



# ERAdiate

Enhancing Research and innovAtion dimensions of the University of Žilina in intelligent transport systems

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## Strategy of the ERAdiate Project

### Introduction

The strategy shows the path to realize the expected impacts from ERAdiate:

- Impacts related to Research and Innovation (R&I):
  - unlocking and stimulating the realization of the UNIZA full research potential in the ITS field
  - more effective management of research and innovations at the University of Žilina (UNIZA)
  - elevated international competitiveness of the UNIZA by means of transnational co-operation
  - increased participation of the UNIZA in the European research and development programs
  - more intensive national and international cooperation with stakeholders, especially innovative business partners, research institutions and professional associations
- Impacts related to institutional and structural changes, aiming for more effective research and innovation management within UNIZA:
  - strategy for sustainable development of human resources and research infrastructures in the field of Intelligent Transport Systems (ITS) at the UNIZA
  - integration of ERA priorities, including open recruitment, gender balance, peer review, and doctoral training, into processes at the UNIZA
- Impacts related to 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

The strategy encompasses activities that create the boundary conditions for UNIZA to obtain excellence in the field of ITS, that contain the gathering and provision of appropriate information and networks as well as the initiation and supporting of institutional and structural changes within the university. These activities can be assigned to one or more of the following strategy areas:

1. R&I field identification
2. Key stakeholder identification
3. Investigate and Take Opportunities
4. Institutional precondition building
5. Communication

## R&I Field Identification

In a changing environment, key fields for R&I activities have to be determined with a validity for at least 4 years, which is the funded period of ERA-diate. Key fields represent a major issue within ITS, that is yet unsolved, in which technology and innovation play a significant role, and that are in the focus of societal development. As such, they represent the “(future) market demand” which pulls research and innovation, a corresponding funding, and market opportunities, respectively. At the other hand, they bear technological risk that can be mitigated in co-operation with scientific research.

The ITS key fields that have been identified are as follows:

1. Co-operative ITS
2. Decarbonisation of Mobility
3. Urban Mobility / Smart City
4. Intermodal ITS

### Co-operative ITS

After a decade of technological basic research, fact finding and feasibility studies, C-ITS (co-operative ITS) is picking up speed. Both, the U.S. Department of Transportation as well as the European Commission are about to create legal frameworks that pave the way to co-operated driving or even autonomous driving. Industry is investing into R&I more than ever within this field. Yet, key techniques are still unsolved, such as air link capabilities, standardization or deployment scenarios.

The ERA-diate sub-topics are:

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

### Decarbonisation of Mobility

The greenhouse gas mitigation policy achievements in industry, private dwelling and agriculture are almost eaten up by mobility with its increasing demand for fossil fuel. Decarbonising transport thus becomes a key issue that is expressed in manifold action plans and road maps, such as the European Commission’s 2011 white book on transportation that envisages steps which reduce conventional fuel consumption in urban areas by 50% until 2030.

The ERAciate sub-topics are as follows:

- eMobility
  - Use of electric vehicles, infrastructure & procedures
  - Simulation, mathematical modelling
  - Pricing models
- Indicators on Greenhouse Gases (GHG)
- Modal shift
- Shared Mobility

### Urban Mobility / Smart City

70% of all Europeans live in cities, urban mobility is already a deciding factor for living quality and prosperity and deserves to be a locational factor more than most others. Consequentially, ITS is increasingly tackling urban mobility issues, covering all modes of transportation including active forms of mobility. The traditional mode-centric approach fails in urban mobility while new aspects such as customer care, user needs and door-to-door become key.

The ERAciate sub-topics to follow are:

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

### Intermodal ITS

Intermodal mobility is increasingly understood as a service but as the sheer provision of seamless mobility options. This path introduces the user, his needs and behaviour as a complex parameter to tackle; nevertheless, this path is key on the way to sustainable mobility. Scientific work is yet to be carried out in order to create (technology oriented) services that are in a position to change mobility behaviour towards a high quality issue that is consuming less resources.

The ERAciate sub-topics are:

- Modal shift
- Shared mobility
- Modelling & Simulation
- Shift Elasticity
- Mobility as a Service (MaaS)
- Big Data
- Sustainable Urban Mobility Plans

## Core Topics

Core topics are **cross-cutting** topics that have a strong relation to more than one R&I field. They have a common methodology, technology, or scientific basis. Certain core topics have been identified:

Core Topic	Mobility Indicators	Sustainable Mobility	Autonomous driving
<b>R&amp;I Field</b>			
Co-operative ITS			X
Decarbonisation of Mobility	X	X	X
Urban Mobility / Smart City	X	X	X
Intermodal ITS	X	X	

## Key Stakeholder Identification

The identification, addressing and integration of existing national and international key contacts in the field of ITS is key to fulfil the ERA-diate goals. The field of potential partners for a collaboration ranges from other universities, to Research And Technology Organisations (RTOs), ministries, city and regional governments to non-profit organisations, European institutions, umbrella organisations, and finally to industry and businesses. The identification and addressing task is an on-going procedure that utilizes multiple channels, the general outline for specific core-topics is exemplified in this document.

The 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 ERA-diate project will support the **creation of a stakeholder platform in ITS** like there exist ITS organisations on national and regional level elsewhere.

## Mobility Indicators

As pointed in the R&I field identification, mobility indicators turn out to be a key issue in various branches of the ITS tree, such as in Decarbonisation of Mobility, Urban Mobility, or Intermodal ITS. The particular goal of mobility indicators is to assess the performance of services, such as mobility service operation, or the effects of measures for the sake of quality of life such as road safety enhancement, noise, pollutants or greenhouse gas mitigation. The role is to identify the actual state or the progress related to a past state. Little research has been undertaken so far, the European Commission started calling for expertise in order to tackle this recognized key topic.

The key users consequentially are regions, municipalities, urban planners or (public) transport operators. Three umbrella organisations have been identified who host these user groups (two city associations and one for public transport operators who are often public services of cities). A cooperation with the umbrella organisation opens a lever in terms of standardisation and uniqueness on the “knowledge market”. Access to cities and transport operators is beneficial in two ways; first

they are potential customers for academic knowledge and second they are valuable partners when it comes to competitive research projects. Furthermore, a cooperation with the experts called by the commission and potential experts that might show up in the scene would be rewording in a way that in the case of other universities it increases scientific knowledge and in a way that in the case of urban planners value chains could be created.

The stakeholders are integrated in the following way:

- Umbrella organisations: a partnership is aspired that opens the way to thematic working groups which broadens the visibility of UNIZA. Eventually a membership is required.
- Cities and Mobility Operators: Involve in project proposals or eventually affect direct tenders.
- Urban Planners: Create value chains in the daily planning routine.
- Other universities: R&I to achieve a profound and recognized scientific basis.

### Sustainable Urban Mobility

Sustainable Urban Mobility Plans (SUMPs) are gaining importance since the 2012 guidelines<sup>1</sup> release. The idea of SUMP is a structured approach that regulates all stages from the idea to the implementation in a way that ensures quality, completeness and sustainability. In the meanwhile, tools are available and planners are taking it up into their planning routine. Nevertheless, the guidelines give little help on which priorities to emphasize. This is particularly relevant if a Central and East European Countries (CEEC) version of the proven Western-European references has to be generated. The experience from numerous SUMP applications have to be translated to the regional CEEC context based on scientific knowledge.

The key users are municipalities or regional governments. As CEE cities are represented only very scarcely in umbrella organisations, these and the related regions have to be accessed directly. This is where programmes like INTERREG, but also territorial co-operations provide valuable opportunities. The option is to make the Zilina region with its capital a CEEC reference, which could become an asset within funded research and implementation projects during all phases of the doing.

The stakeholders are integrated as follows:

- Zilina region: establish a long lasting co-operation with the goal to make the region a blueprint for Slovakia and CEE countries with regards to mobility planning (Zilina region has already been assigned to be the reference region within the Slovak republic by the Ministry of Transport, Construction and Regional Development).
- Territorial co-operations: they can be identified in the course of brokering events which are hosted by Interreg and other programmes. They are addressed with the purpose of a joint project proposal for funding.

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<sup>1</sup> [http://www.eltis.org/sites/eltis/files/guidelines-developing-and-implementing-a-sump\\_final\\_web\\_jan2014b.pdf](http://www.eltis.org/sites/eltis/files/guidelines-developing-and-implementing-a-sump_final_web_jan2014b.pdf)

## Investigate and Take Opportunities

The identification of research and business opportunities is a continuous task of ERAdiate. This covers the active investigation of existing consortia in order to quickly respond with a valuable project contribution. Furthermore, it covers the shaping of new consortia in a way that supports creating value and value chains within UNIZA. Finally, it contains the initiation of strategic partnerships and servicing networks that support the path to a thematic dominance in the pre-defined R&I-fields and core topics. Last but not least it covers ITS education.

The instruments used are framework programmes, regional funding programmes, national funding schemes (Slovak and foreign programmes that allow a participation of UNIZA) as well as unfunded R&I co-operations. The latter might be set up on in various ways.

- On a research level, i.e. UNIZA with another university, RTO or industrial partner; the purpose is to create a recognized research visibility on certain issues.
- On an application level, i.e. UNIZA with a non-academic partner. This can be a user such as a municipality or a regional government in order to create a reference for later procurement. This can also be a governmental body (European Commission, governmental agencies), or a Non-Governmental Organisation (NGO) / umbrella organisation in order to create visibility on a certain issue that increases the probability of further project involvement.

ERAdiate plays an active role in taking the opportunities recognized. This comprises tasks such as raising the awareness within UNIZA, facilitating and co-ordinating proposals or open the dialogue with strategic partners.

ITS education that responds to the international characteristic of ITS is clearly considered as an opportunity. While some universities run (mostly) local study programmes, a barely explored but obviously promising treasure is an ITS education for international students and professionals that ranges up to the highest degree (PhD.). ERAdiate actively investigates the curriculum and possibility of strategic partnerships for ITS degrees at UNIZA.

## Institutional precondition building

The vision of a ERAdiate at UNIZA that is embedded in the field of ITS in an agile way is formulated this way:

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

The prerequisites within UNIZA and its stakeholders to meet this vision are put as follows:

- Research is organised in a way that exceeds the critical mass in order to achieve the “recognised footprint”.
- Research topics undergo a continuous assessment regarding their objectives and significance and are tackled continuously.

ERAdiate thus will stimulate and moderate a process that empowers the existing structures and facilitates mechanisms that end up with the above mentioned prerequisites.

The sub-goals of this process are:

1. Continuously **foster the awareness** of the Deans of Faculties - in their role as the highest decision makers on the research content - regarding internationally relevant R&I fields and opportunities to take.
  - This awareness is the basis of structural decisions regarding the shape, mix and amount of provided resources (staff, skills, and infrastructure).
  - Furthermore, this awareness is the foundation of a Faculty internal research agenda.
2. Create a mechanism that allows the faculties to **benefit from collaborative research** in a significantly higher way than it is the case today.
  - This benefit is supposed to motivate that structural changes are induced and maintained for a longer period.
  - The benefits are funds from third party donors that ought to increase the research capacity (staff, infrastructure).
3. Open the ITS community for the faculties in a way that researchers get a **direct access** to the key stakeholders within the sector.
  - The ITS community is organized in stakeholder groups, umbrella organisations and NGOs that channel strategic thinking towards the European Commission and other decision makers. Participating does not work without involvement and memberships.
4. Create mechanisms that allow a **long lasting partnership** of ERAdiate with regional developers.
  - Complementing the already existing involvement of academic staff in giving expert advice, the scientific knowledge shall be used to build a pioneering role of the Zilina region in ITS.
  - Since many steps are necessary to achieve this goal, the interaction is a continuous one, based on strategic planning, a continuous gain of knowledge and a customer relationship. A sub goal of this partnership is to collect funds.
5. Create a mechanism that allows for **sustainability** - a “saving” of funds for dry periods - particularly for those resources that have to rely on competitive research.
  - A viable solution is a mix of funded research projects and regional development projects and the possibility to retain some of the income for the sustainability of ERAdiate.

## Communication

Numerous and continuous interventions require a communication strategy that regulates what to communicate when to whom. The following strategy is for internal (inside UNIZA) and external communication and is supposed to support the before stated strategy items.

### Internal Communication

This chapter addresses the communication with those stakeholders of UNIZA who are developing the ITS research capacity.

- **Communication with the Deans:** mutual information about key fields and opportunities and the status about R&I resources. Meetings are organized on a quarterly basis. The expected outcome is an assignment of research staff and research goals.
- **Communication with researchers:** This is a project related communication that serves the purpose of refining ideas, preparing and writing tender proposals, or within the project work. Communication is organized according to the project needs on an ad-hoc basis.
- **Rector and Vice-Rectors** shall be enabled to present goals and results of ERAdiate and their joint work with regional and international partners.

### External Communication

This chapter addresses the communication with all that are not subject of the internal communication. They could be within UNIZA but might not be affected by developing the ITS research capacity, or they could be stakeholders outside UNIZA.

- **Regional stakeholders** are actively informed about international trends on the key fields, opportunities, conferences or relevant scientific findings on an ad-hoc basis.
- There is a clear and focussed communication to **international stakeholders** for the purpose of building consortia and other partnerships. This communication is in the centre of ERAdiate action and follows the strict rule of gaining visibility and importance.
- **Governmental organisations** (Slovakia) are getting dedicated information on an ad-hoc basis due to the respective necessities.
- **European Commission** is addressed in order to inform about the ERAdiate activities, to exchange ideas about strategic issues or in a way that delivers expertise towards the EC.
- **Scientific publications and Conference contributions** are key to demonstrate a footprint.
- **Own conferences** are an important factor to prove the significant role within ITS.
- To a much smaller extent, **workshops** aim at fact finding and awareness raising; they are organised due to existing needs and opportunities.
- **Press and media** are handled on an ad-hoc basis due to emerging news.
- **Information** is provided for interested groups.  
Due to environmental reasons printing of material will be limited.

- A **newsletter** is periodically updated and aims at informing the general public.