

## INTELLIGENT SOLUTIONS SUSTAINING URBAN ECONOMIES – A TRIPLE HELIX APPROACH

**Subtheme:** 2.6. Relevance of the Triple Helix model for sustainable development challenges (Climate change and clean energy; Sustainable transport; Sustainable consumption and production; Conservation and management of natural resources; Public health; Social inclusion, demography and migration; Global poverty).

**Title:** Intelligent Solutions Sustaining Urban Economies – A Triple Helix Approach

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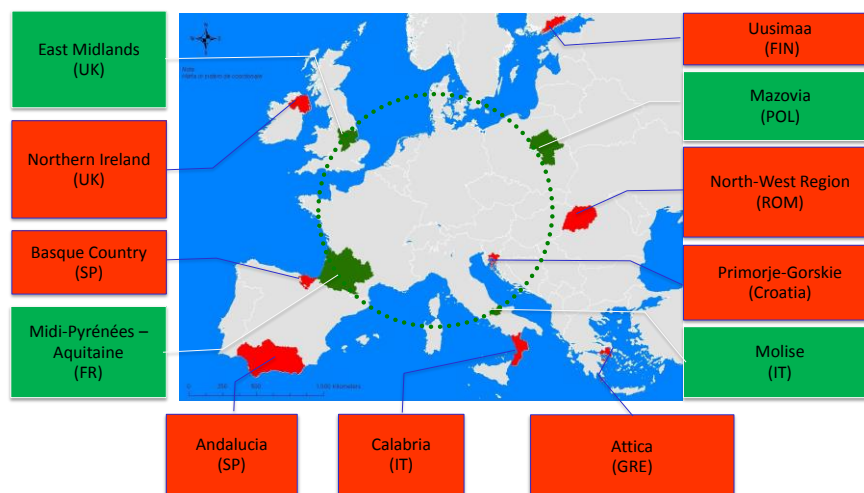
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**Introduction:** THE ISSUE (Transport, Health, Environment, Intelligent Solutions Sustaining Urban economies) is a Regions of Knowledge Project funded through the EU 7<sup>th</sup> Framework Programme<sup>1</sup>. THE ISSUE takes a Triple Helix approach to focus on traffic, health and the environment in order to identify intelligent solutions for sustaining urban economies. The project is made up of four clusters from the East Midlands Region (United Kingdom), the Midi-Pyrenees and Aquitaine Regions (France), the Molise Region (Italy) and the Mazovia Region (Poland). This paper specifically looks at the differences in the Triple Helixes within each region and also how these differ from each other and the Triple Helixes in our associate regions Andalucia and Basque Country (Spain), Calabria (Italy), Attica (Greece), Northern Ireland (United Kingdom), North-West Region (Romania), Primorje-Gorski (Croatia) and Uusimaa (Finland).



**State-of-the-art:** It is traditionally difficult to bring together the Triple Helix (local/regional authorities, university and research organisations and industry [including SMEs]) with a common goal, particularly for urban challenges, such as sustainability in transport. Local and regional authorities understand their transport challenges, priorities and needs, but do not always understand or are aware of the regional expertise and research base in universities, research organisations and industry. Research organisations and industry are not always able to understand or have awareness the needs and priorities of their local and regional authorities and research is often not directed towards meeting these priorities.

Establishment of a Triple Helix in a region creates a mechanism for bringing together the needs and priorities of local authorities with the expertise and knowledge of regional research organisations and industry. Regional Triple Helix networks also allow a movement towards regions becoming collaborative as opposed to competitive and the inclusion of a wider range of stakeholders in policy decisions. This will allow intelligent transport solutions to be developed that will meet the needs of the users.

The level of the Triple Helix is highly variable between our partner regions. Midi-Pyrenees and Aquitaine have a well-established cluster with strong links between authorities, regional SMEs and industry and research organisations. Molise and Mazovia, on the other hand, are on their way to establish a successful cooperation within regional Triple Helix and find THE ISSUE project a great chance to better understand how it can be more efficient.

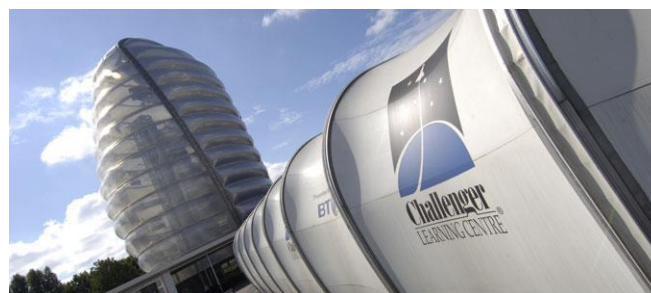
The challenge for establishing and maintaining a regional Triple Helix is often down to resources. THE ISSUE project has gained some resources for establishing this activity in 4 core partner regions and 8 associate regions within Europe. However, these resources are limited and further work is needed.



## East Midlands (UK)

### 1. Introduction to the region

The East Midlands is located in central England and encompasses 9 cities and towns. It contains 9 universities and is broken down into 9 local authorities. 23% of economic output in the region is attributed to manufacturing and an estimated 17.7% of employed people work in the public sector<sup>2</sup>. The East Midlands is the UK's leading region for research into space technologies and the commercial exploitation of Downstream Space Services and is home to the National Space Centre.



*Leicester's National*

*Space Centre<sup>3</sup>*

### 2. Existing Triple Helix Structure

The East Midlands has traditionally had a strong triple helix structure working through the East Midlands Development Agency (EMDA), which was accountable to the East Midlands Regional Assembly (EMRA), composed of elected councillors from all local authorities in the East Midlands Region. EMDA also had representatives of industry, universities, business and labour organisations on its management board. EMRA also managed the production of strategic plans for the Region, covering development, environment and transport. However, these Regional Bodies were closed down by the UK Government in 2012, thus creating a challenge for the continuation of these activities. The Government has now supported the creation of a number of Sub-Regional bodies, known as Local Enterprise Partnerships (LEP) whose role is to take over the functions of EMDA. The LEPs are still under development, but it has been recently announced that they will take over responsibility for the management of some European Structural Funds (ESF) resources.

### **3. Challenges for implementing the Triple Helix**

The main challenge has been to maintain the Regional networks created under EMDA post abolition. This has been partially successful, as the distributed organisations (Universities, Commercial and Local Government) that formed our Triple Helix have continued to co-operate on an informal basis, with various actors taking the lead roles. The other advantage is that a number of ERDF funded bodies, active in niche markets survived EMDA's abolition, and many have successfully secured new ERDF funding to continue operating.

A strong example of post-abolition networking is the East Midlands Transport Sector. Amongst the bodies that are maintaining the triple helix are:

- The Transport iNET: An ERDF funded body based within Loughborough University that supports innovation in Regional Universities and SMEs.
- G-STEP: An ERDF funded body based within the University of Leicester that promotes the commercial use of Earth Observation Data, which has interests in transport.
- GRACE: An ERDF funded body based within the University of Nottingham, which specialises in the research and commercial use of Satellite Navigation data.
- CENEX: A UK funded body that supports the development of low carbon technologies, including low carbon vehicles

A cluster of Universities have also taken on the role of providing Knowledge Based Partnerships (KTP) that used to be offered by EMDA, which linked a University with an SME to translate technology and research into new products. Therefore links between Universities and regional industry are still strong; however input

from policy makers has been weakened. The key challenge therefore is to rebuild the triple helix, engaging all sides of that style of partnership, and to make it financially sustainable.

#### **4. Benefits of an improved Triple Helix for transport, health and environment**

The East Midlands, and Leicester in particular, considers transport, health and environment as a priority, particularly with cities facing increasing costs through fines for poor air quality and health implications. Improving the Triple Helix brings together the technological developments being made through research with industrial partners focused on meeting the needs of the local authorities. This enables solutions to be met within the same region as opposed to looking elsewhere.

### **Midi-Pyrenees and Aquitaine (France)**

#### **1. Introduction to the region**

Midi-Pyrénées and Aquitaine regions are the worldwide leader in terms of space technologies and related services as positioning or data collection. Thanks to the presence of different actors from the satellite industry to the important network of SMEs focused on satellite applications, the territory covers the entire value chain from satellite manufacturing to GIS services. This fertile ground, coupled to increasing needs of more intelligent transport management, lead to the emergence of collaborative projects, mainly based on positioning and navigation technologies of vehicles or citizens. Today the ambition of Midi-Pyrénées/Aquitaine regions is to create innovative and high added value services that could solve issues like traffic regulation thanks to a better use of collected or open data, or issues related to citizens' mobility thanks to innovative travel platforms and GIS for example.

#### **2. Existing Triple Helix Structure**

The French Government has recently promoted an ambitious policy designed to develop clusters and reform higher education and research in order to bring them together and create centres of excellence research networks at the local scale. Between 2004 and 2006, French government legislation successively created 6 "Pôles de compétitivité" (Competitiveness Clusters), 2 "Pôles de Recherche et d'Enseignement Supérieur" (Research and Higher Education Clusters) and 2 "Réseaux Thématiques de Recherche Avancée" (Thematic Networks for Advanced Research) in the regions Midi-Pyrénées and Aquitaine. The main aims of competitiveness clusters are to stimulate innovation and cooperation between the triple helix context industry, public research and education and to constitute a new regional driving force serving the economic growth in a clearly defined territory and given thematic. A total of 71 competitiveness clusters have been distinguished, including seven so-called "world class" competitiveness clusters. Aerospace Valley, based in

Midi-Pyrénées/Aquitaine is one of them. With over 600 members, including more than 300 SMEs, Aerospace Valley is one of the most efficient triple-helix associations in France, with the accreditation of more than 500 projects in 7 years. There are other regional organisations in the trend of the triple helix like: Midi-Pyrénées Innovation which regroup and coordinate innovation, Technical Development Network (Réseau de Développement Technologique), Innovation and technology Transfer Regional Centre (Centre régional d'innovation et de transfert de technologie), Southwest France Enterprise Europe Network, etc. Furthermore, regional authorities invest in certain areas of research by financing innovation projects.

### **3. Challenges for implementing the Triple Helix**

The key success factors of these regions in the aerospace and intelligent transport activities are: the relevant knowhow of universities, partnership between universities; laboratories and companies which allow several funding; partnership between companies and public authorities which represent an important part of the transportation and traffic management market and also, provide support and sites for experimentations and demonstrations.

### **4. Benefits of an improved Triple Helix for transport, health and environment in your region.**

As transport, health and environment are part of general interest and thus, public institution objectives, improving the Triple Helix is making the adequacy between the technologies provided by industries and the needs represented by the public authorities more consistent. In the same way, education, and public research orientation would better fit to the public and private market needs.

## **Mazovia (Poland)**

### **1. Introduction to the region**

Mazovia is located in central Poland and covers area of 35,6 square kilometres (11,4% Poland's area), which makes it the largest region in Poland. Mazovia's population figure 5,2 M people, with almost 2,7 M inhabits the Warsaw Metropolitan area. Urban development of the region is estimated at 65% and regional settlement network consist of 85 cities and towns, among which is the capital of the Poland, Warsaw. Mazovia region can be seen as divided into two different socio-economic zones; one is Warsaw and its metropolitan area and other, rather rural, part of region. Mazovia is the province with the greatest economic potential in Poland, well placed to play a major role among European regions. Mazovia's present industrial potential together with its well developed telecommunication infrastructure as well as its agricultural potential and the most productive human resources in the country, create an unlimited perspective of fast returns on investment outlays.

### **2. Existing Triple Helix Structure**

Mazovia finds the triple helix approach an excellent platform for the exchange of ideas and policy requirements. This ensures that research driven clusters are developing solutions that meet regional government policy objectives and are commercially viable. Mazovia is on their way to establish a successful cooperation within regional triple helix and finds THE ISSUE project as a great chance to better understand how increase its efficiency by learning from more mature clusters. Establishment of a triple helix creates a mechanism for bringing together the needs and priorities of local authorities with the expertise and knowledge of regional research organisations and industry. Existing cooperation between regional industry, research centres and universities is constantly developing, leading to better understanding of mutual needs. Further strengthening of interactions between research and industry, however, is indispensable to achieve better economic growth through introducing innovative solutions.

The weakest chain in Mazovia triple helix cooperation is with authorities and other partners, both business and academic. Nevertheless this cooperation is also improving due to, among others, projects such as THE ISSUE.

### **3. Challenges for implementing the Triple Helix**

The concept of the Triple Helix is the new approach to cooperation, that hasn't been developed in Poland and it will take some time to make people understand its mechanism. The main challenge is to overcome legislative issues, that restrain progress of the Triple Helix initiative. Polish law is not favourable to the cooperation between company and public administration and/or university. There's a barrier connected with the Public Procurement Act that makes it extreme difficult to implement projects together without the complicated procedures and without the risk of being accused of bias. The interaction should be far more easy, in order to generate synergy effects.

The other big challenge is managing human resources – there's a barrier coming from lack of people - each partner should delegate coordinators, unfortunately they often can't afford to dedicate team members, who are involved in other projects. It might be solved, but it needs effort. The reason why people tend not to be devoted to common initiatives is that they don't see the common business aim. To achieve a success each partner should have his own profit, so they take it serious.

What is more, the objective of the Triple Helix is to support each other in applying for funding in EU programmes and reinforce mutual cooperation in other projects, on regional and national level. This concept doesn't force its actors to work in the same configuration every time, so they can adopt to the particular project requirements and search for new partners, by networking actions.

### **4. Benefits of an improved Triple Helix for transport, health and environment in your region**

The better cooperation between Triple Helix actors is, the more chances they have to achieve objectives. In Mazovia region there's a big advantage resulting from good relationships between partners, who like working together and have experiences in previous projects. Partners have a set of complimentary competences, so they are more competitive, when they join their forces. The choice of partners enables highly-innovative projects related to sustaining transport and monitoring urban air quality projects. The Office of the Marshal of the Mazowieckie Voivodeship in Warsaw, as the administrative body, can identify the needs of citizens within its region and tailor its policy to invest in projects that will improve transport, health and environment condition. The support of the Institute of Geodesy and Cartography can be both as the advisory body in the process of creating strategy for region's development and also as the executor of contracted works. Their expertise might be helpful for authorities in order to make right decisions. The third strand in the helix – Intergraph, as a leading GIS company, provides not only experts, but solutions that can be implement. As a worldwide company it can transfer its experiences in other countries into Mazovia and the access to the latest technology can lead to more sophisticated and innovative approach to transport policy.

## **Molise (Italy)**

### **1. Introduction to the region**

Molise is a region situated in the central-southern part of Italy, covers an area of 4.439 square metres and is rightly considered as a bridge between northern and southern Italy and between the peninsula and the Balkan area. The population, according to the last survey conducted in 2011, is made up of 315.000 inhabitants, living in the two provinces of Campobasso and Isernia. The region is composed by 136 councils, most of which of small dimension, with a remarkable territorial dispersion also considering geomorphological compliance of the territory. Molise region is gradually narrowing the gap with the richest national and European economic areas. It is indeed working to fulfill its own goals of modernisation with several operating strategies and to promote economic development.

### **2. Existing Triple Helix Structure**

In Molise the *knowledge system* and the interactions between actors are not sufficiently developed; in other words, there's not optimum combination of the whole complex of environmental conditions - physical, regulatory and administrative - that ensure the competitive advantage of the territory, of the companies, of the research centres, of the stakeholders and actors involved. Some significant experiences can be taken into account, however, the regional profile is overall weak and ought to be strengthened. According to the Regional Innovation Scoreboard (2011), a tool developed by the European Commission to evaluate the



innovation performance throughout Europe and the level of development of each region on the base of selected indicators, Molise region is considered a “modest innovator”. On the other hand, due to the small size of the region, Molise can count on simplified institutional relations and clear opportunities of proximity between public and private actors.

### **3. Challenges for implementing the Triple Helix**

The main challenges for Molise region can be identified in a series of synergic actions which could provide the acceleration of collaboration paths and of development processes:

- sometimes excellent research and development activities conducted by companies, often in complete autonomy, remain still or almost lack of investment possibilities in the phase of large-scale production and, especially, during the promotion of products on national and international markets. Targeted funding from the public sector could encourage such growth paths;
- another key challenge is related to delays in traditional and telematics infrastructures that need to be reinforced or created;
- the specializations of the University of Molise, the main actor in the academic field, are often unable to meet all business needs in terms of human resources and in terms of scientific support to innovative activities of companies; however, there is the possibility for establishing collaborative relationships that go beyond the individual project and prepare the ground for the creation of a research-oriented enterprise economic development;
- in the field of foreign trade should be created better conditions for businesses to internationalize their production. This process, in addition to the normal channels of export, could be triggered by an incentive to knowledge and cultural exchange in favour of young entrepreneurs (eg Erasmus for young entrepreneurs, secondments, agreements with foreign privileged actors operating on international markets).

### **4. Benefits of an improved Triple Helix for transport, health and environment in your region**

The benefits from an improved collaboration are attended for the whole society and, in the future, it is forecasted the growth of interest for these issues, based on the correct and aware understanding of economic benefits associated with the increase of safety and security in the transport network and the reduction of impacts for health of citizens. For example, planning and design of the transport network should be evidence led, based on inclusive societal needs that take account of more than just moving traffic as

quickly as possible. Emerging Transport Plans need to take account of environmental and social issues as well, with a far wider input to the evidence base than just the views of carriers, public transport operators and car owners. New designs, also supported by Intelligent Transport Systems and space technologies solutions, must deliver on a wide range of policy objectives that aids the free movement of goods and people without impacting on air quality, safety and the everyday lives of citizens.

### **Associate Regions**

Our associate regions have varying levels of Triple Helix presence.

The Basque region in Spain is represented by MLC-ITS (Mobility and Logistics Cluster)<sup>4</sup> and already has a strong Triple Helix structure through the organisation bringing together regional SMEs, researchers and local authorities. The Attica region in Greece is represented by the Centre for Research and Technology Hellas (CERTH) who have an objective of further strengthening its collaboration with Green and international industries and enterprises in addition to bringing together the research and governmental aspects of the organisation. The North-West Development Region in Romania is represented by the North-West Regional Development Agency (ADR Nord-Vest) as a consequence of joining THE ISSUE partnership invited universities, research centres, local authorities and private companies to join a future regional Transport Cluster. This has given the region an incentive to start building up a Triple Helix based cluster. Northern Ireland in the UK is represented by the Northern Ireland Space Office with the goal of developing a sectoral response to THE ISSUE project. The Calabria region in Italy is represented by the University of Calabria and currently has a limited Triple Helix presence. The Primorsko Goranska region in Croatia is represented by the Intermodal Transport Cluster which works on a similar membership basis as MLC-ITS. As a result they are experienced in bringing together the different organisations from the Triple Helix, but still face challenges towards solving their transport problems. The Andalusia Region is represented by the local authority but has a very limited Triple Helix presence in the region often due to limited funds and resources. The Uusimaa region in Finland is represented by VTT, a research organisation. A Triple Helix approach in this regional is still in its early stages.

### **Methodology**

THE ISSUE project is focusing on the exploitation of research driven clusters in the general field of Intelligent Transport Systems (ITS), and offering ITS solutions that also have positive impacts for the environment and citizens' health. The Triple Helix approach provides an excellent platform for the exchange of ideas, and

policy requirements. This ensures that research driven clusters are developing solutions that meet Regional Government policy objectives, and are commercially viable.

The Triple-Helix methodology supports a suite of 2-way communication processes:

- Regional Government Policies are able to take account of emerging technologies, and to feedback requirements to the RTD and industrial base.
- RTD actors are able to support informed policy making, and to work with industry to develop cutting edge technology that will be commercially successful, thus enhancing the regional economy.
- Industry actors benefit from gaining access to emerging technology, and can develop supply chains with Regional Government.

We are now approaching the midpoint of the project and have completed an audit of Regional Research Capabilities, Commercial activities and Regional/Local Government Policy objectives. Each Region contacted RTD, Regional Government & Industrial actors in their Regions. Thus we created a database that held the RTD and Industrial capacity to develop and deliver ITS solutions and products. The real strength of the Triple-Helix approach is that this database also identified the Transport Policy Objectives of Regional & Local Government; hence this project is now able to match RTD and Industrial capacity with Policy needs. In effect the project has created a forum from which international supply chains can be developed, and Inter-Regional Consortia developed.

We are now progressing to the development of a Joint Action Plan that will deliver legacy projects and actions that are economically sustainable. The JAP ethos is that having identified policy needs, and the ability of the RTD and industrial base to deliver technical solutions, we must now develop legacy bodies that will support economically sustainable activity in this market sector. For implementation of the JAP a Business Plan will be delivered. Its purpose is to evaluate the resources needed to implement the JAP against likely funding opportunities. It will put down markers for priority funding needed to progress with implementation and it will address opportunities for commercialization of RTD outputs by the industry sector likely to arise from the planned RTD actions.

The JAP will identify core RTD themes, which form the basis of the development of project teams to delivery legacy activities. To support the JAP after the end of the project a number of activities will be carried out to ensure continuation of the excellent work achieved throughout the project.

A Special Interest Group (SIG) will be established. Current thinking and plans are that each partner region will nominate an existing body or establish a new body to be the regional focus for transport, environment

and health in urban environments. Additionally, a European overarching structure will be established to coordinate the activities of the regions with each other. The purpose of including a regional structure for each partner region is that it can be traditionally difficult to encourage participation of SMEs in European activity, whereas it is much more realistic for them to participate in regional activities. A regional focus also works towards improving the Triple Helix in these regions through encouraging the different organisations to work together and communicate through events and newsletters. Another goal of the SIG is to encourage participation of regional Triple Helix partners in future Horizon 2020 funding opportunities. Establishment of the SIG in the associate partner regions will also be encouraged and mentored by the core partners.

Staff exchanges and secondments will be undertaken to share best practice and mentor emerging clusters.

This will take place on three key levels:

1. Secondments and exchanges between different organisations a specific region
2. Secondments and exchanges between different organisations in the different partner regions
3. Secondments and exchanges between the core regions and the associate regions

Secondments of senior executives on to management boards is a well tried route for stimulating knowledge transfer and innovation between different partners in a helix (e.g. academic-industry; industry-public authority; academic-public authority). In addition, each region has their own expertise and experience to share with the other regions in the partnership and working closely together is often a productive way of sharing this.

A set of Master Classes, based on strengths identified throughout the Triple Helix, will also be developed and offered to partners and others for training purpose via the SIG web-portal. This will take the form of a series of webinars and workshops. A monthly webinar will be established in around September 2013 to provide information about best practice, technological developments and other topics relevant to the project. It will be expected that different organisations that make up the Triple Helix will prepare and give their own Master Class during the series. Workshops will take the form of interactive sessions (ideally based around the project meetings) to discuss particular topics. The first workshop to be held in Warsaw in early July 2013 will focus on the topic of open data and how it can be used to meet the needs of cities and also how it might be able to be used to develop new products.

### **Findings and interpretation:**

The project has identified major differences between the Triple Helix arrangements in our different partner regions and these are often linked to the presence of specific organisations to ensure activities that bring the

different organisations that make up the Triple Helix together. It is important to share the experience of regions with a strong Triple Helix with other European regions to ensure that they can move towards a more established structure in order to move forward with research, innovation, implementation and economic growth. These findings will guide the development of the Special Interest Group and a consultation regarding this will be carried out with each region.

It has been interesting to see what the differences are between the regions. For example, the East Midlands is attempting to maintain a Triple Helix, but with no formal body to bring the key organisations together, while Midi-Pyrenees and Aquitaine and the Basque region has strong organisations which carry out these activities based on a membership model. Each region needs to determine the most appropriate mechanisms to develop and build the Triple Helix based on existing cultures.

However, all the of the partner regions have identified the need for a Triple Helix joint approach towards solving their transport and mobility needs in order to ensure that the research activities are working towards the policy objectives and authority needs and priorities and that industrial partners work with both to develop the supply chain to bring the innovations fully to market.

### **Conclusions:**

The four different European regions that make up the core THE ISSUE consortium have differing levels of Triple Helix development. Despite this they are making an attempt to cooperate effectively within the regions as well as between them in order to make ITS initiatives become more user-focused by the early engagement of local industry, and can more easily feed into Local Government Transport Plans because of the Triple Helix networks. The eight associate regions also have differing levels and an exchange of knowledge between those that are well established and those that are not will have a positive impact on developing these networks throughout regions within Europe.

### **Policy implications:**

By bringing together RTD, Industry and Regional Government this project is able to deliver both commercial activities, and recommendations for future Regional, National and EU policy. These submissions will be highly relevant as the proposed calls for Research funding and are informed by current policy needs.

This will form the basis of submissions to relevant policy making bodies, including the Commission and Regional policy makers, on the direction of future publicly funded research programmes.

These submissions therefore will present a case for research funding that is relevant to societal needs, and are commercially viable. In effect the Triple-Helix aids the development of new policies that are scientifically sound, are capable of resulting in economic development, and meet policy objectives.

**Directions for further research:**

The great advantage of the Triple-Helix process for RTD actors is that emerging research is informed by policy needs, and the ability of industry to deliver products and services. These R&D programmes are not 'blue skies' (TRL level 1-3) but are Translational Research Projects which will transform the outcomes of fundamental research into commercial reality in partnership with industrial and policy making partners and thereby meet the needs and priorities of regional authorities in the area of transport.

The next steps are to enable the more advanced clusters to mentor the less advanced cluster in order for them to develop their Triple Helix structures for the future which will help to ensure that organisations within regions are working together to meet the needs, priorities and challenges of their urban environments.

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<sup>1</sup> <http://www.theissue.eu/>

<sup>2</sup> <http://www.ons.gov.uk/ons/regional-statistics/region.html?region=East+Midlands> [accessed 14/05/2013]

<sup>3</sup> <http://www.spacecentre.co.uk/> [accessed 14/05/2013]

<sup>4</sup> <http://www.mlcluster.com/>