regional balance. One of the key aims is to reduce urban-sprawl. A polycentric city-region, based around the Helsinki wedge-like 'finger-plan', will help to maintain a better balance regionally through the development of a hierarchy of new sub-centres and achieve the required critical mass to support new rail lines to these centres. This in turn creates more urbanity, thus enabling a wider arc of public transport connectivity.

The influence of spatial planning can be significant in creating new economic space. It can influence the amount and location of workplaces within the major development areas. Planning can be the facilitator in bringing greater connectivity to these areas, with special regard to making high density workplace business areas centered round the public transport interchanges whilst minimizing heavy vehicle transport within the city. Equally, by granting improved status to the old 'economic' zones, new investment can inject greater innovative opportunities, though this has to be clarified by the possibility that office rents may displace fragile placed firms.

Furthermore, greater attention will be required in achieving a better spatial distribution of high, medium and low-value rental areas. The forthcoming City Plan 2050, which will be ready in 2016, will attempt to promote a greater understanding between improving new workplace locations with the upgrading of the existing economic zones. This will require acknowledgement that not all firms can afford the best locations, and are willing to sacrifice certain externalities for lower costs. This has to be understood in spatial terms to enable greater economic cohesion spatially. All of the 'economic' zones are owned by the City. By employing an integrated spatial set of policies allied to progressive real-estate initiatives, could sustain a healthier economic balance.

'Organised' Public-led Innovation business concentrations in Helsinki

In accordance with the Technical Research Centre of Finland (VTT), they define a cluster as a "knowledge concentration where companies and organizations are in solid or less solid cooperation where product companies, universities, schools and public authorities for example do mutual cooperation and form a cluster of cooperation".

Business concentrations in Helsinki can be divided into two separate groups. Firstly, there are the **'organised' public-led** innovation concentrations, promoted by the public sectors. Secondly, there are the individual private sector initiatives. Each will be dealt with in turn.

Helsinki city-region has 7 major **'organised' public-led** 'clusters', although 'clusters' does not truly reflect an accurate description of the phenomenon, hence, business concentrations is considered a more apt definition. The Helsinki business concentrations have been initiated largely by the City, the State and the Universities. This would appear to be unique as most cases of spatial business concentrations have tended to grow without explicit government intention (7). In Helsinki, public intervention appears to be the catalyst for facilitating the growth of some of the key concentrations of firms within the Metropolitan city-region. Public funds focus on setting-up spatial concentrations of economic development. In doing so, concentrations of firms enable greater use of innovative capabilities and technological change allied to the growing knowledge economy. This adds additional value to the so-called 'triple helix' relationships between universities, city and state governments, and business.

Public sector intervention has been reinforced since 1990 by concentrating universities' activities together. Each university has different fields of expertise. In order to create a favorable atmosphere for the formation of a business concentration, the City needs to establish contacts between actors and create an environment conducive to business. The Helsinki city-region creates the opportunities for companies to come together in business areas through, for example, assisting in real estate matters, creating new business parks, (particularly through the new development areas), providing support for researchers to find a home, by developing and re-orientating the city and its tools towards the needs of business concentrations (business incubators, strategies etc.) and by investment in major structural facilities (research laboratories, universities, new public transport connections, and fibre optics communications). Indeed, developing and extending the public transport infrastructure to make business areas more accessible is very important. Where highly skilled human capital exists, concentrations of firms will take shape.

The following 'organised' public-led campuses are all public sector initiated:

The **campus of human sciences** is in the heart of the city centre, in the area known as the 'Empire city'. Naturally, it is very well accessible. This concentration consists of the faculty of arts, behavioural sciences, law, theology and social sciences. In the immediate surroundings are located companies that are focused on financial intermediation, real estate, and business activities as well as other community, social and personal services activities. The area is connected by metro, tram and rail.

Kumpula is a science campus some 6 kilometres north of the downtown. It includes the faculty of **science**, the department of physics, geology, chemistry, geography,

computer sciences, astronomy and mathematics and statistics. It has been developed in the last ten years. In close proximity to the campus there are companies that are focused on construction, retail trade, hotels and restaurants and other business operations. Access is by tram.

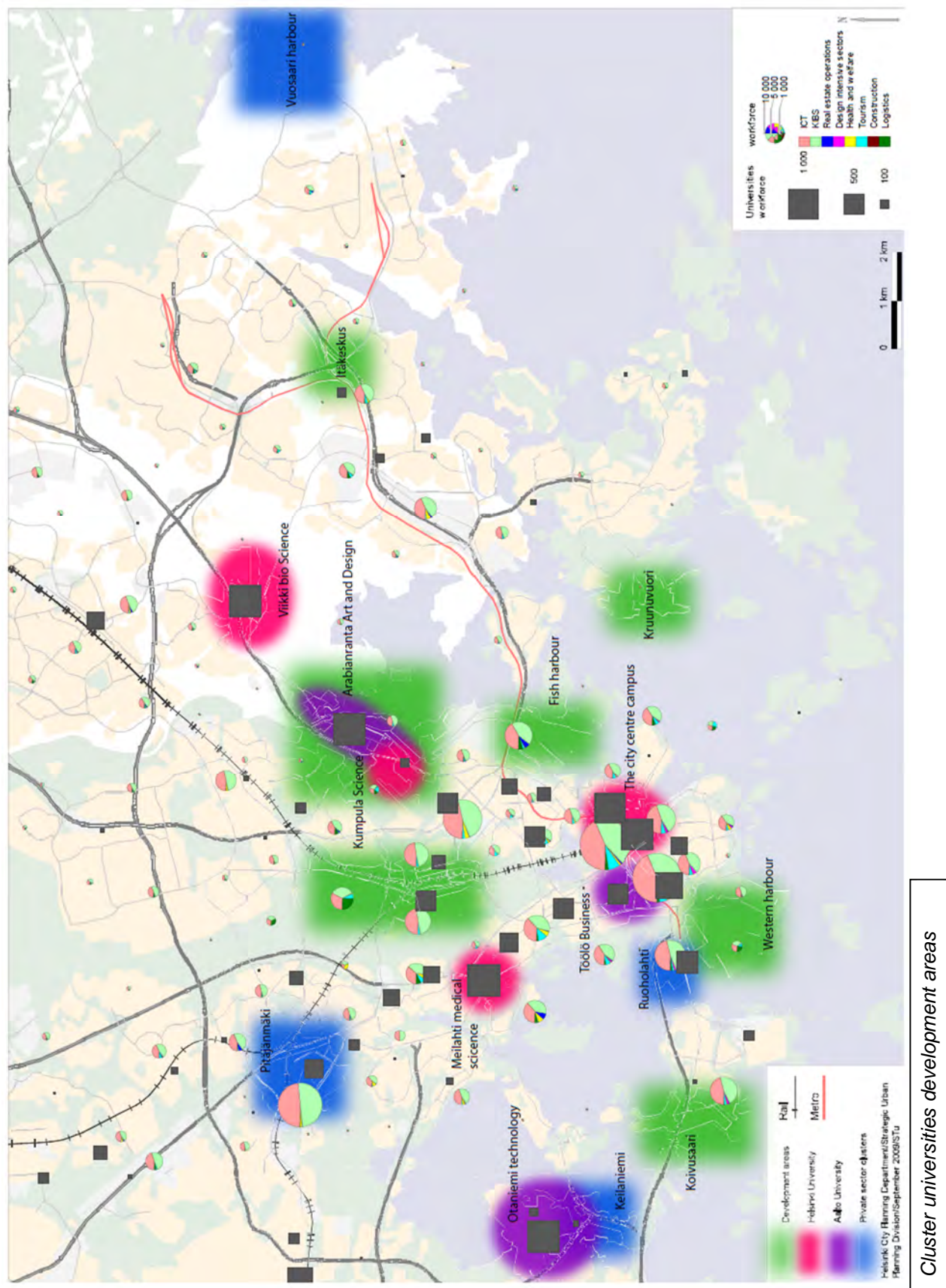
The campus of **Arabianranta** has a very strong identity of **art and design**, and sits opposite the Kumpula cluster. It is Helsinki's new 'Wired City', offering businesses and homes fibre-optic networks. The new high-tech Business Centre aims to utilise shared ventures with the faculty of art, design and media university which forms a part of the innovatory Aalto University initiative. Creative trade and other business activities and extra-territorial organizations and bodies are present alongside the art and design activities. Future aims of linking up with the new science business-park at Viikki and Helsinki's University of Technology (now forming part of the Aalto University) aim to create parallel networks. Access is also by tram.

The **Meilahti** campus is the centre of excellence in **medicine and biotechnology**. It is located a few kilometres to the north-west of the city centre. There is the faculty of medicine, the institute of biomedicine, dentistry, clinical medicine and molecular medicine, department of public health, forensic medicine and medical education, support and development units. Major economic activity in the Meilahti campus is research and development that is accompanied by health and social work and other business activities. Research and development represents around 17 % of the activity. The tram is the key mode of transport to here.

The **Viikki campus or Science Business-Park** is specialized in life sciences. There are faculties of agriculture and forestry, biosciences, pharmacy and veterinary medicine. Main economic activities are related to the sectors of expertise through research and development, which represents about 18 % of the economic activities. There are two business incubators, Cultivator one and two provide an environment which concentrates on knowledge, business environment, research network in biotechnology, food, drug development, diagnostic and in environmental technology. Currently, there is the 'jokeri' cross-town bus service linking the campus in the east from Helsinki directly to the neighbouring city to the west, in Espoo, and direct bus access to the city. A high-speed tram is already planned to replace the cross-town service.

Business campus Töölö is in area immediately to the north of the city centre, near Kamppi. It is the cradle of business. There are the departments of business technology, accounting and finance, economics, marketing and management, languages and communication. In the surroundings of Helsinki's School of Economics are located companies that are focused on computer related activities and real estate and business activities as well as wholesale and retail trade.

In terms of the organised campuses, many companies that benefit from research, knowledge and laboratories are located on or near these campuses. There are business incubators, which help researchers to undertake their researches to products. These organised campuses are dynamic centres where new knowledge is born and innovations arise.



Cluster universities development areas

Business-led Innovation Concentrations

Business-led concentrations within the city-region are formed by private sector companies through their own initiative. In order to facilitate the development of these areas in the city region, there are pulling factors that provide the framework for their development. They search a location where there are workforces for their needs, supportive policies for their business, good-quality living conditions and a secure environment with the appropriate infrastructures and connectivity. The possibilities to co-operate face to face contact with other companies and other organizations as well as support from public bodies can be an engine that leads to the creation and development of a business area. Small concentrations of companies from different economic activity can form a concentration that act as a significant economic development driver if there is interaction between the companies and with the surrounding environment. An important element, overall, is rental costs.

Helsinki's largest concentrations of innovative firms are not, oddly enough, in the organised campuses. Beside these high-knowledge based public-led business concentrations, there exist other business areas formed through private sector initiative. The companies that are located in these private sector concentrations don't need to be involved in a form of intense interaction with universities and their research hubs, but more directly with consumers and users. They are important to the city and they form the bases of Helsinki's strong economy. The companies that belong to the 'business-led' concentrations would appear to have greater competitiveness than those that don't belong to a business area because they benefit one another through spatial location (8). However, belonging to a business-led concentration does not guarantee success.

The Helsinki Metropolitan Area Council (YTV) has listed the business areas in its regional business report (2009) (9). In this view, the assumption is that same type of business concentrations pull together and are spatially interconnected. The Helsinki city-region's key clusters are Information and Communication Technology (ICT), some 21 % of Helsinki's workforce, Knowledge-Intensive Business Services (KIBS) (20 %), logistics (9 %), tourism (11 %), design-intensive sectors (2 %), construction and real estate operations (4 %), and health and welfare cluster (5 %). These business areas are also spatially concentrated in the same areas in Helsinki from the city-centre to Vallila, Pasila and Pitäjänmäki.

Some 64 % of companies in the city-region are located in Helsinki and represent 61 % of employment (10). Helsinki's biggest economic concentration by workforce is in the city centre. In Helsinki, business-led concentrations are overlapping with other clusters. These private sector clusters have at the same time diversified and specialized industries which makes them economically strong. Business concentration of specific competences is strength to the city, in which businesses take advantage of synergies and create innovations together. For new companies, business-led areas offer the possibility to interact and to change their ideas and knowledge with the companies that have longer experience. Networking gives the opportunity to smaller companies to share their limited resources that often lead to their and other party's benefit.

Creative Industries - Creative City

Culture has moved centre stage in cities. 'Creative industries' are seen as the engine for economic development in harnessing creativity to deliver improvements in economic and social development. Creative industries centre on production and distribution. These businesses have become more important in the last twenty years when spending habits have oriented more and more towards services and cultural experiences.

The creative city can be viewed as a combination of the performing arts, music, the visual arts (broadcasting and film), publishing, software design, multi-media, design & fashion and crafts. Florida (11) considers cities that compete successfully will be modern and command advanced technologies, whilst Landry (12) writes that creative cities need to be 'intercultural' and capable of adapting to change through immigration and diversity. In the UK, policymakers have realised the economic potential of this development is playing an important role in helping such clusters to flourish and grow.

Concentration of 'creative industries' in Helsinki still takes the form of city centre concentration. A recent development has also seen a new series of creative clusters forming around Leppävaara and then up along the north-west main commuter rail line. There are, however, no emerging districts such as Shoreditch in London, or the Lower East Side in New York.

In Helsinki, creative industries in business activity may also receive support from the public sector, usually based upon how public funding resources are invested with greatest 'return', both from a non-profit angle as well as financial returns. Creative industries will have a strong cultural identity, thereby setting it apart from the mainstream of innovative business concentrations based specifically upon profit and marginality. Capital support for new innovative ventures can be the difference between survival and bankruptcy. Conventional finance may not work. Creative industries require special 'networking' to foster contacts within the business areas. Art hubs require more than being an 'exhibition space or Mall'; it requires space to interact and thereby create forms of creative culture. There is a difference between a so-called creative district of restaurants and bookshops and a genuine neighbourhood that sponsors art studios, ateliers, design houses, education, film, fashion and music. Although Helsinki may not have its Chelseas (NYC) or Temple Bar (Dublin) style 'cultural-quarters', it does have its own particular network, such as the former Nokia Cable Factory in the new development area of Ruoholahti, a bit similar to say the creative-city project in the 1933 Old Mill building in Shanghai, or the forthcoming venture in St.Etienne (13).

Connectivity and Accessibility

This important aspect consists of two main elements: spatially, in terms of traffic and transport, and secondly, transfer of data.

Accessibility

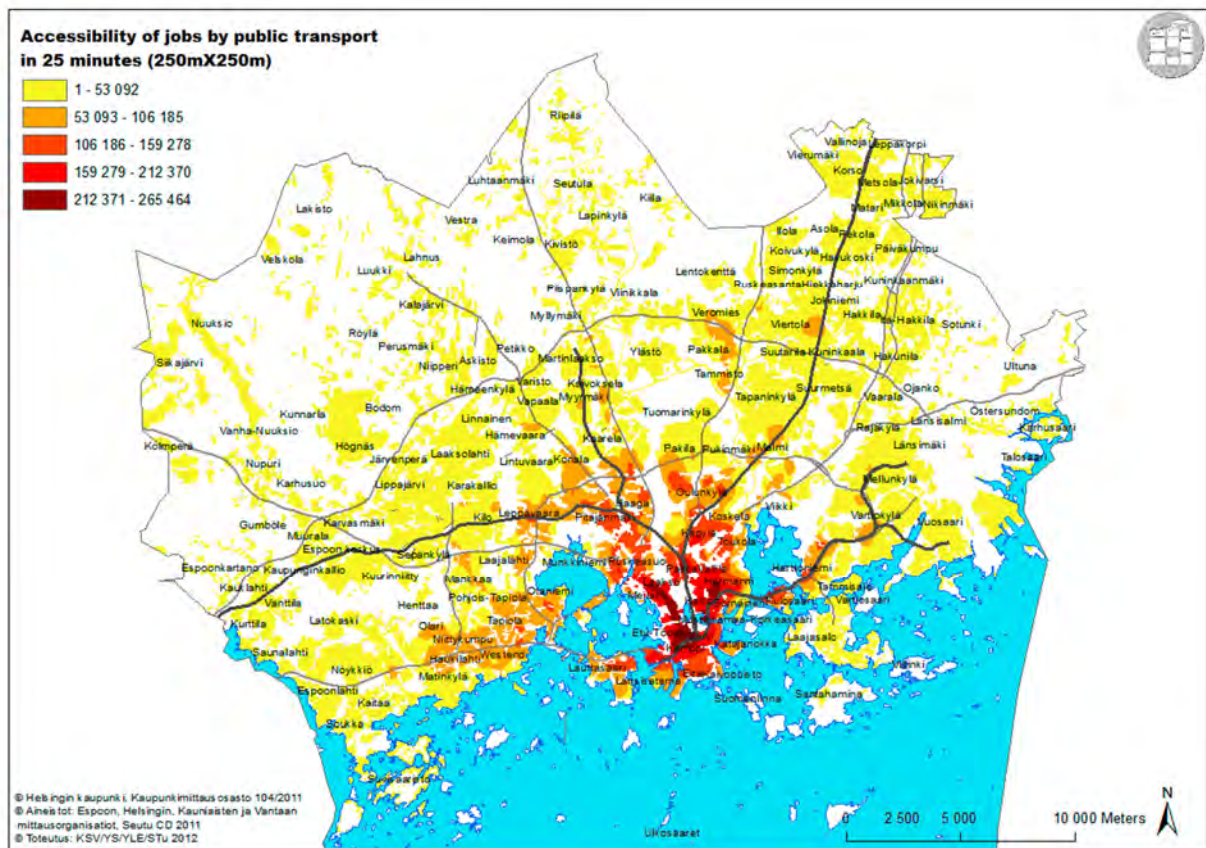
Accessibility is one significant aspect of location dynamics that affects location decision-making by firms. At the current period within the Helsinki city-region the best areas with greatest accessibility can be found within the city centre and along the main motorway and ring road corridors.

Accessibility varies greatly within the city-region and is dependent upon the transport mode and spatial location. Accessibility by car within the metropolitan area is considered 'excellent', in that one can drive from one end of the region to the other in about 25 minutes. Accessibility by public transport is also good, but it cannot compete with the car for mobility (14)

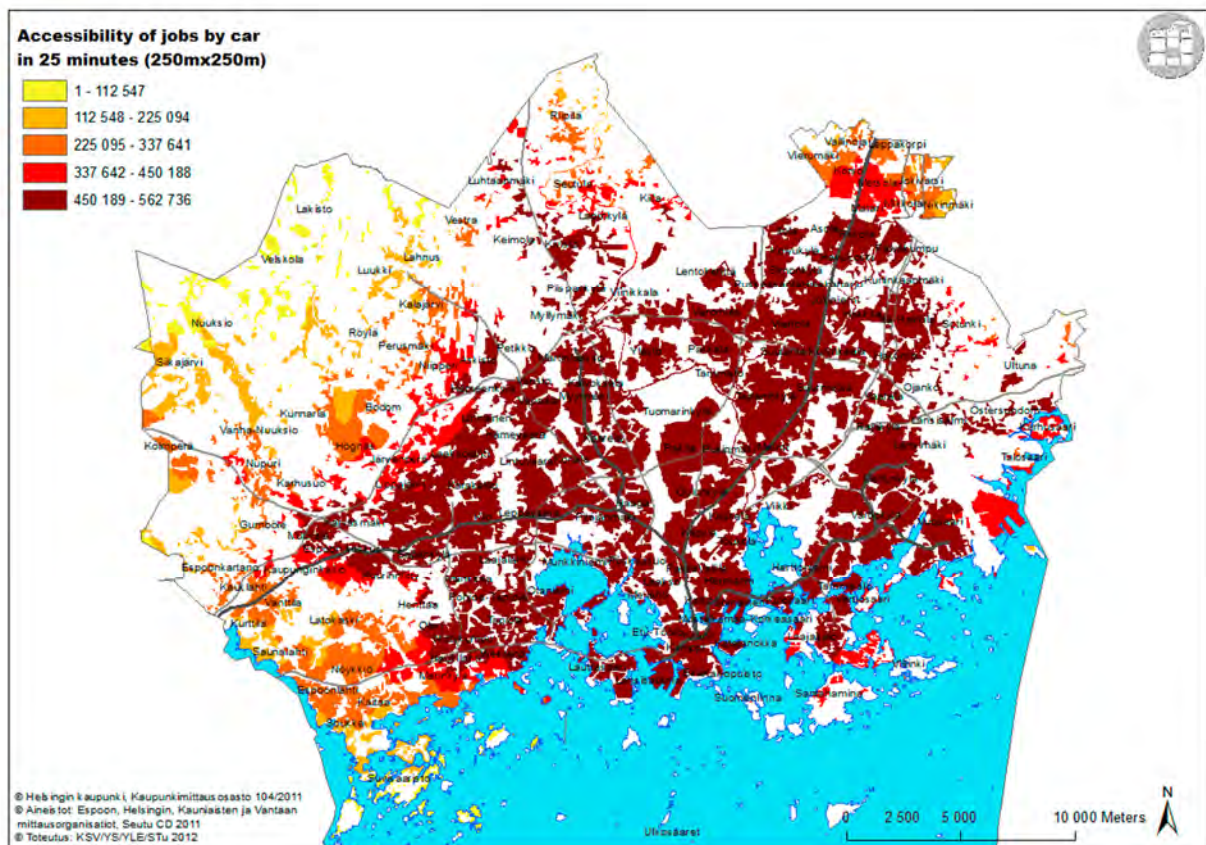
Excellent accessibility for the private car is largely based upon an extensive road network in the city and good connections between major roads as well as flexibility as a means of travel.

Helsinki, as the public authority, does not have policies aimed at restricting the use or generally restraining the slowing down of driving by car, with the exception of the inner city. In that respect, therefore, accessibility by car both for residents and for commuters is superior to the accessibility by public transport. Thus, it is not surprising that for example when a company chooses a location one of the main reasons leading to locate in an area is the accessibility by car. Car travel accessibility is thus, clearly for companies, the preferred mode of travel, giving the conclusion that firms' consider car travel most important of all, especially when compared with public transport. It should be remembered, however, that overall, the preference for people coming into work in the inner city choose public transport, which stands at 72% during rush hours.

The concentration of workplaces within the capital region also tends to promote car travel accessibility. By comparison, workplace areas within the inner city make car journeys less attractive, even although within the inner city, traffic jams are quite minimal. Nonetheless, public transport therefore becomes the overwhelming choice for commuters as the quality of public transport is of such a high quality and provides an extensive radial network. In the future, this network will be further improved with the transversal connections.



Accessibility of jobs by public transport in 25 minutes (Tulikoura S. & Jäppinen S., 2012)



Accessibility of jobs by car in 25 minutes (Tulikoura S. & Jäppinen S., 2012)

Spatial Planning & Connectivity

Helsinki places great emphasis on having an integrated spatial planning and traffic/transport network. The Strategic Spatial Plan provides priority to the development of rail networks.

Spatial planning can influence economic development in Helsinki. The main aspects of influence are to do with promoting new workplaces in the future development areas in an attempt to improve economic competitiveness but equally, to create a better spatial balance across the city-region and strengthening existing business concentrations. This in turn will help maintain economic development and achieve greater competitiveness. Additionally, by improving rail connectivity in the City Plan 2050 to the development areas, this appears to strengthen the formation of new business initiatives forming around the public transport interchanges.

It also has to be recognised, though, that many private firms opt for the private car to get around. In this respect, Helsinki has been successfully upgrading the major Ring Road corridors in and around the city-region. Helsinki is greatly connected from north, east and west. The target is to further improve public transport connectivity to compete with the private car, especially cross-town transversal connections, in order to tackle CO2 emissions. In this respect, the City Plan 2050 envisages that all inner city motorways will be changed in the future to city boulevards connected by tram to the centre.

Public transport

Getting around impacts on the economic performance of a city-region **(15)** and in particular, it appears that high-investment in rail public transport creates wider benefits than reliability on the car.

Helsinki's business concentrations are located around a very good public transport system. Considering the size of the city, some 603,000 of a population and nearly 1.4 million inhabitants in the city-region, the public transport of metro, tram, commuter-rail, bus and ferry, offers a superior form of connectivity for its workforce, making accessibility by public transport to be easy to use. Some 72% of people during rush-hour use public transport within the city of Helsinki **(16)**. The opposite is true regionally, highlighting the different spatial models employed within the region. It is clear that those cities which adopt a high-valued public transport network tend to be compact in size, with higher densities, enabling greater financial investment to support public forms of connectivity to the periphery. This in turn generates savings in energy and lowering of carbon emissions.

The organized public-led campuses located around the new traffic interchanges have high-quality linkages of metro and tram. A number of the public sector business concentrations are located within the new inner city development areas. These quarters in the city centre tend to be smaller, but dynamic, with many office locations within walking distance of one another.

A key pro-active element in the connectivity of business areas is that spatial planning is integrated with transport and traffic planning. Future plans on public transport investment appear to be significant. Over the next 40 years, it is expected that Helsinki will build a new

metro line to the west, to Espoo. A new circle line, linking up the extended CBD to Pasila is planned, as is an extension eastwards of the existing metro to the new suburbs of Sipoo. In addition, a metro to the south-east, towards Laajasalo/Santahamina direction is conceivable. The City Airport will also be included in the new metro network.

Plans for two cross-town, east west corridors of fast-trams covering the Ring Roads I and III are likely to be given a high priority, as is the extension of a more metro-style timetable for the commuter rail lines servicing the city-region.

A 'Spatial Vision' (17) for Helsinki-St.Petersburg-Tallinn was undertaken within an EU funded project on the development of Helsinki as a polycentric city-region. This vision has now been incorporated into the City Plan Vision for 2050. The new vision anticipates a TGV style high-speed train network between Helsinki and St. Petersburg and the building of a rail tunnel between Helsinki and Tallinn. This is now under investigation at the time of writing. In addition, the City Plan aims to build several transversal high-speed trams - east to west - to create a 'polycentric network city-region'.



Helsinki-St.Petersburg-Tallinn Spatial Vision

However, there is a clear difference in attitude between what the spatial planners are trying to achieve with public transport initiatives and what businesses choose to do instead, which is that businesses on the whole prefer the car, particularly cross-town.

Fibre-Optic Connectivity

In respect of fibre-optic cabling connectivity, almost the entire city of Helsinki is near completion of a high-tech fibre-optic network, ensuring that the city remains at the forefront of new technology. Helsinki's Arabiaranta Waterfront development for 7,000 residents and 7,000 workplaces represents Finland's first 'Wired Village' of optic fibre infrastructure custom-personalised for the area. It is a controlled digital network and as such, has attracted a number of innovative companies to test their products under 'live' conditions. The idea has been exported to other areas in the city-region in order to create 'high-tech' quarters similar to Silicon Valley.

A note of caution exists, as the wider network of fibre-optics may create opportunities for those firms that do not require face-to-face contact to move further afield to remote and outlying areas in search of cheaper offices, and by doing so, contributing to urban sprawl. One way of minimizing these external effects is to consider only placing fibre-optics within the new development corridors regionally, and to prevent costly infrastructure investment outwith the corridors.

Future location dynamics & Spatial Cohesion

A number of new business initiatives - public-led and private - will be formed over the next 25 years, namely:-

- Central Pasila - an extension of the CBD
- East Helsinki - around the Regional Eastern district centre and high-tech goods harbour in Vuosaari, some 14 kilometres from the city-centre
- Western-Harbour - part of the new city-centre development strategy for jobs and homes
- strengthening of the City-Centre and widening the urban framework to Ring 1
- Fish Harbour - a new development linking up with the new linear city towards the City-Airport
- Fish-harbour to Central and Northern Pasila
- Arabia waterfront, Eco-Viikki, Aero-Malmi, Tattarisuo and the City-Airport
- Malmi Regional Centre
- City-Airport
- Western Metro to Kivenlahti

So, the future of business-led quarters spatially may take place around the existing industrial zone of Herttoniemi to the east, replacing some of the low-value functions with new ICT high-value initiatives. Tattarisuo is another possible low-value area ripe for new business initiatives. By doing so, it will replace lower-value firms and push them out of Helsinki, thereby reducing opportunities for new firms to get a hand on the business ladder. A city, however, needs a balance of office areas for high, middle and low value activities.

A new business belt may form from the Fish-harbour towards Herttoniemi centre and the Eastern Regional Centre and then onto the new high-tech goods harbour at Vuosaari.

Strengthening of the ICT and business areas around the Aalto university in Otaniemi to the west of the city-centre, may develop around new links to the new development areas of Koivusaari and the Ruoholahti/Western Harbour axis.

It is also possible that the planned high-speed tram crosstown service (Jokeri I) from the Eastern Regional centre to Tapiola in the west may create new potential for businesses around the key development areas serviced by the tram.

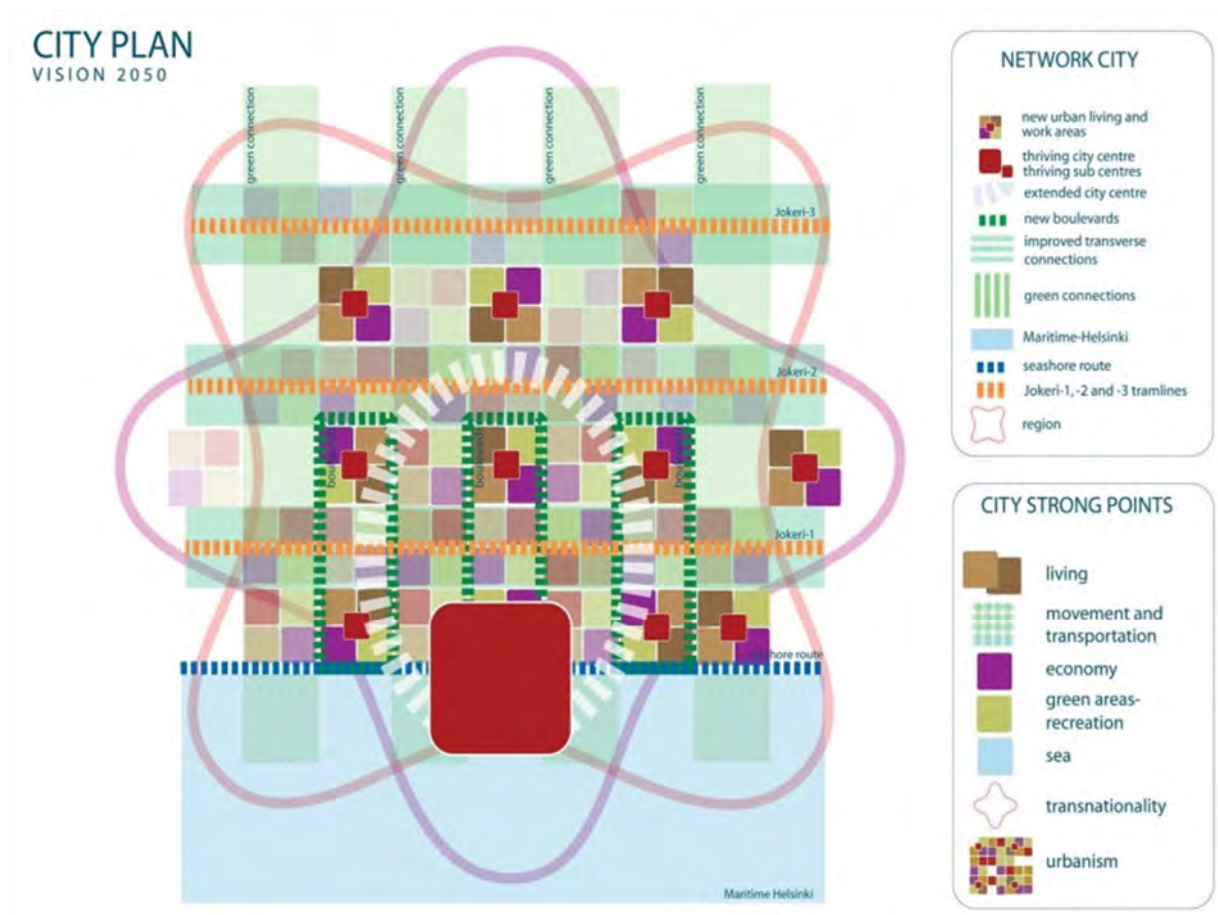
City Plan 2050

Helsinki is preparing a **new City-wide Plan 2050 (18)**. The Helsinki Vision for 2050 is a fast-growing polycentric city-region that is a network city of public rail transport, both radial and transversal, urban and dynamic which sees an expansion of the city centre through greater densification of the suburbs, inter- connected by new rail links.

The Plan's Vision is to strengthen Helsinki's international competitiveness as a spatially balanced city-region in order to promote greater social justice and wellbeing and make Helsinki an attractive place to work and live.

The aim is to improve Helsinki's urban identity by extending the city-centre and making it a 'Network City'. The metro and tram network will be increased, particularly two new transversal cross-town high-speed trams connecting east to west.

Helsinki is **Plan-Led**, meaning the development plan leads strategic planning for 2050, and helps make Helsinki one of the EU's dynamic growing regions.



Helsinki's uniqueness

Helsinki's uniqueness in the EU today is based on the belief that city planning can deliver the necessary conditions to make the city a nice place to live in and work.

Helsinki owns 66% of the land whilst the State owns 13.6%, making for nearly 80% of land in public ownership. Land ownership and land practices make for the City of Helsinki to be the 'driver of change'. The City Plan has created 15 new development areas, the smallest being the Arabia Waterfront for 7,000 people and 7,000 jobs, and the largest in Vuosaari to the east, for 40,000 new residents and a brand new high-tech goods harbor. Some 80 per cent of all construction - houses and offices - takes place on public owned land, mainly the City of Helsinki's land.

City Planning and Traffic and Transport are integrated. This ensures that when large new development areas are built that the metro, rail and tram network are connected to these areas. Public transport accounts for 72% of all journeys during rush hours; the reverse is true in the city-region

Helsinki's Nordic Welfare culture aims to have *social justice* and *social cohesion* as much as *spatial cohesion* for its citizens. Education is world class and makes the city a world leader in development

Involving the Public

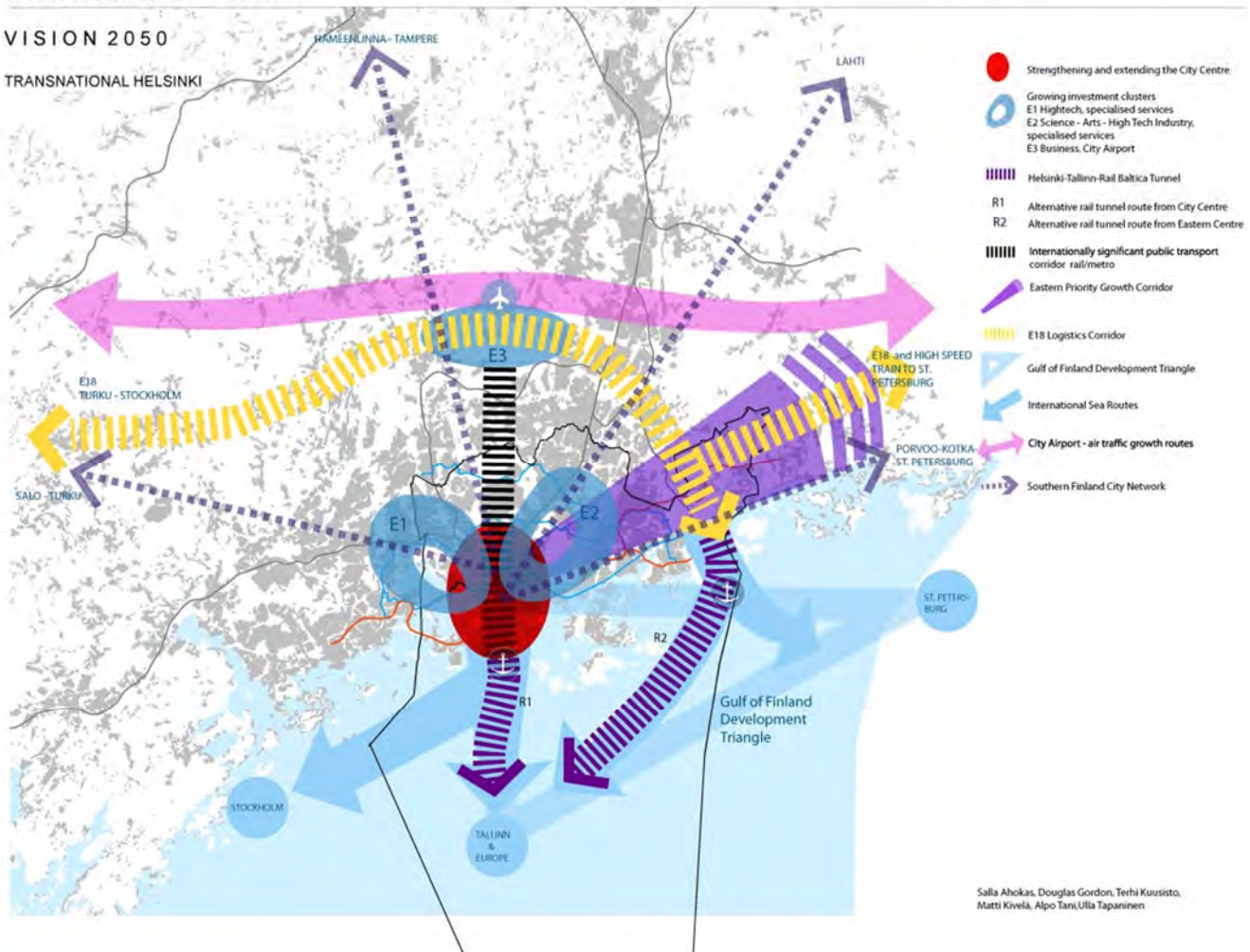
The City Planning department involves the public in decision-making. It opened the first 'Platform' exhibition space in the Nordic countries in the very heart of the city-centre.

The Big Picture - the TransNational Vision

HELSINKI CITY PLAN

VISION 2050

TRANSNATIONAL HELSINKI



Helsinki works closely with its international neighbours. The Gulf of Finland development triangle of Helsinki - Tallinn - St. Petersburg supports a combined critical mass of nearly 10 million people.

Metropolitan Governance matters: Helsinki is involved in consensus and cooperation with its city-regional neighbours.

Helsinki is working with the **EU** through several spatial planning projects to reduce regional disparities

Conclusion to Section 1

Public-led initiatives are spearheading new innovation workplace areas as much as business-led ones in the Helsinki city-region.

What appears to becoming clearer is that the mixture of organized public-led business initiatives, together with the business sector, are following closely the plan-led city-regional structure, as envisaged in the Strategic Spatial Plan. Business concentrations are mainly developing around public transport interchanges, particularly rail, but it has to be recognized that the workplace areas are also easily accessed by motorway networks outside of the city, meaning that it is important for Helsinki's forthcoming City Plan 2050 to have a versatile level of accessibility for all. Future public infrastructures will strengthen existing business initiatives, help achieve the Carbon zero objective and will give businesses the opportunity to develop and to maintain competitiveness. Connectivity is therefore an important driver.

In Helsinki, spatial planning policies allied to a public-driven real estate process, acts as a 'driver of change' to create the necessary conditions for the private sector to flourish. So far, the key business areas tend to be located inside the urban Ring Road I and the inner city. It remains to be seen whether the business and ICT sectors seeking evermore benefits from cheaper rental location and diversify beyond Ring I and opt to go outside the region, thereby exaggerating the problems of urban sprawl. If this is the case, then public transport investment has to be clear in its priorities and try to steer new development into the public-driven development corridors in order to maintain a compact city-region, achieve spatial cohesion and ultimately help prevent urban sprawl in an age of ecological zero carbon necessity.

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Section 2: Clusters and location dynamics in the Helsinki city-region and the implications for the spatial planning process

1. Purpose of the research in section 2

Section 2 of this report describes Clusters and location dynamics in the Helsinki city-region. In addition, it examines how innovation operates within the Helsinki city-region, with particular reference to the location dynamics of business clusters. The research forms part of the new Helsinki City Plan (2016) and the work currently being undertaken by the European Metrex expert group on location dynamics of firms and the implications for the spatial planning process.

Metrex is the network of metropolitan city-regions in Europe that provides expertise and joint action on metropolitan affairs. The city-regions involved include Paris, Madrid, Stockholm, Oslo, Szczecin, Sofia and of course, Helsinki.

Whereas Section 1 of the report described economic development strategies within the Helsinki city-region, Section 2 primarily aims at gaining a better understanding of firms' decisions in respect of location dynamics. The aim is to analyse if there is a link between a firm's decision to locate in a certain spatial area and whether a cluster phenomenon exists. One part of the research is based around a series of interviews with private firms in order to recognise the reasons behind their location choice and if there is important networking taking place with other firms in the area or elsewhere that could indicate possible clustering.

The methodology adopted by the Metrex expert group is being used simultaneously by Paris île-de-France and Helsinki in order to enable international comparison of outcomes.

The research purpose is set up to explore a wide range of issues, namely,

- what are the key drivers for firms in location dynamics within the Helsinki city-region?
- what role does spatial planning have on cluster¹ formation; in what way can city planning assist firms?
- in what way do firms network within their cluster?
- do clusters bring clear advantages to firms?
- what are the future trends and direction for firms within the specified clusters

Economic development is explained in terms of spatial planning and real estate development processes and how these in turn act as the 'driver of change' in creating public-sector driven 'organised' public-led clusters of innovation and their relationship to business-led clusters. The dynamics of 'creative clusters' provide a clear relationship to spatial planning policies for the future and how future investment in rail connectivity may assist new clusters spatially and job creation generally, as to where and how they develop.

In order to explore spatial relations between companies, the first step was to analyze by theoretical spatial analysis method the possible relationships between firms and secondly a range of interviews with the private sector was set-up. The interviews were designed to ascertain the possibilities for spatial planning, through its City Plan 2050, to be more proactive in creating the conditions for the private sector to succeed. The interviews were based around firms that are located in or within the vicinity of a potential cluster in Viikki.

To compare the results, interviews in two other areas of job concentrations - Aviapolis and Vantaanlaakso within the Helsinki city-region - formed part of the research. How these potential clusters came to be identified form part of the theoretical analysis which will be explained during the course of the report.

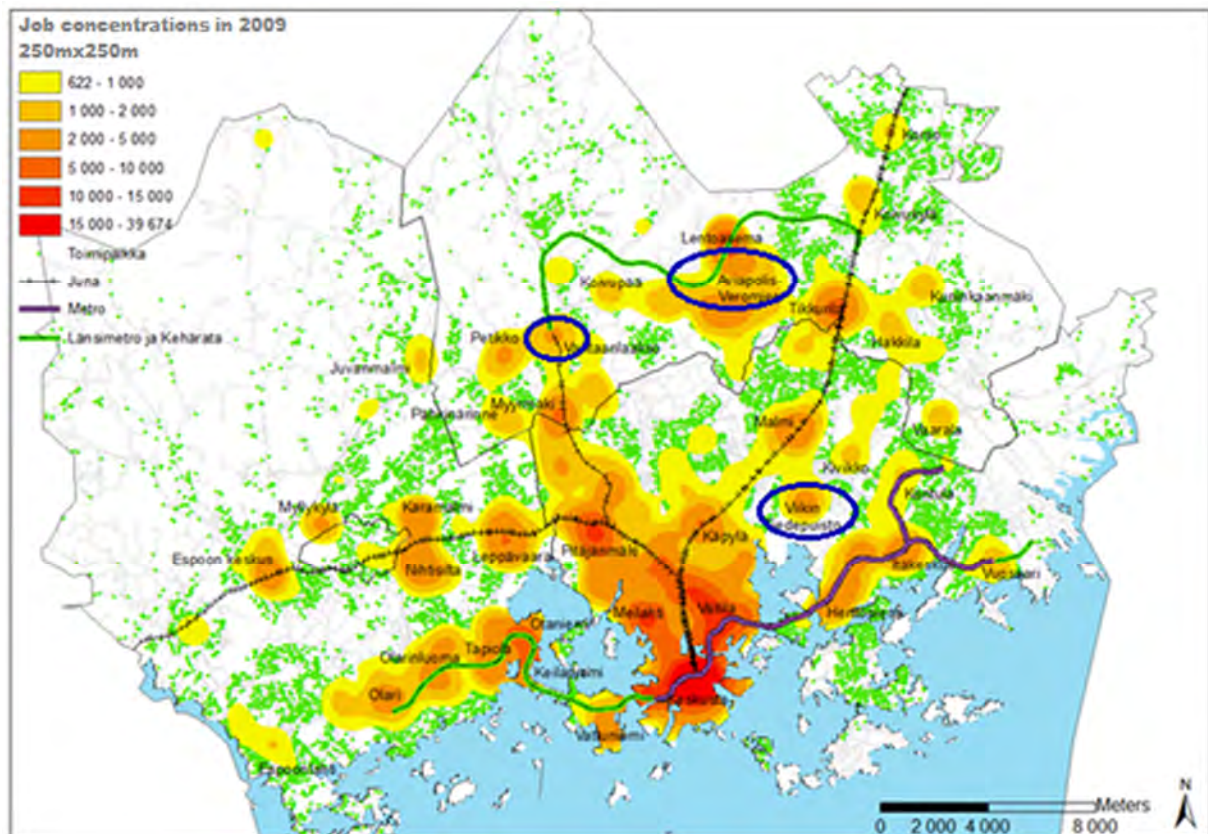


Figure1. Helsinki city-region work-place density and spatial analysis and interview areas 2009

2. Introduction

Firms are connected strongly within the Helsinki city-region where there is a large workforce and residential purchasing potential. Business tends to be concentrated in the city-centre, the circular ring-roads and within the demarcated office and industrial work zones throughout the city and its region. Many firms value the 'urban activities' associated with living and working within the metropolitan area. This can be achieved due to the agglomeration benefits that such activities and areas offer to firms. A spatially balanced and well-planned city offers a sufficiently well organised structure for firms.

Technological advancement and improved connectivity are key factors for a flexible workforce and accessibility to different parts of the city. The surrounding municipalities compete for resources and investment. Firms seek an 'anchor' for the area they wish to locate and offer urban activities and services to attract suitable workers. In particular, dynamic workplaces aim to attract young and well-educated graduates. This in turn provides the municipalities with a strong tax-base for developing their cities. These industries require good housing developments nearby. Cities also compete for people and workplaces in order to grow.

Globalisation guides dependability and mobility (Hautamäki 2007). What happens globally may ultimately affect cities at the local level. The western world is going through a major financial crisis that has a knock-on effect; city competitiveness is subject to the effects of restructuring worldwide. The vast majority of people in Helsinki, for example, are working in services (some 80% of the workforce).

The Capital city-region of Finland is growing strongly today, despite the universal economic downturn. By today's forecasts, Helsinki should grow from 610,000 in 2014 to 870,000 in 2050. This means that there will be an anticipated extra 260,000 people which in turn will require an expected increase in jobs of about 180,000 by 2050.

City growth brings increased productivity. Population growth and higher city densities do not by themselves, produce greater productivity, but what is needed depends upon the type of activity, and one of the most important factor of them is accessibility. The improvement in accessibility, such as the development of traffic connectivity, may influence a firm's location decision and develop business concentrations, which in turn may lead to the birth of clusters.

This report's purpose is to clarify whether or not concentrations of jobs in Helsinki are forming clusters or are they primarily business concentrations in which firms have selected location due to accessibility, good location or because of other agglomeration benefits.

One of the key solutions for the future development of workplace location could be a better understanding of existing concentrations of firms, or firms locating spatially close together. Research suggests that a concentration of firms may achieve additional productivity, synergy and network possibilities through agglomeration benefits.

Making a location choice, firms take into account for example an area's image, the availability of different networks, traffic mobility and accessibility. In addition, availability of information, such as knowledge, skills and know-how, is a daily part of today's work-life and is considered highly important. A firm's location dynamics and decision to locate may be linked to agglomeration benefits that follow-on from other similar type of businesses locating within the same area. Agglomeration benefits accrue when firms of a similar nature locate near one another and create together demand and supply that is larger than one or few firms can provide. In the business concentrations firms can have common sub-contractors, suppliers and customers. By concentrating firms can take advantage of the infrastructure built by public authorities or other firms such as traffic hubs, telecommunication networks, parking facilities or information services.

Business concentrations can provide agglomeration benefits where there is a possibility of cluster development. Clusters can be perceived as a developed model of a business concentration taking advantage of agglomeration benefits, where cluster can benefit an additional gain than traditional agglomeration benefits by specializing into more specific industry or segment. To achieve such benefits, there is required a sufficient number of core firms operating within the same sector together and other companies providing services to these firms with existence of a research and development activity (Virtanen E and

Hernesniemi H. 2005). Within a cluster different types of firms and actors interact together intensively and widely from which all the firms benefit from in a cluster. There is need to be a sufficient number of companies that support the core business activity of a cluster. For some clusters, it is sufficient for a few businesses to come together spatially and in near proximity to one another. For larger clusters it is essential to have larger number of firms. However, the forming of a cluster between firms does not require spatial proximity and firms belonging to a cluster can be located elsewhere in Finland or abroad, so long as there is close cooperation between the firms that generates the necessary benefits.

3. Context

The study originated from the need to assess if clusters are forming at all in Helsinki and specifically, within certain spatial areas. If this is the case, then this will enable the spatial planning process to take account of creating favourable environments for clusters to develop, thereby improving the economic benefits for the City as a whole.

The information network has created a new forum that has helped revolutionise opportunities for firms. Porter's (1991) work on cluster formations around new technology creates the picture of greater competition and synergies taking place through cluster formation. Various other research by Florida (2005) and Hautamäki (2007) tell the tale of similar style firms coming together in network clusters that act as an anchor to attract new firms into a cluster thereby creating agglomeration economies that can work off one another to gain specific benefits from clustering. However, a firm can benefit from agglomeration economies without belonging to a cluster.

The idea of a cluster is founded upon the premise that a geographic concentration of businesses organized into a network can bring benefits to the entire network. Those firms inside a cluster, that can be located near to each other or in other location, cooperate intensively in order to improve synergies and increase productivity. According to Porter (1990) a single firm's success or product does not necessarily create competitive advantage but comes from the synergies between firms and products. In addition, rival firms are attracted to the same spatial area, such as Silicon Valley, which reflects the positive impact of competition on productivity.

Furthermore, there is a possibility that clusters develop due to local natural conditions, demand conditions, and other benefits in the area. However, companies that belong to a cluster are not usually located in the same spatial area, in a concentration of firms. Therefore, clusters are not usually localized into a single specific spatial area in one city. Clusters are larger ensembles than local concentration of firms, since the companies and other entities belonging to a cluster are networked with each other and are not required to be in a face to face contact constantly. That is to say, companies do not need to be located next to each other in order to be networking or to be included in a cluster. In order to sustain any agglomeration benefits, there has to be 'openness' between businesses within the cluster.

4. Methodology

The research in Helsinki began by analyzing workplace concentrations, their spatial preferences and how large they were. The methodology is meant to describe the economy from a spatial point of view in a systematic way without any preconceived idea about clusters. Only large workplace concentrations of over 2000 jobs were analyzed, the idea being to examine whether these areas produced intensive networking and could be characterized as being a cluster, or not. On the other hand, large workplace concentrations did not necessarily suggest that a cluster was in operation. It does not rule out the possibility that the clusters could not be in smaller concentrations. Therefore, there is a possibility that the existing job concentrations are exploiting agglomeration benefits. Hence, the question posed referred to whether or not firms locating near one another produced a cluster or whether it merely created a concentration of firms.

The next step was to analyze the existence of a cluster in a job concentration by examining specialization of economic sectors in the concentration. According to Virtasen and Hernesniemen (2005) clusters have a geographic concentration in some specific economic sectors that can easily be done at little cost, be measured by a 'location quotient', which refers to how specialized the economic structure in a job concentrations is compared to the whole region. This enables the economic sectors that have a high LQ in the concentrations of jobs to be found and could be the core economic sectors of the possible cluster. In Helsinki Viikki came out with a high LQ in R&D in biotechnology.

After the LQ analysis, the next step was to carry out a GWR evaluation (Geographic Weighted Regression analysis), in order to find spatial relationships between possible core economic sectors (dependent variable) and its support and related economic sectors (explanatory variables). The purpose of the GWR is to provide a regression analysis to explore a spatial dependency or relationship between the economic sectors and whether or not this exists. Other spatial relationships were also analyzed such as accessibility (public transport, cars, cycling) and the number of jobs in the area. The idea behind the GWR analysis was to define if Viikki's job concentrations dependent variable, biotechnology research and development, had spatially dependent relationships existing between explanatory variables and whether the relationships were strong. Nonetheless, the results were inconclusive and therefore necessitated to undertake a round of interviews with the businesses in Viikki and in other job concentrations (as a comparison) to determine whether a cluster network existed, or not, as the case may be.

The key research techniques were spatial analysis and interviews. The interviews were conducted round three specific areas identified as possible clusters within the Helsinki city-region, namely, the Viikki Science Park next to Eco-Viikki, a new eco urban village for 16,000 people and 8,000 jobs some 8 kilometres to the north-east of the city centre; Vantaanlaakso, located on the northern border between Helsinki and Vantaa that has a direct rail link to the city-centre; and Aviapolis at the Helsinki City Airport complex.

A set list of questions were determined and used for the interviews based round a number of themes. The aim was to select firms from a wide variety of backgrounds within each workplace area. It included firms that may not have been directly viewed as forming part of

the possible core cluster as it was thought that their location choices and workplace links would be of interest to the analysis.

Interviewing these firms that might form part of a possible cluster may provide a suitable comparison. By comparing the results of the interviews this may reveal whether clusters exist within the Helsinki city-region.

A total of 18 firms agreed to be interviewed, which represents approximately 15 per cent of the total number contacted; the other 85 per cent were unwilling for their time to be taken up in this way.

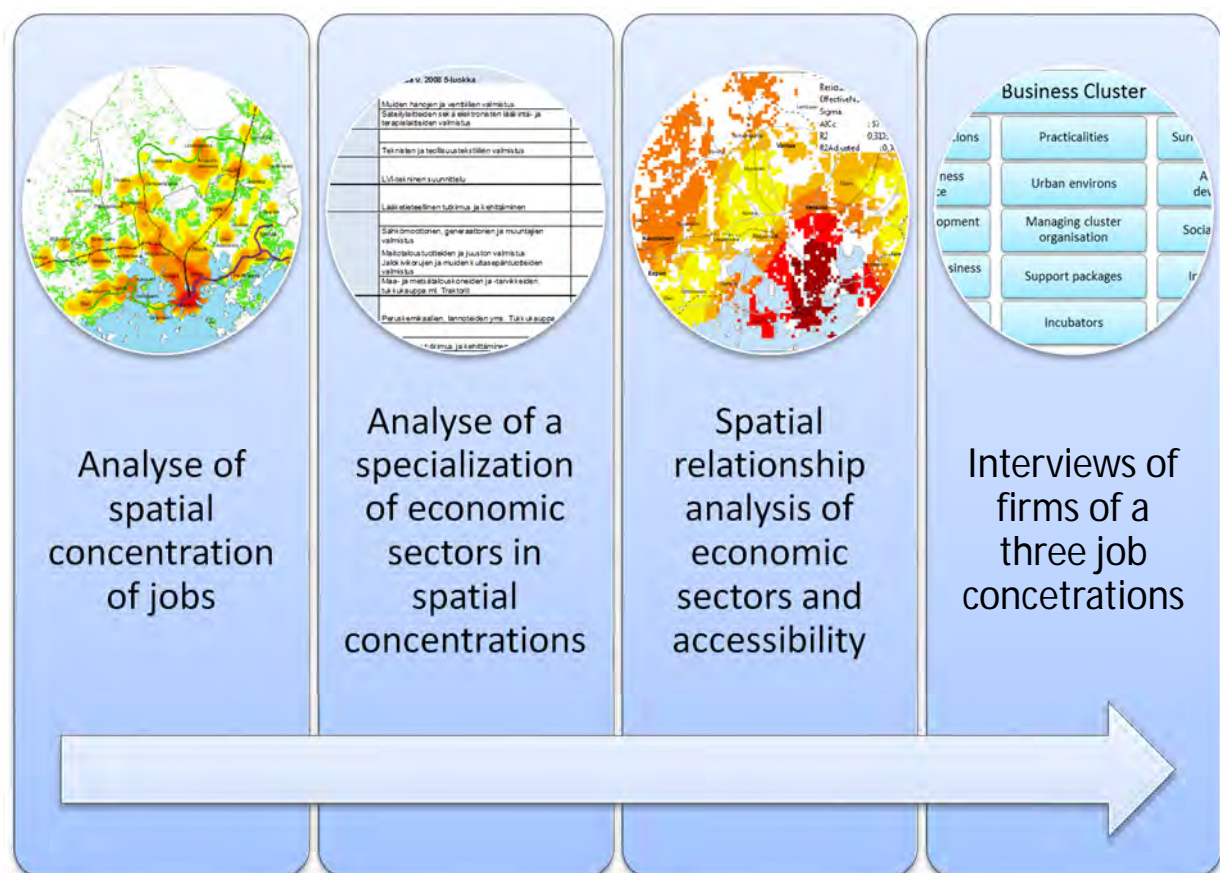


Figure 2. The methodology of cluster analysis

5. Outcomes

By job concentrations and its business structure analysis in terms of Location Quotient and spatial dependency analysis between firms by Geographically Weighted Regression analysis showed that within the Helsinki Capital region and in particular, the Viikki job concentration area, had insufficient evidence that would suggest that clusters existed. The follow-up set of interviews across three inter-dependent spatial areas supported the statistical conclusions.

Geographically Weighted Regression analysis demonstrated that accessibility and job concentrations are linked to one another. The results of the research showed that in terms of

where jobs are located, accessibility to the city centre by car or public transport were significant features, which were also supported in the results of the interviews.

The core elements of firms' location choices from the interviews are summarised in figure 3. It forms a picture of the key aspects that firms concentrate around when researching the area most desirable for them. It takes into account a whole host of factors that interact to form a set of values that enable the firm to make a decision on location.



figure3: firm's central key influence that determine location

Transport connections are considered by firms to be highly important. 'Practilities' refers to the availability of parking places, that products can be delivered easily and that there are clear logistical benefits from an area. Surrounding services examines whether restaurants and other services are close at hand as these offer opportunities for unscheduled contact during breaks with other firms and help build connections. Flexible floorspace enables firms to share common services as well as to improvise within their own space. Urban environs and closeness to the city centre act as a persuasive factor in attracting highly skilled workers who value city centre services. Anchors of development, such as a university or a city airport provide the innovation and potential for firms to concentrate around a key firm that leads the field. Management organisations improve a firm's opportunity to markets, as does Support Packages, which may bring added benefits of joint security, administration and cleaning. Agglomeration benefits go hand-in-hand with savings on marketing, easier contacts, and meeting with similar firms or sharing product logistics. Incubators are important for start-up companies, particularly those that need support during the early stages.

6. Conclusions on the results from the Interviews

All firms are to some extent, affected by global trends. The world financial crisis and market destabilisation influence business decisions. In Finland, the growth in specialist firms place inter-dependency between firms as even more important. Global information networks and easier connections world-wide have made firms more international in their outlook. This showed in every single firm that was interviewed

Within the Helsinki city-region there are five key issues that impact upon the future directions of concentration of firms, namely, spatial accessibility, international development, regional cost differences, city-regional land prices and land-use density levels that affect traffic flows and accessibility as well as access to development plots. These issues particularly affect the planning process, location dynamics and the structure of firms.

The Helsinki city-region is growing rapidly. Housing, development plots, and business premises are in demand. This in turn causes the price of offices and housing to rise. The implications are that many firms may have to move outside the city-region. In Helsinki's case, this refers to new development beyond the fringes of the Ring Road 3 on the outskirts where Helsinki and the City of Vantaa meet. The city-centre price levels are also rising in the same vein. A major trend is that offices situated inside the Helsinki Ring 3 are met by rising office rents and yet are unable to expand due to land development restrictions. Hence, office development is similar to housing in that firms can opt to go further out from the city in order to achieve cheaper facilities with growth potential. Conversely, the area outside the city-centre that exists between Ring 1 (closest to the city-centre) and Ring 3 firms (on the outskirts of the City) are able to achieve high quality transport connections and sufficient parking for their needs at a price they can afford. Firms do take into account the quality of environment and service availability as well as closeness to the city and are prepared to pay extra for the convenience. These firms are dependent upon the city centre and a central location. They can afford to pay higher rents and they will. Such firms benefit from the economies of agglomeration and so are able to meet the high rents or higher capital value of property, benefits that they will get back thanks to economies of scale.

By spatial analysis the research was able to conclude that there was no clustering within the Helsinki Capital Region. The study did not find any relationships between dependent and explanatory variables that would indicate networking or intensive work cooperation between the firms located in a concentrated way.

The conclusion to be reached from the interviews overall, show that the location dynamics of firms within the city-region are dependent upon most of all in terms of their ability to make a profit. This is due primarily to the benefits to be drawn from agglomeration economics and not necessarily from being part of a 'cluster'. This ensures that firms select their location from the most efficient advantage point in order to secure financial success. For example, the important aspects tend to be floorspace and logistical costs, both of which are location driven. In turn, firms are aware of how to optimise accessibility, although some firms are not location-dependent and carry out their work electronically.

In Finland, business networks are concentrated primarily in the Helsinki city-region. The interviews carried out within this network varied dependent upon a firm's domain. Start-up

firms emphasised location, whilst many small firms placed greater importance upon global markets via the internet, such as game companies or mobile 'app' firms.

The Universities and the City Airport areas provide their own 'identity' to attract businesses. Helsinki's City Airport environs together with University campuses are considered by many firms to be excellent anchors as they offer a support framework, particularly where there is a single large business entity. The Airport vicinity brings an international hi-tech atmosphere whilst the University areas create an air of academia and youthful entrepreneurship. The profiles of areas where firms are concentrating are important in terms of image, which in turn can affect investment potential.

The international perspective of businesses situated near the City Airport is growing, and in particular, the Aviapolis development. The Helsinki City Airport is the country's key logistics centre, some 16 kilometres from the city centre. This is recognised by the ever increasing rental values for the area. Helsinki's downtown is still overwhelmingly the most important and costliest in Finland. Nonetheless, the concentration of firms centred round the Airport has superior international transport connections compared to the centre.

Business culture prerequisites and the demands of University style campuses are in stark contrast to one another. The University campuses have many students whose main focus is travelling by public transport or cycling/walking. The interviews show that businesses from Viikki, want car travel and parking spaces. These contradictory scenarios have to be taken into account during the spatial planning process, particularly with regard to the City's policy on restricting car usage and promoting public transport as the main mode of getting around.

Helsinki University functions as Viikki Science Park's anchor, which in turn helps to attract research facilities and other related businesses. The entire area has developed directly because of public sector investment. The concentration of firms working within similar sectors has proved successful. It has enabled competition through comparison yet allowed the possibility of cooperation in certain ventures. A concentration of firms has brought advantages, but yet again, it can also reduce a firm's flexibility, particularly for small businesses that will have to fit into the overall support package that may be on offer from a 'cluster' management organisation, as businesses are unable to 'pick and choose' specific benefits but have to endorse a complete package.

A key element of the research showed that a firm seldom recognised that they belonged to a 'cluster'. The exception to this rule was Aviapolis. Here, most firms understood the benefits from being part of the bigger cluster picture. In Viikki, one of the key advantages driving firms was projects that offered cooperation between firms, since the University offered a series of incubator packages for small firms. When similar groupings of firms locate close to one another, it was clear that not only was there improved communications and cooperation between firms, but also greater agglomeration benefits accrued and cohesion tended to be deeper.

Firms tended to agree that for many of them, location meant in practice that it needed to have good transport infrastructure and good accessibility. Many firms spoke of the need for good car parking, clear connections to road transport and ease of access.

Furthermore, few firms understood the role of city planning or the public sector in helping firms in the private sector. Firms would like to see improvements in services within their areas to improve upon the liveability and comfort of the work areas and to have mixed metropolitan land-uses within the surrounding area. City Planning as well as the public sector need to make the private sector more aware of how much benefit they create through making conditions such as infrastructure, different forms of travel, services or public transport networks available in order that firms are successful locating in Helsinki.

Additionally, even though most firms conduct their work electronically, face-to-face contact is still regarded as important. Nonetheless, the research shows that there are no spatially located clusters in Helsinki and that most firms do not require face-to-face contact all the time.

Clusters do not form spatially merely by the fact that job concentrations exist but are more linked to the favorable environment basis of an area such as the existing specialized business structure, skilled labor force, etc. that attracts companies to the specific location. The Helsinki city-region suggest that it is particularly attractive for cluster concentration and agglomeration benefits, it just has not yet happened.

The companies have located to certain areas mainly because of good accessibility, transport connections, suitable rental costs, or services that have created agglomeration benefits to the area.

The distances within the Helsinki city-region are relatively small in comparison with Central Europe that there is no need to locate next to major companies for close cooperation. This means that firms benefit only from economies of agglomeration by concentrating into a specific spatial location.

7. Future planning principles to improve Location dynamics and development of workplaces

The following planning principles are derived from the overall work being undertaken for the new City development plan 2050 and the work on location dynamics of firms. These principles do not form part of the interviews and therefore do not represent the views expressed in the interviews. However, the points raised by the firms interviewed have been taken into account during the analysis stage and contrasted with the policies of the City. Some ideas from firms may therefore have been incorporated into the set of strategies so long as there were no major contradictions with present practice.

- (i) Promoting economic development
 - creating conditions for new development to take place
 - improve the existing areas where firms are concentrated in terms of their vitality
 - designate future development areas within the city planning process for job creation

- spatial planning as well as the public sector to provide the necessary support to realise cluster potential for firms
 - for each of the areas where firms are concentrated to have an 'anchor', or key partner, that acts as a magnet for other firms wishing to locate in the same vicinity.
 - by enabling the opportunity for improving international business, competition within the Greater Helsinki region can help promote cooperation between businesses, which in turn will improve and highlight the Capital city-region's and Finland's attractiveness
 - 'Office hotels' and incubators are important for businesses. They provide essential support services such as cleaning, security and computer technology
 - business cohesion will help to advance networking and offer more possibilities for wider cooperation in work projects.
- (ii) Recognising new development arcs for firms
- global economic advances, mobility and technology all create changes that make for new dynamics within cluster development
 - Helsinki is a growth centre that enables land and property values to increase. This in turn helps promote more jobs and workplace development. Municipalities compete with one another to attract new investment and workforce within the Greater Helsinki region.
 - global economics places stress on transferring work intensive jobs to the areas with the cheapest workforce. This places the need for existing firms to behave more dynamically
 - housing and people are moving further out from the city searching for cheaper accommodation. This is also the case with businesses, despite the city-centre still having a strong attraction. Hence, the need to urbanise the city-region even more intensively in order to achieve greater agglomeration benefits and thereby attracting both people and workplaces to be within the city-region
 - both Finland and the Greater Helsinki region need to invest in the future by developing new cluster workplace areas
 - high quality education will create a wider level of knowledge and know-how which will improve business flexibility
- (iii) Spatial Planning and Traffic and Transport infrastructure
- the public sector and the spatial planning process needs to be even more proactive in providing the necessary support infrastructure to aid businesses
 - the spatial planning process needs to be aware of future needs of housing and workplaces in order that sufficient floorspace is built to influence both property rents and prices as well as competitiveness
 - a compact, network city will serve firms and help achieve their growth potential when it is easier to get around the city by high quality public rail transport. Both mobility and accessibility are important elements that a city needs to develop
 - public transport, particularly rail, has to maintain its development potential in order that work trips and mobility reduce energy consumption.

- the worst congestion in a city tends to take place around work trips, i.e. rush hour. Hence, it is imperative that work places are located close to public rail transport hubs to maximise the potential for the work force to use such transport, thereby aiming to reduce CO₂ and other harmful oxides in the plight of mitigating against climate change.
- many firms recognise the importance of road connections for business. Clusters, therefore, should tend to be located close not only to public transport hubs, but also near the major motorways and circular ring roads, and especially close to the major business hub of the Helsinki City Airport
- Helsinki's inner public transport network is efficient and of a high quality. However, the city-region as a whole needs considerable new projects to upgrade the outer region to be similar to the compact city network. Too many of the outer areas in the region use cars to get around. If the aim is to reduce car usage in order to decrease congestion and harmful gases, then there is a need to offer better and improved public rail transport to encourage businesses to decrease their dependence upon the car. In that respect, the aim to build new high-speed trams transversally from east to west will provide a better option for all.
- Improved pedestrian and cycle routes within the city are a required preference
- the key roads for business users need to be well maintained
- spatial planning through the forthcoming City Plan 2050 needs to take account of parking needs for business in general.

(iv) Public Sector support

- Helsinki City administration needs to be aware of the needs of small businesses
- support for the private sector is an integral part and new ways are essential if both are to benefit in the long run, such as helping start-up projects with greater financial rewards

(v) Private Sector development

- the new areas of cluster development require to be set within an urban framework, dense and well networked and integrated into the general structure of the city
- the cluster development areas need to be sufficiently large and dense (critical mass) to maximise potential for these new areas to attract restaurants and other local services
- sufficient growth potential within clusters should enable firms to grow and prevent them from leaving the area
- business clusters need to stimulate areas that are within urban quarters to integrate evening and weekend use of space through a policy of mixed uses (see figure 4)
- business profile and cluster image form part of the overall aim to develop an integrated environment



Figure4. Grote's terrace, Helsinki city-centre. Example of offices with a joint internal courtyard. (Helsingin Sanomat).

(vi) A new work culture

- need to develop flexible work cultures, such as occasional home working, flexible hours, office-platforms and such within residential areas
- developing electric cars and flexible public transport modes are essential to the future design of clusters and the City in general
- a more 'open' work culture will help promote greater trust between firms

(vii) The Property market dimension

- design of buildings need to be representative, flexible, airy and light, and practical
- support services for clusters within buildings are an important future element
- new innovative ways in design can help in the enjoyment of the work place and having open space and atriums may be part of the solution
- future clusters without car parking, environmentally friendly and close to transport hubs are the way forward

Susa Tulikoura, Douglas Gordon and Iiro Grönberg

¹ In this case cluster means also concentration of firms or jobs in a certain spatial location even without having characters of a cluster.

Specialization and cluster strategy in the Lombardy Region



Credit: Adriana May

Armando De Crinito, Cristina Pellegrino, Direzione Generale Attività Produttive, Ricerca e Innovazione- Regione Lombardia

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1.THE CHALLENGE

Lombardy's production system is currently one of the most developed in Italy and in Europe: at the end of 2013, there were approximately **815.000 active businesses** (approximately 8.3 businesses/ 100 inhabitants)¹⁴. **Micro and small businesses** are the basis of the production fabric of the region, representing over 99% of Lombard enterprises. The Lombardy productive system has always been **manufacture-oriented**; however, the share of **high-tech industries** is still relatively **low** compared to the leading European regions. Small firms, in many cases operating in mature industries and often characterized by obsolete organizational structure and collaboration mechanisms, need to evolve in a highly competitive global context, demonstrating their ability to innovate and internationalize. Policy improvements should stimulate this change; one of the essential parts of this process is promotion of **networking**. The need of collaboration on the bases of networks has been strongly expressed by the companies themselves, feeling that their small dimension hampers their growth and considering various collaboration frameworks (networks, clusters etc) a winning tactic towards creation of a critical mass and thus development. This **bottom-up approach** is being followed by **top-down actions** of regional authorities, aware of the needs of the companies and thus designing dedicated strategies and policies related to networking, clusters, open innovation - all based on the concept of collaboration and development.

In terms of research institutions, Lombardy has a first class R&D Infrastructure (13 Universities, 12 national Research Council Institutes, etc.) and the Region is recognized as an outstanding center of creative and cultural industries in Europe (third place among European regions), with a strong component of knowledge-intensive services.

Against this background, while defining its smart specialization strategy, Regione Lombardia has identified **7 Specialization Areas (SAs)**¹⁵. They include and well represent a consistent part of the economic and scientific actors situated in the territory, and contribute to increase their leadership in the respective theme. The Specialization Areas identified so far are as follows: Aerospace, Agri-food, Eco-industries, Creative and cultural industries Health industries, Advanced manufacturing, Sustainable mobility. To support and accelerate the process of establishment of emerging industries, the primary tool identified is the support to **Clusters**: an "open environment" where businesses, knowledge institutions and business support organizations can explore radically new cross-sectorial business solutions. Clusters are a continuation of the regional policies of the past 20 years which have gradually brought the creation of entrepreneurial networks and industrial districts.

A system of dynamic, diversified and broad production and scientific skills, crossing the various SAs, has strong potential for convergence and cross-fertilization, which must be decoded and exploited to accelerate the evolutionary process and establishment on the market of **emerging industries** and transformation of the mature industry.

The **challenge** that Regione Lombardia faces is therefore to help the production system evolve and step up in class through an approach based on new forms of collaboration, cross-fertilization and transversal valorization of Key Enabling Technologies. This is further aimed at **seizure and interception of new market opportunities** within the SAs through the

¹⁴ Focus congiunturali: Demografia delle imprese lombarde, 2013, Unioncamere Lombardia 2014, http://www.unioncamerelombardia.it/images/file/OE%20FocusCongiunturali2013/DEMO_TOT_anno_2013.pdf

¹⁵ Research and Innovation Strategies for Smart Specialisation in Regione Lombardia, DGR n. x/1051, 5 December 2013 <http://s3platform.jrc.ec.europa.eu/regions/itc4/tags/itc4>

evolution of their traditional industries into emerging industries, by addressing the needs of the new markets (strengthening the market-driven approach) and helping improve the quality of life of its community (society-driven approach). The final aim is to set up a new value chain able to support this change of industrial paradigm.

Regione Lombardia is determined to face this challenge with suitable measures by drawing up and implementing appropriate policies and services. All necessary ingredients to support this evolution are in place (a vast lively industrial sector and a top-class research environment, together with the Creative and Cultural Industries (CCI) sector for its role in the Europe 2020 Strategy and its strict connections with the regional development¹⁶): they must be linked into a coherent framework through a clear and stable support to turn this potential into a real opportunity for growth.

2.THE REGIONAL STRATEGY

In this view, Regione Lombardia is shifting its policies from a traditional approach, namely providing extensive financial support, to priority strategic choices, focusing on areas with high convergence and contamination potential that should be captured and exploited to accelerate the evolution and affirmation of emerging industries and existing industries transformation.

Some preliminary important steps have been already taken to achieve the overall goal of transformation of the regional economic system with the ultimate aim of capturing new markets and opportunities. These have been broadly described in the following strategic documents:

- *Regional Smart Specialization Strategy for Research and Innovation*, describing an **integrated path** of the territory **development**, identifying resources, skills and innovation potential and setting priorities in terms of industries and technology areas where investments should be focused. The document identifies the need to concentrate support and efforts on 7 Specialization Areas, as introduced in the previous section.
- *Industrial Policy Strategic Document of Regione Lombardia 2013-2018*, identifying and defining the priority actions for the support of competitiveness of the industry and research eco-systems. The document presents three macro-areas of intervention: exploitation of **research and innovation support**, especially in emerging industries and in particular for the CCIs sector, the access to pre-seed funds to support businesses and the matching of creative industries with traditional cultural sectors, in order to promote innovation; **entrepreneurship** - support of the critical phases of company life-cycle and promotion of networks, and **internationalization**, both incoming (attraction of foreign investments, also in view to EXPO 2015) and outgoing (support to Lombard enterprises going abroad).

¹⁶ The Priority Sector Report: Creative and Cultural Industries by European Cluster Observatory empirically emphasizes the direct link between the creative industry localization and territorial development. The open question regards the choice of the collaboration forms most suitable to favor the integration of the Creative and Cultural Industries in the regional strategic development.

- *The new Regional Operational Program 2014-2020* will be based on eight strategic macro-objectives (research and innovation, competitiveness, efficient use of resources and low carbon economy, information and communication technologies, labor market, education, social inclusion and urban development), which can be achieved only by adopting an integrated and transversal approach, exploiting best the synergies with European programs such as Horizon 2020 and COSME and complementarity between financial measures (e.g. EAFRD) and featuring large projects, with a special view to Public–Private Partnerships.

From an operative point of view, a **‘Cluster Action’** has been adopted by Regione Lombardia: the first step towards a new concept of territorial promotion, exploiting the aggregation concept and the triple/ quadruple helix. The Action creates a path towards official recognition of existing clusters by regional authorities; furthermore, it seeks to turn clusters into effective tools of **‘intermediate’ governance** between the industrial and research eco-system on the one side and the regional administration on the other, in order to have trustworthy actors to engage systematically in the planning of regional strategies. In line with the regional priorities, a total of 9 Regional Technology Clusters have been created so far: Agri-food; Aerospace; Green Chemistry; Energy and Clean technologies (thus clearly indicating emerging trends regarding energy efficiency and sustainable production); Intelligent Factory; Mobility; Life Sciences; Smart Communities Technology; Living Environment Technology. According to the principle of full inclusion, Regione Lombardia gives the territory the opportunity of aggregating enterprises, research centers and other economic entities in new clusters in strategic fields such as, for example, Creative and Cultural Industries.

Therefore, in order to strengthen the action outlined, it is now of utmost importance to implement the abovementioned program documents by adopting strategies and tools based on:

- Qualitative and quantitative data regarding cluster composition, exploitable competences, driving factors, opportunities and needs as well as development trends, concerning each single cluster,
- Creation of contexts favorable for the transformation of mature industries into emerging industries,
- Support to international dimension of the economic environment, through the creation of eco-systems able to take from international experiences and collaborate at a global level.

3. PAST AND FUTURE STRATEGY

Over the past decade, Regione Lombardia has spurred Research and Innovation, strongly promoting the scientific and technology-based processes, in many cases pushing the boundaries in terms of purposes and tools, and often setting the pace at a national and EC level.

The framework of these policies is outlined in the **Strategic Document on Research and Innovation**¹⁷, the definition of which has contributed to developing a single, shared strategic vision of a field that is, by its very nature, complex and transversal.

The Document delves into the characteristics, the degrees of development, the economic context, the history and regional policies of recent years, and then melds these elements with the emerging trends to merge present reality and its growth processes with the opportunities opening up on different levels - including EU and international - of government.

The “**district-based**” **industrial policy**, instigated and sustained over the years by Regione Lombardia, is one of the pillars of this strategy, which considers support to the businesses and sectors of excellence, especially the industrial and manufacturing-based, as being cornerstones of growth and productivity not only for the business system, but also for the institutions.

The Document provides a brief, though informative account of the main stages of this process, which starts from the recognition of 16 “geographically localized” Industrial Districts with specialized production, gradually departs from a territorial approach to highlight areas of excellence in production capable of representing poles of development with high technology potential, and today sees Regional Technology Clusters as the leading players.

Under DGR n. VII/3839 of 16/03/2001¹⁸, in order to harmonize the former legislation to the changes imposed by the models of economic development, Regione Lombardia identified the **industrial districts with high levels of specialization in production**¹⁹ by not considering them simply as local aggregations, but as functional entities for the promotion of innovative programs of development.

Following up on this line of action, under the ensuing DGR n. VII/6356 of 5/10/2001²⁰, identified, on an experimental basis, the **Meta-Districts**²¹, referring to them as production areas of excellence, with strong existing and potential bonds with the sphere of research and production of innovation, capable of representing poles of development with high technology potential.

The experience subsequently developed by Regione Lombardia in the Meta-District field validated the effectiveness of the evolutionary model adopted, and was extended to new production systems undergoing significant change in industrial processes. This extension was acknowledged at the regulatory level by LR 1/2007 and implemented through a specific experimentation program named DRIADE (Regional Districts for Innovation, Attraction and Local Economic Dynamism)²².

Parallel to this, also pursuant to the provisions of the ERDF 2007-2013 Operational Program, and with regard to the need for strengthening business networks, the Meta-districts were redefined as Priority Theme Areas (PTA)²³, reinforcing the transversal supply chain logic versus a local and industry logic.

¹⁷ See Annex to DGR IX/4748 of 23/01/2013, *Acknowledgement of the communication from President Formigoni on: “Progress in the implementation of regional policies at the close of the ninth legislature - Presentation of the Strategic Document for Research and Innovation”*

¹⁸ See DGR n. VII/3839 of 16/03/2001, *Identification of the industrial districts with high levels of specialization in production and approval of guidelines for the definition of criteria in the identification of theme clusters/meta districts, implementing LR n. 1 of 5 January 2000*

¹⁹ In the industries of textile-apparel clothing (7), metal production and processing (3), footwear (2), furnishing-accessories (1) woodworking (1) electrical - electronic equipment (1), rubber and plastics (1).

²⁰ See DGR n. VII/6356 of 5/10/2001, *Identification of the industrial meta-districts/theme districts, implementing regional law n. 1 of 5 January 2000*

²¹ Food and non-food biotechnology, New materials, Fashion, Design

²² www.industria.regione.lombardia.it/shared/ccurl/339/82/Pubblicazione_driade.pdf

²³ 6 priority theme areas: Food and non-food biotechnology, New materials, ICT, Fashion, Design

On the domestic front, over the years²⁴, on the occasion of specific programs of industrial research, pre-competitive development, higher education and exploitation of research results, the Ministry of Education, University and Research (MIUR) gradually recognized the High Technology Districts situated in Regione Lombardia, launching, within the technology areas of strategic interest²⁵, specific joint initiatives to consolidate the levels of excellence achieved by the Lombard economy.

Finally, in early 2012, Regione Lombardia launched a major governance action to identify the implementing bodies of the technology districts situated (and recognized) in the Region²⁶. More than 3,000 were identified and divided into 147 aggregations. This initiative was subsequently enhanced also in light of the developments taking place on a national²⁷ and EU²⁸ policy level, and channeled towards the definition of Regional Technology Clusters²⁹, today a crucial element in revitalizing the programming decisions of the coming years but also, and parallel to that, a valuable benchmark of their effectiveness.

What follows is a synopsis of the regional policy process: implementation of the previously recognized High Technology Districts on Biotechnology, ICT and New Materials.

²⁴ Program Agreement signed on 22 March 2004 between MIUR and Regione Lombardia for the creation of the High Technology District on Biotechnology; Program Agreement signed on 19 July 2004 between MIUR and Regione Lombardia for the creation of the High Technology Districts on ICT and Advanced Materials; Program Agreement signed on 20 December 2010 between MIUR and Regione Lombardia for the creation of the High Technology Districts on Agri-food, Aerospace, Sustainable Building, Automotive, Energy, and Renewable Sources

²⁵ See DGR n. IX/1817 of 8/6/2011, Measures for the implementation of the Program Agreement between MIUR and Regione Lombardia. Updating of the strategic sectors for the research and innovation policies, harmonization of the guidelines for the implementation of Axis 1 of the ERDF 2007-2013 "Competitiveness" OP, and approval of the requirements of the joint measure.

²⁶ See DGR IX/2893 of 29/12/2011, Approval of the call for the submission of candidatures by the aggregations of research bodies in partnership with businesses - in implementation of art.3, paragraph 1, letter b, and art. 4 of LR n. 1 of 2 February 2007 - for participation in the initiatives of Regione Lombardia and MIUR for the promotion, strengthening and/or creation of High Technology Districts by means of industrial research projects, experimental development and training (in concert with Vice President Gibelli).

²⁷ MIUR, Directorial Decree 257/Ric of 30 May 2012, Notice for the development and strengthening of National Technology Clusters.

²⁸ COM (2008) 652, Communication of the Commission to the Council, the European Parliament, the European Economic and Social Committee, and the Committee of the Regions towards world-class clusters in the European Union: implementing the broad-based innovation strategy.

²⁹ In the theme areas of agri-food, aerospace, green chemistry, energy, smart factory, technology for smart communities, land and sea mobility, life science, and technology for living environments.

Chart 2.1 - Evolution of the industrial and research and innovation policies of Regione Lombardia (GI, MPMI and Research Bodies)

	Traditional sectors (districts)	Thematic districts	Network of Enterprises and RI (DRIADE production systems)	High Technology Districts (DAT)	Regional Technology Clusters (CTR)
Period	Before 2003	From 2003	2009	2011	2012
Actors	SMEs	SMEs, OdR Organismi di Ricerca [Research Institutes]	MPMGI, OdR Micro, Piccole, Medie e Grandi imprese [Micro, Small, Medium and Large Enterprises]	MPMGI, OdR	MPMGI, OdR
Paradigm	Focus on well-defined geographical areas characterized by traditional industrial sectors (industrial districts with specialisation in production and agricultural and rural districts)	Focus on technologies and know how (ICT, biotech, advanced materials, fashion, design). Integration of value chain to encourage excellence in the manufacturing sector	Focus on emerging sectors, technologies, know-how and fields of application (e.g. nautical sector, aerospace, cosmetics, energy ...)	Focus on 10 strategic technological fields (agriculture, aerospace, mechanics, fashion, advanced materials, energy, building, ICT, Biotech, Automotive)	Focus on 9 priority themes (agrifood, aerospace, life science, living environments, smart communities, mobility, green chemistry, energy building environment, smart factory)
Boundaries	Well-defined geographic boundaries	No geographic boundary	No geographic boundary	No geographic boundary	No geographic boundary
Genesis	Bottom up and recognized by the PA	Top down	Bottom up and recognized by the PA	Top down for strategic fields and Bottom up for the formation of districts	Top down from analysis of the scientific and technological foundations of the country and of national and European Community orientations and Bottom up for the formation of regional clusters
Governance	Structured Governance	Non-structured Governance	Structured Governance	Structured Governance	Structured Governance

Source : "Research and innovation strategies for smart specialisation in regione Lombardia", Dicembre 2013

4. INTERNATIONAL INITIATIVES

Regione Lombardia has arrived at a point where the change is inevitable and therefore it is of highest importance to put into action all competences and resources, of financial and non-financial nature, to support this transformation. Smart Specialization Strategy and Regional Operational Program have been created with an ultimate goal to finance the change; however, they need to be further detailed and proper implementation measures need to be taken. The regional participation in the Enterprise Europe Network through Finlombarda (in-house Agency for development of Regione Lombardia) gives the possibility to exploit and create synergies with EU support programs. Finlombarda is also committed in supporting cluster development, through services dedicated to their local and international growth: to better address this task, Finlombarda successfully participated in the CIP call "Towards World Class Clusters - Promoting Cluster Excellence" in order to strengthen cluster management excellence of Regione Lombardia, by further using the results and tools developed by the European Cluster Excellence Initiative (ECEI) – the project just started in January 2014.

At the same time, the clusters are initiating their path towards their official recognition by regional authorities: the commitment is now to help them grow and develop, basing on strategic plans and high-value added services. The 'Cluster Action', dedicating funds to development, exploitation, internationalization, promotion and sustainability is only a first, important input towards cluster development, which should be further strengthened and combined with other tools and measures.

To achieve this, Regione Lombardia works in close partnership with all relevant stakeholders: regional industries, clusters, SME intermediaries, service providers, research and knowledge institutes and others, in order to identify and select fields on which to focus its support actions. A collaboration mechanism has been put in place, based on the principle of participation and scientific-technological solidarity among the actors in a Region with extremely diversified orientations and paths of specialization.

In parallel, Regione Lombardia has adopted an integrated and transversal approach boosting synergies with other European, national and regional programs (to name but a few: transborder cooperation between Italy and Switzerland, European programs: Horizon 2020 and COSME, participation in European cluster networks such as Feeding the Planet - European Bio Food Clusters on the World Stage project) and assuring that funds from different sources add up to cover different parts of action and guarantee a high added value in achievement of its objectives.

One of the coming initiatives of regional authorities at a European level refers to emerging industries being one of the key topics highlighted by the European Commission as a key driver for the European industrial renaissance. Regione Lombardia aims at hosting the European conference on emerging industries under the Italian Presidency of EU Council of Ministers (second semester of 2014) to identify and analyze the good practices and policy approaches related to clusters, cross-fertilization and competitive growth. The organization of the European Emerging Industries Conference - with the presence of about 450 participants having a leading role in the industrial, research/academic, financial and social fields - will help focus on this topic and reinforce the connections among the members of a high level community to stimulate the growth of Emerging Industries in Europe. The Conference will be an important occasion to invite representatives of the European Cluster Observatory and other five winning model demonstrator regions in order to present the initiative and the advisory support services granted.

Another initiative joined by Regione Lombardia at a European level is the Vanguard Initiative 'New Growth through Smart Specialization', gathering EU regions committed to playing an active role in multi-level governance for the renaissance of industry. The ambition of the Vanguard Initiative for New Growth through Smart Specialization is to accelerate further the mainstreaming of smart specialization in the European industrial and innovation policies and demonstrate that regions can be a leading factor in the mobilization of all policy levels and all stakeholders for new growth. Also in this context, an input from the European Cluster Observatory in terms of policy design, development and implementation will be of high value in the proceedings of the Initiative.

To sum up, the advisory services offered by the European Cluster Observatory in the framework of the present Call for the Expression of Interest will be considered fundamental for the growth and development of the cluster policy in Lombardy. On the one hand, the timing proposed fits perfectly as it corresponds with the start of the new programming period; on the other, development of Lombardy clusters is entering in a crucial phase of recognition, selection of best working methods as well as internal and external configuration, which makes them particularly receptive towards recommendations and suggestions.

Cluster analysis of the Community of Madrid



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Introduction

The Madrid Metropolitan Region has undergone profound changes over the last forty years. Suburban growth, the development of transport infrastructure, the strong growth of economic activity spaces outside the central city, the development of public and private universities outside Madrid, capital, etc., has resulted in a strong increase urbanized area of the region. This process has been accompanied by a significant growth in population and employment that have profoundly transformed the landscape of the region and have revealed new needs and new challenges to deal with the current situation. These changes have been the result of economic growth, as well as changes in the localization process of the enterprises, especially some branches.

Following the economic and social impact caused by the phenomenon of globalization, in the late 90s was widespread idea that business location was a minor factor as companies could obtain goods, information and technology anywhere easily the world. When markets are global, that which can be obtained by all companies in the world on equal terms cannot be a source of competitive advantage.

However, countries, regions, geographical areas or even metropolitan areas continue to show strong trends towards geographical specialization. Thus, Porter concludes that "the global economic map is dominated by what I call clusters", many of them exist, indicating that the location continues to exert a decisive influence on the competitiveness of enterprises.

In this context we have analyzed what are the conditions which exist in the Community of Madrid for the development and consolidation of cluster in four industrial branches (Aerospace, Telecommunications, Media and Publicity), that have a significant presence in the region and constitute high value-added activities and future growth capacity.

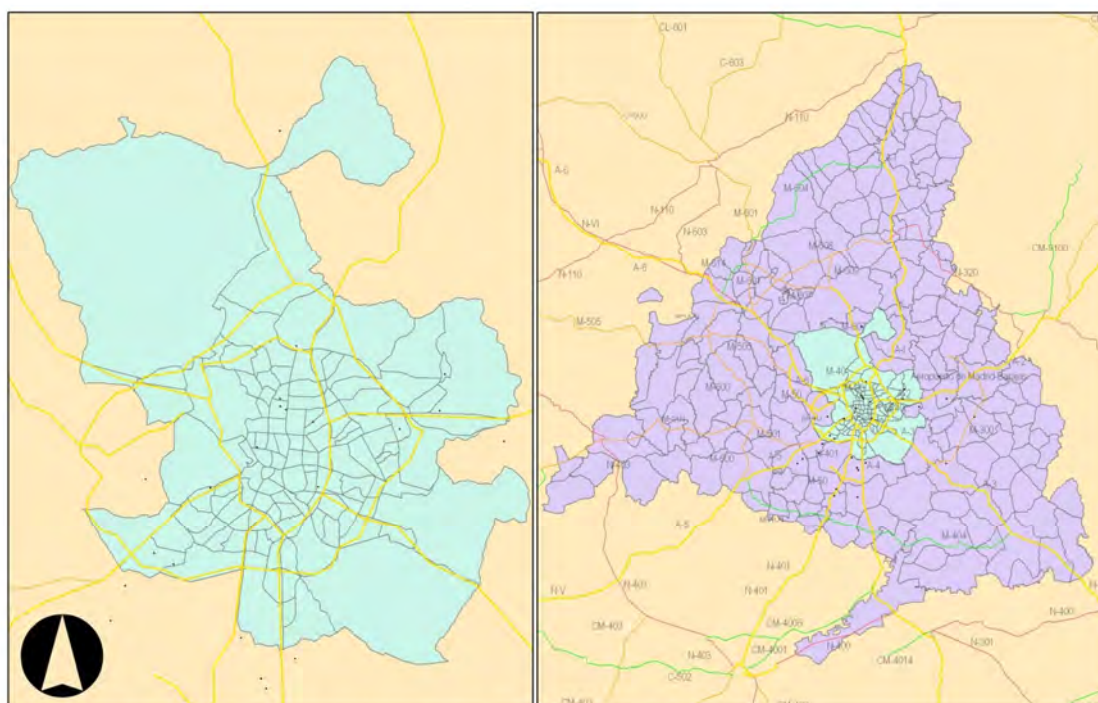
Aerospace

Aerospace is an activity with a high technological component is the Community of Madrid the largest industry concentration at the national level. Generates direct employment for 19,630 people in 2007 and sales of 3,472 million euros (1.92% of regional GDP).

The Aerospace Industry in Madrid

	Value	% Region
Direct jobs	19,630	0.74%
Turnover	3,472 million €	1.92%

Companies tend to find a location close to others of the same sector, especially competitors, suppliers and customers. This proximity is also registered with the companies that provide equipment and machinery, assemblies or subassemblies, or services. The proportion of companies that are located in the same area, the same municipality or other area of these types is significant, although reduced, because the proximity basically occurs at the regional level, due to the characteristics of Community metropolitan Madrid.



Establecimientos CNAE 353 (Aeroespaciales). Fuente: D.U.A.E. 2005

Just over a third of companies has relationships with other non-commercial sector, creating linkages between companies. The size does not seem to be determinant in the existence of

such relationships, which occur especially with customers and suppliers. The importance of these linkages decreases significantly when considering the whole sample, so that only a quarter of companies have this type of relationship. Relations with training centers, maintenance services, vendors and, above all, with research centers are not relevant.

These relationships are positive, especially with distributors, customers and advisory services, while the lowest is the relationship with competitors. The quality is often the main determinant of this relationship, followed by the price. In some cases prevail other criteria such as personal relationships in the case of competitors or technology with technology centers. The proximity does not seem to be a determining factor in general, although reaching some importance with sellers and customers.

The benefits obtained by the company of these relationships vary according to the type of entity to which they relate. Decreasing costs and increasing sales are the main benefits of the relationship with suppliers, distributors and maintenance services. The relationship with sellers is useful for improving the distribution process and quality, while with customers to increase sales and to improve the image of the company. The relationship with competitors allows an increase in sales as a result of entering new markets, while with the research centers also produced an increase in sales, due to technological improvement. With training centers it serves to improve the quality and production processes, while the advisory services allow improving the quality and image of the company.

The exchange of goods, information and people with other companies in the sector is low, not related to their the size. Personal relationships seem to have a significant importance, but also the market, with the exception of the personnel interchange.

The domestic market is the main for the companies, followed by the local market. This varies with the size of the establishments, the local and regional markets are key to smaller companies, while increasing the size of the establishment steps up the importance of the national and international market.

Two out of five companies cooperate with other companies, with two quite different profiles; for establishments with 20 or more employees is majority the cooperation with other companies, but under 20 jobs dominates non-cooperation.

The main content of cooperation is subcontracting while, at long distance, lie the joint product development, joint submission to contests and the generation and / or improving of technology. The generation and / or improvement of machinery, mutual aid, cooperation for sales, research and / or shipping customers and other cooperation systems (promoting of products / services quality improvement, etc..) rarely have a presence.

The main way that implements the cooperation is collaboration in the design and development of certain parts of the product, followed at a distance by selling custom parts and providing ideas for improving machinery.

In general, the assessment of different forms of cooperation is relatively high, highlighting the cooperation for the generation and / or improvement of machinery and at the last position subcontracting.

Companies do not usually belong to business networks and when they do it by integrating into an industry sectorial association, hardly companies belong to an association of research or an informal network of cooperation.

There is no positive perception about the interest of an industry sectorial association for the development of synergies between companies, while slightly less than half of companies believe that there are other entities that support the process of improving companies. They believe mainly in business associations, followed at some distance by the Chamber of Commerce and by institutions such as the Community of Madrid.

Relations with other economic agents such as universities, R & D centers and foundations, are scarce. Relationships with foundations are the best rated, slightly above universities. The relationship with universities and foundations is aimed primarily at training aspect and the recruitment of staff, while improving technology is the purpose with the Centers for R & D.

The companies believe that the space in which they are located is relatively appropriate, while the biggest are the most satisfied. Just over a third of all considers that there is no lack in their current location. The main shortcomings are an appropriate infrastructure and better accessibility, taking less important the basic services, value added services and others like lighting, refuse collection, street existence difficult to identify, the night watch, etc..

A high percentage of companies (35.1%) have not answered about the usefulness of regional infrastructure to develop a cluster. The remaining two-thirds of companies have a positive opinion, being the micro-companies those with more negative perceptions. Something similar happens to assess the usefulness of regional infrastructure. The positive ratings are based on the existence of good communication and a good transport system, good services, the grouping in sectorial estates, good infrastructures, etc.. On the other hand, negative opinions refer to the absence of grants for business, the problems of communication and transport, etc..

The enterprises demand, especially, backing structures, better communications and more efficient telecommunications. The specialized production spaces, public transport, grants and support to companies and freelancers and other demands (training, etc..) are less important, while a quarter does not demand any infrastructure.

Only a quarter of the companies believe that there are institutions that support companies. This percentage demonstrates that companies perceive a lack of support to the aerospace. No institution stands above the rest, sharing the first position the Madrid Chamber of Commerce and various Ministries. The main support given by these entities is education, followed by financial, technological and commercial and, ultimately, urban planning.

The main gaps in support for companies in the sector include the streamlining of procedures, the investment support and the support to small and / or new entrepreneurs. Next come the deficiencies related to training, technological development and fiscal policies, while the last corresponds to the deficiencies in productive infrastructure.

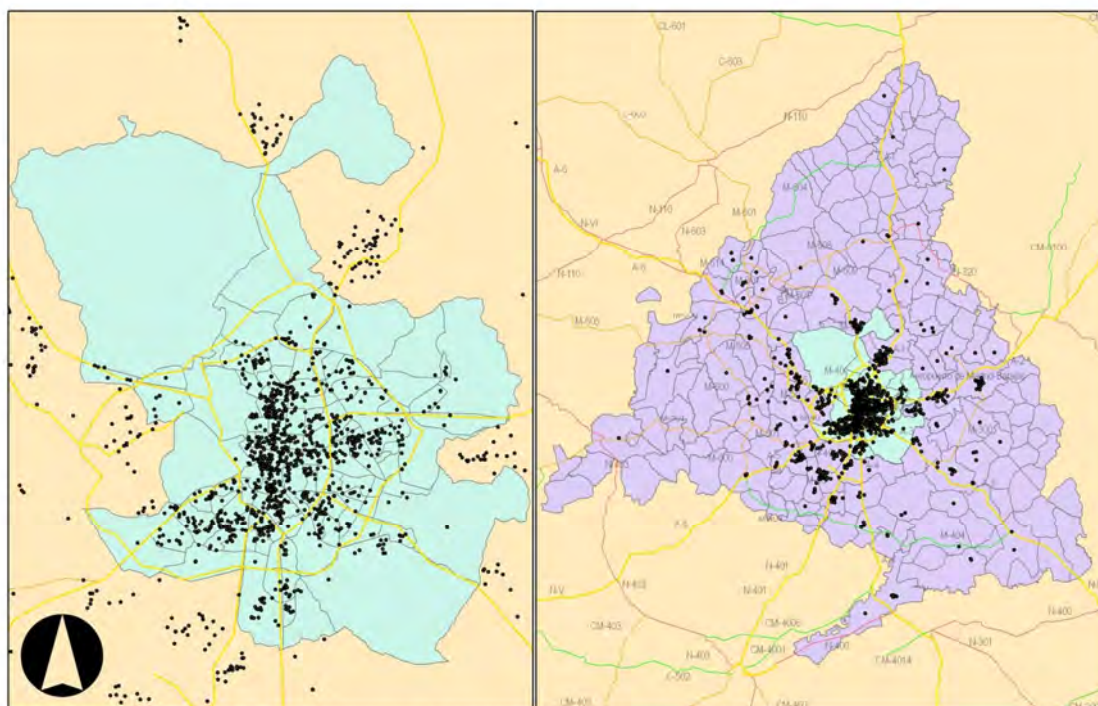
The telecom industry

The telecom industry has an important presence in the Community of Madrid, employing 32,575 people and generating a GDP of \$ 8978.30 million in 2005 (5.6% of the regional total).

Telecommunications in Madrid

	Value	% Region
Direct jobs	32,575	1.22%
Turnover	8,978.30 million €	5.60%

There is a high percentage of companies (57.6%) who seeks proximity to related companies, both competitors, as customers or suppliers, which is fundamental to the operation of a cluster.



Establecimientos CNAE 642 (Telecomunicaciones). Fuente: D.U.A.E. 2005

Most of the companies have their main suppliers of equipment and machinery, assemblies or subassemblies of sector specific services or competitors located in an relatively close area, although there is less significant the percentage of those that are in the same estate, the same town or in the same area as the rest of the region.

Just over a third of companies has non-commercial relationships with others of the same sector, especially with customers and suppliers, while the latter position corresponds to the

relation to research centers. The assessment of these relationships is pretty good, especially with clients, consultancy and R & D centers, while the lowest belong to the relationship with competitors.

The quality is often the main determinant of this relationship, followed by the price, although the raw competitiveness in relation to competitors followed by personal relations and technology relationships with technology centers. The proximity does not seem to be a determining factor.

The increase in sales is the main benefit of these relationships, with the exception of the suppliers, whose main benefit is the lower costs and advisory and maintenance services that emphasize quality improvement.

The exchange of goods, information and people with other companies does not occur large-scale, it is more relevant when it deals with information.

The telecommunications sector is characterized by operating in a global market, although most companies basically operate on a national or local market. The importance of each type of market varies with the size of the companies, so the local market is more important for smaller firms, while international markets increase their importance while they enlarge their size.

A key element to a cluster is the existence of cooperative processes that accompany the competition processes themselves. So 44.3% of firms collaborating with other companies, although there are two different profiles: the enterprise with 50 and more employees cooperate mainly with other companies, while in the rest predominates non-cooperation.

The main way of cooperation is subcontracting, but also has some relevance the joint product development, joint submission to contests or the generation and / or improving technology.

Cooperation is implemented through collaboration in the design and development of certain parts of the product, followed at a distance by providing ideas for improving the machinery and the sale of custom parts. The evaluation of the different types of cooperation does not show large differences, since all of them are scored quite high.

Just one-fifth of the companies belonging to a network linked to the telecommunications sector, basically to an industry association. Hardly any companies belong to an association of research or an informal network of cooperation.

Only 36.0% of the companies think that there are some entities that supports the process of improving the companies, being mentioned the Community of Madrid, the Ministry of Industry or the Chamber of Commerce of Madrid.

The assessment of relationships with other economic and R & D & i (4.27 points), foundations (4.17 points) and universities (4.17 points) shows no major differences. In general, positive, highlighting the treatment received by the companies and the existence of a good personal relationship, while negative aspects are due to specific problems, in that the

relationship is at an early stage or the relationship can still be improved.

The companies value the space in which they are located and their characteristics from the point of view of production. The 36.6% of companies believe that all aspects of their current location are good, while the rest points out some aspect that could be improved: better accessibility, adequate infrastructure, basic services or value added services.

In addition, 54.0% of companies believe that the existing infrastructure in the Madrid region are suitable for the development of an enterprises cluster. But, when they make a specific assessment the situation changes, since only 40.3% gives a positive value. The positive feedback refers to the existence of a good communication and transport system, good services, sector groupings in estates, good infrastructure, etc.. Opposite, the negatives are because there is no support for enterprises, problems of communication and transport, etc..

Around a fifth of the companies would not require any infrastructure, while 22.1% would ask for support structures (services) for their productive activity, 13.8% better communications and 12.8% more efficient telecommunications.

Only a quarter of companies believe that there is an institutional support to the sector, so their perception of the role of institutions as support the enterprise sector is negative. The main type of support provided by these institutions, according to the companies, is financial, followed by training, technology and, a little further, the commercial. Scarcely mentioned is urban planning.

Finally, companies identifies three types of gaps in the support systems that stand above the rest: the streamlining of procedures, the supports to small and / or new business and the support for investments.

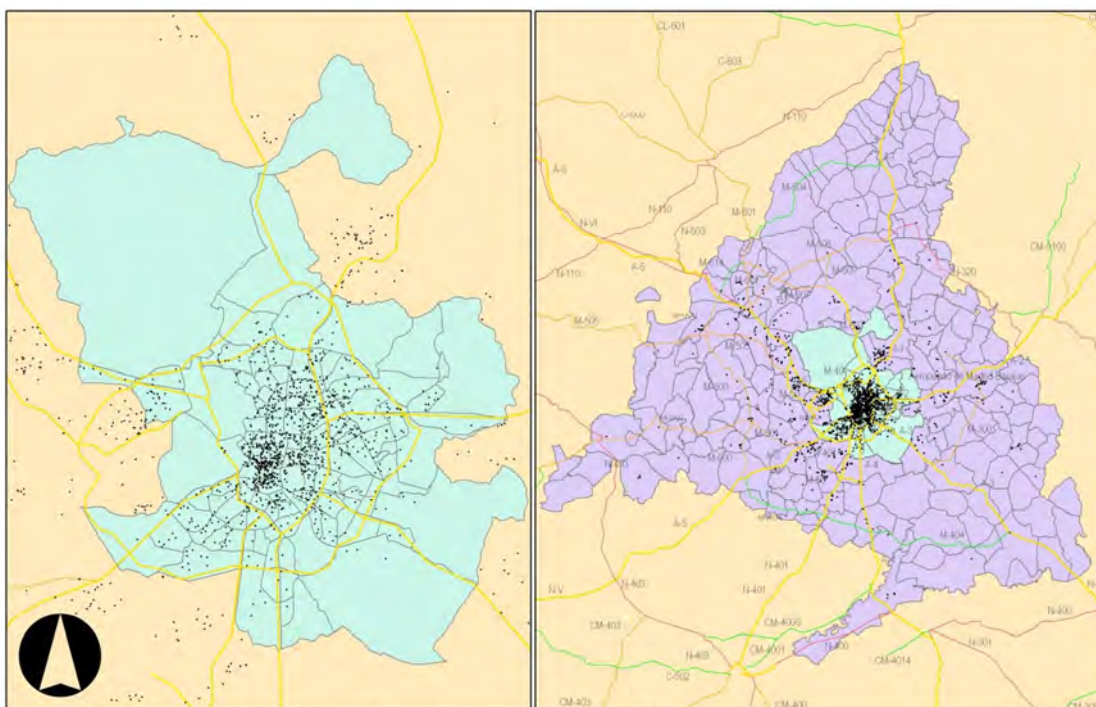
Audiovisual

This hyper-sector generates 30,660 direct jobs in the region and a turnover of 8,800 million Euros in 2007 (4.77% of regional GDP). A 58.7% of the establishments is located close to other companies. The type of companies that are in the vicinity are mainly competitors, suppliers and customers. The other types of businesses are less important, although the percentage is also relevant in the case of distributors and dealers.

The audiovisual sector in Madrid

	Value	% Region
Direct jobs	30,660	1.15%
Turnover	8,800 million €	4.77%

The proximity is essential in a cluster configuration, so it is interesting to know the degree of closeness of companies with their main suppliers of equipment, machinery and industry-specific services and the competence. Mainly, the relationship is between companies within the Community of Madrid, while it is less common than they are in the same estate, the same town or area.



Establecimientos CNAE 92 (Audiovisuales). Fuente: D.U.A.E. 2005

44.4% of the companies has non-commercial relationships with others of the same sector, especially with customers, suppliers and competitors. At a distance we situate relationships with advisory services, distributors and training centre; and at last the relationship with maintenance services, vendors and, most recently, with research centre.

The assessment of these relationships is pretty good, especially when it tackles with the cooperation with customers, vendors and distributors, while the lowest in the relationship maintenance services.

The quality is the determinant factor of the relationship, except in the case of customers, competitors and training centre. In these three cases, personal relationships are the main factor, and this factor is also quite important (second most important) with the distributors and retailers.

The benefits accruing to firms from these relationships vary by type of entity with which they are relate. The increase in sales is the main benefit of the relationship in the case of distributors, vendors and customers, while reducing costs is the most significant for suppliers, training and advisory services. Meanwhile, improving the image of the company is the main benefit in relations with R & D, training and maintenance services and ultimately improving the quality when it comes to competitors.

The exchange of information with other companies in Madrid is the most common situation (60.8%), being less relevant when it comes to people (29.8%) or property (21.5%).

Most of the companies operate in the domestic market, but the local market is higher among smaller establishments and international market gains importance with the increasing size of the establishments.

A key aspect is the cooperation between the companies is the generation of innovation. Thus, 64.0% of companies carry out cooperation with other companies. This positive image is blurred in part when it is observed that the main content of cooperation is reduced to subcontracting (61.4%), well ahead of the joint development of a product (41.2%), while the rest has much less importance.

Cooperation is implemented through collaboration in the design and development of certain parts of a product, while the other has less presence mechanisms. Only the contribution of ideas for the improvement of machinery and general cooperation between companies exceed 10.0% of establishments cooperate.

The best assessment of the different types of cooperation corresponds to share information, followed by the joint working. At the opposite end are located the generation / improvement of machinery and the generation and / or enhancement of technology.

Another different form of cooperation is articulated through membership of companies to some network related to the audiovisual sector. The few companies that belong to a network they do through their integration in an industry association having not just companies that belong to a research association or an informal network of cooperation.

The opinion of the companies on the possible interest of the industry association for the development of synergies between the companies is quite positive, while a significant percentage believes that there is some entity that supports the process of improving sector companies, especially the Ministry of Industry and the Chamber of Commerce of Madrid.

Relations with other economic agents are top rated with foundations (4.16 points), ahead of universities (4.11 points) and R & D (4.00 points). The main objective of cooperation with universities is education, followed by the recruitment of human resources, while the Centers for R & D is to improve technology and productivity improvement and foundations "something

different specified "followed by product improvement and training. Overall, the assessment is positive, highlighting the treatment received by the companies and the existence of a good personal relationship, while negative aspects are due to specific problems, that the relationship is at an early stage or that the relationship can improve.

Most of the companies give a good value to the space in which they are located, so that 59.0% believe that nothing is missing from your current location. The main demand refer to the need for better accessibility, lack of adequate infrastructure, advanced services (eg, those associated with new technologies) or basic services (cleaning, public transport, parks, shops restaurants) .

Just over half of companies believe that the existing infrastructures in the Madrid region are useful for the development of enterprises cluster. However, the assessment of the usefulness of regional infrastructure, changes slightly, as only 41.6% gives a positive assessment. The positive assessment is due to communications and public transport, to the existence of clusters in the industrial sector, the existence of cooperation processes between companies and receipt of aid granted by the Community of Madrid. By contrast, the negative is that there are problems with communications and transportation, or lack of support for businesses.

The most demanded infrastructure for the audiovisual companies are services of support companies, telecommunications more efficient and better communications. By other hand, 28.7% of companies do not demand any productive infrastructure.

The 37.6% of companies believe that there are institutions that provide assistance to companies, being primarily business associations, followed at some distance by the Ministries and the Community of Madrid. The type of support provided is primarily financial, with less emphasis on educational, commercial and technological.

The main shortage of the support systems of the institutions for the companies are: the investment support, support to small and new businesses, speeding up of administrative proceedings and research supports. They are linked to the financing aspects, except for the streamlining of procedures, a recurrent theme in our country, which has a clearly negative differential compared to other countries.

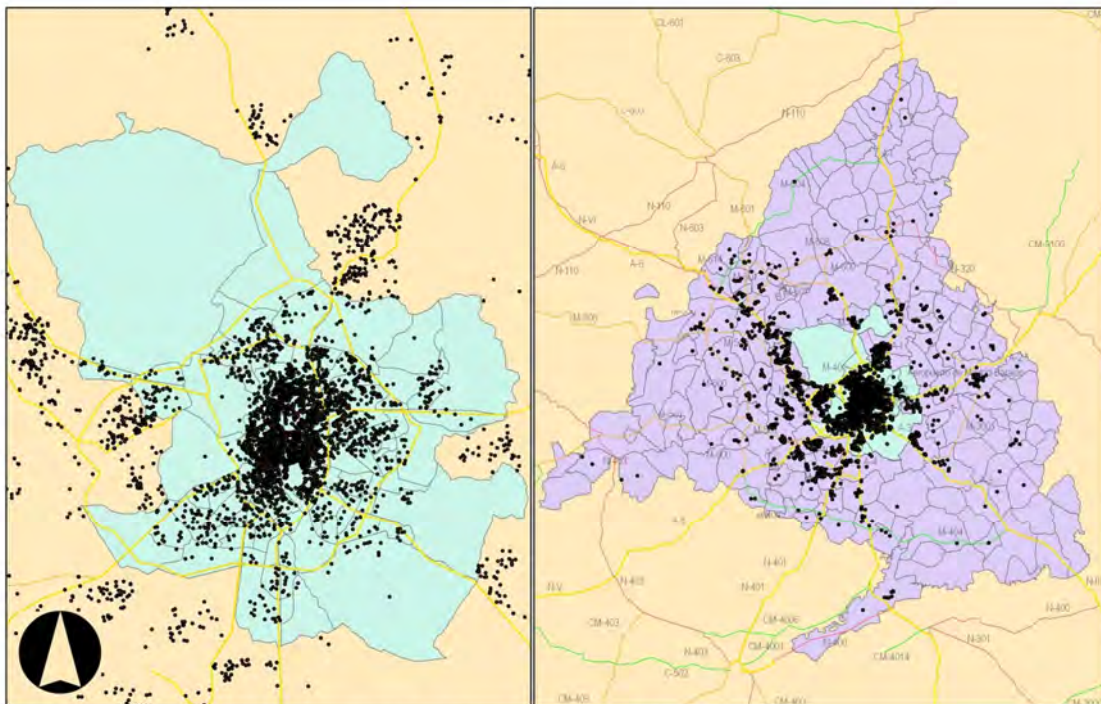
Advertising

It is a sector with a significant presence in the Community of Madrid, employing directly to 36,100 people and generates revenues of 2,649.00 million Euros in 2005 (1.6% of regional GDP).

The Advertising sector in Madrid

	Value	% Region
Direct jobs	36,100	1.35%
Turnover	2,649.00 million €	1.6%

An interesting aspect is the possible existence of clusters of companies working to produce the same good or service, which is one of the defining elements of a cluster. Thus, 56.9% of the companies is located close to other companies, a fact that does not appear related to the size. The highest percentage of proximity between firms occurs with competitors (65.8%), suppliers (57.8%) and clients (57.2%). The 30.5% is close to distribution companies; a quarter is close to sellers and around a fifth is in the vicinity of advisory services. The proximity to companies of maintenance, training and above all, research is very less.



Establecimientos CNAE 744 (Publicidad). Fuente: D.U.A.E. 2005

Proximity is a key factor in a cluster configuration. Thus, most companies have their main suppliers of equipment and machinery, and subassemblies of parts, services industry-specific for the sector and the competitors, in a range close to his, mainly within the Community of Madrid, and with a greater importance in the rest of the region, and far less the presence in the same polygon, the same town or area.

Another key element in the operation of a cluster is the existence of chains, not just business, that occur between the different actors. Two out of four companies point to the existence of non-commercial relationships with other companies. The level existence of these relationships are higher with customers and suppliers produce, which place some distance from the rest, and very little with concerning research centre.

It positive evaluating these relationships, especially with clients, advisory services and distributors, while the least valued are the relationship with competitors.

The main determinants factors of these relationships tend to be the quality and price. Quality is the main factor when it comes to distributors, vendors, customers, training, advisory services and maintenance. Meanwhile, the price is a determining factor in the relationship with suppliers, relationships with competitors and technology with R & D.

The benefits accruing to firms vary with the type of entity with which maintaining relations. The increase in sales is the main benefit of the relationship with vendors and customers, the lower costs with suppliers, distributors and sellers, greater penetration into new markets with competitors and R & D centre, improving the image of the company with training centre and ultimately improving the quality is related with competitors, advisory services and maintenance.

The proportion of companies that carry out the exchange of goods and people is quite small, whereas it is more meaningful when it comes to sharing information.

Most of the companies is scoped the national market, followed by local and, to a lesser extent, regional and international. The establishment size introduces significant changes since the local market has usually more weight among companies with small size establishments, while the national and international market tend to increase in importance with the size of the establishment.

Nearly half of companies cooperate with other companies. The contents of this collaboration are focused primarily on outsourcing at a great distance from the rest, occupying the following positions the joint development of products and joint submission to contests.

Cooperation is implemented through collaboration in the design and / or development of certain parts of the product while the other options have a much lower weight. Overall, the assessment is quite good, corresponding to the lowest values (4.00 points) to cases with one or two firms, while made by a larger number of companies have a minimum rating of 4.16 points Outsourcing and joint product development.

Just one fifth belongs to some network of companies, a percentage that increases with the size of the establishments. The majority belongs to an industry association; while very few companies are part of a research partnership or an informal network.

The 42.3% of companies believe that there is an interest in sectoral partnership for the development of synergies between them, increasing this opinion among larger establishments. In addition, around a quarter of companies believe that there is any entity that supports them in the process of improvement, mainly in the case of business

associations.

Business relationships with various players like universities, R & D centre and foundations are relatively rare. The most valued are the relationships with foundations (4.36 points), ahead of universities (4.22 points) and R & D centre (4.23 points). The relationships with universities have a formative purpose and human resource recruitment, while looking for technological improvement and, at some distance, improve production with R & D centre and "other different from the explicit" with foundations. Overall, the assessment is positive, highlighting the treatment received and the existence of a good personal relationship, while negative aspects are due to specific problems, to which the relationship can be improved or that fails to excellence desirable.

The 55.5% of companies believe that the current location of your accommodation is good and almost one-third rated as very good. The 42.9% of companies believe that there are no gaps in the current location of their establishments, while for the rest; the main shortcomings are accessibility, lack of adequate infrastructures and lack of basic services.

The majority opinion of the companies (56.4%) is that the infrastructures for the Community of Madrid are useful for the development of the cluster. The results change slightly when asked to issue an assessment, as the 42.9% emits a positive and 15.4% negative. Positive responses are based on the existence of good communication and good public transport, aid the Community of Madrid, the grouping of sector in polygons with good infrastructure, etc., While the negative ones that there is no support for companies or there are problems with communication and public and private transport.

Just over a quarter of companies do not demand any particular infrastructure, while another quarter requested support structures, 21.0% better communications and 20.1% efficient telecommunications.

Only 22.6% of companies believe that there are institutions that help companies. The main institutions according with the companies opinion that are supporting the sector are business associations and, at a distance, the Ministries. The type of support provided is basically training, followed by the financial and commercial support, while technology support ranked fourth and barely mentioned urban planning.

Finally, 5.6% believe that there is no deficiency in the systems to support the sector, while 45.8% mentioned the lack of mechanisms to support small businesses and entrepreneurs, a 38.9% see gap in the investment support, 23.6% in the support systems for research and 22.2% in the streamlining of administrative procedures.

Policies

The policies to support the establishment and / or strengthening of cluster in these activities should take into account the different aspects that are relevant to the competitiveness of a sector such as: competitiveness, cooperation, diversification, R & D, infrastructure, internationalization, funding, training and other.

Beyond the specific measures proposed the most relevant is that they should be aimed at strengthening those aspects that are the cornerstones of a cluster, i.e. cooperation, innovation, technological development and the creation of formal and informal networks - to promote the sharing of knowledge, contacts, resources, etc., creating a local culture to enhance collaboration and competition between firms, and the involvement and relationship with regional and local institutions, etc..

The promotion of clusters should be complemented with the territorial perspective fostering productive infrastructure adapted to the needs of business and be called to economies of agglomeration. The design of actions (parks of suppliers, technology development centre, technology districts, etc..) should consider their ability to generate economies of agglomeration and thus help guide the process of locating companies, generating synergies and complementarities in production, etc.. These are items that should be addressed from the perspective of spatial planning, taking into account not only the market trends, but also introducing elements of territorial rebalancing. Besides It is also necessary to tackle the lack of adaptation of the planning regulations to the current requirements of the different economic activities; introducing new elements that facilitate their implementation in the region and contributing to making companies more competitive in Madrid.

In short, this is to further advance the mission the Technological Innovation Plan 2005-2007 of the Community of Madrid that commissioned to Madrid Network , so attract and locate knowledge-based companies (existing or new), promote innovation based in the new technologies, provide an appropriate interface to both businesses and clusters as to the research and educational institutions to share a common research environment, and leverage the local resources and knowledge to improve the regional economic base.

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
General	Territorial Planning			
	Adaptation planning regulations for the implementation of economic activities			
Infrastructure				
	Carpetania/Park suppliers	Park suppliers	Creating a visual city	Improved availability and access to infrastructure and services
	Improved availability and access to infrastructure and services	Improving the region's business space	Improved productive spaces	Provide access to business incubators
	Facilitate access to business incubators	Facilitate the access of new business initiatives at sector incubators	Provide access to business incubators	Help to search for business space
	Help to search for land for companies	Search help land Enterprise Search	Helps to look for land to the companies	
	Technology Center	Technology Center	Technology Center	

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
Competitiveness				
	Promote tools to help companies in their certification processes	Guidance and advice on management strategy companies	Strengthening local suppliers	Promoting the integration of SMEs
	Promoting the integration of SMEs	Support for certification of enterprises.	Outsourcing.	Enhancement of spin-off.
	Strengthening local suppliers	Promoting the integration of SMEs	Support for the implementation of new technological processes	
	Development of joint purchase systems	Strengthening local suppliers.	Enhancement of spin-off	
	Outsourcing.	Development of joint purchase components.		
	Support the implementation of new technological and industrial processes.	Support the implementation of new technological and industrial processes.		
	Enhancement of spin-off.	Demonstration Center and trade promotion		
		Enhancement of spin-off.		

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
Internationalization				
	Development of joint marketing activities	Development of joint marketing activities	Development of joint marketing activities	Development of joint marketing activities
	Support sector exports del sector	Foreign trade promotion program.	Support sector exports.	Support sector exports.
	Support sector exports.	Development of promotional tools on the Internet, Virtual Fairs.	Service export support	Service export support
	Promotion of Madrid as a meeting of aerospace			
Cooperation				
	Cooperation between companies	Cooperation between companies	Cooperation between companies	Cooperation between companies
	Promote relations between different actors of the Science-Technology-Enterprise	Promoting relations between the different actors of the Science-Technology-Enterprise	Promoting relations between the different actors of the Science-Technology-Enterprise	Collaboration and cooperation with other national and international organizations
	Collaboration and cooperation with other national and international organizations	Collaboration and cooperation with other national and international organizations	Collaboration and cooperation with other national and international organizations	

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
Diversification				
	Diversification of SMEs SME subcontractors	Diversification SMEs	Diversification SMEs	Diversification SMEs
I+D+i				
	Realization of research activities, technological development and innovation (R+D+i)	Activities de Research, technological development and innovation (R+D+i)	Scaling up research, technological development and innovation (R+d+i)	Enhancing the innovation
	Promoting the participation of businesses, organizations and public and private national and international programs	Promoting the participation of businesses, organizations and public and private national and international programs	Transfer of research results and technologies relating to the sector	
	Transfer of research results and technologies relating to the sector	Transfer of research results and technologies relating to the sector	Advisory Service R & D + i	
	Service support for R & D + i	Dissemination of best available technologies	Promoting innovation in SMEs	
	Promoting the development of patents	Technological advice and guidance	Technological monitoring service	
	Promoting	Promoting the	Dissemination	

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
	innovation in SMEs	development of patents	of best available technologies among SMEs	
	Technological monitoring service	Promoting innovation in SMEs		
	Dissemination of best available technologies among SMEs	Technological monitoring service		
		Dissemination of best available technologies among SMEs		
Financing				
	Venture Capital	Venture Capital	Venture Capital	Design adapted financial mechanisms sector needs
	Seed capital	Seed capital	Seed capital	Seed capital
	Service guarantees and collateral bonds and guarantees	Service guarantees and collateral bonds and guarantees	Service guarantees and collateral bonds and guarantees	Service guarantees and collateral bonds and guarantees

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
Training				
	Creating the sector Training Observatory	Diagnosis sector training needs	Study of training needs in the sector	Study of training needs in the sector
	Formative assessment	Formative assessment	Advice on training to teach in the Counseling industry to impart training in the field	Advice on training to teach in the Counseling industry to impart training in the field
	Specialized training services	Specialized training services	Specialized training services	Specialized training services
	Technical conferences and seminars for scientific and technical training of those involved in the sector	business management training programs for business management	Business management training programs for business management.	business management training programs for business management
	Business management training programs for business management	Talent Attraction Program	Program to attract qualified personnel	Programs to attract "creative talent" sector
	Program to attract qualified personnel to the sector			

FIELD	ACTIVITY			
	Aerospace	Telecommunications	Audiovisual	Advertising
Others				
	Promote the production and dissemination of reports, publications, studies and statistics on aerospace	Dissemination of relevant information about the sector	Implementation and dissemination of reports, publications, studies and statistics on the sector	Implementation and dissemination of reports, publications, studies and statistics on the sector
	Creating Madrid Aerospace Observatory (OAM) virtual one-stop service	Virtual one-stop service	Virtual one-stop service	Virtual one-stop service
	Virtual one-stop service	Disclosure of relevant information	Creating Audiovisual Observatory	Service reporting and disclosure
	Systematization and dissemination of relevant information	Dissemination and awareness days	Disclosure of relevant information	Permanent forum for the promotion of business activities of the sector in the Community of Madrid
	Permanent forum for the promotion of business activities of the sector in the Community of Madrid	Forum for exchange of results and best practices	Forum for the promotion of business activities of the sector in the Community of Madrid	



City of Oslo



Spatial strategies for Oslo and Akershus analysis of business impacts



©Photo: City of Oslo

Peter Austin, Planning Advisor, Urban Development Dept, City of Oslo

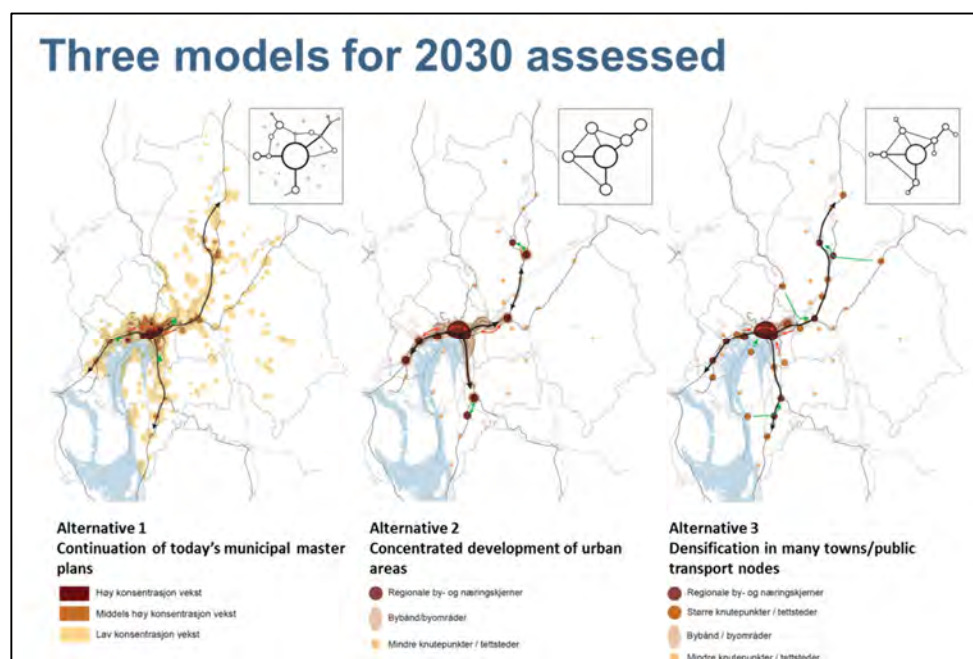
1. Introduction – purpose of the study

The purpose of this study was to identify which locations are likely to be most attractive for future businesses to establish in Oslo and Akershus. Alternative business locations are considered in relation to alternative models for the overall spatial strategy (including housing, transport and open space), which is being developed for the period 2014-2030³⁰. This study of business-impacts is one of 5 thematic reports, which contributes to the choices made in the final draft spatial strategy for the region³¹.

A political goal for the regional spatial strategy is to enable the Oslo Region to be competitive and sustainable within Europe.

Vista Analysis assessed the potential effects on business development for three spatial strategy models:

- i. Continuation of current municipal plans
- ii. More concentrated development within major hubs and towns, and
- iii. Densification in a multitude of transport-nodes.



The main focus of the analysis was on the following two main challenges for regional business development:

- Reduction of uncontrolled spatial dispersion of employment outside Oslo
- Encouragement of office-based companies towards central locations.

³⁰ The analysis was completed by Vista Analysis in 2013. A final draft for the final regional plan is due to be approved for public consultation in November 2014, with a final decision on the plan by November 2015.

³¹ The other thematic impact-studies were for transportation, housing, land conservation and local government finance.

2. Key findings

Sixty four percent of all jobs in Oslo / Akershus region, and 71 percent of all the region's highly skilled jobs, are located in the core city of Oslo. The most competitive business locations in Oslo are at the main public transport hubs. The regional railways, the city metro-lines, and efficient transfer-interchanges provide high quality access for highly skilled staff from across the region to work in both the CBD and at hub-locations along the main urban transport ring (Oslo's outer ring-road and metro-ring) and some of the major station-towns.

Spatial patterns for businesses are highly differentiated in Oslo. The majority of highly skilled jobs are in the western and central parts of Oslo, while the eastern corridor is dominated by light industry, logistics and retail. The industrial structure in Akershus is also spatially differentiated, with certain differences in which sectors dominate within each sub-region. In many cases businesses have located at the edge of major towns in Akershus, a pattern of non-central locational that can be found across all sectors.

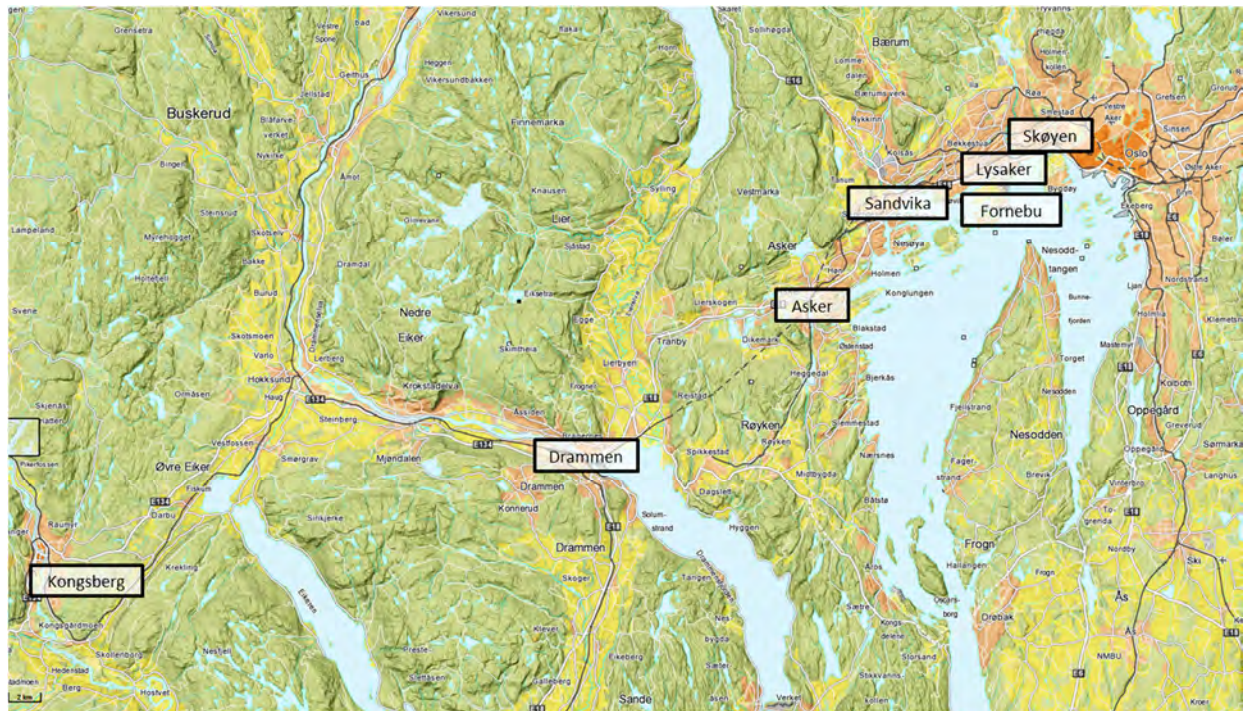
Urbanization, centralization, market growth, international connectivity and regional policies are all important factors for businesses' location decisions. National decisions and policy guidelines have played a major role for businesses' locational choices between the sub-regions. Examples include national approval in 1994 to relocate the national airport from Fornebu (10 km SW of Oslo) to Gardermoen (50 km NE of Oslo), and more recently to relocate the Institute of Veterinary Science from the centrally located University of Oslo to the University of Ås, (30 km south of Oslo).

2.1. Strong sub-regional patterns

Vista Analysis have given special consideration to business development patterns and future potentials in the three main corridors out of Oslo.

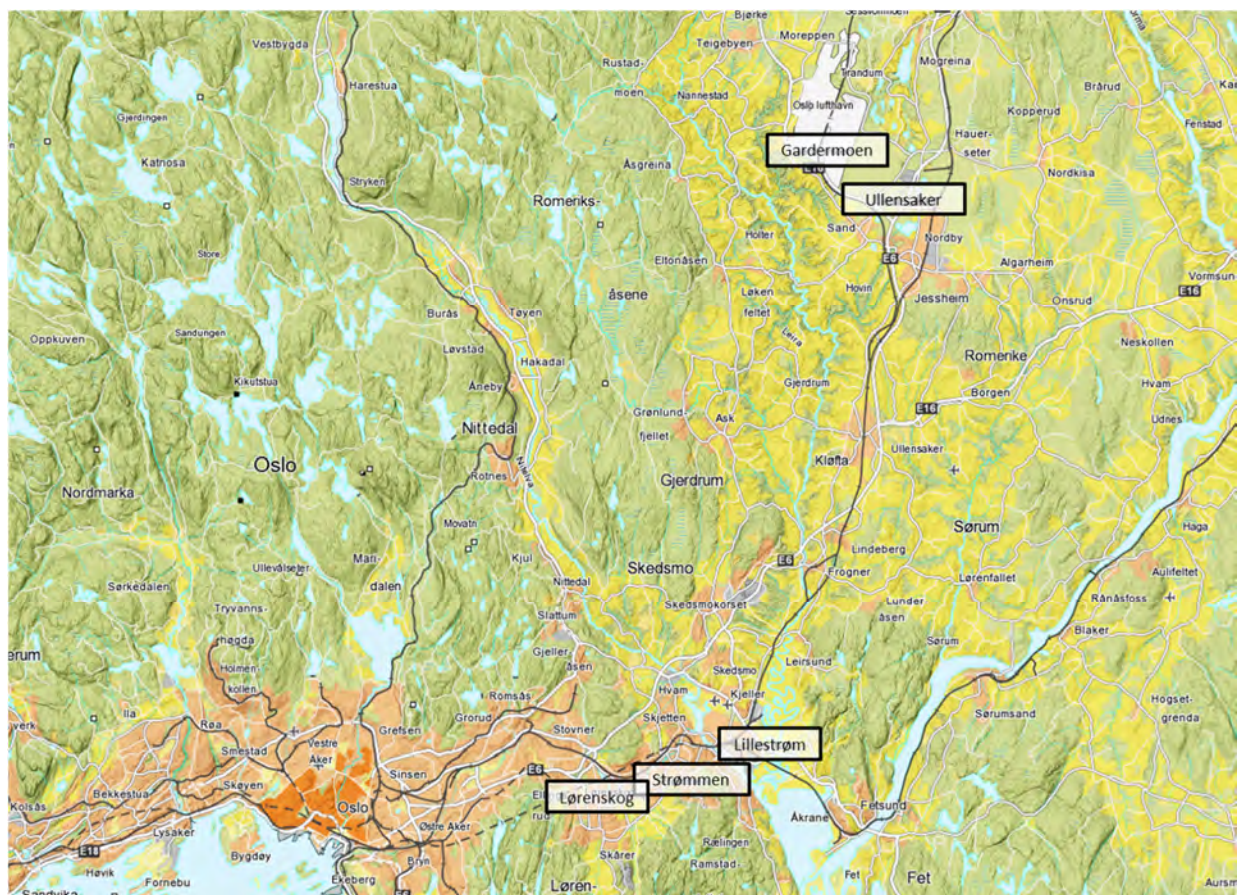
2.1.1. *The South West corridor*

The petroleum sector is a central pillar in Norway's economy. Over the last decades, supplier industries based on offshore production have tended to be drawn towards a belt of companies that have located along the motorway to the south-west of Oslo, with easy access to the former national airport. This has grown to become a national "technology axis", extending along the motorway and railway-lines from Skøyen (Oslo-west), via Lysaker / Fornebu and Asker (within the core conurbation in Akershus) to Kongsberg (80 km west of Oslo, in the neighboring county of Buskerud). Localization decisions have been based on the housing patterns of key employees who live in the same region – a causal relationship which has become self-perpetuating over the decades.



Map showing key business locations in Oslo's South West Corridor

Source: Base-map, Norges Kartverk



Map showing key business locations in Oslo's North East Corridor

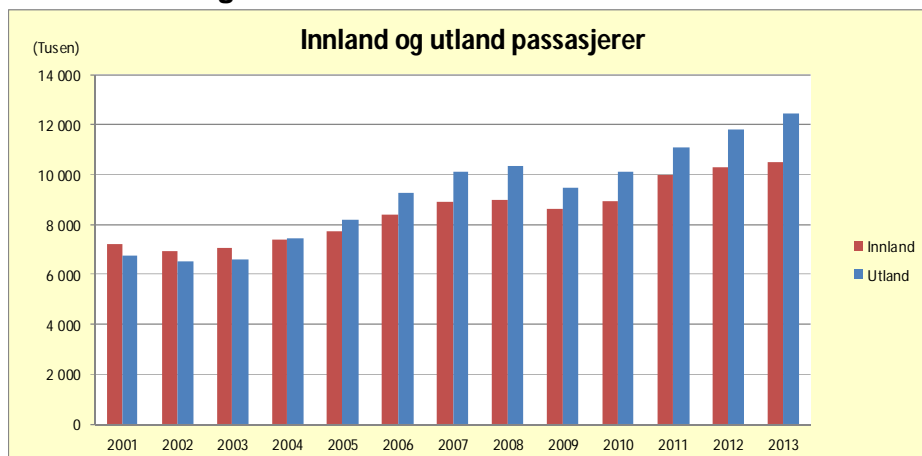
Source: Base-map, Norges Kartverk

2.1.2. North-East corridor

Business developments around the national airport at Gardermoen have so far been mostly confined to airport-related services, such as hotels, catering and freight. This is contrary to some initial aspirations for attracting major national or international companies' head-offices to the vicinity of the national airport. In reality, the host municipality of Ullensaker is too far from Oslo for commuting, which would involve travelling first into the city center and then taking a high speed train to the airport. Gardermoen has therefore become a secondary business-center, with companies that are more typically found in and around airports and in second cities.

The volume of air traffic and numbers of jobs in and around Gardermoen airport is expected to increase strongly, in line with increasing air-travel and anticipated national economic growth (see historic growth in figure below). However, there is no reason to expect that more highly skilled professional jobs will be created in the airport sub-region than before.

Growth in passengers at Gardermoen, Norway's national airport – domestic and international flights



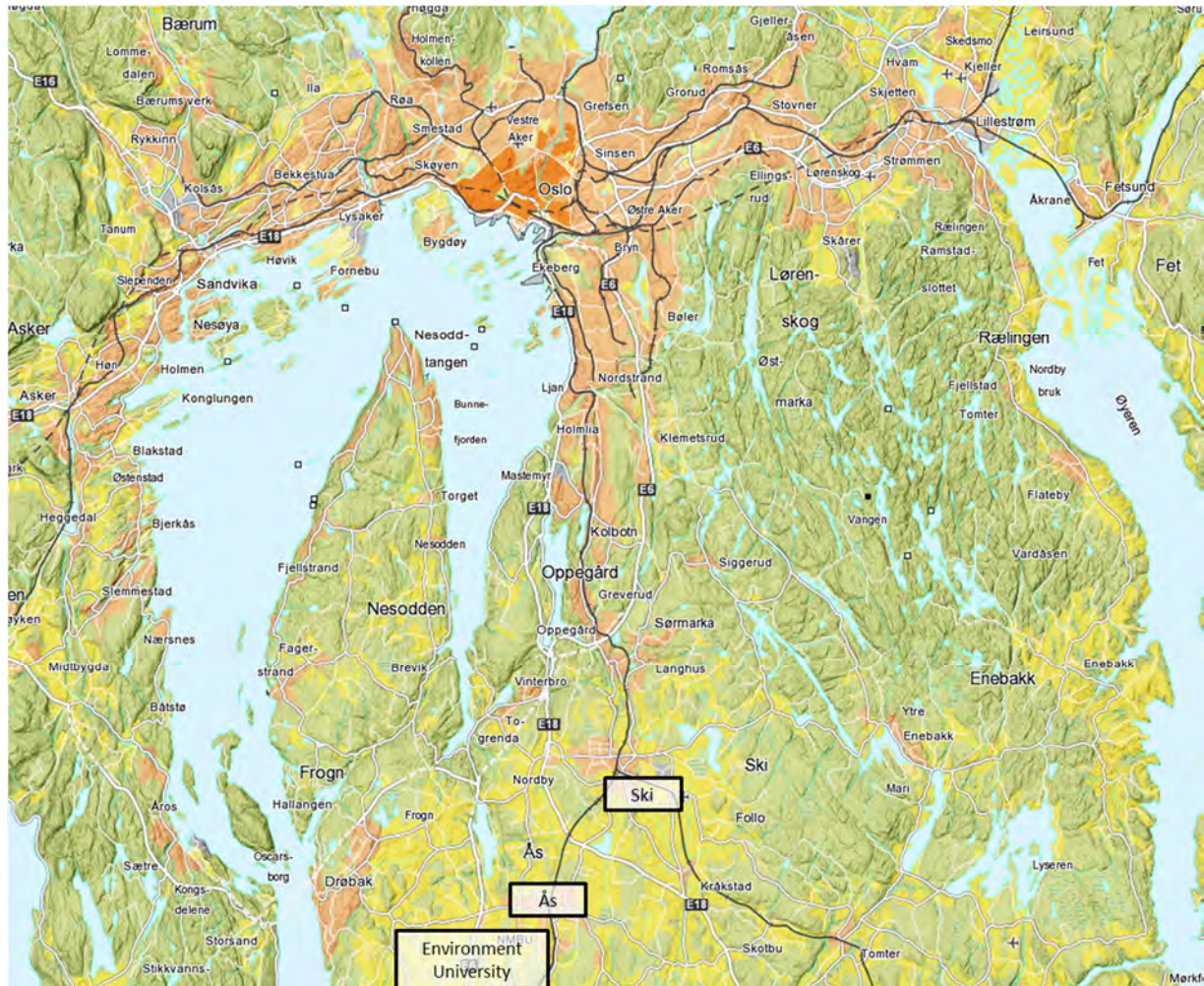
Source: Avinor 2014.

Two municipalities in the outskirts of Oslo to the north-east, Lørenskog and Skedsmo, have attracted activities which need access to large sites. Large plots of vacant land are no longer available within Oslo. Large public service companies, such as the national postal depot and a fully refurbished regional hospital, are in Lørenskog. These developments are not thought to have increased the local level of urbanization. However, lying close to Oslo, within the conurbation and with good facilities for businesses, Lørenskog, together with neighboring Strømmen and Lillestrøm, could have a greater potential for future business growth. Beyond these municipalities, as the distance from Oslo increases, the likelihood of industrial growth with highly skilled jobs is considered to be substantially lower.

2.1.3. Southern corridor

The southern corridor has the lowest level of local employment in the region, and thus a high potential for new businesses. The settlement pattern is already highly concentrated along the rail-corridor, as well as the main motorway access for all international transport. Important drivers in the region are the Environmental University in Ås, where the national veterinary institute has recently been relocated, and a new high-speed rail link directly from Ski to Oslo central station (due to open 2020). Both the towns have also attracted light industry and logistical firms to sites with good motorway-access.

Life-science and technical firms should be encouraged to sites in and around the Environmental University of Ås, encouraging synergies between research institutions and the private sector. This would help to strengthen links between the University and Ås town center, supporting urbanization with a high skill sector. Ski has already a concentration of regional administrative offices and businesses in the town center.



Map showing key potential business locations in Oslo's South Corridor

Source: Base-map, Norges Kartverk

3 Assessment in relation to alternative regional models for development

Seen in general, it is important to prioritize central locations for office development, even when it may not be currently in demand. This would create a high-value land reserve and prevent residential development in the most central and accessible locations. Key towns should include industrial growth in their long-term goals for development. It is generally important that office jobs are located in the most central areas.

3.1. Alternative 1 – continuation of current municipal plans:

The analysis shows that that this alternative will reinforce the current patterns of concentration and differentiation in jobs and sectors between the different parts of the region. A further concentration of highly skilled jobs in Oslo and along the south-western corridor can be expected and in areas close to Oslo and with motorway access. Another consequence is likely to be continued low levels of local employment further from the core city, leading to increasing commuting volumes and challenges in encouraging a more urbanized form of development.

3.1.2. Alternative 2 – more concentrated development within major towns:

This was defined in the analysis as concentrated development in the major towns, with 80 percent of population growth concentrated in the regional centres. Increased migration into the major towns will strengthen the demand for jobs based on local residential markets, such as retail, private and public services. It is especially important to design a spatial framework for business development, to avoid house-building coming first in the most central locations. Businesses will weigh up the lower costs of peripheral sites, where these are available, against market benefits of more central locations. The areas closest to Oslo will continue to be most attractive for business community.

3.1.3. Alternative 3 – densification in many of the transport nodes:

Whatever the size of city / town / core, edge-of-town sites will remain attractive for many businesses due to easy car-access and lower land prices. In order to stimulate businesses and public administrations to locate in more central sites, these areas must have planning approval and be structured and made accessible for commercial development in land use plans for the core areas. Public sector offices should not be forgotten, as these already take a major share of office space in smaller towns. Communities at the edge of the Oslo-conurbation have advantages with good access to a wide variety of employment within short travel distances. As distance to Oslo increases, settlements have an increasing share of employment in public services and retail, and office space is in less demand.

Access to local jobs is an important prerequisite for further development of smaller towns. Public and private services and retail are likely to continue to dominate. Business growth across the wider Oslo region is driven by localization preferences and increased demand for goods and services. Local growth is however determined by prices and the scale of the local customer base [seen in relation to competition from neighboring settlements]. As a rule of thumb, between eight and ten thousand residents appears to be a critical size for a customer base sufficient for services to cover every day needs. Smaller towns could therefore aim to expand to around 10,000 residents and develop towards becoming a sustainable market. This would also give a good scale for varied housing provision.

4. Conclusion

The picture is varied, with different conclusions for each of the main transport axes.

Seen as a whole, Alternative 2 will be most attractive for the business community in northeastern and southern corridors, assuming the municipalities play an active role in regulating central locations for long-term office-space development. Major demand for office space cannot always be expected at initially, but the land should be kept in reserve as far as possible. The public sector should act as an example and driver, and avoid locating in the peripheral areas.

The main focus for business development in the next 10 - 15 years should be in municipalities based on their local strengths. Providing attractive homes for skilled employees is particularly important. Alternative 3 seems most applicable in the southwestern corridor, where development pressure in central areas is already large and demand for office space will continue to grow. The strong pressure for offices space in central areas here may even come into conflict with local housing needs. This increases the need to ensure highly efficient use of development land through density and good accessibility.

Peter Austin, City of Oslo, October 2014

Regional growth, attractiveness and effects of investments

impact studies on Stockholm region's development



Credit : Cecilia Lindahl, Kista ICT cluster

Jessica Andersson and **Cecilia Lindahl**, Regional Planners, Stockholm County Council, Office of Growth, Environment and Regional Planning. **Carl-Johan Engström**, consultant, has put together the summary of the two reports

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Preface

The Office of Growth, Environment and Regional planning (TMR) is part of the Stockholm County Council and responsible for the spatial planning of the Stockholm region. It includes, among other tasks, the responsibility to produce a Regional Development Plan for the County of Stockholm. The latest version, RUFS 2010, was adopted in 2010 and is valid until 2016. The office of Growth, Environment and Regional planning seek to achieve a shared vision for how the unique assets and strengths of the Stockholm region best can be managed and developed. The office works within a broad spectrum of regional planning issues, initiates processes and produce documentation, forecasts and statistics. The issues dealt with include land use, housing, environmental issues such as climate adaptation and mitigation, nature conservation, energy, sparsely populated areas, the archipelago, integration, social perspectives and international cooperation. Today, rapid urbanization makes the Stockholm region with its 26 municipalities increase with more than 35 000 inhabitants per year. This creates both challenges and opportunities. The vision of RUFS 2010 is to become Europe's most attractive metropolitan region 2030.

This report presents two studies produced by TMR, founded on evidence-based correlation between urban qualities, investments and consequential effects for the development of different parts of a region. Are there certain urban qualities that attract businesses and new startups to a region, and to a certain place? Can public investments contribute to subsequent private investments? And can – in the same way – public investments contribute to a region's development potential or to areas of it being given new conditions?

The answers to these questions might seem self-evident, but preconceived ideas about these answers may contribute to a path dependence, which drives public planning (and for that matter, market assessments) towards misjudged initiatives.

International research has developed regional economic explanatory models that provide a sound basis on which to predict and explain courses of development as a basis for strategic assessments at an overarching level. Urban quality analyses add important elements to the understanding of attractiveness. This is, however, not sufficient to guarantee that strategies result in action. Experiences from actual cases show that public planning must also be carried out in processes that guarantee the involvement of various players in development procedures.

All in all, TMR's studies offer support for the development strategies that are applied in regional planning and in many municipalities' master plans. The studies also offer support for the development of better collaboration between public and private sectors in connection with bigger initiatives.

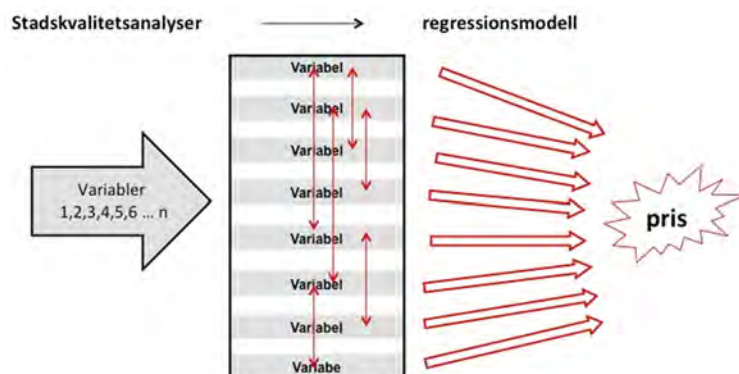
1. Introduction

The studies – which are summarized in this report, *Synergies between investments – eight case studies* conducted by the Royal Institute of Technology, and *Valuations of urban qualities, urban environment and office rents in the Stockholm region*, conducted by the consultancy companies Evidens, Spacescape and White – are based on assignments from the Office of Growth, Environment and Regional planning (TMR). The former aimed to examine how different investments within the Stockholm region affect one another. The latter aimed to identify, in quantitative terms, how spatial and urban qualities effect demand for offices in different areas.

The first case deals with which effects may be observed as a consequence of different investments. Can it be proven that public investments have resulted in private investments that would otherwise not have materialized and what is their possible impact on security and well-being? Can this knowledge be made use of in future planning? To get close to the answer to these questions by means of case studies, a general knowledge is required of what attracts people and businesses to a metropolitan region. The study therefore also provides general knowledge of theories on the probable effects of investments. On the basis of this, and the results of the case studies, analyses have been performed that show that the theory cannot be applied mechanically. To explain sequences and success factors in individual cases, analyses of processes and stakeholders are also required in each case with the support of governance theory.

The correlation between the attractiveness of offices and urban qualities has been investigated by means of studies into how the urban environment affects office rents. The studies were conducted in two phases: spatial analyses in which the urban environment is analyzed with reference to theories and hypotheses on quality and attractiveness, and regression analyses in order to extract the significant indicators that together can explain the price variation in office rents between different areas in the region.

Figure 1 Analysis model in the study into urban qualities. After analyzing urban qualities in a GIS system, the variables are tested in a regression model to extract the significant ones.



Source: Evidens, Spacescape, White

The two main urban qualities identified as significant for attractiveness in the study, good access to public transport and high density of urban activities, are strong drivers and a base for planning guidelines in the region's current planning.

2. Regional growth – effects of investments

2.1. General explanatory models for regional development

This section is based on the report entitled *Synergies between investments- eight case studies*. Below is a report on research into regional development based on theories taken from NEG³² (New Economic Geography).

2.1.1. The metropolitan region as an import node, innovation environment and domestic market

A large *domestic market* means that there is a sufficient number of individuals/households that have the financial conditions to demand new and initially often expensive products and services. This promotes a culture that rewards consumption as an expression of lifestyle and values³³, and where “the latest” has its own inherent value. Having a presence in such a domestic market is a competitive advantage. The profitability of a product is often at its highest before competitors have been able to develop a similar concept. A successful launch also results in large batches and falling prices, opening up opportunities for more companies at both production and service levels. These are mechanisms that benefit innovations³⁴ but that also presume that the region has sufficiently *high international accessibility*.

Metropolitan regions are often members of global networks with advanced interaction between units in multinational companies where decisions are made on import and export flows.³⁵ Companies in various sectors therefore benefit from having a presence in big cities and locating their development and marketing activities there. New, often complex, products are developed in collaboration between specialist companies. Large companies are major buyers of specialist and consultancy services. Specialist companies in turn require a customer base that is difficult to find in sufficient numbers outside the metropolitan area – despite contacts and communication via IT.

Qualified development works involving various specialists require personal meetings. It is in such meetings that communication and trust can develop and genuine creativity emerge. And this is where new ideas can be developed into products and services that can be sold on the market, i.e. innovations.

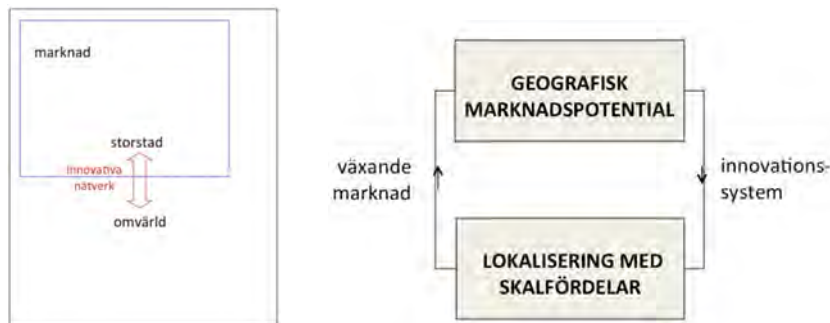
³² Krugman P R., *Geografi och handel [Geography and Trade]*, SNS Stockholm, 1996

³³ Holmberg S, Weibull L, *SOM report 46*, 2009

³⁴ Engström C-J & Cars G *Stadsutvecklingens betydelse för kreativitet och innovationer [The significance of urban development for creativity and innovations]*, *Insikt 2010:2 City of Malmö*

³⁵ Hårsman B, Johansson B, Klaesson J, Strömquist U, *Översikt av forskning om urbana strukturer [Summary of research into urban structures]*, RTK 2009

Figure 2 Contact flows and innovation processes in big cities. Both figures show how interaction between companies in big cities creates innovations.



Sources: The figure on the left from Engström & Cars Stadsutvecklingens betydelse för kreativitet och innovationer [The importance of urban development for creativity and innovations], *Insikt* 2010:2 City of Malmö; the figure on the right from Liljeström & Strömquist Den nya ekonomiska geografin [The new economic geography], Fritzes 2000.

But the growth of big cities is not only driven by specialist and knowledge-intensive businesses. Many service businesses, in both personal and company-related services, that do not require advanced qualifications, require – like specialist businesses – a significant customer base. The big city is home to dry cleaners, printers, flower watering companies, food outlets, etc. In other words, there are both well-paid, specialist functions and low-paid, entry-level jobs, and a large domestic market is crucial for a new business startup.

A highly accessible metropolitan region thus offers particularly good conditions for:

large companies – especially their strategic units and administrative functions; *specialist companies* offering, for example, financial services, marketing, legal advice, design, software companies with IT products and support services, so-called KIBS companies (Knowledge Intensive Business Services); and *service companies* aimed at more basic personal and business services. In addition to this there will be public administration and publicly funded educational, healthcare and social care services that account for a significant element of the labour market and employment.

All in all, this results in lower unemployment, less dependence on the state of the economy and self-reinforcing growth³⁶ compared with the nation as a whole, and in particular compared with smaller regions.

³⁶ Cars, G & Engström, C-J (ed.), *Stadsregioners utvecklingskraft: trender och nya perspektiv* [The development potential of urban regions: trends and new perspectives], KTH 2008

2.1.2. The big city as a functional region and integrated labour market

Regional integration is a key factor for a functional region – the more convenient it is for people to commute, the easier it is for people to choose a workplace. A high number of accessible workplaces enhance the conditions for individual employees to find a job that matches the interests and qualifications of the individual. A well-differentiated labour market such as this is becoming increasingly significant in the choice of a place to live³⁷. In other words, a region's *internal accessibility* is decisive, and the importance is particularly significant for Swedish and other labour markets, which are dominated by families with two earners³⁸.

A high proportion of households with two people at work thus enhance the benefit of a large, differentiated labour market. In the past, households usually moved in connection with the man changing jobs. Such a move can today make it difficult for the other person in work to find an adequate job or to continue in education. In the modern society, in which children also have a say in family matters, households tend to be less inclined to move. People tend to move in connection with the household being established and are made to a big city with its broad market for labour and education, which provides good conditions for each individual to develop – to change job or supplement his or her education in future. A change of job or studies can be managed by commuting instead of moving home. This results in a high level of people moving into metropolitan regions, despite shortages in the availability of homes³⁹. And this results in an increase in commuting.

The value of the home being accessible is greater for anyone who is commuting. The attractiveness and prices of small homes and cooperative apartments increase in central areas and at traffic hubs⁴⁰. This is also true of the creation of smaller communities in the metropolitan region. In contrast, parts of the region with poor connections are less attractive⁴¹.

From a *company perspective*, companies in a densely populated region have access to a large supply of labour with the competence demanded by various companies. Companies are therefore increasingly moving to places with a high labour supply⁴². As both individuals and companies have considerable choice in a large, broad-based labour market, there are also greater opportunities for matching. This benefits job sharing, specialisation and further education, which in turn increases the region's productivity and economic growth⁴³. This brings important competitive advantages to a metropolitan region.

³⁷ Björk, C (2006) I regionförstoringens spår [In the footsteps of regional enlargement], KTH 2006

³⁸ Gustafsson Siv, Ekonomisk teori för tvåförsörjarfamiljen [Economic theory for the family with two earners], Ekonomisk Debatt 6/91

³⁹ Glaeser, E L, *Stadens triumf* [The triumph of the city], SNS förlag, Stockholm, 2012

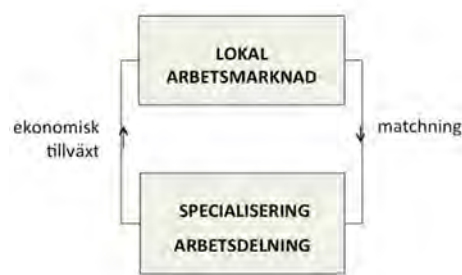
⁴⁰ Evidens, Spacescape AB, *Värdering av stadskvaliteter* [Evaluating urban qualities], Memo 2011 Region Planning Office (now TMR)

⁴¹ Cars, Göran & Engström, Carl-Johan (ed.), *Stadsregioners utvecklingskraft: trender och nya perspektiv* [The development potential of urban regions: trends and new perspectives], Royal Institute of Technology, Urban Regions and Development Potential, Stockholm, 2008

⁴² *ibid*, Cars, Engström

⁴³ Wiberg U, A Competitive Local and Regional Milieu for Firms and People, from Planning in Sweden, FFS 2013

Figure 3 The size of the local labour market increases opportunities for matching, specialization and job sharing which results in self-reinforcing growth.



Source: Liljeström, & Strömquist Den nya ekonomiska geografin [The new economic geography], Fritzes 2000

Internal accessibility and regional integration thus constitute a fundamental explanatory factor and are probably more important than aspects usually highlighted such as attractiveness and urban lifestyle. These may, however, be considered to be *consequential effects*, see also section 3.2 below.

2.1.3. Cluster formation

The word 'cluster' has no widely accepted meaning. Different actors, from researchers to regional bodies with responsibility for development, use the term in widely differing ways. Confusion increases when networks of companies and initiatives by authorities use the term in different, usually positively charged contexts. It has therefore been difficult to find a uniform way of using the word in the field of research. This report applies the Swedish Agency for Economic and Regional Growth's definition: "Geographical concentrations of related companies and players characterized by mutual dependence and influence on one another."⁴⁴ This definition sees a cluster as a market-driven phenomenon.

Cluster, where the word is associated with separate forms of collaboration between companies, academia and authorities, has emerged in the field of regional development policy⁴⁵. By pursuing an active so-called *cluster policy*, it is expected that regions will be able to promote structural transformation and energise certain industrial sectors by promoting collaboration and applied research.

Geographical concentrations of related companies, i.e. co-location benefits, often emerge between closely related sectors – known as horizontal integration. Kista (ICT cluster) is the most obvious example in the Stockholm region, and is often explained by the benefits that emerge through the dissemination of knowledge and skills development. But the benefits of co-location through the dissemination of knowledge also emerge *between* different sectors in a supply chain, i.e. vertically integrated⁴⁶ companies. Financial advice, IT services, design and marketing services, and lobbying services are examples of sectors in such clusters, e.g. commercial areas such as Värtahamnen in Stockholm and Uppsala Science Park in the wider Stockholm region are described as such clusters. Such clusters increase the

⁴⁴ www.tillvaxtverket.se

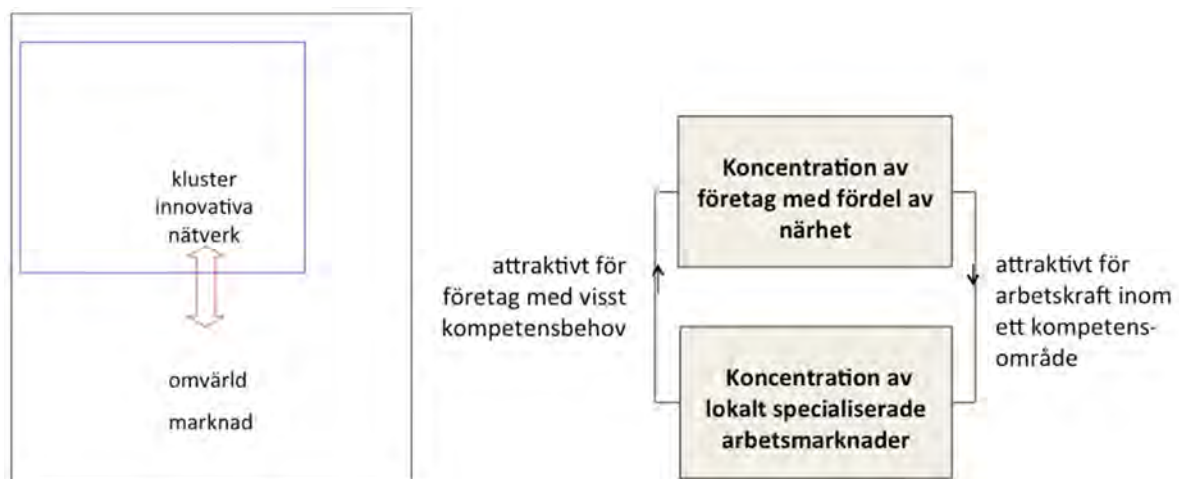
⁴⁵ The EU published a framework for *cluster policy* in 2008.

⁴⁶ Nilsson J and Uhlin Å, Regionala innovationssystem [Regional innovation systems], Vinnova 2002

opportunities to compete in a global market by developing concepts from initial idea to finished product with low transaction costs.

The best examples of successful clusters are those where co-located companies within one main sector attract companies that have input products or services. The cluster then usually consists of companies specialising in developing advisory and support functions for the specific area of industry.⁴⁷ All in all, this creates conditions for increased specialisation and career opportunities through the possibility of changing jobs within the cluster, resulting in continuing learning processes, which in turn increases the competitive advantages. Something known as silent knowledge emerges in a collective process, giving an advantage to the cluster as a whole. A concentration of horizontally or vertically integrated companies thus has a *critical mass*⁴⁸ in which the combined competence creates the conditions for the development of new, advanced products and services not just on *one* occasion, but with the capacity for continuous renewal.

Figure 4 Clusters as a basis for co-location, innovations and self-reinforcing growth. When companies that benefit to be close to other companies are situated at a certain place they attract a labour force, which makes it even more attractive for new companies to move to that area.



Sources: the figure on the left, Engström & Cars *Stadsutvecklingens betydelse för kreativitet och innovationer* [The importance of urban development for creativity and innovations]; the figure on the right from Liljeström, & Strömquist *Den nya ekonomiska geografin* [The new economic geography].

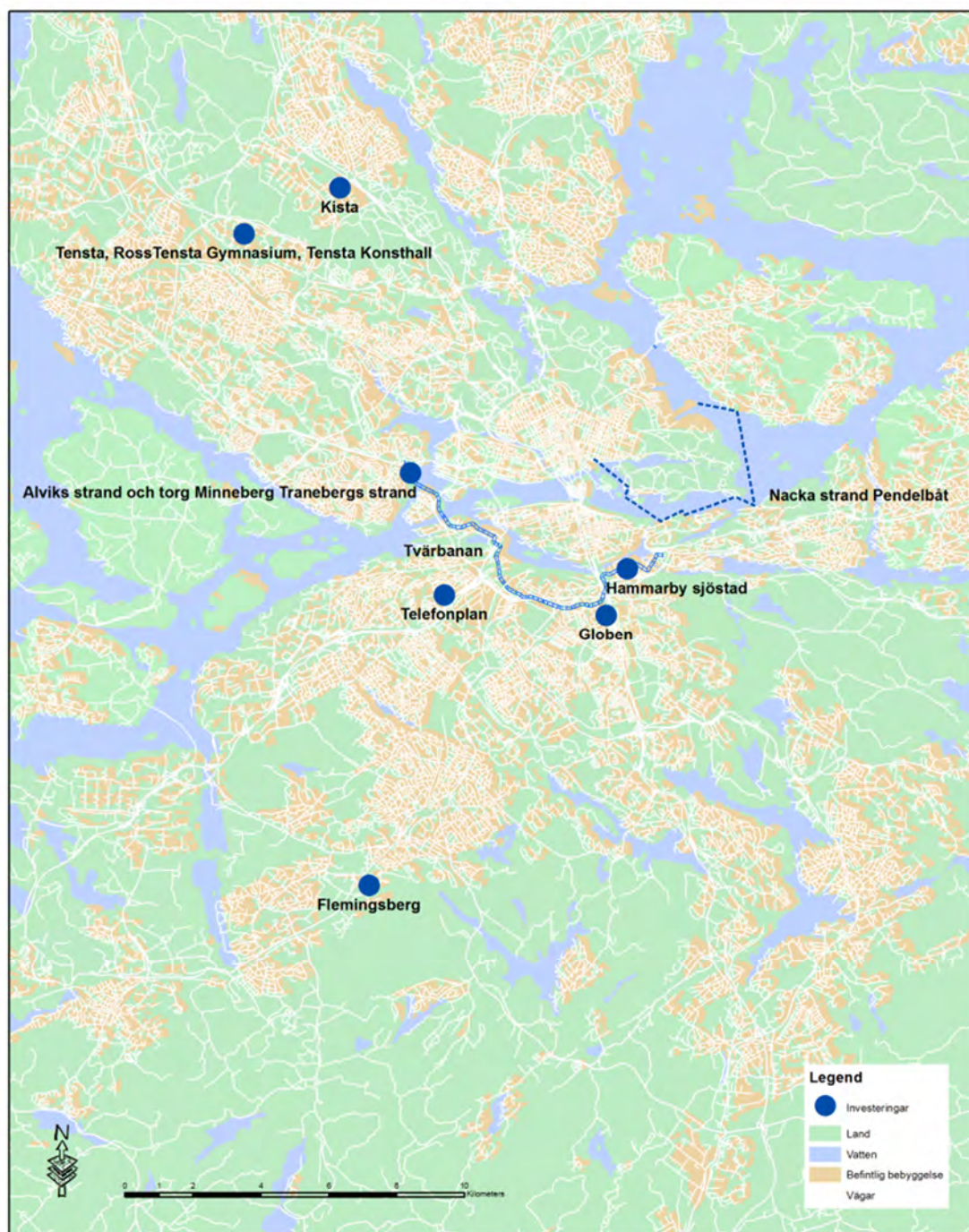
The report entitled Synergies between investments highlights cases in which investments were made for the purpose of enhancing the development of clusters within a geographical area. Examples of this include Telefonplan in the City of Stockholm and Novum in Huddinge Municipality. These public initiatives have not yet been considered to have achieved their goal of creating the horizontal integration of companies within certain sectors. The question of effects of investments in research and education is also relevant outside attempts to create clusters, see also section 2.2.3. Kista's development towards a horizontal cluster has taken place with the support of private and public investments alternately. This reflects successful parallel initiatives in the public and private sectors. Private and public investments

⁴⁷ Innovativa verksamheter i storstäder, en forskningsöversikt [Innovative businesses in big cities, a research summary], RTK 2008

⁴⁸ Christensen L & Kempinsky P, Att mobilisera för regional tillväxt [Mobilising for regional growth], Lund 2004

have interacted with one another in an alternating, sequential process. The process can be viewed as self-reinforcing when an institutionalized collaboration between business and academia is of great significance.

Figure 5: Map over the central parts of the Stockholm region, showing the eight investment cases highlighted in the report Synergies between investments.



2.2. Expected effects of investments in infrastructure, homes, research and education, as well as facilities for culture and events

This section describes research into the empirical correlation between the effects of investments on land values in a number of cases. The explanatory models described are compared with the indications of the eight case studies contained in the report entitled *Synergies between investments*. The eight case studies dealt with the actual effects of developments, both in the immediate geographical vicinity of the investment and in the region as a whole.

Below is an explanation of the state of research on the correlation between investments in infrastructure, homes, research and education, as well as facilities for culture and events. There is also a brief account of what the case studies concluded. The differences between theory and actual development are discussed in section 4.

2.2.1. Investments in infrastructure

Research into the correlation between investments in infrastructure and regional and local development is extensive. In the long term, it is clear that being connected to a modern infrastructure is crucial for a location's development. One only needs to examine the expansion of the Swedish railway network and the places that were connected and those that were not in order to confirm such effects. Identifying the direct correlation between an increase in the capacity of the road network, for example, and a part of a city's development is much more difficult⁴⁹. Studies such as Swedish Population Centres⁵⁰ and The E4 City⁵¹ do, however, reveal that the restructuring of the city/urban landscape is significant over time, as the transport system is developed in built-up areas.

The report entitled *Synergies between investments* deals primarily with the correlation between an investment in infrastructure and effects on land values and rent levels. A study⁵² shows that the correlation is a clear one. Land values have increased by between 1% and 7% for homes and by far more for certain businesses (offices up to 14%, shops up to 37%) if the distance from the railway station was less than 500 metres. Effects of office rental levels are discussed in more detail later in this report; to summarise, the study into the effects on office rental levels shows that proximity to public transport can increase rent by up to 30%. Varying degrees of accessibility by car reveal no such significant correlation (see also section 3.1).

If we summarize the research findings, accessibility is in general extremely significant. Accessibility is greatest when the combined transport costs are lowest – i.e. at nodes/transfer points.⁵³ But the explanatory factor is not unambiguous. Case studies conducted contain

⁴⁹ Modée V, Hur påverkas fastighetsvärden av en stor satsning på infrastruktur? [How are property values affected by a major infrastructure initiative?] Södra Länken [The Southern Link], KTH 2006

⁵⁰ Engström C-J, Svensk tätort – bebyggelsebeskrivning för planeringsändamål [Swedish Population Centres – description of urban development for planning purposes], Association of Local Authorities 1988

⁵¹ Bergman, B, *E4-staden: det trafikala stadslandskapet längs E4:an genom Stockholm* [The E4 City: traffic in the urban landscape alongside the E4 through Stockholm], Stockholmia, Stockholm, 2008

⁵² Pikosz A, Tiberig D, How improved rail infrastructure will affect property values in northern Stockholm, KTH 2011

⁵³ Anderstig, Christer, Från statlig fastighetsskatt till regional markskatt [From State property tax to regional land tax], Regional Programme, Federation of Swedish County Councils, Stockholm, 1993

examples of accessibility to public transport both being significant and having no correlation whatsoever. Nacka Strand is a private investment where the absence of good public transport services restricted development. The example of Alvik, with offices close to both the underground system and its own tram stop, shows that this is not a sufficient precondition for the creation of an attractive office environment. It has proven difficult to let newly built offices there. Tensta, with a lack of a node function – i.e. there are no regional transfer facilities in the public transport system – has not been able to make itself sufficiently attractive to entice students from other parts of the city despite significant investments in the upper secondary school. Flemingsberg, by contrast, has become extremely significant for the whole of Södertörn by means of a high degree of accessibility and sustainable investments in areas such as research and education. See map above.

2.2.2. Investments in housing

A metropolitan region has strong competitive advantages. These can be rendered irrelevant if housing is not provided at the same rate at which people are looking to move to the region. Studies show that high prices of housing restrict growth, despite the fact that incomes are often higher than the national average, and that strategic investments in housing can enhance a location's competitiveness by offering value-for-money housing.^{54,55}

A study has been conducted in the Stockholm region to put a value on the qualities that make housing attractive.⁵⁶ According to this study, access to urban activities, given by high density of housing and businesses, is decisive for the level of housing prices. Environments with urban activity for large parts of the day have qualities that create a sense of security, which also has an impact on the area's attractiveness. The correlation can also be observed following physical enhancements that have positive social effects.⁵⁷ There is a parallel in American studies that investigated the correlation between services available and attractiveness. Well-maintained public environments – alongside good schools – have a direct impact on house prices in the USA.⁵⁸

The conclusion of these studies may be summarized as being that continued metropolitan development is dependent on an adequate supply of housing, but also on the housing having the right qualities and being secure. In this context we can talk about synergies for regional development in which both quantity and quality are important. Case studies relating to housing have been conducted in the City of Stockholm in the districts of Tensta, Minneberg, Alviks strand and Hammarby Sjöstad. The explanatory factors summarized above have major relevance in all of these cases.

⁵⁴ Glaeser, Edward L., *Stadens triumf: hur vår största uppfinning gör oss rikare, smartare, grönare, friskare och lyckligare* [The triumph of the city: how our greatest invention makes us richer, greener, healthier and happier], 1st edition, SNS förlag, Stockholm, 2012

⁵⁵ <http://www.chamber.se/rapporter/flaskhals.htm>

⁵⁶ Evidens, Spacescape AB, *Värdering av stadskvaliteter* [Valuing urban qualities], Memo 2011 Region Planning Office (now TMR)

⁵⁷ Nilsson Joel, *Ekonomiska effekter av trygghetsåtgärder i bostadsområden* [Economic impact of security measures in residential areas], KTH 2007

⁵⁸ Larsen James E; *Public services satisfaction and single-family house prices in the USA*, *Internat Journal of Housing Markets and Analysis*, Vol 3 2010

2.2.3. Investments in research and education

Research on the correlation between on the one hand research and education, and on the other hand regional development, shows that investments in higher education can have a major impact. Knowledge-intensive businesses generally require personnel with university-level qualifications, often at doctoral level. But the correlation between investment in education/research and regional development is more complex than that. The correlation is also difficult to study, although the following can be said.

What is often highlighted is the impact on the innovative force in the region. The explanatory model is that research findings are translated into concepts, which are in turn translated into saleable products and services in companies. In this context the social fabric⁵⁹ is particularly significant, as it cannot be taken for granted that the interaction between higher education (with a reward culture as a measure of value) and business (with entirely different incentives for success) works in practice. It is difficult to confirm any unambiguous correlation⁶⁰.

It is, however, confirmed that a region where a large proportion of the workforce is well educated attracts businesses. The consequential investments that then arise do so in the region as a whole, and not in the immediate vicinity of the institute of higher education, even though there are also examples of this. Another effect of investments in research is that they contribute to a change in the nature of demand for products and services. It is well established that the supply of goods is broadened and niched towards quality products and that a broader and more diverse range of culture and experiences⁶¹ is demanded.

Entrepreneurship and research thus need – in order to achieve interaction and creative encounters – stable relations and an accessible physical environment that facilitates encounters. Collaboration can also be further stimulated by means of public initiatives in which the collaboration is institutionalized in various forms and companies are located close to institutes of higher education, e.g. in science parks.⁶² Case studies relating to investments in R&D and education describe Södertörn University College in Flemingsberg, Kista with investments in both public and private R&D, Telefonplan and Tensta upper secondary school. Case studies from Flemingsberg and Telefonplan show that the effects only emerge after a long time. The case study from Kista shows that formalised collaboration has contributed to additional investments. The partnership in Kista between business, the City of Stockholm and institutes of higher education is characterised by the fact that the parties are very familiar with each other's perspectives, which means that the partnership has been smooth and result-oriented.

⁵⁹ See, for example, Sörlin, Sverker & Törnqvist, Gunnar, *Kunskap för välstånd: universiteten och omvandlingen av Sverige [Knowledge for wealth: higher education and the transformation of Sweden]*, SNS Stockholm 2000

⁶⁰ *ibid*

⁶¹ Snickars F et al, *Metropolitan Innovation Systems*, Springer 2010

⁶² Larsson, Bo (ed.), *Univer-city: the old middle-sized European academic town as framework of the global society of science - challenges and possibilities*, Sekel Lund, 2008

Picture 1. Kista Science Tower



2.2.4. Investments in facilities for culture and events

Investments in facilities for culture and events have, in smaller regions, resulted in a broader range of experience-based products/services⁶³ and thus contributed to differentiation of a labour market that is often limited (e.g. Bilbao, R ros, Vara – cities in Spain, Norway and Sweden). Of the cases in this study, the Tensta Art Space represents a similar ambition, albeit one that has not been fully realised.

An OECD study⁶⁴ indicates, however, that the bigger the region, the greater the effects of investments in culture and events. This can probably be explained by the fact that the overall effects of the range of culture on offer becoming bigger and more varied increases interest in accessing it. Another explanation is that lifestyles in big cities tend to favour the consumption of experiences. Metropolitan residents spend 20-44 per cent more money on concerts, museums and cinema visits than their “country cousins”⁶⁵ (with otherwise equal conditions⁶⁶). Few studies have been conducted into the direct local impact on land and property values. These studies indicate positive effects in the form of more service and status in the local area.

⁶³ A number of studies have been conducted; we refer here to Growth Analysis report 2010:10.

⁶⁴ OECD, *Culture and local development*, 2005

⁶⁵ Glaeser, E. L., *Stadens triumf: hur v r st rsta uppfinning g r oss rikare, smartare, gr nare, friskare och lyckligare* [The triumph of the city: how our greatest invention makes us richer, greener, healthier and happier], Stockholm, 2012

⁶⁶ The comparisons are based on details of income, education, civil status and age.

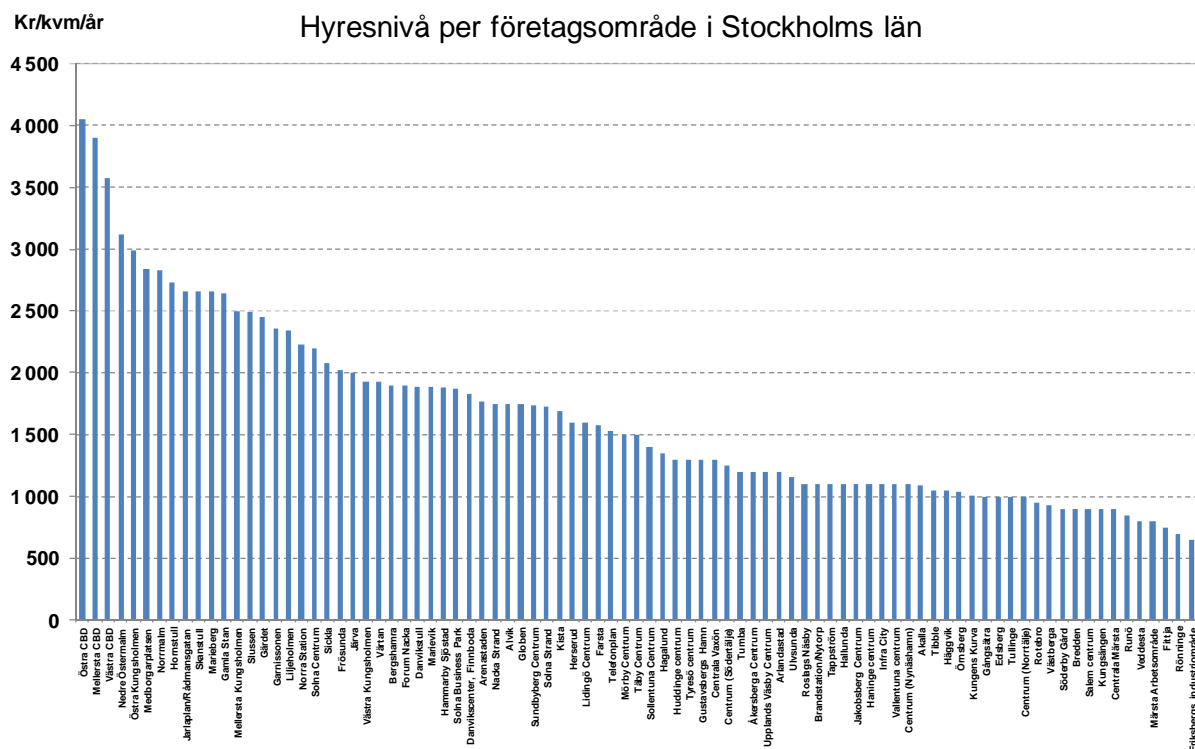
3. Urban qualities as a growth and localization factor

The regional development plan for the Stockholm region (RUF 2010) emphasizes the importance of a densely populated, polycentric region. This provides good conditions for an attractive, competitive region and at the same time for increasing sustainability by means of effective utilities, good public transport services and resource efficient management of land development. If the pressure on the city centre is not to become too great, regional urban cores must be developed. It is therefore important that they are able to attract urban qualities such as mixed functions, population density, a high degree of services and attractive public spaces, in order to contribute to a vibrant urban life. The study entitled Valuations of urban qualities has investigated to what extent companies' valuations of locations for new business coincide with the urban qualities that constitute desired objectives in both RUF 2010 and in municipalities' master plans. This is important knowledge in order to better predict the market conditions and their implications for urban strategic planning.

The study is based on the assumption that price variations in office rents provide a fair reflection of the attractiveness of an office area. The figure p17 shows that today there is significant price variation in the Stockholm region.

The urban qualities that can be seen to have the clearest impact on office rents are accessibility to public transport, proximity to urban activities, cluster effects, modernity and vacancy rates. Accessibility to public transport is by far the heaviest (appr 73%) significant factor, followed by the density of and accessibility to urban activities (appr 13%).

Figure 6 Rental level per business area in Stockholm County. Source: Evidens, Spacescape, White

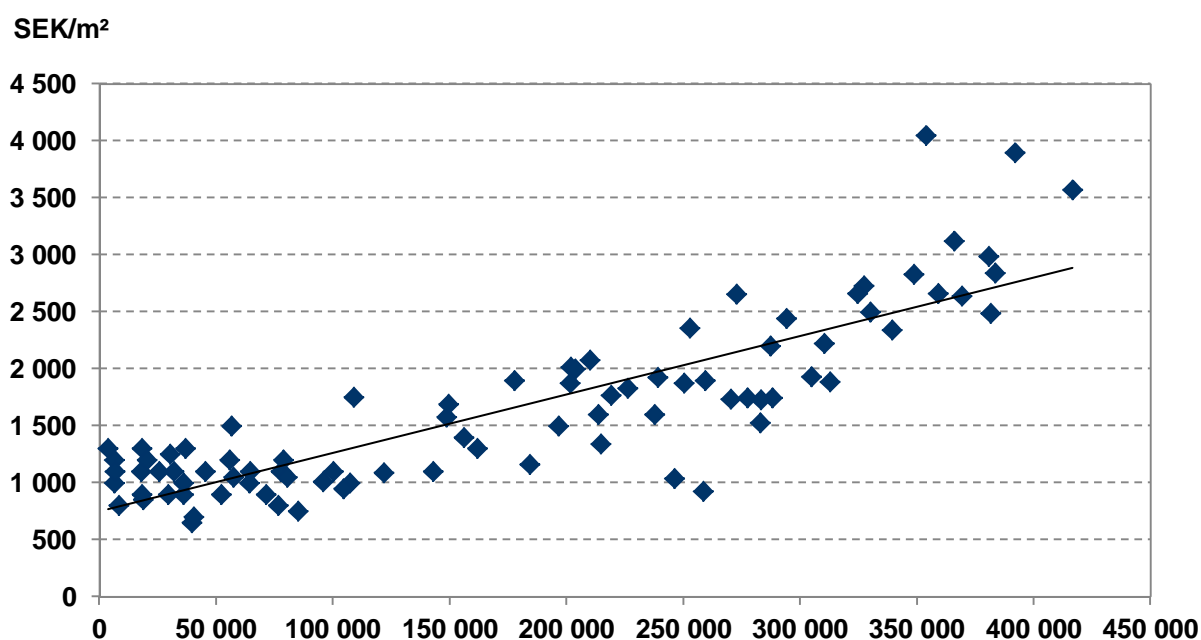


Källa: Strategy, Datscha, Spacescape och Evidens

3.1. Accessibility to public transport

Accessibility is a basic prerequisite for a metropolitan region to function and compete, as described in sections 2.1.2 and 2.2.1. This situation is clearly reflected in the variation in office rents. As a general rule, the closer a location is to the city centre, the higher the demand for it⁶⁷.

Figure 7 Correlation between accessibility (number of residents who can reach the area within 30 minutes by public transport) and office rents (Swedish krona).



Source: Evidens, Spacescape, White

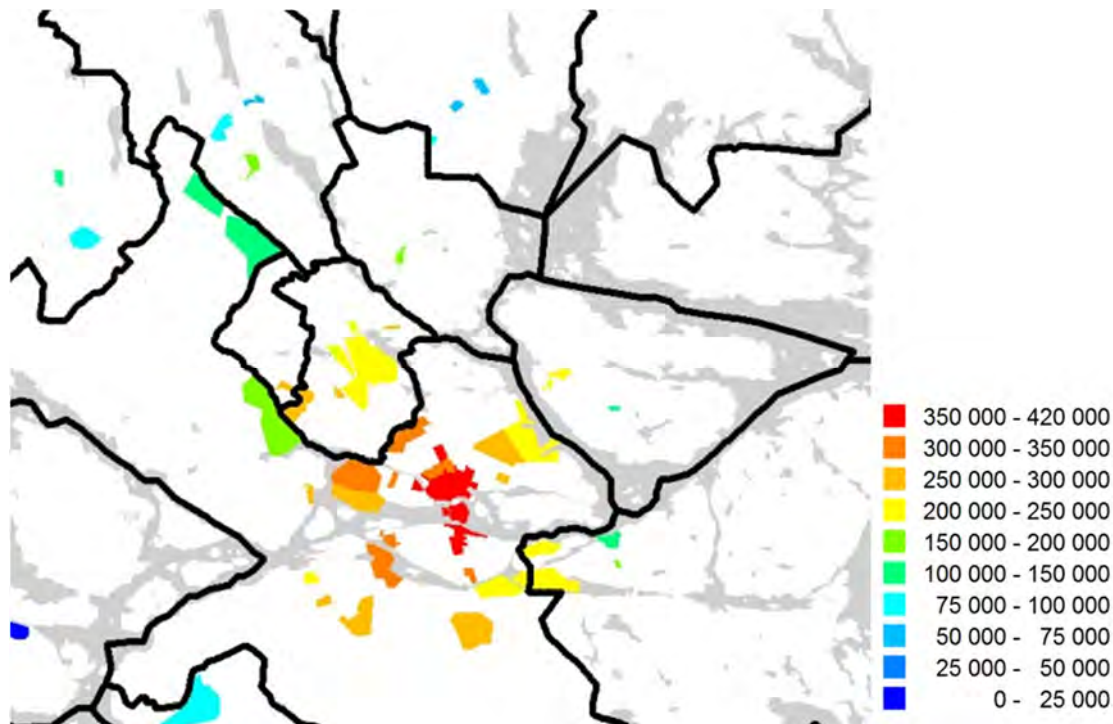
Figure seven above shows a significant correlation for accessibility to public transport. No equivalent correlation could be confirmed for travel by car. One assumption is that this can be explained by the fact that this is an option widespread in the region, which creates small relative differences in the attractiveness of location.

A closer analysis of the correlations shows that accessibility to housing is the decisive factor, which shows in turn that it is good conditions for commuting to work by public transport that create attractiveness. Rail-based traffic plays a particularly important role (the so-called rail factor⁶⁸), although less so for office areas than for residential areas. Accessibility by bus is also extremely significant for offices. Other kinds of accessibility such as proximity to other urban functions also creates added value – but only if these functions are within walking distance – i.e. we can talk about a functionally integrated environment, see also section 3.2.

⁶⁷ Christaller W (1933), *How I discovered the Theory of Central Places*, Oxford Univ. Press 1972

⁶⁸ Johansson T & Svensson T, *Spårfaktorn på spåret [The rail factor on the rails]*, VTI 2011

Figure 8 Accessibility from residential to office areas (Measured by: number of residents within 30 minutes by public transport within the Stockholm region).



Source: Evidens, Spacescape, White

Figure eight above shows that proximity to the Stockholm city centre is of decisive importance for rental levels. This means that the desire to invest and the pressure to develop are greatest in the central parts of the Stockholm region. The study verifies the research referred to above (section 2.2.1), which shows that demand for offices is greatest when the combined transport costs are lowest. The figure also shows that certain regional city centres have good accessibility; the circle denotes Kista.

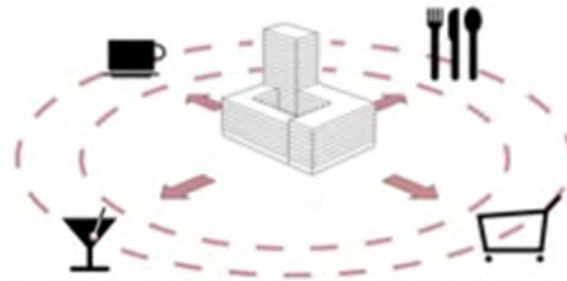
3.2. Urban activities, population density and mixed functions

An attractive urban environment is associated with the presence of shops, restaurants and experience-based businesses and activities within walking distance. This is not only about consumption, but about what is known in the world of research as a *third place*, away from the home and the workplace. A place where you can meet others in connection with a social activity – an urban living room⁶⁹. According to the study entitled *Valuations of urban quality*, the range of urban businesses depends on the following variables: the area's accessibility, density and the number of entrances at street level. According to the study, the first two variables depend strongly on the region's total number of inhabitants. The variable "number of entrances at street level" shows that an attractive local environment is also required in

⁶⁹ Oldenburg R, *The Great Good Place*, New York 1991

order achieving attractiveness, and this is a factor possible to develop within the frame of public spatial planning.

Figure 9 The urban quality “urban activities” measured as the range of shops and restaurants available within 1,000 metres of the office.



Source: Evidens, Spacescape, White

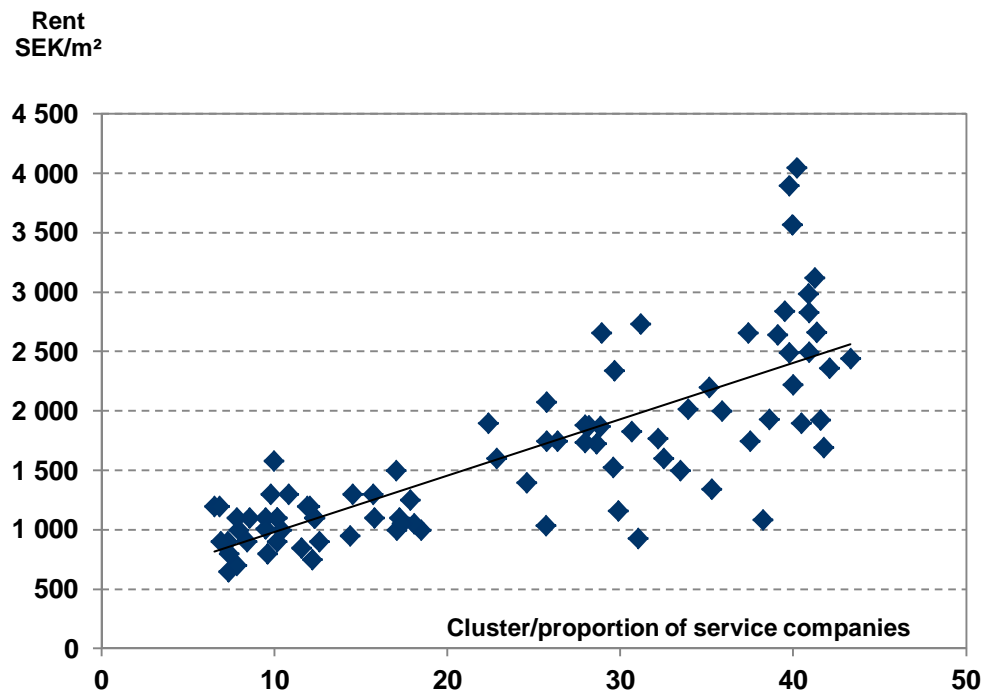
Urban activities are very important for offices. Being able to go out and eat at lunchtime or after work as well as to go shopping and do errands are very important for employees. This is also important for companies, as restaurants and cafés are venues for meetings and business transactions. Research shows that knowledge-intensive companies are more likely than others to look for vibrant, densely populated, mixed-function environments where there are significant opportunities for social interaction and financial transactions⁷⁰. The study also shows that businesses at street level are affected by the layout of the road network, not only for throughflow and flows, but also for walking and spending time.

⁷⁰ Engström C-J, *Kunskapsdriven näringslivsutveckling och stadsomvandling [Knowledge-driven business development and urban transformation]*, (from an anthology entitled “The development potential of urban regions”) KTH 2008

3.3. Cluster formation

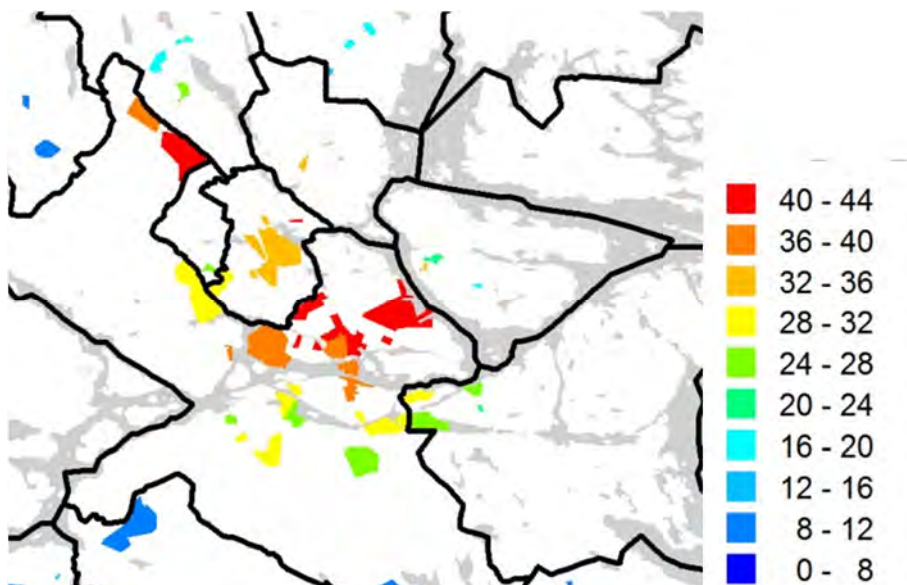
The study entitled *Valuations of urban quality* shows that areas with a high proportion of office-oriented business activities have higher rental levels.

Figure 10 Correlation between a high proportion of companies in the area and rental levels.



Source: Evidens, Spacescape, White

Figure 11 Areas with a high concentration of office businesses in the Stockholm region. (Measured as: the proportion of office employees within 3 km walking distance). The circles denote regional city centers



Source: Evidens, Spacescape, White

The attractiveness of being located close to other companies can be explained by the cluster theory, see section 2.1.3. The figure above shows that some regional city centers have the “critical mass” that can be called a cluster and is required in order to attract new office-based businesses.

3.4. Modernity and vacancy rates

Building design is also significant when it comes to demand for offices. However, the study entitled *Valuations of urban quality* found it difficult to apply other measures of design than the degree of modernity (measured here as year of construction, i.e. when the office was built or renovated). For the year of construction, there is a correlation with the rental level, albeit much less clearly stated than the parameters described above. The willingness to pay for premises of a modern quality is usually higher compared with older office premises. The explanation is that modern offices are space-efficient and have a good working environment and better comfort through modern installations.

The property market in the Stockholm region today is largely balanced. This means that new office buildings are drawing tenants from older ones. Areas with increasing vacancies generate lower rental levels. The vacancy rate is an *image carrier*. Areas that have taken on a lower image exude low attractiveness – which can be difficult to reverse.

3.5. Summary

The study *Valuations of urban qualities* shows that a small number of qualities can explain the connection between office rents and the attractiveness of a place for locating your office. The study has identified, and verified, the fact that certain urban environment qualities are significantly important for rental levels in an office area. The correlation is by far strongest for accessibility to public transport (73%). This gives Stockholm city center a strong competitive advantage. There is, however, empirical support for the theory that a consistent investment in the accessibility of regional city cores towards a polycentric future can relieve the load on the city itself and strengthen the multi-core nature of the region. There are two conclusions of the study: *firstly* that rail-bound stations should form the hub of urban developments, and *secondly* that urban activities and well laid out, integrating street-grids should be developed around, and linked to, these nodes. The study also draws the conclusion that the layout of the road network and high density in developments are the key tasks for the urban planning function. The street is a public space where people must be able to both travel *and* meet – making it an element of the urban environment that constitutes urbanity.

4. The significance of the process, and of public transport

The two studies *Synergies between investments* and *Valuations of urban qualities* both show that theories of regional development and urbanity represent a sound basis for the planning focus described in RUFS 2010 and in many municipal master plans in Stockholm County. The urban qualities study shows that some of the theories are followed by a concrete reality where efficient urban transport and high urban density is a strong driver for office locations.

The most important conclusion in the Synergy report is that investments cannot be generally or mechanically expected to create a predictable chain of effects. When it comes to effects of investments, certain effects only emerge after a very long time. Other – perhaps expected – effects may occur, but at places where they were not foreseen and that cannot be attributed solely to the investment made. Certain effects fail to materialize at all, despite empirical evidence from other similar cases suggesting that they should probably have happened. Instead, the case studies suggest a picture reflecting that the individual processes and interaction between parties involved were of decisive importance for the outcome. The fact that processes are of great importance is well known from research based on governance theory.

4.1. From objective to actual reality

The case studies in the Synergies-report show that the motives and expectations – the objectives – that existed initially in both public and private initiatives do not as a general rule correspond with the actual course of events in realizing these objectives.

Furthermore, many of the cases show that close, sustainable collaboration is required in order for genuine synergies to develop. This applies between public projects such as in Tensta and Flemingsberg, where public investments in education, culture and central businesses were not coordinated. It is equally true of the collaboration between public and private sectors, where cases such as Alvik, Nacka strand and Telefonplan have not so far resulted in the desired outcome. In other words, there is often no clear allocation of roles or forms of collaboration between public and private sectors regarding long-term strategies. The fact that such forms do exist is proven by the case of Kista, which represents a well-developed, institutionalized collaboration.

It is also true of collaboration between private property owners. Hammarby Sjöstad is an example of several small property owners acting independently. This reduces the opportunities to create a diverse range of shops and services that strengthen one another. The municipality's engagement ceased when the detailed plan was adopted, which proved to be a general problem. No municipal player in the City of Stockholm feels that it is responsible for realizing the overarching objectives through collaboration in the administrative phase.

Telefonplan and Flemingsberg are examples of cases where both public and private property owners have been unable to help establish a good mix of companies in the area. The reasons for this are that developments take a long time, which brings risks of rental losses if the “right” tenant cannot be attracted. Not even public property companies have had an undertaking that involves this kind of social objective.

A third observation is that the absence of methods and tools to *monitor* developments and thus obtain base data on which to act when the expected development is not realized or moves in directions other than those envisaged. This kind of monitoring and evaluation of the

direction of travel for strategically important areas, e.g. regional city centers, should be integrated into strategic planning at regional and municipal level.

4.2 Concluding reflections

What has become clear in the case studies in the Synergy report is partly the lack of interaction between public and private sectors, and partly the link between the early, more strategic, stages and the later stages, when a more pragmatic approach takes over and those involved 'do what they've always done'.

The observations of the case studies can be summarized on this basis. The following reflections may offer guidance for processes in which the intentions must have the conditions to be realized.

4.2.1. The importance of clarifying environmental conditions

Investments take place in both a regional and a local context – against the background of an increasingly global, network-based integration of economies. Is the intended investment having effects in the region, in parts of it or within the area? What is required for the effects to emerge where they are considered to be most important for continued regional development in strategic terms? Neither public nor private players can assess these issues on their own.

Processes involving many different parties that depend on how others act for their own future actions should therefore contain elements of a joint environmental analysis and work on objectives.

4.2.2. The importance of a sustainable focus and flexible implementation

Effects of a certain investment in infrastructure, housing and installations often take a long time to become visible, and an even longer time to achieve their full effect. It takes time for the physical reality to change, and also to change the 'mental maps' that affect actual behavior, e.g. travel habits as well as perceptions of an area, its status and its attractiveness.

Lofty ambitions are often associated with detailed solutions that are confirmed in legal institutes as detailed plans. This can hamper practical implementation, where deviations may require changes to the current plan – especially if small businesses and junior administrators are involved.

4.2.3. Advanced platforms for collaboration

Complex development processes require stable collaboration, in which the parties involved are very familiar with each other's interests and perspectives. Collaboration at present is almost sequential, i.e. the parties take over from one another in assuming responsibility to take the process forwards. It appears that the original intentions lose force with each such handover, perhaps eventually disappearing entirely.

In order to prevent such a trend, platforms for collaboration are required that manage risks of a certain strategic focus and that regulate how various future courses of action may be managed by different parties. There are international examples of planning contracts that could be applied in a Swedish context. This model is well established in France. An embryonic form can be discerned in the current agreement between the Swedish government, Stockholm County Council and Nacka Municipality and the City of Stockholm. There, the arrival of the new underground line is conditional upon Nacka Municipality releasing new homes, which is also expected to co-fund the investment in a new underground line.



LABOUR FORCE LOCATION IN SZCZECIN - A SPATIAL STUDY

Cluster mapping and analyses



©Photo: Urząd Miasta Szczecin

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Picture on the cover: *The fountain at the foot of Chrobry Waterfront, Szczecin*

Acknowledgements

The authors wish to extend their thanks to Thierry Petit (of IAU-Ile de France) and Douglas Gordon from Helsinki (City Planning Department, Strategic and Urban Planning Division, City Plan Team) for their creative contribution and inspirational discussions during all METREX meetings on the economic significance of clusters and the impact of labour spatial location on socio-economic development of agglomeration.

This Study was developed by joint effort in Biuro Planowania Przestrzennego Miasta (Szczecin City Spatial Planning Office - BPPM), responsible for developing the city spatial planning policy that is subject to the city council decision in the form required by the local law as 'The Study of conditions and directions of spatial development of the city of Szczecin' (hereafter referred to as the Study of Conditions) and for preparing local city development plans (hereafter referred to as local plans), which after their acceptance by the Mayor of Szczecin and adoption by the City Council become the local law.

The final content of the Study reflects the expertise of the authors, namely: Ms Ewa Kurjata (City Strategy Management Department, Szczecin Local Government), Mr Dariusz Dołgoszyja and Mr Krzysztof Michalski (both of BPPM), who participated in works and meetings or conferences held by the Network of European Metropolitan Areas and Regions (METREX) at various times.

Concept and organization of the Study

The analysis of cluster development potentials has been based on the information gathered from other entities, somehow connected with or organising the cluster initiatives in the region (Zachodniopomorskie Voivodeship⁷¹). It also takes into account individual self-studies in order to identify the existing gap in the clusters' activities, in the context of taking up new cluster initiatives. The case study of the ICT cluster has been included here.

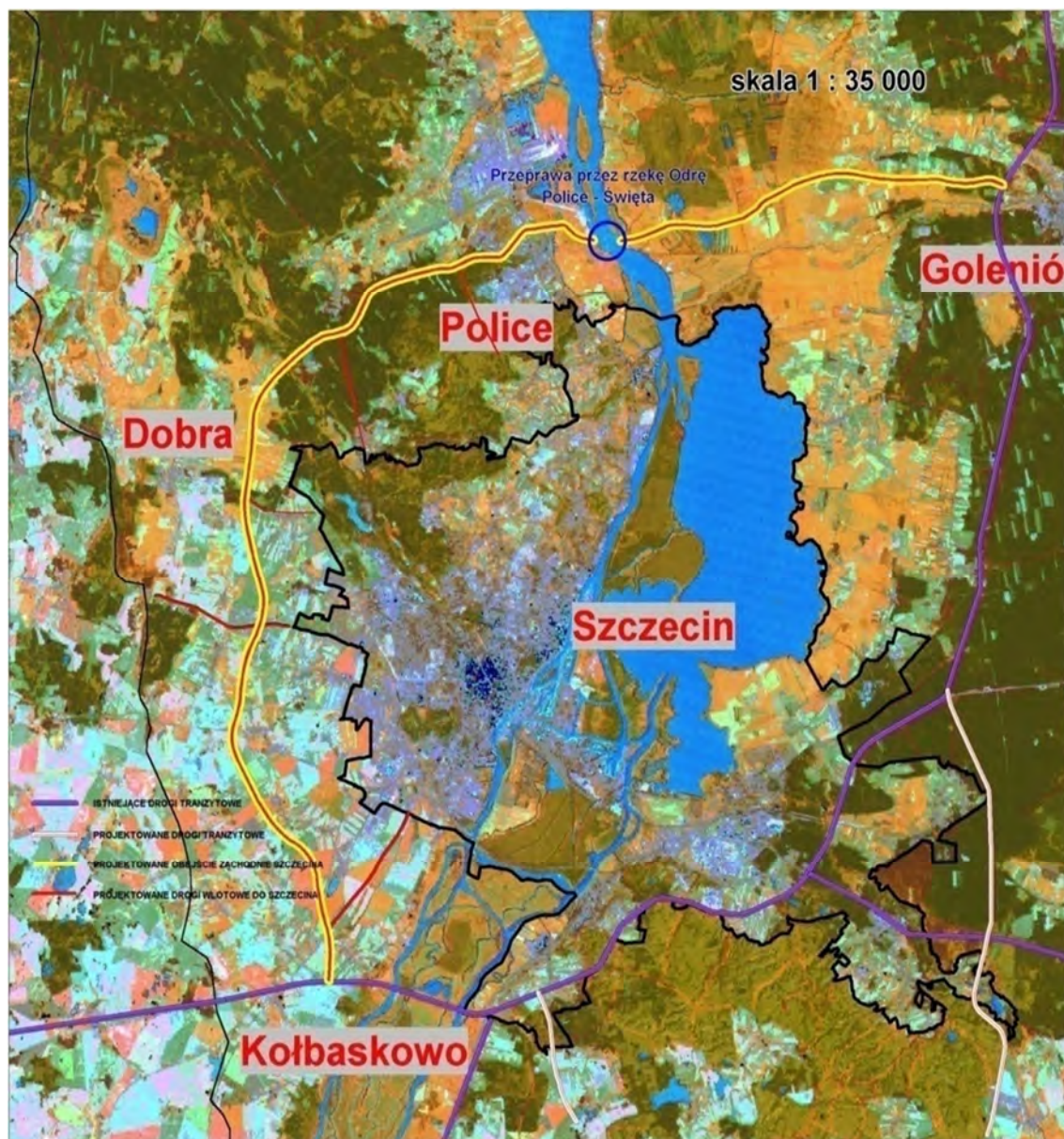
Spatial and functional analysis of enterprises concentration in Szczecin has been based on the data provided by the Central Statistical Office (GUS) and Social Insurance Institution (ZUS). After having verified their activities, the businesses were analysed according to the classes of size: micro, small, medium and large, as well as along the classes and sections of the Polish Classification of Activities - PKD. The results were confronted with the present spatial instructions.

Spatial concentration of labour required carrying out of numerous preliminary analyses to identify the average employment in various size classes and types of public and non-public entities. The results were confronted with the areas of concentration of industry, transport services system, including public transport services.

⁷¹ Since 1999, the **administrative division of Poland** has been based on three levels of subdivision. The Polish territory divided into voivodeships (states) (Polish: województwo); these are further divided into powiats (counties), and these in turn are divided into gminas (communes or municipalities). Major cities normally have the status of both gmina and powiat. Poland currently has 16 voivodeships, 379 powiats (including 65 cities with powiat status), and 2,478 gminas. The current system was introduced pursuant to a series of acts passed by the Polish Parliament in 1998, and came into effect on 1 January 1999. Previously (in the period from 1975 to 1998), there had been 49 smaller voivodeships, and no powiats. The reform created 16 larger voivodeships (largely based on and named after historical regions) and reintroduced powiats. Source: http://en.wikipedia.org/wiki/Administrative_divisions_of_Poland.

City of Szczecin – Information sheet –2012

Szczecin



1. Position in national context

largest city on the Polish-German border and in the south Baltic area; capital of Euroregion Pomerania; capital of Zachodniopomorskie Region; administrative/cultural centre;

2. City Population

408,913 / (agglomeration),

686,900 / (metropolitan area)

3. Population development

decreasing population from 416,657 in 2000; status quo in the metropolitan area

4. Main economic sectors:

financial and legal services, consumer services, trade and logistics, government, health care services, ICT services, construction industry, BPO; maritime industry.

5. No. of Universities:

4 (22 higher educational institutions in total)

6. Administration budget (€) 406.1 ml

Preface

Reasons behind the choice of topic and the scope of Study

A large dynamics of economic changes connected with the transformation from the Socialist to market economy diametrically changed the entrepreneurial and labour markets. This has immediately resulted in the lack of data and spatial analyses of entities and labour force location (on the local level). This deficit is a major drawback of spatial policy, which in the Polish legal system defines the framework for economic activity, through local master plans.

While working on the spatial policy for the city of Szczecin, and its further updates, it was concluded that, the scope of so far planning works should be extended to include the analysis of cluster development potential and labour market analyses.

The analyses on demographic changes and their socio-spatial effects in Szczecin, implementation of the city transport model since 2005 launched by BPPM, gave pretexts to start this Study. (The mentioned analyses also included analyses on trade development and many others).

An excellent opportunity to prepare this pioneering in Szczecin spatial analysis of labour market arose, when working relations with partners from the METREX Economic Expert Group started.

Intended objective of the work

The objective of this Study is to develop the first economic atlas for the Szczecin agglomeration, which will allow for verifying to date spatial policy implemented in the city. It will also help designating the framework of future spatial-economic materials that are supposed to shape the economic development policy of the core city and its metropolitan area.

This very Study is a synthetic description of the labour market in Szczecin as of 2011. The material has been organized in the way agreed with the partners from the Metrex Economic Group. It contains a case study of ICT cluster, supported by the Szczecin Local Government (i.e. institutional support).

This work, after being completed, will serve a significant role in shaping the development policy, extending its assumptions to include spatial analyses of business entities location and their functional concentration, including the phenomenon of cluster creation.

The analyses on the labour market, including those on the concentration of labour force, will support to date analyses on transport services and transport policy for the city of Szczecin (accessibility), and those on social needs. They will indicate significant economic and organisational conditions for running business activity in Szczecin.

Challenges

A fundamental drawback of economic and social analyses is related to the accessibility of data. This Study uses the statistical data on the number of businesses in the size classes

and on total employment and in the groups of sections PKD 2007⁷²). The authors acquired the address base of entities with basic registered data. During the work, a group of active entities was identified. Information on employment in some entities of small and large sizes was obtained via e-mails.

A necessary condition to prepare a spatial analysis of the labour market was to identify an average employment level in the size classes of businesses (micro, small, medium and large) and in the groups of sections K1 : K5 (K1=A, K2= B,C,D,E and F, K3= G,H,I and J, K4= K and L, K5= M,N,O,P,Q,R,S and T. (Section U has not been taken into consideration).

A solution to such problem had to tackle with additional limiting factors, namely the conformity between the number of economic entities and employment in them (for the population of all economic entities).

While analysing various classes of functions, the authors searched for such interrelation for which the field under the parabolic curve (which presents the function, whose argument is a number of the employed) best corresponds to employment in the whole population of entities (businesses) and at the same time meets the requirements given above (for groupings of sections and size classes of economic entities). The received solutions were confronted with the data on employment received directly from businesses.

The obtained matrix of the average levels of employment in 20 groups of companies brought us closer to their spatial location, and it served to prepare analytical and general (surveying) maps for the labour market.

In such analyses, the Kernel method relying on the assumption of the existence of symmetrical distribution of probabilistic feature density for an analysed feature around the analysed core is often used.

In case of spatial analysis of labour force location, there are however a number of limitations, such as for example: referring employment to the headquarters of the entity. Companies are not always willing to reveal in the statistical registries information on relevant changes in their activity profile. Besides, information on the level of employment is not available, either. That was a decisive factor while choosing the relevant analytical method, based on a high dimensional analysis of weighted averages

Applying the mean method results in raising/overstating employment in some entities at the cost of other entities (in the analysed group). Obtained accuracy is however in the light of other limitations and obtainable statistical data, sufficient to reach the aim of the analysis.

Micro businesses constitute the most difficult area of analyses. Some of them are one person entities. Another group consists of entities possessing many sources of revenues. Some part of the population of one-person micro businesses should be counted as groups of employees as they operate as employers themselves, and depending on the need, instead of work contract they choose to register business activity (in a colloquial language such a form of activity is called "rubbish contract"). The picture of spatial location of labour in this group is burdened with the largest risk of error.

⁷² PKD 2007 stands for the newest and currently valid classification of types of activities, adjusted to the classifications used in the European Union.

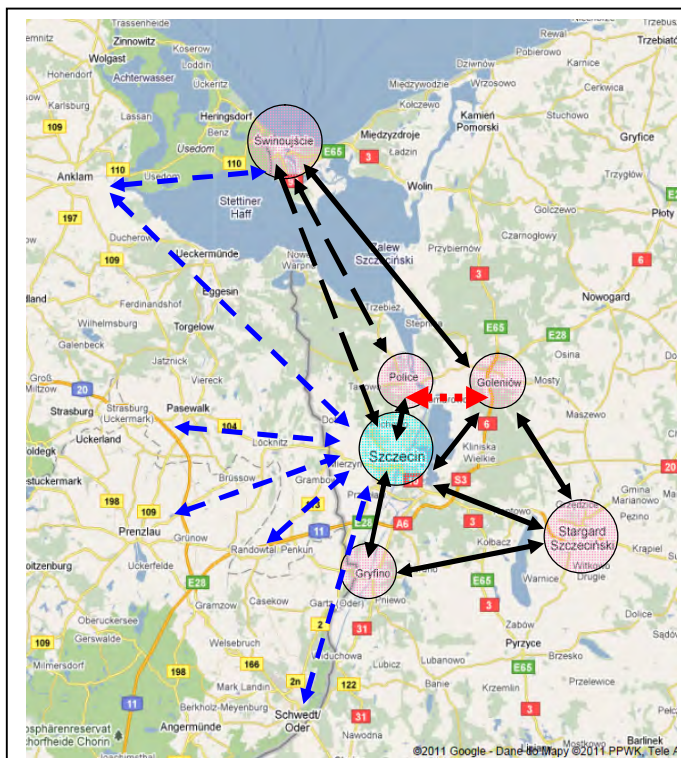
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1. Basic information about the Szczecin Metropolitan Area. The SMA in a nutshell.

The Szczecin Metropolitan Area (SMA) is inhabited by ca. 687 thousand people, out of which 409 thousand live in Szczecin only. One can observe two trends in the area. First is related to intensive urbanization of suburban areas and intramigrations by young and middle-aged persons (single house development), and the other is connected with ageing of population, which within the coming 20 years will result in the projected 2% drop of population.

The SMA is inhabited by 39.9% of the region's population. The SMA's most important cities are: Police, Goleniów, Stargard Szczeciński, Świnoujście and Gryfino, which together with Szczecin form a well-located polycentric system. As little as 4.6% SMA's population lives in the rural areas. During the last 20 years, two residential areas have been created at Dobra Szczecińska and at Kołbaskowo, where ca. 4.3% SMA's population lives.



Source: <http://mapy.google.pl/>



Source: The Association of Szczecin Metropolitan Area, 2012: The administrative division of the SMA.

TABLE. 1. AGE STRUCTURE IN THE SZCZECIN METROPOLITAN AREA (2012)

Territorial unit	Population in total	Pre-production age - below 15 years of age	Production age: 15- 59 years of age - females, 15-64 years of age - males	Pre-production age (17 years and less)	Production age: 18-59 years of age-females, 18- 64 years of age- males
	[person]	[person]	[person]	[person]	[person]
Stargard Szczeciński (1)	69724	9785	47641	11929	45497
Kobylanka (2)	4761	791	3342	968	3165
Stargard Szczeciński (2)	12380	2150	8769	2650	8269
Szczecin (1)	408913	52401	273480	63412	262469
Goleniów (3)	35381	5698	24276	6890	23084
Goleniów - town (4)	22846	3384	15415	4103	14696
Goleniów – rural area (5)	12535	2314	8861	2787	8388
Stepnica (2)	4858	779	3407	960	3226
Gryfino (3)	32177	4864	22410	5946	21328
Gryfino - town (4)	21589	3096	15022	3775	14343
Gryfino – rural area (5)	10588	1768	7388	2171	6985
Stare Czarnowo (2)	3864	576	2675	711	2540
Dobra (Szczecińska) (2)	18357	3651	12923	4299	12275
Kołbaskowo (2)	11251	2200	8112	2628	7684
Nowe Warpno (3)	1692	249	1194	319	1124
Nowe Warpno - town (4)	1246	179	874	235	818
Nowe Warpno – rural area (5)	446	70	320	84	306
Police (3)	42033	6328	30132	7811	28649
Police - town (4)	33816	4964	24400	6130	23234
Police – rural area (5)	8217	1364	5732	1681	5415
Świnoujście (1)	41509	5031	28105	6216	26920
SOM - in total	686900	94503	466466	114739	446230

Source: Local Data Bank, accessed in August, 2013.

Explanatory note:

Numbers standing next to the names of territorial units⁷³ denote: (1) urban gmina, (2) rural gmina, (3) urban-rural gmina, (4) town in an urban-rural gmina (a rural locality, which assigned the status of town), (5) rural area in an urban-rural gmina (the remaining area of a gmina, excluding the area of a town).

One can easily notice that the greatest share of population in the pre-production age can be found outside Szczecin. As a result, great numbers of young people commute to schools in Szczecin. Outside Szczecin, the largest production-age group of people live in the towns of Police, Świnoujście and Stargard Szczeciński.

Placing in the SMA industries of weak links with R&D, including textile industry, despite a 20-year transformation, did not allow solving the problem of relatively high structural unemployment. The situation in the market has been worsened because of the bankruptcy of the Szczecin Shipyard in 2010.

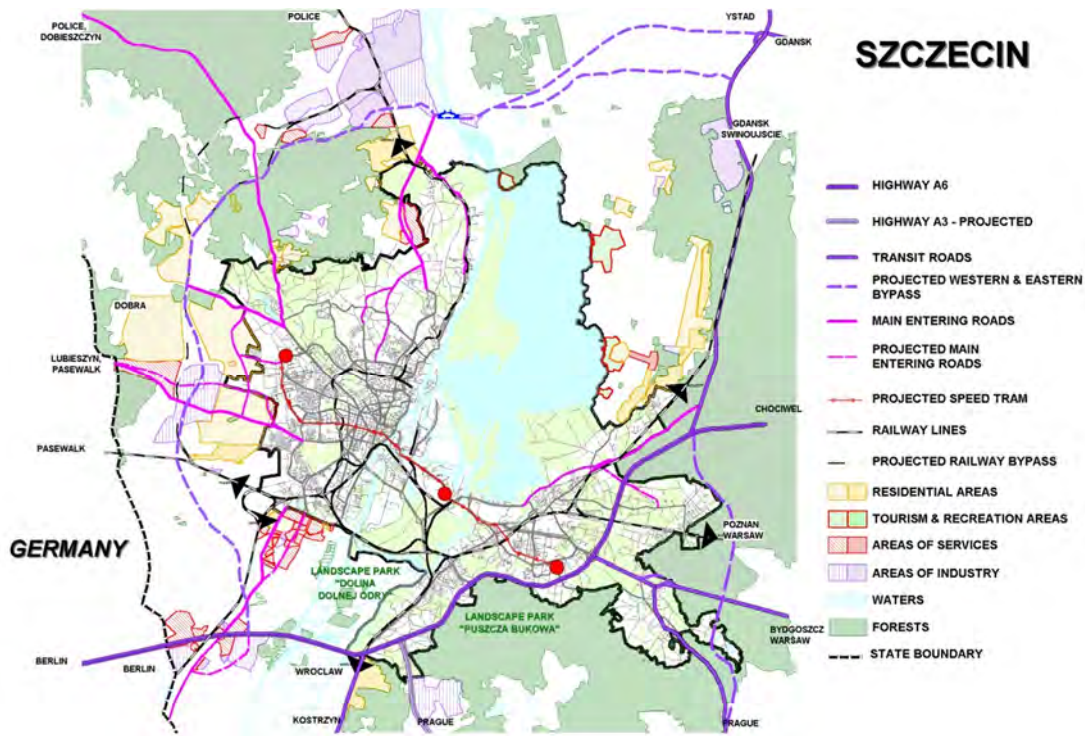
⁷³ The names of territorial units comply with the NUTS (Nomenclature of Statistical Territorial Units) terminology, introduced by Eurostat, the European Commission's Statistical Office, to classify regions into a hierarchy of five levels on the basis of their size. More: Z. Horvath, Handbook on the European Union, Hvgorac, Bugapest, 2005.

TABLE. 2. AGE STRUCTURE AND POPULATION DENSITY IN THE SZCZECIN METROPOLITAN AREA (2012)

Territorial Unit	Population total	Density per 1 km2	Pre- production age	Production age	Post- production age	production age-mobile age	Production age-non- mobile age	Post- production age
	[person]	[person]	[%]	[%]	[%]	[person]	[person]	[person]
Stargard Szczeciński (1)	69724	1453	17,1	65,3	17,6	27622	17875	12298
Kobylanka (2)	4761	39	20,3	66,5	13,2	1942	1223	628
Stargard Szczeciński (2)	12380	39	21,4	66,8	11,8	5294	2975	1461
Szczecin (1)	408913	1359	15,5	64,2	20,3	161778	100691	83032
Goleniów (3)	35381	80	19,5	65,2	15,3	14317	8767	5407
Goleniów - town (4)	22846	1904	18,0	64,3	17,7	9089	5607	4047
Goleniów – rural area (5)	12535	29	22,2	66,9	10,8	5228	3160	1360
Stepnica (2)	4858	17	19,8	66,4	13,8	1982	1244	672
Gryfino (3)	32177	127	18,5	66,3	15,2	13046	8282	4903
Gryfino - town (4)	21589	2159	17,5	66,4	16,1	8634	5709	3471
Gryfino – rural area (5)	10588	43	20,5	66,0	13,5	4412	2573	1432
Stare Czarnowo (2)	3864	25	18,4	65,7	15,9	1553	987	613
Dobra (Szczecińska) (2)	18357	167	23,4	66,9	9,7	8053	4222	1783
Kołbaskowo (2)	11251	107	23,4	68,3	8,3	5360	2324	939
Nowe Warpno (3)	1692	9	18,9	66,4	14,7	668	456	249
Nowe Warpno - town (4)	1246	50	18,9	65,7	15,5	481	337	193
Nowe Warpno – rural area (5)	446	3	18,8	68,6	12,6	187	119	56
Police (3)	42033	167	18,6	68,2	13,3	17101	11548	5573
Police - town (4)	33816	914	18,1	68,7	13,2	13844	9390	4452
Police – rural area (5)	8217	38	20,5	65,9	13,6	3257	2158	1121
Świnoujście (1)	41509	211	15,0	64,9	20,2	15677	11243	8373
SOM - in total	686900	175	16,7	65,0	18,3	274393	171837	125931

Source: Local Data Bank, accessed in August, 2013.

SPATIAL LOCATION OF SOME OF THE METROPOLITAN FUNCTIONS AROUND SZCZECIN



Source: Self-study by BPPM in Szczecin.

One of possible activities of territorial self-governments within the SMA is to support cluster initiatives. Through consolidating entities within clusters, they can significantly contribute to creating new jobs and keeping graduates in the SMA. The Industrial Park at Police meets such needs, with its area of ca. 500 ha. Another industrial park in Stargard has the area of ca. 960 ha. In Szczecin itself several parks have been established. Together with investment areas of Szczecin-Świnoujście Sea Bi-port, the total investment area is ca. 1,500 ha.

TABLE. 3. UNEMPLOYMENT AND LABOUR FORCE IN THE SZCZECIN METROPOLITAN AREA

Year 2012	UNEMPLOYMENT						EMPLOYEES IN MAIN PLACE OF EMPLOYMENT		
LABOUR MARKET	The unemployed registered by sex			Share of registered unemployed in a number of production age population			Employees by sex		
	total	males	females	total	males	females	total	males	Females
	[person]	[person]	[person]	[%]	[%]	[%]	[person]	[person]	[person]
Territorial Unit									
Stargard Szczeciński (1)	3700	1715	1985	8.1	7.2	9.2	14072	6691	7381
Kobylanka (2)	217	91	126	6.9	5.4	8.6	713	449	264
Stargard Szczeciński (2)	872	407	465	10.5	9.1	12.3	1249	643	606
Szczecin (1)	19143	9799	9344	7.3	7.2	7.4	106625	49947	56678
Goleniów (3)	1630	750	880	7.1	6.1	8.1	10263	5691	4572
Goleniów - town (4)							6182	3138	3044
Goleniów – rural area (5)							4081	2553	1528
Stepnica (2)	252	102	150	7.8	5.9	9.9	748	401	347
Gryfino (3)	1476	657	819	6.9	5.8	8.2	6396	3111	3285
Gryfino - town (4)							3454	1351	2103
Gryfino – rural area (5)							2942	1760	1182
Stare Czarnowo (2)	177	71	106	7.0	5.0	9.6	373	224	149
Dobra (Szczecińska) (2)	739	309	430	6.0	4.9	7.2	2976	1623	1353
Kołbaskowo (2)	522	246	276	6.8	6.3	7.3	1742	798	944
Nowe Warpno (3)	132	58	74	11.7	9.7	14.0	113	42	71
Nowe Warpno - town (4)							97	29	68
Nowe Warpno – rural area (5)							16	13	3
Police (3)	2430	1049	1381	8.5	7.0	10.2	8793	5017	3776
Police - town (4)							7952	4713	3239
Police – rural area (5)							841	304	537
Świnoujście (1)	1387	673	714	5.2	4.7	5.7	7744	3550	4194
SOM - in total	32677	15927	16750	7.3	6.8	7.9	187372	92048	95324

Source: Local Data Bank, accessed in August, 2013.

The structure of size class of entities shows dominating micro companies, employing up to 9 workers, which is typical of Poland. The population of companies which may be interested in working under a cluster structure consists of entities by size classes: (10–49), (50–249), (250–999). As seen from the table No. 5, there are 4255 entities in the SMA (out of 114236 entities) potentially interested to join in the cluster.

TABLE. 4 PUBLIC AND PRIVATE ENTITIES (2012)

Territorial Unit	Total	Public sector	Private sector
	[business unit]	[business unit]	[business unit]
Stargard Szczeciński (1)	8276	295	7981
Kobylanka (2)	634	11	623
Stargard Szczeciński (2)	957	9	948
Szczecin (1)	66106	1831	64275
Goleniów (3)	4348	148	4200
Goleniów - town (4)	2925	132	2793
Goleniów – rural area (5)	1423	16	1407
Stepnica (2)	417	12	405
Gryfino (3)	3732	83	3649
Gryfino - town (4)	2655	70	2585
Gryfino – rural area (5)	1077	13	1064
Stare Czarnowo (2)	443	8	435
Dobra (Szczecińska) (2)	3411	20	3391
Kołbaskowo (2)	1635	15	1620
Nowe Warpno (3)	175	7	168
Nowe Warpno - town (4)	127	7	120
Nowe Warpno – rural area (5)	48	0	48
Police (3)	4595	226	4369
Police - town (4)	3497	207	3290
Police – rural area (5)	1098	19	1079
Świnoujście (1)	6657	133	6524
SOM - In total	114236	3262	110974

Source: Local Data Bank, accessed in August, 2013.

Despite the highest economic activity of inhabitants of the Zachodniopomorskie Region in Poland (illustrated by the largest number of entities for 10 thousand of citizens), one has to conclude that the structure of size classes of entities is less advantageous than in the best developed countries of the European Community.

As the largest effectiveness is shown by private entities, one should distinguish from all entities, the public ones. All activities related to the birth of a cluster should be directed to private entities. Public entities can initiate a cluster (becoming a cluster's promotor) and participate in its activities in the vertical system (e.g. research institute).

TABLE 5. CLASSES OF BUSINESSES IN THE SMA (in 2012)

Territorial Units	NATIONAL ECONOMY ENTITIES by size classes					
	Total	0 - 9	10 - 49	50 - 249	250 - 999	1000 & more
	[entities]	[entities]	[entities]	[entities]	[entities]	[entities]
Stargard Szczeciński	8276	7950	261	62	3	0
Kobylanka (2)	634	618	14	1	0	1
Stargard Szczeciński	957	927	26	2	1	1
Szczecin (1)	66106	63655	1993	395	53	10
Goleniów (3) -	4348	4158	145	40	4	1
Goleniów - town (4)	2925	2802	100	19	3	1
Goleniów – rural area	1423	1356	45	21	1	0
Stepnica (2)	417	404	13	0	0	0
Gryfino (3)	3732	3591	108	30	2	1
Gryfino - town (4)	2655	2558	72	23	2	0
Gryfino – rural area (5)	1077	1033	36	7	0	1
Stare Czarnowo (2)	443	428	10	5	0	0
Dobra (Szczecińska)	3411	3309	90	10	2	0
Kołbaskowo (2)	1635	1580	48	7	0	0
Nowe Warpno (3)	175	170	5	0	0	0
Nowe Warpno - town	127	123	4	0	0	0
Nowe Warpno – rural	48	47	1	0	0	0
Police (3)	4595	4410	152	31	1	1
Police - town (4)	3497	3351	116	28	1	1
Police – rural area (5)	1098	1059	36	3	0	0
Świnoujście (1)	6657	6452	167	35	3	0
SOM In total	114236	109981	3442	719	76	18

Source: Local Data Bank, accessed in August, 2013.

The comparison with the Eurostat's data clearly indicates less advantageous relations of size classes of EU 27 economic entities against the SMA and the Zachodniopomorskie Region. It has been shown on the enclosed chart.

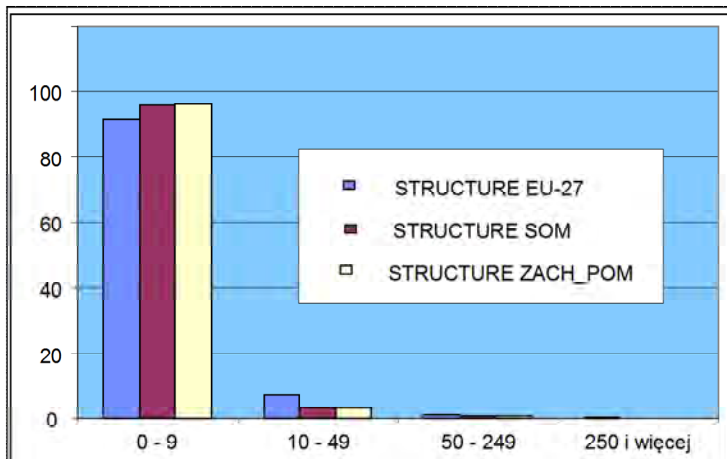
Table 1: Key indicators for enterprises in the non-financial business economy, EU-27, 2005 ⁽¹⁾

	Total	SMEs	Micro	Small	Medium	Large
Number of enterprises (millions)	19.65	19.60	18.04	1.35	0.21	0.04
Share in total (%)	100.0	99.8	91.8	6.9	1.1	0.2
Persons employed (millions)	126.7	85.0	37.5	26.1	21.3	41.7
Share in total (%)	100.0	67.1	29.6	20.6	16.8	32.9
Value added (EUR billion)	5 360	3 090	1 120	1 011	954	2 270
Share in total (%)	100.0	57.6	20.9	18.9	17.8	42.4
Apparent labour productivity (EUR 1 000 per person employed)	42.3	36.4	29.9	38.7	44.8	54.4
Relative to total (%)	100.0	86.1	70.7	91.5	105.9	128.6

Source: Eurostat (SBS size class)

⁽¹⁾ Including rounded estimates based on non-confidential data; SMEs (1-249 persons employed); micro enterprises (1-9 persons employed); small enterprises (10-49 persons employed); medium-sized enterprises (50-249 persons employed); large enterprises (250 or more persons employed).

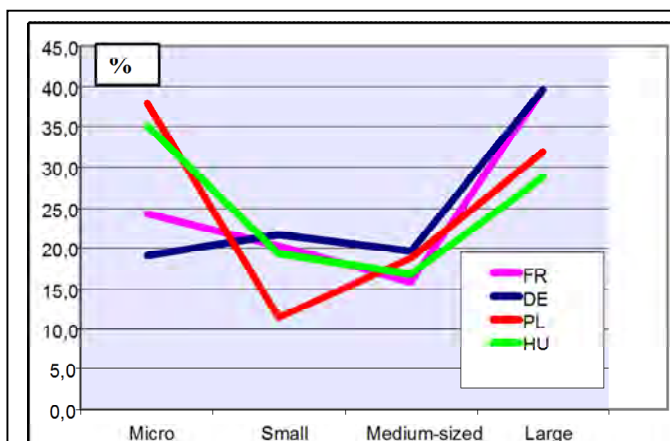
Source: Manfred SCHMIEMANN, Industry, trade and services, **Statistics in focus** 31/2008, EUROSTAT.



Charter 1. Structure of size classes in the SMA, as compared with the Region and EU-27.

One should stress here that the structure of size classes of the SMA entities is more favourable than those in the Zachodniopomorskie Region, and consequently they show a larger economic potential.

The differences in sizes of classes of entities is even more clearly visible in the EUROSTAT's data related to non-financial sector entities. The chart below shows the structure of size classes of entities in France and in Germany against the structure of size classes of entities in Poland and in Hungary.



Charter 2. The structure of size classes of entities in non-financial sector in Poland and in Hungary as compared to the classes of entities in France and in Germany; „2” – current statistics (short-term)

A considerably larger number of micro entities highlights the significance of business incubators, which as an initial stage, help firms go to a higher class of small and medium enterprises that create in the Polish conditions clusters.

In Hungary, there are less large entities, while in Poland there is less both small and large entities.

As shown above, the following factors influence the capability of growing clusters in the region:

- structure of size classes of entities,
- share of private entities,
- concentration of population in the region, including urban population,
- concentration of economic potential in the SMA,

- distribution of the labour force,
- employment structure as a result of former industry branches structure in the region,
- presence of R&D centres in the region,
- presence of higher education schools in the region,
- endogenic potentials in the region.

Assessing the region's capability of incubating clusters, one should in detail analyse the structure of entities registered by REGON – the system staying in compliance with the European classification of types of activity.

Table 6. Business entities registered according to GDP 2007 (2012).

Territorial Unit	Zachodniopomorski Region			Metropolitan Area		
	total [entities]	Public [entities]	Private [entities]	total [entities]	Public [entities]	Private [entities]
section A	6091	53	6038	1522	10	1512
section B	127	1	126	52	1	51
section C	17110	37	17073	9868	26	9842
section D	538	27	511	296	10	286
section E	612	80	532	297	22	275
section F	27985	24	27961	14773	15	14758
section G	52562	18	52544	26926	13	26913
section H	14106	38	14068	8737	27	8710
section I	12885	53	12832	3722	25	3697
section J	4104	7	4097	2850	5	2845
section K	6512	5	6507	3688	5	3683
section L	15259	3721	11538	7654	1930	5724
section M	16109	56	16053	10697	24	10673
section N	6258	9	6249	3986	5	3981
section O	1051	588	463	284	217	67
section P	6453	1918	4535	3493	741	2752
section Q	13242	313	12929	7087	120	6967
section R	3715	221	3494	1737	63	1674
sections S and T	12320	6	12314	6561	2	6559
section U	6	1	5	6	1	5
Total:	217045	7176	209869	114236	3262	110974

Source: Self-study, based on the Local Data Bank, accessed in August, 2013.

The next table shows the share of private sector entities operating in the SMA among the population of private entities functioning in the region. The table shows the classification sections in the REGON, in which over 60% are private sector entities. In this group, beside extraterritorial units, section J has the greatest significance (INFORMATION AND COMMUNICATIONS), grouping ca. 69.44% entities registered in the region. Also, section M – (PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITY), grouping ca. 66.49% of entities registered in the region plays a significant role.

The fact was a major premise for the Mayor of Szczecin's decision to establish and to support organisationally and financially (actual construction of the technological park) the ICT cluster (Informatics and Telecommunications).

Table 7. Participation of private sector entities active in the SAM against the population of private entities active in the Region (2012)

SECTION	Zachodniopomorski Region	Metropolitan Area	Share of SMA in the region
	Private sector	Private sector	
	[entities]	[entities]	[%]
SECTION A - AGRICULTURE, FORESTRY, HUNTING, FISHERY	6038	1512	25.04
SECTION B - MINING AND EXTRACTING	126	51	40.48
SECTION C - INDUSTRIAL MANUFACTURING	17073	9842	57.65
SECTION D - PRODUCING AND SUPPLYING IN ELECTRIC ENERGY, GAS, VAPOUR, HOT WATER AND AIR TO AIR	511	286	55.97
SECTION E P- WATER DELIVERY; WASTE WATER AND WASTE MANAGEMENT, RECULTIVATION	532	275	51.69
SECTION F - CONSTRUCTION	27961	14758	52.78
SECTION G - WHOLESALE AND RETAIL TRADE ; REPAIRS OF VEHICLES, INCLUDING MOTORCYCLES	52544	26913	51.22
SECTION H - TRANSPORT AND WAREHOUSES SYSTEM	14068	8710	61.91
SECTION I - ACCOMMODATION AND CATERING SERVICES	12832	3697	28.81
SECTION J - INFORMATION AND COMMUNICATIONS	4097	2845	69.44
SECTION K - FINANCES AND INSURANCE SERVICES	6507	3683	56.60
SECTION L - REAL ESTATE MARKET SERVICES	11538	5724	49.61
SECTION M - PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITY	16053	10673	66.49
SECTION N - ADMINISTRATIVE AND BACK-UP SERVICES	6249	3981	63.71
SECTION O - PUBLIC ADMINISTRATION AND NATIONAL DEFENCE; OBLIGATORY SOCIAL SECURITY	463	67	14.47
SECTION P - EDUCATION	4535	2752	60.68
SECTION Q - HEALTH CARE AND SOCIAL WELFARE	12929	6967	53.89
SECTION R - CULTURE, ENTERTAINMENT AND RECREATION	3494	1674	47.91
SECTION S - REMAINING SERVICES & SECTION T - HOUSEHOLDS EMPLOYING EMPLOYEES, HOUSEHOLDS	12314	6559	53.26
SECTION U - ORGANISATIONS AND EXTRATERRITORIAL UNITS	5	5	100.00
In total:	209869	110974	52.88

Source: Self-study, based on the Local Data Bank, accessed in August, 2013.

Analysing the economic structure of the SMA and the region, one can trace back such economic activity that while using endogenic potentials of the region, one can project establishing clusters. A complete list of potential clusters can be formed after taking into consideration global trends, namely the development of branches sparring innovativeness and development of the world's economy. An example of such a branch can be activity related to collecting, processing and transmitting of information, etc. The analysis of establishing new clusters was placed in the Attachment No.1.

A list of main clusters established in the region

Numerous cluster initiatives have been initiated as a result of cooperation among entrepreneurs, higher education schools and territorial self-governments. So far, the following clusters have been formed in the region:

- food cluster,
- chemical cluster,
- wood cluster,
- tourism cluster,
- medical cluster,
- maritime cluster,
- ICT cluster.

More detailed information about clusters is available on the CD-ROM ("Szczecin Metropolitan Area – Cluster Initiatives", Labour location Group, Vilnius-Riga, May 2010, Volume 2). Additionally, one expects the establishment and growth of such clusters:

- green energy cluster
- health food cluster
- pharmaceutical cluster.

Table 8. Frame of reference – changes in the period of 20 years: 1991 - 2020

Specification	1991	2010
NUMBER OF BUSINESSES in total	26133	65 761
STRUCTURE of businesses:		
Public sector	525	1 796 (455 only self-governmental)
Private sector	25608	63 965
joint ventures	202	1 955
micro businesses (up to 9 employees)	24031	47 880
STATE ENTERPRISES	135	5
Foundations	6	176
Private sector – associations and social organisations	0	1102
Private sector – commercial companies	1002	6 639
UNEMPLOYMENT [%]	7	9,6

Source: Self-study, based on the data acquired from the Central Statistical Office.

The number of dwellings grew of almost 25%. If one should take into consideration a number of dwellings (ca. 192 thousand) and an average number of delivered dwellings per year (ca. 2 thousand, even 3 thousand), then the problem of lack of dwellings should be solved during the period of 10 to 15 years. The number of persons per one dwelling is 2.52 at present. A further drop of this index is expected. (In Europe this index reaches the value of ca. 1.9, and in many regions it is even lower).

In the crisis times and profound economic transformations, the standard of living of inhabitants has significantly improved which can be reflected in the increasing human lifespan.

Table 9. Inhabited dwellings, state as of 31 XII.

SPECIFICATION	1990	2010
Dwellings	127 786	161 240
No. of persons per dwelling	3.12	2.52
Rooms	433 753	557 350
No. of persons per room	0.92	0.73
Usable space of dwellings in thousands of	7 042	9 839

Source: Self-study, based on the data acquired from Central Statistical Office.

In Szczecin in 2011, there were ca. 65 thousand of entities in total that employed 154.6 thousand in total persons, of which there was the group of entities employing 10 and more employees - 109 thousand of persons. The employment structure in size classes of entities is shown in the below table. The charts are showing changes in the number of entities and the level of employment on the time axis.



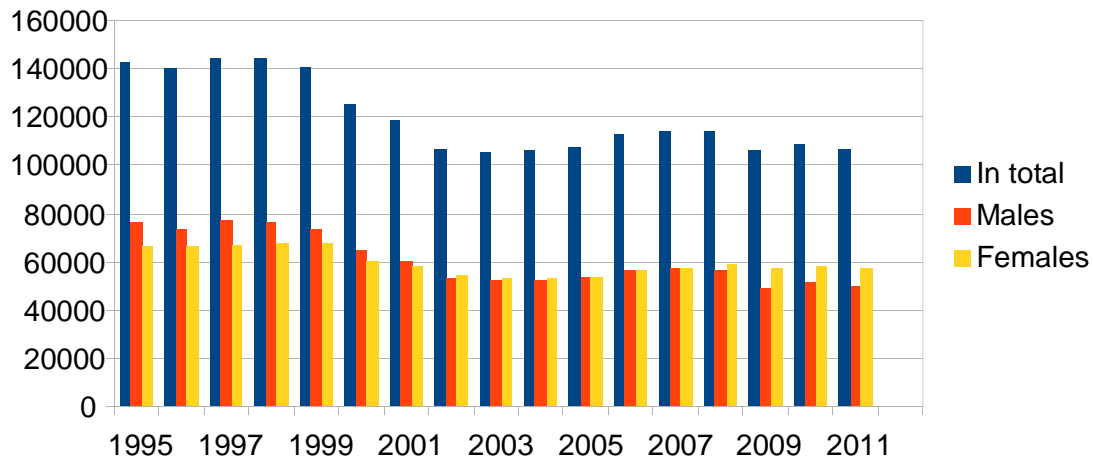
Source: Self-study based on the data from the Local Data Bank, accessed in August, 2013.

Table 10. Number of businesses in PKD sections 2007

Szczecin	2009	2010	2011	2012
In total	64373	65761	65134	66106
Section A	384	408	399	412
Section B	35	34	37	38
Section C	5061	5178	5152	5280
Section D	156	175	202	229
Section E	133	139	134	151
Section F	7501	7693	7712	7878
Section G	16021	16198	15654	15528
Section H	5375	5309	5066	4986
Section I	1814	1872	1880	1916
Section J	1642	1791	1872	1983
Section K	2317	2344	2283	2212
Section L	4492	4624	4735	4770
Section M	6921	7129	7091	7210
Section N	2255	2303	2332	2401
Section O	108	106	104	102
Section P	1622	1698	1733	2040
Section Q	4069	4171	4167	4247
Section R	963	968	968	991
Sections S and T	3498	3615	3607	3726
Section U	6	6	6	6

Source: Self-study, based on the data from the Local Data Bank, accessed in August, 2013.

Employees in Szczecin

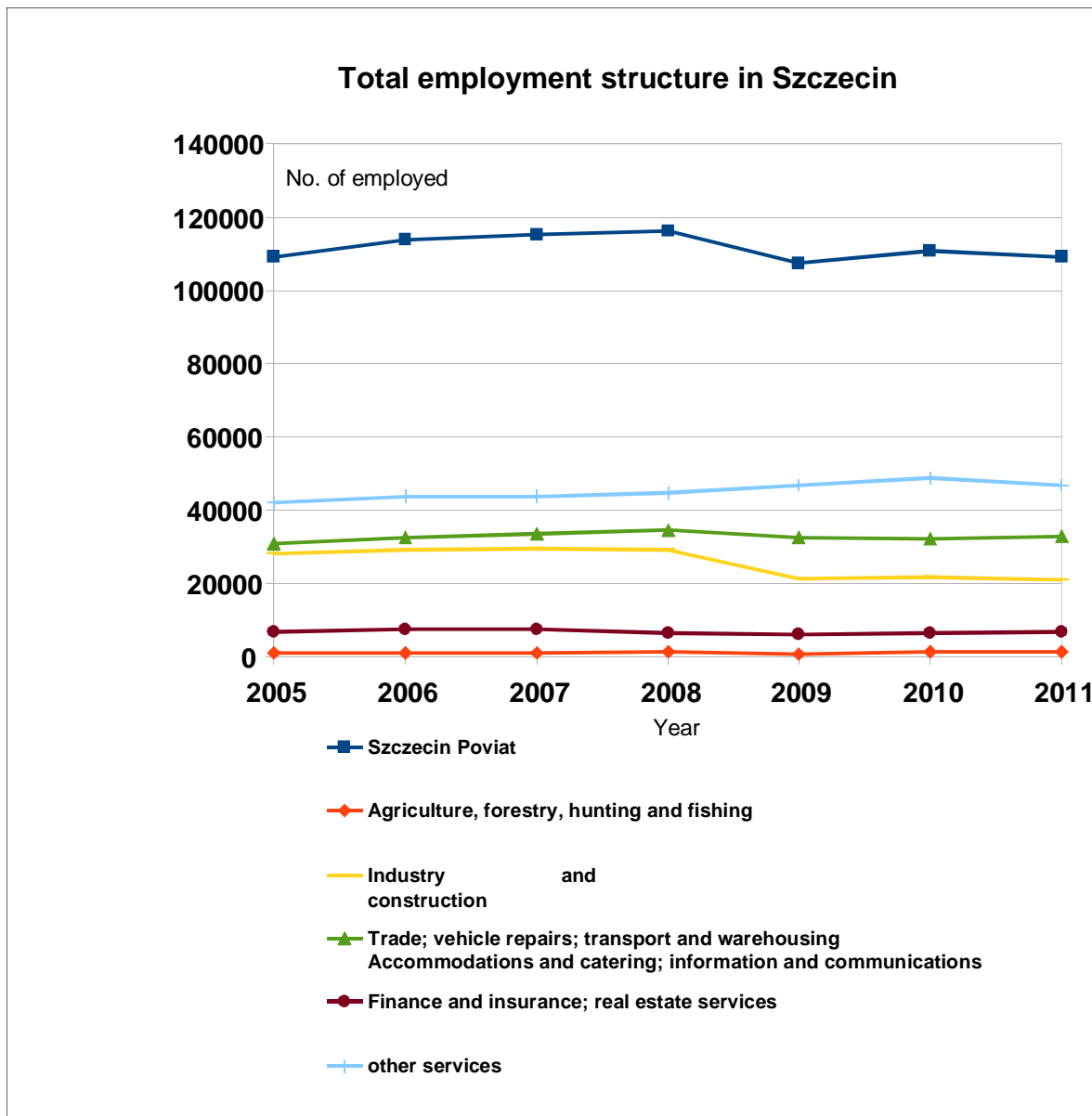


Source: Self-study based on the data from the Local Data Bank, accessed in August 2013.

This data is related to the employed in companies, possessing more than 9 employees.

Basic restrictions on the labour market are consequence of the present size structure of entities. Micro and small businesses dominate. Former large state entities have been eliminated or privatised. Under the conditions of still going on economic transformation in the city, as well as observed diversification of the labour market, various organisations grouping entrepreneurs were formed (chambers of commerce and germs of clusters). Because of the short period of operation, they are still in the organisational and consolidation phase.

This Study has shown a spatial picture and the potential of companies based in Szczecin. Their PKD shows that they already are or may be members of clusters operating in the region. These are: food (FC), chemical (ChC), tourist (TC), wood (WC), medical (MC), maritime (MsC) and informatics (ITC) clusters.



Spatial location of companies depending on their sizes was presented here as well. Presenting the data on employment, one obtained maps depicting the labour market in general, for particular groups of sections and size classes of businesses.

Table 11. Number of persons employed in total in entities having 10 or more employees

Szczecin Powiat	2009	2010	2011	Sections PKD 2007	Code
In total	107480	110918	109025		
agriculture, forestry, hunting and fishing	741	1416	1428	Section A	K1
Industry and building construction	21424	21820	21002	Section B, C,	K2
trade; vehicle repairs; transport and	32476	32329	32865	Section G, H, I,	K3
Financial and insurance activity; services	6079	6444	6902	Section K, L	K4
Remaining services	46760	48909	46828	Section M, N,	K5

Table 12. Total number of the employed in entities

Szczecin Powiat	2010	2011	Sections PKD 2007	Code
In total	153243	154674		
agriculture, forestry, hunting and fishing	1457	1480	Section A	K1
Industry and building construction	30671	30835	Section B, C, D, E, F	K2
trade; vehicle repairs; transport and	51290	52201	Section G, H, I, J	K3
Financial and insurance activity; services	8827	9306	Section K, L	K4
Remaining services	60998	60852	Section M, N, O, P, Q,	K5

Table 13. Business entities in Szczecin according to size class

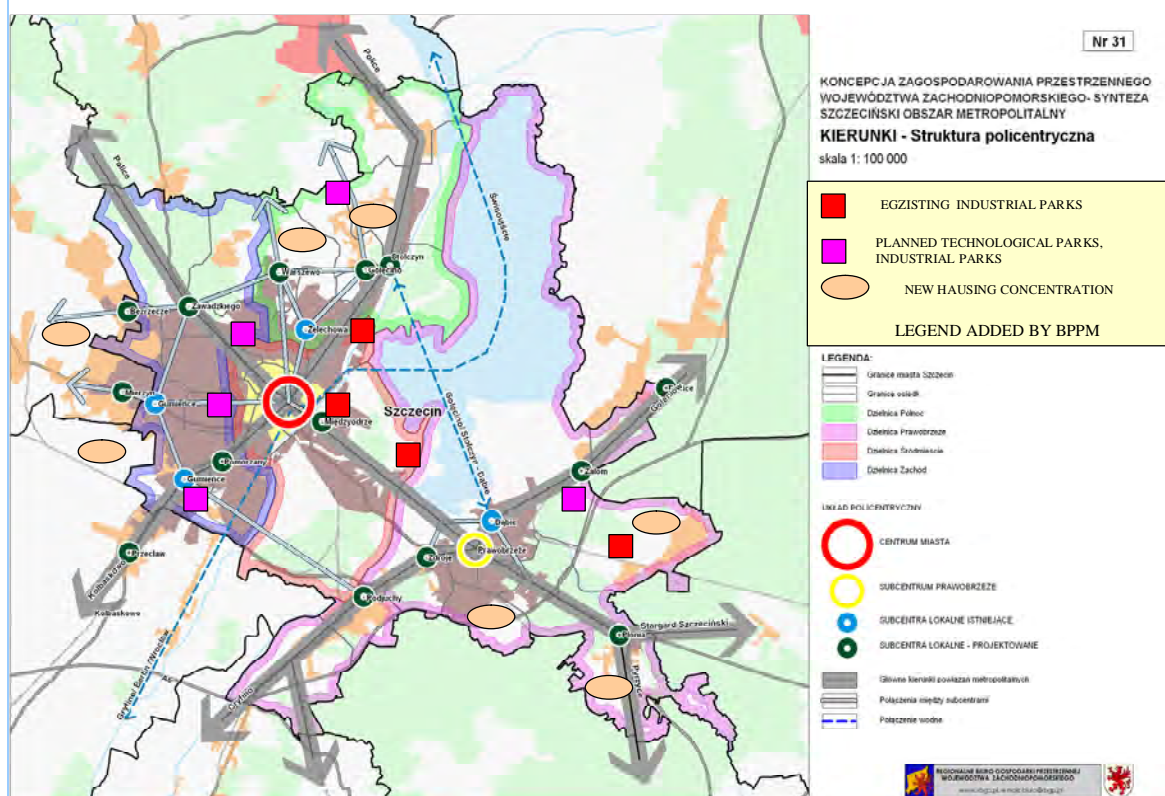
Year	2010	2011	2012
Size class	[No. of businesses]	[No. of businesses]	[No. of businesses]
In total	65761	65134	66106
0 - 9	63286	62656	63655
10 - 49	1998	2006	1993
50 - 249	407	405	395
250 - 999	59	56	53
1000 and more	11	11	10

3. General spatial policy of the City of Szczecin. Conditions for clusters in the field of urban planning

3.1. Szczecin Spatial Policy - creating conditions for business activity in Szczecin

In Szczecin's spatial policy, there are no specific actions, conditions, orders, bans, permissions or locations targeted at concrete clusters. On one hand, it results from the lack of mature economic entities such as a cluster, and on the other, it is because of the existence of very many types of activity possible to be taken in the same location and under the category of production and warehouses (industry) or various commercial services (related to business servicing).

The existing initiatives or created clusters are in the organisational phase, in its start-up phases, that is why their needs related to the spatial policy have not been clearly identified (e.g. addressed to concrete locations).



SOURCE: © Regionalne Biuro Gospodarki Przestrzennej Województwa Zachodniopomorskiego

In the spatial policy one can distinguish the following categories of areas designated for business activity:

- **sea port grounds** (designated for unlimited types of activity, unlimited by law or concessions, related to port operations: the access to quays or maritime and in-land transport, one-way transport (e.g. import or export of products, goods and raw materials; food processing and clothing, etc. also allowed under this category, on the condition it is connected with the port turnover; localization of logistics bases, etc.),
- **production and warehousing grounds** (remaining grounds for economic activity allowed by the Szczecin Spatial Policy), including:
 - a/ **special economic zones** – the scope of activity in compliance with the granted permit and the profile of the zone,
 - b/ **free customs zones** – the scope of activity in compliance with the permit and the profile of the zone,
 - c/ **industrial parks** – the scope of activity results from the size and its location (preferred arduous activity or clean production only),
- **technological parks** (grounds for economic activity for advanced technologies, located whenever possible in the neighbourhood of higher education schools; non-arduous activity that can be carried out near protected functions is only allowed (e.g. housing),
- **commercial services grounds** (the grounds in which production is excluded, in particular arduous production; wholesale trade, clothing, transport services, craftsmanship, xeroxing services, etc. are allowed),
- **large area commercial space** – commercial space above 2000 m² (the category imposed by the national law).

Good practices in spatial policy include:

- **clear distinguishing of functions** (separating housing estate from production and commercial services,
- **localizing economic activity grounds in relation with the main transport infrastructure**: limiting heavy vehicles transport, providing access to railways, reducing noise emissions and other pollutions,
- **distribution of industrial grounds in the vicinity of housing development concentrations**, including distribution of labour force, social infrastructure (nurseries, kindergartens, schools); needs related to commuting to work,
- **location of 'clean' production in the core area**, whereas a large-scale and arduous production in the industrial parks located in the metropolitan area,
- **protection of valuable natural grounds** against degradation due to production located nearby,
- **landscape protection**, e.g. through limiting the height of housing stock or a ban of activity connected with smoke or vapour emissions, etc.
- **using buffer belts**, e.g. greenery belts or using the shape of land to separate functions, providing security and reducing arduous activity.

4. Analyses of spatial location of businesses and labour force

The analysis covers the population of active businesses, as selected among all the registered entities in the REGON system in Szczecin.

Based on the size classes of entities and employment in those classes, aggregated statistical data for sections and groups of PKD sections and employment in those groups, the data bases assigned to the addresses of those entities on the map, were prepared.

Multi-dimensional analysis of the level of employment in businesses, together with the data on employment as delivered by some entities, allowed for generating the map of spatial location of the labour force in various cross-sections, including those for the populations of businesses that are or potentially will join clusters active in the Zachodniopomorskie Region.

Table 14. Active entities of groups of PKD sections and size classes of businesses

Group of sections PKD	10 - 49	50 - 249	250 - 999	Code
Agriculture, forestry, hunting & fishing	11	2	0	K1
Industry & building construction	592	93	10	K2
trade; repairs of vehicles; transport & warehousing;	667	60	12	K3
Financial & insurance activity; Real estate services	77	14	1	K4
Remaining services	558	172	26	K5
In total:	1907	390	49	

The entities have been ascribed to particular sections and groups of sections, all marked with symbols from K1 to K5 for easier identification.

K1=A,
K2= B,C,D,E and F,
K3= G,H,I and J,
K4= K and L,
K5= M,N,O,P,Q,R,S and T.

Size classes of entities respectively: micro (0:9), small (10:49), medium (50:249) and large (250 more employees).

The analysis has been conducted in the following cross-sections:

- 1/ The analysis of spatial concentration of enterprises (maps No.: 1, 2 and 3)
- 2/ The analysis of spatial location of jobs (maps No.: 4, 5, 6, 7 and 8)
- 3/ The analysis of cluster development potential in size classes of economic entities (maps: 9, 10, 11, 12, 13, 14 and 15)
- 4/ The analysis of spatial concentration of entities and jobs in chosen groups of sections PKD (maps: 16, 17, 18, 19 and 20).

As this Study focuses on spatial analysis of labour force location, while thinking of the possibilities of supporting establishment and development of clusters, general issues related to: transport accessibility (spatial), development axes, differences in prices of land in a city -

rural area or the costs of functioning of entities (e.g. logistics costs), environmental restrictions, agglomeration advantages (willingness to bear higher costs in return for the firm's location in the city or its centre), accessibility to airports, higher education schools and their infrastructure, have been skipped.

4.1. Spatial analysis of enterprises' concentration in Szczecin

The base of economic entities (firms) and basic information on them, have been acquired from several sources, based on regional and national statistics, as well as from Zakład Ubezpieczeń Społecznych (Social Insurance Institution - ZUS).

The acquired information served as a base for generating review maps, presenting spatial picture of entity location depending on the size (micro, small, medium and large).

Analysed maps:

Map.1. Density of economic entities location in the grid 50 [m] x 50 [m]

Map.2. Density of economic entities location vs. population in the grid 50 [m] x 50 [m]

Map.3. Small, medium and large entities in the areas of the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy.

Based on the analysis of the attached maps, one can form the following conclusions:

- 1) There is no clear partitioning between the place of the economic activity is conducted and the place of residence. Bothersome activity (as seen by residents and legally) is located in the neighbourhood of housing development.
- 2) Mean density of firms' location, referred to the number of residents is alike in the whole agglomeration. The larger density, the less micro firms present. The areas distinguishable because of hyper activity of residents cannot be shown. The situation reflects the structure of economy in the initial development phase, dominated by micro firms. Businesses employing more than 10 persons concentrate themselves in the downtown, and in the area of a second city centre on the East bank of the Oder.
3. Production, warehouses and services areas, as indicated in the city's spatial policy, to a large extent, are extensively used or they serve as a reserve for new or moved economic activity. These areas are also used by entities that have their premises outside them. This however could not be taken account of due to the lack of relevant information.

4.2. Analysis of spatial location of jobs

The analysis bases on investigating the density of jobs location in the squares of 50 [m] x 50 [m]. The results are of discreet nature. The density of employment is illustrated by fields of various colour intensity.

It is an alternative method to the one that gives continuous depiction, based on the Kernel function showing the density of probabilistic feature location in the analysed areas. Using the Kernel function does not lead to obtaining more certain results. The method offers another

way of presenting the data.

The analysis has been made for the first time. However, at its present stage, the results allow to verify a long-term planning in terms of transport infrastructure development, including public transport.

Analysed maps:

Map.4. Location of jobs vs. production, warehouses and services areas, as identified in Szczecin's spatial policy

Map.5. Density of jobs location in the grid 50[m] x 50[m]

Map.6. Density of areas to be populated location in the grid 50[m] x 50[m]

Map.7. Density of jobs location in the transport areas

Map.8. Density of jobs in housing estates location.

The analysis of the attached maps allows forming the following conclusions:

- 1) Spatial distribution of jobs as presented on these maps shows the concentration of the majority of jobs in the downtown area of Szczecin, that it is confirmed by the data on the number of public transport users).
- 2) Within the downtown area, one can indicate smaller areas of jobs concentration. These are areas where one should review the transport policy, car parking policy, external accessibility, and their impact on the housing development.
- 3) Map No. 6 exposes the areas with a large share of jobs vs. the number of inhabitants, which has a significant meaning in the border areas towards the downtown. Due to some uncertainty as to the data on the employment in micro firms which dominate on these areas, the data still require further verifying and analysing.
- 4/ A very clear picture of the density of job location is shown on the maps depicting employment in the transport areas (Map No. 7) and in the housing estates (Map No. 8). The information (after taking into consideration demographic processes and the number of inhabitants) will allow for more effective city management (socially and economically), and in the context of long-term activities, it will allow for better use of investment resources.

4.3. Analysis of cluster development potential in size classes of business entities

Here is a general listing of firms. The analysis has been made, paying special attention to potential membership in clusters operating in the region.

4.3.1 Class of firms: 0 to 9 employees

Micro firms constitute a huge potential for cluster development. They are innovative and flexible in adjusting to the requirements of the market. However, they need support in acquiring better access to information, trainings and counselling. Such firms are creditworthy in a limited way. They are distrustful and they fear losing their primary clients. Their active participation in cluster initiatives requires time and stable situation in the market which create favourable conditions for forming cooperation ties.

The data are burdened with some uncertainty. They should be treated as very approximate and based on the statistical research. Own evaluations show those firms' development potential and even density of their location, which in turn indicates large economic activity of the community members. At the same time, it is ca. 95% of the population of firms in total, providing ca. 30% of jobs.

Table 15. Active micro business in groups of sections PKD.

Code	A Group of sections PKD	No. of active firms
K1	agriculture, forestry, hunting & fishing	308
K2	industry & building construction	10850
K3	trade; repairs of vehicles; transport & warehousing;	21221
K4	financial & insurance activities; real estate services	6578
K5	remaining services	18127
	In total:	57084

Number of firms and the level of employment of present and potential members of clusters in class: 0 to 9 employees

Name of cluster	Food Cluster	Chemical Cluster	Wood Cluster	Tourist Cluster	Medical Cluster	Maritime Cluster	ICT Cluster
No. of firms	3954	1487	2267	2155	5330	7418	3135
Employment	2975	1080	1675	1687	3912	5774	2450

Total employment in the class of firms employing between 0 to 9 employees is 45649 persons.

4.3.2. Class of firms: 10 to 49 employees

Taking the number of employees, this is a smallest group of firms. However, these firms are an awaited partner for clusters and technological parks. Their size determines needs related to joint representation, trainings and counselling. These firms are the quickest ones both to react to changes taking place in the market and open to innovations. A frequent barrier to development of such firms is a limited availability of resources to finance developmental activity.

Number of firms and employment of present and potential cluster members in the class: 10 to 49 employees

Name of cluster	Food Cluster	Chemical Cluster	Wood Cluster	Tourist Cluster	Medical Cluster	Maritime Cluster	ICT Cluster
No. of firms	169	55	71	121	71	255	64
Employment	3053	780	1170	2409	824	3587	1137

Total employment in the class of firms employing more than 10-49 persons is 31195.

4.3.3. Class of firms: 50 to 249 employees

This is the class of firms which is a strongest partner for clusters. In Szczecin, such firms offer the greatest number of jobs. A considerably larger level of economic independence and reached level of development constitute good conditions for further growth, quicker within the framework offered by clusters.

Number of firms and employment of present and potential members of clusters in the class: 50 to 249 employees

Name of cluster	Food Cluster	Chemical Cluster	Wood Cluster	Turist Cluster	Medical Cluster	Maritime Cluster	ITC Cluster
No. of firms	20	12	7	9	23	55	10
Employment	1713	1412	756	1376	2582	5642	1320

Total employment in the class of firms employing between 50 and 249 employees is 43688 persons.

4.3.4. Class of firms: 250 employees and more

Taking Szczecin conditions, large firms are those that have managed to defend themselves in the market after privatisation of state enterprises or were established as a result of division or liquidation of state enterprises. Weakness of the market lies in a small share of those firms in R&D sphere. Its strength lies in their location in traditionally strong regional branches, such as e.g. maritime industry.

Number of firms and employment of present and potential members of clusters in the class: 250 and more employees

Name of cluster	Food Cluster	Chemical Cluster	Wood Cluster	Turist Cluster	Medical Cluster	Maritime Cluster	ICT Cluster
No. of firms	5	0	1	1	11	11	1
Employment	3097	0	460	325	6581	6410	461

Total employment in the class of firms having over 249 employees is 34142 persons.

Overall list of clusters active in the region

Table 16. Overall list of firms having a potential of belonging to clusters present in the region

Size class of firms	Name of cluster	Food Cluster	Chemical Cluster	Wood Cluster	Tourist Cluster	Medical Cluster	Maritime Cluster	ICT Cluster
0 - 9	No. of firms	3954	1487	2267	2155	5330	7418	3135
	Employment	2975	1080	1675	1687	3912	5774	2450
10 - 49	No. of firms	169	55	71	121	71	255	64
	Employment	3053	780	1170	2409	824	3587	1137
50 - 249	No. of firms	20	12	7	9	23	55	10
	Employment	1713	1412	756	1376	2582	5642	1320
> 250	No. of firms	5	0	1	1	11	11	1
	Employment	3097	0	460	325	6581	6410	461

Analysed maps:

Map.9. Food Cluster vs. areas of the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy

Map.10. Chemical Cluster vs. areas of the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy

Map.11. Wood Cluster vs. areas of the following function: production, warehouses and services, as indicated in Szczecin's spatial policy

Map.12. Tourist Cluster vs. areas of the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy

Map.13. Medical Cluster vs. areas if the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy

Map.14. Maritime Cluster vs. areas with the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy

Map.15. Informatics & Communications Cluster (ICT) vs. Areas with the following functions: production, warehouses and services, as indicated in Szczecin's spatial policy.

The analysis of the attached maps allows forming the following conclusions:

- 1) The firms of a profile close to cluster activity formula are located in space purely coincidentally. An exception to this is the Maritime Cluster. A significant number of medium and large firms is located in areas connected with water, in the production and warehousing areas, and within the limits of Szczecin-Świnoujście Sea Bi-Port.
- 2) Branches of industry in which clusters operate are represented by entities whose impact on the environment (housing or nature areas) do not bear conflicts. Large entities are located in industrial or port sites.
- 3) The city of Szczecin in its offers still possesses free investment areas where production firms can be located. The only limitation can be the size of plot (up to 50 ha) and significant negative impact on the environment, including living conditions of residents.

4.4. Analysis of entities and jobs concentration in selected groups of sections PKD

In this part, spatial location of entities and offered by them jobs in groups of sections PKD have been analysed. Selected groups correspond to groupings adopted by the national statistics.

Analysed maps:

Map 16. Distribution of jobs in groups of sections PKD

Map 17. Industry and building construction – a group of sections K2

Map 18. Trade; repair of vehicles; transport and warehousing; accommodation and catering; information and communications – a group of sections K3

Map 19. Financial and insurance activities; real market services – a group of sections K4

Map 20. Trade and services location (number of entities) – a group of sections K5, plus network trade

The analysis of the attached maps allows forming the following conclusions:

- 1) A group of sections marked as symbol K2 (industry and building construction) does not show a clear picture in the spatial analysis. Production firms are “tied” to their registered seat, while building companies are usually relatively small mobile entities rendering services in the whole functioning area of Szczecin. Knowing individual code PKD, we can make configurations freely to interrelate numbers of entities and their sizes (division of employment) in the analyses. However, there is one limitation, namely the lack of data on employment in those entities. The largest number of jobs are offered by companies located in the downtown area of Szczecin.
- 2) Location of jobs for the group of sections marked with symbol K3 is very alike picture obtained in case of group K. This means dominating of small service firms and confirms a small share of industry in today’s economy of Szczecin city.
- 3) Entities ascribed to group marked with symbol K4 concentrate themselves on a small part of the downtown Szczecin. Spatially, one could consider such a situation as preferable for cluster development, however the nature of the firms’ activity, strong competition and the size of entities indicate this would be an inappropriate approach.

5. Exchange of experiences and information

Direct public actions (designating grounds, identifying their functions and legal protection) attract new companies to settle down and the growth of those already existing.

In this way, the economic aims as given below are met:

- creating favourable conditions for creating new jobs,
- halting highly qualified labour force (building up the social capital),
- increasing revenues in the city budget through introducing deductions from high salaries,
- long-lasting change of the city brand and its economic profile.

As clusters active in the region are still in their initial stage of development, there are no indices allowing appraisal of their impact on the region's economy. The most appropriate indices and methods appraising the clusters include:

- clusters' reports,
- expenditures for resources in the branch related to the cluster's activity (compared with the average resources in the neighbourhood),
- number of employees in the branch,
- revenues of the branch,
- number of implemented projects and their financial value, incl. application of scientific work,
- number of patents and protected signs,
- share in revenues of the branch against revenues of other entities (increase/decrease).

However, the question how to assess the cluster's reaching the critical mass (maturity stage as described by Porter and understood as one economic body not requiring institutional support by the local authorities) is still vital.

Here are some conclusions of general nature:

- 1) The analysis of labour force location will be used during the next review of Szczecin's spatial policy. It creates the opportunity for verifying long-term investment plans. Together with the demographical analysis, it creates opportunities for modifying transport policy, including public transport and car park Policy. It shows actual location of entities and jobs in comparison with the offer of free investment areas.
- 2) Statistical data, despite difficulties in obtaining them, lack of statistical obligation by some entities, are satisfactory for conducting spatial analyses. Obtained results show main trends and phenomena, which makes it possible to rationalise the city development policymaking in a more economically and socially effective.
- 3) In case of Szczecin, one can speak about the completion of the first stage of transformation. Awaited consolidation of entities will also have a spatial dimension. That is why this analysis is thought to be an important spatial planning document determining a future shape of the spatial and developmental policies of Szczecin.

- 4) The analysis explicitly shows a huge potential for developing clusters that is, however, limited by the structure of size classes of entities and their economic potential.
- 5) The picture of entities' concentration and labour force location, determine the directions for tramway infrastructure, and confirm up to date and targeted tramway grid correctness.
- 6) It is assumed that clusters are defined in the same way in the EU. What makes them different is the structure of entity sizes, their economic „efficiency”, the period of stable development and socially and culturally conditioned capability of collaboration under the conditions of market competitiveness.
- 7) It is difficult to pinpoint a cluster in the spatial sense. Spatial and sectoral dispersal of firms is a natural phenomenon that results from the real market functioning, as well as from many other limitations, including those dependent on the legal system valid in a given country, and the size of the functional area of a greater city.
- 8) From an urban point of view, concentration of entities functioning in a cluster can take place through establishing industrial and technological parks, industrial zones and business incubators. Cluster development is a result of combined effort in the spheres of organisation and management or through institutional structures.
- 9) Spatial limitations for clusters (and other firms) mainly result from their impact on the environment. In Szczecin, it is not allowed to locate industrial enterprises exerting a significant negative impact on the environment (as understood in compliance with the environmental law). Companies, burdensome for the environment may be located in the industrial parks or within the area of Szczecin-Świnoujście Bi-port.
- 10) Real estate market development (varying real estate prices) will influence the firms' decision on changes of their location. In Szczecin, the Międzyodrze Isles can serve as an example that such a process has just started. Here, a typical for a large city developments have been launched. The increase in land prices has triggered the transformation of the whole area and firms' removals from other less prestigious locations.
- 11) Present stage of cluster development in Poland does not require their spatial concentration, which does not rule out such possibilities in case of developing industrial and technological parks, office spaces, office buildings where one find prestigious location.
- 12/ The conducted analysis of jobs location will be used to consider new infrastructure projects which would rise investing attractiveness of office and services areas (e.g. new bridges across the Odra River).
- 13) Under market conditions, spatial concentration of businesses does not lead to spontaneous establishment of a cluster, unless those businesses operate in a common reception area of clients of co-operators.
In case of the metro areas, there will be predominating diversity, with the tendency for

specialisation, mainly because of large entities, which get support from academic centres. Spatial concentration of firms from a chosen branch is possible in very large metropolises; it's a function of entities and the scale of their activity.

- 14) Standing costs of new businesses' functioning is a decisive factor in their choice of a location. However, services companies are becoming more and more interested in modern office spaces and prestigious locations.
- 15) Spatial planning is oriented to creating favourable conditions for running economic activity. It favours cluster developing through defining conditions for such an activity (e.g. clean and advanced Technologies – technological park, production activity – industrial parks and industrial zones in case of increased arduous capacity). It is accepted that a high quality of life (settlement, work and leisure) conditions attracting a highly skilled labour force. Also, the city's demographic potential determines the attractiveness of the labour market.

6. Conclusions and outcomes

Szczecin's experiences indicate that acting within the legal frames defined by the national law, the best strategy is to support such economic activity that leads to a change and upgrading the economic structure of the city. Economically speaking, this is attracting investors in every field, with preferences to such fields that have been named in the Szczecin Development Strategy (advanced technologies, Szczecin's growth as an academic centre, maritime industry). The economic activity is supported by the spatial policy. These are mainly aimed at:

- enhancing transport services of the existing industrial sites (e.g. Szczecin-Świnoujście Bi-Port grounds),
- changing the arrangement of production grounds and warehouses in such a way as to adjust the area's profile to the conditions outside it,
- improving transport linkages with the surrounding area,
- improving the arrangement of these areas in terms of the labour force,
- reducing the arduousness of production for inhabitants and the environment.

Cooperation with municipalities within the SMA and their joint business marketing is an important element of Szczecin's strategy. The reason justifying this approach is that within the city limits there are not enough plots to locate production requiring large space (50 ha, 100 ha and more). Industrial parks in the SMA offer such possibility.

As presented in the Study, clusters operating in the region are in their initial stage of growth. However, Szczecin Development Strategy assumes that the concentration of production activity within the SMA has crucial significance for the local labour market, R&D and Szczecin's growth as an academic centre. In this context, clusters are important tools for the Strategy execution and spatial cohesion of the SMA. It is understood that supporting the growth of clusters will be a tool for improving Szczecin's competitiveness with other national and European regional centres. We also assume that the spatial arrangement of the city and the SMA, its spatial economic and transport structure have a key role for Szczecin's economic growth.

Growing of clusters has also another positive effect on Szczecin's promotion and attracting investors. In the Polish law, there is no requirement of obligatory membership in chambers of commerce. That is why beside already functioning economic organizations, grouping various entities, clusters in their branches and basing on endogenous resources of the region, multiplying the social capital of the SMA are considered to be a very important partner of the Szczecin Local Government and the SMA.

Attachment No. 1. Definitions of clusters and the methodology of identifying potential for establishing clusters

A. Basic definitions

Clusters in Poland - definition of a cluster (a legal definition):

A cluster is recognized as a spatial and sectoral concentration of entrepreneurships acting for economic development or innovation, with participation in it of not less than 10 entrepreneurs, including: micro entrepreneurs, as well as small and medium entrepreneurs, executing their economic activities on the terrain of one or several neighbouring provinces, competing and co-operating in the same or related branches, linked by complex network of formal and informal character. At least half or more of firms functioning in the frame of the cluster are small or average entrepreneurs. The members of the cluster have to possess premises. In case of business being a physical body - the place of residence must be located on the territory of the Republic of Poland.

The REGULATION BY MINISTER OF ECONOMY as of 2 December 2006 on granting the financial aid non related with operational programmes by Polish Agency for Entrepreneurship Development (PARP) (Official Journal Dz.U.06.226.1651)

Innovative Cluster defined by the EU

Concentration of independent companies, active in a defined sector, co-operate with other institutions such as universities etc., stimulated in innovative activity to achieve technology transfer, a member state should lead to appropriate balance between small, medium and big enterprises in the framework of cluster, to achieve critical mass, especially in the defined field of activity R+D+I.

A member state intervention to stimulate innovative activity and technology transfer to achieve critical mass in the framework of cluster.

Cluster definition by Porter

Geografic concentration, and co-operation, joints with other institutions like universities, etc., must have critical mass and stage of agglomeration to have success in the market, are characteristic of every country, region, or agglomeration.

Competition and co-operation to achieve critical mass in the framework of the free market game. Internal need of geographically concentrated entrepreneurs

Basic branches:

- 1/ In the light of the previous definition, most of clusters in Poland can be recognised as innovative clusters, and their activity remains in compliance with the Polish and EU regulations.**
- 2/ In many cases, it is a local initiative based on co-operation among local and regional authorities with higher education schools, research and development centres, including local agencies and foundations.**
- 3/ Branches or fields in which clusters are active, are identified as a egzogenic potential of a region, a potential for new bussiness creation or are based on co-operation and initiatives /activities/ leading /high scale/ to an industrial plant (as in the case of the Green Chemistry Cluster)**
http://www.pi.gov.pl/klastry/teoria_i_informacje_o_klastrach.

The differences in activities between the commercial (Porter) and institutional (EU) models mainly lie in the nature of the Cluster's Promoter". In the first case it is an association or an organisation operating on commercial principles, while in the second case, it is an institution or non-commercial organisation (not-for-profit) such as a high education school, association, foundation, and the like.

B. Identifying potential for establishing clusters

(A procedure to prepare establishing of new clusters)

In the region with economy under transformation and development, it is worth evaluating to what extent the taken initiatives (operating clusters) exhaust the existing regional potential. On the other hand, in the regions characterised with mature economies, such an analysis could be an additional incentive to extend the structure of a cluster to include new entities. Here is a simple in its nature procedure to allow initiating by the public authorities new clusters, with the least possible risk of spending the public money in an inappropriate way.

The procedure can be described in several steps, as given below.

Step 1: Developing „COMPATIBILITY MATRIX”

Developing the matrix relies in correlating in records the blocks of information, comprising the following details:

- identified endogenous potentials of the region (metropolitan area, etc.) used or to be used in the economic activity;
- structure of the region's economy (metropolitan area, etc.) in the form of a list of branches (sections and groups of PKD) operating in the region, including a number of entities and their size classes;
- global trends (worldwide, national, etc.), description of dynamically developing branches of economy whose presence in the region would be desirable;
- a list of R&D centres and high er education schools operating in the region, including their profiles.

In a selected column of the matrix for each of its record, we give the names of existing or potential clusters, making possible use of the described resource.

Step 2: Developing „REVERSE MATRIX”

The matrix is to be transformed in such a way so as to save in its records the names of clusters given at Step 1.

The matrix shows multitude of factors that can be associated with a concrete cluster (resources, sectors of economy, etc.). The more factors, the more potential for cluster's development. The matrix also shows duplicating records, which gives a possibility of combining various cluster initiatives under one formula.

Step 3: Making CROSS-ANALYSIS

Conducting a cross analysis relies in preparing a matrix in which records and labels are names of clusters. Such action shows the possibilities of cooperation of clusters among themselves. The analysis allows to reduce the number of proposed clusters as some of them can function as “complex clusters” (comprising in themselves other, potential cluster initiatives). In this step, one can also indicate “individual clusters” (of narrow specialisation in a concrete branch).

Step three also allows to name the list of potential clusters, limited only to necessary items.

Step 4: GAP ANALYSIS – POTENTIALLY NEW CLUSTERS

A list of potential cluster initiatives obtained in Step 3 can be now put together with the list of already operating clusters in the analysed area. As a result, we get potential clusters that can be established in the region.

When analysing the obtained listing, we can single out clusters having the largest development potential and it is on them that we concentrate the supportive activity of local governments. Such an analysis may indicate what type of investors should be looked for to use the existing growth potential.

Step 5: Choosing „CLUSTER'S PROMOTER”

In this step, we conduct the analysis of available actors (firms, R&D, higher education schools, NGOs, local authorities) and select „the Cluster's Promoter”, initiating establishment of a cluster.

A necessary step in order to take the initiative and establish a cluster, it is to prepare a detailed description of its scope of activity and its recipients.

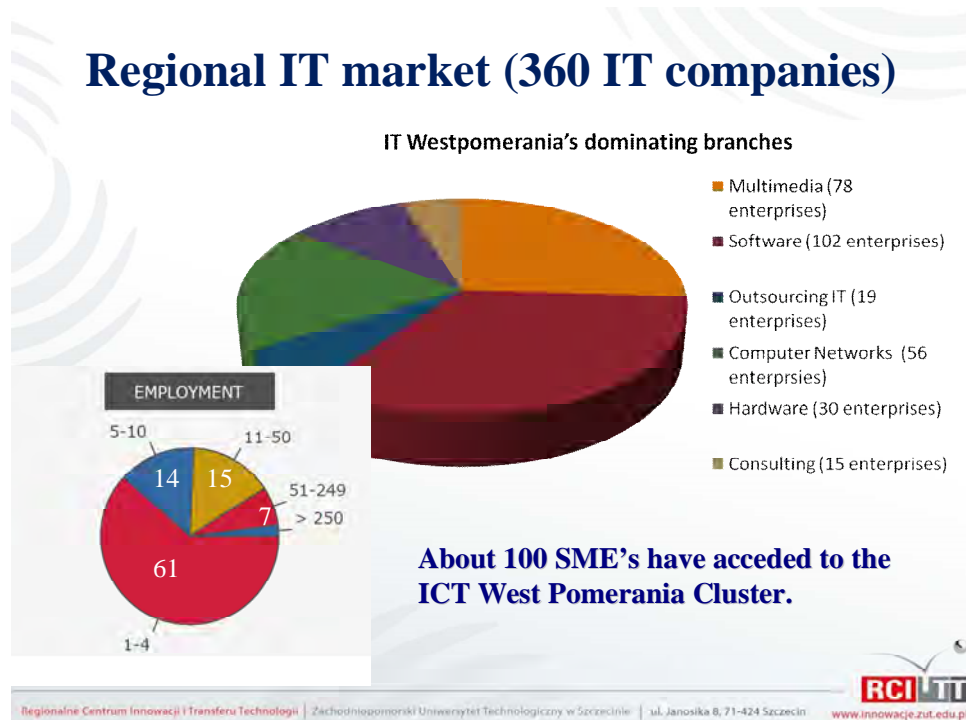
Conclusions based on the results of the analysis:

- 1/ Analyses of the regional economy have shown that Szczecin Municipality's biggest development potential lies in branches of informatics and telecommunications. Nearly 69% privately-owned companies are located in the SMA (2845 companies).
- 2/ The ICT companies declared their will for co-operation with the municipal government and local higher education schools.
- 3/ One of the main goals of the Szczecin Development Strategy accepted by the Mayor and the City Council is transforming Szczecin's economy into innovative and modern one with the growing share of high-tech businesses.
- 4/ Analyses of potential for creating new clusters indicates that alongside already operating clusters, one can expect that further new clusters can be developed. These are:
 - green energy cluster,
 - health food cluster,
 - pharmaceutical cluster.

Attachment No. 2. A case study – ITC cluster

1. Introduction

During the economic transformation processes Szczecin has gradually been losing its companies to date considered as the so called traditional industries. The city authorities became mobilized to search for possibilities of supporting economic transformation through preparing conditions to the growth of modern industries and services.



Source: Regionalne Centrum Transferu Technologii (Regional Centre for Technology Transfer).

After taking numerous analyses and meetings with the academics, the decision on establishing the ICT cluster in Szczecin was taken. The reasons behind the decision were as follows:

- the number of entities active in the sector (developed market of computer /informatics companies)
- existence of higher education schools of appropriate profile,
- local initiatives of entrepreneurs, their interest in the form of cooperation,
- the analyses of the market needs resulting from the work over the Szczecin Development Strategy,
- the city's offer related to the establishment of the technological park.

The municipal authorities were also aware of the necessity to support companies dynamizing growth and creating high-paid jobs (deduction from PIT tax for the city, i.e. 39% is much more advantageous for high-paid positions). Meeting the needs of economic entities in the

spatial policy, the city indicated locations for industrial and technological parks, favourably placed near higher education schools. Szczecin can serve as an example of a city which took effort to actively support the ICT cluster also in the field of spatial planning.

2. Stage I – the birth of ICT cluster

The following organisational-legal activities were taken while launching the ICT cluster:

2000

The Mayor of Szczecin established a limited company called Szczeciński Park Technologiczny (Szczecin Technology Park - SPT) in December 2000. The company was established with the scope of personnel and resources of self-governmental organisation – Szczecin Entrepreneurial Centre.

2002

In 2002 the Mayor of Szczecin changes the scope of activities of SPT and gives it a new name of Szczeciński Park Naukowo-Technologiczny (Szczecin Science and Technology Park - SPNT). The city owns the company (100 percent of shares).

SPNT is counted as a company servicing business as its activity concentrates on creating organisational and technical conditions for growth of economic entities, particularly local and regional innovative circles. The company serves as Initiator, Integrator and Coordinator, creating various activities in the scope of New Technologies, mainly in teleinformatics and information society development in the city of Szczecin and the Zachodniopomorskie voivodeship.

3. Stage II – organization and functioning of ICT cluster

2006 - 2008

The beginning of ICT cluster in the Zachodniopomorskie Region goes back to 2006, when the SPNT launched its Project No. Z/2.32/II/2.6/ZARR/W/II/7/06 named: „Regional networks of innovative cooperation in the scope of using of and knowledge transfer, creating foundations for the informatics cluster". The project was co-financed in 75% by the European Social Fund (within the Integrated Operational Programme of Regional Development) and in 25% by the state budget. The project was completed in 2008.

It was the period of research and analyses of the regional IT sector and contacts with companies, in which entrepreneurs were presented the idea of clusters, including the very initiative of creating the ICT cluster in Szczecin.

The project stages covered among others:

- developing the data base of the IT companies,
- meetings with companies interested in the cluster,
- monitoring of activities by other Polish and overseas clusters (participation in Innonet project),
- seeking out and delivering information to companies on potential business partners (on the basis of the European base - Innovation Relay Centres),
- preparing project portals ict-pomorzezachodnie.pl and dizajnerzy.pl, applications to generating electronic surveys, etc.

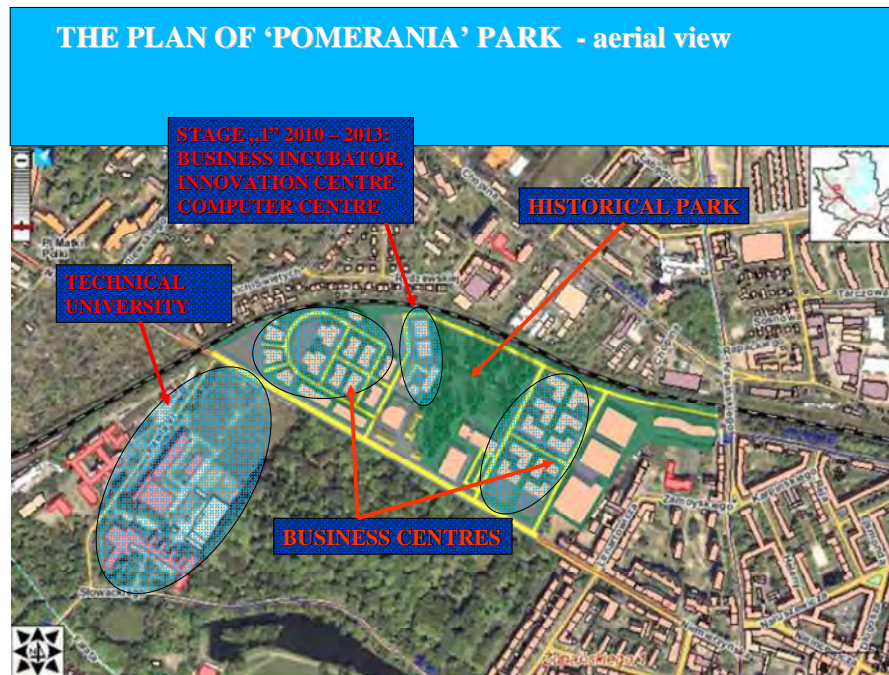
The results of carried out analyses indicated the necessity of directing the company's activities to:

- educating IT staff – organizing specialist training session on IT and management, targeted at members of the cluster;
- integration of the branch – organizing meetings of the cluster members, joint participation in fairs and conferences;
- investing in the growth of science & technology park.

SPNT, as the Cluster Coordinator, received from the city of Szczecin the grounds to manage (indicated in the city spatial policy to be revitalised) and prepare it for developing the scientific-technological park. Acting jointly with the Mayor of Szczecin, it started adapting the building at ul. Niemierzyńska 17a for the Business Incubator and prepared the concept of developing the Technopark Pomerania offering: office space, laboratories, incubator and server rooms (hardware and software) for ICT and high-tech companies. The company also made some promotional activities related to building the ICT Pomorze Zachodnie cluster brand and consulting.

2009

In 2009 organisational activities to launch ICT Pomorze Zachodnie cluster were initiated. Activities of SPNT – animator and promoter of ICT cluster concentrated on creating the framework of cooperation and business links among innovative IT companies in the Zachodnopomorskie Region and institutions, higher education schools, research centres, and establishing contacts with foreign research-growth centres and cluster organisations in Poland and in Europe. It was agreed that participation in the cluster will require paying membership fees. In this way, collected resources will cover costs of developing the cluster's portal and promoting initiatives such as interaction meetings, mutual promotion in the local and regional media, and in the Internet service. Until the end of 2009, ten new companies joined the cluster.



2010

Since the beginning of 2010 intensive talks are held with the entrepreneurs from the computer branch on further development of ICT Pomorze Zachodnie Cluster and possible development of joint activities. Steps aiming at formalizing the cluster initiative into the association were taken. The cluster currently has 36 members (as of December 2010).

The founding meeting of the ICT West Pomerania Cluster took place on 24 February 2010. Several tens of owners and representatives of West Pomeranian informatics companies participated. During the meeting the resolution about establishing the association, its board, the board of audit and other organs, as well as the by-laws were adopted. The association was registered as: Stowarzyszenie Klaster ICT Pomorze Zachodnie (Cluster ICT West Pomerania Association).

The by-laws define the following aims of the Association:

- ❖ reach high qualifications and accessibility of personnel of the informatics branch in the region,
- ❖ reach high level of innovativeness and competitiveness by companies grouped in the cluster,
- ❖ gather integrated and well-supportive environment of persons actively operating in the ICT branch in the Zachodniopomorskie Region,
- ❖ creating and maintaining a good brand of the Association, enhancing credibility and prestige of its members and the region's attractiveness for the employees, investors and local entrepreneurs,
- ❖ creating the strong informatics lobby in the Zachodniopomorskie Region, enhancing the image of the Region and the City as attractive places for investors.

4. Stage III – the current state and development plans

4.1 Spatial policy



The activities taken by Szczecin Municipality and other public entities executing the Szczecin Development Strategy were concentrated on creating and developing the ICT Cluster through:

1/ developing the concept of Szczecin Science & Technology Park 'Pomerania' (final choice of the location at: ul. Niemierzyńska in November 2007).

2/ establishing the limited liability company Szczecin Science & Technology Park Pomerania Ltd. Making a contribution in the form of grounds and buildings – 2007.

3/ developing the land use and functioning concept (objects distribution, internal communications, car parks, greenery, etc. - 2007.

4/ developing the master plan for the Park (The plan: BOLINKO – NIEMIERZYŃSKA), adopted on 14.12.2009 by the Szczecin City Council (Resolution No XLII/1056/09) (published in the Official Journal: DUWZach No 6 item 117. of 22.01.2010).

4.2 Investment

1/ Adaptation of a closed down tram depot for the Museum of Technology functionally connected with the location of Science & Technology Park – service life since 2010.

2/ Between 2008 - 2010 works to convert the school into business incubator took place.

Photos taken at the construction site [September 2009]:



The tenants began moving into the building in 2010. They were offered:

- offices and space for possible laboratories (20 - 30m²),
- server rooms, training rooms, computer lab, warehousing space

- air-conditioned conference room with the catering unit, WC, cloakroom,
- Internet – two independent broadbands min. 10 Mb/s each, WiFi, VOIP.

3/ introducing into the Multi-year Investment Plan Technical and Communications infrastructure – upgrading ul. Niemierzyńska – completed in 2012.

4.3 Planned investment projects until 2014

At present the computer centre, innovation centre and business incubator are being designed. The site to be developed covers the area of 13,596 m².

Business incubator – designated for start-ups and already functioning small entities in the field of high-tech (informatics, telecommunications, designing, services, trade and distribution, agents) and specialist laboratories - completed in 2012.

Computer centre – construction of server room and the back-up units to meet the needs of companies grouped in the Park; it will provide hosting of services, managing portals and information wortals, massive data processing, informatics infrastructure visualization, keeping archives of info data, etc. – under construction.

Innovation centre – the high technical standard buildings will accommodate companies specialising in high tech, informatics techniques, R&D centres, as well as those specializing in e-commerce, outsourcing, electronic banking, telejobs, telemedicine, e-learning, call center, back-up systems, help desks, software, informatics networks, hiring computer software via the Internet (ASP) and other electronic services – under construction.



All actions undertaken by the municipality have been fully supported by the local community and the entrepreneurs, some of whom joined the cluster (56 companies at the moment). The master plan for this area has been adopted with the public consent. There were no protests.

Current information about the ICT cluster:

Stowarzyszenie Klaster ICT Pomorze Zachodnie

ul. Niemierzyńska 17a, 71-441 Szczecin

tel.: +48 91 85 22 911, faks: +48 91 433 60 53

email: biuro@klaster.it, www.klaster.it

Address:

Szczeciński Park Naukowo-Technologiczny sp. z o.o.

71-441 Szczecin, ul. Niemierzyńska 17a,

Tel.: +48 91 85 22 911; Fax: +48 91 433 60 53;

www.technopark-pomerania.pl,

technopark@spnt.pl

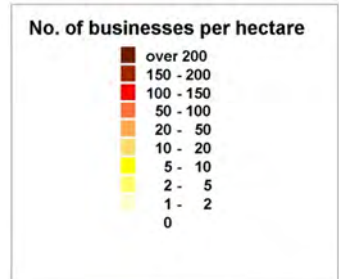
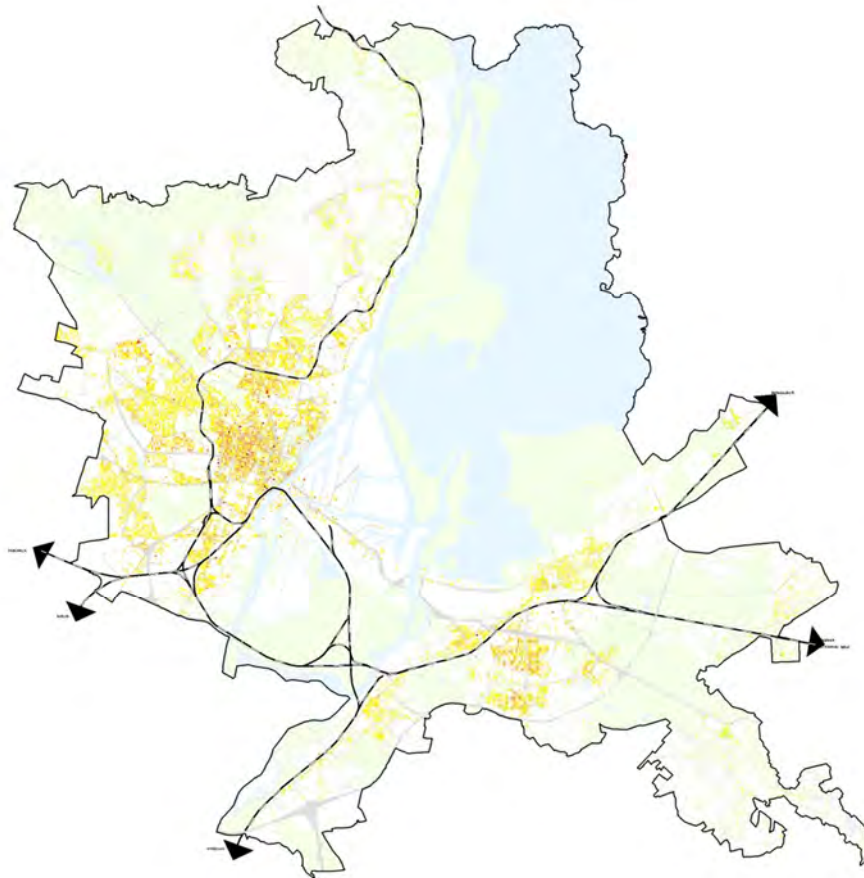


Source: Information sheets prepared by Szczeciński Park Naukowo-Technologiczny sp. z o.o.

Visualisation of the first stage of construction of Szczeciński Park Naukowo-Technologiczny sp. z o.o.(Szczecin Scientific-Technological Park Ltd.). Completion of the investment project and opening up of new facilities of the technopark is planned for the IV quarter of 2013.

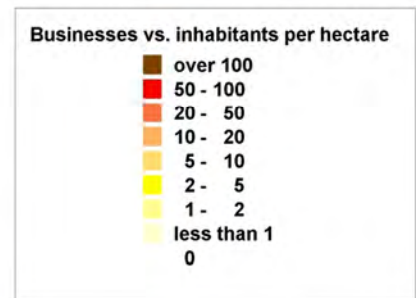
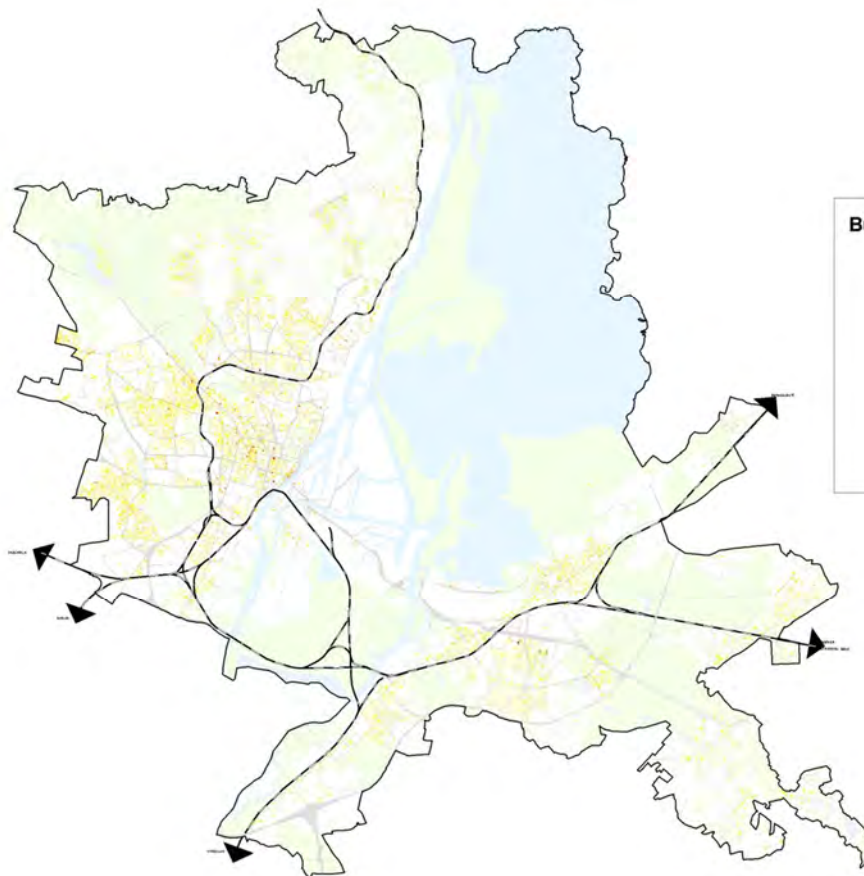
Attachment No. 3. Set of Maps referred to the text

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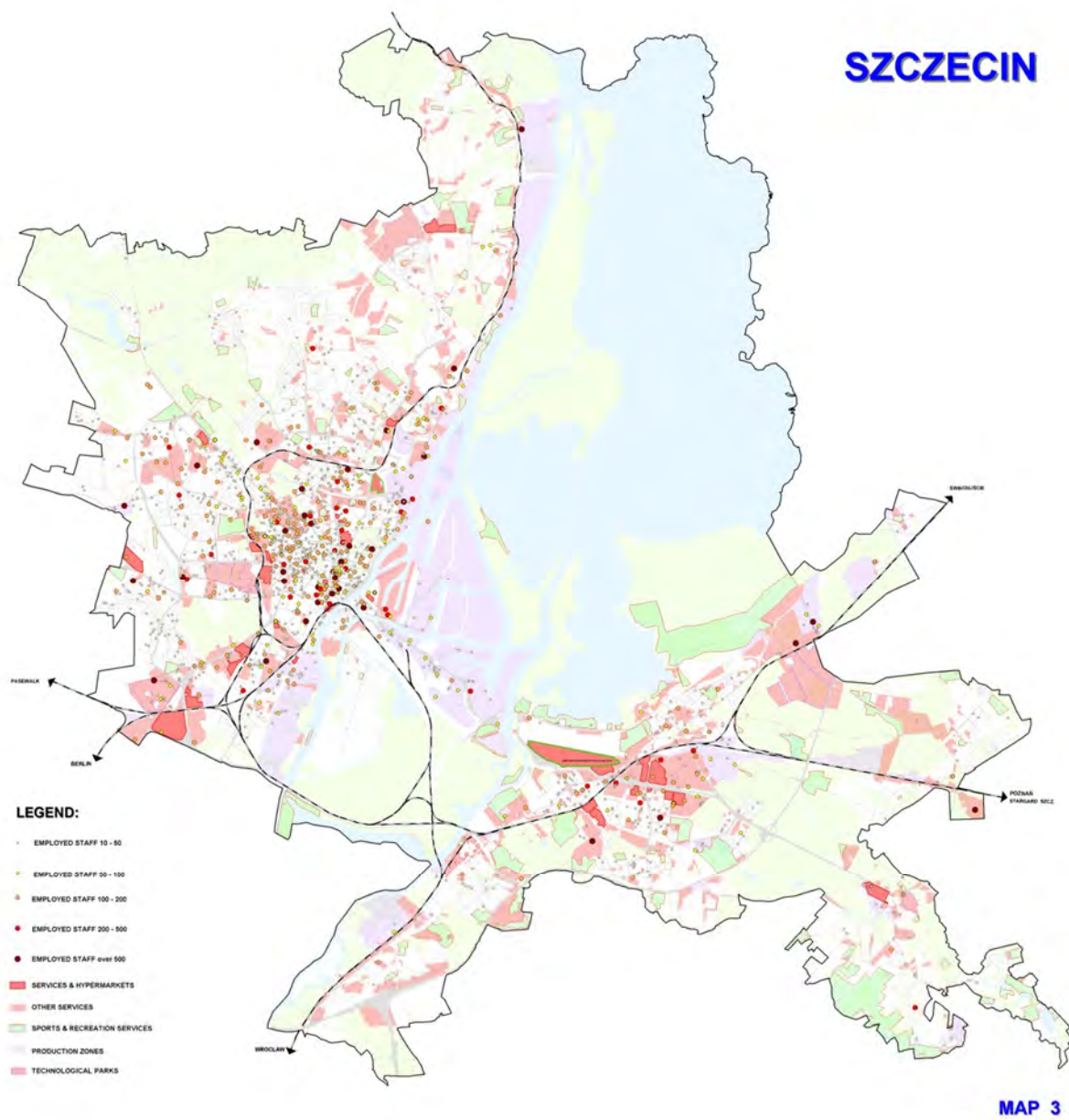


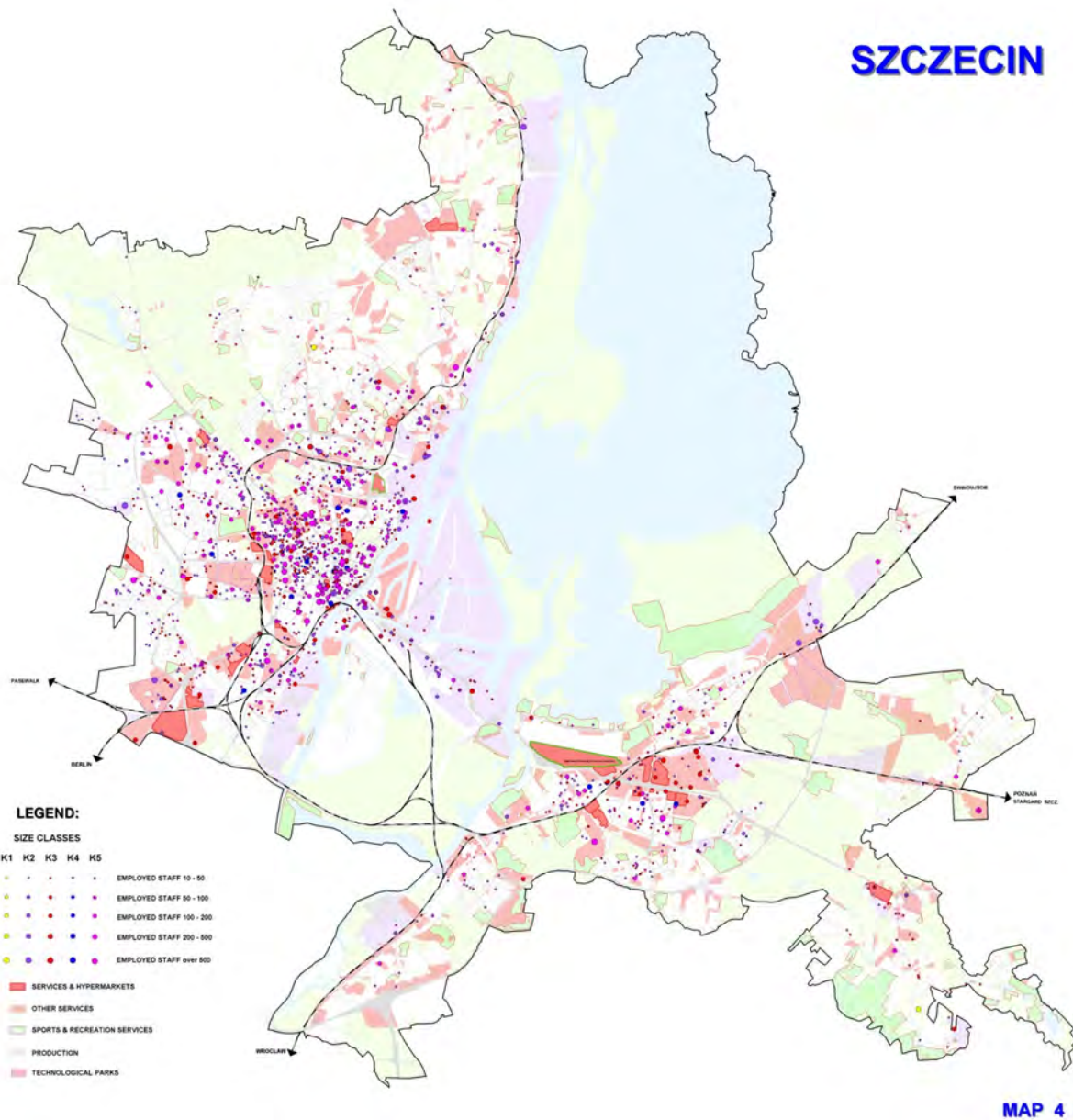
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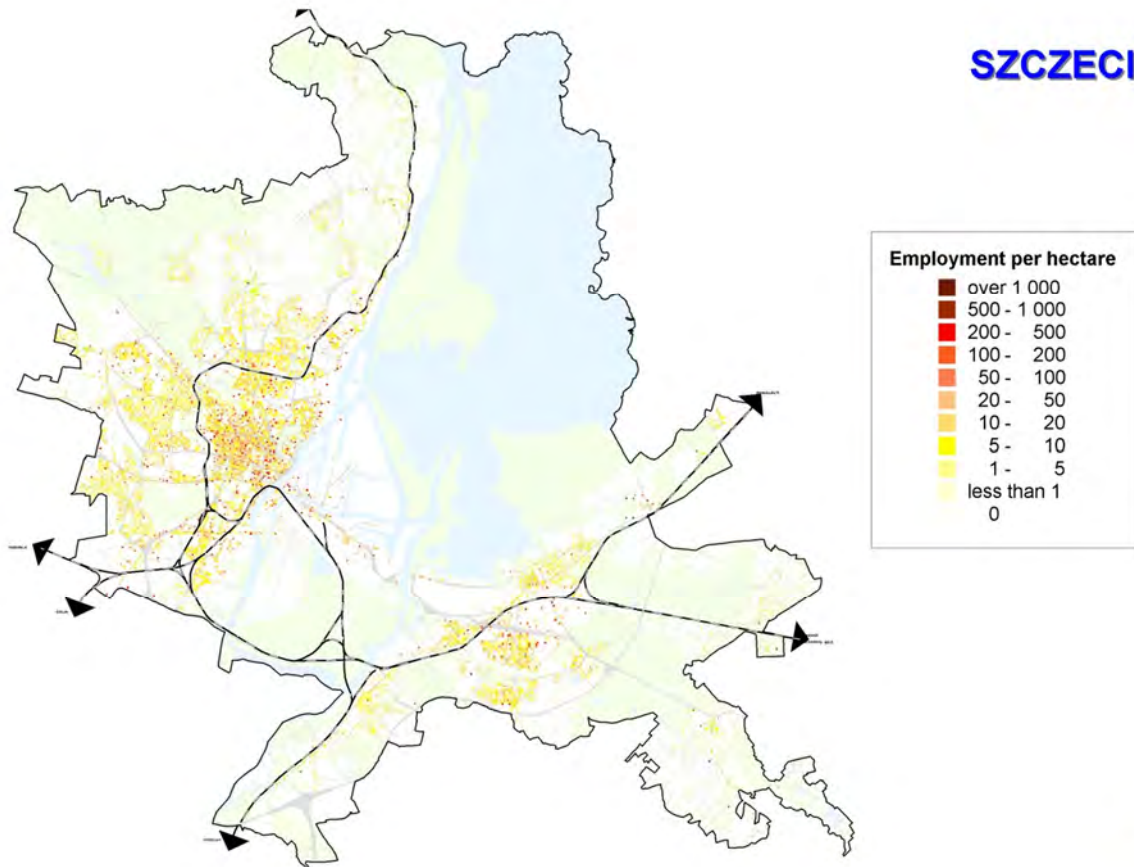


MAP 2



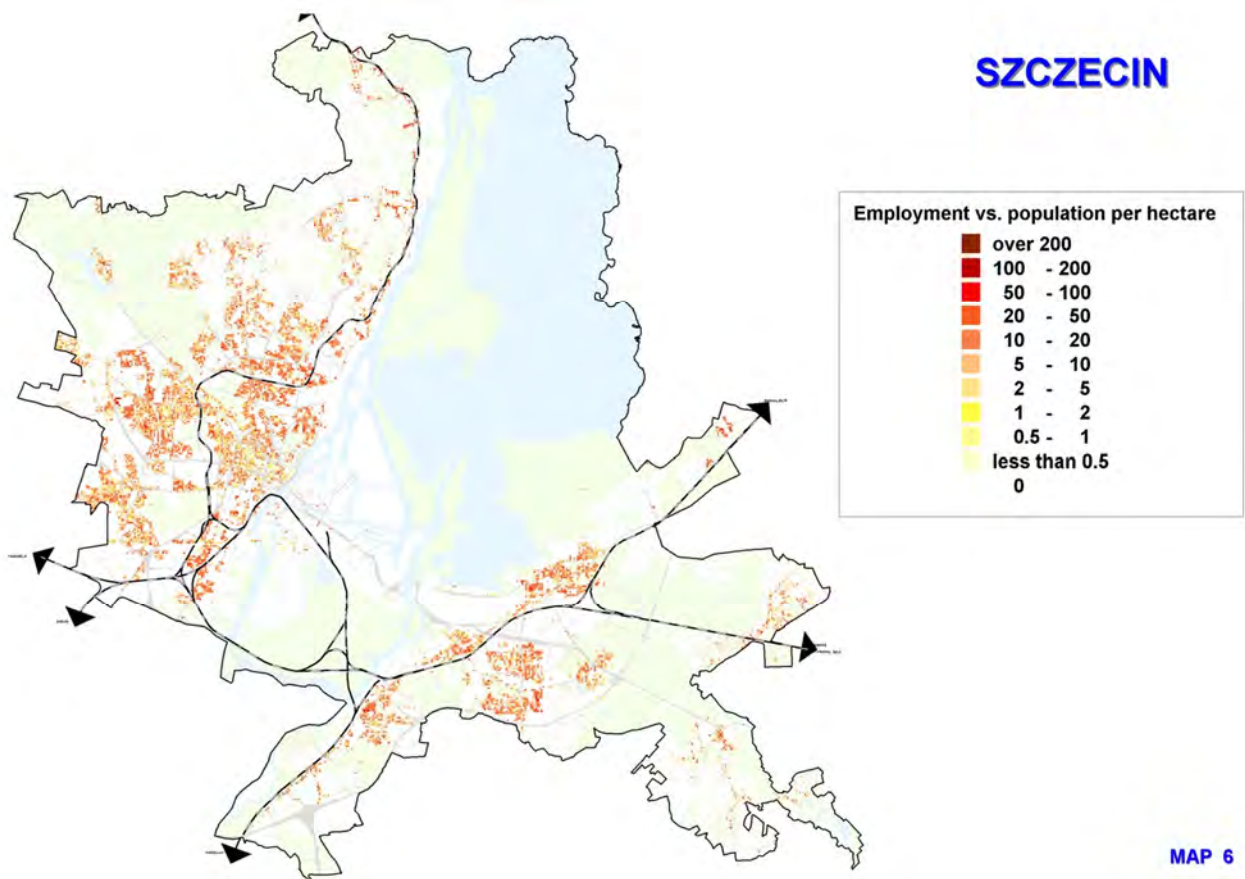


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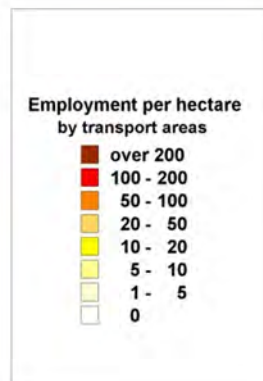
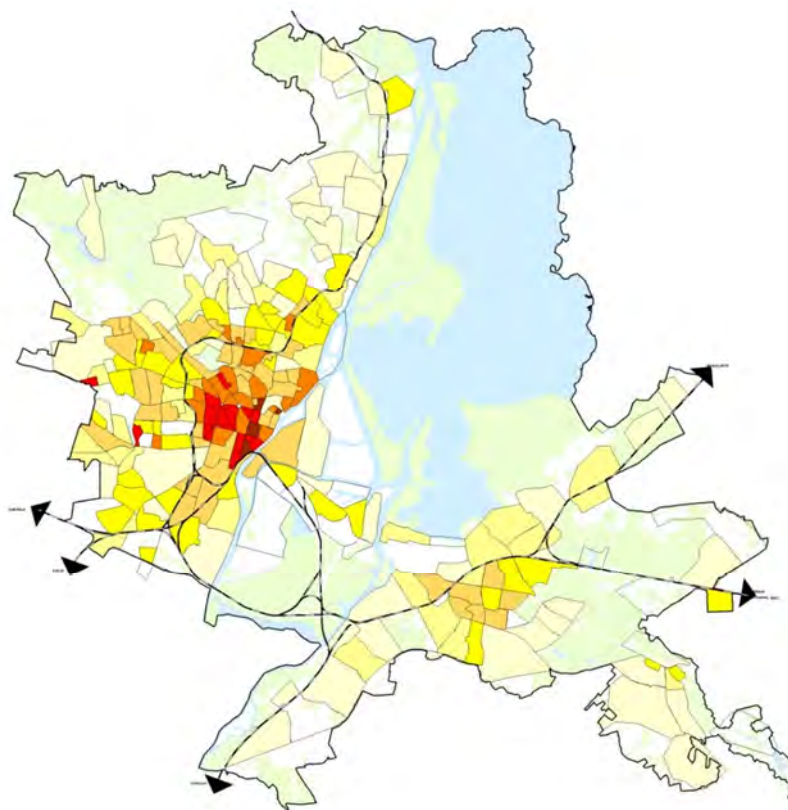
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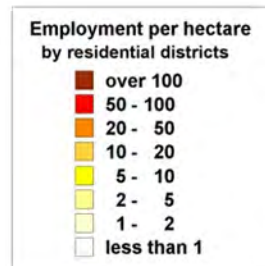
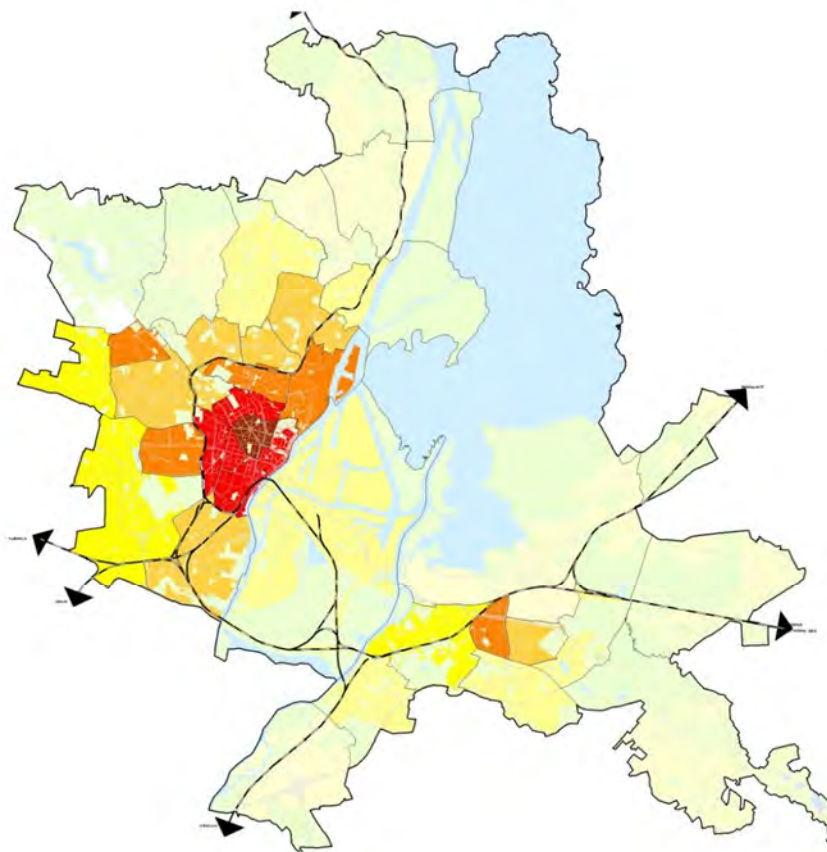
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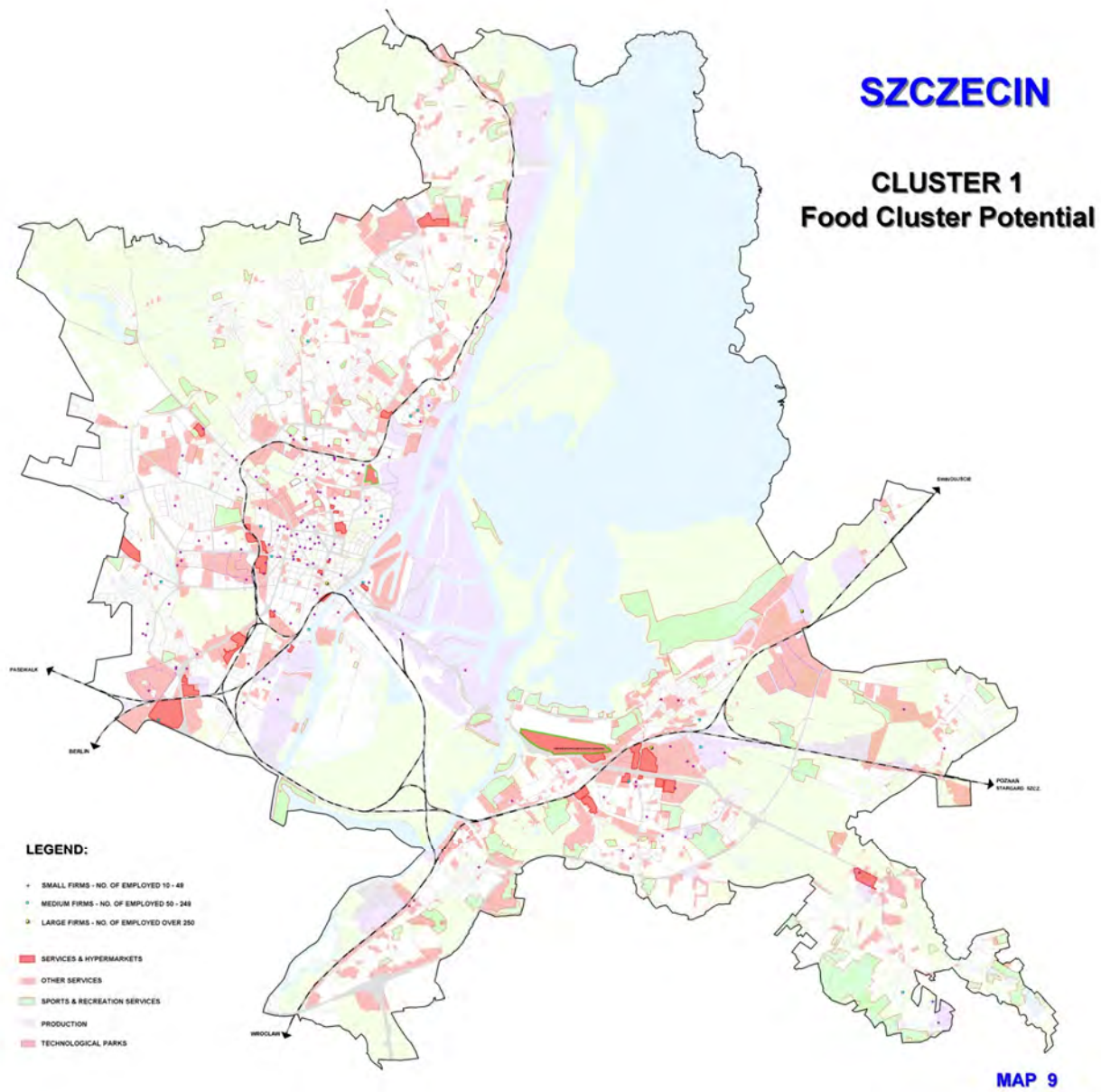


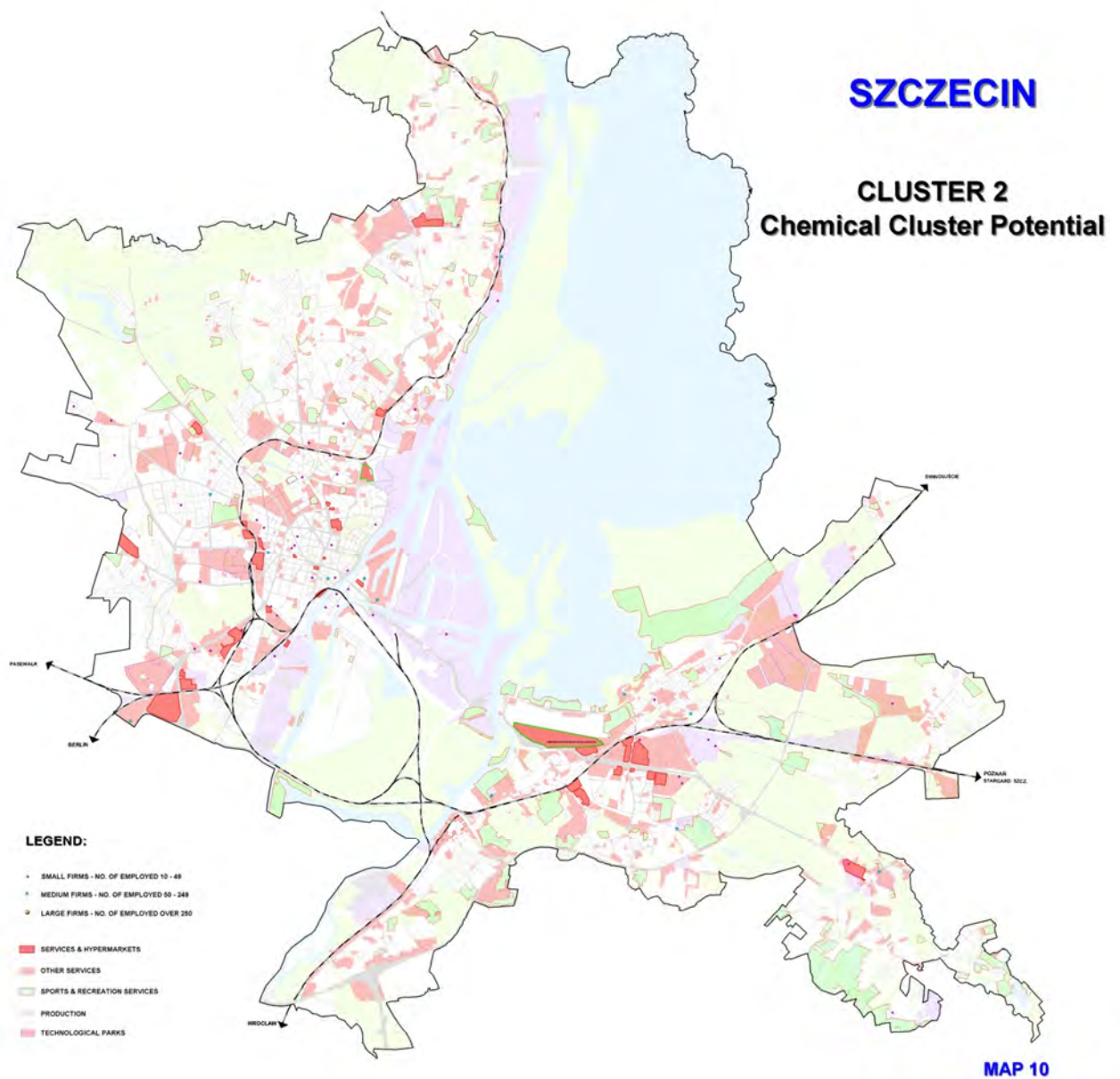
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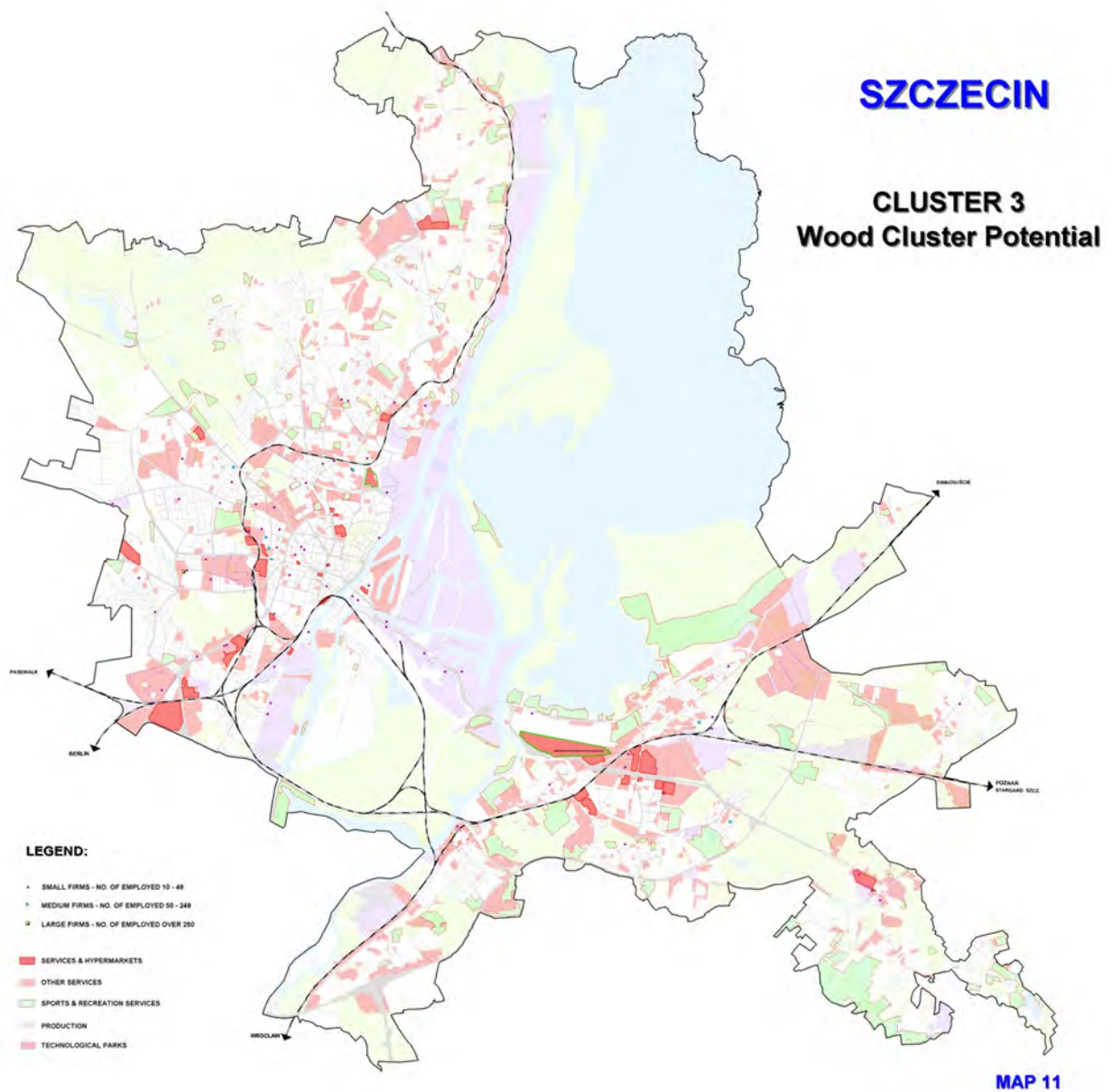
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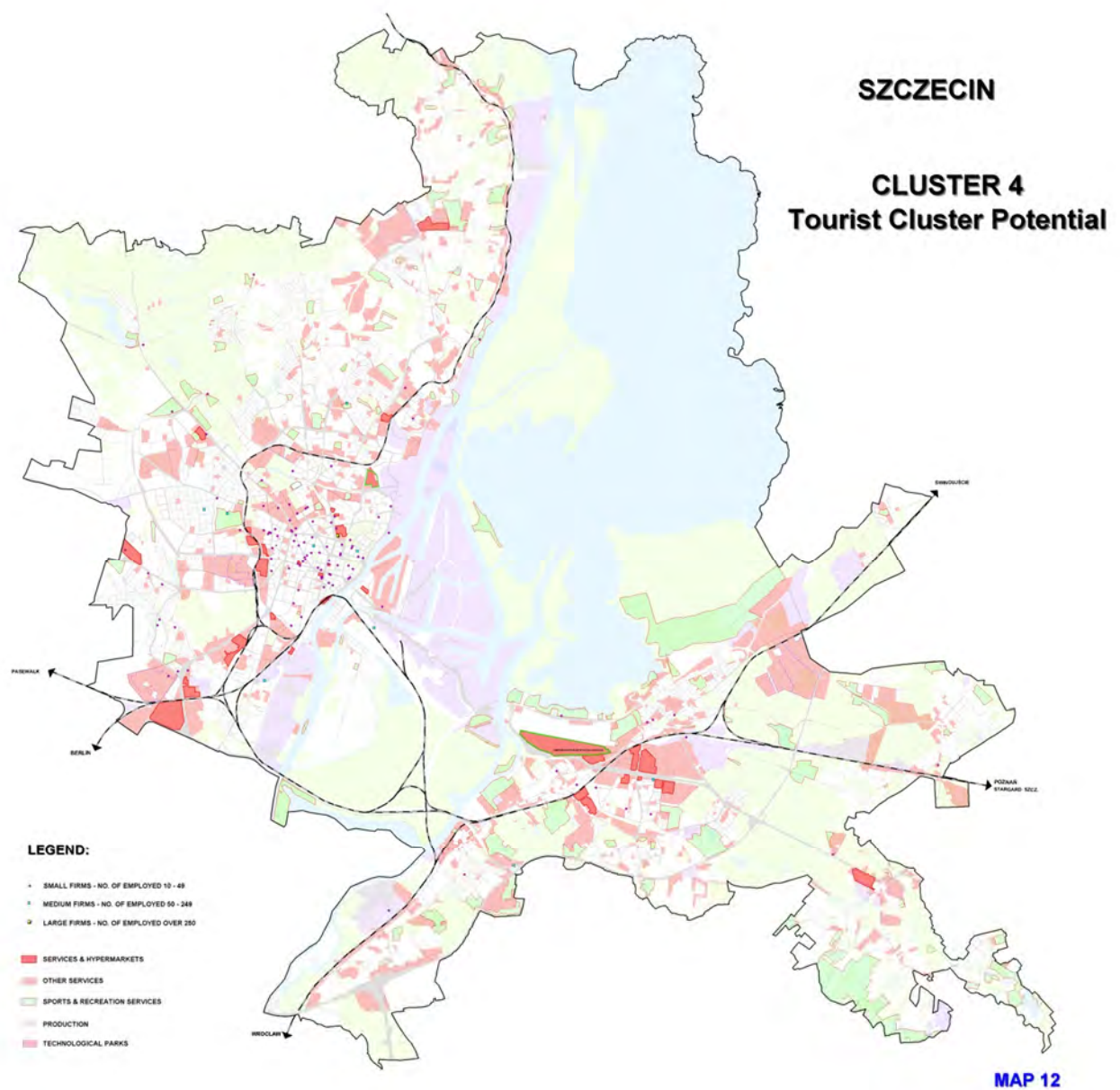


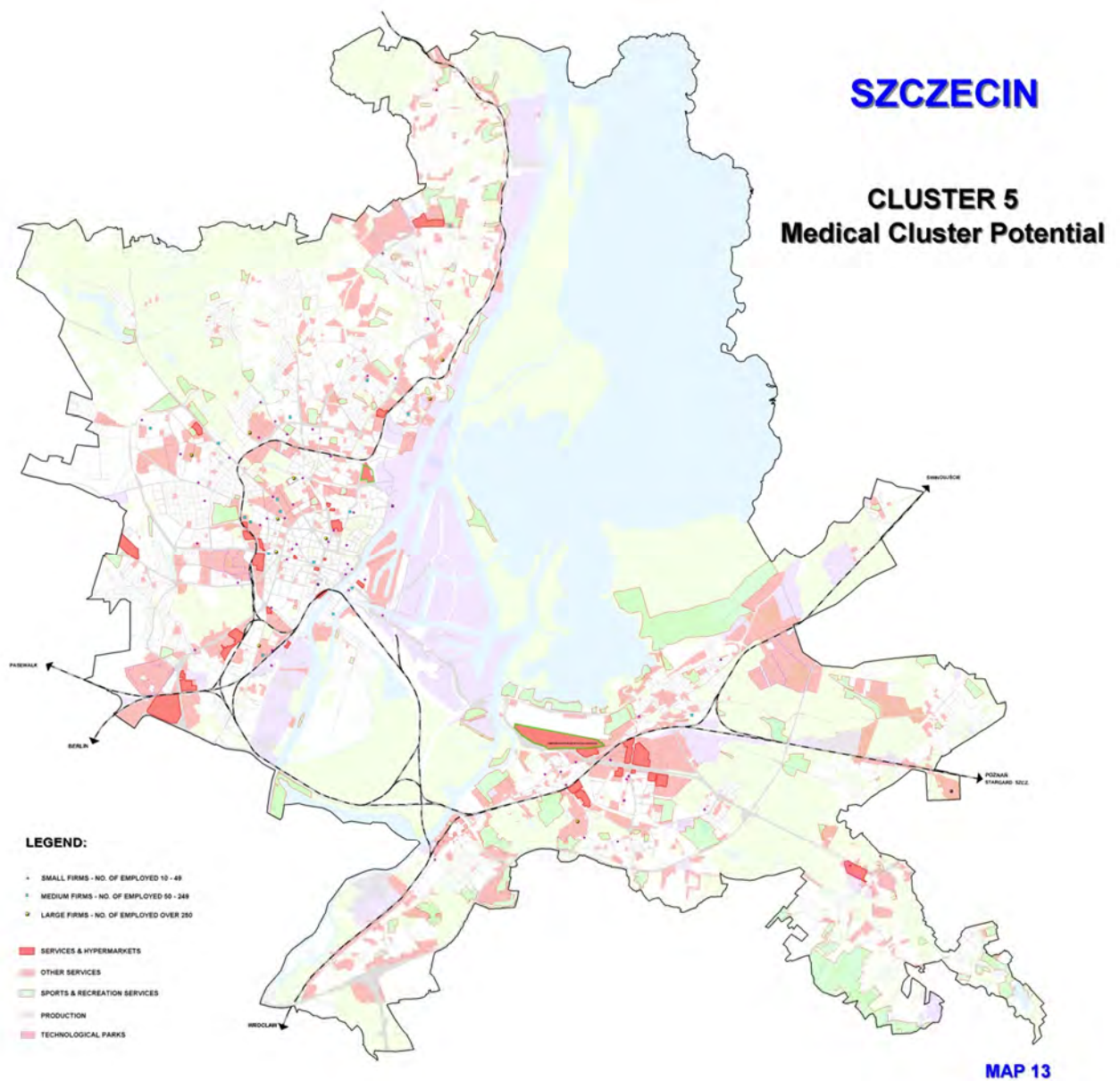
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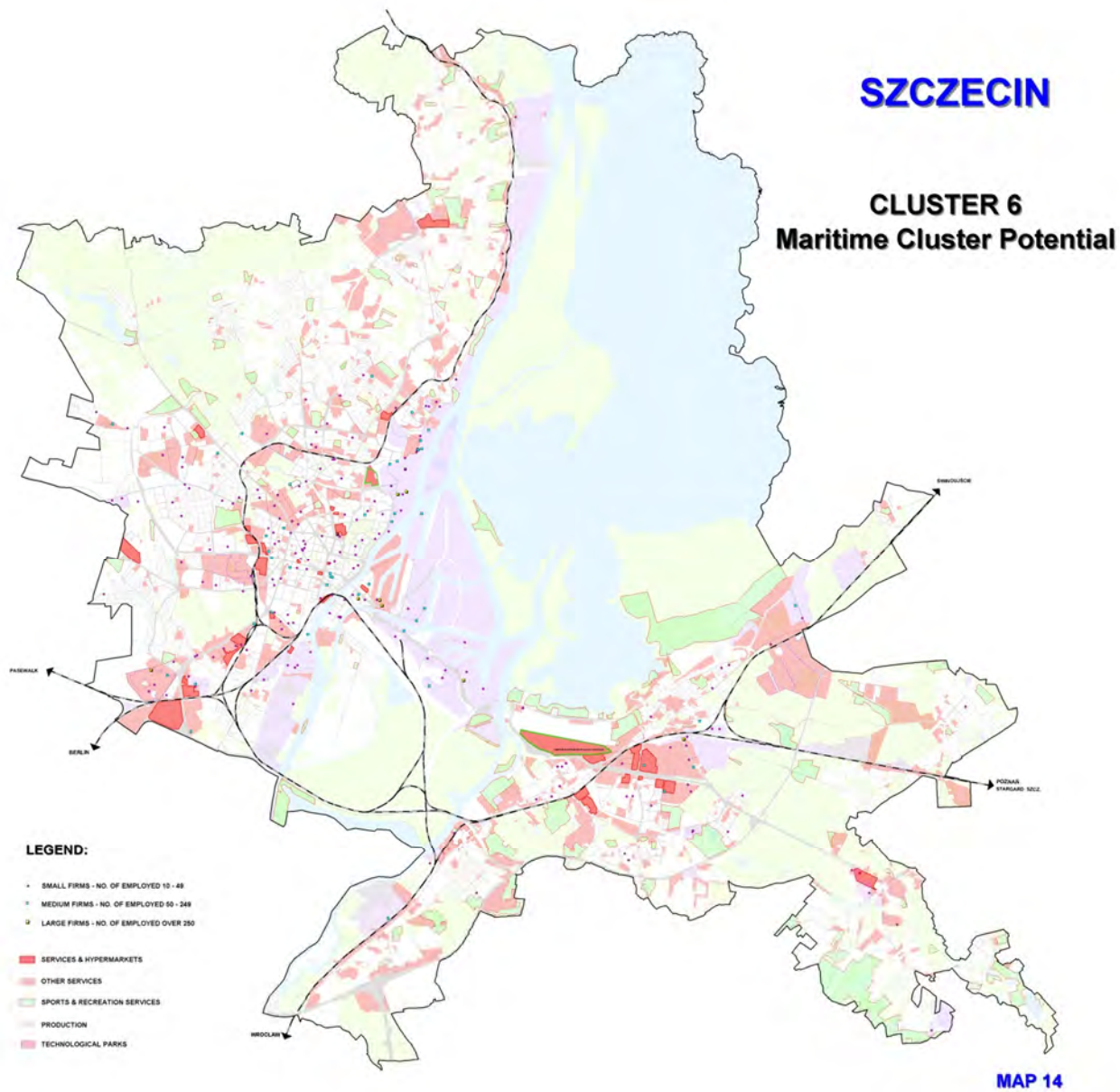


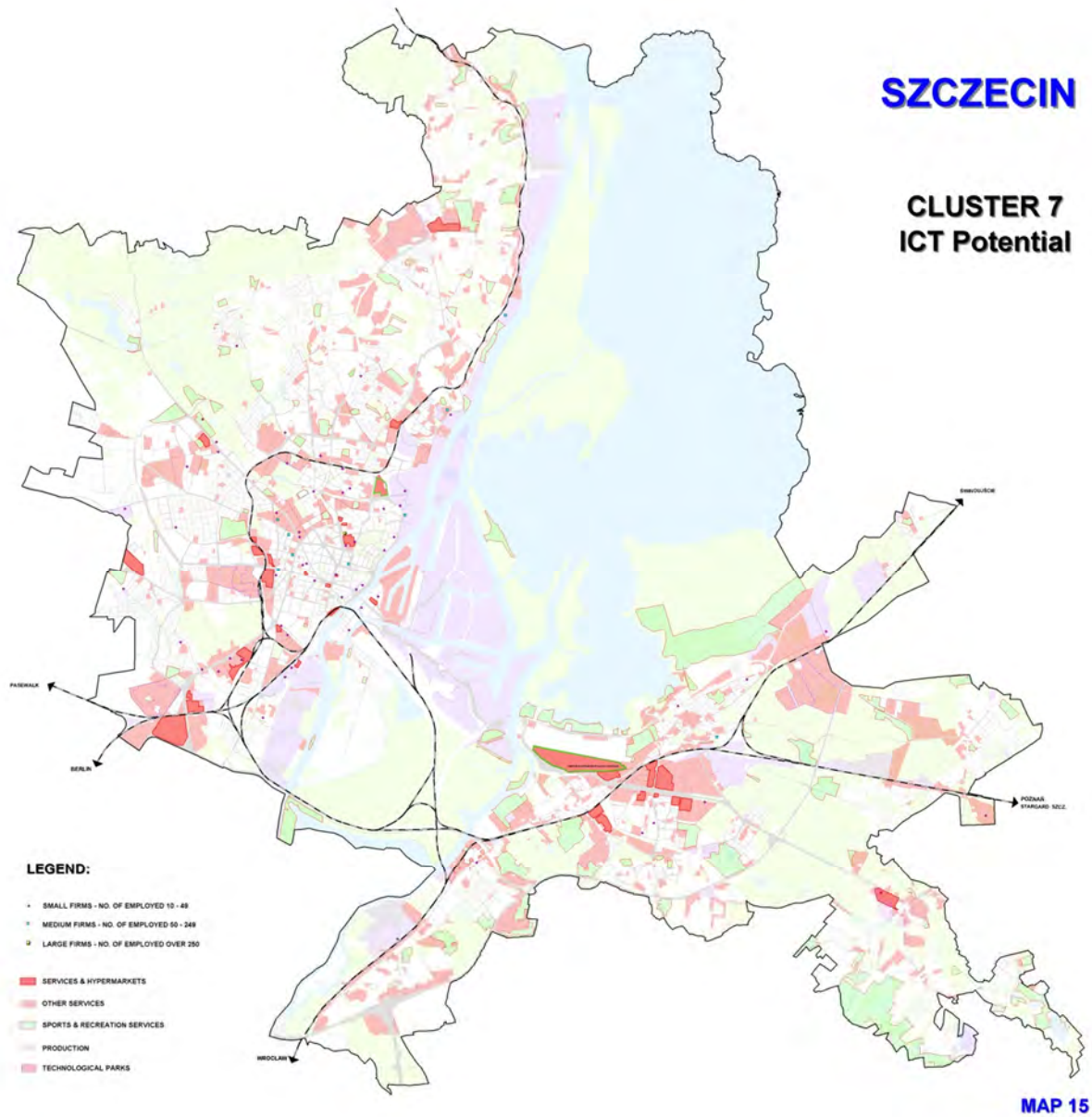


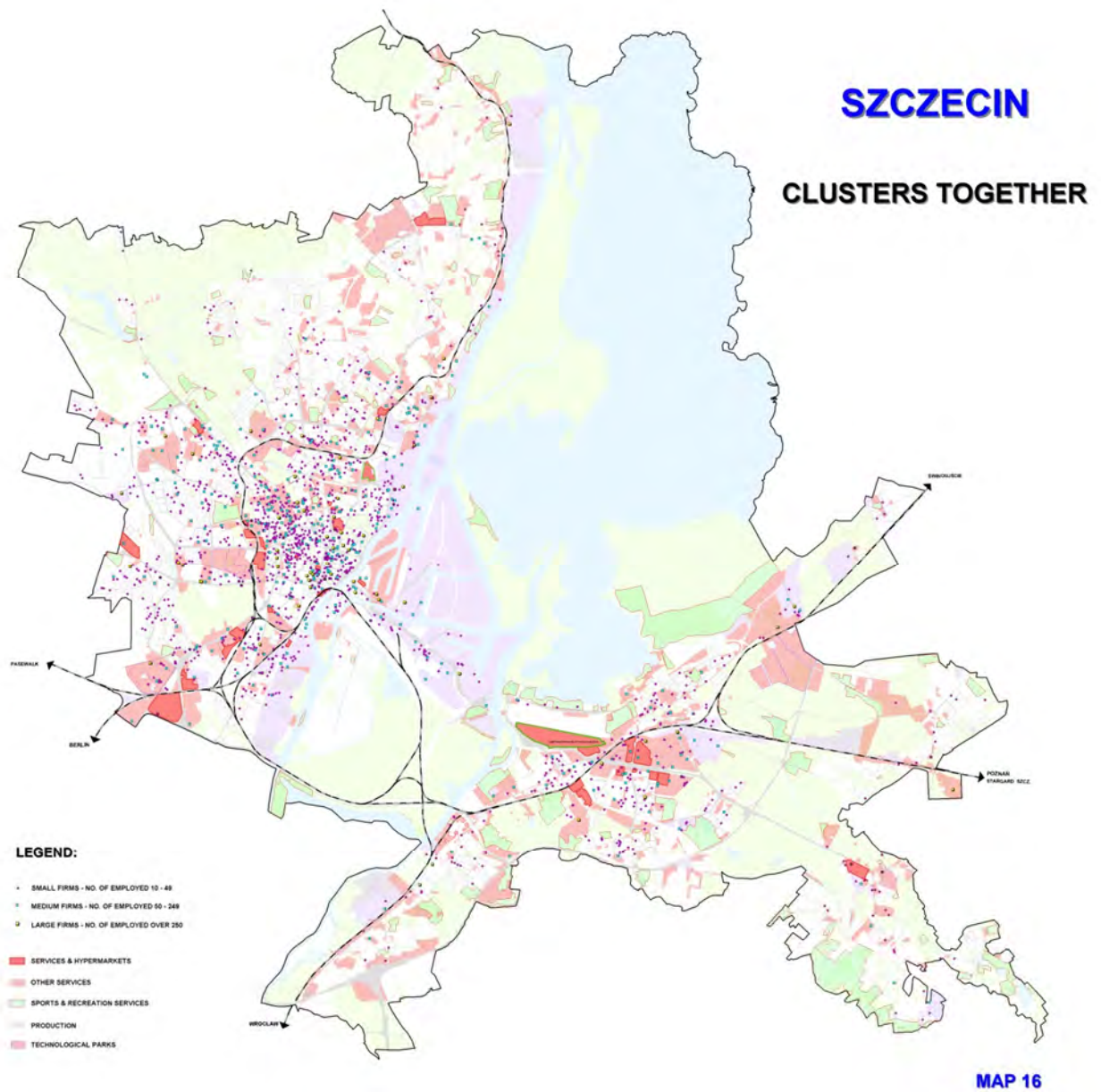










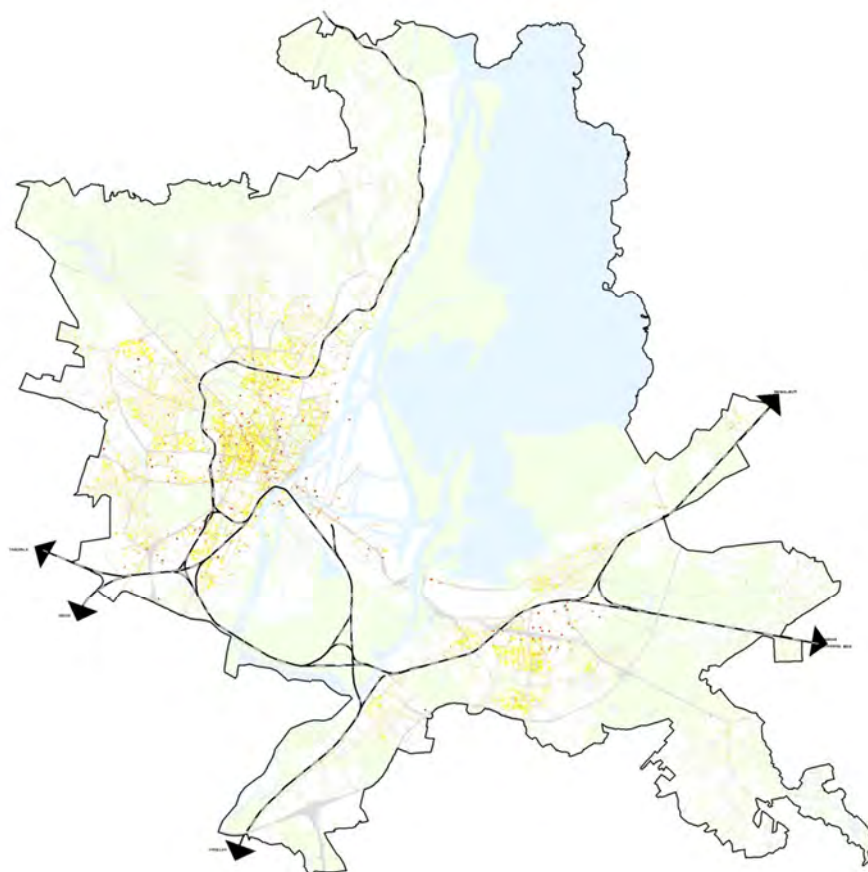


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MAP 17

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MAP 18

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MAP 19

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MAP 20

Part III:

Main findings and conclusion:

Why Clusters?

1. Reasons Why

The reason behind the study on work-placed clusters by the Metrex expert group on spatial planning and the economy developed from the need to understand how spatial planning can benefit a city's economy with regard to cluster-based formation.

The Expert group had previously studied employment location evolution within large metropolitan areas. The focus now turned to a specific area of work places, namely, business clusters. Porter's work on clusters suggested that there were potential competitive advantages for firms to locate spatially together where there were common themes of interest such as has been seen in California's Silicon Valley. In this regard, the study paid particular attention to the possible added-value to be gained through spatial location.

The economy is one of the key drivers of change. Given that business clusters may create the opportunity for economic success (added value) the study asked how this would benefit the city and enable the city to develop and sustain balanced development. In this context, spatial planning is viewed as a specific and necessary part of the economic process to manage urban growth in a holistic way so that a coherent city and city-regional structure can be achieved.

The Metrex group started from the premise in line with the EU Territorial Agenda that the city can no longer prevail on its own but has to take account of the spatial context for an entire city-region. The Territorial Agenda in particular provides a Vision and framework that gives expression to spatial planning within the EU in terms of how future development requires to be managed within city-regions. The ESDP (European Spatial Development Perspective) and the Territorial Agenda set out spatial planning theory which aims to achieve a better urban balance (spatial cohesion) between and within city-regions in the future.

Spatial Cohesion is "a better balance between city-regions" (ESDP & Territorial Agenda). Spatial cohesion is a "balanced distribution of human activities across the Union" (3rd Cohesion report). Spatial Cohesion "reduces development disparities by means of spatial planning" (Committee of Regions 2010). It can therefore be deduced that Spatial Cohesion can be interpreted as spatially balanced regions (Territorial State and Perspective 2011) and it is through the polycentric process of development for city-regions that spatial cohesion can be achieved. The Territorial Agenda aims to achieve polycentric and balanced development between the city centre and the periphery, the new city-region, thereby initiating new patterns of development across Europe.

With this in mind, the Metrex Economic Expert group aimed to analyse the various economic and planning strategies of the participating city-regions which could contribute to competitiveness and better spatial cohesion for a city-region. It would be important to understand 'cluster' formation and to judge whether this would be favourable to achieving the key objectives of a more competitive and spatially balanced city-region.

The importance of exchanging experiences and knowledge within the Metrex framework aids

Metropolitan city-region's to develop. It forms a joint network of information and shared experiences. This in turn has helped develop a common understanding of how clusters produce value and how this works within a city-region.

The work undertaken in this report demonstrates that direct public driven action through the city and its region with reference to regulatory spatial planning and economic policy can help achieve success in our cities and city-regions.

2. City-region perspective: introduction to the research agenda

There were 6 city-regions involved throughout the study. Paris Region, together with the City of Helsinki, led the group study. Madrid, the Stockholm region, Oslo/Akerhus city and region, and Szczecin made up the core group. Other city-regions, such as Lombardy Region (Milano) and Sofia contributed to the debate, as did the Polish Mazovia city-region for Warsaw. Lombardy was able to contribute to the report, making seven cities and regions in all. Due to work commitments, the Sofia and Mazovia city-regions were unable to complete their studies, but nonetheless, their work was equally valuable in participating during the discussions held during the Metrex Conferences.

Each city-region had to provide an analysis as to how they approached the relationship between spatial planning and the economy. Stockholm, for example, adopted a tangential approach by examining how spatial and urban qualities affected demand for offices and workplaces and how spatial planning can assist the process. Stockholm also examined what the effects may be observed as a consequence of different investments. Madrid on the other hand, directly attributed economic impact to major cluster work-place locations and as a result, carried out a study on Aerospace, Telecommunications, Media, and Publicity clusters to assess their impact upon the region. In doing so, Madrid looked at how these four key clusters contributed to adding high-end value to the economy and how spatial planning contributed to the cluster formation process.

Szczecin has been analysing the potential for development of existing clusters and the possibility for growth. The spatial distribution of the labour force was linked to demographic research in order to optimize both the spatial policy and functional structure of the city. The relationships between clusters and spatial location of enterprises and distribution of labour force were also undertaken as to how this may have an impact on the spatial policy of the city.

Oslo, whilst not dealing specifically with clusters, focused on the possible impacts that regional strategy may have on business development.

Paris city-region, being one of the world economic leaders, focused primarily on the clustering process and its various forms regarding the different cluster sectors involved. The level of innovation and the types of jobs concerned formed a major part of their study and asked the question, 'how does spatial planning impact upon this process'? Inspired by other world cities' examples, the most recent developments in urban planning in the Paris region tended toward the creation of innovative clusters through the development of "science cities".

The Lombardia region (Milano) contributed to the research through its 'cluster action' regional strategy. This is based around support for 9 clusters that have been identified as 'sectors of excellence' with high levels of specialization. The difference with Milano is the clear identification of seeking EU support programmes to create joint synergies for these clusters.

Helsinki, however, aimed to express the impact of clusters on the city-regional economy by asking whether clusters existed within the region, or was it simply location dynamics and concentration of jobs at play? Was there a link between a firm's decisions to locate in a certain spatial area and the spatial traffic and public transport infrastructure or whether indeed a cluster phenomenon existed? The reason behind this approach was to evaluate through new research the factors behind firms' location in a specific area and ask at the same time if the spatial planning process can be a benefit. This in turn mirrored the Stockholm investigation as both city-regions viewed the relationship between urban qualities and location dynamics in terms of agglomeration benefits to the city-region as a whole.

This report, therefore, aimed to provide new insights to the clustering process and the possible impact spatial planning may have to the economy of a city-region.

3. Study prescription and research methods

The participating city-regions all asked issues around clustering, with brief panoramas and description of the metropolitan city-region and the cluster studies undertaken and how spatial planning may, or may not, intervene within the process.

The studies aimed at providing an overall sketch of how clusters emerge, if at all, whether spatial planning through its policies on the economy, housing, traffic infrastructure and the environmental impact upon the cluster formation, and how clusters operate within each region. Both qualitative and quantitative approaches were adopted. The qualitative approaches were more specific and intensive with greater detail to the study, involving interviews and research analysis. Other city-regions adopted a more quantitative approach with greater use of large scale surveys that sought to quantify core concepts. In practical terms, many used both approaches to justify their findings.

Helsinki in particular, developed a methodological study using interviews with firms. Critical questions were posed with reference to cluster formation as opposed to concentration of firms, how city planning may contribute to cluster development through the implementation of city plan policies such as new traffic rail infrastructure or providing more public services. How important is public transport for a cluster or is parking more important? The key issue was to define and demonstrate that there may or may not be clusters in the city-region and to show where job concentrations were spatially. Could the planning process give support to the creation of cluster through the targeting of potential new areas of opportunity through spatial planning in future developments?

4. Key Issues of the research

A cluster is a group of public and private sector firms and actors spatially connected through collaboration or cooperation. The key here was to gain an understanding of how important it is for a cluster to be connected within the same locality. This could be understood to be within the same building or it could mean within the same street or district quarter. All of the city-regions tested this hypothesis through analyzing their current policies on where concentrations of businesses are located. Each in turn used spatial analysis to determine the types of work-place concentrations and its relationship, say to public transport services. But why study Cluster development?

Essentially to gain a better understanding of how business concentrations can create added value and jobs for the city and its surrounding regions and find how clusters could develop. Clusters create the opportunity for economic success (value) which benefits the city and enables the city to develop and sustain balanced development. This was what was behind the ESDP (EU framework promotes 'economic growth' and 'spatial cohesion' through European Spatial Development Perspective & Territorial Agenda documents).

Nevertheless, assuming cluster development achieves such major benefits key questions have to be asked. This is what the Metrex Expert group set out to do - to set up clear questions that needed to be answered, though it could be argued that as practitioners, most of the studies adopted the questions more as assumptions rather than pure scientific research.. The questions revolved around such issues as 'how is the city planning process able to best support cluster development' or 'how important is the flow of information via 'face to face' business contact', and finally, 'how important is public transport development for a cluster'.

City planning, for all the city-regions involved, believe that spatial planning can deliver, that planning is an important element in making cities quality places to live and work. It can do this by targeting economic development spatially, either through regulation of land-use development or by public authority direct intervention, such as in Helsinki, where the city directs new investments and public rail infrastructure to brownfield areas within its city-centre (regeneration) and through urbanizing the suburbs. Working together with the surrounding towns, Helsinki is beginning to create a polycentric city-region with sub-centers based around public rail transport infrastructure. This aims to create a better balanced (spatial) cohesion within the city-region. This in turn prevents uneven development (urban sprawl) through direct intervention.

What can be concluded from the report is that direct public driven action through each of the participating city-regions with reference to regulatory spatial planning and economic policy can help achieve success in our cities and city-regions.

The Paris region is historically monocentric with a polycentric tendency impulsed by the planning process. As the capital region of France it is the field of action in both government and the Regional Council in intervening to foster economic development. How? In Paris, the aim is to achieve balanced development by utilizing existing and potential concentration of jobs through intensifying new spatial developments at rail intersections - 'transport hubs' - as well as targeting uneven development by supporting new/existing clusters and trying to initiate/innovate private sector partnership in those clusters. The most emblematic future

cluster is to be developed in Saclay (20km south east of Paris), thanks to the existing large public R&D centres. It is due to become one of the world's largest public sector and private R&D clusters, strongly reinforcing the status of the region as being a 'start-up' region.

The regional development plan for the Stockholm region (RUFS 2010) emphasizes the importance of a densely populated, polycentric region. This provides good conditions for an attractive, competitive region and at the same time for increasing sustainability by means of effective utilities, good public transport services and resource efficient management of land development.

One of the two Stockholm studies highlighted some cases in which investments were made on purpose with the aim of enhancing the development of clusters within a geographical area. In some cases, the public initiatives have yet to have achieved their goal of creating horizontal integration of companies with other sectors. The most successful case has taken place with the support of both private and public investments, thereby supporting the thesis that complex development processes require collaboration between the public and private sectors.

Stockholm also initiated a study in three parts (apartments, offices and single family housing) based on an econometric model that used economic transactions of housing and office locations (the focus in the EconoMetrex report being on offices). This included information on the final price and the exact location, to evaluate the connection between urban quality and the value of offices or apartments. This has made it possible to evaluate the value added by public investments like a public transport line or a park. The model made it possible to predict the future value of offices or apartments within an almost 90% accuracy rate. This tool can help public actors in the planning process and make it possible for the public authorities to negotiate the participation of investors in public investments that will add value to properties and therefore raise their profit. In turn, the research enables the city-region to determine if companies would effectively accept "the price to pay for density" as a means of providing additional support for the private sector.

In the Stockholm study, however, the research focus was not on which activity sector the companies belong to or what kind of functions were present in transactions observed but to understand why companies accept to locate in high valued places rather than others. The study acknowledged that this approach, by adopting 'the final cost' analysis, made it interesting and complementary to the one developed by Helsinki, as Stockholm's report aimed at identifying clusters of density and attractivity rather than primarily predicting activity by sector.

The Oslo study equally focused on identifying locations likely to be the most attractive for future businesses to set up within the city-region. The study formed part of the overall draft spatial strategy for the Oslo region. Oslo developed 3 spatial strategies and tested them in terms of how each strategy impacts on spatial dispersion of employment set against city-centre locations.

Madrid, on the other hand showed how spatial planning can help consolidate cluster formations, particularly in the suburbs and surrounding region, based on the need to know where the new transport infrastructures should be concentrated to support the strong economic growth of economic space outside the prime locations in the city centre.

Madrid has seen strong development axes being built within their capital region, with public and private money securing university development towards the fringes and resulted in strong increase in urbanization. In many regards, it could be argued that Stockholm and Helsinki's city authorities have followed with similar programmes. The urbanization processes create changes in the location dynamics of firms to move ever outward, searching seemingly to reduce costs, enable expansion, and where possible, locate near to transport hubs to the key international airports and harbours.

In Szczecin the analysis of the labour force location in relation to clusters is being used to support the city's spatial policy and long term investment plans. This in turn has an impact on transport policy, including public transport and car park policy. Szczecin's public policy is aiming to establish new clusters through industrial and technological parks as well as business incubators, thereby supporting the view that the City administration can help support the private sector.

Milano's review on clusters was specifically aimed at identifying resources to attract new investment and focus on priority clusters such as aerospace, green industries, health and sustainable mobility. The study concluded that there has been a gradual departure from a territorial approach to one that highlights 'areas of excellence in production'.

The public policies pursued by Helsinki strike a chord not too dissimilar to Madrid, or Stockholm and Paris for that matter, in that competitiveness and innovation are accelerated through new rail transport infrastructure hubs and cooperating its policies with the State to decentralize Universities to form new 'Science Parks'. Paris has complied with national government policies which aim at rebalancing development among the French regions. Paris has seen how changes in the economic structure of its key metropolis - rising land prices - forces households and firms to migrate out of the urban core to the periphery or even beyond the regional boundaries. Firms affected by this process still seek to find accommodation close to the main public transport infrastructures.

Paris is perhaps fortunate that the State has created planning tools on strategic areas to directly negotiate with local actors to enforce its view on key issues. In French law, the region is responsible for setting up the framework for planning and land use. The Regional plan is the tool to achieve this goal. The regional plan does not actually mentions the word "cluster", yet it is a key objective of the Regional master plan to rebalance economic development between the various parts of the region, even if it also targets 'metropolitan interest areas' that match the state's strategic areas. These two views tend to lead towards a more polycentric city-regional structure in practice.

Helsinki pursues the exact same philosophy. The City has the power to influence where economic development may happen and the nature and type of development to take place. Paris is identical in its policies. The power of the city lies in the fact that it is the unique actor to have the power to give the building permit. All of the city and city-regions employ such a strategy to great effect. It is not always successful, but generally, can contribute to greater regional cohesion and reduce urban sprawl.

5. Clustering process& public-led initiatives

The clustering process can be in various forms regarding the activity of workplace sectors. Madrid concentrates on four cluster formations within specific spatial locations to underpin their success for the region and to promote wider collaboration and competition between firms.

All of the participating city-regions address the issue of agglomeration with respect to economies of scale in order to improve the regional economic base.

Recent developments in urban planning within Paris, Madrid, Stockholm, Helsinki and Szczecin go toward the creation of innovative clusters or job concentration, through the development of science cities or business parks. This is a perfect example of how spatial planning can intervene and have a positive impact not only on innovation but also in job creation. Milano, in particular, highlighted the need for regional strategies to use governance as a means to aid identified clusters and systemize the process of entrepreneurial discovery.

Szczecin's strategy indicates that spatial policy supports such initiatives as the other city-regions. Szczecin identifies areas for 'industrial parks' in its spatial plan. The plan recognizes that clusters are at their initial stage of growth, yet argues that concentration of productions has a crucial significance for the labour market. Helsinki, however, claims that their research found no evidence of specific clusters; instead, job concentrations exist based upon good accessibility to public transport connections and suitable rental costs or services provided. The distances within the Helsinki city-region are relatively small in comparison with Central Europe. This means that firms benefit from economies of scale through concentrating into a specific spatial location.

Public-led 'organised' areas of job concentration exist in Helsinki. They are formed together from integrated work between university departments, the State and the City Council which are spatially connected through collaboration or cooperation with firms. But this only exists in about half of the job concentration areas, and even within this process, cooperation is not the key issue.

What the Helsinki study has shown is that a group of private sector firms spatially connected through collaboration or cooperation with other firms as business clusters tends to exist within Paris, Madrid and to some extent, Stockholm, but it is only beginning to emerge in places like Szczecin, and does not exist within the Helsinki boundaries although Helsinki does have connections to clusters nationwide and globally.

Clustering is considered by all cities and city-regions in the study to offer innovation potential. In turn, Porter, Furman and Stern* analysis suggests that innovation benefits can lead to greater commercialisation between companies (such as "achieving a high market share of high-technology export markets") as well as collaboration between firms. Porter et al were also of the same opinion as the Metrex Expert group on clusters that "public policy" plays an important role in shaping innovation. Clustering may also create the possibilities to reduce costs of production and attracts more suppliers and customers that will have a positive impact on firms' growth. Clusters have 'Networks' that are within the area and/or regionally, or internationally, and that clusters within clusters require face-to-face contact. Collaboration works in the way that information, knowledge and sharing of ideas is being transferred

because it is held that it improves productivity, profit and innovation. Therefore, firms network in order to increase knowledge that generally goes toward making more added-value.

This report, therefore, concludes that there has been a common understanding on clusters and policies driving the economy in our city-regions through a series of city-region practices. The impact of cluster policies on economic competitiveness and spatial cohesion would appear to be universal within the EconoMetrex group in that the cities and city-regions, through the spatial planning process, use these policies and actions in conjunction with other wide-ranging policies on public transport connectivity, housing, and the environment to help manage a city-region's configuration. Cluster policies and work-place concentrations are but one of a string of policies overall that city authorities use as a planning tool to improve the effectiveness of spatial planning so that cities and regions can operate at their most efficient scale.

Each city-region has its own context. In presenting a collection of economic and planning strategies from the involved cities and city-regions, the outcomes may allow us to conclude that such strategies have contributed to the competitiveness and spatial cohesion of each city-region in some form or other. It could be argued, therefore, that 'cluster' formation as well as job concentrations are viewed as one of the key goals to be achieved based on the assumption that they have a favourable result for cities and their regions to benefit their economies.

This then leaves some key questions unanswered, namely, does the spatial configuration of a city-region contribute to the economic and social welfare success and if so, what part does cluster formation do to improve the effectiveness of city-region development; and even more significant, does it really matter whether cities and regions support cluster based development or is it merely a case of trying to support the conditions for jobs to be spatial concentrated, no matter what type of activity is undertaken?

Douglas Gordon, Helsinki 2014

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Appendix : Methodology for the Helsinki Case

Susa Tulikoura and Douglas Gordon

Structure of a cluster

Collaboration between the participant cities and regions tended to support that one driver company and/or research centre and/or University was a necessary key for clusters to operate. It acts as a magnet for other companies but it could also be because of a concentration of firms that are specialized in some "industry" have located near to other support industries, suppliers and/or competitors.

The common study on clusters was conducted by Helsinki and Paris from a methodology developed by Helsinki and experimented by Helsinki and Paris. Overall, from this analysis 20 geographic zones emerged in Helsinki and 40 for the Paris region were identified. For each geographic zone the presence of the R&D in biotechnology was examined.

In order to determine whether clusters exist, the Paris and Helsinki city-regions tested the hypothesis through cluster mapping, with the demand side being the application of technology and the supply side being the provision of technology. Geographical information system (GIS) was used to recognize concentrations of jobs in a region (kernel-based method) in order to carry out spatial cluster analysis. Only areas that had over 2000 jobs were used. The cluster analysis was done in the past 5 to 10 years to show how the number of jobs, firms, and added value have grown in these areas (global and national economic recessions included) were taken into account in order to recognize strong concentrations of jobs.

Specialisation analysis consisted of making a 'location quotient' (LQ) to spatial clusters. This technique compared the local economy to a reference economy, in the process attempting to identify specializations in the local economy in order to compare a region's economy to those selected sectors/ areas in the economic base (including specific type of clusters there are for example, bio, creative...etc). The next step was to evaluate the interdependency between the different economic sectors in the clusters to determine whether or not the economic sector of the firms, research branches or universities plays a role in the phenomena of localization and concentration.

Location and determinant spatial factors analysis

It was important to gain an understanding as to whether clusters existed or not in a city-region with regards to the various metropolises involved in the Metrex Expert group.

Correlation analysis analysed if location of clusters will have positive correlation with proximity of infrastructure like rail lines, roads, airports, a certain type of land use etc.

In this respect, each city-region was asked to describe how clusters were organized in their region, both spatially and non-spatially. Equally, it was expected that the city-regions explain the difference between a cluster and concentration of companies, (research centers and/or universities) and specifically, where clusters locate spatially.

Some key questions were asked:

- Why clusters are specifically located in these areas?
- What are the key "industries" of these clusters?
- What led to their creation? Was it proactive by private businesses or public sector-led?
- Are firms that form part of clusters located within close spatial proximity to one another or is spatial proximity not important?

The objective was to find out if those job concentrations were a cluster, or some of them were, or were they just job concentrations that benefit from economies of scale?

Employment Concentrations

The first step was to localise employment concentrations in the region. It was based on the spatial Kernel method that allowed for density squares of 250 m squares.

For the next step Helsinki chose a limit of 2000 and Paris 5000 jobs.

Specialization of the possible clusters

The second part of the method was to do a LQ (location quotient) for each job concentration. The economic sectors that have a high LQ could be the core economic sectors of the possible cluster. In Helsinki, Viikki came out with a high LQ in R&D in biotechnology.

Model performance and relationship of independent and dependent variables

The final step was to do a Geographically Weighted Regression analysis (GWR) in order to find possible spatial relationships between core economic sector (dependent variable) and its support and related economic sectors and accessibility to the city centre by car, bicycle and by public transport (explanatory variables) defined by LQ analysis. Before doing a GWR there was the need to do an Ordinary Least Square (OLS) method analysis to remove overlapping explanatory variables that would tell the same thing and find the statistical correlation between economic activities that are present in the identified geographic zone.

Overlapping economic sectors were deleted from the OLS analysis and it was done again so that there were no overlapping explanatory variables. OLS was done also to check the model performance, the quality and the strength of the relationship between independent and dependent variables statistically and spatially.

Spatial autocorrelation

Before doing a GWR analysis a spatial autocorrelation for OLS was done. It was done for residuals, so that the study could be sure that they were randomly distributed in the city-region. If they were clustered it meant that there was missing some other explicative economic sectors that were left out after the LQ analysis.

The result was that residuals were dispersed. This meant that neighboring values were more dissimilar than expected. This would mean that there wasn't a spatial relationship between the chosen economic sectors. This was true in the whole Helsinki city-region, because these explanatory economic sectors were not only dependent upon one economic sector but of several other economic sectors. It was seen that the OLS mapping residuals had a positive value in Viikki, so it was possible to continue the analysis and do a Geographical Weighted Regression (GWR).

Spatial relationship analysis by GWR

The last step was to analyse the possible interrelations between economic sectors and other variables such as accessibility in Viikki with GWR method that took into account also the spatial aspect. It reflected the intensity of the spatial relationship between independent and dependent variables (and showed the spatial autocorrelation between the R&D in biotechnology and activities that seem to be correlated from a statistical point of view, using a Geographical weighted regression). The results from it has to be random so that there

were not missing important economic sectors from the analysis and that there could be a possible spatial relationship.

GWR for Viikki

A regression analysis was undertaken so that it was possible to explore the spatial dependency of explanatory economic sectors with "R&D en biotechnologie" (7211Z) sector. The objective of this phase was to assess if there was a spatial dependency or relationship between some of the explanatory economic sectors or all of them with "R&D en biotechnologie" (7211Z).

This could tell that if there was a large existence of some of the explanatory economic sectors there was also a "R&D en biotechnologie" (7211Z) or, if there wasn't, that it could be an ideal location for those types of firms to locate.

GWR analysis results

The result produced the possibility to select economic sectors that might effectively form a cluster and where firms were chosen to be interviewed on their motivation to locate there. The objective was also to definitively find out if those job concentrations were a cluster, or some of them were, or were they just job concentrations that benefited from economies of scale?

First of all it was important to verify that there was a properly specified model and that analysis after OLS modeling was worthy of being continued.

The Koenker test from OLS was statistically significant (19.9) which meant that by doing a GWR the results would be improved statistically. An adjusted R² and an AICc value told us if there had been an improvement in the study or not. The R²Adjusted was 0.98 in the GWR. This meant that the explanatory economic sectors explained 98% of the variation of the "R&D en biotechnologie" (7211Z). In OLS results it was 93%. This meant that there was an important improvement in the model. The AICc value was 256 and in OLS it was 260. A decrease of AICc of more than 3 values indicated that there had been a real improvement in the performance of the study. In this case the difference was important. Therefore it was important that a spatial autocorrelation was undertaken to see if these results were the same as in the OLS study and that the residuals were randomly distributed. In this case it came out that the residuals were randomly distributed. This was good, because this indicated that there was a properly specified model.

Mapping results of GWR

In Geographically Weighted Regression it was important to map coefficients that come out from the analysis. These coefficients showed the relationship with the chosen "R&D en biotechnologie" (7211Z) and with other economic sectors that were located in the area. This helped to limit the number of firms to be interviewed for those specific economic sectors. According to the GWR analysis none of the economic sectors had a significant relationship with R&D Biotechnology. Altogether it seemed that the most important interrelationships between biotechnology and other variables that got selected were with accessibility to the city centre by car and public transport.

According to the final results it was possible to conclude that there were no significant signs of clustering in Helsinki, at least not as locally as was analysed. Accessibility by car or by public transport played an important role with other factors such as the price of land, the image of the area, and so on.

