

TRANSPORT INNOVATION RESEARCH SCHEME REPORT

SLIM VERSION

INNOTRANS | PGI02182

COMMON FRAMEWORK REPORT
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1

INTRODUCTION





The role of the Framework Report is to reflect structural conditions and characteristics of the regions at the EU level and their impact on the transport sector dynamics. It is correlated to the outputs of the INNOTRANS project, which will map regional transport innovation capacity and identify the competitive advantage of the regions.



This report outlines the transport innovation landscape within the five regions included in the project: Abruzzo, West Midlands, South-East, Central Macedonia and Prague.

The PGI02182, INNOTRANS project is under implementation within the second call for proposals of the Interreg Europe Program (<http://www.interregeurope.eu/>), under the policy topic Research and Innovation.

The following five partners are involved in its implementation:

1. **Coventry University Enterprises Limited (CUE), United Kingdom**
2. **Abruzzo Region, Italy**
3. **City of Prague, Czech Republic**
4. **South-East Regional Development Agency, Romania**
5. **Aristotle University of Thessaloniki, Greece.**



2

ANALYSIS





The Regions involved in this project reflect diverse territories and degrees of development. Partner regions performance is unequal and provides a variety of experiences useful for improving policy interventions.



2.1 GOVERNANCE OF INNOVATION

Regions compared are very different as territory and geography. One supplementary exception is the West Midlands classified as NUTS 1 in the NUTS nomenclature. The rest of Regions are NUTS 2 type of regions.

Abruzzo



The region has exclusive competencies in policymaking in scientific and technological research and support to innovation for industrial sectors, guided by national legislation. In Abruzzo, Regional Department of Economic Development, Labour, Education, Research and University Policies is the body responsible for the implementation of the innovation policies. There is not a proper correlation between region's autonomy in designing innovation policy and funding resources. For the Smart Specialisation Strategy (S3), the Region has established a system of governance based on the two levels¹.

- The first level relates to the programming, implementing and monitoring of the strategy. A Board of Control manages the first level. The Board of Control includes the following actors: ERDF Managing Authority, the Department of Economic Development, Labour, Education, Research and University Policies, and the Department of Presidency and European relationships.
- The second level is updating strategy with the stakeholders engaged. The Regional Council for Research and Development carries out this level.

Central Macedonia

RCM is characterized as a *less developed region* since it is lagging behind both the total country's and EU's performance; further deviation from the EU average is observed due to the prolonged recession in Greece (ROP, 2014).

The Region of Central Macedonia's key attributions relate to the programming and implementation of different policies but more important, the programming and implementation

¹ <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/abruzzo>



Central Macedonia

of RTDI policies. RCM is managing projects specific to region such as *transportation, ICT infrastructures, urban planning and environment, commerce, tourism and employment, natural resources, energy and industry*². Another innovation related key responsibility of RCM is the design of the Innovation Smart Specialisation Strategy (RIS3).

Prague

Research and innovations is primarily in competence of **national government** and is therefore a voluntary activity for regional/local self-governments as part of their own economic policy. Policy areas relevant for innovation accounted for a minor part of the budget in 2013. Most important activities reflected by the budget share include the development and maintaining of the transport system (40 %) associated with massive investment to the road infrastructure and development of public transportation. The second most important budget item (18 %) is “The city infrastructure”, represented basically by investments in wastewater plant, sewer systems, footways, flood-control systems and other technical infrastructure (RIM Plus 2017).

High level of urbanisation, concentration of many functions and the proximity of key players in the capital makes Prague a distinct centre of development at a national level and places Prague above the other regions in nearly all of the structural indicators. For instance, it accounts for one-quarter of the Czech GDP.



Charles' Bridge in Prague

2 <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/organisation/region-kentriki-makedonia>

South East Development Region

Since Romania has no official regional RDI policy, South East does not have a formal role in RDI policy-making. The Ministry of Research designs and coordinates the RDI policies. The Ministry has a very limited role in regional RDI potential and exerts little territorial coordination of RDI. Romanian legislation does not provide administrative status for the regions; therefore, South East Region is a development purpose region with NUTS 2 territorial status. South East is responsible for programming and managing regional funds. **South-East Regional Development Agency** is responsible for implementing the Regional Development Plan for 2014-2022 and acts as a key driver and developer of the Smart Specialization and RIS 3 strategies. South-East Region ranks fourth in terms of regional GDP, the level recorded in 2014 being 2.3 times lower than the GDP of the Bucharest-Ilfov Region, the most developed Romanian region.



Romania, Galati

West Midlands

UK has a centralized approach for innovation policy. The Department for Business, Energy & Industrial Strategy (BEIS) was in 2018 the government department responsible for innovation policies. UK has developed entity body, UK Research and Innovation (over 500 million pounds budget per year), to facilitate and coordinate innovation programmes. LEPs (Local Enterprise Partnerships), local or devolved authorities and other institutions are in charge at local level. The UK governance model allows different institutions to be recipients and managers of innovation programmes.

West Midlands hosts one combined authority (CA), The West Midlands Combined Authority (WMCA), consisting of 18 local authorities and four Local Enterprise Partnerships (LEPs). As CA, the WMCA is a major local partner for the implementation of regional innovation measures and strategies³.



National Express



³ <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/west-midlands>

2.2 REGIONAL KEY INNOVATION INDICATORS

Selected regional key indicators in the table below show key features of the regions and allow a better understanding of the general regional performance. It includes key indicators available at EU level.

Table 1. Key innovation indicators

Regions	West Midlands	Central Macedonia	South East Romania	Prague	Abruzzo
Indicators					
GERD (Gross Expenditure on Research and Development) or similar indicator showing spending for Innovation (Different Sources)	3,640 mil EUR (2014)	204.26 mil EUR (2013)	14.37 mil EUR (2015)	34.8% of total Czech intramural research spending, EUR (2014)	300 mil EUR (2015)
Unemployment Rate (Eurostat)	28.7% (2017)	22.9% (2017)	42.4% (2016)	21.8 (2015)	43.2% (2015)
Motorways density (km per square thousands km)	33	NA	2	89	57
GDP (purchasing power per inhabitant EURO)	25.700	15.400	14.500	53.100	24.600
Human Resources in Science and Technology (% of active population)	NA	36.6%	21.9%	60,2%	33.6%
Employment in High Tech sectors (% of total employment)	NA	2,4%	1.1%	9,2%	2.9%
Population density (inhabitants per square km)	445.4	99.6	73	2,626.8	122.5
Total population (No)	5,772,082	1,883,339	2,469,801	1,267,449	1,326,513

Source: Statistics prepared by author from Eurostat, cut-off date 2016; where data was not available for 106, it was mentioned specifically, <https://ec.europa.eu/eurostat/cache/RCI/#?vis=nuts2.economy&lang=en>



2.3 REGIONAL ECONOMIC PERFORMANCE



From the economic performance perspective, the regions included in this project are very different. However, key economic indicators presented below reflect a diversity of situations. Economic dynamic of the regions is a key driver also for investments in Research and Development and especially for investments in innovation.

Table 2. Selected macroeconomic indicators

Regions	West Midlands	Central Macedonia	South East Romania	Prague	Abruzzo
Indicators					
GDP <i>Basic prices – mil EURO</i>	16,294.1	20,786	39,692.1	154,474.8	28,691
GDP <i>Purchasing power standard per inhabitant</i>	14,500	15,400	53,100	25,700	24,600
Gross Domestic Product <i>(purchasing power standard in % as EU average)</i>	88	53	50	182	84
Real Growth Rate <i>Regional Gross Value Added - % change of previous year</i>	NA	NA	0.8	1.8	-0.1

Source: Statistics prepared by author from EUROSTAT – cut-off year 2016

When compared with other regions of Mezzogiorno, in 2008-2016, the economic performance of **Abruzzo** continues to stand significantly above the Mezzogiorno average in term of activity rate, employment rate and GDP per capita.

In 2015, **Central Macedonia** accounted for 13.5% (€23,636m) of the national Gross Domestic Product (GDP), second only to Attiki (€84,368m) (Eurostat, 2017). Regional GDP values have been falling since 2008, although in later years (2014-2015) the negative trend has slowed down (Regional Innovation Monitor Plus, 2018). RCM is characterized as a less developed region since it is a bit behind of total country's and EU's performance; further deviation from the EU average is observed due to the prolonged recession in Greece (ROP, 2014).

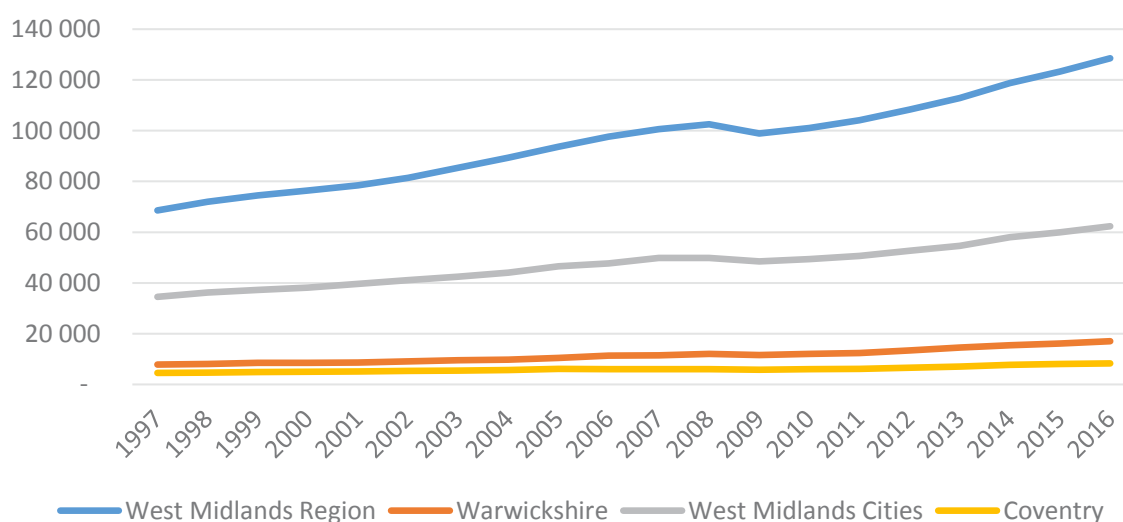
Prague is the economic centre of the country and also a hub when it comes to economic relations in Czech Republic. Apart from all main authorities of the state administration, most financial institutions and foreign enterprises are based in Prague. All this has a significant effect on the regional economy. Approximately a quarter of the Czech Republic's GDP (24,6 % in 2014) is generated in Prague. GDP per capita in Prague reached 210 % of the Czech Republic's average. Presently, Prague exceeds average values for the entire EU-28 (GDP per capita in Prague was 68,9 % higher). Higher GDP (generally typical for a metropolis) is related to a higher level of wages, localisation of activities with a high added value and the concentration of central bodies of both the public and private sector.

At the level of the **South-East Region**, the Gross Domestic Product (GDP), expressed in millions of lei, was 75,239.3 million lei in 2014, which represents 11.26% of Romania's GDP and about 0.12% EU GDP 28. When comparing Romanian development regions, one can notice

significant disparities. Out of 8 development regions in Romania, South-East Region ranks fourth in terms of regional GDP, the level recorded in 2014 being 2.3 times lower than the GDP of the Bucharest-Ilfov Region, the most developed of the eight regions of the country.

Although the **West Midlands** region historically underperforms, over the past twenty years it showed consistent growth. Even in local terms Coventry has grown at a slower rate than the rest of the region overall⁴.

fig. 1 GVA Growth in the West Midlands Region



2.4 TRANSPORT IN REGIONS

Transport related indicators from the regions reflect the sectorial context in which they operate. Key infrastructure indicators are important incentives to develop innovative policies in transport sector. When a region is connected by multiple transport modes, chances for innovation are even bigger.

Table 3. Key transport indicators

Regions	West Midlands	Central Macedonia	South East Romania	Prague	Abruzzo
Indicators					
Motorways density (km per square thousands km)	33	NA	2	89	57
Rail (km per thousand km)		28	49	475	
No of victims/ car accidents (per 1 mil inhabitants)	27	76	112	21	57

Air transport total (freight and mail) – thousand tonnes	32	7	NA	71	NA
Air transport – passengers (thousands)	11,639	5,735	NA	12,990	569
Population density (inhabitants per square km)	445.4	99.6	73	2,626.8	122.5
Total population (No)	5,772,082	1,883,339	2,469,801	1,267,449	1,326,513
Gross Domestic Product (purchasing power standard in % as EU average)	88	53	50	182	84

Source: Eurostat data (2016) processed by Author

Railway lines, ports, airport and motorways connect **Abruzzo** region to the major Italian cities and to the national transport network. There are 2 airports (Abruzzo International Airport, L'Aquila-Preturo Airport), four main ports (Pescara, Ortona, Vasto, Giulianova), two main railways lines – Adriatic railway and Pescara-Rome railway, and the inland railways -, three highways A24 Rome - L'Aquila – Teramo, A 25 Teramo-Avezzano-Pescara, A14 Bologna – Taranto; intermodal centres: Interporto of Abruzzo, Val Pescara freight terminal, Roseto lorry terminal, San Salvo lorry terminal, Goods sorting center for Marsica.



Abruzzo Region Palace

Central Macedonia networks comprise different infrastructures, while the key priority is improvement of TEN-T networks and the strengthening of the inter-regional network associated with the TEN-T (ROP, 2014). The available infrastructures include airports, a port of international importance, motorways and railway network, indicatively mentioning Thessaloniki International Airport “Makedonia” and Egnatia Motorway that runs through Central Macedonia, being 191 km long and extending from Polimylos to Strimonas (Enterprise Greece, Mar 2018), Kastania bypass, railway network that passes through the entire region of Central Macedonia.

Since 1992, **Prague** has an integrated system of transport. It contains underground - metro, trams, city and suburban buses, railways, funicular to Petrin, ferries. About 1,350,042,240

people used public transport in 2017 (1,261,243,240 in the City of Prague and 88,799,000 in the Central Bohemia). The Prague Integrated Transport (PID) system offers the inhabitants of Prague and a large part of the Central Bohemian region to travel using a unique travel document irrespective of the chosen means of public transport.



Prague bus station

In the South-East Region the global TEN-T network includes the airports from Constanta and Tulcea. South East is connected to three pan-European transport corridors, is an important commercial node with three maritime ports: Constanta, Midia and Medgidia, which are commercial ports, and Tomis, a touristic port. The region plays an important role at the national level since it hosts two major intermodal terminals, Constanta and Galati. Constanta is the largest Romanian port and Galati is the biggest river port.

West Midlands is focusing its activities on advanced manufacturing and engineering that represent a key driver of economic growth in the region. For the region, data shows that there has been a small shift away from public transport and an increase in the use of cars between 2011 and 2015. Compared to the average for the conurbation this is the reverse of the trend, which has shown a small decline in the use of private transport and a move towards rail.

Table 4. Use of different transportation in West Midlands

All region	Mode			
	Bus	Rail	Metro	Car
2010/11	23%	12%	1%	64%
2012/13	22%	12%	1%	65%
2014/15 ⁵	22%	15%	0%	63%
Average by Mode	22%	13%	1%	64%

Source: Transport for West Midlands, 2016

⁵ Figures for Metro are affected by station closures



3

REGIONAL INNOVATION





The Regional Innovation Scoreboard refines the analytical framework of the European Innovation Scoreboard to the extent possible in terms of data availability. It analyses and compares structural differences between regions.



3.1 GENERAL INNOVATION OUTLOOK

Regions under study were analyzed according to the Regional Innovation Scoreboard and national/regional/local plans and strategies affecting these regions. According to the Regional Innovation Scoreboard, West Midlands is an Innovation Leader while the rest of the Regions are Strong, Moderate and Modest Innovators.



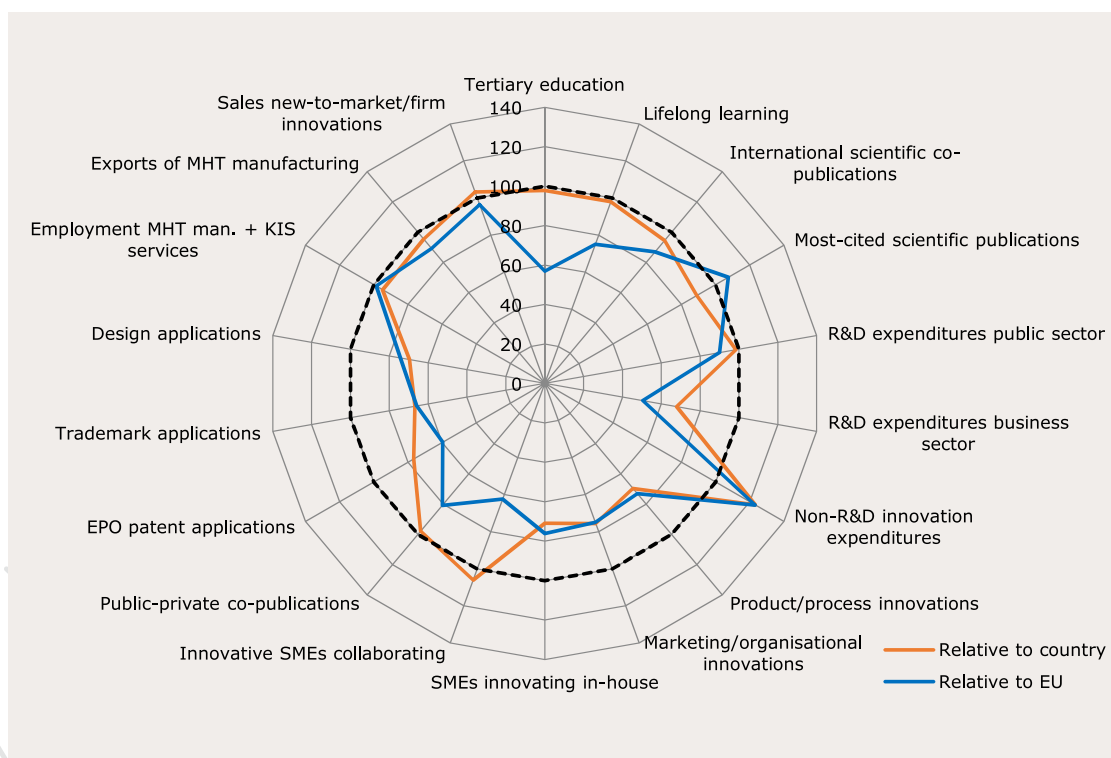
3.2 REGIONAL INNOVATION⁶

Abruzzo

According to the Regional Innovation Scoreboard (RIS) 2017⁷, Abruzzo is ranked as a **moderate innovator**. Moderate innovators are those regions with a relative performance less than 10% below but more than 50% above that of the EU28.

⁶ Source for graphs in this section is RIS 2017

⁷ The Regional Innovation Scoreboard is a regional extension of the European Innovation Scoreboard, assessing the innovation performance of European regions based on a limited number of indicators. The European Innovation Scoreboard provides a comparative analysis of innovation performance in EU countries, other European countries, and regional neighbours. It assesses relative strengths and weaknesses of national innovation systems and helps countries identify areas they need to address.

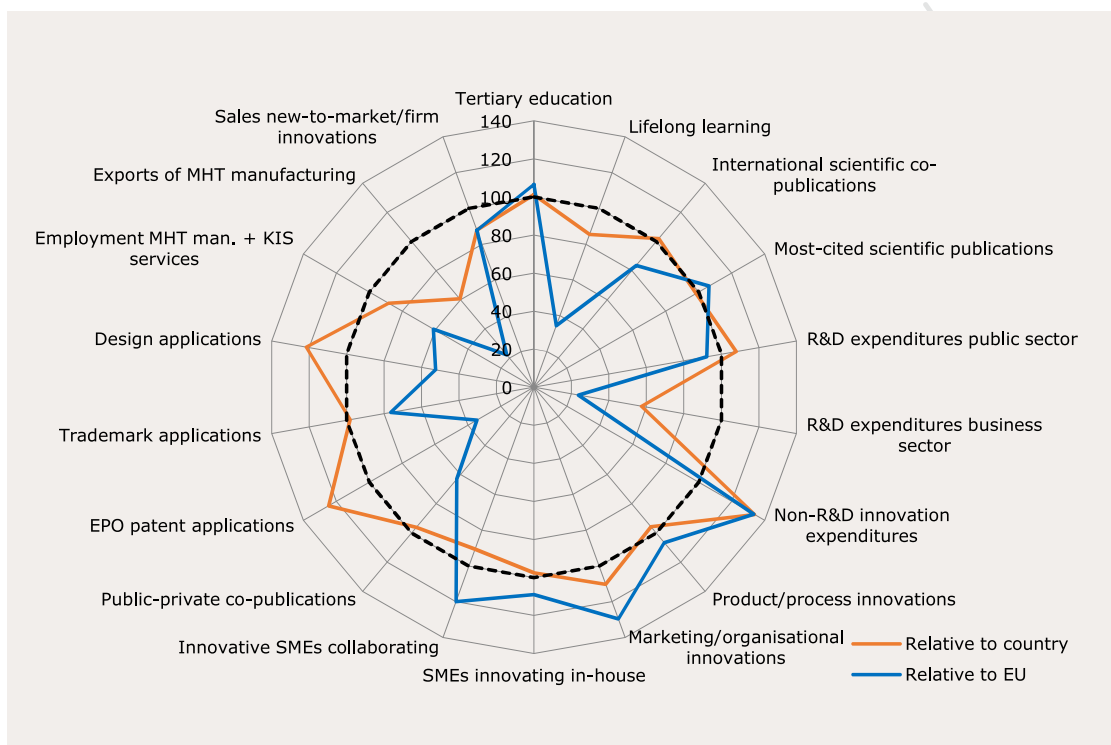


Radar graph 2017, source http://ec.europa.eu/growth/industry/innovation/facts-figures/regional_it.

Central Macedonia

According to the Regional Innovation Scoreboard 2017 (RIS 2017), RCM is a **moderate innovator**, and innovation performance has increased over time.

The Regional Innovation Index (RII) in 2017 was 0.298 (normalised score), 98.1 relative to Greece (set equal to 100) and 65.6 relative to the EU (set equal to 100). The RII change between 2011 and 2017 was 2.4 (normalised score).

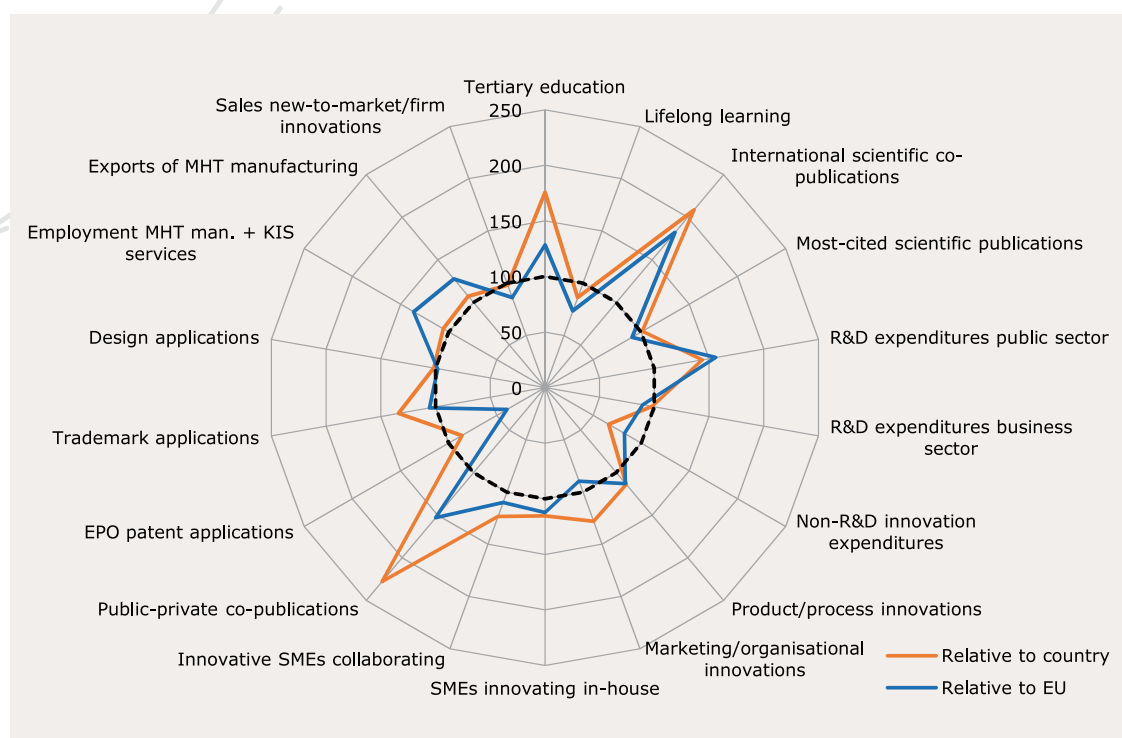




Prague

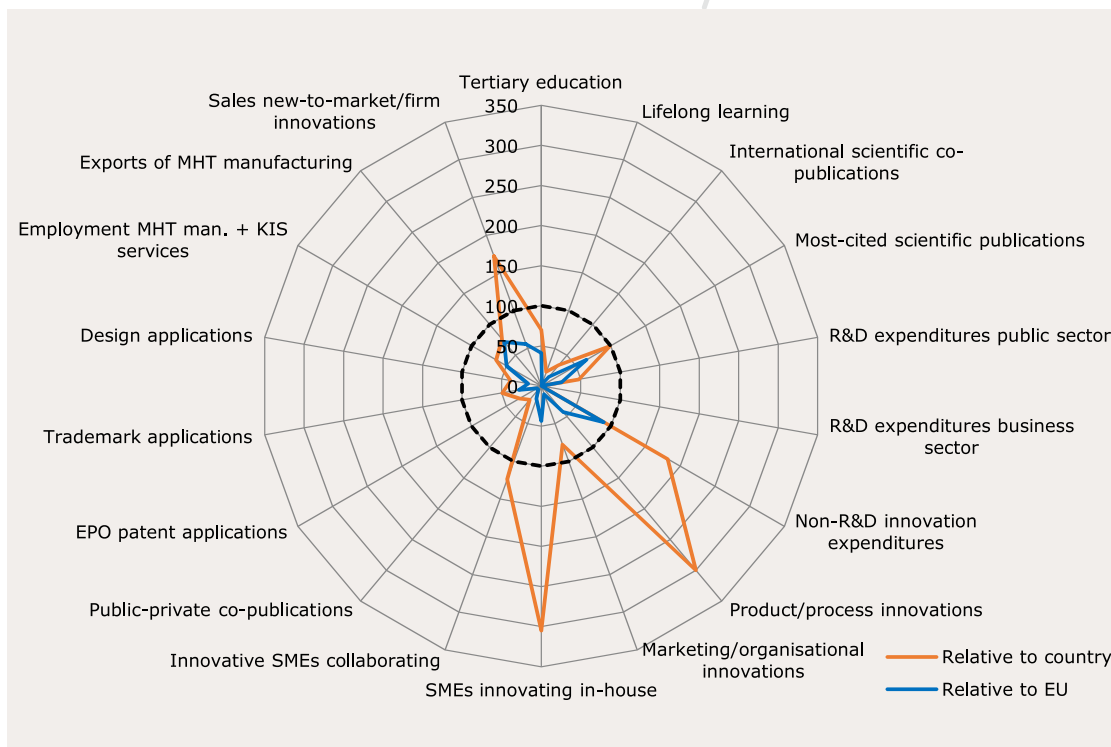
Prague is a **strong innovator**, and innovation performance has decreased over time. Relative strengths compared to Czech Republic and the EU, highlight relative strengths (e.g. International scientific co-publications) and weaknesses (e.g., EPO patent applications).

Based on The National Research and Innovation Strategy for Smart Specialization of Czech Republic (The National RIS3 Strategy) three topics were identified as the topics of smart specialization: automotive, aerospace industry and railway vehicles.



South-East Romania

South-East Region is a **modest innovator**. Modest Innovators are all regions with a relative performance below 50% of the EU average in 2017⁸. The radar graph shows relative strengths compared to Romania and the EU, highlighting relative strengths (e.g. non R&D innovation expenditures) and weaknesses (e.g. Public-Sector R&D expenditures).



One important feature of the innovation framework is the existence of the qualified human resources in the field. The statistical data show that at the level of South-East Region, the number of researchers is increasing slightly but not substantially to produce a big dynamic in the R&D area.

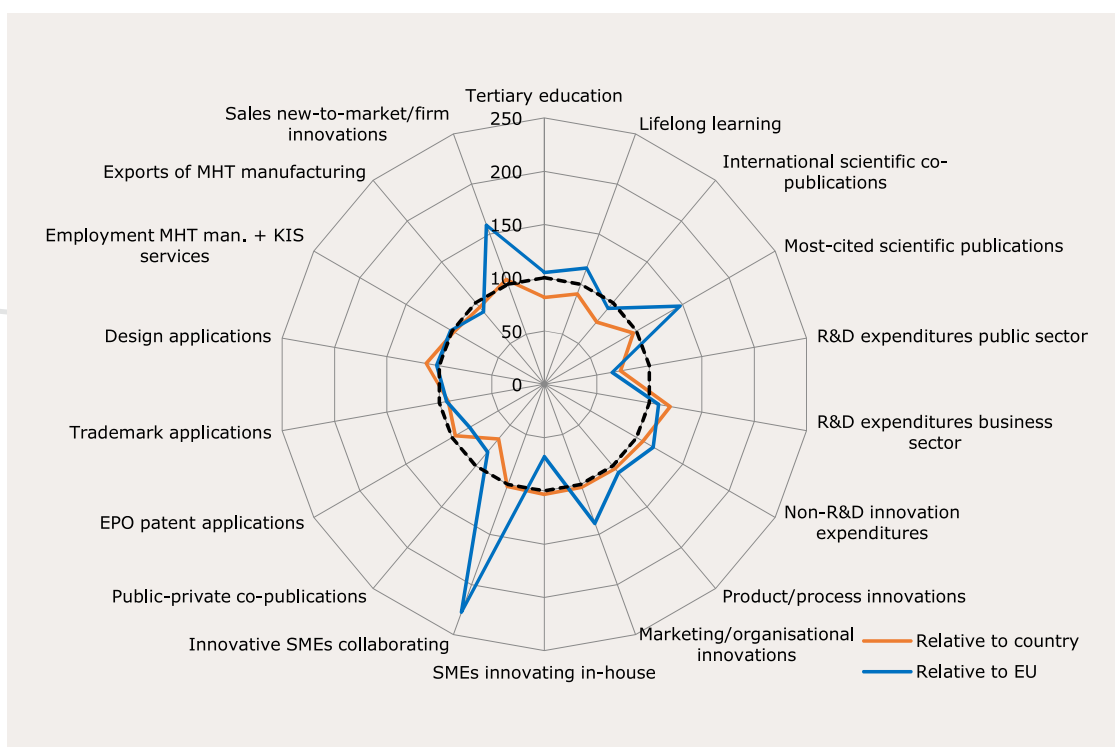
West Midlands

According to RIS 2017, West Midlands is a **strong innovator**, with innovation performance increasing significantly over time. For 2017, several relative strengths could be highlighted (e.g. Marketing & organizational innovations) and weaknesses (e.g. Public-sector R&D expenditures). The region is more densely populated, with higher than average employment share in manufacturing, and lower than average GDP per capita.

Universities are key drivers for West Midlands innovation capacity (Warwick, Birmingham, Coventry) with three more in the top 50, (Harper Adams, Keele and Aston). Two of these universities are in Coventry. Two others are close by in Birmingham. This creates a potentially powerful and influential research hub. Other Universities include Birmingham City, Stoke, and Worcester.



⁸ https://ec.europa.eu/growth/industry/innovation/facts-figures/regional_en



3.2 TRANSPORT SPECIALIZATION

According to the Regional Innovation Scoreboard, West Midlands and Prague are most dynamic innovators, being innovative leaders, while the rest of the regions included in this project are moderate innovators. However, regions have different results when analysed based on EU datasets and indicators.

Abruzzo Region occupies a pivotal location in the middle of the Adriatic Corridor, a multi-modal transport network, which re-establishes the role of the Adriatic Sea as a major cross-border region characterized by cultural exchanges and economic cooperation.



Central Macedonia has a very good dynamic in terms of growth, especially considering the multimodality capacities of the region and the activity of the academic sector. A series of actors, including local authorities but also Universities and businesses are included in the implementation of the Strategy/transport plans for the regions. South East Region has a good activity in improving public transportation, especially using ESIF. Public transportation as well as private investments in auto industry are a key feature, conclusion that also applies to the other analysed Regions.

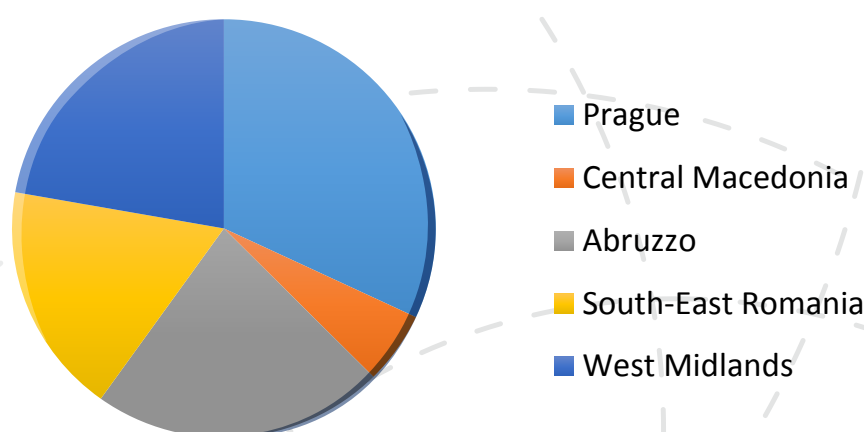
For developing innovative technologies, human resources are a key element. The table below shows key elements regarding the quality of HR in the regions. Prague and West Midlands are best performers here.

Table 5. RDI indicators

	Population with tertiary education	Lifelong learning	Scientific co-publications	Most-cited publications
Prague	0.707	0.346	0.759	0.494
Central Macedonia	0.587	0.162	0.349	0.580
Abruzzo	0.313	0.353	0.363	0.587
South-East	0.227	0.011	0.060	0.355
West Midlands	0.578	0.546	0.388	0.802
Source	RIS, 2017			

Exports of medium and high-tech manufacturing is of key importance for the Regions. Prague, West Midlands and South East Region are best performers in this area.

Fig 6. Exports medium and high tech manufacturing



Source: RIS 2017 processed by author from database

Other **key factors for innovation** are the European funding opportunities, important boosters for regional innovation, but also the bureaucracy, a major set-back.

Given the geographical position of the regions included in the project, they have the potential to become major intermodal nodes. For example, West Midlands is the central nexus for Road and Rail communication throughout the UK, the same in the case of Prague, RCM and Abruzzo, the Romanian South-East Region hosts important maritime and fluvial ports.

For different reasons, public transport still needs important investments. An important goal is to improve transport public policies in the Regions. For example, in the South-East Region, local fleets are out-dated and there are not many alternatives regarding the local transport. In addition, the increase in the number of vehicles between 2002 and 2011, has recorded significant values in terms of cars and freight cars. Unfortunately, the number of passengers transported by public transport in urban environment is decreasing. Between 2000 and 2008, it decreased about 16% and in 2011 compared to 2000 with 33.31%. In Central Macedonia, public transport is currently limited to buses. In the West Midlands region between 2011 and 2015 there has been a small shift away from public transport and an increase in the use of cars.

Economic crisis had a negative impact on the number of employees in innovative fields. For example, in RCM between 2000 and 2008 high-tech industries and knowledge-intensiv-

services accounted for 1.7% of total employment and improved in 2016, reaching 1.9%, still below the national (2.5%) and EU28(4%) averages. At the level of the South-East Region in 2011, 1,515 employees worked in the R&D sector, which represents a decrease of 198 employees compared to the values registered one year before. The R&D employees are mainly concentrated in the counties of Constanta (27,4/10,000 employees), Galati (25,2/10,000 civilian occupation) and Tulcea (22,0/10,000 civilian employees). At regional level, in 2011, researchers accounted for 0.11% of the civilian population, below the national average of 0.30%. In 2010, the South-East Region was among the last in the European Union, with 0.14 researchers per 100 employed people. West Midlands Region has been a centre of innovation in transport for decades. After a decrease in productivity and innovation due to a decline in the manufacturing base, particularly automotive, the region began a remarkable turnaround in 2008 when Ford sold Jaguar Land Rover to the Tata Group.

3.3 RESEARCH, DEVELOPMENT AND INNOVATION SPENDING

This subsection gathers available information on spending in transport sector. Data included is different due to the diversity of data sources.

Abruzzo



Almost half of all expenditure for R&D in Abruzzo (47.6%) is generated by the business sector, with an index score that places it amongst the regions of Southern Italy with the highest level of investment. Universities account for 38.8% of economic output and public authorities for 13.6% of the total (the contribution from non-profit organisations is still low).

The innovative capacity of the Abruzzo production system is better than it used to be: the current context as defined using the parameters of the European Innovation Scoreboard is more or less in line with what is found nationally.



Abruzzo Tocco da Casauria

Central Macedonia

The only sector where the R&D expenditure as a share of GDP is above the national average is that of the higher education, with higher education expenditure on R&D (HERD) accounting for 0.4% (€97.29m) of regional GDP (2013), compared to the national average of 0.3% (see 4.4 Transport innovation mechanisms) (Regional Innovation Monitor Plus, 2018). In 2011, RCM ranked 4th among the Greek Regions in terms of R&D expenditure.



Castle of Platamon Central Macedonia

Prague

Almost one-third of all the organisations performing research and development are in Prague. Prague has almost a 50% share of all the organisations performing R&D in the governmental sector and more than a 35% share in the public university sector. To be more specific, 21% of innovating companies, 75% of institutes of the Academy of Sciences of the Czech Republic, 43% of universities (public and private) and 30% of other research institutes (including private companies) are based in Prague.

This fact also relates to other characteristics such as the employment rate in R&D and expenditure on R&D. Prague accounted for 41,5% of the total R&D expenditure in 2014. Its value has increased in current prices by 172,4% since 2000, while the growth in the whole of Czech Republic reached only 126%. In purchasing power standard in constant prices, R&D expenditure allocated in Prague increased by 96,9%. This growth significantly exceeded the growth rate of the Czech Republic (63,4 %) and the EU-28 (18,3%). Support to research and development from the national budget was at the level of approximately 2,6% of GDP in Prague (the Czech Republic 1,9%, EU-28 2,3%).

South-East Region



Based on data inputs from Regional Development Plan of the South-East Region, in terms of innovation typology, in 2010, 43.89% of enterprises were product and process innovators, 40.72% were process-only innovators, while 10.86% introduced product-only innovations. Large innovative enterprises own the highest share. Innovation can be found in 60% of the large firms, 45.70% of the medium-sized enterprises and falls to 33.7% for small enterprises. Sectorial analysis shows that between 2008-2010, at the level of the South-East Region, 36.30% of the industrial enterprises and 37.80% of the tertiary enterprises were innovative.

Research and development activity is not, however, the main source of innovation in innovative enterprises: only 8.58% of innovation spending in 2010 was R&D activity, while purchases of machinery, equipment and software accounted for 89.48%. **The share of R&D expenditure** is particularly low in large enterprises, the decrease being 25 times compared to 2008, reaching 3.12% in 2010 (from 122,503 thousand lei to 4,782 thousand lei), and a drastic decrease in expenditures on purchases of machinery and equipment (from 451,548 thousand lei to 145,912 thousand lei).



Teatro Maria Filotti, Braila, Romania

West Midlands

Spending on research in the region has traditionally lagged the rest of the country. Since 2010, this has been changing, but it can be difficult to isolate – in 2016, the published headline data combined information from West and East Midlands to preserve confidentiality. Until 2016, growth in spending was higher over the past five years than the rest of the country.

Department of Transport provides specific funding schemes for innovation, advertised on a national basis, and the region has been successful in gaining some of these funds. Additionally, funding is available both from the UK government Department for Trade and Industry through Innovate UK and from EU Structural Funds. This funding supports business and targets regional growth. Whilst almost all of the funding is generic for businesses, given the size of the transport industry in the area, some of it is used for transport innovation.



3.4 TRANSPORT INNOVATION MECHANISMS



Junction crossing city

Most regions have rather defined mechanisms as key projects and methods in the area of innovative transport. West Midlands, Prague and Central Macedonia have presented a series of projects and initiatives related to the improvement of transport in the area. Most innovations projects focus on: *developing software application for public transport, improving parking, improving classic transport switching to using light rail, amongst others.*

Many Regions have initiated projects and measures in correlation with their attributions as providers, as public services and the existence of RDI resources such as Universities, Companies, institutes and funding available.

In the analysed regions, innovation relates specially to process innovation and most often directly correlates **to the presence and dynamics in the university and academic sector** in general in the region as well as to the existence of **collaboration** between **universities and the business sector**.

Some Regions, such as South-East, Abruzzo and Central Macedonia have a greater focus on being the driver for innovation and a policy actor. They **conduct strategies on innovation in transport while financing key investment projects financed** under various sources such as ERDF - Regional Programs sponsored by the EU. Most of the Regions have the responsibility to finance Urban Transport.

Municipalities in the Regions have drafted **Urban Mobility Plans**, which represent a key step in developing local policies for transport as public service. In Prague for example, a series of instruments such as Innovation Market web application, ESA Business Incubation Centre Prague (ESA-BIC Prague), Prague Startup Centre called Prague IoT Centre: IoT & SmartCity incubator. Smart Traffic includes topics such as:

- Electromobility and Smart Traffic
- Smartphone applications for drivers
- Transport optimization
- Availability of parking places

- Measuring the passage of cars
- Monitoring driver behaviour

Other regions have developed mechanisms for transport Innovation, such as:

- Specific research projects: Holistic Personal Public Eco-Mobility
- Strategies for urban mobility: Assist-mi (for people with disabilities), Apply parking
- Software developed to serve for transport as public service: Intelligent Variable Messaging System providing journey guidance for passengers
- Innovation of classic means of transportation such as West Midlands projects for Light Rail and Light Innovation



3.5 BARRIERS AND ENABLER/DRIVERS OF TRANSPORT INNOVATION

3.5.1 Barriers

Barriers represent a threat identified by key stakeholders in the Regions and have most of the time an external source to the institutions. Barriers can be organized around some typologies and include fiscal or regulatory constraints, competition constraints.

General conclusions

Lack of strong economic incentives for an ecological transport system

Price tools aim to stimulate the purchase of green cars, the use of environmentally friendly fuels and the reduction of vehicle use. Examples: fuel taxes, high parking rates, tax cuts for new vehicles using environmentally friendly technology (such as hydrogen, methane, electricity and hybrid technology).

Lack of efficient urban transport

One key step is to provide or continue funding for implementation of Sustainable Urban Mobility Plans for all cities with a population of more than 100,000 and even expand to associations/partnerships of cities aiming to organize transport in common.

Reduced investment in road infrastructure

Road infrastructure development should be done using appropriate transport infrastructure technologies, which will save fuel and reduce CO₂ emissions.

Lack of communication and collaboration between stakeholders, public actors – businesses – universities

Human Resources in Transport RDI are scarce and therefore well-prepared experts to improve the public-private and university dialogue. Best collaboration shows up where the private environment is active and takes responsibilities in producing investment. The role of Universities is that of improving public policies in transport and create DEMAND for innovation.

Policy focused on public transport

Focus on Public Transport and less on developing products/private transport businesses.

Limited access to finance

Banks and other financing is poor; ESIF has a targeted strategy financing public transport – green – not so much.

Infrastructure barriers

Lack of infrastructures for smart and green fleets, access to build infrastructures in historical sites.

Policy barriers

Tax barriers, property of infrastructure related barriers.

3.5.2 Drivers

Drivers are generally strengths met by the Regions, opportunities that might be used in the future to improve the development of transport innovation. Drivers, similar to barriers, can be either policies and regulations, methodologies and methods, financing programs, product development or even business good practices.



General conclusions

Demand for innovation

The UK example indicates that Universities and public authorities should design public policies in transport and create DEMAND for innovation.

Stakeholders' collaboration and the role of the public authorities as key innovation drivers

Communication between stakeholders is a key success factor. Good examples from the Regions include: RIS3 strategies governance structures, role of the Regional Agencies or Management Authorities for Regional Operational Programs (South East, RCM, Abruzzo).

Universities are another key driver for innovation in transport

Academic activity in the Regions part of the project is intense since key European universities work there. Coventry and Birmingham University are lead research institutions and produce RDI results such as patents that are part of the technological transfer projects. Prague also collaborates with the University of Prague.

Resources and financing programs, EU support for Transport Innovation

Financing programs to stimulate collaborative research or investment in transport. Good practices could be met in all regions involved, from the Regional Funds allocated to transport and urban mobility (South East) to national programs (UK Autodrive) and public-private partnerships (RCM). In general, ESIF financing focuses on innovation, transport.

Innovative Projects

From the driverless programs to different software development to improve public transport accessibility, projects are a great feature of the Regions.

Regulations/transport policy

Urban Mobility Plans, traffic management initiatives, infrastructure construction/modernization, greening urban fleets, considering investing in new transport modes.

Tax relief when innovative investments or process innovation in transport are initiated by the private sectors.

Dynamic of private transport sector

South East (Yazaki), West Midlands (Jaguar Land Rover).



3.6 GOVERNANCE

Governance is a key element in the process of improving public policies in the area of innovation and transport innovation. Partners have set up different mechanisms to negotiate and substantiate policies at regional level, including Innovation Strategies and Local Strategies, Innovation Committees for Innovation and so on. Public administration representatives, Universities, Research institutes, Transport Companies and other Business and NGOs are categories of stakeholders invited to participate and improve policies.



4

SWOT ANALYSIS





Strengths, Weaknesses, Opportunities and Threats were identified for participant Regions. Some key conclusions are presented below:

Strenghts	Weaknesses
Networking: cooperation with Academia and Public Authorities	Not enough developed and widely adopted business 'culture' that favours the development of a well-structured marketing and sales strategy
Participation in transport related research and territorial cooperation projects at European level	Cooperation of the academia with the industrial sector is usually not facilitated directly by establishing links with companies
Existence of Smart Specialization Strategies	Bureaucracy, the taxing system and the absence of a culture favouring business initiatives
Existence of RIS 3 documents	Institutional framework of different laws that are in force and regulate the mobility and logistics
Relative high share of qualified academics	Limited self-financing capacity of regional SMEs for innovation
Specialization of Regions	Complicated legislation setting and regulations negatively affecting the innovation implementation
Good share of high tech products to export	Productivity and competitiveness below global standards in many plants
Private sector manufacturing transport sector	Concerns about quality and costs – relatively high costs of labour
Emerging capability in new higher-value-added technologies especially autonomous vehicles	
Opportunities	Threats
The enhancement of researchers' mobility and the encouragement of involvement in international fora and activities could help in innovation promotion	Unclear and changing institutional framework
Growing pressure to export may help to drive business innovation and an increased openness of the production system	The migration of high level educated people
Transfer of international experiences and best practices	General scepticism, mistrust and lack of interest to the European Union funding and subsidies
Innovations and improvements in public transport vehicles resulting in higher preference of public transport and decline of private vehicle traffic	Lack of interest of public authorities in the innovation processes and their support
Current transport problems increase the demand for new and alternative solutions	High investment costs associated with innovation
Multiple funding opportunities	Reluctance of private enterprises and universities to cooperate
Exploiting regional technology expertise to attract inward investors	Global trends in transport industry and slow catch-up capacity at a large scale (mostly SMEs are pioneer innovators)

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