ESPON

ADES

Airports as Drivers of Economic Success in Peripheral Regions

Targeted Analysis 2013/2/17

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This report presents the interim results of a Targeted Analysis conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

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

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

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This basic report exists only in an electronic version.

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EXECUTIVE SUMMARY

The **ADES project** officially started in November 2011. The project is set out to investigate the role of regional airports in making peripheral European regions grow. As it is a multidimensional issue we apply a mix of several methods and eventually bring the results of all these methods together into one coherent view about the role of regional airports for regional economic development in European peripheral regions.

The ADES project is developed by the Department of Sciences for Architecture – University of Genoa - Italy (Lead partner), BAK Basel Economics AG - Switzerland, KiNNO Consulting LTD – Greece, and Jyväskylä University School of Business and Economics – Finland. The project is specifically targeted to the situation and needs of three stakeholder regions: Province of Savona – Italy, Region of Western Greece – Greece and the City of Jyväskylä – Finland. The three stakeholder regions differ significantly. Given the many-sidedness and complexity of the research questions, we propose not to use a single approach, but rather a combination of several methods. A parallel or multiple approach should best be able to answer the research questions, also given the fact that ESPON explicitly asks for case studies, which, in turn, are not able to answer the more general research questions.

The parallel approach can also been illustrated by the following these questions (on the meta level):

1. What do we already know from previous EU projects and academic work in the field?
2. What can we learn from the three stakeholder regions (which are all peripheral regions)?
3. What results can we get from empirical methods?
4. What are the strategies to transform airports' infrastructures into re-activators of territories?

The **Interim Report** is divided in different chapters that follow the main structure of the research. In each chapter, we first present input that each partner gave to elaborate their scientific contributions, in particular regarding the empirical methods and the case study approach. The first part presents the urban theory that is behind the research: the theoretical approach and the hypothesis on which urban planning is founded. In the Inception Report we already presented the economic background and literature that is behind the research.

For the empirical part (see *Chapter 3*), the methodology is structured adopting and comparing three different tools that are described in this document:

1. Panel causality tests
2. Structural regression analysis
3. Frontier analysis (DEA)

From the results obtained so far we can conclude

- that supply side effects do play a certain role, especially in peripheral regions. This means that better accessibility has a positive influence on the attractiveness of a region for people and business and therefore on economic performance.
- that demand side effect are rather strong in all regions. This means that a good economic performance leads to more demand for transportation services which in turn results sooner or later in better transport infrastructure, more transport services and better accessibility.

From the other side, there are the case studies with an analysis of the three different stakeholder regions through their geographical localization, economic situation, infrastructure and accessibility, services and heritage (see *Chapter 4*). This part is supported by the presentation of other projects that transformed abandoned or obsolete airports in new urban centralities (see *Annex 5*). At the end of this part, we present the method that the three partners used to elaborate the questionnaire and interviews structure (see *Chapter 4, Paragraph 4.3*).

The project deals primarily with the relation between accessibility, airport development, territorial challenges and economic prosperity.

Since the late Nineties, the development of the infrastructures networks caused an unexpected acceleration in the changing process at the urban scale. In Europe, during the last centuries, the transformations of the urban settlements leaded the growth of the industrial city. This generated a complex change in the way of thinking and living the territory, the landscape and the city. The infrastructures characterized these processes. The grafts of Pan-European transport corridors had an impact on the attractiveness and competiveness of the urban areas. It is clear how new economies influence relations and exchanges between territories. New temporal regimes are identified by new work life and social attitudes. These ways of life brought new uses for the territories that expressed different population with different social condition and different organization of time.
A direct relation between activities and places is not anymore an essential condition. The measurement of physical distances has less significance[1]. The cities have lost a delimited physical connotation and they become more fields of relations[2]. The *neverending city*, which today draws the ways of living in Italy and in Europe, is the result of a myriad of autonomous decisions - generated by the intensity of interconnections - that affect the structure and forms of all[3].

A continuous urbanized landscape has joined in new metropolitan conurbations - *constellations of identity*: these conurbations are able to compete in the global market. Cities once dominant, have seen resized their importance. Others cities have reach a central and a new territorial role in the junctions of infrastructure networks. The urban geography traced by the speed of the infrastructure networks has promoted several territories and has marginalized others. These processes directly involved the space, the lives and imaginations of the citizens. In other words, at the end of last century, these urban transformations have supported the post-modern idea that not the productions but rather the connections create the fundamental conditions for the economic growth of regions and territories.

It is a conviction that directly relates the future of the local population with the myth of infrastructure development. This has driven the European policies in order to fund the territorial cohesion and the investments on the physical forms of urban sprawl[4]. It activated processes of urban regeneration in the areas around the infrastructure hubs. It also generated a different culture of the city and the landscape and it created new landmarks in the *neverending city*. The AV corridors, the new big airport hubs, the Euro Tunnel, Euralille, the Öresund bridge, but also the high speed train station, the projects for the bridge over the Stretto di Messina and the stations High speed (and changes brought while it is waited the project realization), are among the most visible effects - and more extreme - of the *super*-infrastructures in the European territories.

This view of growth is mainly based on three principles axiomatic.
The first is deterministic: the infrastructures produce economic development in peripheral areas. The second, almost the reciprocal of the first, asserts that there is no economic development without new infrastructures. For the third axiom the development of infrastructure networks gives value to new landscape: a landscape which brings together speed and permanence, cathedrals and shopping malls, metropolis and *strapaese* (ruralism), the traces of the history and the unclear figures of the change[5].

At the present time, none of these axioms seems to be valid, neither the third. The economical and environmental crisis has radically changed the way we look to the future. The resources to build new infrastructures have been cut down. But it is not only a matter of this.

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[1] Cfr. Franco Farinelli, *L'invenzione della Terra,* Sellerio, Palermo, 2007.
[2] Cfr. Zygmund Bauman, *Liquid Modernity*, Polity Press, Cambridge, 2000.
[3] Cfr. Bonomi A., Abruzzese A., La città infinita, B. Mondadori, Milano, 2004.
[4] The European Union has assigned an important role to the transport sector in the actions of urban renewal. Maastricht introduced the concept of the Trans-European Network of Infrastructure for energy, transport and telecommunications (TEN). In this framework have been identified 10 guidelines multimodal Pan-European or Trans-European Corridors. This powerful skeleton attracts industrial districts, services, and commercial areas, and it causes the quaternary transformation of the city. The Trans-European rail corridors are an opportunity to rebalance the urban framework. In Italy a logistics network should have been made in order to connect the main rail terminals to the productive areas, to the main ports and to the markets of Central, Eastern and Western Europe.
[5] This new landscape is defined by the European Landscape Convention in 2000.

The data of abandoned infrastructures, but also the conflicts over the construction of the AV and the directives of the 2014-2020 funding[6] give the measures of how much the new European Governance is questioning not only local development strategies, but also the principles that guided the regional policies about infrastructure in the last century. It is important to reflect on contemporary city and on its future. A new urbanity has been gradually defined by new environmental and landscape qualities with a higher respect and consideration on local territories and identities.
This is profoundly changing not only contexts and topics, but also the way to project infrastructures. It happens at architectonic, urban and landscape scale. It subverts the axioms of *super*-infrastructure.

Therefore, the main question for the project seems to identify strategies of *recycle* existing obsoletes infrastructure rather than the construction of new infrastructure. The experimentation of different tactics, that are defined case by case, offers a network of paths in the landscape rather than it presents one-way routes that strongly limit the way of living in the territory[7]. It also changes the nature of the infrastructure. So, the infrastructure acquires other functions: it produces energy; it communicates culture; it shows landscapes; it qualifies the junctions. It also integrates itself with the city in different level (as in the case of the *Highline* in New York). These tactics discover the versatility of the infrastructure in order to create a different kind of public or collective space, as in the *Trento Tunnels* project by Elisabetta Terragni or in the *Highline* by James Corner Field Operation (see *Annex 5, Paragraph 2.1*).

These are the assumptions of ADES research which explores different visions for obsolete infrastructures and takes into account new opportunities and uses of theme. It is a new concept that considers the airport *as a place to live, before a place to leave*[8].
We have the chance to imagine the infrastructure in a different way. It has to be considered as a collective space with irregular intensity, a place to stay and not only to cross.

Throughout the world, there are hundreds of second and third tier obsolete airports stuck in a pre-decline phase. It is urgent to think about their future. The ADES research case studies are: *Jyväskylä Airport*, City of Jyväskylä, Central Finland; *Araxos Airport*, *Aktion Airport*, *Andravida Airport*, Region of Western Greece; *Villanova d'Albenga Airport*, Province of Savona, Italy. These airports show different examples of the widespread situation of underused airports structures that have never managed to reach their potential or have lost their central role.

The central issue is to investigate the possibility of recycling existing airport infrastructure, re-using and maximizing their potential through development strategies. Through this investigation we could identify re-use strategies that will give these *(infra)*structures a new identity. Therefore, the research suggests an operation of *recycling obsolete infrastructure*.

The preliminary results suggest the impossibility to propose one singular strategy for the airports' development. The diversity of the territories and the complexity of the problems drive the TPG to think on multiple proposals of future development strategies. These strategies will propose new operations. The device that drives these operations is the *osmosis*[9]*.* The *osmotic devices* will establish a stronger relation between the infrastructure and their surrounding territories. At the same time they will gain an economic improvement and new uses for the airports.

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[6] Cfr. EU Cohesion Policy 2012-2020, European Commission
http://ec.europa.eu/regional_policy/sources/docgener/panorama/pdf/mag40/mag40_it.pdf
[7] Cfr. Mirko Guaralda, *Le infrastrutture viarie dismesse o declassate ed il progetto di paesaggio.* Libreria CLUP Soc. Coop., Segrate (MI), 2006.
[8] Ricci M., Favargiotti S., (2012). *The Re-cycle of secondary airports and new opportunities for the territory - ADES Research (ESPON 2013 Project). AIRDEV 2012*. Airport Development Conference. Conference Proceedings. Edit by Rosário Macário. ISBN: 978-989-20-3071-5.
[9] Osmosis is the net movement of solvent molecules through a partially permeable membrane into a region of higher solute concentration, in order to equalize the solute concentrations on the two sides. It may also be used to describe a physical process in which any solvent moves, without input of energy, across a semipermeable membrane (permeable to the solvent, but not the solute) separating two solutions of different concentrations.
Cfr. *Osmosi*, www.wikipedia.org

1. INTRODUCTION

The EU cohesion goal calls particularly for an improvement of the framework conditions of peripheral or remote regions. Better accessibility is one of the means to move towards this goal.

Economies of scale and agglomeration effects in favour of big conurbations (or even mega cities) are generally accepted. However, it is widely accepted that there are also diseconomies from rising costs to industry, due to increasing cost of land and labour, traffic congestion, crime etc, which make smaller cities and city nets more valuable than very large cities. Measured in pure terms of GDP per capita, the effect of a polycentric territorial development is likely to be underestimated. Even when looking at growth, GDP per capita growth figures will tend to be biased in favour of larger cities as they ignore negative external effects which will prevail in large conurbations.

Measures of level or changes in wellbeing would – were they widely available – clearly be in favour of smaller cities and peripheral regions, as such measures take all negative externalities into account. As a consequence, growth policy in the sense of maximizing human wellbeing in Europe should focus primarily on peripheral or remote cities and regions. This will also help establishing a more balanced territorial development.

Academic research has shown that accessibility is one of several relevant location factors. As it is quite obvious that it is hardly feasible for every region in Europe to have a large airport, the project will not only discuss the role of airports for economic and social development, but also in which cases (regions, cities) which type and quality of transport services (and infrastructure) best suit the needs of the population (airports, rail links, highways).

The main question to be answered is: What is the optimal amount and optimal mix of traffic infrastructure for different types of peripheral regions?

1.1 METHODOLOGY

At the heart of this highly participatory project were interdisciplinary discussions held in three learning network workshops in the three stakeholder countries (Genoa, Athens and one Skype meeting). In addition, a number of focus groups and meetings with local stakeholders were also held. These had a substantial impact on the development of the ADES project. Already in this first phase, many learning network members posed critical questions that had to be reflected on and resolved. This means that the project didn't always follow the straight time and methodology line as originally anticipated in the project proposal but often modified its timetable following the input of different stakeholders and partners.
However, the methodology is structured on two main parallel levels: the empirical analysis and the case studies analysis. The empirical analyses focus more on the general case using data from many regions throughout Europe. The case studies analyses focus on the three stakeholder regions. They are crucial to highlight specific characteristics and to identify guidelines for the airports' future.

The methodology of the project can be summarised as follows:

(A) Empirical work:

- Data base and benchmarking
- Panel causality tests
- Structural regression analysis
- Frontier analysis (DEA)

(B) Case studies in the stakeholder regions

- City of Jyväskylä – Finland
- Region of Western Greece – Greece
- Province of Savona – Italy

(C) Consistent summary of all results and policy recommendations

Part A looks at many regions. Using a common database covering several hundred regions, we use three different empirical methods to catch different dimensions of the same issue: What is the relation between accessibility and economic performance? The three different methods highlight different aspects. The causality tests focus on the question whether the direction of influence goes from accessibility to economic performance emphasising supply side elements, or whether it rather goes from economic activities to accessibility emphasising demand side elements. While these results are qualitative, the structural regressions estimate numerically the size of such influences. Thus, it is possible to see how relevant the impact of accessibility is relative to other regional location factors. The frontier analysis finally will show the degree of production efficiency of each region and bring out the limiting factors. This will give answer to the question whether an insufficient traffic infrastructure is a limiting factor for the economic development of a region.

Part B focuses on the three stakeholder regions to discuss the general results obtained in *Part A* on the very concrete basis of just a few real regions. Here it is not a statistical average; it is rather the socio-political and economic reality of three European peripheral regions. What is their situation, how do their economic leaders and policymakers analyse and judge their very situation? What is the need of the regions for accessibility and transport services, how do they see the situation of their own region? To answer these questions, we use several methods (1) a benchmarking analysis with a systematic comparison of the three regions with other European regions; (2) a topological and socio-geographical analysis in the context of the transportation facilities including neighbouring regions; (3) an analysis of the airports of the respective regions and their role for the regional economies (a detailed description will be captured in the *Draft Final Report*). This part is supported by the presentation of other projects (see *Annex 5*) that transformed abandoned or obsolete airports in new urban centralities.

Part C is a synthesis of all the results obtained above. We shall bear in mind that using such an abundance of different types of analysis, not all results may be consistent. It will be the task of this *Part C* to interpret all results and form a consistent view of the transportation reality of peripheral regions in Europe which is strong enough to be base for solid policy recommendations. In addition, a set of maps will be deliverd by the TPG (see *Chapter 5*). Maps are essential implements of communication with the local context, and were developed to be instructions for use, in service of political actors and institutions in general. ADES Maps are divided into two groups: *Descriptive Maps* (to show the current situation) and *Vision Maps* (as a support for further development process).The Interim Report present the preliminary results of this part. These issues will be deeply argued in the *Draft Final Report*.

To ensure optimal effectiveness and efficiency of the ADES project, effective and timely communication is crucial during the whole project. **(D) A dissemination strategy** coordinates the presentations of results and the calendar of events for the communication of the project. The TPG will contribute actively to all the dissemination events organised by the Stakeholders, providing relevant information, presentations and support at local level through the local experts, as well as attending transnational events and dedicated meetings of umbrella organisations where required.

During these months, the TPG was already involved in different national and international events in which the partners presented and discussed the results of the first research phase. We plan to participate in even more ESPON events, international seminars and local events to presents the project and further research results. We indicate a detailed list of events (see *Annex 6*) in which different TPG partners participated and a plan for future dissemination meetings (see *Chapter 6*). The research activities have already progressed considerably. The main challenge now is to bring all results together, compose consistent results and formulate adequate policy recommendations.

The TPG is now developing deeply the research activities regarding the application of different empirical analytical systems and contacting different local stakeholders through focus group, compilation of questionnaire and interviews and drawings maps as communication tool. The TPG managed to fulfil all requirements and completed all the tasks defined in the subsidy contract until this intermediate phase. The Draft Final Report will be submitted by the 30th November 2012.

2. THEORETICAL UNDERPINNING AND RESEARCH HYPOTHESES

2.1 THE PERIPHERAL TERRITORY. THE INFRASTRUCTURES. THE CRISIS

The phenomena of urban sprawl, the ‘loss of centre’, the role of infrastructure, and the ‘fusion’ between city and country are widely studied territorial and urban transformation phenomena, starting from the '60s.

Where the city ‘invades’ everything, it still makes sense to talk about periphery?

Economists consider what is peripheral as a consequence of multiple factors: accessibility, intensity of flows transport and domestic product per capita (GDP). According to this interpretation, the areas less accessible are the more peripheral. At the same time, the territories with less regular flows (transport of persons or goods) are the areas where there is more poverty.

Peripheral territories exist: these are a recognized and widespread reality. The definition of *peripheral* commonly came out from an Eurocentric vision of the world. Defining what is peripheral in Europe is a very difficult and ambiguous issue. Its definition can be in a superficial way declined to indicators that determine a *peripherality* based on the data considered each single time. The first objective is therefore to change the point of view, from national to local scale, by combining information provided by the indexes to establish parameters by which define what is peripheral in relation with each local territories.

In Italy, the history of modern and pre-modern infrastructures coincides with the need to connect different places and territories of a country affected by a complex geography in order to save them from isolation and marginalization. After the Second World War, roads and highways were carried out to assert the emancipation of national economic *boom* from poverty. Through the construction of new infrastructures, peripheral areas became less remote and more related to central geographic, economic, territorial, commonly recognized (in terms of geography, economy or territory). If from one side the construction always moved money, economy and construction market, on the other, once construction is completed, these facilities often remain isolated, proving that the best strategy would perhaps have been not to build them at all. Hence the paradox: the infrastructures, instead of integrating territories and implementing local deficiency, become the main problem.

The infrastructure, without real and widespread processes of economic support, and without coherent strategies and territorial projects, don’t generate any development. A new infrastructure supports forms of development where these processes are already in place. The theme, in the last 50 years, has also been associated to the impact of the urban phenomenon, that is the end of the compact city which has come to be the sprawl city without limits, where the continuous consumption of land has seconded a model that forced expansion, and forces the connection of many points in a network that tends to the limits of the urban expansion, hence the spread of road networks with an exponentially increasing of the individual use of cars. A well known and widely investigated model, which produced extensive suburbs, marginality, precarious economic development, heavy pollution and that only recently stimulates deep thought.

But things are changing and the persistence of a crisis that changes the nature of the phenomena, their speed and priority of the solutions requires new forms of analysis and sustainable alternatives with the new context that will lead to a greater sensitivity with respect to change and persistencies of the present time. In this framework, the infrastructure becomes the main topic: one thing is to talk about the infrastructure issues in a context of development, and another thing is to talk about it in a state of constant slowdown and perhaps even a stable situation.

Through the accessibility infrastructure has a different reading: in those areas where accessibility is weak, this does not ignore the total lack of infrastructure, but rather to reflect

on the fact that many areas have unused infrastructure. At the same time there are areas that are economically developed but are not equipped with a superstructure infrastructure, revealing how accessibility, economic development and peripheral issues are trans-scalar to each other but can also develop in parallel planes.

Going back to original question, does physical infrastructures (roads, railways, airports) to really develop peripheral territories? According to the data set out above, the answer maybe not: at least not always, for three reasons.

I. The *peripherality* in the European territories today is an ambiguous condition, perhaps more a social issue than a geographical question. It depends from the development processes that are not necessarily related to the intensity of physical connections and material flows of people or things. There are peripheral areas in the heart of large metropolitan areas and it is possible to identify important centralities in remote areas. Furthermore some territories economically well developed limited their accessibility and connections: an *enclave* territory as an affirmation of local identity. For example the Alto Adige or the surrounding areas of Cuneo are the richest and most developed regions of the Italian territory but the accessibility is limited. Also some Greek islands, those suffering less the crisis, are classified as economically peripheral areas in the European Union only because they don't have a high development of infrastructures and they are far from the main flows of traffic.

II. In the European *neverending city*, the periphery as a physical space does not exist by definition. Each place can be at the same time the central or peripheral with respect to the various immaterial networks of relationships that structure the settlement around the world.

III. Somehow the physical space of the major material networks in Europe is saturated. The physical infrastructures are already built and there are no more funds for all new interventions that were planned. The European funds planned for the period 2014-2020 are geared towards the development of interconnections with the networks of corridors minute local, the creation of new hubs light to the government of the effects on cities.

The European funding planned for the period 2014-2020 is geared towards the development of the corridors whit local networks, to the creation of new slight hubs (it seems ended the era of big railway stations and fast competition with the airports), and to govern the effects on cities. Furthermore, many local population do not accept anymore that the environmental and landscape quality of their territories could be damage by new heavy construction. The increasing social conflicts for the construction of the high-speed train line are graver in peripheral contexts: this indicates the need to change the paradigm.

This actual condition also explains the irrelevance of the axiom for which there is no development without new infrastructure. The Europeans landscapes are full by the ruins of this statement. There is a widespread situation of underused infrastructures that have never managed to reach their potential or have lost their central role. They partially or totally lost their uses and brought negative economic consequences on their surrounding contexts.

In Italy, for example, there are more than 6000 km of abandoned railway lines: these lines are closed to traffic, unfinished lines and variations of the main route[10]. There is a widespread number of stations and tollbooths abandoned or partially used, including some recently built. There are 114 airports open to traffic. 13 of these are used only for military operations. Furthermore there are hundreds airfields and heliports suitable for landing. Only 39 of these airports are classified as commercial airports and not all have a regular traffic of flights[11]. It is not possible to list all the abandoned or underused roads. In that sense, it is significant the research of Mirko Guaralda on abandoned infrastructures[12], or the icon-project of Elisabetta Terragni for the Historical Museum of Trentino[13] where an high-speed road becomes an

[10] Cfr. http://www.ferrovieabbandonate.it, dati Associazione Italiana Greenways, 2012
[11] Cfr. Mosè Ricci*, iSpace*, Meltemi editore, Roma, 2009.
[12] Cfr. Mirko Guaralda, *Le infrastrutture viarie dismesse o declassate ed il progetto di paesaggio.* Libreria CLUP Soc. Coop., Segrate (MI), 2006.
[13] Cfr. Pippo Ciorra, Sara Marini (a cura di) *Re-cycle*, Electa, Milano, 2011

extraordinary public space for culture and representation of local identity (see *Annex 5*).

Therefore questioning the nature of the infrastructure, with particular attention to airport infrastructure, becomes a key consideration in the approach to this research topic. Airport infrastructure for its dimension and relations with the territory is a catalytic agent and an activator of contexts: airports as generators of development in peripheral regions but also as generators of a new image for the area and of themselves.

In particular, the re-use of secondary airports, projecting the territory in the European network of mobility, offers interesting potentialities of development. The key question becomes the land use management: an operative airport in an international context attracts other functions and activities not strictly related to air traffic, as input to the local economy of the territory. Therefore the need to understand the nature of these transformations, to govern them coherently and in line with the contextual situations in which these are developed, making the presence of a regional airport a positive energy for territorial development and also for the community, and not the cause of negative externalities. Attention must be given to the structuring of the airport complex, that is the study of the dynamics of the location of new businesses, service facilities and transport infrastructure, the consequences for pollution, the occupation of agricultural land, the compromising of natural areas, etc. Therefore the goal is to understand what is the sustainability of these interventions for the territories. This issue will be developed by ADES Research through operative strategies elaborated on the ADES case studies.

2.2 EU DOCUMENTS, RESEARCHES AND ESPON PROJECTS

The ADES project is related to the goals of European Union in terms of competitiveness, territorial cohesion and environmental sustainability. The following documents and projects contributed to focused the aims of ADES research. The contents of the *Fifth Report of Social, Economic and Territorial Cohesion*, other studies on transport services and *the AsPIRE project* was discussed and taken into account by the TPG.

The contents of the **Fifth Report of Social, Economic and Territorial Cohesion** give important references. The Fifth Report precise that regional competitiveness and development prospects are also affected by infrastructure endowment, such as transport or telecommunication networks. This document is relevant for ADES research to define the basis of our reflections regard the main research issues of: accessibility, infrastructure (in particular air travel), transport system and regional development.
As indicated by many studies, the provision of public infrastructure has a positive and large effect on productivity and growth. Physical infrastructure can adversely affect the environment, especially heavy and long-lasting infrastructure such as roads, motorways, railway lines and modifications to watercourses. In such cases, the trade-off between economic and environmental costs and benefits needs to be explicitly and properly taken into account. The report assumes also that a good transport system is important for regional economic development. It reduces journey times and, accordingly, production costs, so increasing competitiveness. It improves access to markets for consumers, workers and business and is an important aspect of the attractiveness of a region for investors. However, a good transport system in itself is not sufficient to ensure regional development. The effect of investment in transport and other infrastructure on economic performance also depends on the region's capacity to use it efficiently, as well as on investment in other factors important for development, such as in human capital and innovation. This partly explains why the return on investment in infrastructure can vary significantly between regions.

Furthermore, air travel has continued to grow over the past few years up until the onset of the crisis in 2008. The highest growth in traffic has been in secondary airports, which are mostly used by low-cost airlines as well as in the airports in the capital cities in the EU-12. This proliferation of low-cost companies started to promote the revitalization of secondary airports. They generate a rapid transformation of land use and of the infrastructure network relative to land transportation. The integration of new economical, cultural and leisure activities to these airports, permitted to make the surrounding territory more dynamic and to improve local

business. In that sense the secondary low-cost airports became a landmark in the territory and an important element for the local economy. For taht reason they are a relavent examples taken in account by ADES research (see *Annex 5*).

In a study about **«Transport services and networks»** the authors (2004) examine how the transport network may constitute a key factor of a more balanced, polycentric and sustainable development. A further question is how the accessibility to basic services and to knowledge should be developed in order to increase the territorial development. The authors conclude that the reality is more complicated than the generally accepted idea «more network for better accessibility for more GDP». This idea is shared by ADES project. The economical and environmental crisis has radically changed the guideline for infrastructures' development. At the present time, the axiom that infrastructures produce economic development in peripheral regions seems to be no more valid. The concept of periphery is ambiguous, as we explained above. The «Transport services and networks» study underlines this statement. In fact, even in central regions there are enclosed zones, the space is heterogeneous from the national to the local scale. Nevertheless there is a kind of structure: a center-periphery structure, consisting of a pentagon called blue banana and peripheral spaces less inhabited and less served by networks. However, regions in both parts are very heterogeneous as the authors identify «central» zones in the peripheries and zones with peripheral characteristics in the pentagon.

Another important reference for the peripheral issue is the European comparative research project entitled **Aspatial Peripherality, Innovation and the Rural Economy (AsPIRE)**, which was funded by the European Union Fifth Framework Programme. The AsPIRE project was concerned with the changing nature of peripheral disadvantage. A starting point for the project was the fact that technological advances in transport and communication have created the potential for gradual but fundamental changes in relationships between accessible "core areas" and the less accessible "periphery". Some peripheral regions seem to take advantage of these new opportunities, whilst others, perhaps more accessible in conventional spatial terms, seem to lag behind. The AsPIRE project defines the concept of *aspatial peripherality*. This term indicates regional deficits which are often associated with peripheral location but can also appear in centrally located regions. In a time when physical distance or travel cost are less and less restrictions to economic activity, such deficits as insufficient utilizations of new information and communication technologies or poor networks between local firms, development agencies and markets are becoming more and more important for central as for peripheral regions. ADES research agree with this analysis, as mentioned above: in the European *neverending city*, each place can be at the same time the central or peripheral with respect to the various immaterial networks of relationships that structure the settlement around the world.

In addition, the following ESPON studies, that address the issues of transportation or accessibility in Europe, are significant for ADES project. This strand of applied literature is in line with the EU 2020 priorities, which include among others "Inclusive growth – fostering a high-employment economy delivering economic, social and territorial cohesion" and the priorities from the Territorial Agenda 2020 include among others the following goals: to promote polycentric and balanced territorial development and to improve territorial connectivity for individuals and enterprises.

The **ESPON 1.2.1** deals with "transport services and networks: territorial trends and supply", where they examine how the transport network may constitute a key factor of a more balanced, polycentric and sustainable development.

The **ESPON INTERCO** deals with territorial cohesion and polycentrism and how to measure it. Focusing on the accessibility by air, road and rail, it is rather clear that large disparities still exist. In many cases, regional disparities even increased due to the construction of high-level transport infrastructures such as high-speed rail lines or motorways, connecting urban centers with each other and bypassing rural or remote areas. As for accessibility by road, the disparities are still important among territories especially in remote areas, despite some effort to increase accessibility in some region that helps the trend towards more convergence in

return. However, we know that access to services is a challenge for European countries within territories as well as between territories as it is underlined in the *Fifth Cohesion Report*.

ESPON Applied Research:
- ESPON TRACC: TRansport ACCessibility at regional/local scale and patterns in Europe
- ESPON SIESTA: Spatial Indicators for a Europe 2020 Strategy Territorial Analysis
- ESPON GEOSPEC: Geographic Specificities and Development Potentials in Europe

ESPON Target Analysis:
- ESPON TeDi: Territorial Diversity in Europe

A study that has started in July 2010 named **Transport accessibility at regional/local scale and patterns in Europe (TRACC)** addresses issues of accessibility on a European and a regional level. One of the main motivating question of this project (What is the relation between accessibility (at the different levels and for different modes) of European regions and their economic development?) is a common goal with ADES research (see *Chapter 3*). The TRACC project aims at taking up and updating the results of existing studies on accessibility at the European scale, to extend the range of accessibility indicators by further indicators responding to new policy questions, to extend the spatial resolution of accessibility indicators and to explore the likely impacts of policies at the European and national scale to improve global, European and regional accessibility in the light of new challenges, such as globalisation, energy scarcity and climate change. Furthermore shall be examined how bottlenecks for the four transport modes can be identified on the regional and European scale. This Applied Research Project is of high relevance for the ADES study as it comprises much information about the accessibility of European regions.

The aim of the project **Spatial Indicators for a Europe 2020 Strategy Territorial Analysis (SIESTA)** is to provide evidence on the territorial dimension of the EU2020 Strategy by identifying opportunities for different types of regions in relation to the targets and flagship initiatives set out in the strategy. In particular the following research areas are identified: (1) which types of regions have what opportunities with regard to exploiting their territorial potentials in support of smart, sustainable and inclusive territories in Europe, and (2) which types of regions can be perceived as key drivers for European development and growth at various scales. In this field, ADES research will explore potential new assets for air transportation system. In fact, airport infrastructure for its dimension and relations with the territory is a potential catalytic agent and an activator of contexts: airports as generators of development in peripheral regions but also as generators of a new image for the area and of themselves.

The main objective of the project **Geographic Specificities and Development Potentials in Europe (GEOSPEC)** is to provide a coherent transversal framework to characterise the past trends, state and potential future developments of geographical specificities for territorial policy and regional development. A secondary objective of this study is to facilitate the integration of this sense of commonality and of the discourses constructed to justify specific treatments, on the basis of geographic specificities, in European territorial cohesion strategies.European maps revealing the specific types of territories and regions and their strengths and weaknesses as well as new typologies aiming at the clustering of regions.
Also ADES research will propose the maps as fundamental tool to help decision makers to choose and define the best strategies for local development (see *Chapter 5*). The additional value of ADES maps will develope to be instructions for use, in service of political actors and institutions in general. The TPG will produce the graphical analysis of the case studies regions through the realization of two different typologies of maps: **Descriptive Maps (**to show and confront the current situation) and **Vision Maps (**as a support fot further development process).

A more recent study named **Territorial Diversity in Europe (TeDi)** (2010) examines the potential of differentiated regional and spatial development policies which fit the potentials present in the individual regions or areas. The goal of the study is to find out how to ensure a sustainable development based on regional comparative advantages. First the authors mention «the difficulty of bringing together development perspectives of this wide diversity of

territories into a common framework». They recommend territorial cooperation to stimulate the balanced functional integration of the examined regions (such as islands or mountainous regions) with their surrounding areas. Additionally territorial cooperation could «contribute to strengthen the capacity of local and regional authorities to identify their growth potentials and formulate development strategies».

3. EMPIRICAL RESULTS

This chapter presents all empirical results. The whole empirical body starts with the question of the role of airports for peripheral regions in Europe. The methods, however, vary across the chapter. Using different methods augments the chance to capture the relevant issues in a holistic way. The challenge, then, will be to formulate a coherent view of all findings in order to present a consistent result to the politicians, including appropriate policy recommendations.

We first describe the data set used and the data developed under this project. Using a common database covering several hundred regions, we use three different empirical methods to catch different dimensions of the same issue: What is the relation between accessibility and economic performance? Thereby we can distinguish two main channels of influence:

- Supply side effects: Good general framework conditions (including accessibility) improve the attractiveness of a region and thus attract both people and companies. Production and the supply of goods will grow. Therefore, accessibility will enhance economic performance.
- Demand side effects: When a region grows – be it more people or higher wages – the demand for travelling will usually grow. Thus, it will be interesting for suppliers of travel services to enlarge their supply. If there are bottlenecks in the infrastructure, such additional demand may lead to an improvement of the respective infrastructure. Therefore, economic performance improves accessibility.

The three different methods focus on different aspects of the relation between accessibility and economic performance:
The (1) causality tests focus on the question whether the direction of influence goes from accessibility to economic performance emphasizing supply side elements, or whether it rather goes from economic activities to accessibility emphasizing demand side elements. While these results are qualitative, the (2) structural regressions estimate numerically the size of such influences. Thus, it is possible to see how relevant the impact of accessibility is relative to other regional location factors. The (3) frontier analysis finally will show the degree of production efficiency of each region and bring out the limiting factors. This will give answer to the question whether an insufficient traffic infrastructure is a limiting factor for the economic development of a region.

3.1 DATABASE

As the following three sections on causality, structural regressions, and frontier analysis use the same data base, a short description of it is provided in this section (a detailed description is captured in *Annex 1*). The data base covers different types of data: economic performance, population and area, location factors (including accessibility), and airport performance per region. The following tables provide an overview of the four types:

Table 1 Data on economic performance

Shortcut	Indicator	Unit
XXN	nominal GDP	in Mio. Euro
XXR	real GDP	in Mio. Euro PPP[14]
NN	Employment	in thousand persons
XAN	nominal hourly productivity of labour	in Euro
XAR	real hourly productivity of labour	in Euro PPP

Data source: BAKBASEL

Performance data are indicators of economic activity and success. Often, they are also used as indicators to measure the success of economic policy. They are purchasing power corrected.

Table 2 Data on population and area

Shortcut	Indicator	Unit
PO	population	in thousand persons
FL	area	in square miles

Data source: BAKBASEL

Data on population and area are primarily used to descale data like GDP or employment which heavily depend on the geographical delimitation of a region.

Table 3 Data on location factors

Shortcut	Indicator	Unit
AC	Total accessibility	Index
AG	Geographical accessibility	Index
AT	Transport accessibility	Index
RGEP	national regulation of labour markets	Scale
RGPM	national regulation of product markets	Scale
TXCO	tax burden for companies	in %
TXMP	tax burden for manpower	in %
FEGP	research & development	in % of GDP
IVSE	secondary education	in % of labour force
IVTE	tertiary education	in % of labour force
Pat	Patents	Scale

Data source: BAKBASEL

[14] PPP = purchasing power parity corrected

Location factors describe the attractiveness of a region. Their quality can determine economic performance in the long run. Many location factors can be influenced by policy decisions; hence countries and regions have some scope in determining their long term growth path. Although some location factors are elusive, others can be measured with the help of quantitative indicators. Data on accessibility have been produced in the context of this project. All other data are part of the pre-existing database of BAKBASEL.

Table 4 Data on airport performance

Shortcut	Indicator	Unit
AXP	number of commercial passengers	passengers
AXC	cargo (freight & mail)	in metric tons

Data source: ACI[15]

Data on airport performance, measured as the number of passengers on commercial flights and as tons of freight and mail of an airport, are used to investigate the interrelation with economic activity. When there are several airports in a region, the performance data will be aggregated.

The data base includes time series from 1990 to 2010 for 336 regions (NUTS2 or NUTS3). Airport data are very often not available for such a long period. The Final Report will include an annex with a detailed description of all data and sources.

As already mentioned above, data on accessibility have been produced in the context of this project. All other data are part of the pre-existing database of BAKBASEL and not part of this project.

Special attention is paid to **accessibility** as a location factor. In general, people are not interested in transport infrastructures per se. The nicest new airport is hardly of any value if there are no scheduled flights. On the other hand, it is very relevant, when a train can run at a higher speed and reach its goal faster, even when there is no new infrastructure, but only new coaches and engines or probably only a new computer programme.

Accessibility is a complex term. Thus, it is important to clarify what should be measured before indicators are determined. The accessibility concept used here is based on the idea of realizing an economic benefit out of easily reaching other regions and at the same time of being easily reached from other regions. This benefit is characterised by the answers to the questions formulated in the following table.

Table 5 Accessibility concept

5 questions …	… and 5 answers
Accessibility for whom?	People, especially for businessmen and employees
Accessibility of what (potential/activity parameter)?	Markets for goods and services (nominal GDP)
Which metric for spatial resistance?	Travel time (fastest connection) and geographic distance (linear distance)
Within which area?	Europe: 336 West-European starting points (core cities of the 202 considered NUTS2-regions) 291 European (east and west) destinations (important European cities)

[15] ACI = Airport Council International

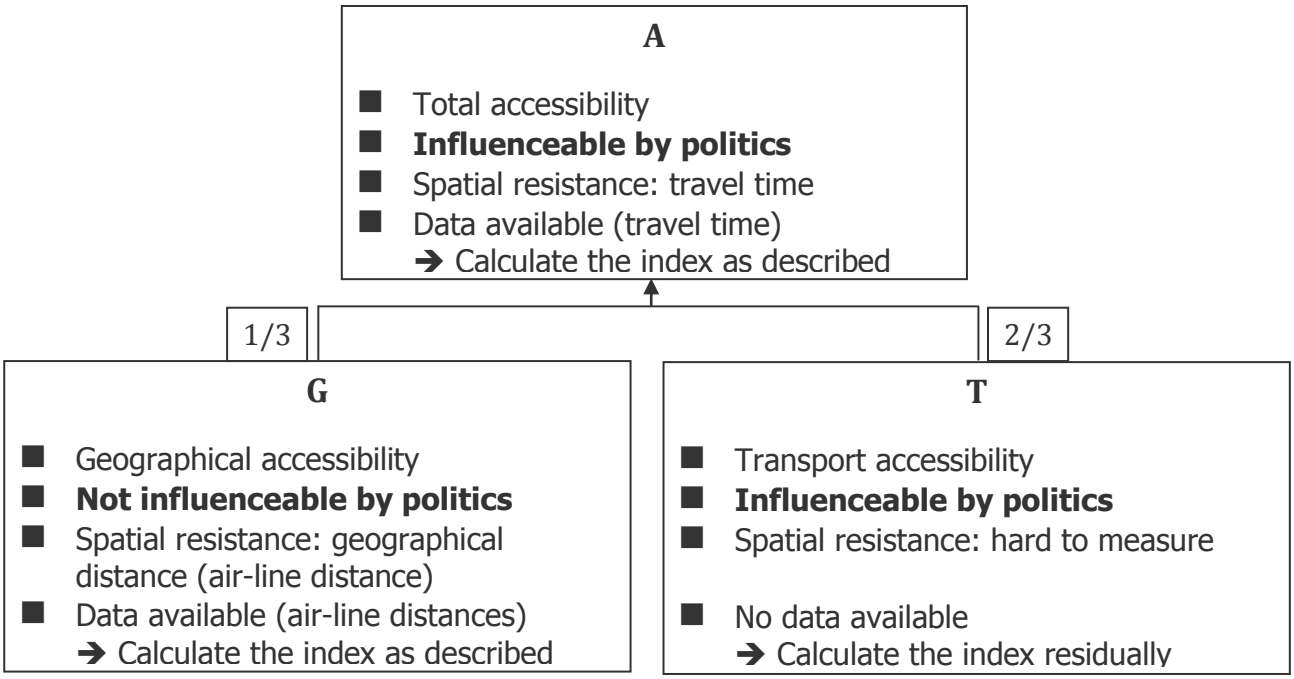
Which mode of transport? Europe: Multimodal (ideal combination of air, rail and road traffic)

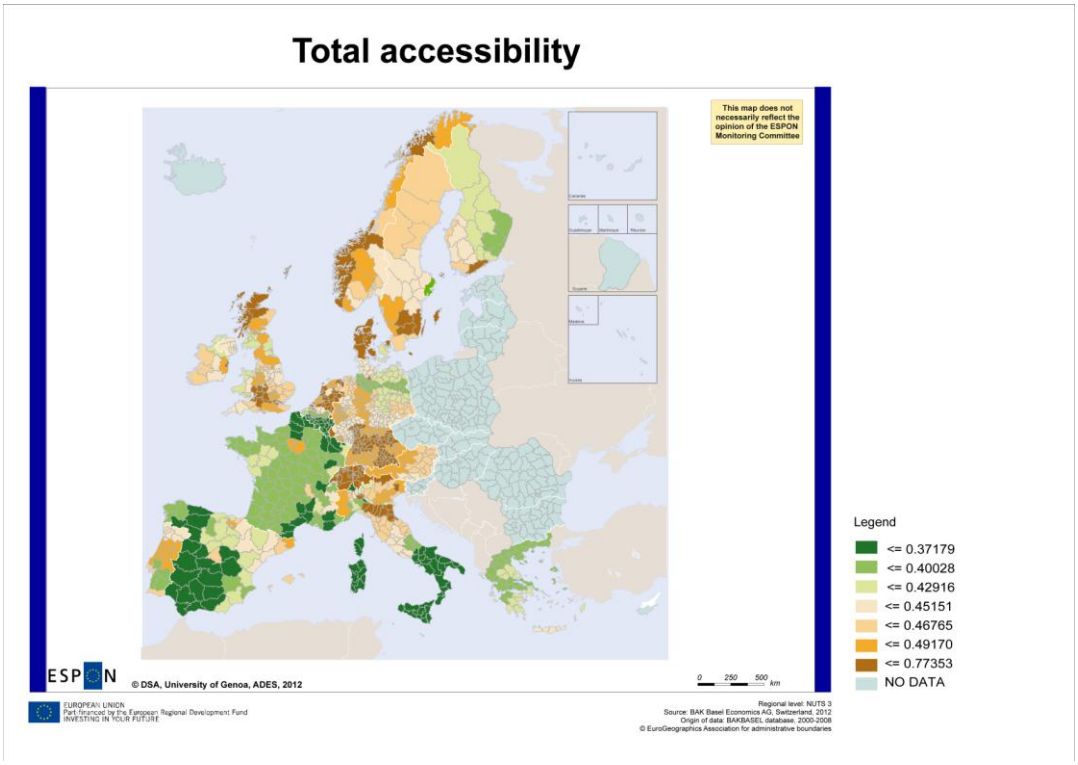
Source: BAKBASEL

The accessibility model focuses on the benefits for businessmen and employees, which come along with easy accessible markets for goods and services. This corresponds to the transmission channel of increased productivity through more efficient management of existing markets or the opening up of new markets, respectively. However, travelling costs reduce the benefits mentioned before.
At a first glance, travel fees in Euros appear to be the relevant cost item. While this should be true for most tourists, for the business traveller mentioned above, time is usually money and time cost substantially higher than travel fees. Thus we employ a model with time as a measure of spatial resistance (whereby the fastest daily connection is chosen). In addition we also adopt a model where air distance is used as an indicator for spatial resistance.
The following graph illustrates this procedure. Accessibility (A) can be calculated using weighted travel time to 202 NUTS2 regions in Western Europe with an inverse exponential function. The measure is multimodal, taking into account the best combination of air, rail and road travel. The weight used is the relative GDP or "market share" of each region (for details refer to the annex). In the same way, accessibility can be calculated using air distances resulting in the so called geographical accessibility (G).

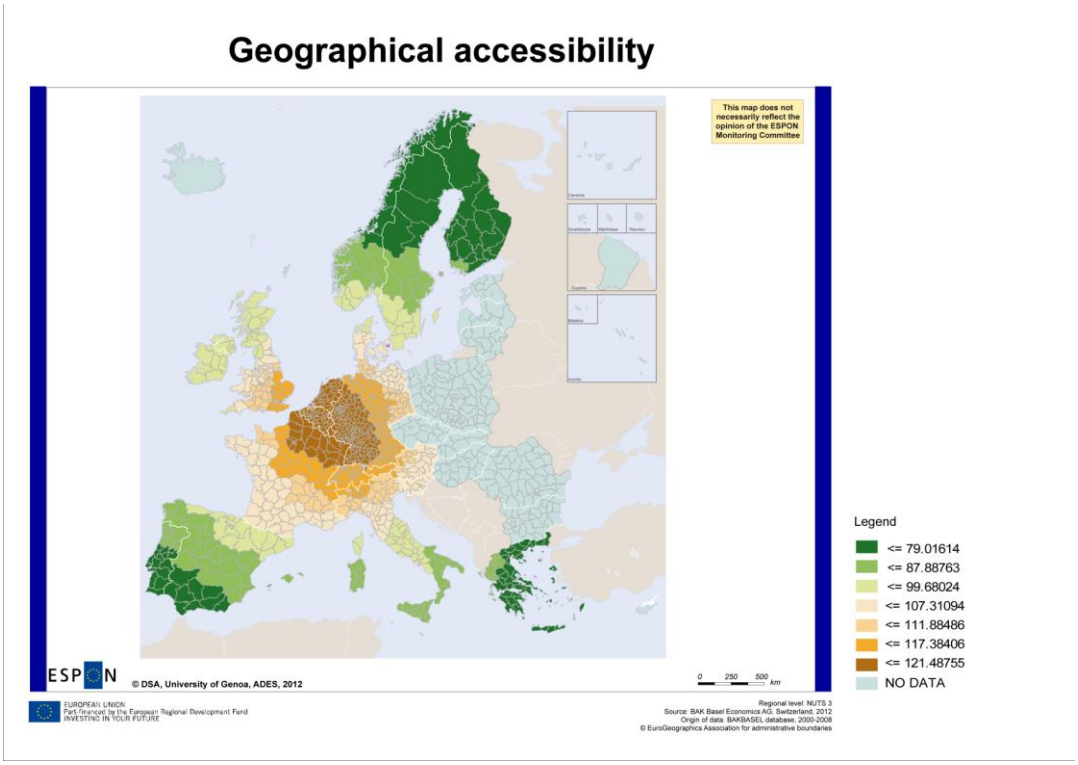
In general, these two concepts do not yield the same result: The difference is due to transportation services. Thus, the transport accessibility (T), which reflects both all kind of transport infrastructure and the quality of transport services can be calculated residually. Assuming a weighted additive relation (of the form A = 1/3*G + 2/3*T), T can be easily computed (as T = (3A – G)/2).

Figure 1 Measurement concept of accessibility

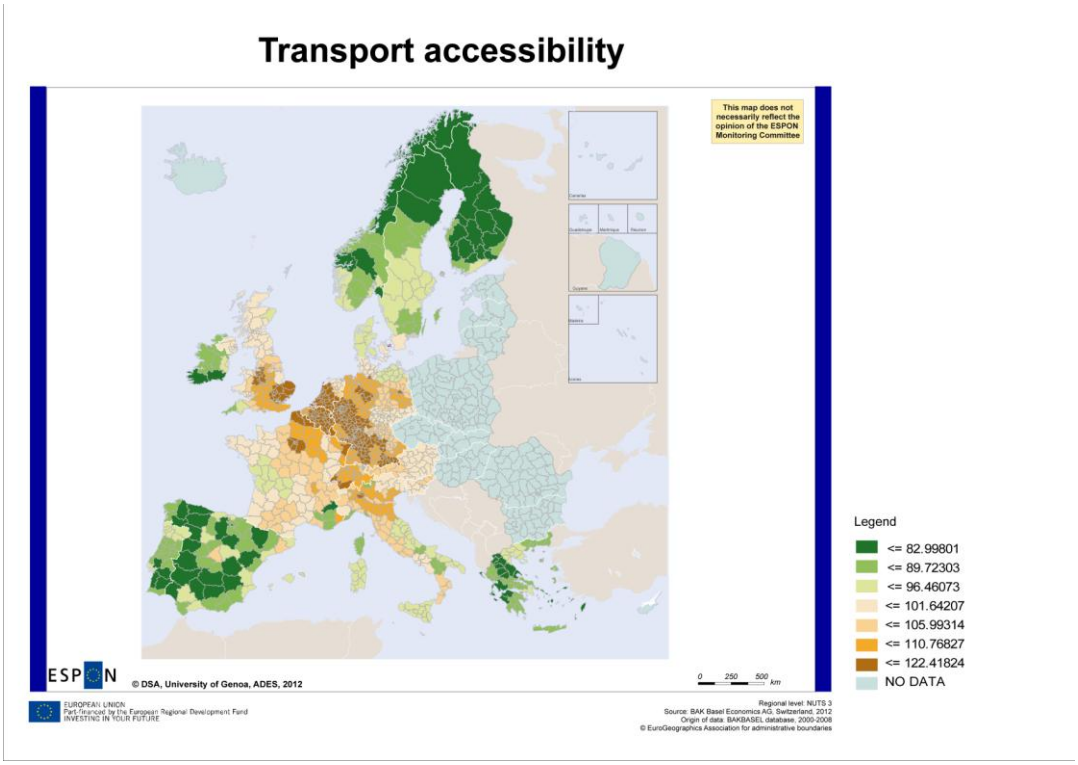




Map 1. Total accessibility (A): Multimodal, Europe, 2000-2008



Map 2. Geographical accessibility (G): Europe, 2000-2008



Map 3. Transport accessibility (T): Multimodal, Europe, 2000-2008

While air-line distances (G) are not influenceable by politicians, transport infrastructure and services (T) are man-made and regularly object of national and regional policy. Through this channel, also overall accessibility (A) can be influenced by policy.

Maps 1, 2 and 3 show the mean values of the accessibility indices over the period 2000-2008 for total accessibility (A), the geographical accessibility (G) and the transport accessibility (T). The geographical accessibility (G, Map 2) clearly shows that the economic centre of gravity of Western Europe is located in the triangle «London/Berlin – Paris – Ruhr area». Around this core area the geographic accessibility declines in the form of concentric circles. Regions that are close to the centre tend to perform well in terms of total accessibility (A, Map 1) due to the simple fact of their geographical proximity to this centre. Regions located rather on the periphery are clearly harder to reach. However, regions with an important intercontinental airport (e.g. Stockholm or Madrid) stand out especially in terms of transport activity (T, Map 3). Stockholm clearly illustrates that despite of geographical disadvantages total accessibility is not necessarily bad. While Madrid or Stockholm are good examples for regions with a low geographical but excellent transport accessibility, the opposite holds true for some regions in central France or Eastern Germany.

As the three stakeholder regions (Savona, Western Greece, Jyväskylä) are all located in (so called) Western Europe, the statistical analysis focuses and is limited to this area. Regions in (so called) Eastern Europe have a completely different history and economic time path, which even could distort the results of the analyses below. For this reason, also the extensive data work has only been done for the regions, which will be included in the data set for the empirical analyses.

3.2 PANEL CAUSALITY TESTS (see *Annex 2*)

The first method used is causality tests. They focus on the question whether the direction of influence goes from accessibility to economic performance emphasizing supply side elements, or whether it rather goes from economic activities to accessibility emphasizing demand side elements. Thus we will get a qualitative answer to the question whether air traffic has an effect on regional growth in Europe.

To address the existence of causality in this chapter, we consider the nature of the relationship between regional development and transportation infrastructure, as evidenced by air traffic. We ask whether accessibility is a key factor to economic success or its consequence in Europe. As this question is of the utmost importance to regional policy makers, we will analyze this causality in detail.

Transportation in general and air transportation in particular, is an important factor in realising the economic potential of a region. However, providing transportation does not automatically lead to economic development. It may also work in reverse; economic development may spur a region to provide increased, better transportation. Thus, while there is typically a strong correlation between air traffic and economic growth, the causation between the two is not entirely clear (Green 2002; Button et al. 2009). In a theory stressing the supply-side elements, the implementation of transportation infrastructure and accessibility leads to economic development, and airports act as catalysts for local investment. However, according to demand-side theory, economic development determines transportation needs and services. The question of whether demand-side or supply-side effects are more important remains largely unsettled.

Evaluating the character of the causal relationship between two variables can be problematic. Attempting to establish the core of causal processes is an issue that is central to the work of econometricians, and progress has been made toward answering the questions posed above. Earlier airport studies by Brueckner (2003) and Green (2007) utilized the methodology of instrumental variables (IV) in panel data to control for the potential endogeneity of airline traffic. The problem with the IV method as applied here is to find appropriate instruments that explain only airport activity, not regional growth.

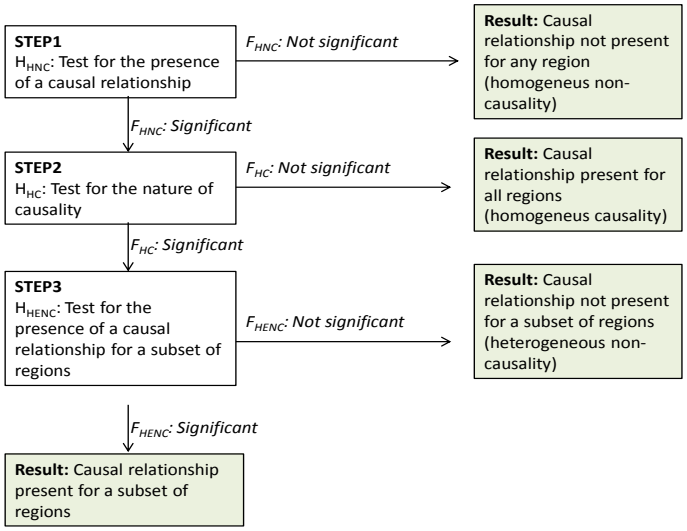
Button et al. (1999) used Granger causality tests to conclude that airport traffic leads to development. These tests are designed to demonstrate causation by examining whether the lagged values of one variable carry explanatory power in the presence of the lagged values of a dependent variable and possibly of other covariates. Granger causality testing exploits the fact that there is temporal ordering in a time series and assumes that effects cannot occur before causes. Conventional Granger causality tests, such as those in the study of Button et al. (1999), utilise time series data from only one observation. However, Granger tests are increasingly being used to evaluate causal relationships in panel data. Panel Granger tests are significantly more efficient than conventional Granger tests (Baltagi 2005; Hurlin and Venet 2001 and 2005; Hood III et al. 2008; Tervo 2009). They can generate significant results with shorter time periods as the number of observations increases. A potential flaw shared by many analyses is an inappropriate assumption of causal homogeneity. In fact, earlier literature largely ignores the possibility of heterogeneity, in which a causal relationship may be present only in a subset of cross-sections but not in others. In our case, some airports may have a causal effect on economic development, while others do not, and vice versa.

Our aim is to shed further light on the relationship between regional airports and economic performance in different types of regions, including remote regions and regions serviced by small airports. The earlier literature focuses on the role of airports from the perspective of metropolitan development, whereas the relationship between airports and peripheral regions has been studied less thoroughly. However, the competitive and locational advantages of peripheral regions may be strongly influenced by airline networks. Causality between regional performance and air traffic may vary according to the concept of peripherality because to grow, remote regions must be accessible via air connections. In peripheral regions, air traffic may weaken the negative effects of long distances. Improved accessibility allows firms in those regions to be more productive and more competitive than firms in regions with inferior

accessibility. Improvements in the transportation infrastructure mean shorter travel times and better scheduling, thereby creating new locational advantages. Easy accessibility attracts firms and economic activity to a region and stimulates employment growth, even at established firms. The development of core regions, on the other hand, is led by many agglomerative forces, and their success is not inevitably dependent on the impact of airports, although they naturally require efficient airlines.

To test the relative importance of various effects, we will apply the Granger non-causality methodology in a panel framework. To address the potential problem of heterogeneous causal processes, we employ the Hurlin and Venet (2001 and 2005) procedure. The procedure has three main steps, which are related to the homogeneous non-causality, homogeneous causality and heterogeneous non-causality hypotheses (Figure 1). The tests are based on a panel data model with fixed coefficients.

Figure 1. Testing procedure



The empirical analysis is based on regional-level data from Europe in the period of 1991-2010. To perform a causal analysis between regional development and airport activity, we require two variables, for which we have different options. For the measurement of regional development, we use two variables, the first one measuring growth in employment and the second one measuring growth in purchasing power corrected real GDP. For the measurement of airport activity, we use a variable depicting development in the number of commercial air passengers. In addition, we use a geographical accessibility variable, which measures a weighted average travel time to 202 NUTS2 regions in Western Europe. The measure is multimodal, taking into account the best combination of air, rail and road travel. The weight used is the relative GDP or “market share” of each region.

Airport Council International produces data on the use of airports in Europe, but these data are limited by the number of reporting airports, and the availability of airport data diminishes further as we go back in time. Because the availability of -airport data is incomplete, the number of observations (regions) in the analysis is reduced remarkably. However, complete airport data are available for the period of 1991-2010 for 86 NUTS Level 2 or 3 regions from 13 countries in Europe. This data set includes 3 regions from Austria, 3 from Switzerland, 13 from Germany, 1 from Denmark, 22 from Spain, 12 from France, 2 from Ireland, 7 from Italy, 1 from Luxembourg, 2 from Holland, 2 from Norway, 3 from Portugal and 15 from the UK. To accomplish the panel causal tests, we have an adequate number of cross-section and time-series observations – in fact, the number of cross-section observations (regions) in relation to the length of the time-series cannot be too large from the point of view of the method. For the

representativeness of the data, because the regions included in the data are distributed quite evenly across Europe, we consider the data to represent Europe rather well.

To test the heterogeneous non-causality hypothesis in the third step of our testing procedure, we categorize the regions into three groups of equal sizes using the accessibility variable. This methodology allows determining whether peripherality explains the differences in causal processes. Accessibility is lowest in peripheral regions, highest in core regions and mid-range in intermediate regions. Table 1 shows that employment and real GDP are higher when the region is more accessible. The number of air passengers is also lowest in peripheral regions and highest in core regions.

Table 1. Means of the variables by region type (annual averages in 1991-2010)

Region type	Accessibility	Air passengers (1000)	Employment (1000)	Real GDP (Mio Euro PPP)
Peripheral	88.7	1 981.8	376.4	19.992.3
Middle	102.4	4 794.8	703.2	44 819.7
Core	113.3	16 539.6	1 154.0	77 196.3
All regions	101.5	7 806.7	745.0	47 365.3

We performed Granger causality tests between regional growth and air transportation in 86 European regions for the period from 1991-2010 and with lags one and two. For both side variables in the analysis, we first take natural logarithms and then difference them to eliminate possible unit roots and to reach time stationarity. Consequently, we are thereby analyzing growth rates. We follow the nested procedure described above to test different causality relationships. The tests are based on so called Wald statistics.

As a first step in exploring bi-directional Granger causality between airport activity and regional development, we assess the homogeneous non-causality (HNC) hypothesis. The HNC hypothesis implies the non-existence of individual causality relationships. Table 2 presents the results from four possible combinations of the variables: air passengers and GDP; air passengers and employment; accessibility and GDP; and accessibility and employment.

Table 2. Test results for homogeneous non-causality (HNC hypothesis)

Direction of causality and lags	***F-statistic and its significance***			
	Air passengers - GDP	**Air passengers - employment**	**Accessibility - GDP**	**Accessibility -employment**
Causality from air traffic to regional growth				
Lag 1	1.602***	1.591** *	1.947***	1.947***
Lag 2	0.576	0.716	0.991	1.391***
Causality from regional growth to air traffic				
Lag 1	0.956	1.206*	0.694	1.016
Lag 2	0.420	0.604	0.470	0.586

All the test statistics related to the homogenous non-causality hypothesis are statistically significant with one lag when the direction of causality is from air traffic to regional development. With two lags, however, these statistics are not significant, with the exception of the pair of variables “accessibility – employment”. These results allow us to reject the homogeneous non-causality hypothesis because there is statistical evidence of Granger

causality from air traffic (accessibility) to regional growth for at least some regions (and possibly all).

The evidence of the opposite direction of causality – from regional development to air traffic – is only partial. The test statistics cannot be rejected even at lag one when using the combination of variables "air passengers – GDP", "accessibility – GDP" or "accessibility – employment". It is, however, rejected at the 10% significance level when airport activity is measured by the number of air passengers and employment is used instead of GDP. This rejection calls for the next step in the testing procedure.

If the HNC hypothesis is rejected, the next step is to test the hypothesis of homogeneous causality (HC). The results presented in Table 3 indicate significant test statistics for all pairs of variables when the direction of causality is from air traffic to regional growth. Accordingly, we can state at this point that there are causal processes from air traffic (accessibility) to regional growth, but these processes are not uniform. The test statistic about the opposite direction of causality, where employment causes air traffic in all regions, is not rejected, implying a homogenous causal process. An alternative interpretation is that there are no causal processes at all. This is the result we obtain with all of the other pairs of variables.

Table 3. Test results for homogenous causality (HC hypothesis)

Direction of causality	***F-statistic and its significance***			
	Air passengers - GDP	**Air passengers - employment**	**Accessibility - GDP**	**Accessibility -employment**
Causality from air traffic to regional growth				
Lag 1	1.646***	1.521***	2.018***	1.950***
Causality from regional growth to air traffic				
Lag 1	-	0.925	-	-

The results thus far indicate that air traffic, or accessibility in general, Granger-causes regional growth in some regions, but not in all regions. The data-generating process is non-homogeneous, and homogeneous causality relationships cannot be obtained. It may, however, still be possible that causality relationships continue to exist for one or more cross-regions. There is a need for further analysis and testing for the heterogeneous non-causality hypotheses. As the number of regions is high at 86, we did not test the contribution of each individual region to the existence of causality; instead, we categorised the regions into three groups according to their peripherality. The categorisation is especially important because we wish to analyse the significance of remote airports to their regions.

The third step is to test the heterogeneous non-causality hypothesis (HENC). Interestingly, the results shown in Table 4 suggest that peripherality indeed matters. The more peripheral a region is, the more important it is to its development to have efficient air connections. This conclusion is most evident with the pair of variables "air passengers – GDP". For peripheral regions, the statistical test results are significant with all combinations of variables; for the other regions, the results vary somewhat, depending on the variables.

Table 4. Test results for heterogeneous causality (HENC hypothesis, lag 1)

Direction of causality and	***F-statistic and its significance***			
region type	**Air passengers - GDP**	**Air passengers - employment**	**Accessibility - GDP**	**Accessibility - employment**

Causality from air traffic to regional growth				
Peripheral regions	2.527***	3.533***	2.952***	4.685***
Middle regions	1.374*	0.760	1.152	0.618
Core regions	0.873	0.393	1.607*	0.385

To conclude, our results present evidence of causal processes in these relationships and suggest that air transportation is more than a facilitator in remote regions. In these regions, in addition to regional growth causing airport activity, air activity appears to boost regional development. Supply-side effects are, thus, important for distant regions. In core regions, only the reverse is true: that is, airport activity does not cause regional growth, but regional growth causes airport activity.

Given these results, the message for regional policy makers is clearly that there are good reasons to defend local airlines because they are important to the development of remote regions. The traditional challenge for many small airports is that they are not financially viable, which has led to financial support being provided to airports and airport companies. Although subsidies often distort competition and waste money, our results suggest that there indeed might be a case for subsidizing local airports in remote regions if the result is increased regional growth and welfare.

It should be noted that while Granger causality represents progress toward uncovering true causal processes, it is indicative rather than confirmatory. While airport activity may appear to cause economic development because lagged airport activity values carry explanatory power, the apparent causation may, in fact, be due to omitted variables that move in tandem with airport activity but are not picked up in lagged economic development values. Moreover, lagged airport values may sometimes be generated in response to anticipated future economic development values; that is, airports are originally built for regions that have the most potential for economic success.

3.3 STRUCTURAL REGRESSION ANALYSIS (see *Annex 3*)

The second method used is structural regression analysis. It estimates numerically the size of the influences. The regression analysis yields quantitative results about the relation of economic performance and transport infrastructure. Thus, it is possible to see how relevant the impact of accessibility is relative to other regional location factors. The quantitative results also allow estimating welfare losses due to insufficient or underdeveloped transport facilities, and welfare gains through better accessibility.

Simple correlation analysis gives a first insight into the relationship between accessibility and economic performance. The following table allows investigating the relationship between multimodal accessibility and economic prosperity. It displays the correlation coefficient for the total, geographical and transport accessibility. Thereby three kinds of influences of accessibility in accordance with the theoretical equations that will be tested are considered:

- Accessibility level on GDP per capita, productivity and participation (level)
- Accessibility growth on GDP per capita, productivity and participation growth (difference)

Table 1. Correlation analysis between accessibility and economic performance[16]

		GDP per capita		Real hourly productivity of labour		Participation rate
		Level	Growth	Level	Growth	Level
Total accessibility	Level	0.54	0.09	0.59	0.12	0.38
	Growth		0.29		0.22	
Geographical accessibility	Level	0.47	0.04	0.57	0.08	0.31
	Growth					
Transport accessibility	Level	0.52	0.10	0.52	0.13	0.37
	Growth		0.29		0.23	

It is evident that there is a positive relationship both in levels as well as in differences. Correlation in levels is rather high, a bit lower in differences and hardly existing between the level of accessibility and economic growth rates. These results indicate that better accessibility has primarily an effect on the level of economic performance, but hardly on economic growth. Thus, the improvement of transport infrastructures has a one time effect on the level of economic performance (shift), but not a permanent effect on the slope.

The correlation in growth rates cannot be computed for the geographical accessibility, because this variable does not change over time. Furthermore, concerning the relationship between accessibility and GDP per capita the question of causality remains unresolved: Does better accessibility level lead to a higher level of prosperity or vice versa? This uncertainty has been dealt with in the previous chapter by means of the concept of the Granger causality.

Of course, simple correlation coefficients do not reveal the whole truth. To this end, we perform detailed regression analysis and econometric tests. The main model is a reduced form production function, cross section model in logarithmic levels where economic activity is explained by accessibility, the degree of (national) regulation, tax burden and the innovation potential. Economic activity can be measured by GDP per capita, hourly labour productivity, and the participation rate respectively. In addition, we use three further models: a cross section model in first differences (with a convergence term), a panel data model in levels (as a co-integration equation), and a panel data model in first differences (with an error correction term).[17]

The empirical estimation of these four models using the data set described above allows identifying the factors, which explain regional variance of economic performance.[18] The main results can be summarized as follows:

- Accessibility matters: There is a positive impact on economic performance. Faster transportation allows people being in more places in a given time span. Thus, better accessibility improves productivity, as we would expect from economic theory. Higher

[16] Cross section of 336 regions using average data for the period 1991 to 2008

[17] The respective tests were inconclusive both on the level of integration (stationary or not) and on the question of cointegration. Therefore, we estimate both level and difference equations, and included an error correction term in the panel difference equations. Consequently, the panel level equation can be seen as a stationary representation or as a cointegration regression. In addition, the Hausman tests clearly indicate (regional) fixed effects. For more details refer to the annex.

[18] The cross section models use data for 336 regions, the panel models use annual data from 2000 to 2008 yielding 3024 observations.

productivity leads to higher GDP and thus higher GDP per capita. Higher accessibility also yields in a higher participation rate, thereby reducing (official and hidden) unemployment.

- The positive impact of accessibility is higher for output (GDP) and labour productivity and lower for the participation rate (jobs). However, this is not surprising, as the effect on participation and on productivity add in some way to the overall effect on GDP.
- The long term impact of accessibility on economic performance is much higher than the short term impact. This result is in line with economic theory. If there is a substantial improvement in accessibility, it is usually known quite in advance. Thus, additional economic activities (such as construction) may already start well before the opening of new transport services. On the other hand, it also may take some time until activities adjust to the new accessibility level.
- The differences in accessibility between regions (from the cross section models) have a much higher impact than changes over time (from the panel data models). This effect implies that changes in accessibility over time take some time for economic activities to adjust. Thus, the estimated effect is lower. The higher regional effect is likely to estimate equilibrium (and thus long term) effects.
- The impact of geography and of transport services adds to the impact of overall accessibility. The regression estimates show that transport services (politics) are more relevant than geography. This is good news as transport services can be shaped by politics, while geographical accessibility is just fate.
- The impact for peripheral regions is similar as for the non-peripheral regions. However, there is one exception: While the impact of accessibility on the participation rate is substantial on average, it is close to zero for peripheral regions.

The estimated equations, which can be interpreted as reduced form production functions, also show that taxation is a strong brake and innovation quite a strong boost factor for regional economies.

All in all, better accessibility goes hand in hand with better economic performance. It should be noted here, that the direction of causality cannot be read from these regression analyses. It is possible that better accessibility has a positive impact on the decisions of economic agents thereby enlarging economic activities and prosperity which is the supply side effect. However, it is also possible, that higher economic activities ask for more transportation services thereby improving accessibility which is the demand side effect. The panel causality analysis in the previous section shows rather clear that the supply side effect dominates.

In addition we adopt a model to estimate the demand for airport services using airport data. The model is a cross section model in logarithmic levels where the number of commercial passengers is explained by labour productivity, the participation rate and population. Again, the same four types of models are used as above (cross section and panel data in levels and in first differences).

The empirical estimation of these four models using the data set described above allows identifying the factors which explain regional variance of economic performance.[19] The main results can be summarised as follows:

- Regional economic activity is very relevant for airport performance. All three factors (population, participation rate and labour productivity) have a clearly positive impact on the number of commercial passengers in a region.
- In the long run, the positive effect is over proportionate. When any of the three factors rise by one percent, the number of commercial passenger rises by more than one percent.
- The participation rate has the highest impact for explaining the number of commercial passengers. The participation rate might be an indicator for higher growth rates (lower unemployment rates) or for higher immigration, as larger cities very often profit from net immigration resulting in younger populations and higher participation rates, while peripheral regions tend to suffer from net emigration and thus older populations

[19] The cross section models use data for 203 regions, the panel models use annual data from 2006 to 2010 yielding 1015 observations.

and lower participation rates.
- Larger airports grow faster than smaller ones. While there is a convergence in economic performance of regions (poorer regions grow faster than richer regions) there is a divergence regarding airports.
-

Using the results of the structural equations it will be possible to estimate welfare effects.

The structural regression analysis clearly shows that accessibility does matter and has a significant impact on the level of regional GDP and productivity. The effect is much lower on the growth rates of economic performance. Also, the impact of the geographical location is less relevant than the impact of transport services. This is very relevant to regional policy: Improving accessibility by either better infrastructures (such as new rail links) or better transportation services (such as additional scheduled direct flights to existing destinations or new direct flights to additional destinations) tends to increase economic activity in the region.

3.4 FRONTIER ANALYSIS

The third method used is frontier analysis. It will show the degree of production efficiency for each region and bring out the limiting factors. This will give answer to the question whether an insufficient traffic infrastructure is a limiting factor for the economic development of a region.

To analyse these research questions we apply a Data Envelopment Analysis (DEA), which is a widely used frontier analysis method (Charnes, A., Cooper, W. W., Lewin, A. Y., Seiford 1995). DEA constitutes a non-parametric approach based on mathematical optimization methods, in order to construct a non-parametric surface over the available data. Performance – or efficiency – measurement of each Decision Making Unit (DMUs) can be computed, regarding its position on this surface. DEA evaluates the relative performance of each DMU (e.g., airports, regions) and can easily handle multiple inputs and outputs. The efficient DMUs define an efficient production possibility surface or frontier.

DEA does not only provide us with a ranking of the DMUs regarding their efficiency. What is more important is the fact that, DEA can propose specific ways of improvement for the inefficient DMUs. On the other hand, the efficient airports (that are located on the frontier), cannot further improve their output, unless they increase their input correspondingly. Additionally, the regional policy makers are able to evaluate the limiting factors regarding their own region.
In our case study, this frontier is derived from empirical observations using the database described above, and it measures the relative performance obtained using the existing technology or management strategy. More specifically, we analyse data for a large number of airports and regions, in order to compute the efficiency frontier. The efficient airports have an efficiency score of unity, whereas the inefficient airports have an efficiency score below one.
The dataset used, contains data from 453 European airports regarding the time period from 1991 to 2010. However, the number of reporting airports declines as we go back in time. For example, in the year 1991 there is only data on 205 airports available.

Our study will use the DEA method, in order to provide answers to two research questions. First, we are interested in assessing the regional economic performance (e.g., GDP) regarding their airports as an input. Second, we need to evaluate the airport services (as an output) given their infrastructure etc. (as inputs).
Therefore, the first DEA model uses economic performance as output variables and the framework conditions including accessibility as input variables. The second DEA model uses the two indicators of airport performance as output variables and again the framework conditions as input variables.
Due to the large number of DMUs, a state-of-the-art DEA software package is required to be used. In this study we will use the well-known DEA-Solver Professional v.8.0a (Cooper, W. W., Seiford, L. M., Tone 2007). The latest version of DEA-Solver Professional consists of 41 clusters including totally 175 DEA models (SAITECH 2011).

The preliminary results from the first model indicate that supply side effects are indeed

relevant. Most areas are well below their individual efficiency frontier: If they were efficient, they could either increase output (and thus welfare) considerably using the same amount of inputs, or they could reach the same output level with much lower inputs. Focussing on the latter, the models indicate that qualified manpower is on average used most efficiently. This means that an increase in the amount (or number) of qualified labour force would increase output and also the degree of efficiency of the other input factors. Thus, on average, qualified manpower is the most limiting factor for economic performance of regions. In the second place we find already transport accessibility. From this result we may conclude for policy that improvements in qualified manpower and accessibility are most promising for regional economic development. Note that transport accessibility includes not only air travel but roads and rails as well.

The preliminary results from the second model indicate that that the vast majority of airports are far below their efficiency frontier. Given the economic performance and the framework conditions, most of them should do much better. The bottleneck is unlikely to be the physical infrastructure but rather the distribution of airports in space. In other words: the airport of Athens is bigger than adequate for the Athens region while the airport Patras is smaller than adequate for Western Greece. As airports profit a lot from economies to scale and passengers profit substantially from large hubs, this is somewhat a “natural” phenomenon (similar to a natural monopoly). Thus, regional airports will always be also relatively small, but they should have good connections to at least one nearby hub.

3.5 PRELIMINARY SYNTHESIS

As we are well aware that this ESPON project is a targeted analysis, the final goal is to produce policy recommendations, which are solidly based on all project results.

The goal is to build a consistent view of all empirical analyses done within this project and described in this chapter. Thus, we will take the results of the three preceding chapters and present them in a kind of synopsis:

- Panel causality models and tests
- Structural regression analysis and econometric tests
- Frontier analysis and identification of limiting factors

Using the results above, we can draw some first conclusions which are summarised in the following table:

Table 1: Summary results of the empirical analyses

	Supply side effects: Accessibility enhances economic performance	Demand side effects: Economic performance improves accessibility
Causality analysis	YES; but only true for peripheral regions	YES, for all regions
Structural regressions	YES, mostly positive effects (especially for GDP)	YES, strong positive effects (especially from the participation rate)
Frontier analysis (DEA	YES, it is one of the limiting factors (behind qualified labour)	YES (but this seems to be less relevant)

The three different ways of analysing the relation between accessibility and economic performance shows that supply side effects are relevant, especially in peripheral regions. However, the influence is either limited or other factors seem to have a stronger effect on economic performance than accessibility. Nonetheless, better accessibility has a positive influence on the attractiveness of a region for people and business and therefore on economic performance. On the other hand, the demand side effects are rather strong in all regions. This means that a good economic performance leads to more demand for transportation services which in turn results sooner or later in better transport infrastructure, more transport services and better accessibility.

The political conclusion is that the improvement of accessibility may help improving the economic situation of a region. However, each region must carry out a thorough analysis what is the most efficient way to improve accessibility. In some cases (like in a remote area in Finland) this might be the strengthening of an airport (expansion of the structures and good offer of scheduled flights). In other cases (like in Greek regions), it might be the subsidy of scheduled flights to the next large hub. In few cases, it is recommended to completely abandon airport activities in order to transform it in an urban falcility that will have stronger effects on the economic perfomarce of the region. In even other cases (like in Italian regions) it might be best to integrate urban functions in the airport areas and to improve the highway or rail network system to better reach a nearby airport with a good offer of scheduled flights. A preliminary description is captured in *Chapter 5*.

In the *Draft Final Report*, there will be also a comparison of the empirical results described above with the results from the questionnaires and interviews in the stakeholder regions.

4. CASE STUDIES

4.1 DIFFERENCES OF REGIONS AND AIRPORTS

Throughout the world, there are hundreds of second and third tier obsolete airports stuck in a pre-decline phase. It is urgent to think about their future. What does it mean to transform airports' infrastructure into urban re-activators? What are the strategies? How the city can prepare itself before the airport infrastructure arrives in its obsolete phase?

The ADES research case studies are: *Jyväskylä Airport*, City of Jyväskylä, Central Finland; *Araxos Airport*, *Aktion Airport*, *Andravida Airport*, Region of Western Greece; *Villanova d'Albenga Airport*, Province of Savona, Italy (Figure 1). These airports show different examples of the widespread situation of underused airports structures that have never managed to reach their potential or have lost their central role.

Figure 1. Villanova d'Albenga Airport, Savona, Italy

4.1.1 THE RE-CYCLE OF SECONDARY AIRPORT AND NEW OPPORTUNITIES FOR THE TERRITORY

Building new infrastructure, ever more today, in this moment of crisis, does not reveal itself as the most sustainable strategy, considering sustainability as an aim in relation to social and territorial changes. The European Commission's White Paper (2001)[20] indicates that it is an absolutely necessary strategy to interrupt the connection between increased mobility and economic growth.

This is the context in which this research wants to offer an alternative to the excessive construction of new infrastructure: don't build new roads but strengthen the existing public system. At the same time, don't build new airports, but to reuse the existing airport infrastructure and use them as activators of the economies and local contexts. **The recycling of obsolete infrastructure**, and the re-use in order to optimize their potentialities becomes the most sustainable and desirable solution. To re-think not only the abandoned and unused infrastructure in search of a new identity, but to recycle all those infrastructures those are already active but poorly operating and unproductive.

Around the word, exist a lot of examples of Re-cycled airports (see *Annex 5, Chapter 4.1*).
After their decommission, many former military airports were not re-used and they remain in an abandoned state for years. But due to the growing population and the high demand for new houses, many of these airports could be re-developed as a new part of the city. Starting with the transformation of the air connection infrastructure (runway, technical street) into urban main roads and street, and continue this new urban development with houses, public services, commercial and business areas.

In other cases, many problematic airports no longer present themselves in the potential range for urban expansion. These airports, which were once peripheral, have now been engulfed in the urban context, becoming physically central in the city. This simplifies their re-conversation into urban park space. These case studies propose the transformation into public urban parks as the suitable solution for the re-use of abandoned airports.

Therefore, the main question for the project seems to identify strategies of *recycle* existing obsoletes infrastructure rather than the construction of new infrastructure. The experimentation of different tactics, that are defined case by case, offers a network of paths in the landscape rather than it presents one-way routes that strongly limit the way of living in the territory[21].

4.1.2 FROM AIRPORT INFRASTRUCTURE TO *AIRPORT OSMOTIC INFRASTRUCTURE*

The preliminary results suggest the impossibility to propose one singular strategy for the airports' development. The diversity of the territories and the complexity of the problems drive the TPG to think on multiple proposals of future development strategies. These strategies will propose new operations.**The device** that drives these operations **is the *osmosis*[22].**
The *osmotic devices* will establish a stronger relation between the infrastructure and their surrounding territories. At the same time they will gain an economic improvement and new uses for the airports.

From an infrastructure 'tube' to an *osmotic infrastructure*, in osmosis with the surrounding

[20] *The European transport policy for 2010*, COM(2001) 370. Reviewed in 2006 by the Council Commission Communication and the European Parliament.
[21] Cfr. Mirko Guaralda, *Le infrastrutture viarie dismesse o declassate ed il progetto di paesaggio.* Libreria CLUP Soc. Coop., Segrate (MI), 2006.
[22] Osmosis is the net movement of solvent molecules through a partially permeable membrane into a region of higher solute concentration, in order to equalize the solute concentrations on the two sides. It may also be used to describe a physical process in which any solvent moves, without input of energy, across a semipermeable membrane (permeable to the solvent, but not the solute) separating two solutions of different concentrations. Cfr. *Osmosi*, www.wikipedia.org.

area. Consider the infrastructure as a place of permanence and not just a transition, a biological material originating from the surrounding area and an integral part of the new housing situation. Through this *osmotic membrane* it could be possible to design infrastructure in a different way, as a place to stay and not only to cross. No longer like a tube that connects faraway places, but as a biological material which is part of the new housing situation. The *osmotic membrane* gives a new relevant value as multi-functional infrastructure. At the same time, a spine that holds up a fragmented and dispersed urban structure, and an *osmotic membrane* that promotes trade and exchange between infrastructure and landscapes along the way.

Infrastructure that generates trade with landscapes but also allows us to see new landscapes. The airport becomes a place to live and not only a door to cross to go to another destination. From airports to reach to fly 'beyond', a far away destination, to airports in which to go and stay in, as attractors of flows related to activities associated with the local area and the structure of the airport.

In that sense, the ***airport osmotic infrastructure*** becomes *a place to live before a place to leave*[23]. It is organised to satisfy not only one specific sector (flight operation) but it could adapt itself and its efficiency in relation to the surrounding context and business, it could exchange fluxes (physical and immaterial) with the surrounding territory and it could accommodate multiple functions, as in the Postmodern examples (see *Annex 5*, *Chapter 4.1*).

4.1.3 ABANDONED AIRPORTS AND AIRPORTS *ON HOLD*

It is necessary to approach the everyday dimension of the airport's life. It is necessary to think in airports at the present time, with the current socio-economical condition. In that sense, the research suggests an operation of *recycling obsolete infrastructure.* Abandoned airports (*Andravida Airport)* and airports *on hold* (*Villanova d'Albenga Airport, Jyväskylä Airport* (Figure 2), *Araxos Airport* (Map 4), *Aktion Airport*) are the material on which we are working on.

Figure 2. Entrance at Jyväskylä Airport, Finland

[23] Ricci M., Favargiotti S., (2012). *The Re-cycle of secondary airports and new opportunities for the territory - ADES Research (ESPON 2013 Project). AIRDEV 2012*. Airport Development Conference. Conference Proceedings. Edit by Rosário Macário. ISBN: 978-989-20-3071-5.

Map 4. Araxos Airport, Western Greece (ID_Airport card_DRAFT)

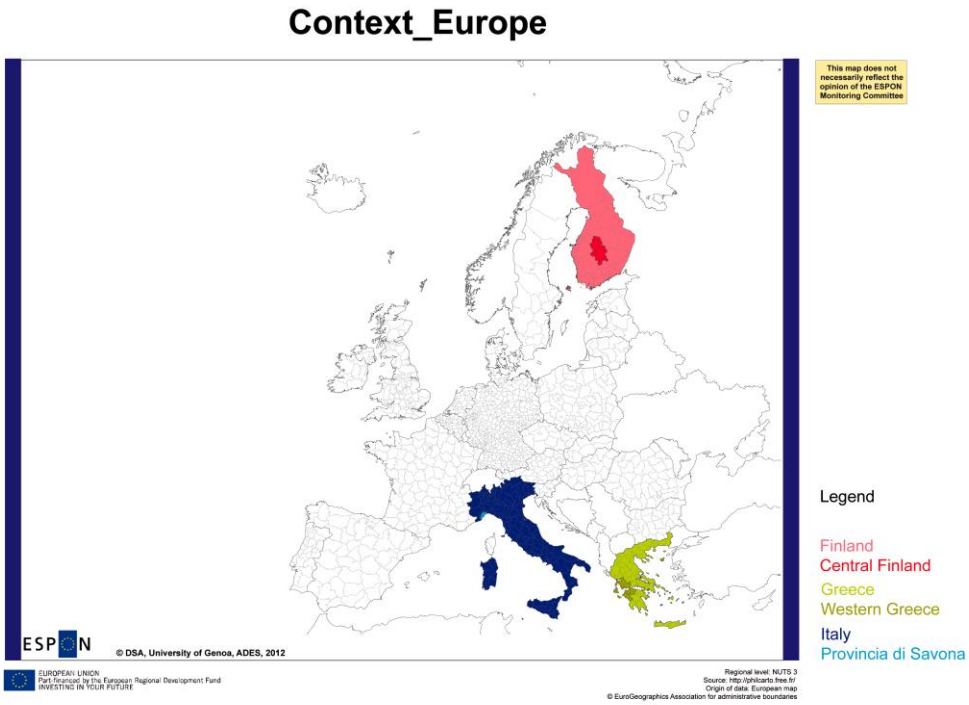
The central issue is to investigate the possibility of recycling existing airport infrastructure, re-using and maximizing their potential through development strategies. Through this investigation we could identify re-use strategies that will give these *(infra)*structures a new identity.

The peripheral context of airports generates interest but also a limit. Urban growth, in this moment of crisis, is very slow therefore making airports' possible central role in urban development very difficult. The recycling of airports could become an operative strategy for other urban transformations. The reconversion of airport infrastructure will increase quality and development of the surrounding urban and social condition: from airports on hold to airports catalytic of processes. The re-significance of this infrastructure could activate processes of growth of mobility, to develop transport and communication networks, to lost a physical precise cities' connotation, to increase the need of landscape and places in which to live in and recognize themselves.

This could be the operative strategy for these airports to recalibrate their fundamental function in their physical contexts: the integration of air traffic transportation facilities with activities that regenerate their life and the surrounding business.

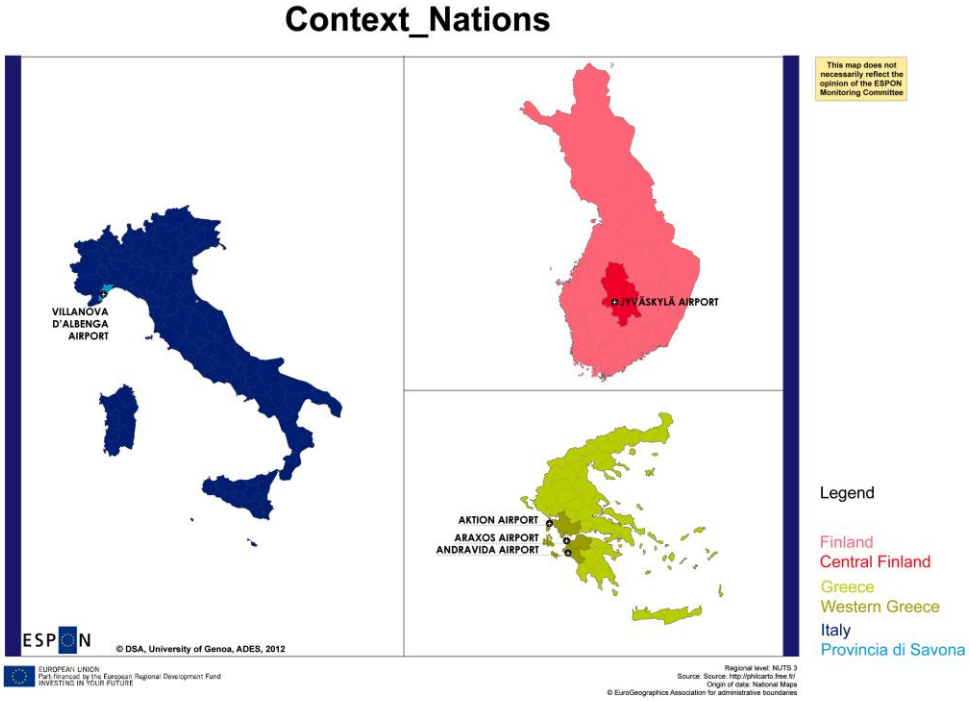
4.2 ANALYSIS OF THE THREE STAKEHOLDER REGIONS

The geographical situation of the three stakeholder regions is very different (Map 5-6).



Map 5. Context_Europe_Stakeholder regions

Jyväskylä in Central Finland is very central to Finland but very peripheral relative to Central Europe. As the economic centre of Finland is south of Jyväskylä, Central Finland is even more remote and Helsinki becomes a natural gateway to "Europe" for the whole of Finland.



Map 6. Context_Nations_Stakeholder regions

Patras in Western Greece is also rather central to Greece, but Greece as a whole is at the southern periphery of Europe. Despite the fact that Patras is even closer to Central Europe than the capital Athens, almost all air traffic goes through Athens.The situation of Savona differs considerably. It is rather central in Europe, but very peripheral in an Italian context. The airports of Genoa, Nice, Torino and Milano are relatively close. Thus, the air link situation of the three stakeholder regions also differs substantially.

The objective of this chapter is to provide an overview of the main economic indicators and the industry structure of the stakeholders regions. Then, we describe the regional contexts of each case study areas through the same descriptive categories (see below *Paragraph 4.2.5-8*).

We start with a brief comparison of the three regions. In each case, the cognitive framework for socio-economic and territorial aspects is based on specific databases, indicators and elaborations that define the potential economic impacts of airports.

4.2.1 ECONOMIC OVERVIEW OF THE STAKEHOLDER REGIONS

In socio-economic terms, Central Finland and the Province of Savona are of about the same size, while Western Greece is about twice as big. The following table presents some economic key figures:

Table 1: Economic performance, 2010

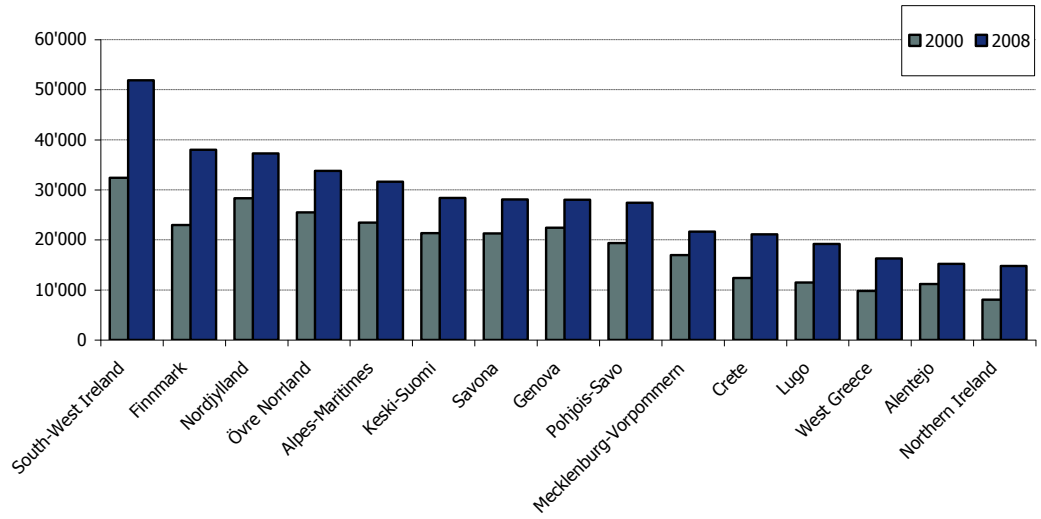
	Central Finland	Western Greece	Province of Savona
Nominal GDP (in million €)	7'395	13'056	8’168
Real GDP-Growth (2000-2010)	1.4% p.a.	2.1% p.a.	0.8% p.a.
GDP per capita (in €)	27'007	17'516	28’367
Hourly productivity (in €)	38.27	19.28	34.14
Employment	109'282	285’695	120’667
Employment Growth (2000-2010)	0.3% p.a	0.3% p.a	1.5% p.a.

Source: BAKBASEL

For a better understanding of the three stakeholder regions we present a short benchmarking exercise with a systematic comparison of these three regions with similar regions in the respective countries and additional rather peripheral regions in some other countries. The regions selected for this analysis can be seen from the following graph. For a more detailed benchmarking analysis (and a description of the data used) please refer to the *Annex 4*. The most relevant results regarding economic performance are:

- GDP per capita level as an indicator of general welfare: Central Finland (Keski-Suomi) and the Province of Savona (Savona) are in the midfield, while West Greece is in the lower third (of this rather week sample). As the participation rates in the three stakeholder regions are rather similar, this results reflects to a large extent the differences in the level of productivity.
- Real GDP per capita growth (2000–2008) as a central economic performance indicator: West Greece is among the best, Central Finland in the middle and Savona at the lower end of the scale. Although the participation rate in Savona grew more rapidly leading to a relatively large increase in employment, GDP growth was very low as productivity hardly grew. In Central Finland the participation rate did not change much, but an average increase of labour productivity led to an average output growth. Finally, a small increase in the participation rate combined with a large increase in productivity results in a high real GDP growth in West Greece.

Figure 1: A comparison of welfare (measured as nominal GDP per capita)



Note: In EUR PPP (at current prices and exchange rates)
Source: BAKBASEL

Part of the differences in the economic performance may be explained by the quality of the framework conditions. Here, the most relevant results are:

- Accessibility: Savona is in quite a good position, particularly because of its geographic proximity to the large European economic centres. Central Finland is in a middle position within the sample under consideration. Western Greece is in a relatively bad position, particularly because of its low transport accessibility.
- Innovation: Using the share of research and development expenditures in GDP as an indicator for the innovation potential of a region, Central Finland is in a top position, while Savona is below average and Western Greece almost last in the ranking of the 15 regions of the benchmark.
- Taxation: For both taxes for qualified manpower and companies Western Greece exhibits a rather low burden, and Savona quite a high tax rates. In Finland, company taxes are below, manpower taxes above the sample average.
- Regulation: Regulation for both product and labour markets is quite liberal in Finland and quite strict in Greece. In Italy, labour market regulation is distinctly more liberal than product market regulation.

In the following chapters, the three stakeholder regions will be presented individually.

4.2.2 ECONOMIC OVERVIEW OF CENTRAL FINLAND

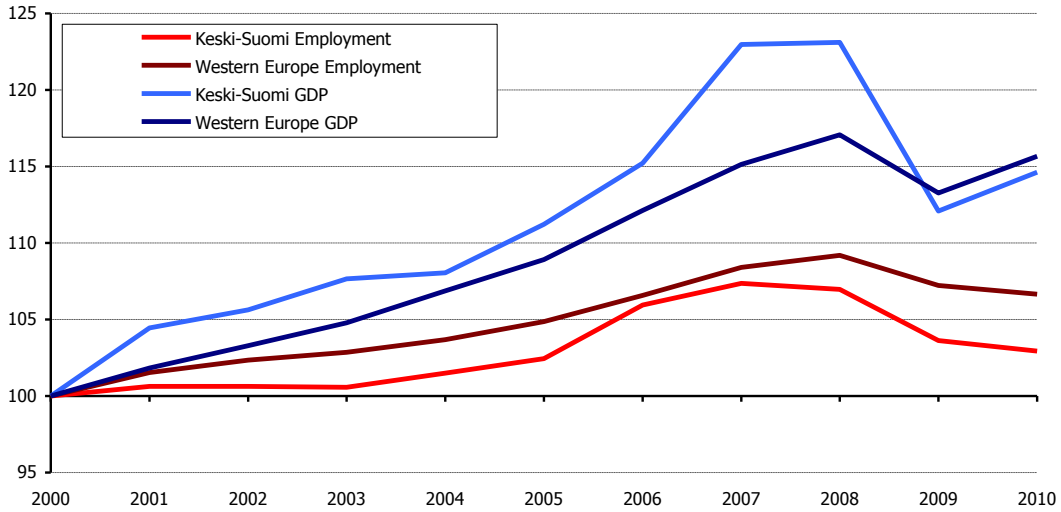
Table 1: Economic performance, 2010

	Central Finland	Finland	Western Europe
Nominal GDP (in million €)	7'395	179'891	11'591'738
Real GDP-Growth (2000-2010)	1.4% p.a.	1.8% p.a.	1.5% p.a
GDP per capita (in €)	27'007	33'453	28'314
Hourly productivity (in €)	38.27	39.81	35.48
Employment	109'282	2'435'412	182'485'506
Employment Growth (2000-2010)	0.3% p.a	0.5% p.a.	0.6% p.a

Source: BAKBASEL

In 2010, the region of Central Finland achieved a nominal Gross Domestic Product (GDP) of more than 7'390 million Euro and there were approximately 109'000 employed. The level of GDP in capita in the region was slightly below the national and Western European average. This is reflected in values of 27'000 Euro per capita in Central Finland, 33'500 Euro per capita in Finland and 28'300 Euro per capita in Western Europe. In contrast, the hourly productivity in the region was higher than the Western European average, while the average hourly productivity in Finland exceeded the value of the region (see table 1).

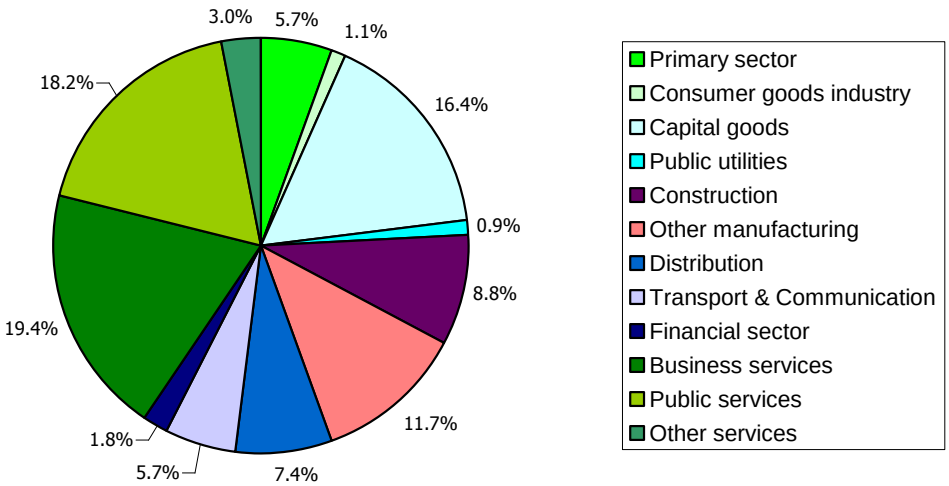
Figure 1: Real GDP- and Employment Growth



Index, 2000 = 100 (GDP: at constant prices and exchange rates)
Source: BAKBASEL

Figure 1 displays the growth of GDP and employment in the period 2000-2010. Despite the sharp decline of GDP in 2009 it is visible that the region had a dynamic development. The region grew by 1.4 percent per annum, which is similar to the Western European average (1.5% p.a.) It strikes the eye that in contrast to GDP growth Central Finland performed in terms of employment growth worse than the Western European average. So the region achieved only an augmentation of 0.3 percent per annum. The last two years the employment even shrank by 3.8 percent.

Figure 2: Industry structure, 2010



Share of total economy, in %
Source: BAKBASEL

The pie shows the industry structure of the Central Finland economy in the year 2010 as shares in GDP (using the NACE classification). The service sector had the largest share with 55.4 percent, while the primary and the secondary sector contribute 5.7 and 38.9 percent to total GDP. The most important industries in the service sector were the business services and the public services. Most important for the industry sector was the production of capital goods.

4.2.3 ECONOMIC OVERVIEW OF WESTERN GREECE

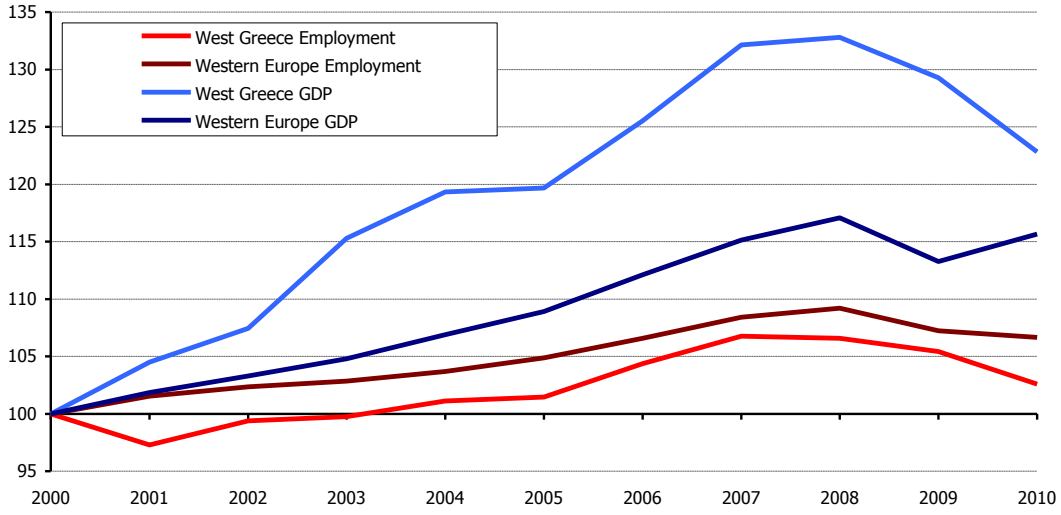
Table 1: Economic performance, 2010

	West Greece	Greece	Western Europe
Nominal GDP (in million €)	13'056	226'991	11'591'738
Real GDP-Growth (2000-2010)	2.1% p.a.	2.3% p.a	1.5% p.a.
GDP per capita (in €)	17'516	20'001	28'314
Hourly productivity (in €)	19.28	20.51	35.48
Employment	285'695	4'647'826	182'485'506
Employment Growth (2000-2010)	0.3% p.a	0.9% p.a	0.6% p.a.

Source: BAKBASEL

In 2010, West Greece achieved a nominal Gross Domestic Product (GDP) of more than 13'050 million Euro and there were approximately 285'700 employed. The level of GDP in capita in the region was slightly below the national average, but more than one-third smaller than the Western European average. This is reflected in values of 17'516 Euro per capita in West Greece, 20'001 Euro per capita in Greece and 28'314 Euro per capita in Western Europe. A resembling picture is drawn by the hourly productivity. So the hourly productivity of the region was clearly lower than the Western European average, while the national average recorded a slightly higher value (see table 1).

Figure 1: Real GDP- and Employment Growth

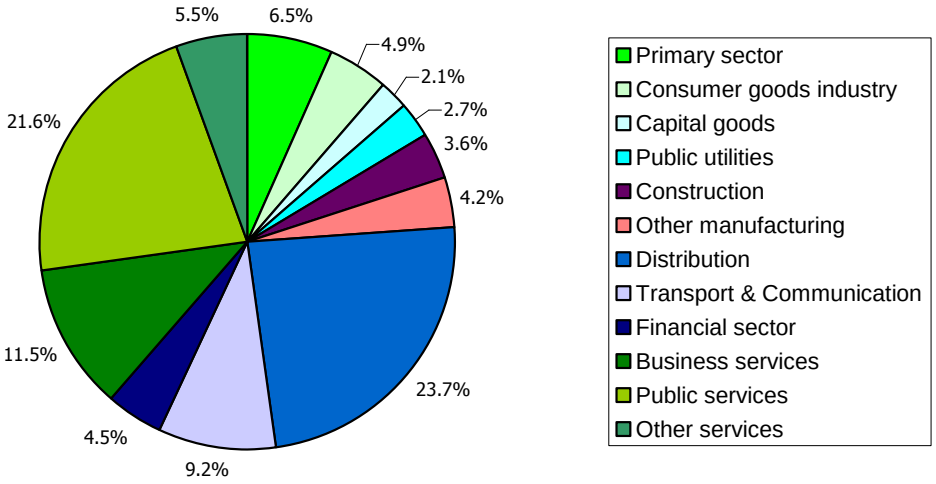


Index, 2000 = 100 (GDP: at constant prices and exchange rates)
Source: BAKBASEL

Figure 1 displays the growth of GDP and employment in the period 2000-2010. Despite the decline of GDP in the years 2009 and 2010 the region grew by 2.1 percent per annum in the period 2000-2010, which was clearly above the development of the Western European

average (1.5% p.a.) In contrast to GDP growth West Greece performed in terms of employment growth worse than the Western European average. So the region achieved only an augmentation of 0.3 percent per annum, while Western Europe recorded an increase of 0.6 percent per year.

Figure 2: Industry structure, 2010



Share of total economy, in %
Source: BAKBASEL

The pie shows the industry structure of the economy in West Greece in the year 2010 as shares in GDP (using the NACE classification). The industry structure is dominated by the service sector which accounts for more than 75 percent of total economy in 2010. The most important industries in the service sector were the public services (21.6%) and the distribution (23.7%). The primary and the secondary sector contribute 6.5 and 17.5 percent to total GDP. Most important for the industry sector was the consumer goods industry.

4.2.4 ECONOMIC OVERVIEW OF PROVINCE OF SAVONA

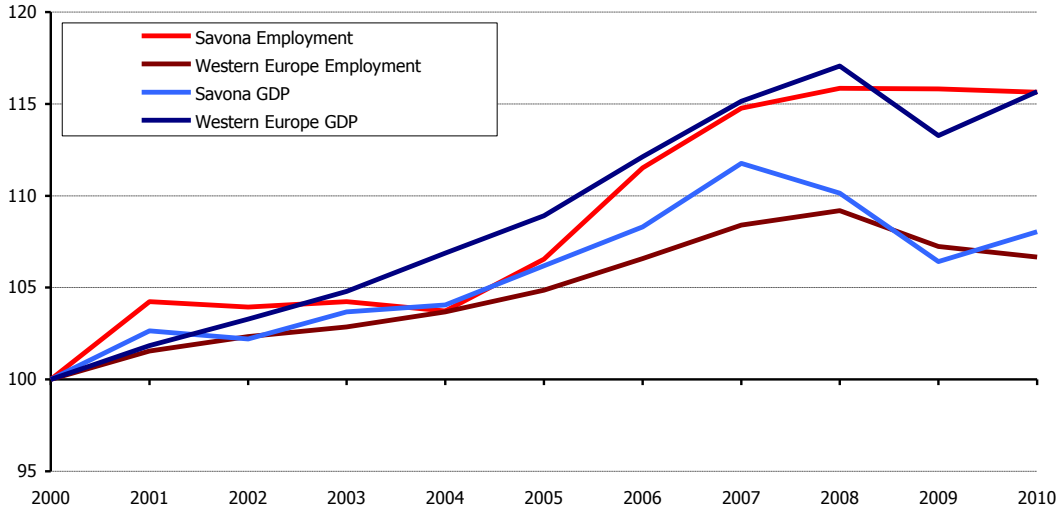
Table 1: Economic performance, 2010

	Savona	Italy	Western Europe
Nominal GDP (in million €)	8’168	1’555’034	11’591’738
Real GDP-Growth (2000-2010)	0.8% p.a.	0.2% p.a.	1.5% p.a.
GDP per capita (in €)	28’367	25’667	28’314
Hourly productivity (in €)	34.14	31.81	35.48
Employment	120’667	24’482’065	182’485’506
Employment Growth (2000-2010)	1.5% p.a.	0.7% p.a.	0.6% p.a.

Source: BAKBASEL

In 2010, the region of Savona achieved a nominal Gross Domestic Product (GDP) of more than 8'160 million Euro and there were approximately 120'000 employed. The level of GDP in capita in the region was similar to the Western European average and above the national average. This is reflected in values of 28'3567 Euro per capita in Savona, 25'667 Euro per capita in Italy and 28'314 Euro per capita in Western Europe. A resembling picture is drawn by the hourly productivity. So the hourly productivity of the region was only slightly lower than the Western European average, while the national average recorded a lower value (see Table 1).

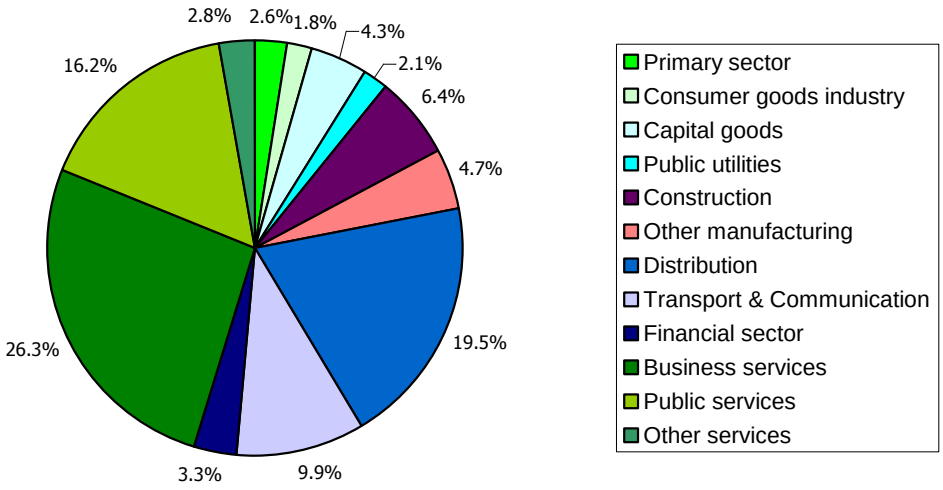
Figure 1: Real GDP- and Employment Growth



Index, 2000 = 100 (GDP: at constant prices and exchange rates)
Source: BAKBASEL

Figure 1 displays the growth of GDP and employment in the period 2000-2010. Despite the decline of GDP in the years 2008 and 2009 the region grew by 0.8 percent per annum in the period 2000-2010. However, this increase was clearly below the development of the Western European average (1.5% p.a.) It strikes the eye that in contrast to GDP growth Savona performed in terms of employment growth much better than the Western European average. So the region achieved a significant increase in employment by 1.5 percent per annum. Especially in the period 2004-2007 the growth rates were high.

Figure 2: Industry structure, 2010



Share of total economy, in %
Source: BAKBASEL

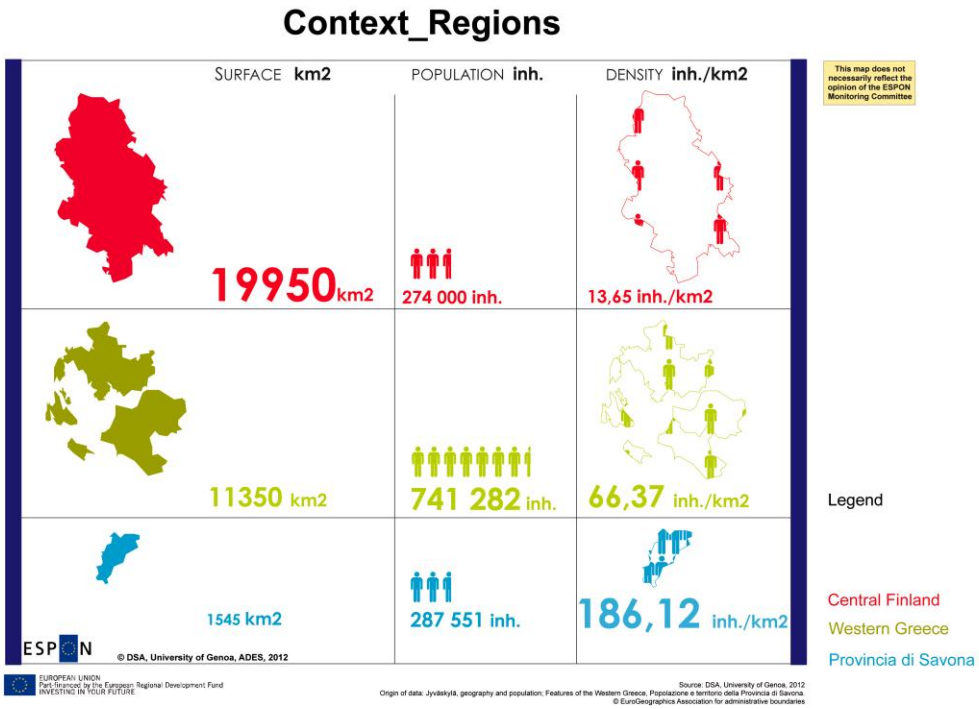
The pie shows the industry structure of the economy in Savona in the year 2010 as shares in GDP (using the NACE classification). The industry structure is dominated by the service sector which accounts for more than 75 percent of total economy in 2010. The most important industries in the service sector were the business services (26.3%) and the distribution (16.2%). The primary and the secondary sector contribute 2.6 and 19.4 percent to total GDP. Beside construction there can not be identified any important (export-oriented) industry cluster in the secondary sector.

4.2.5 REGIONAL CONTEXT (see the integrative contributions in *Annex 5*)

It is fundamental to learn about ADES case study areas in order to understand the characterics and the differences between each regions. This survey wants to answer the following questions:

- What can we learn from (and for) the three stakeholder regions?
- How much important is the role and situation of airports and accessibility in the three stakeholders regions?
- What results are the local actors (stakeholders) expected from this research?

We analyzed the situation in the regions, focusing on the spatial context and the socio-economic context.
This activity was carried out simultaneously by LP, P3 and P4 and will include two parts: information gathering (analysis of the situation in the region, inerviews and questionnaires, benchmarking the stakeholder regions) and SWOT analysis.



Map 7. Context_Stakeholder Regions_ Comparison of Surface, Population and Density

The first regional-scale map shows the three main statistical data on the peripheral regions in the studio: surface, population and density (Map 7). The comparison of these data provides an interesting insight into the sheer diversity of the three territories: Central Finland has a surface of 19950 kmq and a population of only 274.000 inhabitants, Western Greece has a surface of 11350 kmq and a population of 741.282 inhabitants, Liguria, finally, has a surface of only 5420 kmq, but also a population of 1.616.788 inhabitants.
The most significant is the density: 13,65 inhabitants/kmq for Central Finland, 66,37 inhabitants/kmq for Western Greece and even 298,3 inhabitants/kmq for Liguria.

In the next paragrahs, we describe the regional contexts of each case study areas through the same descriptive categories:

- **geographical location**
- **infrstructures and accessibility**
- **economic trends**
- **servicies**
- **tourism**
- **landscape**

4.2.6 CONTEXT OF CENTRAL FINLAND

Geographical location
Central Finland is one of the 20 provinces (NUTS 3) in Finland. It consists of six NUTS 4 level sub-regions (Joutsa, Jyväskylä, Jämsä, Keuruu, Saarijärvi-Viitasaari and Äänekoski) and of 23 municipalities. The region of Jyväskylä forms a central area of the province covering seven municipalities. The city of Jyväskylä is the largest city in the area and the seventh largest city in Finland. The polarized nature of economic development with focus on core regions and major cities is clearly visible in the case of Central Finland. Population in Central Finland is nearly 274,400 (in 2011; 5% of the total population in Finland) of which 64% lives in the Jyväskylä sub-region (Figure NN). In the city of Jyväskylä, there are 132,000 inhabitants (see *Annex 5; Chapter 2.2.1; Paragraph: Population*).

Central Finland is situated in the heart of the Finnish lake district. It is an area of typical Finnish region with landscape of forest and lakes. The total area of Central Finland is 19,950 sq km, land area 16 700 sq km and built-up area only 358 sq km. Thus, the share of densely populated area is only about 2 % of the total area. In the Jyväskylä region, this share is about 4%. The length of the area is 240 km and breadth 145 km.

Three cities in Central Finland, Äänekoski, Jyväskylä and Jämsä, form a so called development corridor in Central Finland which is now called Jyväskylä urban region. This expresses about the strengthening of the Jyväskylä region, but reflects also an aspiration towards a more polycentric development in Central Finland. Jyväskylä urban region is a combination of two industrial towns Jämsä and Äänekoski and a city of education and new technology Jyväskylä. This area of 220,000 inhabitants is a core of the province, the background to which is provided by the natural strengths of three cities and the surrounding countryside.

The distances from the central area of Jyväskylä to other central regions in Finland are:
- to Helsinki (capital): 270 km (to the south)
- to Turku: 300 km (to the south-west)
- to Tampere:150 km (to the south)
- to Oulu: 340 km (to the north)

The distances between Central Finland and European cities are:
- Paris – Jyväskylä: 2,300 km
- Rome – Jyväskylä: 3,050 km
- Brussels – Jyväskylä: 2,050 km

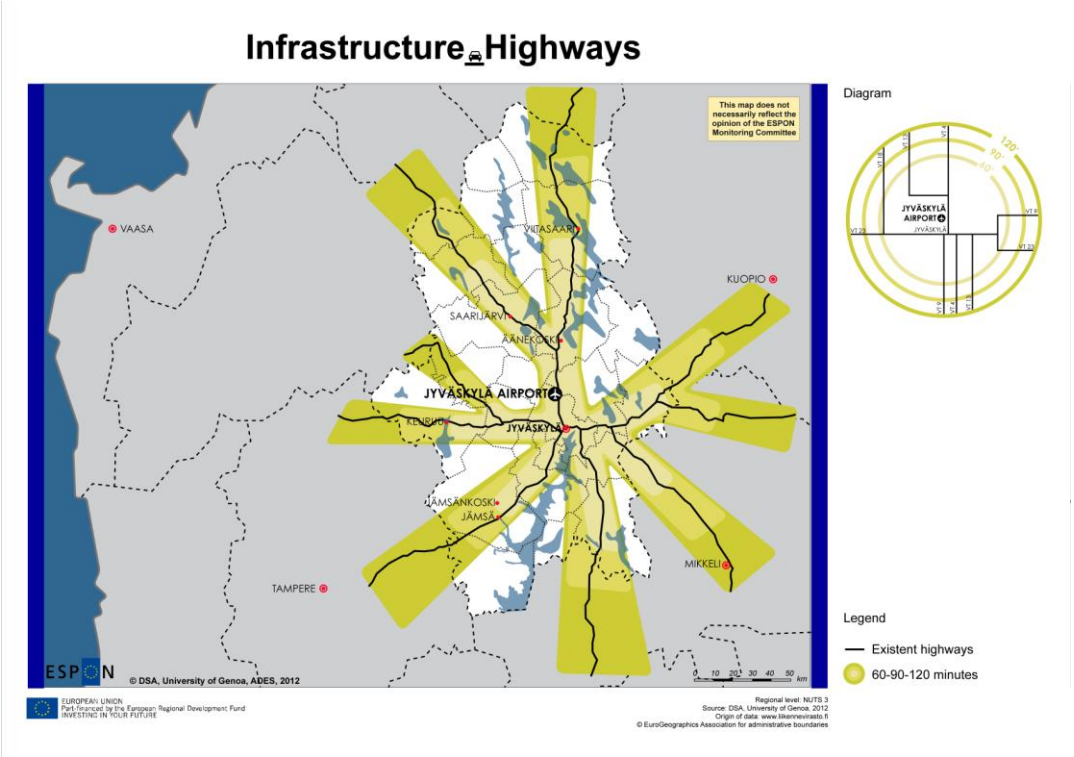
Infrastructures and Accessibility
Central Finland can be reached by different modes of transportation. There are two airports in the province, one is situated in Tikkakoski, 20 km to the north of the city of Jyväskylä, and the other is located in the southern part of the province in Jämsä. However, the latter is only for military use. Currently, there are three daily flights between Jyväskylä and the main hub in the capital Helsinki operated by Flybe. Before October 2011, the number of daily flights was six operated by Finnair.

A flight to Helsinki takes forty minutes. Starting from March 2012, Estonian Air has operated direct flights between Tallinn and Jyväskylä seven times a week. The supply of flight connections from Jyväskylä has been unstable due to unprofitability problems. Currently, both operators, Flybe and Estonian Air, are supported financially (including marketing activities) by the city of Jyväskylä and regional authorities / other regions. There are also a few direct charter flights per year from Jyväskylä to the holiday destinations. The airport busses run between Jyväskylä city centre and airport following the schedules of Helsinki and Tallinn flights. Also regular busses from other parts of Central Finland go via airport a few times a day.

According to the users, the airport is rather easily accessible. The nearest airports (Map 8) outside Central Finland are located in Kuopio, Tampere and Varkaus (120-150 km from Jyväskylä).

Map 8. Descriptive Maps_Aiports in Finland

The main users of air traffic in Jyväskylä are business travellers (including firms' staff and collaborators) and foreign visitors of congresses and other events. There are several national and international events organized annually in Central Finland (see below *Services*).



Map 9. Descriptive Maps_Infrastructure_Highways

Jyväskylä forms a crossroads for Finland's main highways (highway 4, E75, 9, E63, 13 and 23), which has helped it become an increasingly important centre of road transport (Map 9). By bus from Jyväskylä to Helsinki it takes approximately four hours and there are several

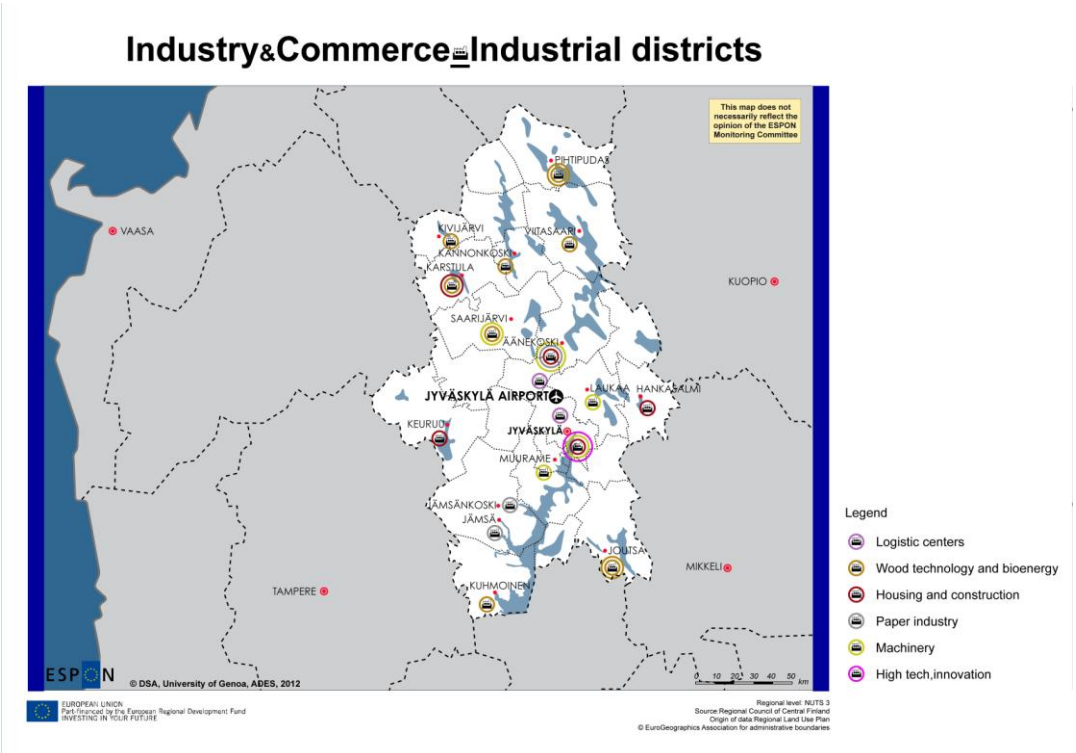
departures per day. The network of bus connections covers the whole Central Finland.

The daily railway and bus connections from Central Finland to the capital region and other parts of the country are quite well organized. There are four railway stations in Central Finland: in Jyväskylä, Jämsä (southern part of the province), Keuruu (western part) and Hankasalmi (50 km to north-east from Jyväskylä). Passenger trains in Finland have at their disposal 4,000 km of tracks. The network interconnects the major Finnish cities. The most important sections of line are electrified. The train connection between Helsinki and Jyväskylä takes some three hours. Due to the improvements in the track network and faster trains, the travel time today is thirty minutes less than it was at the beginning of 1990s. Due to the improvements in travel times and convenience, the use of trains has partly replaced the use of airplanes.

Economic trends (Maps 10-11)
Employment in Central Finland covers 5% (approximately 111,000 employees) of the total employment in Finland. Central Finland is an industrial area with approximately 22 000 industrial jobs (one fifth of all employment). The role of manufacturing sector as an employer is more emphasized in Central Finland than on a national level on the average. Special expertise can be found in the fields of paper manufacturing and paper machinery as well as energy production, environmental, information and wellness technology.

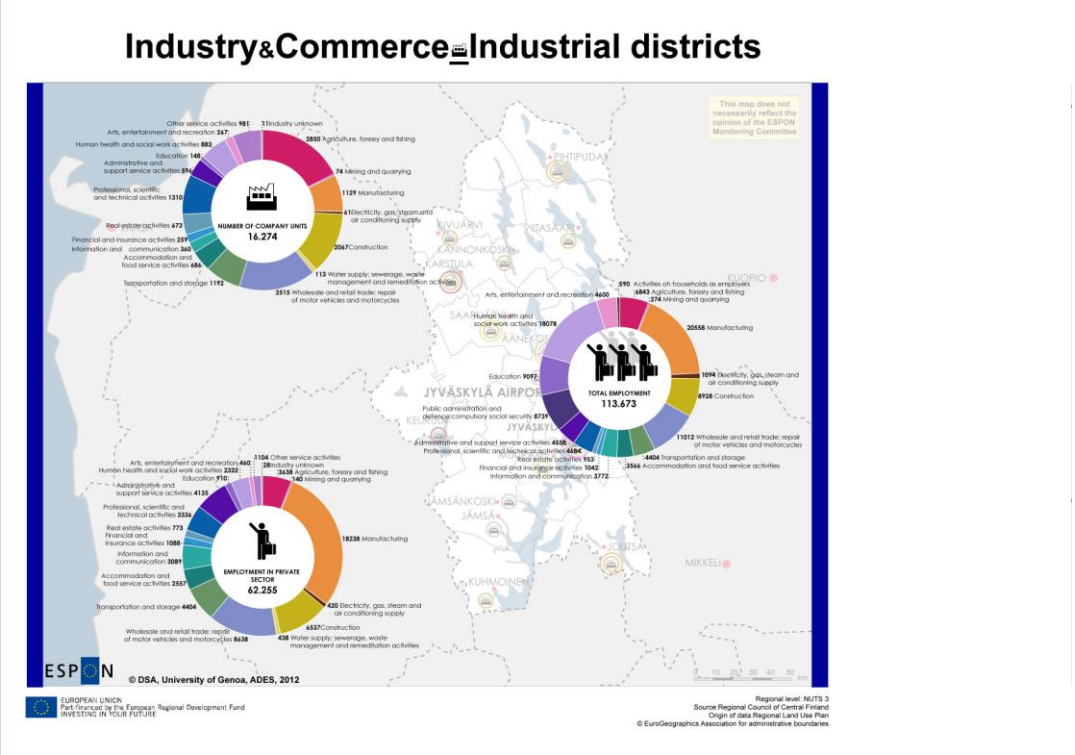
The service sector is especially strong in the Jyväskylä region (approximately 72% of employment) but its role is increasing also in the other parts of the province (67% of employment). Knowledge intensive business services and wellbeing services, in particular, are rapidly expanding sectors.

The biggest firms in the province are a global major paper machinery supplier Metso Paper Oy with 1,800 employees and Keskimaa Osk with 1,700 employees. The latter engages in retail, tourism and food trade and also owns petrol stations and iron stores. The third biggest company is the UPM-Kymmene Oy that employs approximately 1,400 workers in two paper mills in the Jämsä region. Besides the few large international companies, there is a lot of small firms (less than 50 employees) in Central Finland, 99% of all firms. They employ 65% of private sectors' workers whereas the share of big firms' (with more than 249 employees) is 13.5% (in Finland 62% and 16%, respectively).



Map 10. Descriptive Maps_ Industry&Commerce_Industrial districts

The multi-disciplinary higher education institutions, University of Jyväskylä and Jyväskylä Polytechnic, are also important actors and employers in Central Finland. They employ approximately 3,300 employees and there are 23,000 students. They are among Finland's leading research and higher educational institutions. As a whole, the jobs in the education sector covers 9 % of the Jyväskylä region's total employment.



Map 11. Descriptive Maps_ Industry&Commerce_Industrial districts (graphics)

Services

On the cultural side, the Jyväskylä is known by the world-famous architect Alvar Aalto who is widely regarded as one of the greatest innovators in western architecture. Alvar Aalto lived and attended school in Jyväskylä. The Alvar Aalto Museum and the numerous buildings designed by Aalto are to found across the city of Jyväskylä and its surroundings. Other cultural places in Central Finland are Petäjävesi Old Church included on UNESCO's World Heritage List, Keuruu Old Church and Stone-Age Village in Saarijärvi.

In regard to sport and leisure time activities, there are several downhill skiing centres in Central Finland. Himos, a ski center with the biggest and most comprehensive slopes in Southern and Central Finland, is one of the most popular ski resorts in Finland. It is located in Jämsä. New activities in Himos will include18-hole pay and play golf course where the opening stroke will be hit in the summer of 2013. There are also two smaller skiing centers, Laajavuori and Riihivuori, located in the Jyväskylä region. Other leisure activities include spas. Peurunka Spa provides the versatile sport facilities in Laukaa, 25 km north of Jyväskylä. Laajavuori spa is situated a few minutes' trip from the center of Jyväskylä. The role of nature characterized by forests and lakes is essential in Central Finland. The Finland's second largest lake, Päijänne, is an important part of Central Finland. It is 119 km long and 30 km wide. There are numerous holiday cottages and farm holiday locations as well as Europe's largest area of inland watercourses for fishing, hiking and paddling in Central Finland.

Tourism

There are several national and international events organized annually in Central Finland. For more than fifty years now, every summer, Jyväskylä and Central Finland host the Neste Oil Rally Finland (part of the round of the World Rally Championship) that brings numbers of tourists from Finland and abroad to the area. Jyväskylä is also Finland's second most popular city for fairs and exhibitions and a highly popular venue for congresses and conferences. Jyväskylä Paviljonki Congress Centre houses a wealth of large-scale events in Central Finland. The Paviljonki is situated quite literally in the middle of Finland and of Jyväskylä: it is

right next to the railway station, at the intersection of several highways. Each year more than 700 events are organized in the Paviljonki and they gather almost 400,000 visitors.

Landscape

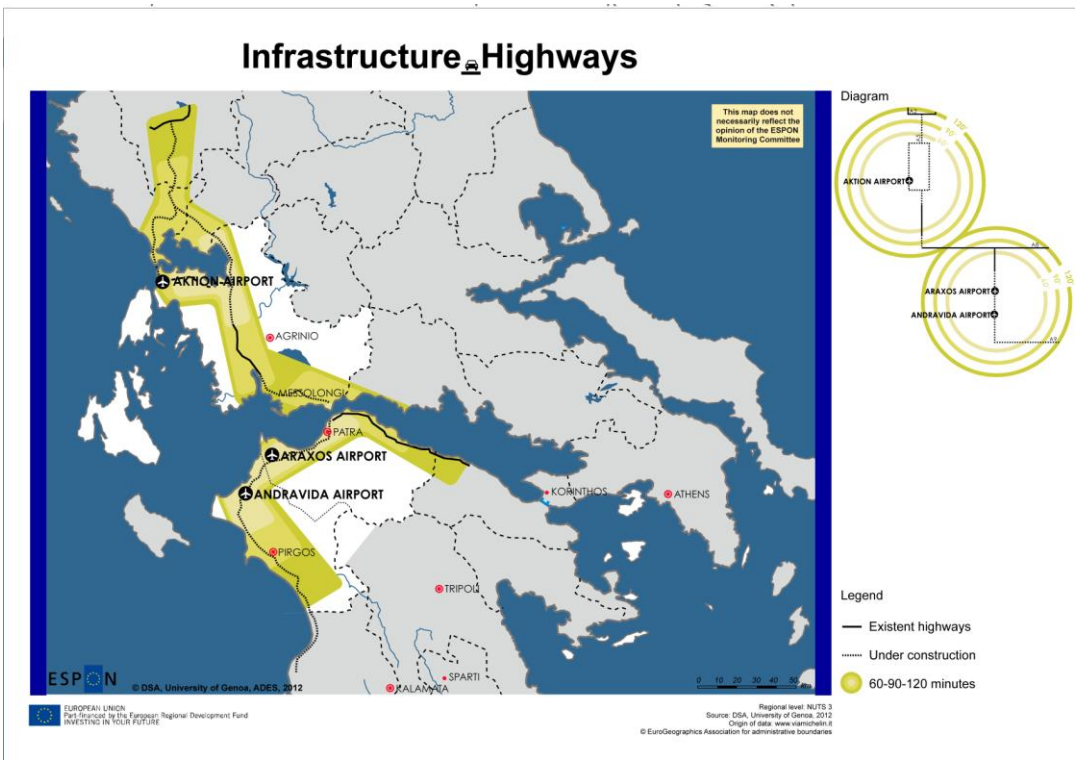
Central Finland is located 100-200 meters above sea level. It belongs to the Finnish lake district. Much of the territory is forested and has a low population density. The hilly, forest-covered landscape of the lake plateau is dominated by drumlins and by long sinuous eskers.
In all, 80% of the area of Central Finland is covered by forests and 16% by water. On average, there are 40 lakes per 100 square kilometers in the lake district. Lake Päijänne is the largest lake (second largest in Finland). Water is mostly flowing from north to south, and the majority of them fall into Lake Päijänne which drains into the Gulf of Finland.
Central Finland has been characterized as the 'the Lapland of Finnish lake district'. The scenery is dominated by uninhabited forest and marsh areas. Agricultural landscape has a minor role. Here and there, there are hills and rapid routes. Central Finland owns the best fishing rapids in southern Finland. In all, Central Finland represents at its best traditional Finnish lake and water scenery and all the attractions around them. This is what the Finns love, a sauna by the shore and a dip in the lake.

4.2.7 CONTEXT OF WESTERN GREECE

Geographical location

Western Greece is one of the thirteen regions of Greece. It comprises the western part of continental Greece and the northwestern part of the Peloponnese peninsula.
The West Greece region was established in the 1987 administrative reform. With the 2010 Kallikratis plan, its powers and authority were redefined and extended. Along with Peloponnese and the Ionian Islands regions, it is supervised by the Decentralized Administration of the Peloponnese, Western Greece and the Ionian Islands based at Patras. The region is based at Patras and is divided into three regional units (pre-Kallikratis prefectures), Aetolia-Acarnania in Central Greece and Achaea and Elis in the Peloponnese, which are further subdivided into 19 municipalities.

Infrastructures and Accessibility



Map 12. Descriptive Maps_Infrastructure_Highways

The Region of Western Greece is situated in a strategic geographical position, connecting the Peloponnese with Central Greece and Epirus and constitutes one of the main gates of the country. With regard to transport infrastructure, the strategic development of the previous programme periods has led to considerable improvement of the Region's infrastructure.

The road network of the Region is particularly extended and continually improved (Map 12). The central road that connects the city of Patra with Athens is part of the basic national axis (axis Patra-Athens - Thessaloniki - Evzoni) and belongs to the European network. The national network extends to 895 km, while the provincial road extends to 3,520 km. On the coast and lowlands, it is developed, however it is relatively insufficient, both quantitatively and qualitatively, in less favored mountainous areas. Among the major technical works that have been completed in the Region, the most important was the connection of Rio- Antirio through the homonymous suspended bridge of 2.5 km that connects Peloponnese with the mainland. Through this work, the whole transport system of Western Greece was upgraded.

The Region's rail network has a length of 300 km and crosses the coastal zone of Achaia and Ileia through the connection of Athens- Patra- Pyrgos- Kalamata. In addition, there is the picturesque railway that connects Diakopto with Kalavryta and constitutes a tourist attraction. Apart from the above mentioned rail network, there is also the connection of Kiato with Patra, a work that is being constructed during the last years.

The airports (Map 13) that serve the Region of Western Greece are military and are located in Araxos, in Aktio and in Andravida. However, they have the appropriate infrastructure to serve commercial flights and charter. The potentials of the existing airport infra are considered to be out of date, regarding the operational data of the aircraft areas (runways, tracks for aircraft parking), the building installations as well as other facilities.

Map 13. Descriptive Maps_Aiports in Greece

As far as port infrastructures are concerned, the port of Patra in Achaia dominates because of its strategic position, being the Western Gate of Greece towards Adriatic and West Europe. The harbour's infrastructure can serve cargo of up to 25,000 tons, and passenger ships of up to 16,000 tons and 220 meters long. Other important ports of the Region are those of Aigio, Kyllini, Katakolo, Messolonghi, Astakos and Amphilochia.

Economic trends

The industrial discrict (Map 14) of Patra- Achaia is composed by different types of industries, in particular food and beverage, leather and fur clothes, tires and plastic products.

Also in Western Greece are produced electrical equipment, metal products and constructions, petroleum products and, finally, building materials and prefabricated buildings. There are also many companies engaged in manufacturing of furniture, decorative products, bottling liquid gasses and chemicals.

Imports and exports of agricultural products produced in Western Greece are principally maize, potatoes, lemons, barley and apples. Moreover in the region are traded beef, pork, milk and other dairy products, like cheese.

The *Industrial Systems Institute (ISI)* was established in Patras on February 1998. The main aims of ISI are the active participation and substantial contribution at high-technology sectors, which relate to integrated industrial systems, with the objective of increasing the competitiveness of the Greek industry, through application of state-of-the-art technologies.
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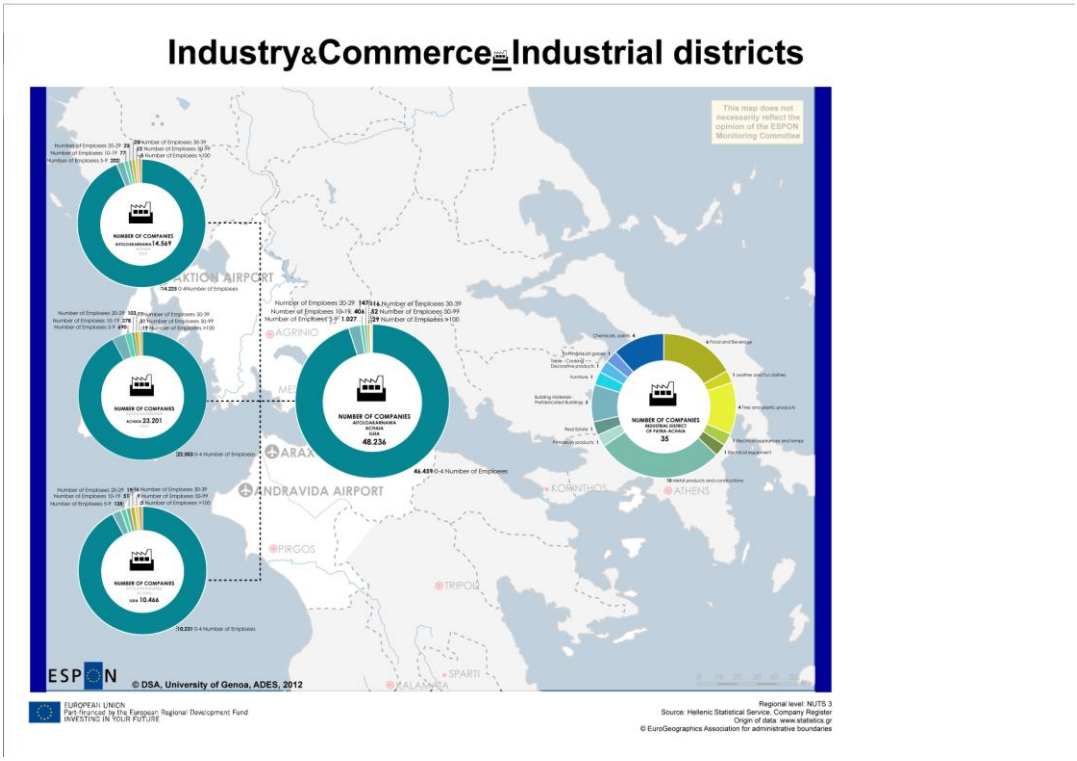
Among the general aims of ISI are implementation of applied and technological research, development of methodologies, products and services, relevant to scientific and technological sectors of particular interest, such as information and communication systems for production processes, modeling and automation of industrial systems, contemporary methods and production technologies, management / design of production systems, electronic systems, intelligent microsystems, machine vision, and information technology for production processes.



Map 14. Descriptive Maps_ Industry&Commerce_Industrial districts (graphics)

Patras Science Park (PSP) is an active organization established 15 years ago. Today, a remarkable number of new and strong enterprises are operating under the auspices of PSP, most of them are inventors, adepts and users of new technologies, and PSP deserves to look forward in the future with trust and optimism. The strategic target of PSP is to establish an Innovative Business Area in the Region of West Greece, which will be a development and

guidance tool for this Region towards the “rising innovative economic-productive frame” by facilitating – additively and alternatively- new economic, productive and business activities in the region. Thus, it aims at contributing essentially to the “innovative area” prominence.

Servicies
In Western Greece, the University offer is divided into University of Patra, Hellenic Open University, Technological Educational Institute of Patra, and Technological Educational Institute of Messolonghi.
University of Patra is mainly a scientific school and is divide into School of Natural Sciences, School of Engineering, School of Health Sciences and School of Humanities and Social Sciences.
Hellenic Open University is formed by different structures, in particular The School of Humanities, School of Social Sciences, Science & Technology and Applied Arts.

Two are the main research institutions in Western Greecs: the *Computer Technology Institute and Press "Diophantus" (CTI)* and the *Institute of Chemical Engineering and High Temperature Chemical Processes (ICE-HT).* The CTI has its headquarters in the city of Patra. A particular emphasis is placed on education, by developing a conventional and digital media in education and lifelong learning; publishing printed and electronic educational materials; administrating and managing the Greek School Network; and supporting the organization and operation of the electronic infrastructure of the Greek Ministry of Education, Lifelong Learning and Religious Affairs and all educational units. The ICE-HT comproses institutes all around Greece. This institute conducts fundamental and technological research that is focused on cutting-edge areas of science, specific needs of industry and the environment.

In Patra there are also two sports complex: Pampeloponisiako Stadium and National Sports Center of Patra “Tofalos”. The main facilities are track, football fields, indoor basketball, volleyball, indoor swimming pools, tennis fields and indoor gym. There is another sport complex in Nafpaktos (Aitoloakarnania), Pancharalampio National Stadium of Nafpaktos, with a stadium and open - air fileds.

Tourism
The Region of Western Greece is ranked among the privileged areas of Greece in terms of existing natural, cultural and tourism advantages. Its strategic position with key advantage the fact that it is the western gateway of the country, its rich cultural heritage, the archaeological treasures of ancient Olympia, the countless natural attractions of the inland and the mountainous areas, the large areas and the purity of the sea, the rich and rare ecosystems, the monasteries, the modern sports facilities, the convention centers, the growing and modernized tourist facilities compose a variety of comparative advantages.
The infrastructure of the region has been upgraded to a large extent due to the Olympic Games. The majority of the projects was completed as well as those that were in the implementation phase, supporting the development of tourism.

Furthermore under the *Regional Operational Programme*, under the priority of Tourism several actions aiming SMEs have been enhanced: the modernization of tourism enterprises, the improvement of the quality of services, the enrichment of the composition of tourism product and the development of new tourism products with high added value, reducing seasonality. The maintenance and enhancement of competitiveness of tourism businesses and destinations and therefore the tourism product, impose new rules and new forms of strategy, management and administration, and new modern information tools of the international economic and tourism market. In a tourism market saturated with similar products and standard tourist packages (sand-sea-sun), the Region of Western Greece has the unique ability to offer modern alternative forms of tourism, high quality, developing innovative products and services. More specifically in the prefecture of Achaia: City Tourism, Conference-Sports-Religious-Marine tourism. In the prefecture of Ilia: Spa-Marine-Archaeological-Cultural tourism. In Aitoloakarnania: Agrotourism-Ecotourism- Sea-Diving-Guided Diving tourism etc.

This role will be developed by Tourism Development Region of Western Greece, which has a leading role in the future of tourism in the region. It aims at coordinating activities and

processes of all entities that serve the tourist development of the region, contributing significantly to local economic development and based on the overall strategy of the Ministry of Tourism in conjunction with the selection of the Region of Western Greece for mild tourist development (along with an emphasis on alternative forms of tourism) and highlight areas of tourist interest. All the strengths and comparative advantages are highlighted, so that the tourists leave the area completely satisfied and having a vivid recollection of the region. The effort to upgrade the tourism profile of the economy of Western Greece coincides with the effort to introduce alternative forms of tourism in specific parts of the market. Moreover, the improved composition of service quality in all sectors of tourism enterprises will contribute to expanding the tourism season by promoting and highlighting new destinations that will satisfy modern and demanding needs.

The high targets and optimism that exist in this effort due to the comparative advantages, the plurality of destinations and services, the human resources of the region, the unifying role under the umbrella of the region for the three counties, the creation of modern infrastructure, as well as the scientific and technological background that is developed between the Research / Technology and Business entities support the role of the Region in the management and implementation of innovation.

Landscape

For the most part the terrain is mountainous (45,3%) or hilly (25,6%), while only 29,1% consists of plains. All three prefectures have extensive coastal areas along the Ionian Sea and the Gulfs of Ambrakia, Patras and Corinth.

In the northern area of the Delta of Acheloos numerous riverside forests are preserved, remnants of the vast forests that once existed in these areas. The forests are formed by plane trees (Platanus orientalis), Kavakia (Populus nigra), Klithra (Alnus glutinosa) and various bushes, such as Armyrikia and Ligaries.

The mountain of Panachaiko reaches 1.926 meters of altitude. The rivers of Glafkos and Selinounta are the natural borders of the mountain. It is characterised by the alternation of two types of biotopes, mountain meadows and heaths, while numerous species of birds and mammals live in the area. Moreover, it has joined the NATURA 2000 network in order to preserve the habitats and the wild fauna and flora.

The cave of the lakes is situated close to the village of Kastria and constitutes a rare creation of the nature. Apart from the labyrinth of corridors, mysterious rooms and strange stalactite formations, the ‘Cave of the Lakes’ has repeated graded and even three-floor-lakes, which highlight its uniqueness in the world. During winter, when the snow melts, the cave is converted into an underground river with natural waterfalls. In summer months it is partially dry and reveals a lace-work of stone basins and dams. The rest of the cave reserves water permanently in thirteen lakes. The developed length of the cave, which is ideal for a visit, is 500 feet. In the lower level fossilized human and animal bones including hippopotamus were found.

The gulf of Kyparissia is marine area expands from Cape Katakolo to Kyparissia, a town in western Peloponnisos and belongs to NATURA network. The substrate is sandy and the seabed is covered by fine-grained sand with scattered eroded calcareous rocks. Wide beaches of fine sand are backed by dunes along the coastline. The bay is not deep. Patches of Cymodocea nodosa in the shallows are followed by the beds of Posidonia. The latter are very well developed with high density population and robust plants. On the calcareous rocks a few species of macrophytes grow. The beds of Posidonia in the site are probably the best developed of all around Peloponnisos. They constitute an unseparable part of the marine ecosystem as they offer ground for fish to lay eggs, to find food and shelter. Studies have shown that the adjacent sandy beaches of the bay are very important nesting areas for the loggerhead turtle Caretta caretta.

Beaches awarded the blue flag for 2011 in the region of Western Greece are in Ileia, Skafidia, Kourouta, Kastro/Chryssi Akti, Loutra Kyllinis 1 and Loutra Kyllinis 2. In Achia, instead, are Kalogria, Lakkopetra, Alyki, Psani and Grimbovo.

The Prefecture of Arta with the Preveza Prefecture promotes the project “Management, restoration and enhancement of wetland of international importance Amvrakikos Gulf”, which has been approved under the Program of the EOX Financial Mechanism (Financed by 75% from XM and 25% by PDE). The Development Agency of South Epirus Amvrakikos SA Municipality (ETANAM SA) constitutes the technical and scientific supporter of the project, which is a continuation of activities implemented under the LIFE Nature and INTERREG II, prepared and submitted for funding by ETANAM SA Local Authorities and the Prefectures of Arta and Preveza. The wetland of Messolonghi – Etoliko and the Delta of Acheloos and Evinos is one of the most important wetlands in the Mediterranean, situated at the westerner edge of the mainland of Greece in Aitoloakarnania. Its area covers 250,000 acres and has been created over the years from the debris of the two rivers.

The cultural heritage is, of course, one of the major actaction of Greece. It is reflected in archeologic places and temples. In particular, in Western Greece is possible to visit the archaeological museums of Agrinio, the Temple of Zeus and the Ancient Theater of Staros. The temple of Lafria Artemis and Lafrios Apollo constitutes a very important sanctuary in ancient Calydonia, which is known as Lafriaio and where Artemis and Apollo were worshiped. In Patra, the ancient Odeum of Patra is located in the West of the Acropolis, in the upper city of Patra and was built at an earlier date than the Athens Odeum (Herodion 160 AD). Earthquakes, wars and invaders destroyed the odeon and covered it with soil and other buildings.
The Ancient Olympia, a sanctuary of ancient Greece in Ilia, is known for having been the site of the Olympic Games that were held every Olympiad (every four years). The first Olympic Games were in Olympia in honor of Zeus.

Another cultural attraction that reflects another age is the Ottoman castle of Rio is located at the north edge of the Rio peninsula in the prefecture of Achaia, at the entrance of the Corinthian Gulf. Today it is used for cultural purposes, especially for concerts and it is a tourist attraction.

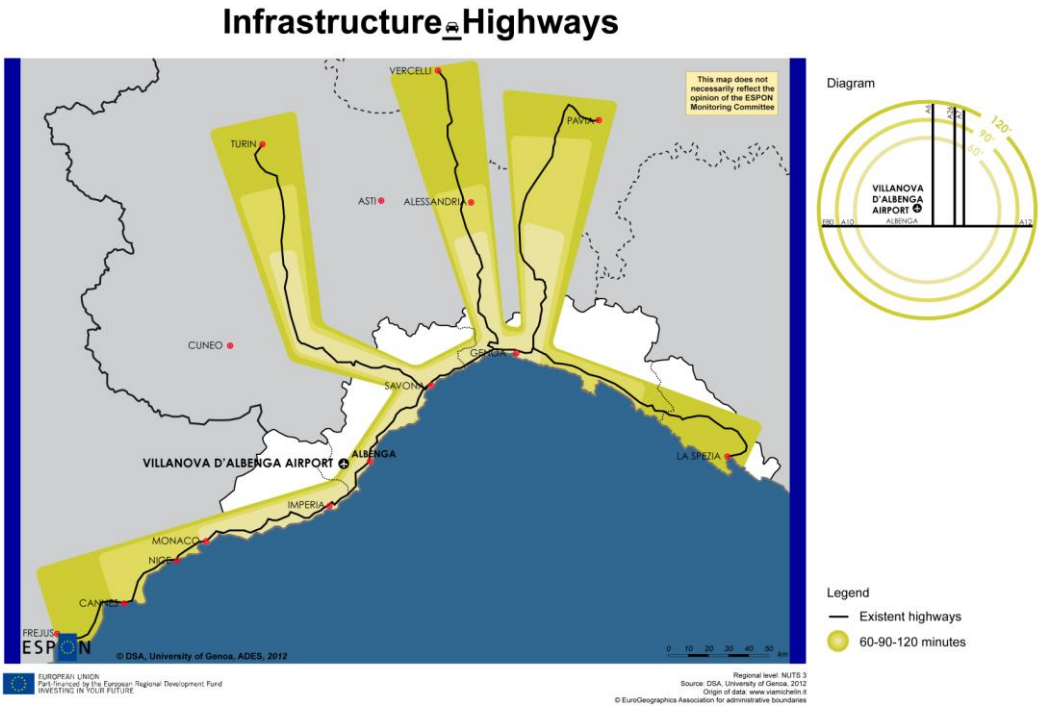
4.2.8 CONTEXT OF PROVINCE OF SAVONA

Geographical location
The Province of Savona is one of four provinces that constitute the Region Liguria. It is bordered to the east with the province of Genoa and west by that of Imperia. It has a total area of 1,545 sq km and it has about 300,000 inhabitants. The area is densely popolated with 194,76 inhabitants/kmq. It consists of 70 municipalities: the second most populous is Albenga, with about 24,000 inhabitants.

Infrastructures and Accessibility
The railway lines passing through the province are essentially three, which allow the connection of the provincial capital with Genoa, Turin and Alessandria. The line Ventimiglia was recently the subject of structural changes due to the displacement of the railway line upstream from the coast. In many cases the shift rail led to the emergence of new walks to sea, near the sea, like suddenly walking and cycling Varazze - Cogoleto. The line Savona - Torino, important for the commercial traffic at the port of Savona, has many features single-track or alternate with steep slopes, due to crossing the Apennine section.

The province is crossed by two major highways (Map 15), with heavy traffic, due to summer tourism in the Riviera di Ponente. The highway A10 called *Autostrada dei Fiori*, allows the connection road between the cities of Genoa - Savona and Ventimiglia, this is the gateway between Italy and France. The connection with Piemonte, specifically the province of Cuneo, is allowed by the highway A6, which connects with the Savona regional capital of Piemonte (Turin).

The airport (Map 16) is located on the northern edge of the plain of Albenga and unfortunately does not have a privileged access to the motorway but the closet barriers are Albenga and Alassio, reachable through highway A10 Genova - Ventimiglia or SS Aurelia 1 bis.



Map 15. Descriptive Maps_Infrastructure_Highways

The main interventions under the *Integrated Project 3b (Territorial Provincial Coordination Plan)* are related with the new shaft infrastructure Ingauno Aurelia between Finale Ligure and Albenga and between Alassio and Andora, the displacement upstream of the railway, the development of the airport structure of Villanova d'Albenga and construction of a traffic center for logistics businesses of Ingauna area, to which we must add, on the longer term, linking with the motorway Albenga-Millesimo-Predosa.

Map 16. Descriptive Maps_Aiports in Italy

Economic trends

The economy of the area is based mainly on agricultural trade and flowers, but with the presence of a strong service sector. There are many financial services firms and even some industries, also from a few years has been developing vigorously the tourism sector, both wine and food culture. The horticultural crops are, above all, aromatic plants and flowers. Around this is a real economic sector consists of the farms (mostly family), the structures and operators (technical advice, sale of products for cultivation, etc.) and traders, who often import products of the plain and the area towards the northern countries (especially Germany). It also activates the wine and olive cultivation and other agricultural products. Tourism is, of course, the largest source of income of the province of Savona.

The most significant aspects of the success of this area's rich variety of landscapes, from hills - range at sea, the efficiency of hotel services, market and port facilities and supply of local food.

The beautyness of the coast and the hinterland is enriched with artistic and architectural features, which can be discovered in churches, urban design, in craft shops. History and prehistory are revealed in the archaeological sites and caves that offer fascinating routes. The craftsmanship has its excellence in manufacturing glass and ceramics, both of ancient tradition.

The *Business Plan 2012-2012* signed by the Board of Directors of the Villanova d'Albenga Airport will provide a restructuring actions of the airport. In essence, the *Business Plan 2001-2012* will pursue three lines of action:

- correction of the economic and financial adequacy and recurrence, with the organic investment;
- development of a unique business strategy, enabling the identification of the factors necessary to support the action referred to above;
- recovery of the business and the industrial structure to reach an effective monitoring process, and the elevation of the low efficiency of service delivery.

The redefinition of the economic and corporate identity and vocation is the act of correction of spending and easing the cost of the system due to the industrialization of business processes, careful management of internal costs, but also to creation of a unified system of transportation of Western Liguria, which involved companies in the provinces of Imperia and Savona, currently represented on the board.

The intention is to unify the management of the center of various business activities, giving the activities previously managed by a consulting relationship, and thus creating a synergistic system of managing these service and support. The goal is to get the role of 'airport in the territory' in the service of the peculiarities of the area (western Liguria, Piemonte, French riviera) with collection of incoming traffic in the same territory with tourist and business, as well as the development of forms of horizontal integration (agreements with other airports in the country) and a vertical single logistics system (car-airplane-train).

The development model is based on the enhancement of the role of the airport to support the business aviation (such as the Cannes Mandelieu) and related services of premium aircraft hangars, and the attractiveness to carriers make available lines to major cities (Rome, Venice, Monaco Munich, Geneva), providing a streamlined and handling costs competitive. The project involves investments of around € 2,500,000, sustainable self-financing activities of the resulting revenues.

Furthmore, another objective of the *Integrated Project 3b (Territorial Provincial Coordination Plan)* is the integration of airport with new productive features advanced technology complementary to the Air Force, in particular you would like to associate the image of the airport of Villanova di Albenga to that of "Ecoaeroporto" by creating a buffer zone than in the airport where ecological connection between the protected areas in these provinces and the SIC and the inclusion of facilities for the production of energy from renewable sources (solar, wind).

Servicies

The area economy is based mainly on agricultural trade and flowers, but with the presence of a strong service sector. There are many financial services firms and even some industries, also from a few years has been developing vigorously the tourism sector, both wine and food culture.

The horticultural crops are, above all, aromatic plants and flowers. Around this is a real economic sector consists of the farms (mostly family), the structures and operators (technical advice, sale of products for cultivation, etc..) and traders, who often import products of the plain and the area towards the northern countries (especially Germany). It also activates the wine and olive cultivation and other agricultural products.

There are some companies, import-export famous and leading national and European level in this sector as the Noberasco regarding dried fruit, Fruttital for import and export of fresh fruits and Fitimex renard vegetables.

Many products have won awards Denomination of Controlled Origin (DOC), Protected Designation of Origin (PDO), Tipical Geographical Indication (IGT), Protected Geographical Indication (PGI).

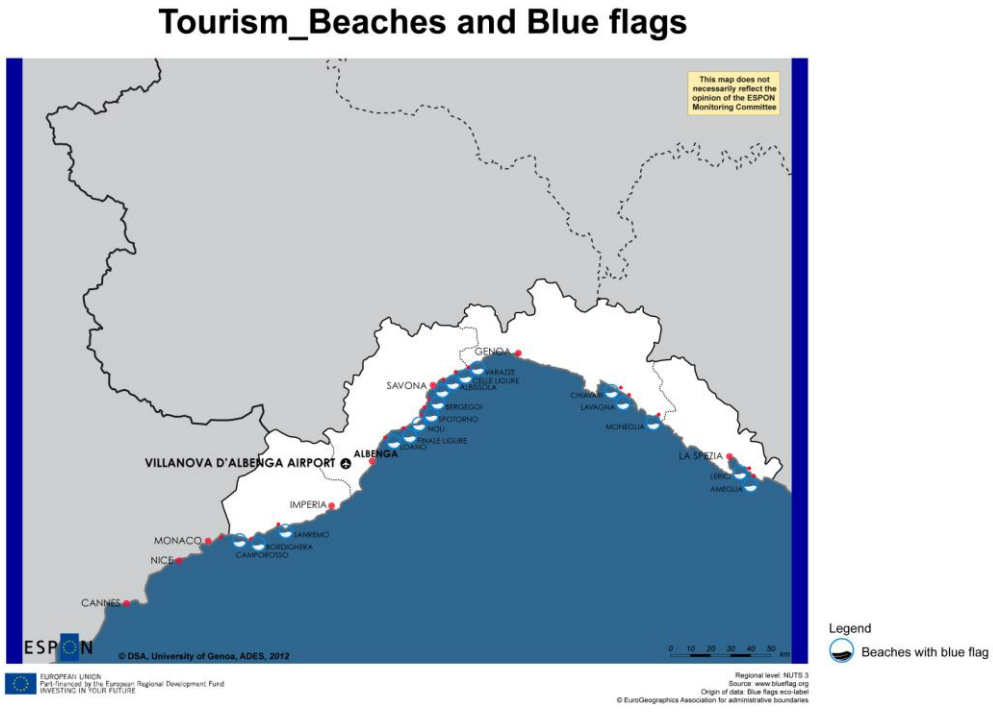
In the Province of Savona are also distinguished by the City of Albisola for the production of handmade ceramic crafts, excellence at national level.

The main industrial center of the province is Vado Ligure (2 km from Savona), where there are many factories and companies, including major railways are a large factory which produces electromotive opened in 1905 and the Thermoelectric Central Tirreno Power. Port activity is intense: in addition to the many ferries that connect to Corsica and Sardinia, dock cargo ships, container carriers and numerous tankers, making the port of Vado's first Italian port for petroleum and its derivatives. Shopping malls are numerous and widespread in this region. The main sports complexes are located between Savona and Loano. Very Important and specialized are the two hospitals of Pietra Ligure and Savona (in particular the field of Hand Surgery).

Tourism

Tourism is, of course, the largest source of income of the province of Savona.The most significant aspects of the success of this area's rich variety of landscapes, from hills - range at sea, the efficiency of hotel services, market and port facilities and supply of local food.

The attractiveness of the coast and the hinterland is enriched with artistic and architectural features, which can be discovered in churches, urban design and craft shops.



Map 17. Descriptive Maps_Tourism_Blue flags

History and prehistory are revealed in the archaeological sites and caves that offer fascinating routes. The craftsmanship has its excellence in manufacturing glass and ceramics, both of ancient tradition. The Museum System of the Province of Savona preserves and makes available to the public a great historical, artistic and naturalistic. Events and festivals throughout the year offering moments of culture, relaxation and fun, to enrich the reception that the various resorts give to their guests.

There are numerous places to visit between the cities of art, the various coastal hills and picturesque villages, eight of whom are enrolled in the club of the most beautiful villages in Italy for their architectural heritage and natural beauty. Three locations also boast of Orange Flag, marking the Italian Touring Club for the small inland villages that stand out for their quality tourism and environment.

In 2011, for the second consecutive year, the Riviera has been awarded 17 blue flags for beaches of its coast (national record): 10 are in the Province of Savona (Map 17).

Landscape
The Province of Savona has a high number of places of natural interest, which represent the peculiarities of the region. The main nature reserves, adjacent to the zone of interest, the Regional Natural Park of Beigua, the largest protected area in the region, and the Regional Natural Reserve of Bergeggi Island, a few miles from Savona and Vado Ligure.
It's very interesting the stretch of coast that extends along the extreme eastern portion of the province of Savona, which preserves outstanding scenic and natural characteristics. This protected area of provincial interest has its fulcrum in the Coastal Park Plans Invrea.

4.3 INTERVIEWS AND QUESTIONNAIRES

The objective is to know what relevant stakeholders in the region think about the role and situation of airports and accessibility in their region.

The infrastructure, without real and widespread processes of economic support, without coherent strategies and territorial projects, don't bring any development. But things are changing and the persistence of a crisis that changes the nature of the phenomena, their speed and priority of the solutions requires new forms of analysis and sustainable alternatives with the new context that will lead to a greater sensitivity to changes and stays the present time. In this framework, the infrastructure becomes the main topic: one thing is to talk about the infrastructure issues in a context of development, and other thing is to talk about it in a state of constant slowdown and perhaps stable situation.

Even more today, in this moment of crisis, build new infrastructure does not reveal the most sustainable strategy, considering sustainability as a aim in relation to social and territorial changes. The European Commission's White Paper (2001) indicates that as a strategy that provides absolutely necessary to interrupt the connection between increased mobility and economic growth. An alternative to the excessive construction of new infrastructure is it possible: don't built new roads but strengthen the existing public system; at the same time don't built new airports, but reuse the existing airport infrastructure and use them as activators of economies and local contexts.

The recycle of existing infrastructure, that does not work, and re-use in order to optimize their potentialities become the solution most sustainable and desirable. Re-think not only on the infrastructure abandoned and unused that are looking for a new identity, but re-use all those infrastructures that are already active but poorly operating and production.

The interview structure and the questionnaire will be identical for all three stakeholder regions (in order to increase comparability).They will be carried out by LP, P3 and P4 in local languages. This will avoid language problems and ensure maximal return and inside information on what the relevant success or failure factors are believed to be The results will be input for the SWOT analysis.

Interviews

Interviews are based on the results of the literature review the TPG setted up a common structure for the interviews with policy makers and policy advisors in the three stakeholders regions. There are at least five interviews per region covering policy advisors and policy makers. The choice of the interview partners was discussed and decided on together with the three stakeholder regions.

The politicians in the different regions are the most important stakeholders and prime targets of the results of this targeted analysis. If they are to understand the results of the analysis, we must know what they think and why. Where are the major bottlenecks in the regional transport system? What could be done to overcome these bottlenecks? Who can become active to remove these bottlenecks? What can be done to improve the situation? How relevant are bottlenecks or inefficiencies in the regional transport system for regional development?

In-depth interviews will be carried out in local languages with key relevant stakeholders (at least five interviews per Region covering policy advisors, sectoral experts and policy makers).

List of interviews

In Jyväskylä/Central Finland, we carried out 9 interviews (incl. regional authorities/planners, universities, congress office and airport staff):
- Markku Andersson, Mayor, City of Jyväskylä
- Olli Hyvönen, Project Manager (air traffic), Jyväskylä Regional Development Company Jykes Ltd.
- Veli-Pekka Päivänen, Development Manager, Regional Council of Central Finland
- Uljas Valkeinen, Managing Director, Central Finland Chamber of Commerce
- Jouko Varis, Managing Director, Ääneseudun kehitys Ltd.
- Esa Kainulainen, Airport manager, Jyväskylä Airport
- Leo Potkonen, Managing Director, Jyväskylä Paviljonki International CongressCentre Ltd
- Kirsi Moisander, Director of Administration, University of Jyväskylä
- Jussi Halttunen, Rector, Jyväskylä University of Applied Sciences

In Western Greece Regions, we carried out 5 interviews:
- Dr. Michalis Mandas, Transportation Systems and Logistics Laboratory
- Mr. Theodoris Dionysopoulos, Ministry of Infrastructure, Transport and Networks
- Dr. Christos Tzomakas, Regional Development Fund, Western Greece Region
- Mr. Stathis Papachristopoulos, Regional Development Fund, Western Greece Region
- Mr. Achilleas Pappas, Researcher on Local Tour Operators in Western Greece

In Savona, we carried out 6 interviews:
- Maurizio Maricone, Management Committee President of the Villanova d'Albenga Airport
- Umberto Vallino, Management Committee President of the Nice Airport
- Santiago Vacca, Councillor of Infrastructure + Mayor of Borghetto Santo Spirito
- Claudio Linoli, Project Designer, Piaggio Aerop Industres S.P.A., Finale Ligure, Savona
- Aldo Alberto, Italian Agriculture Confederation (CIA) + Floricola Society
- Giacomo Mamberto, Local tour operator

Questionnaire

The TPG prepared in a collective interchange a Focused questionnaire model (developed from literature review and above analysis). The questionnaire will focus on the transport situation of the regions and cover both the demand as well as the supply side where it addresses both the needs (necessities) and the quality of the effective services.

Structured questionnaires will be distributed in local languages to relevant regional/national stakeholders, and they will be completed by a wide range of respondents. The TPG also setted up a focused questionnaire directed towards the relevant actors stemming from different functional fields but which are highly specialised on the topic of regional infrastructure and development (politicians, spatial planners, companies, etc.). The aim of the survey is to collect very actual information on the topic of transportation and economic performance.

These questionnaires are focussed and short, but with many respondents. The questionnaires will be filed using telephone interviews or internet based forms. The questionnaire will also be distributed to the umbrella organizations.

In Jyväskylä/Central Finland, they have planned to carry out 100 questionnaires to local firms. An external service provider (research and marketing company) will carry out the telephone interviews. Firms were classified according to their size into three groups, and random sample was taken followingly: 20 micro firms (<10 employees). 40 small firms (10-49 employees) and 40 medium-sized and big firms (>49 employees).
In Western Greece Regions, they have planned to carry out approximately 80-90 questionnaires to local firms. They will use an internet based forms.
In Savona, they have planned to carry out approximately 80 questionnaires to regional authorities/planners, universities, congress office, airport staff and local firms. They will use an internet based forms.

4.4 NEXT STEPS: FURTHER PROCEEDINGS OF CASE STUDIES

The next steps will involve the TPG in the organization and evaluation of information collected by the analysis of relevant existing documents, in-depht interviews and structured questionnaires. These will be imput fot SWOT analysis.

In particular, the SWOT analysis will be based on the information gathered above and carried out according to a commonly-agreed methodology (which will be part of the project). To this end, the regional partners will collaborate with the Stakeholders also in the development of the local case studies. The common and commonly-agreed methodology will allow for benchlearning exchange. The SWOT analysis will analyse the current situation of the airports in the three respective regions (strengths and weaknesses) and show rated options for possible futures (opportunities and threats).This activity will be closely coordinated with the Stakeholders Region and each regional partner will establish a communication procedure with the relevant stakeholders in order to establish the timely delivery of all activity. The activity includes managing all upstream and downstream information between the TPG and the Stakeholders.

In general, this first phase of analysis allowed the TPG to set out some guidelines as preliminary results. The three case studies provide important topics for reflection. From this basis we will outline the guidelines for development and renewal of infrastructure and the peripheral region in which it is located. The logic for intervention in various areas is obviously different, depending on contextual analyzes conducted and results obtained.

The analyses, referred to three airports, already highlighted differences, specificities, problems and strategies to put in practice such as: the development of airport infrastructures; the increase in flight numbers; the implementation of new industrial and commercial functions of airport; the integration with urban structures and functions; the improvement of environmental conditions.

From that, we defined the preliminary guidelines. These are based on three different strategies and they will be better developed in the *vision maps* (see *Chapter 5* and *Draft Final Report*):

- Expansion of the existing airport, increasing the number of flights, adding new functions to neighboring industrial and commercial (*incREase*);
- Maintenance of airport operation, hybridization with insertion of the functions of existing activities and related to the local context surrounding integration of urban functions (*REuse*);
- Leaving the airport function in favor of a comprehensive recycling, reclaiming land from the old infrastructure of the landscape and the city's new urban development, creation of a park and public facilities (*REcycle*).

The results of the three case studies on the stakeholder regions will produce strong policy

recommendations. Each case study regions have many similarities with other European regions. That will allow the TPG to generalize the results into a larger group of European regions. In fact, it will be possible to structure a ***matrix of strategies*** and solution that could be adopted by other politicians in their own regions. The matrix will give the characteristic (strength and weakness) of the second tier airport and of the regions. They will be described by general and comparable categories. Then, each airports will propose different strategies on different scale (trans-national, regional or local). This will be the operative material that each politicians could adopt to include in the development policy of its region. This part will better developed in the *Draft Final Report*.

Tasks and Deliverables

Set up coordination and consultation process with relative Stakeholders through meetings and Focus Groups.
Collect the information gathered by the interviews and questionnaires (with many relevant stakeholders).
SWOT analysis;
Organisation of the information for dissemination;
Local translation of key summary documents;
Matrix of strategies.

5. MAPS

Maps are a powerful tools to visualise spatial data but they can be also a useful instrument to help decision makers to choose and define the best strategies for local development. They are essential implements of communication with the local context, and were developed to be instructions for use, in service of political actors and institutions in general.

This chapter will be better developed in the *Draft Final Report*. We start with a brief explication of the maps developed by the Lead Partner. Maps are divided into two groups:

- **Descriptive Maps**: to show the current situation
- **Vision Maps**: as a support fot further development process

5.1 DESCRIPTIVE MAPS

For each region, Descriptive Maps show the current situation and outline a series of representations that visualise statistical information. They show both the present situation and the changes over the last years in the three regions. The maps focus (among others) on the spatial profile and accessibility as well as regional transformations, new centralities, environmental mitigation and compensation.

The set of maps has been envisioned according to a precise structure, through which is possible understand the logical path of construction of each context and every consequential vision. In particular:

- **Europe**
  It is an overall image of Europe in which are juxtaposed ESPON maps of accessibility and GDP per capita. The comparison between these two maps is used to introduce two fundamental issues around the research work: economy and accessibility of each area. From these maps is possible to understand how seemingly inaccessible areas, can have, instead, a high level of production and economic. In contrast, regions well connected and equipped with infrastructure networks, reach rather low values of GDP.This situation leads to reflect on the importance of local contexts and the need to make insights at the regional scale.

- **Nation**
  In these three maps, one for each nation, are represented at national level the position of the main national airports. Airports are cataloged by the flow of passengers per annum (in reference to 2010 in particular). In this way there is an immediate image of the main airports hubs for each region. In particular, flows of passengers range from a maximum of 35 million in a year (e.g. Roma Fiumicino, Italy) and minimum of 100.000 in a year (e.g. Araxos, Western Greece).

- **Region**
  The first regional-scale map shows the three main statistical data on the peripheral regions in the studio: surface, population and density. The comparison of these data provides an interesting insight into the sheer diversity of the three territories: Central Finland has a surface of 19950 kmq and a population of only 274.000 inhabitants, Western Greece has a surface of 11350 kmq and a population of 741.282 inhabitants, Liguria, finally, has a surface of only 5420 kmq, but also a population of 1.616.788 inhabitants. The most significant is the density: 13,65 inhabitants/kmq for Central Finland, 66,37 inhabitants/kmq for Western Greece and even 298,3 inhabitants/kmq for Liguria.

  Below, was prepared a series of maps on a regional scale, for each region, represents the current environment through their specificity. In particular: infrastructures (higways, secundary roads, train, harbours, airports), industry and commerce (industrial districts and shopping malls), landscape heritage (parks and natural reserve, beaches, blue flags, orange flags, monuments), pubblic servicies (sport complex, hospitals), education and research (universities, research institutions). Each system is rational and is interpreted through conceptual and synthetic diagrams.

- **Airports**
  In this structure the connection between Descriptive Maps maps and Vision Maps is realized through the introduction of three maps on the airports, themes of the research. They are like ID cards and contain all the basic information on the airports of Jyväskylä, Andravida, Araxos, Aktion and Villanova d'Albenga. In particular, surface, number of employees, flows of passengers, length and characteristics of the track, etc.

5.2 VISION MAPS

The objective of Vision Maps is drawing a set of images that visualise potential futures and possible further development, specifically of the transportation system. Vision maps explore potential new assets; they use design as analysis and methodological support for strategic processes.

Airport infrastructure for its dimension and relations with the territory is a potential catalytic agent and an activator of contexts: airports as generators of development in peripheral regions but also as generators of a new image for the area and of themselves. As introduced above, the logic for intervention in various areas is obviously different, depending on contextual analyzes conducted and results obtained.

The **Concept** of *osmotic airport* introduces this group of maps. The concept is an abstract image describing the inner nature of the project and at the same time represents its essence and manifesto. Through one icon-image, the *osmotic concept* clearly defines the ways to describe the transformation of physical space: it establish a stronger relation between the infrastructure and their surrounding territories. At the same time the territories gain an economic improvement and new uses for the airports.

Below we brief introduce the preliminary guidelines for the **vision maps**. These are based on three different strategies:

- **incREase**
  This design strategy provides for the maintenance of existing airport facilities and strengthen it with new facilities and equipment.

  In particular, it's proposed the development of the potentials found in the analysis, in an attempt to enlarge the airport and ensure economic growth in the local context.

  This strategy is approached to the cases of ***Jyväskylä*** and ***Aktion***.

  In Central Finland, military traffic has a strong role and will secure the good conditions also for the commercial air traffic in the future. Moreover, the development of Jyväskylä air traffic will concentrate on the international connections (and transfer passengers). At the same time, the rail transportation will be developed (domestic travel). Finally, new route between Jyväskylä and Tallinn attracts more tourists and strengthen the role of free-time travelling. Jyväskylä airport aims to become the most important junction plane of the Central Finland.

  Aktion, instead, points to a strengthening of existing airport facilities to support the tourist traffic in summer and increasing the number of flights during the summer. Really important are connections with the main resorts surrounding periodic use (summer) of the airport building.

- **REuse**
  This design strategy provides for the maintenance of airport operation and hybridization with insertion of the functions of existing activities and related to the local context surrounding integration of urban functions. In particular, it's proposed the development of the potentials found in the analysis, in an attempt to merge the airport with the local context.

  This strategy is approached to the cases of ***Araxos*** and ***Villanova d'Albenga***.

  In Western Greece, the strategy includes dual use of airport facilities: the airport is up and running, but spaces are located with extra activities, related, for example, to entertainment or research. In this way, it provides that structure activity lasts all year and provides the local context new areas of economic growth and productive equipment. The air traffic, in this case, will be concentrated during the summer and connected to tourism in the region.

  Also in Villanova d'Albenga, the design strategy of reuse as a double feature in its structure.

  On one side, the possible further development of the airport is only in business aviation, or executive jet, because of the impossibility of accept all typologies of aeroplanes. On the other side, it's possible imagine that land is used to cultivate flowers and agricultural products by the society, in a further vision in which there is synergy between agricultural and touristic sectors (e.g. open air exhibition in the land; contemporary art events; etc.).

  Another interesting vision could be to work with the industrial sector that could find its localization in the flat land of Albenga. In this way, the growth of the airport could generate new possibilities to know the surrounding territories and enrich the poor local context.

- **REcycle**
  This design strategy provides for leaving the airport function in favor of a comprehensive recycling, reclaiming land from the old infrastructure of the landscape and the city's new urban development, with creation of parks and public facilities. In particular, it's proposed the development of the potentials found in the analysis, in an attempt to recycle the airport and give back to the city.

  This strategy is approached to the cases of ***Andravida***.

The primary aspect related to the recycle of small airports is the requalification and development of a good level of accessibility, allowing these to become dynamic centralities for the surrounding territory.

In fact, more accessible larger scale national and international trade has often overshadowed these territories. Accessibility is therefore fundamental and central resource for territories, helping them to attract and re-activate diverse incoming flows, such as tourism, but also activities related to commerce, culture, education, health, agriculture, energy or high-tech technology. Value and anticipate the correct strategy of recycling airport is an increasingly urgent need to anticipate the inevitable decline of these structures and to activate recovery process in synergy with the different urban realities.

5.3 LIST OF MAPS

Descriptive Maps

A) ESPON Maps
1. Europe: accessibility/peripherality (data from BAKBasel)
2. Nation: surface/ population /density (compared in the three nations)
3. Stakeholders Regions: airports+data of infrastructure

B) Regional Maps
4. Infrastructure (trains / highways / road)
5. Harbour
6. Airports
7. Landscape heritage: parks/reserves/beaches
8. Cultural heritage
9. Industrial districts + Diagrams Companies: local units / employees
10. Shopping malls + Diagrams Commerce: import/export
11. Research Institutes
12. University
13. Sport complex
14. Hospitals

15. Synthesis of Descriptive Maps (one per Region)
16. *Airport ID card:* description of each airports

Concept

17. Concept: *osmotic airport*

Vision Maps

18. Strategies for the development of each airports (3 maps for each airport)
19. Masterplan
20. 3D simulation / render (to be defined)

In the *Draft Final Report,* this chapter will be deepened through the Report.The maps will show the synthesis of all the analysis carried by the TPG in the three Stakeholder regions. They also interpret all results obtained and will form a consistent view of the better strategies for the case studies development. A graphical and technical support for solid policy recommendations will be delivered.

6. DISSEMINATION

To ensure optimal effectiveness and efficiency of the ADES project, effective and timely communication is crucial during the whole project. Interaction and coordination with the stakeholders involved will permanently challenge both the research process and the outcomes of the research. Furthermore, discussion and dissemination to the ESPON community will further enhance the research process.

6.1 COMMUNICATION PLAN

Parallel Dissemination Strategy – TPG:
A parallel dissemination strategy during and after the project lifetime is adopted intended to promote the project scope and results to the academic community and regional policy stakeholders. To maximise impact in the scientific community and relate the targeted analysis to both theoretical debates in the academic community, the project results are presented at appropriate meetings and conferences, to be agreed by the TPG and communicated to the Steering Committee and ESPON. The project results are also presented for publication in relevant scientific conference, journals and local newspapers.

The Lead Partner and others members of the TPG carry out the dissemination activities and ensure that information and the outputs of the other activities are made available for dissemination purposes in appropriate formats. All dissemination documents are presented in appropriate formats and using non-technical language to reach the target audience and non-specialist planners who are final end-users of the project results. The TPG participated in some ESPON events and Seminars. It also presented the project and its results, as invited by the ESPON CU, public conference, international congress and seminars to present and discuss the first results between experts and regional representatives. The TPG will also presented during 3 stakeholder Seminars the state of ADES project to present and discuss the results. These coordinate meetings will take place in the case study regions and will produce a coordinate Report.

The TPG will also ensure that the summary materials for local, regional and national dissemination are available in an appropriate format that will be left at the disposal of the stakeholders also after the end of the project (presentations, summary conclusions of final report in a downloadable form).

Target Groups
The dissemination activities are targeted on a regional level through the direct communication in local meeting to local actors: firms, companies, politicians, and airport users. At the same time, the dissemination is carried out by the divulgation of the on-going activities through international congress and events. The purpose is to disseminate the research results not only at end of the project but during all the lifetime of the research, to maintained active and productive the interest and the participation of local actors on the research issues. Furthermore, the dissemination strategy planned the attendance not only in events related to the academic world, but especially in regional meetings with the direct participation of local actors, in particular politicians.

Dissemination tools
Efficient dissemination requires making use of a variety of dissemination tools.
The results of the ADES project will be made available through papers to be published in scientific and technical journals worldwide. Popular media (press, magazines, etc.) addressed to the users and the general public will also be targeted.

- Press releases (e.g. local newspapers)
- Media (e.g. a link on the official municipality website)
- Maps as tool of communication
- Questionnaires and interviews

The goal will be to have a number of ADES-related publications and presentations accepted for publication in proceedings and conferences. This will allow to reach a larger number of users and people interested in this topic.

Dissemination activities
The ADES research findings (also in a preliminary phase) are disseminated in national and international events and activities. The list of ADES events include:

a) ESPON Seminars
b) National and International Congresses and Conferences related to transportation systems, air infrastructure and regional development.
c) Umbrella organizations
d) Regional meetings (seminars, focus group or workshops) to present and discuss results to policy-makers and practitioners in the Stakeholder regions (including provision of material in English and local languages)
e) Academic events (with the participation of professionals from both research and practice)
f) European Workshops
g) Reports

a) ESPON Seminars
The TPG will participate in Seminars organized by ESPON CU and the stakeholder regions, (at least 3 ESPON seminars), and the public conference organized by ESPON. The TPG guarantee the presence of its partners at these events to share and discuss the results with the ESPON community.

b) National and International Congresses and Conferences
The TPG will participate at International Congress and Conferences during the project. Each Conference will include scientific presentations and papers, all peer reviewed by a Scientific Committee. The goal is to share experience with other experts on the same issues and to promote the ESPON research findings.

c) Umbrella organizations
The TPG will attend a dedicated meeting of at least one of these umbrella organizations and assist in providing appropriate materials for dissemination through these organizations to other regions. This approach facilitates the dialogue between local and regional authorities and other actors of the sector, such as industry, research centres and universities.

d) Regional meetings
At least one local event is planned to take place at each Stakeholder Regions. They will be coordinated by the TPG and could be structured as seminars, focus groups or workshops. During these meetings, the ADES results will be present and discuss to get feedback from the different local actors (user groups) and local Stakeholders. The goal is to promote project findings and results among representatives from local and regional authorities. The meetings will be opened to the public.

e) Academic events
According to the TPG dissemination strategy, the research findings are presented first to the academic community to get the scientific acceptance. Then, the results can be presented and disseminated to regional policy makers and other wider audience. Due the fact that part of the research activities are developed in academic contexts, it is extremely relevant to share the research findings to experts in the same fields of interest. The add value of these events is that at these meetings always participate professionals from both research and practice.

f) European Workshops
The Workshops are organized in different European cities and airports. These events are conceived as an in situ intensive studio to address some of the themes at the level of the airports and their surrounding territories. The goal is to know the actual condition of underused airports, to upgrade the knowledge by sharing findings with other experts.

e) Reports
The meetings in the Stakeholder Regions will be produced a Report of each events. This report will have a common template in order to make heterogeneous the contents in the documents. They will be in local language (for local authorities) and in English (to divulge at an European level).
The project will be concluded by a Final Report, consisting of several parts suitable for academics and regional policy-makers, with an Executive Summary that shall be translated into local languages by the TPG for most effective dissemination purposes.

6.2 NEXT STEPS: FURTHER PROCEEDINGS OF DISSEMINATION

The TPG will participate in all ESPON events and Seminars and present the project and its results, as invited by the ESPON CU, as well as participate in the public conference to be organised in collaboration with ESPON to present and discuss the results between experts and regional representatives.
The TPG will provide the key results of the project in synthetic form and in local languages for local use and dissemination through institutional websites and press releases.
The TPG will contribute actively to all the dissemination events organised by the Stakeholders, providing relevant information, presentations and support at local level through the local experts, as well as attending transnational events and dedicated meetings of umbrella organisations where required. The experts will ensure that the summary materials for local, regional and national dissemination are available in an appropriate format that will be left at the disposal of the stakeholders also after the end of the project (Presentations, summary conclusions of final report in a downloadable form).
The TPG will be present at three stakeholder Seminars to present and discuss the results, which will take place in the case study regions.

The project will be concluded by a final report, consisting of several parts suitable for academics and regional policy-makers, with an executive summary that shall be translated into local languages by the TPG for most effective dissemination purposes.
The communication manager will ensure that as the main addressees of the reports are policy advisers and policy makers, all dissemination materials and presentations should be understandable for non-academics and non-planners, such as general managers or policy advisors).

In particular for events organized by a platform as Umbrella Organization and the think-thank networks, the Lead Partner asks to ESPON CU and to the Stakeholders to provide information for relevant umbrella organisations.

6.3 PRELIMINARY SCHEDULE OF THE ADES DISSEMINATION ACTIVITIES

The following Table gives a preliminary schedule of ADES dissemination activities:

Date	**Location**	**Event**	**Typology of Activity**
19 - 20 September 2011	IUAV Venice, Italy	International VDH3 Seminar	Academic events
16 - 21 October 2011	Lleida-Alguaire, Cataluña	International Workshop Emerging Infrastructural Landscapes	European Workshops
1 - 2 December 2011	MAXXI, Rome, Italy	International VDH3 Seminar	Academic events

8 - 10 March 2012	TU Delft, The Netherlands	International VDH3 Seminar	Academic events
14 - 15 March 2012	Oslo, Norway	Joint NS-RSA and ESPON Norba Scientific Seminar	ESPON Seminar
19 - 20 April 2012	Lisbon, Portugal	AIRDEV 2012 Conference	International Conference
13 - 16 May 2012	Delft, The Nederlands	Regional Studies Association European Conference	Umbrella Organization
28 - 29 June 2012	Genoa, Italy	MED.NET.EU.12 International Congress	International Congress
	Region of Western Greece	Introduction letter of questionnaire	Questionnaire
March 2012	City of Jyväskylä, Finland	Summary about the results of the case study of Jyväskylä (in Finnish)	Report
September 2012	City of Jyväskylä, Finland	Press release	Press and publication
21 - 25 August 2012	Bratislava, Slovakia	52nd European Congress of the RSAI (ERSA)	International Congress
16 - 19 October 2012	TU Delft, The Nederlands	EAAE/ISUF “New Urban Configuration” Conference	International Conference
5 - 6 December 2012	Paphos, Cyprus	Internal ESPON Seminar	ESPON Seminar
December 2012	City of Jyväskylä, Finland	Article in ESPON publication (in Finnish)	Press and publication
December 2012	Helsinki, Finland	ESPON Seminar	ESPON Seminar
October 2012 - January 2013	City of Jyväskylä, Finland	Regional meeting	Regional meeting and Report
October 2012 - January 2013	Region of Western Greece (Patros)	Regional meeting	Regional meeting and Report
October 2012 - January 2013	Province of Savona (Villanova d'Albenga), Italy	Regional meeting	Regional meeting and Report

For a more detailed list of dissemination activities see *Annex 6*.

This Dissemination Plan presented a comprehensive dissemination strategy with a common graphic identity, specific tools and activities adapted to the respective target groups, a clear communication policy and an internal assessment procedure. To further improve the dissemination strategy during the project's life, the Dissemination. Plan will be updated in the *Draft Final Report*.

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