



Thematic Workshop on Sustainable Transport

March 6 2013

Space and ICT applications in the transport sector

Professor Alan Wells

THE ISSUE, Scientific Adviser





THE ISSUE AFTER 1 YEAR OUTCOMES AND OUTPUTS



INTRODUCTION TO THE CONSORTIUM

SOCIAL AND ECONOMIC DRIVERS

RTD CAPACITIES

REGIONAL LOCAL AUTHORITY OBJECTIVES

ENGAGEMENT WITH ASSOCIATE REGIONS

DISSEMINATION AND COMMUNICATION

FORESIGHT SCENARIO CONSULTATION
10 and 20 Year view

JAP and BUSINESS PLAN PREPARATION



Mission Statement

Traffic-Health-Environment

Intelligent Solutions Sustaining Urban Economies

Application of information and communication technologies (ICT) and downstream space data and services for the transport sector.

THE ISSUE

Space and ICT applications in the transport sector

March 6 2013



THE ISSUE

Regions of Knowledge Project



Response to 2010 Call

**“Co-ordination of Research, Technology, and Development
between Regional Research Clusters.**

**Supporting sustainable economic development by boosting the
competitiveness of transport-related economies.”**

**“Triple Helix” regional research clusters.
Academic, Industry and Local or Regional Authorities.**

**Core partners from four European Member States
(UK, Fr, Po, It).**

Associate Regions

THE ISSUE

Space and ICT applications in the transport
sector

March 6 2013



THE ISSUE and FP7

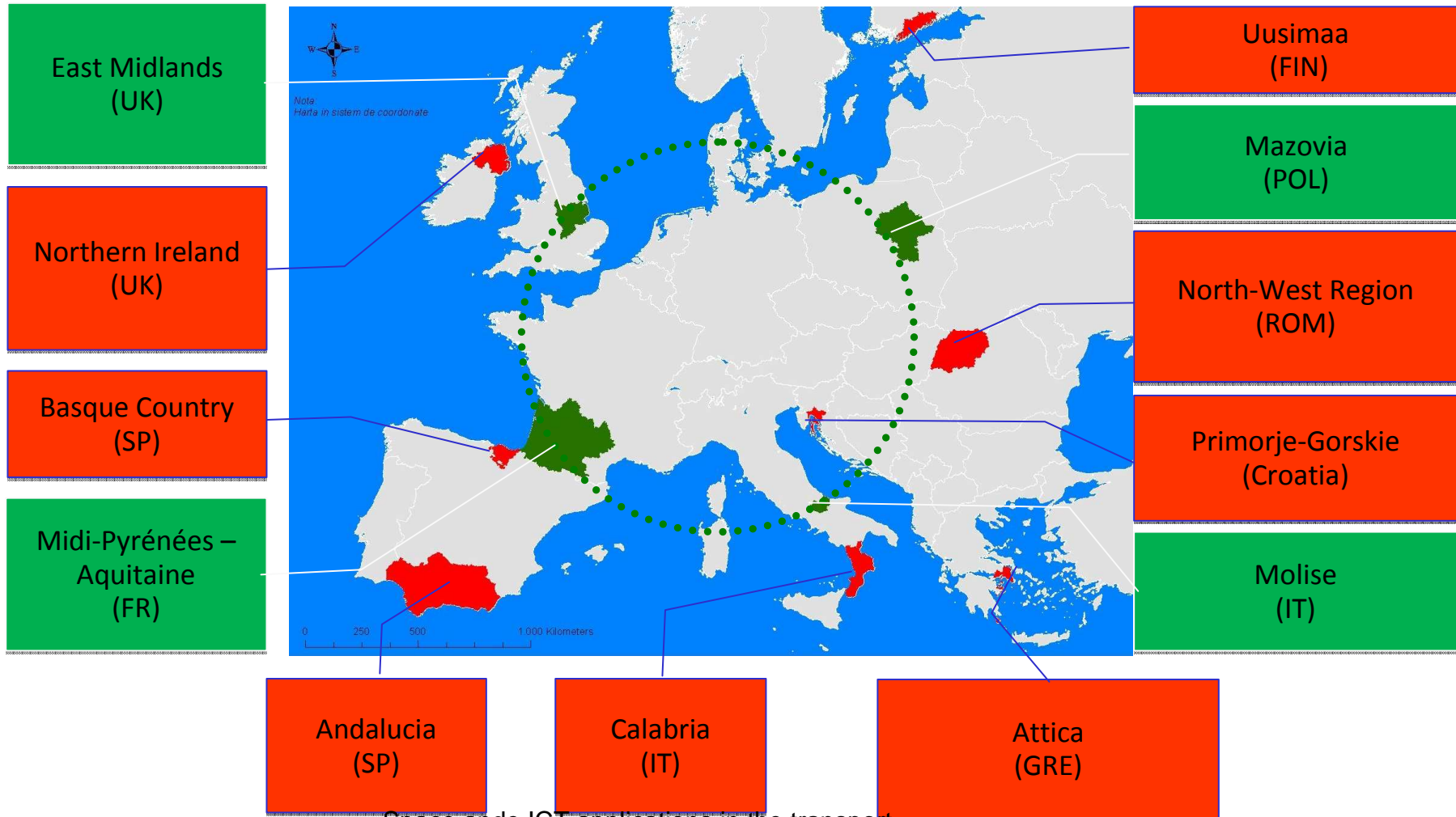


- **Socio-economic sciences and humanities research** has addressed various socio-economic processes in urban area
 - Strong urban focus in areas of **transport**, **energy**, **ICT** and **environment**
- **Health** in urban environments has emerged as a research area
- **Security** and **space research** have started to address urban environments (safety issues and GMES)



THE ISSUE CONSORTIUM

Core Triple Helix Clusters and Associate Partners



THE ISSUE

Space and ICT applications in the transport sector



Transport Impacts

UK Government statistics:

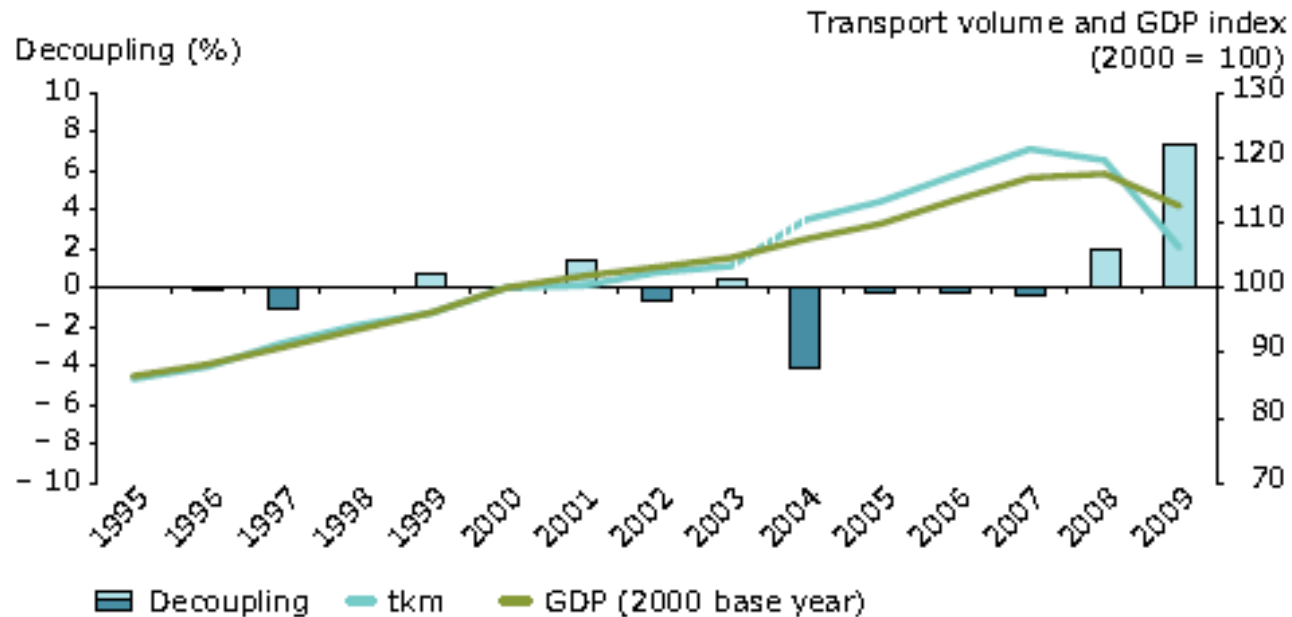
- Excess delay is costing our urban economies £11 billion per annum
- Carbon emissions impose costs to society of up to £4 billion per annum
- Cost to public health are up to £25 billion through physical inactivity, air quality and noise.
- *[Source: Cabinet Office strategy unit et al 2009]*



Freight Transport: Economic Growth Indicator (EEA 23012)



Trends in EU GDP and Freight Transport Volume (ktm=tonne kilometres)



Annual aggregated costs attributable to gridlocked traffic is estimated at 7.8B€ in Germany; 5.5B€ in France; 4.9B€ in UK..¹



The Economic Cost of Gridlock-Dec 2012. Report for INRIX by Centre for Economics and Business Research Ltd.



Table A Aggregate annual costs of idling in traffic to households, millions of euros, 2011

	Country, €m			Cities, €m		
	UK	France	Germany	London	Paris	Stuttgart
Direct costs (higher fuel and value of time costs)	€3,620	€3,883	€5,647	€1,358	€1,817	€701
Indirect costs (higher costs of goods & services)	€1,320	€1,674	€2,183	€539	€858	€261
Total	€4,940	€5,557	€7,830	€1,896	€2,675	€962

Source: INRIX, Cebr analysis

Average cost to a car-commuting household of traffic gridlock estimated at €14.2/hour



URBAN AIR POLLUTION=Health Risk

Committee on the Medical Effects of Air Pollution 1998.



Vs



EU Air Quality Directives

Local Transport Plans

Economic cost of air pollution from transport estimated to exceed 100 billion per year.

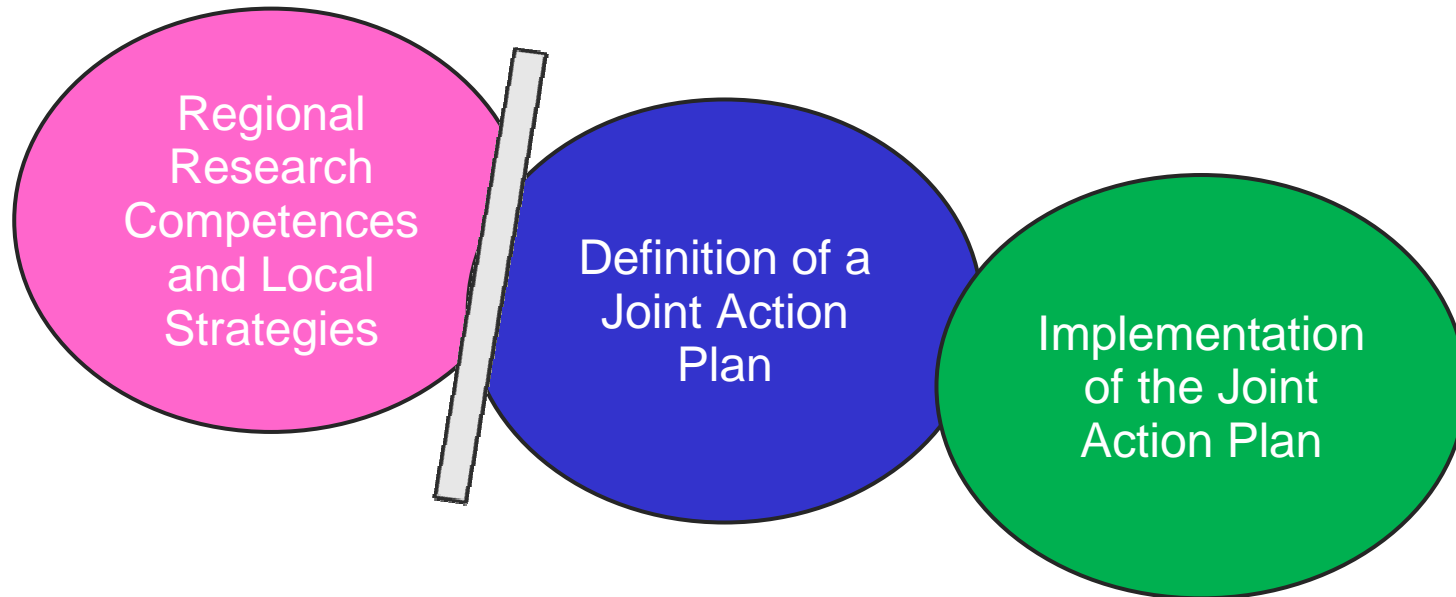
Pollution from HGVs alone costs EEA Member Countries € 43-46 billion per year, paid in years of reduced health and lost life.

EEA proposes increased taxation to mitigate rising PM and Nox pollution from HGVs.

Increasing tax burden inhibits GDP growth.



Main project steps



Where have we come from?

Where are we now?

What next?



EMERGING PRIORITIES for THE ISSUE

Application of ICT and downstream space data and services for the transport sector.

and Reduced traffic congestion, lower carbon emissions and improved air quality.

Solutions for transport mobility and intermodality for economic sustainability, social benefit and environmental health in urban and regional communities.

Knowledge exchange and inward investment through co-operation between research-driven clusters.

98 transport-related research and development activities found among the 4 core regional partners. Over half using ICT or Space Technologies.



THE ISSUE TARGET THEMES

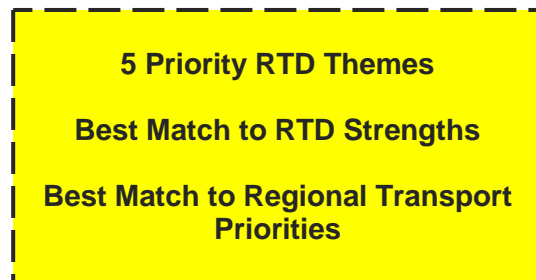
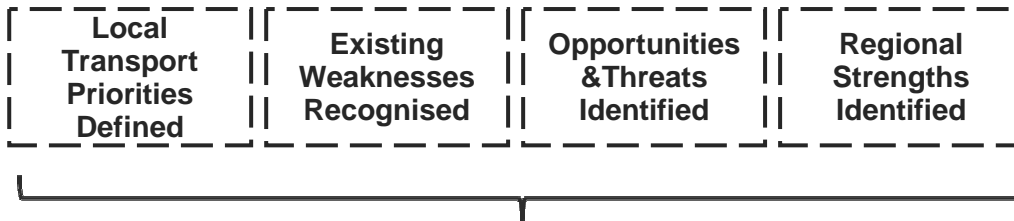
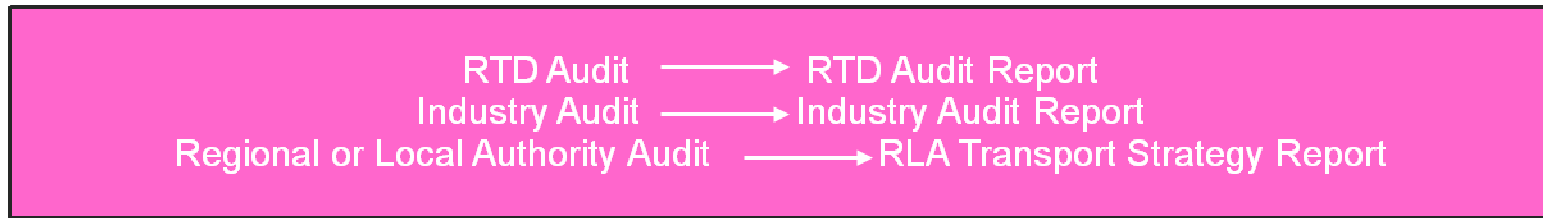


- **Intelligent Transport Systems**
- **Transport impacts on urban mobility.**
- **Transport greening.**
- **Intermodal transport**
- **Associated economic, health and environmental impacts.**
- **Safety and security of citizens.**



DATA GATHERING

Each Core Regional Cluster





ENGAGING ASSOCIATE REGIONS



Eight Regions joined THE ISSUE consortium as Associates.
MOUs signed in June 2012

Participation in THE ISSUE conferences.

Associates RTD survey against THE ISSUE prime objectives completed.

Associates participated in THE ISSUE Foresight Consultation

Planning for Associate partnering in future THE ISSUE projects.



DISSEMINATION & COMMUNICATION



Website www.theissue.eu

Open Section: News, Conference Announcements, Published Reports, Facebook, LinkedIn.

Private Section: Working documents, draft reports, internal communications.

Quarterly Newsletters.

Networks: NEREUS, Regional Cluster Networks.

Directories of regional industry transport capabilities compiled for publication.

THE ISSUE Conferences at critical project milestones.

Leicester, (UK) Jan 2012, Toulouse, (Fr) June 2012, Isernia, (It)Jan 2013.

Participation in international conferences and EC workshops.

Project Management Team and Steering Group meetings.

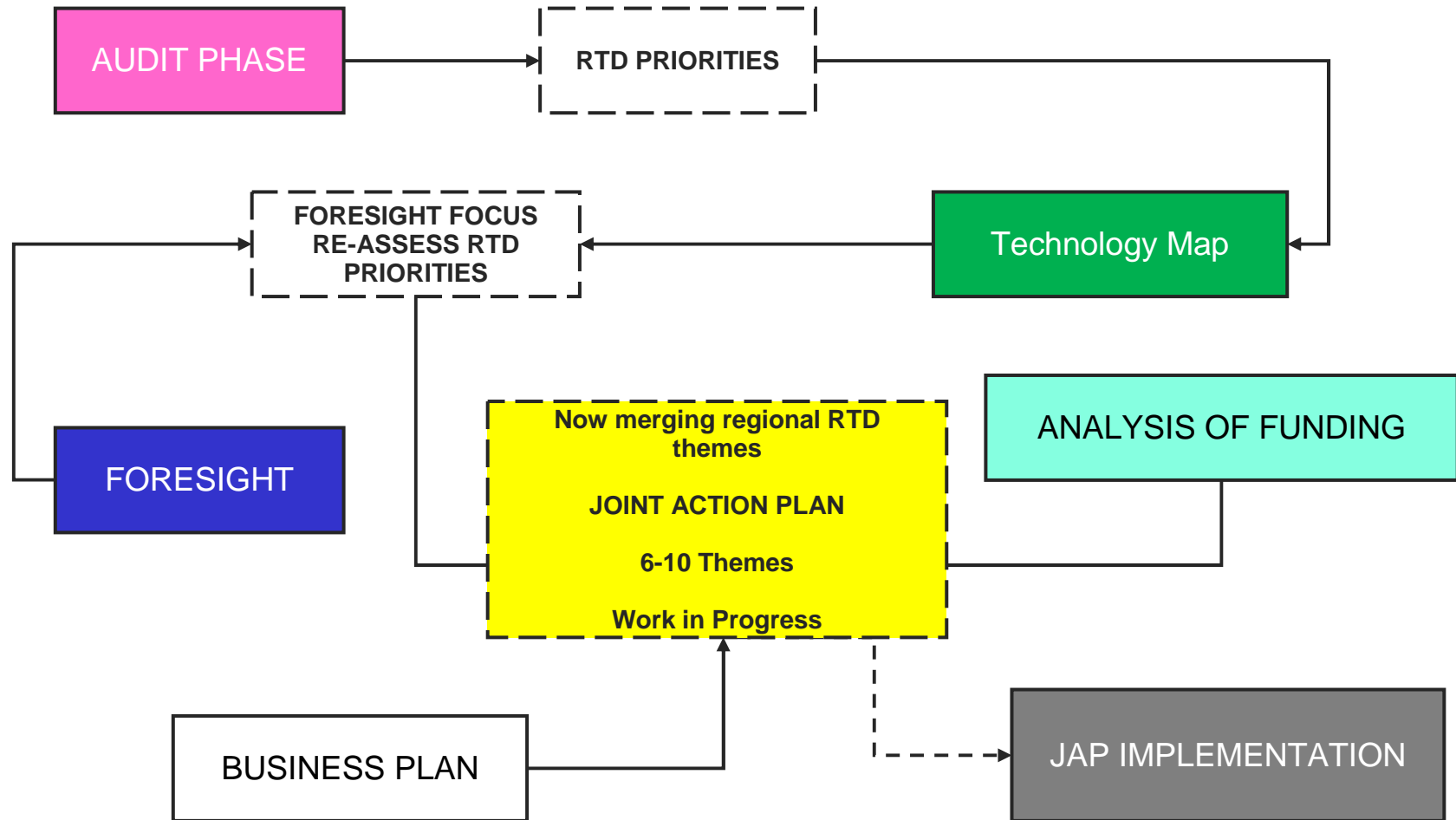
THE ISSUE

Space and ICT applications in the transport sector

March 6 2013



Consortium Workflow



10-20 Year FORESIGHT

Different futures or convergent paths?

10 year Scenario

Austerity driven

Mobility becomes less affordable,
Public service networks struggle to serve expanding cities
Constraints on private car use
Adoption of new mobility technologies

Technological or Socio-Economic Drivers?

20 year Scenario

Growth Driven

Demand for more affordable personal mobility solutions drives acceptance of managed access networks offering individual point to point mobility between and within urban centres

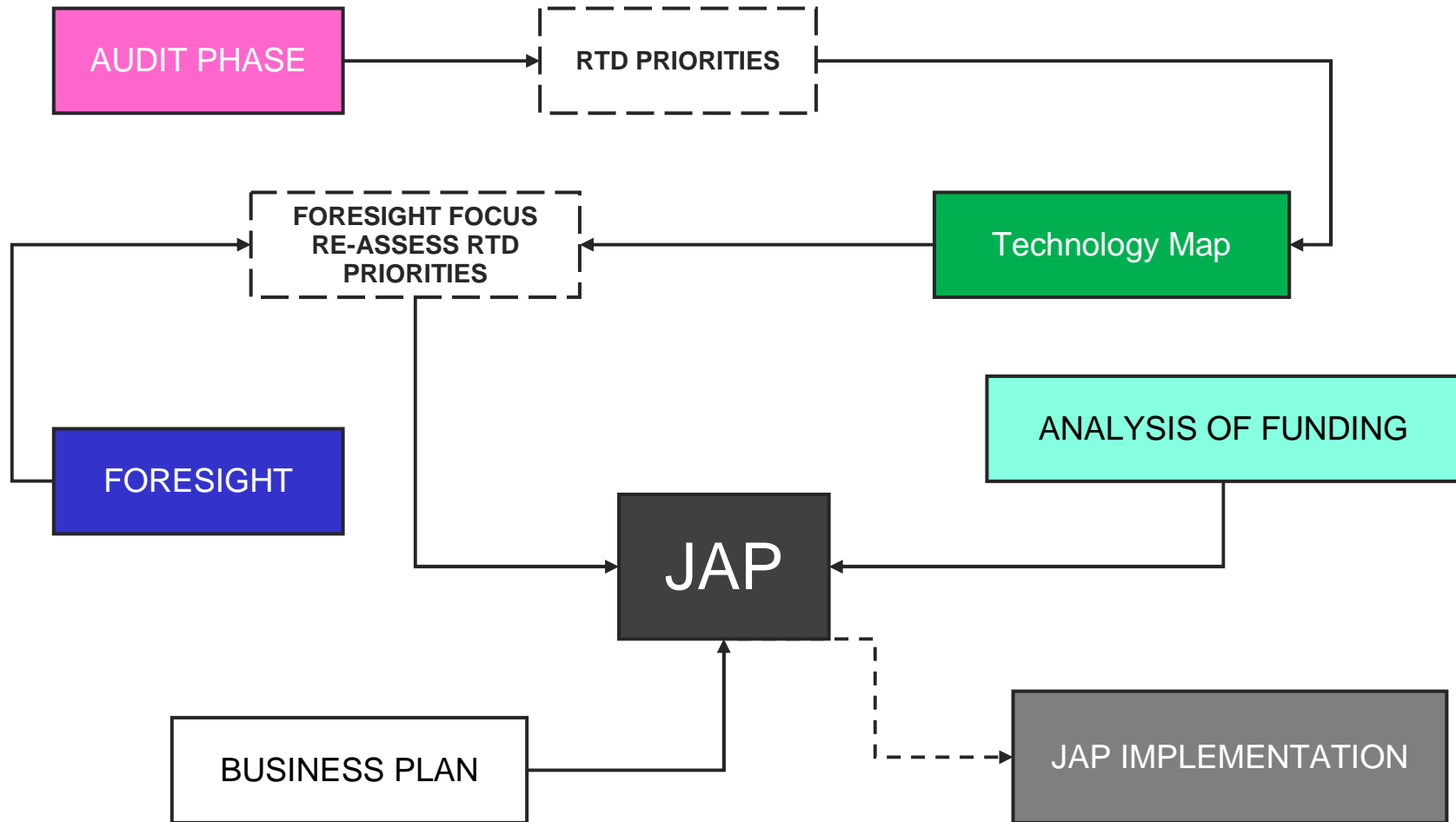
**VISION "Want to travel more, need to travel less",
Physical transport infrastructure shared by both public and private vehicles;
Managed access networks to control growing congestion and pollution;
Increased capacity of public transport networks, Better informed citizens,
Affordable point to point mobility.**

Space and ICT applications in the transport sector

March 6 2013



Consortium Workflow





Intelligent Traffic Systems East Midland RTD Priority:



Traffic Congestion and Air Quality Management are important regional policy objectives in UK Local Authority Transport Plans.

Local Authority Priorities

**High levels of urban congestion.
Air Quality directives exceeded.
Limited regional investment.
More efficient use of existing road infrastructure preferred to new built infrastructure.**



Regional Strengths

**Strong research base in Air Quality science and technology.
Innovative traffic management technology.
Developing academic-business partnership programmes with local authority end users.**





Integrated Traffic Control and Air Quality East Midlands.

Broad RTD Objective

Innovation in Intelligent Traffic Management through uptake of cross cutting technology from computer intelligence and space technology solutions.

Actual or Potential Benefit to Regional Policy

Objective matched to regional authority priorities for traffic congestion management and air pollution control. Helping regional authorities address national and European air quality and climate change directives

RTD State of Art -The Technological Solution

iTRAQ pilot trials successfully completed (Leicester 2012).
Operational system under development with full scale urban demonstration by 2014. Using GNSS and Copernicus space data sources. Supported by European Space Agency

Outlook for the Future

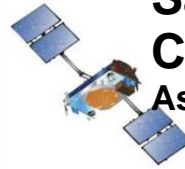
“Smart, Green, Sustainable Transport” theme of Horizon 2020.
Knowledge transfer into intermodal transport applications.
Operational systems in the market place within 5 years.

THE ISSUE

Space and ICT applications in the transport sector



March 6 2013



Satellite Construction
Astrium



Services for large public and local authority



Structural actors:
Guide platform, EGNOS

**MIDI-PYRENEES
AQUITAINE**
**OUT- & IN-DOOR
POSITIONING**



Data Provider
IGN, Telepazio, CN

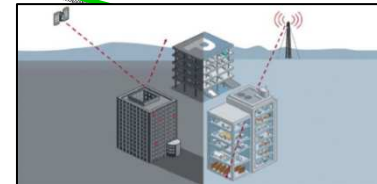
Companies:
34 SMEs, 10 Large
Indoor WW Leaders



Research
10 research centres
Pivotal Research Activities :
TeSa, ENAC, ISAE

PROJECT example

NAVIG
Navigation system for
visually impaired



FIL
Precise positioning
- Indoor - Low cost
- Hybridation

THE ISSUE

Space and ICT applications in the transport sector

March 6 2013



INDOOR AND OUTDOOR POSITIONING Midi Pyrenees-Aquitaine

Broad RTD Objective

GNSS, hybridization methods, precise localization, indoor/outdoor transition

Actual or Potential Benefit to Regional Policy

Access to traveler information in multimodal platforms, optimization of the use of the current network and regulation of cars and heavy goods, traffic data.

RTD State of Art -The Technological Solution

Navigation assisted with hybridization between embedded vision and GNSS positioning to help mobility of visually impaired.

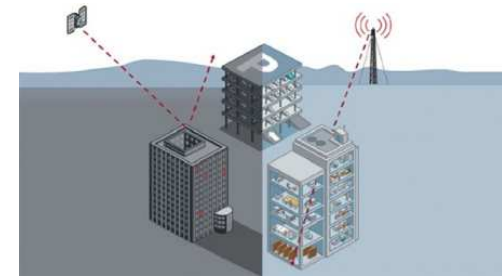
Design of an innovative localization system (*Precise positioning - Indoor - Low cost - Hybrids systems - GPS/GNSS - PDA*) with a high location accuracy and availability.

Outlook for the Future

Complete industrial chain in regions: Satellite construction – data providers – research – industry – commercialised services for large public. Structural actors : Guide platform, EGNOS Pivotal Research Activities .

THE ISSUE

Space and ICT applications in the transport sector



March 6 2013



MAZOVIA

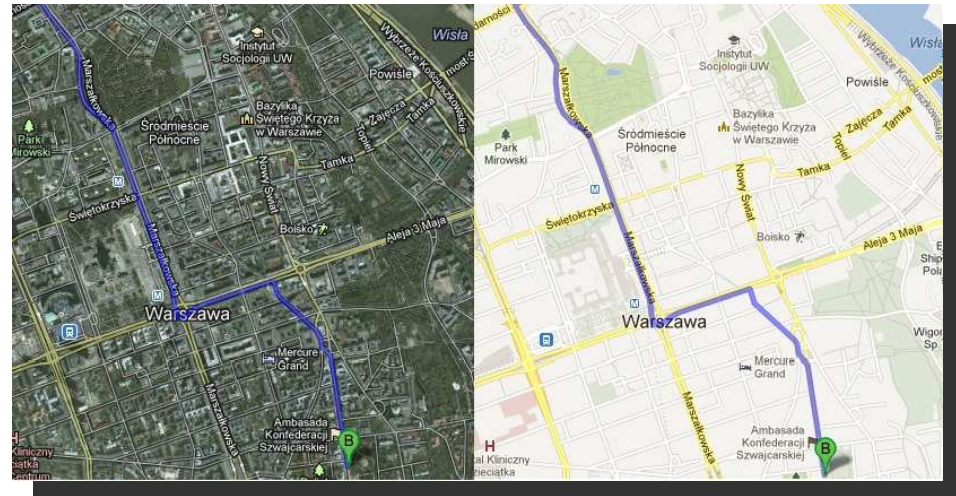


Copernicus (GMES) services for transport and physical planning applications using Spatial Data Infrastructure (SDI) solutions

Mazovia Objectives within THE ISSUE:

Utilise Intelligent Traffic Management to boost the competitiveness of transport-related economies at urban, regional and local levels .

Achieve modal shift towards public transport to reduce urban congestion and shorten journey times



Actual or Potential Benefit to Regional Policy:

1. Improving the condition of the transport system and standard of maintenance
2. Traffic congestion reduction

Document reference:

1. Spatial Development Plan Mazovia;
2. Mazovia Development Strategy;
3. Spatial Development Plan of Warsaw;
4. Warsaw Transport Strategy;
5. National Transport Policy 2006-25.



COPERNICUS SERVICES FOR TRANSPORT AND PLANNING. Mazovia.



Broad RTD Objective

Copernicus (GMES) services for transport and physical planning applications using SDI solutions. Reduction of harmful traffic related factors (air pollution and noise mitigation) introducing low carbon economies.

Actual or Potential Benefit to Regional Policy

- Development of main transport connections. Improvement of transport system conditions and standards of maintenance. Improvement of traffic safety. Development of multimodal transport network and logistic centers.

RTD State of Art -The Technological Solution

GIS4U – Provision of interoperable datasets to open GI to EU communities

Outlook for the Future

Identify market opportunities for mature RTD applications and commercial implementation . Provide regional planners with comprehensive databases of transport infrastructures to support their regional strategic planning

THE ISSUE

Space and ICT applications in the transport sector



March 6 2013



MOLISE ROAD AND RAIL NETWORKS ICT TOOLS FOR MONITORING AND CONTROL



LOCAL TRANSPORT PRIORITIES	POTENTIAL RTD SOLUTIONS
<p>1. Quality of the road network</p> <p>a) Enhancing the quality and the capacity of the main road network</p> <p>b) Increasing of the level of service for secondary roads</p>	<ol style="list-style-type: none">1. Innovative traffic management systems as tutor system for speed control2. ICT technologies to provide real time monitoring and control of road network3. Creation of specific tool (software + hardware) for road safety enhancement





MOLISE ROAD AND RAIL NETWORKS ICT TOOLS FOR MONITORING AND CONTROL



LOCAL TRANSPORT PRIORITIES	POTENTIAL RTD SOLUTIONS
<p>2. Public transport services</p> <p>a) Increasing the efficiency of public transport services, especially for the budget required for these services</p> <p>b) Improving the effectiveness of public transport services in terms of travel times and accessibility to the system;</p> <p>c) Redefining the role of the railway network and the rail passenger services</p>	<p>1. Use of real-time position, tracking, velocity and timing information for public transport services.</p> <p>2. Improving the data collection, trend monitoring and the use of innovative planning and management for the public transport system</p> <p>3. Use of ICT technologies to provide data and information to public transport operators so improving reliability, punctuality, accessibility and usage of public transport</p>





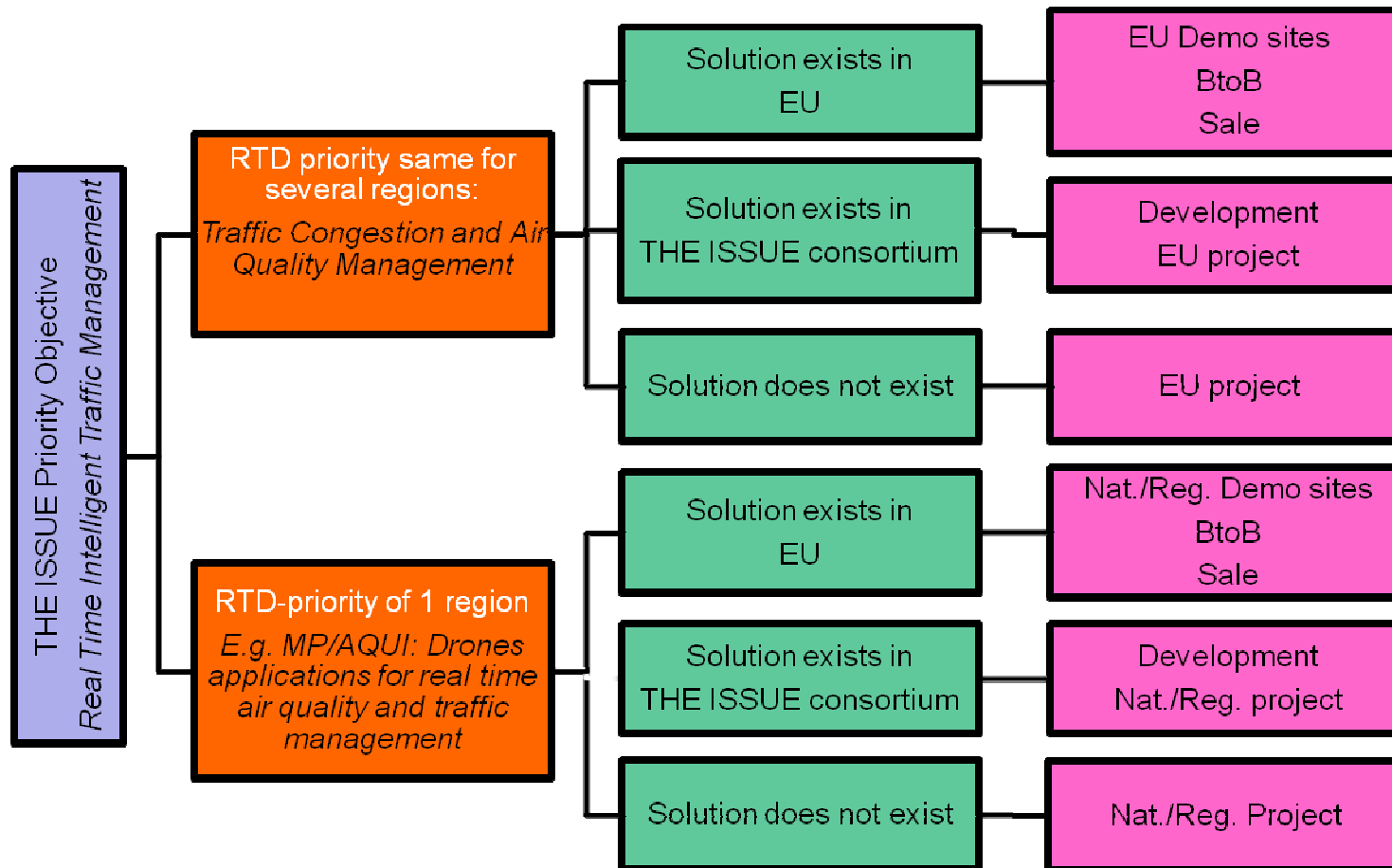
Regional RTD Priorities Guiding THE ISSUE Themes across the 4 Regions



Region	RTD priorities	THE ISSUE themes					
		Intelligent Transport Systems	Transport Impacts on Urban Mobility	Transport Greening	Intermodal Regional Transport	Safety and Security of Citizens	Associated Economic, Health and Environmental Impacts
East Midlands	Traffic Congestion and Air Quality Management	•				•	•
	Low Carbon Vehicles (LCV)		•	•			•
	Future Carbon and Air Quality Monitoring		•				•
	Road freight interoperability across urban/regional interfaces	•	•		•	•	•
	Open GIS + Interoperability	•	•		•		
Mazovia	Road information system for road network planning and intelligent traffic management	•	•		•		
	ITS solutions for accident avoidance	•				•	
	LBS solutions for improvement of transport functioning	•	•		•	•	
	Copernicus (GMES) services for transport and physical planning applications using SDI solutions	•	•		•	•	•
	Reduction of harmful traffic related factors (air pollution and noise mitigation) introducing low carbon economies			•			•
Midi-Pyrenees	Development of cooperative systems (M2M, V2V, V2I ...) for travel, traffic and air quality information services and for security issues	•			•	•	•
	Indoor and outdoor positioning (GNSS, hybridization methods, precise localization, indoor/outdoor transition ...) for transport uses	•	•				
	Modelling, management and reliability estimates of passenger flows data (all modes: car, pedestrian, bicycle ...)				•		
	UAV applications: traffic and air quality real time monitoring, control of transport infrastructures					•	•
	Satellite image processing and GIS to provide data for transport and territorial planning	•			•		
Molise	Improving quality and optimization of road network	•			•	•	
	Optimization of Public transport services		•		•		
	Promote modal change				•		
	Monitoring and control of the impact of transport on environment and citizens health	•					•



Development Paths for Priority Objectives





THE ISSUE and HORIZON 2020



'Societal challenges' Theme with €31.7 billion allocated to tackling major issues affecting the lives of European citizens and bringing results of research to market.

The focus will be on six key areas :

Health, demographic change and well-being;

Food security, sustainable agriculture, marine and maritime research and the bio-based economy;

Secure, clean and efficient energy;

Climate action, resource efficiency and raw materials;

Inclusive, innovative and secure societies.

Smart, green and integrated transport;

Smart, green and integrated transport;

Smart transport equipment,

infrastructures and services;

innovative transport management systems;

Safety aspects.



Use of Structural Funds ERDF



ERDF has been used to launch RTD projects in transport and space applications in 2007-2013. e.g. East Midlands and other NEREUS regions.

- For a smarter, greener and more inclusive Europe by 2020, **Research and Innovation** have been put **on top of the political agenda**
- Efforts to underpin a major overhaul of research and innovation systems in Europe will not only be channelled through **the Union's Research and Innovation Framework Programmes** but also through **the Union's Structural Funds** that will enter a new era in 2014
- **Smart Specialisation** will be the major driver for our future efforts at national and regional level

THE ISSUE Objective: Identify ICT and space technologies for innovation in the transport sector as an ERDF priority for Smart Specialisation in 2014-2020. Action by all 12 THE ISSUE regional partners.



Conclusions to date



PROs

RTD capabilities now well defined

Potential user needs of our regional/local authorities defined

Research triple helix cluster becoming more effective
New level of dialogue academic-industry- RLA.

Cons

Associate region engagement restricted by insufficient financial support.

Barriers to full engagement of RLAs
Austerity measures limiting flexibility of RLAs to engage or invest.

Networking is OK, but tangible benefits will need to be demonstrated to ensure sustainability.



Implementation Targets



JAP and Business Plan are the next deliverables

Implementation through delivery of tangible projects into the regional clusters is our real test.