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Technical Assistance to Connectivity in the Western Balkans

Strategic Framework for implementation of ITS on TEN-T Core/Comprehensive Network on the WB6

Code: CONNECTA-TRA-CRM-REG-03
Area: Connectivity Transport Reform Measures

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Background

- The development of the Comprehensive and Core Network, up to the TEN-T Regulation 1315/2013 standards with the aim of attracting international traffic flows and increasing the regional mobility along the Network, remains a prevailing goal of the regional transport cooperation conducted under the umbrella of former SEETO.

- Currently, the Regional Participants are at different stages of introducing ITS systems, without a coherent introduction of the ITS on even a national level (different transport modes), usually without the necessary interconnection between modes and between different systems at national and international level.

- Since deployment of the ITS is a requirement according to several EU legislative acts, one regional strategy showing the gaps, costs and impact of the introduction of the IT systems is required.
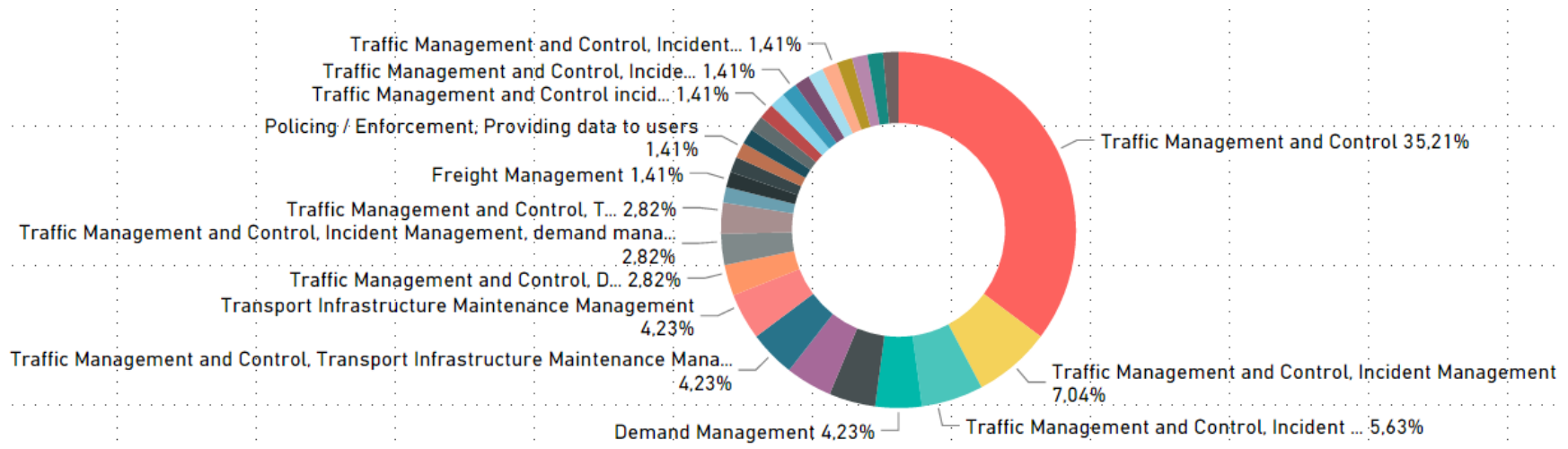
Activities

- Activity (i): Identify user needs and specific objectives at national level for all transport modes;

- Activity (ii): Assess the ITS system needs, requirements and priority ITS services in WB region (especially the connection between the needs and requirements set by the TEN-T Guidelines, more specifically Core Network standards);

- Activity (iii): Legal approximation of regional ITS legislative acts and further recommendation for what still needs to be achieved to be in line with the EU acquis;

- Activity (iv): Assess the EU standards and specifications and propose equal standards and technical specifications relevant for ITS implementation in Western Balkans;

- Activities (v) and (vi): Carry out impact assessment and cost and benefit calculation of the introduction of ITS

- Activity (vii): Develop regional ITS vision and key strategic directions to ensure harmonized regional ITS development;

- Activity (viii): Develop the regional strategic framework together with Roadmaps and deployment plans for each RP per transport mode in line with the national strategies;

- Activity (ix): Provide guidance and assistance to the Regional Participants in the preparation of national ITS strategies.

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Current state of play

- ITS implementation in the region is limited to road sections and tunnels newly constructed or currently under construction is partly implemented.

- ITS implementation is uncoordinated at regional level and also at RP level. ITS services are developed separately for every mode, usually with insufficient collaboration and coordination.

- **ITS application deployment is still in its infancy. This can be considered as advantage because WB6 Regional Participants can avoid the friction of legacy systems and easily build a state of the art ITS Architecture at RP level, based on a regional one.**

User Needs Analysis – Regional Level

Traffic Management and Operation Services

As shown in the graphic and table below, under the Traffic Management and Operation Services functional area, the three most identified ITS needs are:

- Traffic Management & Control
- Incident Management
- Transport Infrastructure Maintenance Management

Traffic Management and Control, Incident... 1,41%
Traffic Management and Control, Incide... 1,41%
Traffic Management and Control incid... 1,41%
Policing / Enforcement; Providing data to users 1,41%
Freight Management 1,41%
Traffic Management and Control, T... 2,82%
Traffic Management and Control, Incident Management, demand mana... 2,82%
Traffic Management and Control, D... 2,82%
Transport Infrastructure Maintenance Management 4,23%
Traffic Management and Control, Transport Infrastructure Maintenance Mana... 4,23%
Demand Management 4,23%

Traffic Management and Control 35,21%
Traffic Management and Control, Incident Management 7,04%
Traffic Management and Control, Incident ... 5,63%

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Emergency Services

Under the Emergency Services functional area, the three most identified ITS needs are:
- Emergency Notification and Personal Security
- Hazardous Materials and Incident Management
- Emergency Vehicle Management

Road Transport Personal Safety and Security

Under the Road Transport Personal Security functional area, the three most identified ITS needs are:

- Emergency Notification (accidents, eCall)
- Road condition and weather notification
- Ghost Driver Management

Intelligent Vehicle Services

Under the Intelligent Vehicle Services functional area, the three most identified ITS needs are:

- Advance Driver Assistance Systems
- Automated Vehicle Operation
- Cooperative Systems (V2V,V2I)

Freight and Logistics

Under the Freight and Logistics functional area, the three most identified ITS needs are:

- Positioning and Freight Tracking Services
- Cross Border Services
- Dangerous/Abnormal Freight Management

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Transport-related Electronic Payment Services

Under the Transport-related Electronic Payment Services functional area, the three most identified ITS needs are:
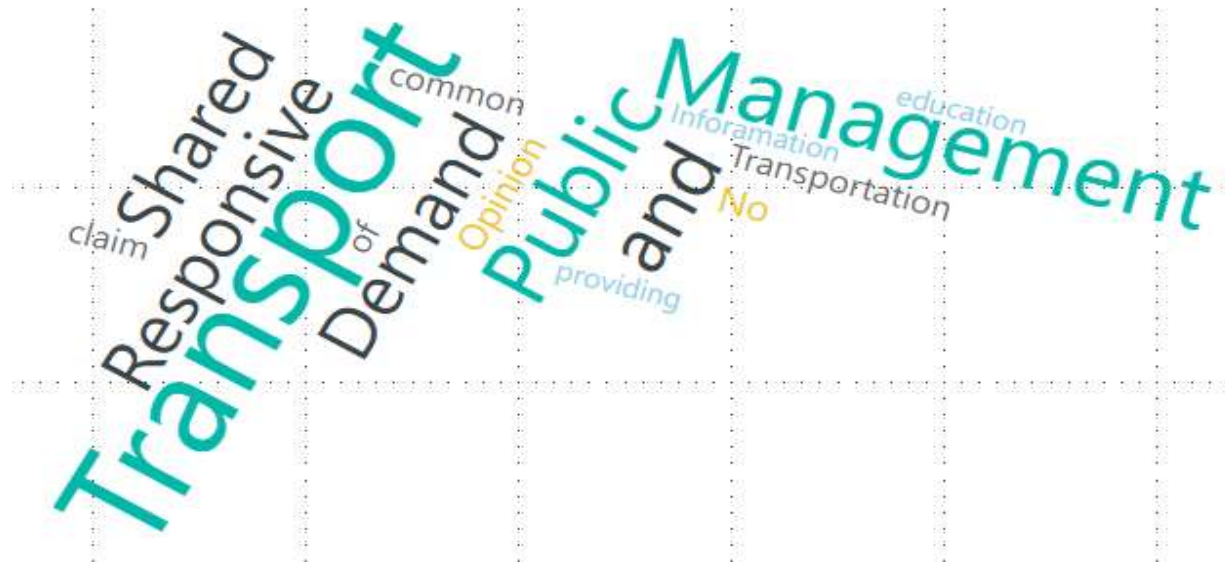
- Electronic Road Tolling
- Integration of Payment Systems
- Public Transport Electronic Payment

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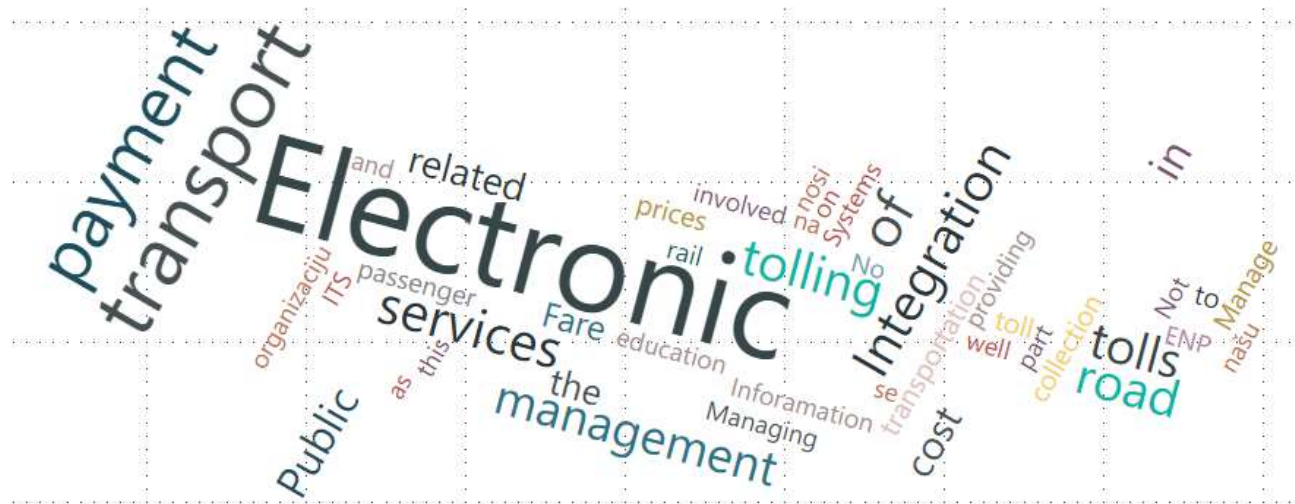
Public Transport ITS Services

Under the Public Transport ITS Services functional area, the two identified ITS needs are:

- Public Transport Management
- Demand Responsive Public Transport

User Needs Analysis – Regional Level

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Information Services

As shown in the graphic and table below, under the Information Services functional area, the three most identified ITS needs are:

- Road Safety related information / incident warning
- Real time traffic information services
- Pre-trip travel information

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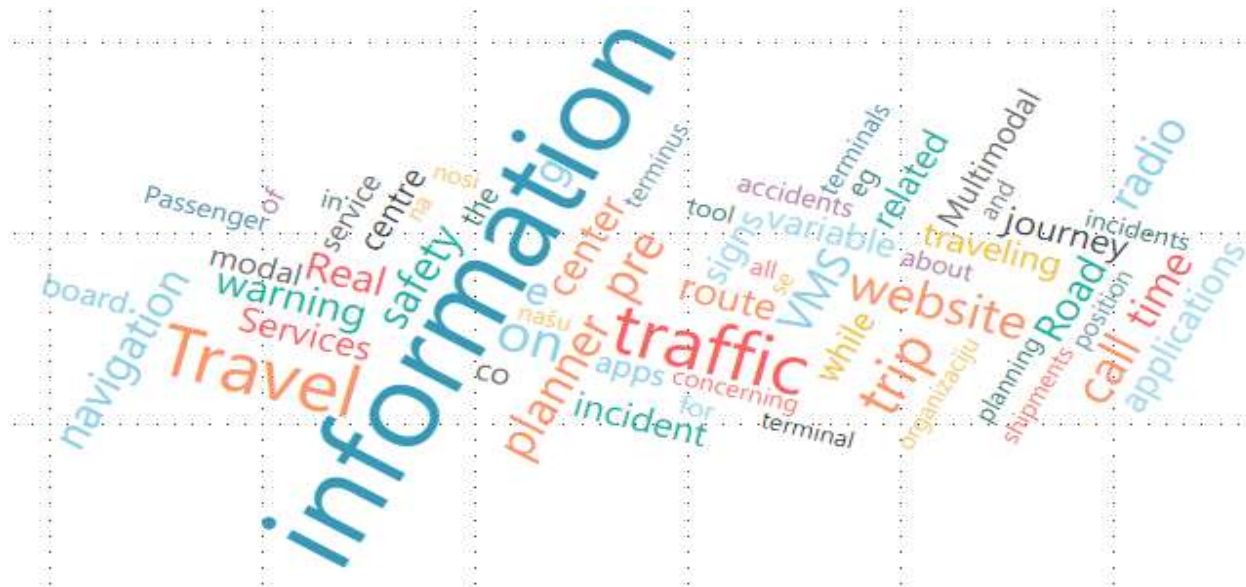
Legal approximation – technical standards and specifications

- A series of actions have to be taken in order to proceed with ITS and IT deployment, concerning transposition of the EU acquis, as well as mandatory use of the relevant standards.

- Interoperability is an imperative of an ITS EU-wide system and the application of CEN/ CENELEC related standards is crucial for its effectiveness and efficiency. For implementation of obligatory standards, article 8 of the 2010/40/EU Directive highlights that interoperability should be strongly supported by the provision of standards by the relevant standardisation bodies.

- Standards are needed to address interoperability at different layers in the ITS architecture and issues of data compatibility across ITS applications and services.

- The application of standards ensures a coherent national ITS system and enables integration of its components into European and international systems. CEN/TC278 standards have been and are being adopted by the corresponding national standardization body. What is common practice in all WB6 beneficiaries is that following the standards is on a voluntary basis and so stakeholders responsible for the ITS adoption and implementation are not aware of the existence of these standards.

Legal approximation – technical standards and specifications

- Regional Participants should:
    - Transpose the EU ITS Directive 2010/40/EU and Delegated Acts;
    - Adopt all CEN/TC 278 standards;
    - Make the above two obligatory to follow by adopting ITS Strategy and Action plans as well as through implementation of provisions of related EU directives (supplementing 2010/40/EU);
    - Transpose the relevant Regulations and Directives and respective technical standards and specifications;
    - For the ICT domain, to transpose the relevant EU legislative and regulatory framework (cybersecurity, personal data protection, electronic communications, liability, cross-border ticket sales and passenger rights, e-Document, e-Customs and Integrated Border Management) and promote implementation of the WB Digital Agenda;
    - establish communication and cooperation between different ministries with expertise in different fields of application of ITS. Lead to be given to competent ministry for Transport.

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Costs and Benefits – Roads/ICT (1/2)

Costs: c. € 248 million implementation cost, plus € 18.6 million annual operation and maintenance costs (including the respective costs for control centres).

For Core TEN-T
Implementation costs:
c. € 159 million
O&M costs:
c. € 12 million

Section	Implementation costs with control centres (EUR)						
	ALB	BIH	MKD	MNE	SER	KOS	total
Corridor Vc	0	17,845,018	0	0	0	0	17,845,018
Corridor VIII	16,649,541	0	14,228,879	0	0	0	30,878,420
Corridor X	0	0	8,893,049	0	22,750,239	0	31,643,288
Corridor Xb	0	0	0	0	7,926,166	0	7,926,166
Corridor Xc	0	0	0	0	4,712,856	0	4,712,856
Corridor Xd	0	0	5,335,830	0	0	0	5,335,830
Route 1	602,908	312,288	0	4,149,571	0	0	5,064,767
Route 2a	0	10,171,661	0	0	0	0	10,171,661
Route 2b	8,023,316	4,639,705	0	7,720,132	0	0	20,383,153
Route 2c	5,797,194	0	0	0	0	0	5,797,194
Route 3	0	5,844,244	0	0	2,313,584	0	8,157,827
Route 4	0	0	0	8,685,149	18,037,383	0	26,722,532
Route 5	0	0	0	0	9,125,802	0	9,125,802
Route 6a	0	0	112,108	3,811,815	1,071,104	7,350,867	12,345,893
Route 6b	0	0	0	4,873,333	0	5,662,890	10,536,224
Route 7	5,287,041	0	0	0	3,641,752	5,826,243	14,755,036
Route 8	0	0	3,557,220	0	0	0	3,557,220
Route 9a	0	9,547,085	0	0	5,741,115	0	15,288,200
Route 10	0	0	7,752,915	0	0	0	7,752,915
Total	36,360,000	48,360,000	39,880,000	29,240,000	75,320,000	18,840,000	248,000,000

Section	O&M costs with traffic control centres (EUR)						
	ALB	BIH	MKD	MNE	SER	KOS	total
Corridor Vc	0	1,360,000	0	0	0	0	1,360,000
Corridor VIII	1,220,600	0	1,060,800	0	0	0	2,281,400
Corridor X	0	0	663,000	0	1,805,400	0	2,468,400
Corridor Xb	0	0	0	0	629,000	0	629,000
Corridor Xc	0	0	0	0	374,000	0	374,000
Corridor Xd	0	0	397,800	0	0	0	397,800
Route 1	44,200	23,800	0	292,400	0	0	360,400
Route 2a	0	775,200	0	0	0	0	775,200
Route 2b	588,200	353,600	0	544,000	0	0	1,485,800
Route 2c	425,000	0	0	0	0	0	425,000
Route 3	0	445,400	0	0	183,600	0	629,000
Route 4	0	0	0	612,000	1,431,400	0	2,043,400
Route 5	0	0	0	0	724,200	0	724,200
Route 6a	0	0	68,000	268,600	85,000	459,000	880,600
Route 6b	0	0	0	343,400	0	353,600	697,000
Route 7	387,600	0	0	0	289,000	363,800	1,040,400
Route 8	0	0	265,200	0	0	0	265,200
Route 9a	0	727,600	0	0	455,600	0	1,183,200
Route 10	0	0	578,000	0	0	0	578,000
Total	2,665,600	3,685,600	3,032,800	2,060,400	5,977,200	1,176,400	18,598,000

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Benefits: c. € 185 million annually from times savings (without considering traffic growth) and c. € 4 million annually from accident cost reduction.

Section	Time savings/year + accident reduction/year						
	ALB	BIH	MKD	MNE	SER	KOS	Total
Corridor Vc	0	49,406,909	0	0	0	0	49,406,909
Corridor VIII	24,934,901	0	5,915,864	0	0	0	30,850,765
Corridor X	0	0	4,254,635	0	27,693,618	0	31,948,253
Corridor Xb	0	0	0	0	8,204,911	0	8,204,911
Corridor Xc	0	0	0	0	2,329,183	0	2,329,183
Corridor Xd	0	0	103,601	0	0	0	103,601
Route 1	103,773	132,675	0	4,492,347	0	0	4,728,795
Route 2a	0	13,564,645	0	0	0	0	13,564,645
Route 2b	11,662,577	21,931	0	83,046	0	0	11,767,553
Route 2c	1,753,264	0	0	0	0	0	1,753,264
Route 3	0	28,168	0	0	54,350	0	82,518
Route 4	0	0	0	9,715,745	10,987,281	0	20,703,026
Route 5	0	0	0	0	211,570	0	211,570
Route 6a	0	0	17,076	40,238	24,117	5,064,696	5,146,127
Route 6b	0	0	0	49,057	0	93,849	142,906
Route 7	2,296,935	0	0	0	695,621	4,017,579	7,010,135
Route 8	0	0	68,670	0	0	0	68,670
Route 9a	0	67,906	0	0	135,454	0	203,360
Route 10	0	0	150,295	0	0	0	150,295
Total	40,751,450	63,222,233	10,510,142	14,380,433	50,336,104	9,176,123	188,376,486

Indicative Extension of the TEN-T Road Comprehensive/Core Network to the Western Balkans

Legend
— Core Network
— Comprehensive Network

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Challenges

- ITS applications deployment in the region is in its infancy and WB6 can avoid the friction of legacy systems and easily build a state of the art National ITS Architecture, based on a regional one. A prerequisite for this is the dissemination and awareness raising regarding ITS benefits to the stakeholders and wider public. <u>This was identified as one of the regional barriers to ITS implementation</u>.

- The three most significant barriers identified are:

    - unavailability of financing;

    - lack of relevant legislation; and

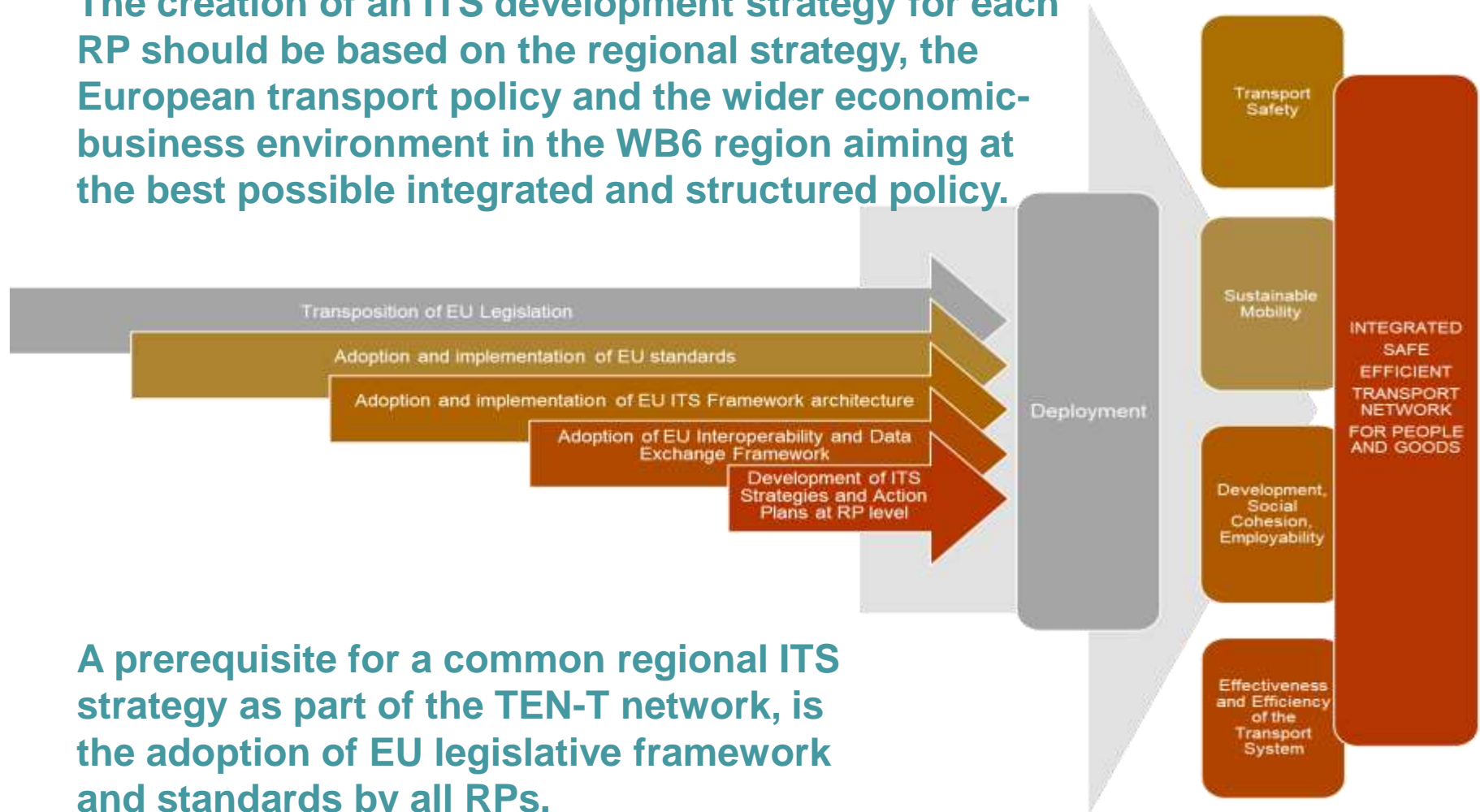   - unclear anticipated benefits.

    Thus, the most crucial step is to overcome those barriers. The two main challenges that the WB6 Regional Participants must face, towards a regional ITS implementation are changes needed at institutional level to abolish different and contradicting legislation, by adopting EU's ITS guidelines and standards and the promotion of best practices.

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Benefits

- Building a common regional ITS Strategy will help WB6 countries to build their own harmonized National ITS Architecture. For WB6 countries, having a National ITS Architecture provides specifications that enable:

  - Compatibility of information delivered to end users through different media;

  - Compatibility of equipment with infrastructures, thus enabling seamless travel across Europe;

  - A basis for national and/or regional authorities to produce master plans and recommendations to facilitate ITS deployment;

  - An open market for services and equipment where compatible subsystems are offered (no more ad-hoc solutions);

  - A known marketplace into which producers can supply products with reduced financial risk.

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Regional Vision and Strategic Objectives

Intelligent Transport Systems development in the entire WB6 area will contribute significantly to the creation of an integrated, safe and efficient transport network and will be a policy axis for ensuring sustainable mobility of people and transport of goods, development, employability and social cohesion in the Western Balkans region.

Strategic Framework

The creation of an ITS development strategy for each RP should be based on the regional strategy, the European transport policy and the wider economic-business environment in the WB6 region aiming at the best possible integrated and structured policy.

Transposition of EU Legislation

Adoption and implementation of EU standards

Adoption and implementation of EU ITS Framework architecture

Adoption of EU Interoperability and Data Exchange Framework

Development of ITS Strategies and Action Plans at RP level

Deployment

Transport Safety

Sustainable Mobility

Development, Social Cohesion, Employability

Effectiveness and Efficiency of the Transport System

INTEGRATED SAFE EFFICIENT TRANSPORT NETWORK FOR PEOPLE AND GOODS

A prerequisite for a common regional ITS strategy as part of the TEN-T network, is the adoption of EU legislative framework and standards by all RPs.

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Strategic Framework – Required actions

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Action	Sub-actions	Goal
Transposition of EU Legislation	Transposition of EU Directives	Completion of Institutional Framework
	Developing a legal framework, where required	Policy Making
Adoption and implementation of EU Standards	Ensuring the use of European standards and specifications for all new projects and upgrading old ones (if the case)	Completion of Institutional Framework Policy Making
Adoption and implementation of EU ITS Framework Architecture	Creating a framework for each RP's ITS architecture and ITS systems	Creation of ITS Framework
	Adopting the European framework and adapting to each RP's needs and objectives	Creation of ITS Framework
	Active involvement of RPs in ERTICO and other transport related bodies.	Capacity building Policy Making
Adoption of EU Interoperability and Data Exchange Framework	Adopting the EU interoperability framework and a mechanism for the exchange of ITS data at regional level (DATEX II, C-ITS, EETS)	Development of common standards and interoperability requirements at RP level, for integrating traffic management systems and other traffic data sources
Development of ITS Strategies and Action Plans at RP level	Creating a Strategy and a General Development Framework for ITS at RP level	Ensure alignment with the common regional Vision and Strategic Objectives
	Signing of a Memorandum of Understanding between WB6 RPs, committing to the common ITS Vision and its strategic objectives	Establishment of a common regional understanding on ITS and its benefits

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ITS & Green Mobility

ITS applications contribute to reduced emissions and save energy through better demand management including the use of electronic tolling, trip planning, parking management etc.

ITS applications and more specifically support for Connected and Coordinated vehicles can speed the transition of electrification of mobility, reducing its carbon footprint, paving our way towards climate change adaptation. One key element for providing a resilient road network are ITS applications supporting models to predict weather events, congestion, other relevant factors and real time management systems to provide early warning of trigger events and instigate intelligent re-routing and modal shift.

Conclusions

- Using the previous work done by former SEETO as basis and building on the available knowledge and the updated information provided on progress during recent years in each Regional Participant and in the EU concerning legislative and technological improvements, and in line with the Connectivity Reform Measures, the provisions of the Transport Community Treaty and its respective emerging obligations, **the Strategic Framework and Roadmaps constitutes a reference for the Regional Participants**.

- **The development of tailor-made ITS Multimodal Strategies and Action Plans should be a first priority for the Regional Participants**. This will be as per the expectations of the European Commission a) for accelerating and making decisive steps in the necessary reforms and adoption of the EU acquis and b) for establishing and ensuring an interoperable transport network in the region with standards equal to TEN-T, including ITS architecture, applications and services.

- **CONNECTA remains available to support the RPs through additional sub-projects in the field of ITS development**, provided that they are aligned with the Strategic ITS Framework and recommendations made, the RPs overall Transport Strategies and, above all, in the direction of harmonization with the EU Legislation and Standards and serving the scope of the Connectivity Agenda.

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