



ERAdiate

**Fostering Interdisciplinary Research and
Innovation on Intelligent Transport Systems
at the University of Žilina**

Dr. Giuseppe Lugano

TD1403 BigSkyEarth Workshop

Sopron (Hungary), 23-24 February 2017

Presentation Outline

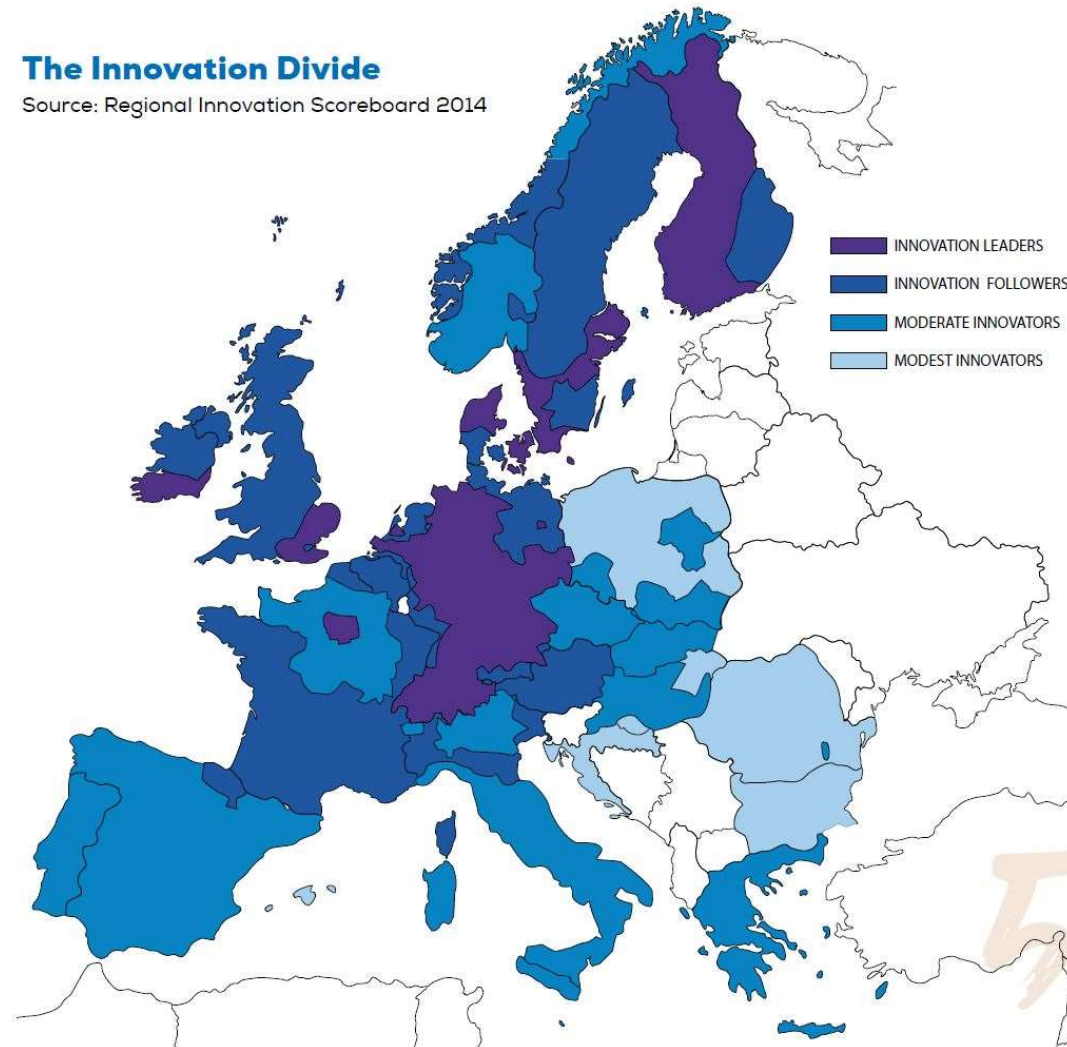
- Closing the Innovation Divide in the EU
- ERA Chairs
- ERAdiate: ERA Chair on ITS
- BigSkyEarth & ERAdiate: areas for collaboration



Closing the Innovation Divide in the EU

The Innovation Divide

Source: Regional Innovation Scoreboard 2014



Spreading Excellence and Widening Participation in H2020

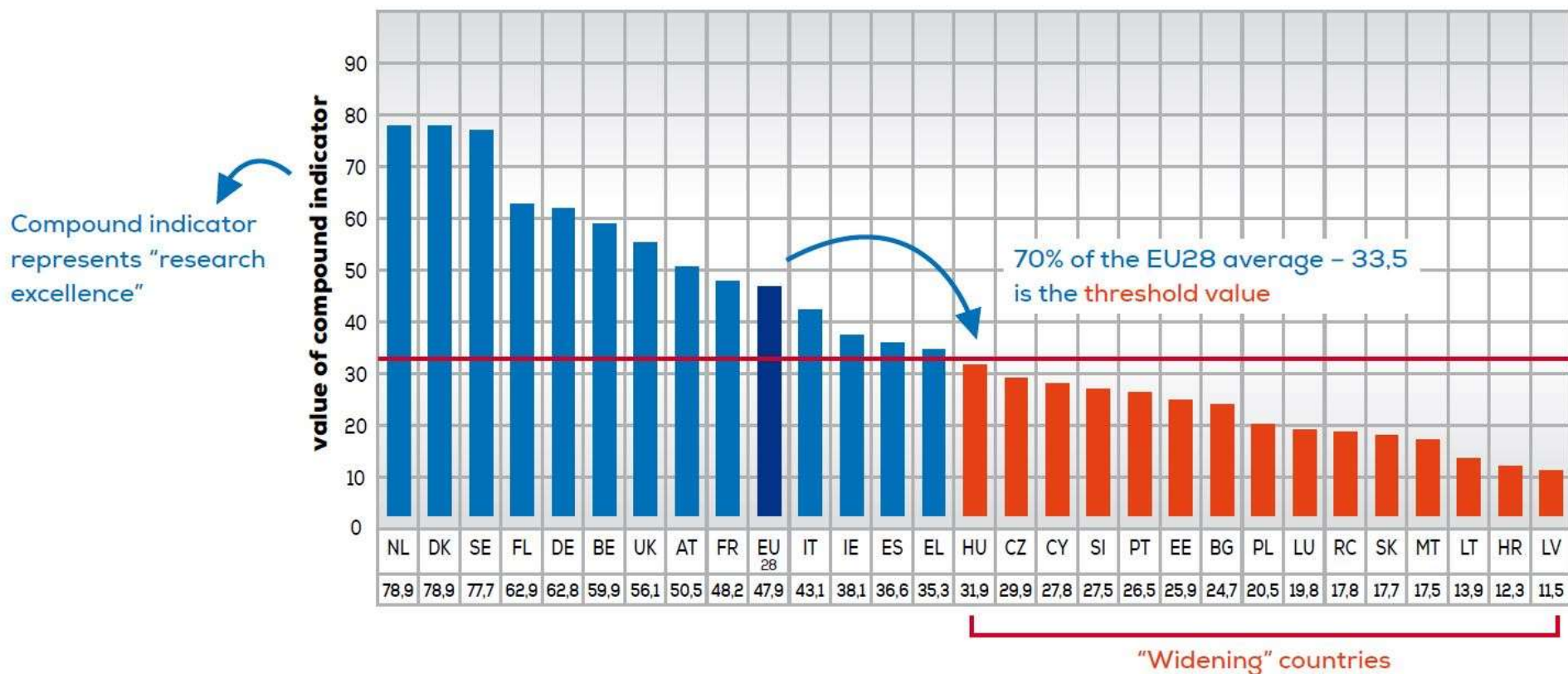
- Challenge: closing the Research and Innovation (R&I) divide in the EU by integrating and empowering excellent researchers and scientists from academic, public and private institutions in EU countries less performing in terms of R&I



“Widening Countries”

Performance in the compound indicator “research excellence”

Source: NCP_WIDE.NET Project



“Widening” in H2020: multiple complementary instruments

- **COST:** open pan-European networks
- **Twinning:** focused and intense partnerships in a defined research field between excellent institutions
- **Teaming:** creation/upgrade of centres of excellence in less research performing countries
- **ERA Chairs:** team of experts recruited to promote social and economic regional development via research and innovation initiatives on a specific topic (e.g. ITS)
- **National Contact Points (NCPs):** information, support



ERA Chairs

- Bring high quality researchers and managers to universities and other research organisations **with the potential for research excellence**
- Institutions should implement **structural changes** to achieve excellence on a sustainable basis
- ERA Chairs grant does not cover infrastructure and research costs



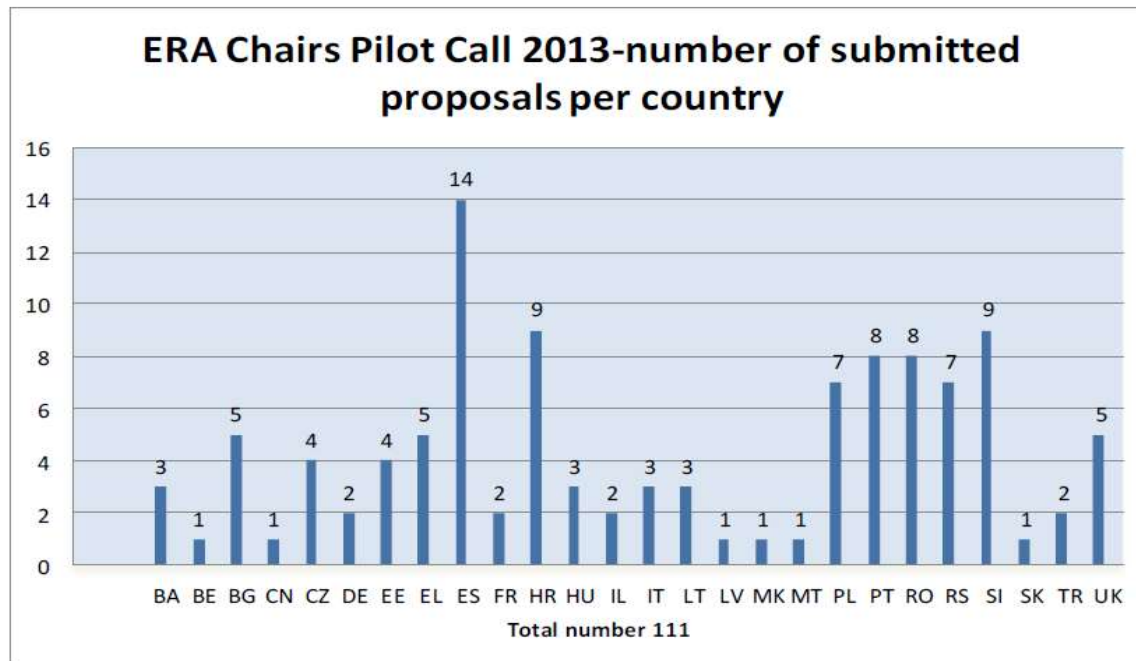
ERA Chairs – Expected Impact

- Increased attractiveness of institution and region for **excellent researchers**
- **Research excellence** in the fields covered by the ERA Chair
- **Increased participation** of the institution in Horizon 2020 and other competitive funding programmes
- Institutional changes to comply with **ERA priorities**
- Contribution to regional and/or national **smart specialisation strategies**, including obtaining support from European Structural and Investment Funds



ERA Chairs FP7 Pilot Call 2013

- 111 proposals from 26 EU countries
- Budget increased from 12M to 24M EUR
- Funding scheme: CSA – SA



ERA Chairs FP7 Pilot Call

- 11 ERA Chairs awarded

Country	Insitution	Acronym	Project subject
Belgium	Université de Mons	Re-SIZED	Energy efficiency in cities
Croatia	University of Zagreb -Faculty of Veterinary Medicine	VetMedZed	Molecular veterinary medecine
Czech Republic	Masarykova univerzita	CEITEC	Life sciences
Estonia	Tallinna Tehnikaulikool	TUTIC GREEN	Chemistry and biomass treatment
Poland	Instytut Genetyki Roslin Polskiej Akademi Nauk	BIOTALENT	Plant biology
Portugal	MITI – Madeira Interactive Techn ologies Institute Associacao	LEAPFROG	Human computer interactions
Republic of Serbia	Institut Za Nuklearne Nauke Vinca	MAGBIOVIN	Nanotechnology
Slovakia	Zilinska Univerzita v Ziline	ERADIATE	Transport systems and communication technologies
Slovenia	Institut Jozef Stefan	ISOFOOD	Food analysis through radioactive isotopes
Spain	Universidad de las Palmas de Grand Canaria	ECOAQUA	Aquaculture
United Kingdom	Falmouth University	GRO	Digital games design



ERAdiate: ERA Chair on ITS

Historical Background

- The University of Žilina is a university with a strong technical focus and tradition in transport
 - “University of Railways” established in 1953 as a detachment of the Czech Technical University of Prague
 - 1959: renamed as “University of Transport”
 - 1980: broader focus as “University of Transport and Communications”
 - Since 1996, established as the “University of Zilina”
- Research on all transportation modes (road, railway, water, aerial, intermodal), infrastructure and services



ERAdiate: ERA Chair on ITS

Growing opportunities in ITS

- Žilina also hosts CETRA, a centre of excellence for Transportation Research certified by the EC
- In 2015, the University Science Park was established thanks to EU Structural Funds
- Several transport and ICT companies based in the Žilina region (e.g. KIA; ESET has just established research center)



ERAdiate: ERA Chair on ITS

Challenges

- Difficulty to establish synergies and collaborative efforts because of a culture of competition, even within university (among faculties and departments working on overlapping/compatible topics)
- Low interdisciplinarity
- Low internationalization
- Need to further improve efficiency of organizational processes and skills of admin & research support staff
- Research excellence with innovation potential remains often confined to academic context, and lacks ambition
- Decreasing number of students & researchers. Salaries and conditions in private sector more attractive (especially to young people)
- High administrative burden
- Resistance to change



ERAdiate: ERA Chair on ITS

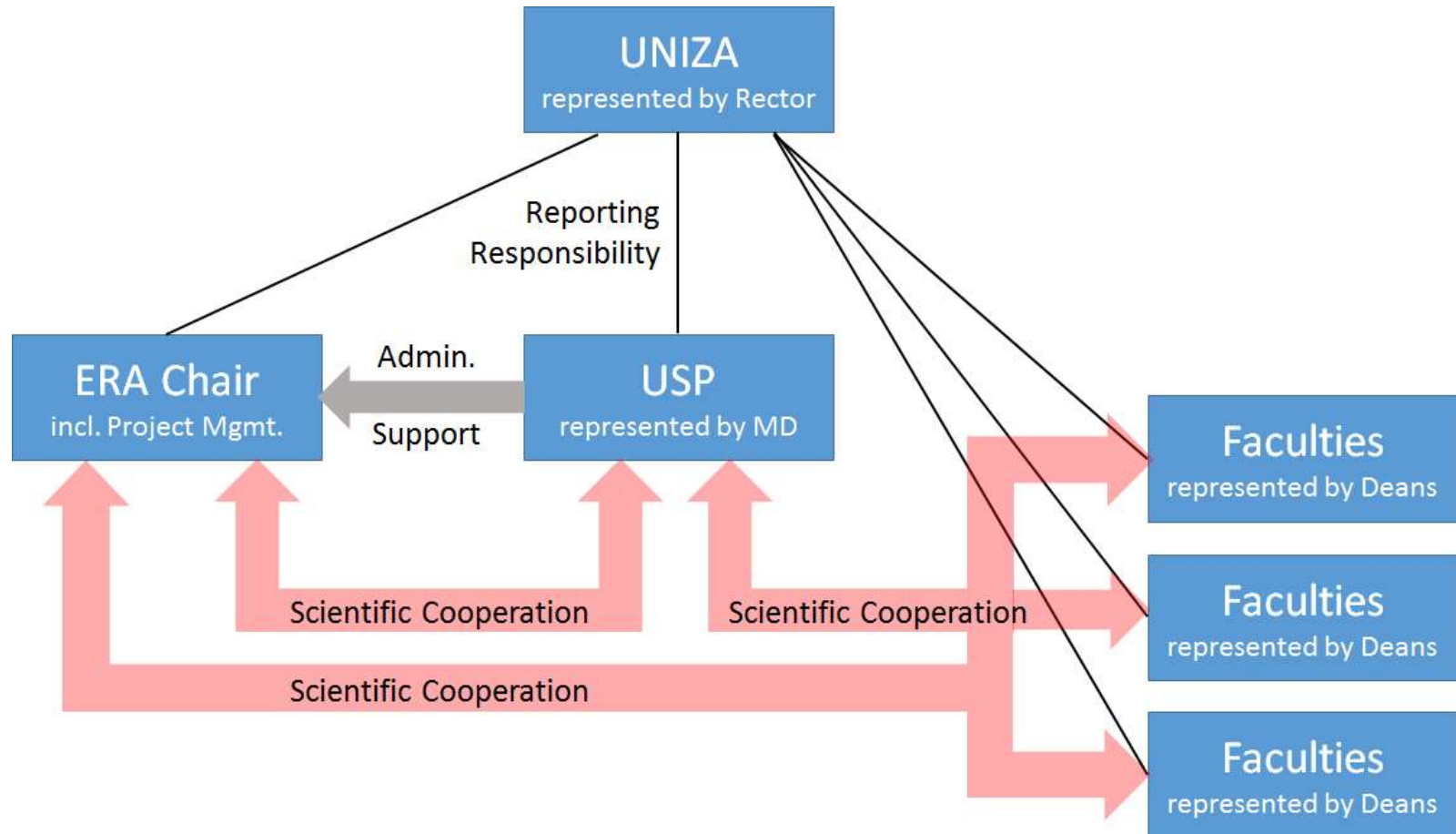
- Funding Period: 2014 – 2019 (5 years)
- ERAdiate to address identified challenges through a team of experts with complementary skills and backgrounds

ERAdiate Vision

“ERAdiate is developing significant ITS topics with international recognition and creates a recognized footprint”



ERAdiate in UNIZA Structure



ERAdiate R&I Impacts

- Unlocking and stimulating the **realization of the University of Žilina (UNIZA)** full research potential in the ITS field
- **More effective management of research and innovations**
- **Elevated international competitiveness** by means of transnational co-operation
- **Increased participation in the European R&D programs**
- More intensive national and international **cooperation with stakeholders**, especially innovative business partners, research institutions and professional associations



ERAdiate Impact on Institutional and Structural Changes

- More effective research and innovation management
 - Strategy for sustainable development of human resources and research infrastructures in the field of Intelligent Transport Systems (ITS)
 - Integration of ERA priorities, including open recruitment, gender balance, peer review, and doctoral training, into processes

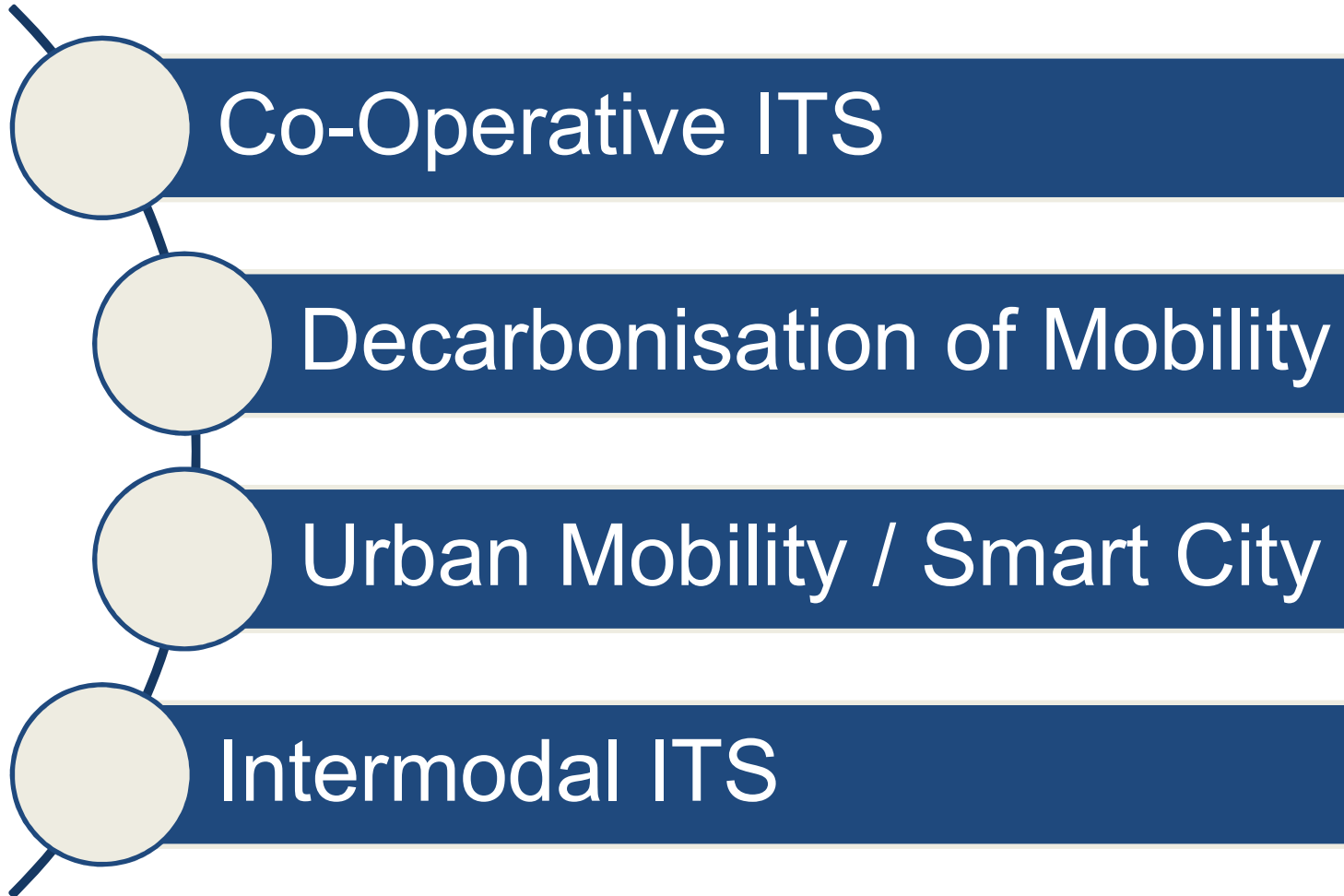


ERAdiate Impact on Regional Development

- **Enhanced interaction with regional and national authorities** in designing and implementing research and innovation strategies and policies for the SMART specialization
- Enlarged research and innovation performance of the UNIZA with **direct contribution to regional and national development plans**
- **Effective contribution to the regional economic and social development**



ERAdiate Focus Areas



ERAdiate Focus Areas

Co-Operative ITS

- eCall (implementation in the Slovak Republic)
- Communication
 - Ad hoc networks
 - Efficient communication
 - Security & trust
 - LTE
- Applications (mainly safety related)
- Standardisation – CEN & ETSI
- Localisation
 - Relative positioning
 - Trajectories
- Local Dynamic Maps (LDM)
 - Static map & dynamic information

ERAdiate Focus Areas

Decarbonisation of Mobility

- eMobility
 - Use of electrical vehicles, infrastructure & procedures
 - Simulation, mathematical modeling
 - Pricing models
- Indicators on GHG
- Modal shift
- Shared Mobility

ERAdiate Focus Areas

Urban Mobility / Smart Cities

- Urban Mobility Indicators
 - GHG
 - Safety
 - Connectivity
 - Inclusion
- Sensor networks & traffic management
- Incident detection & classification
- Urban logistics & last mile delivery

ERAdiate Focus Areas

Intermodal ITS

- Modal shift
- Shared mobility
- Modeling & Simulation
- Shift/price-elasticity
- Mobility as a Service (MaaS)
- Big Data
- Sustainable Urban Mobility Plans

Cross-Cutting Topics



Mobility Indicators

Sustainable Mobility

Autonomous Driving



ERAdiate Success in Project Funding

Project	Funding Scheme	UNIZA Role	Duration
SENSors and Intelligence in BuiLt Environment (SENSIBLE)	H2020 MSCA-RISE-2016	Partner	3 years (2017-2020)
Safety IMprovement using near Miss Analysis on Road Crossings	Austrian Research Funding Agency FFG	Partner	2 years (2017-2019)
Decentralised real-time electric vehicle charging: optimality, fairness and resilience	Alan Turing Institute - Lloyd's Register Foundation	Partner	2 years (2017-2019)

Submitted Projects to H2020 (under evaluation)

- Widespread-04-2017 (Teaming) - Coordinator
- MG-8-5-2017 (Value of Travel Time) – Coordinator
- MG-7-2-2017 – Partner
- COST Action Proposal submitted to OC-2016-2 - Partner



ERAdiate Activities and Initiatives

- **UNIZA Grants Week**
 - Improve skills and knowledge of UNIZA research community on research funding
 - 3 full-day programme
 - Free of charge
 - International trainers



SAVE the DATE!

19-21 September 2017

UNIZA GRANTS WEEK

Maximise your chances of success
in research applications!

Organised by the ERAdiate project at the University of Žilina, the Grants Week will provide comprehensive information and advice on how to find the most relevant Slovak and European funding programmes and how to write professional and competitive grant proposals.

Registrations are open until 30 April 2017

For further information, please visit the ERAdiate website:

<http://www.erachair.uniza.sk>



ERAdiate
Enhancing Research and Innovation Dimensions
of the University of Žilina in intelligent transport
systems



ERAdiate project funded under
FP7 (contract no. 621386)

Free of charge

Seats are limited!

Registration
deadline
30/04/2017

Open to research
community, PhD
students and
research support
staff

Develop your
competences and
knowledge to get
your research
ideas funded

International
trainers

ERAdiate project

University of Žilina
University Science Park
Univerzitná 8215/1
010 26 Žilina
Slovakia

www.erachair.uniza.sk



ERAdiate Activities and Initiatives

International Conference “ITS: Tool or Toy?”

- Co-organized with COST
- EU Slovak Presidency
- ~150 participants from 22 EU countries
- Press conference widely covered by national media
- One of the most international conferences ever held in Zilina



Intelligent Transport Systems: a Tool or a Toy?



22-23 November 2016

Holiday Inn Žilina
Športová 2
010 01 Žilina
Slovakia



Local partners:



Media partners:

Pan European
Networks

 #ITStoolortoy



ERAdiate Activities and Initiatives

- **Promoting UNIZA membership and active involvement within relevant professional organisations**
- ERAdiate introduced UNIZA at EARPA (Association of Automotive R&D Organisations)
- UNIZA approved as new member of EARPA since December 2016



ERAdiate Activities and Initiatives

- **Development of “ITS Slovakia”:** unlike many other countries, ITS stakeholders in Slovak Republic do not have a common platform to promote their abilities and interests yet.
- To enhance visibility of needs and activities in the field of ITS the ERAdiate project supports the **creation of a stakeholder platform in ITS** via e.g. ITS events, social media (LinkedIn group)



Enhancing UNIZA Visibility

PEN SPEAKS TO THE ERADIATE PROJECT'S DR KARL ERNST AMBROSCH AND PROFESSOR TATIANA KOVACIKOVA ABOUT INTELLIGENT TRANSPORT SYSTEMS

A tool or a toy?

IN 2014, the University of Zilina (UNIZA) in Slovakia, a hotspot in Intelligent Transport Systems (ITS) research, was awarded with an ERA Chair in order to foster excellent research and to strengthen not only the Zilina convergence region, but also to impact on ITS in Europe. The research areas for this initiative, known as the ERADIATE project, are co-operative and complex mobility systems, smart solutions, such as smart cities, access and pricing, the decarbonisation of mobility, business models for ITS and ICT, inclusive mobility and societal effects of ITS deployment.

When Pan European Networks asked the ERA chair, Dr Karl Ernst Ambrosch, about the initiative, he explained that it will go some way to helping Slovakia "catch up" with other EU member states with regard to ITS, which, currently, has "a very limited number of stakeholders as well as a limited number of governmental activities," which, he said, is the case for many countries who have recently joined the bloc.

This situation is changing, and, in the last 10-20 years, discussions around the interoperability of transport systems (which led to a number of actions being taken by the European Commission) have continued to develop.

Priorities

Many of the ERA Chair's priorities are closely tied to those identified by the European Commission. According to Ambrosch, one of the initiative's main aims is to garner an adequate support for Intelligent Transport Systems from across the board in order to make the best choice of transport modes and the combination of transport modes available to citizens.

Ambrosch said, "Of course, this is closely linked to the question of how to best organise the mobility of people and goods in the urban centres as well as better exploitation of public transport, which is therefore closely related to the concept of smart cities. Here, areas such as electromobility (which has an important role to play in decarbonisation) and autonomous driving become important.



Ambrosch highlighted the need to satisfy the personal and economical need for mobility in a world that has to reduce energy consumption and decarbonise all of its processes

"We approach these issues from a user perspective – exploring things such as the benefits to citizens, what the requirements are from an end-user point of view, and what the business cases are – rather than from a technology perspective because the technology solutions in these areas have been investigated for some time now and, in most instances, the technology is there."

According to Ambrosch, added emphasis is also placed on the issues of availability (working towards 24/7 service delivery) and inclusivity, that is ensuring the services are available to all groups of society.

Smart cities

Given the way in which smart and intelligent transport fits into the concept of smart cities more generally, a multidisciplinary approach needs to be taken and, of course, the inclusion of a wide variety of stakeholders is crucial. This ranges from researchers exploring the technology aspects, to citizens, transport providers and to policy makers, but also to those involved in city and urban planning.

As Ambrosch explained, "It is important that the layout of an urban area is such that it works to implement transport solutions that make it as easy as possible to travel from A to B – whether by public or private transport, on foot or by bicycle – as well as providing adequate infrastructure such as parking facilities. This will not only help to reduce the environmental impact of the transport sector, but will also have a positive effect on the health and wellbeing of citizens."

He also highlighted the need to satisfy the personal and economical need for mobility in a world that has to reduce energy consumption and decarbonise all of its processes. Asked how he thought these seemingly disparate objectives – increased need with less (carbon) resources – can be achieved, and what more needs to be done with regard to the development of ICT-based approaches (perhaps including systems of systems and embedded systems) for this to be realised, he explained that the potential

problem with a system of systems approach stems from standardisation, which is quite difficult to achieve and which is typically done for less complex systems.

"Dealing with systems of systems can be quite tricky and it requires the participation of a higher number of stakeholders," he said, "And, what is more, very often the business case isn't particularly good for this or, even worse, those who pay for it don't benefit, which reduces motivation even further."

This could be addressed, he went on, by arguing that standardisation is of public interest and so should be paid for with public money but the long-term effect of this type of approach is perhaps questionable. However, with a stronger business case for smart transport solutions evolving, and with a new emphasis being placed on "Mobility as a Service" by the ERADIATE project, Ambrosch said, it is to be hoped that public money will not be needed for mobility solutions moving forwards.

A tool or a toy?

In November 2016, the 'Intelligent Transport Systems: a Tool or a Toy?' conference will take place at Slovakia's University of Zilina, where Pan European Networks is acting as media partner. The event, co-organised between the COST Association and the University of Zilina as European Research Area chair (of the ERADIATE project) on ITS, and is held under the auspices of the Slovak Presidency of the Council of the European Union.

The aim of this event is to bring special attention to the role of research organisations in providing evidence to the policy makers for shaping the right ecosystem in ITS, and to the role of the industry, and in particular small and medium enterprises, in delivering innovative, sustainable and interoperable solutions. Particular attention will be given to two important pillars of future mobility: autonomous driving and mobility as a service.

Discussing the conference, Professor Tatiana Kovacikova, the ERA chair's senior researcher, told PEN: "It is not sufficient to push for technology progress alone. It is also necessary to define the challenges that we are currently facing in the field of Intelligent Transport Systems, such as data security, safety, reliability, legal issues, social and economic aspects and so on.

"In this context, the concept of 'mobility as a service' can be seen as a new paradigm, transforming both the customer experience and the utilisation of physical resources. It also

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brings into play new transportation alternatives and new transport mixed modes, whilst also having an impact on city planning, land use, and the role of public organisations. User acceptance is also crucial here."

Co-operation

Kovacikova also highlighted the importance of taking a multidisciplinary approach and of collaborative working, explaining that the event will seek to address researchers, technology developers, public administration, policy makers and transport operators.

"From the conference," she continued, "we hope to be able to bring special attention to the role that research organisations and research bodies – including the many COST Actions that will be involved in the event, as well as others – play in providing evidence to policy makers and public administrations when it comes to the ITS ecosystem. We also hope to showcase the role of industry and SMEs involved in innovative and sustainable and interoperable solutions and who are ready to address local needs either by introducing new mobility solutions or by adapting existing ones.

"We hope that the diverse stakeholders who travel to Zilina will share their ideas and best practices, learning from each other."

According to the European Commission's White Paper on Transport, new forms of mobility have to be proposed for overcoming reliability, environmental safety and affordability issues towards sustainable solutions for the transport of people and goods. Until now, advancements in research and technology have significantly contributed to this recommendation by integrating multidisciplinary approaches, and having addressed the fragmentation of knowledge in ITS.

However, the deployment of widely used interoperable and seamless ITS solutions is still lagging behind the expectations, both in terms of their sustainability and competitiveness, as well as integrating their socioeconomic impact at regional, national and pan-European level.

The ERADIATE project and the Zilina event will certainly go some way to addressing some of these challenges, with the January 2017 edition of *Horizon 2020 Projects: Portal* featuring coverage of the conference and interviews with some of the delegates.

Dr Karl Ernst Ambrosch
Professor Tatiana Kovacikova
ERADIATE Project

<http://www.erachair.uniza.sk/>

Example article on Pan European Networks: Science and Technology magazine (November 2016 issue)



ERAdiate & BigSkyEarth: areas for collaboration

- Both BigSkyEarth and ERAdiate funded as “**Widening**” tools contributing to close the “Innovation Divide” in the EU
- Approaches to **big data** management, analysis and visualization discussed within BigSkyEarth to address mobility / transport issues (e.g. traffic management)



ERAdiate & BigSkyEarth: areas for collaboration

- As BigSkyEarth, also ERAdiate seeks creation of a **trans-disciplinary community** jointly tackling environmental, technological and socio-economic challenges related to ITS applications
- ERAdiate is not a “research project”. It is open to discuss/develop project ideas and other initiatives in line with its objectives (i.e. acts as a **catalyst/incubator of research and innovation**)

