



Република Северна Македонија

**Министерство за
транспорт и врски**

Presentation of National ITS Strategy for Republic of North Macedonia

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11th Road Technical Committee
04 April 2023, Skopje



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BACKGROUND

The National Transport Strategy reflects this ambition through the development of a sustainable transport sector that is harmonized with other strategic developments of the country; counts on an intermodal infrastructure fully integrated into the European TEN-T network.

As declared, the National Transport Strategy 2018-2030:

” The Government of the Republic of North Macedonia is committed to transposing EU Guidelines and Directives/Regulations (the EU acquis) to integrate within the European Union and become a full member of the European Union. The National Transport Strategy (NTS) demonstrates this ambition through the development of a sustainable transport sector that is harmonized with other strategic developments of the country. Prioritization of ITS planning in North Macedonia is essential as it has become an integral component of international transport networks today.



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OVERALL OBJECTIVE

Development of National ITS Strategy for the Republic of North Macedonia aligned with national and international (EU) legal framework and plan for its implementation.

PURPOSE

Have an action plan for a period of 10 years with activities in terms of legal, institutional, technical, and operational modifications to be implemented in the Republic of North Macedonia in order to have an ITS ecosystem fully aligned with European and International standards.



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ROAD NETWORK

According to Eurostat, in 2019 the density of road transport network was 13m per km² for motorways (4m less than the EU average) and 569m per km² for other roads (849km in the EU's case).

The road network includes:

- Local roads - approximately 19,000 km.
- Sectional road network: municipalities and regions, 906 km.
- Motorways and highways, with a total length of 228 km.
- Additionally, the Skopje Ring Road has a total length of 26.5 km on the highway.
- Two Pan-European Transportation Corridors, Corridor VIII (east-west) and Corridor X (northsouth) pass through North Macedonia.
 - Corridor VIII consists of the E-65 road from Varna (Bulgaria) to Durres (Albania) via Sofia (Bulgaria) and Skopje. The length of this road in North Macedonia is 253 km (183.5 km on the highway) with a traffic flow of 1,500 to 2,500 vehicles daily.
 - Corridor X consists of the E-75 road from Athens via Skopje, Belgrade and Zagreb to Munich. The length of this road in North Macedonia is 170.4 km (118.7 km on the highway)





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NATIONAL CHALLENGES

The main objective of the Macedonian Government is to bring European standards and values to enable the citizens a European way of life.

The implementation of ITS achieves three main goals:

- road safety; environment improvement and protection; and mobility and transport efficiency.

These key goals are identified by the European Commission in the “Sustainable and Smart Mobility Strategy – putting European transport on track for the future”, and internationally by SuM4All2:





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ITS FRAMEWORK

The implementation of ITS solutions is characterized by three (3) aspects:

- Legal framework, referring to the context that regulates ITS design, implementation and operation.
- Organizational framework, referring to the identification of stakeholders involved in the design, implementation and operation of ITS directly or consequently by transport and mobility services.
- Technical framework, referring to the characteristics of existing ITS implementations.



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NEEDS ASSEMENT

Country Partnership
Framework for the
Republic of North
Macedonia 2019-2023

Programme for work
of the Government of
the Republic of North
Macedonia for the
period 2022-2024



THE WORLD BANK
International Development Bank



GENERAL
NATIONAL
CHALLENGES



ITS DIAGNOSTIC



FEEDBACK FROM
STAKEHOLDERS

NEEDS

Need 1

Macedonian legal and regulatory framework, aligned with Europe, that supports the implementation of ITS.

Need 2

An institutional organization to lead, promote and regulate the development of ITS.

Need 3

Promote the development of commercial activities related with ITS, encouraging public and private investments

Need 4

Improve the quality of all modes of transport and mobility services.

Need 5

Improve mobility and transport management capabilities.

Need 6

Improve the access to mobility information.

Need 7

Reduce the number and fatality of accidents on road and street networks, including railway level crossings.

Need 8

Reduce the contribution of mobility and transport on air pollution.

Need 9

Promote multimodality in public transport.

Need 10

Promote the creation of a Macedonian innovative cluster¹ working on technological solutions applied on mobility and transport



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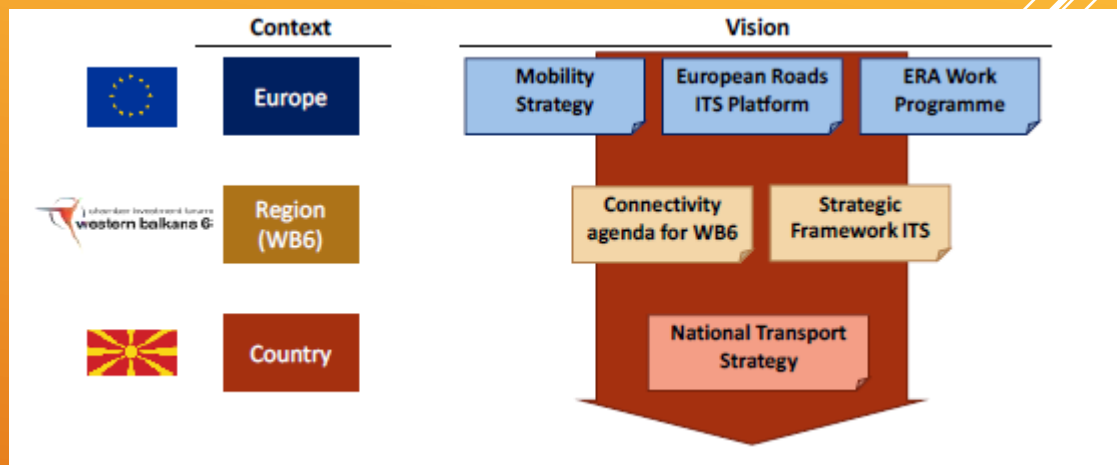
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Objectives

Mission

Vision

Needs



VISION



European country with a mature framework of interoperable ITS solutions, implemented to cover Macedonian needs according to the European context and International standards and best practices, that supports a sustainable, efficient and safe mobility interconnected with the European transport network.



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MISSION



The strategic plan defines actions on Macedonian legal, institutional and technological frameworks to establish an environment that enables and promotes the implementation of ITS solutions according to the European context for a sustainable, efficient and safe mobility:

Legal: create a specific Macedonian Legal framework for ITS in their fields, fully aligned with Europe and guaranteeing the implementation of interoperable solutions through the use of standards.

Institutional: establish a Macedonian governance structure that, integrating public and private actors, leads, regulates and promotes the development of a mature framework of interoperable ITS solutions.

Technical: implement high quality, integrated and interoperable ITS solutions and ICT facilities adapted to the Macedonian framework, to improve mobility and all modes of transport services.



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STRATEGIC OBJECTIVES



Objective 1 SAFETY

Avoid fatalities, injuries, and crashes from transport accidents, consequently preventing the public health risks, and social and economic losses associated with unsafe mobility.



Objective 2 EFFICIENCY

Develop a predictable, reliable, timely and cost-effective transport of passengers and goods, under one mode of transport or a combination of modes.



Objective 3 SUSTAINABILITY

Reduce the environmental impact of mobility in terms of GHG emissions and the increase in air and noise pollution to contribute to a healthy and resilient community.



Objective 4 INTEROPERABILITY

Availability of a mobility data platform for mobility managers, developers and all-users that supports their cooperation.



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ACTION PLAN

- 17 actions initially proposed by the Consortium to solve identified needs.
- 9 actions proposed by stakeholders during the workshops and approved by PSC. These additional actions come from:
 - Interpretation done by the stakeholders about national needs.
 - Alignment of North Macedonia to international challenges about Smart Mobility.



ITS organization in Europe that promotes research and defines ITS industry standards



Leading network of European cities and regions working together to develop innovative technologies and policies for local transport



*Volpe Center. U.S. Department of Transportation.
Federal Cabinet department of the U.S. government
concerned with transportation*



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ACTION PLAN

Action 1	Minimum required update in Macedonian legal framework
Action 2	Adaptation of the Macedonian legal framework for ITS implementation
Action 3	Digitalization of the traffic enforcement
Action 4	Creation of the ITS leader body
Action 5	Promotion of an ITS Association
Action 6	Development of a program for innovation on ITS
Action 7	Establishment of an ITS Service Charter for transport and mobility
Action 8	National Traffic Management Center
Action 9	National Access Point
Action 10	Development of a digital platform for mobility and transport planning
Action 11	Development of the Telecommunication Plan for main mobility and transport infrastructures
Action 12	National multimodal Fare Collection System
Action 13	Digital information channels in railway transport



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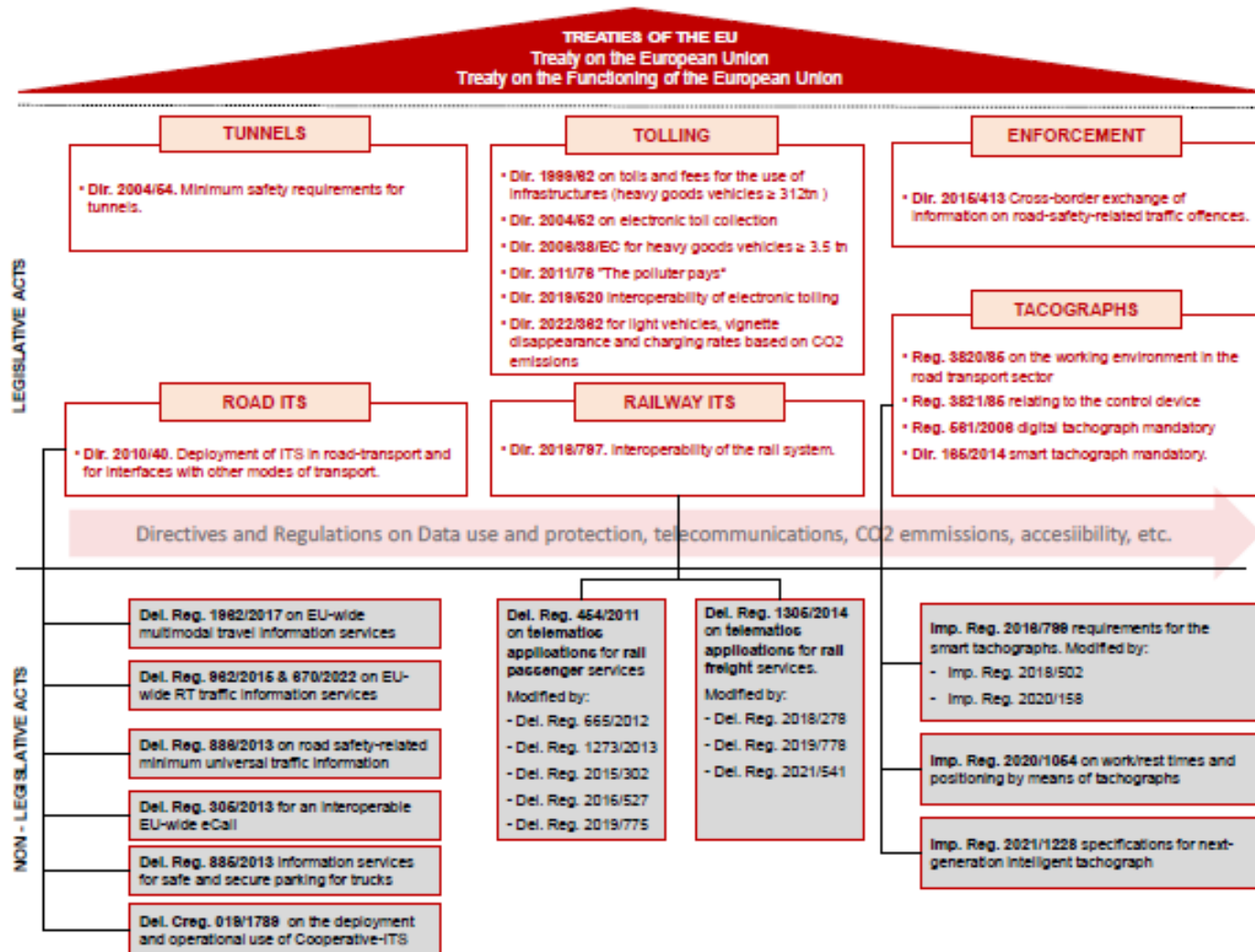
ACTION PLAN

Action 14	ALPR technology in the national tolling system
Action 15	Program for the development of C-ITS in North Macedonia
Action 16	Improvement of the operation in road tunnels
Action 17	Safety improvement in railway level crossings
Action 18	ITS solutions to facilitate people and goods movement in border crossings
Action 19	Promotion of ITS implementation in cities with more than 20,000 citizens
Action 20	Improvement of accessibility of travelers with special needs
Action 21	Program to implement ITS solutions in highways and national roads.
Action 22	Improvement of security for vulnerable travelers of transport services.
Action 23	ITS solutions to improve the safety of routes to schools and kindergartens.
Action 24	Promotion of the implementation of LEZ in cities.
Action 25	Promotion of MaaS solutions.
Action 26	Digitalization of traffic management in highways and national roads

KEY ACTIONS

ACTION 1+2

ADAPTATION OF THE MACEDONIAN LEGAL FRAMEWORK FOR ITS IMPLEMENTATION





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KEY ACTIONS

ACTION
1+2

ADAPTATION OF THE MACEDONIAN LEGAL FRAMEWORK FOR ITS IMPLEMENTATION

Adaptation of Macedonian legal framework with specific laws, equivalent to the existing European regulation, for each of the following topics:

- **Road ITS**, taking into account EU Directive 2010/40 and related delegated regulations.
- **E-Tolling**, taking into account EU Directives 1999/62, 2004/52, 2006/38, 2011/76, 2019/520, 2022/362 and related delegated regulations.
- **Tunnel safety**, taking into account EU Directive 2004/54.
- **Cross-borders data exchange**, taking into account EU Directive 2015/413.

In addition:

- Road safety: 2019/1936.
- Accessibility of public web site and application: 2016/2102.



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KEY ACTIONS

ACTION 3

DIGITALIZATION OF TRAFFIC ENFORCEMENT

Although European regulations do not impose the use of automatic enforcement or digitalized procedure, the Commission Recommendation on enforcement in the field of road safety (2004/345) stated as a best practice for speeding:

“the use of automated speed enforcement systems, followed up by procedures that have the necessary capacity to cope with a large number of violations”.

Digitalization of the traffic enforcement including:

1. Incorporate in the **law** the possibility of not notifying an infraction at the moment that it happens if the infraction has been detected with automatic enforcement equipment.
2. Implement a **National Traffic Infractions Management Center** where the automatically detected infractions are centralized, reviewed and processed and, if applies, notified to the offender.
3. Extend the **implementation of automatic enforcement system along road network** in order to be aligned with European rates.



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KEY ACTIONS

ACTION 12

NATIONAL MULTIMODAL FARE COLLECTION SYSTEM

Offer the users a way to identify, pay and consequently be granted access to the transport services integrated into the system; and in the same way, provide mobility and transport operators with a tool to identify users, charge according to their user characteristics and collect information about the use of the transport service



- Development, implementation, configuration, installation, operation, and management of the **Ticketing Central System**. The main functionalities are the **Clearing House** actions, the management of transport cards and security issues.
- Configuration and integration of the Central System with every **Operators Central System**. This integration is based on the agreement between the different stakeholders, especially the relevant administrations of the different public transport systems.
- The supply, installation, configuration, and testing of the **ticket and/or card validation equipment**.
- The supply, installation, configuration, and testing of **equipment to buy tickets and acquire and top up transport cards**.



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KEY ACTIONS

**ACTION
17**

SAFETY IMPROVEMENT IN LEVEL CROSSINGS

248 level crossings with the following characteristics:

- Road horizontal/vertical signalization (without barriers): 142 level crossings.
- Manual barriers: 11 level crossings.
- Signal-safety equipment (automatic barriers, light/sound signals): 95 level crossings



55% Active (safe)
45% Passive



43% Active (safe)
57% Passive

Action in 42 level crossing in order to equate North Macedonia with European average

- Diagnostic of existing level crossings.
- Categorization of level crossings based on flow, dangerousness or other criteria.
- Definition of technical alternatives (signaling, detection...).
- Implementation of the safety measures in a prioritized way.



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KEY ACTIONS

ACTION 18

ITS SOLUTIONS TO FACILITATE PEOPLE AND GOODS MOVEMENT IN BORDER CROSSINGS

The mobility of goods and people cross border crossings can vary depending on the period of the year or the time of the day, as well as social, political and/or economic conditions.



ITS solutions to inform and guide border crossings users are useful.

- **Border crossing**, VMS are useful in order to inform users and indicate the use of the lanes in each case.
- **Road section to the border crossing**, VMS before waiting areas or gas stations located close to the border crossing informing about the waiting time in the border crossing





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TIMELINE

SHORT TIME

2023

2025

MEDIUM TIME

2026

2029

LONG TIME

2030

2032

Criticality	Action to address identified challenges	Action to reach best-practices level	Action to position North Macedonia in ITS roadmap
Required investment	Low investment (less than 1 million €)	Medium investment (less than 15 millions €)	High investment (more than 15 millions €)
Political commitment	Political commitment required	Political commitment not required	Political commitment not required
Maturity	Accessibility to marketable mature technological solutions	Mature technological framework in Europe	Innovative solutions
Correlation between actions	Non conditioned action	Action conditioned by any developed in previous period	Action conditioned by any developed in previous period

❏ Criticality

❏ Correlation
between
actions

❏ Maturity

❏ Political
commitment

❏ Required
investment

		SHORT TERM																MEDIUM TERM																LONG TERM											
		2023				2024				2025				2026				2027				2028				2029				2030				2031				2032							
		Q1-2023	Q2-2023	Q3-2023	Q4-2023	Q1-2024	Q2-2024	Q3-2024	Q4-2024	Q1-2025	Q2-2025	Q3-2025	Q4-2025	Q1-2026	Q2-2026	Q3-2026	Q4-2026	Q1-2027	Q2-2027	Q3-2027	Q4-2027	Q1-2028	Q2-2028	Q3-2028	Q4-2028	Q1-2029	Q2-2029	Q3-2029	Q4-2029	Q1-2030	Q2-2030	Q3-2030	Q4-2030	Q1-2031	Q2-2031	Q3-2031	Q4-2031	Q1-2032	Q2-2032	Q3-2032	Q4-2032				
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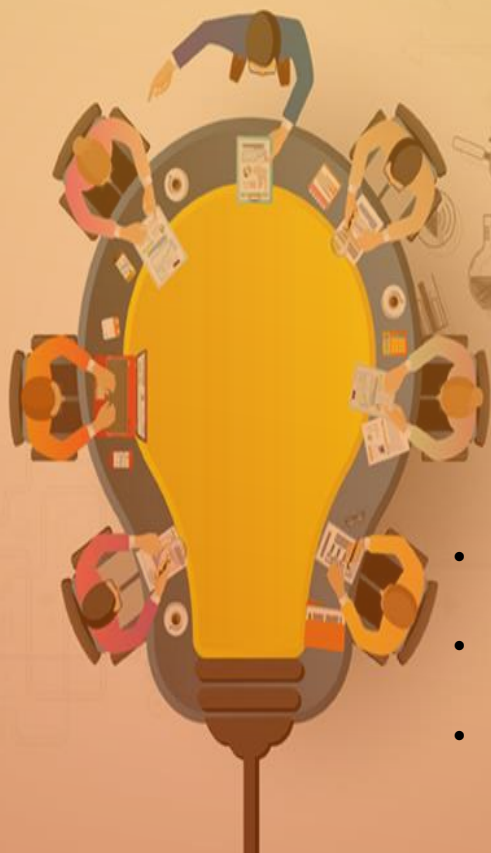


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APPROVAL OF ACTION PLAN

WORKSHOP WITH STAKEHOLDERS



- July 20th, 2022
- September 21st, 2022
- November 17th, 2022

Indicate for each of the following statements the level of agreement by your side:

0 - No concern

1 - Disagree

2 - Partially agree

3 - Agree

1	Identified needs represent Macedonian current challenges in terms of technological solutions implementation regarding mobility and transport	
2	Stated vision is aligned with national general objectives	
3	Stated vision supports the evolution of ITS implementation in North Macedonia	
4	Defined actions are achievable tasks	
5	Defined actions support the solution of identified needs	
6	The scope of each of the actions covers expected outcomes for each of them	
7	The identification of involved stakeholders and leadership is coherent with Macedonian framework	
8	Used prioritization criteria for timeline definition is coherent with strategic framework and national challenges	
9	Defined action plan can promote the development of national qualification on ITS	
10	Defined action plan can promote the development of the national ITS market	
11	North Macedonia should make efforts to complete the development of the Action Plan according to stated strategy	



AVERAGE
QUALIFICATION

2,5-3,0 agree



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**NATIONAL TRAFFIC
MANAGMENT CENTER**



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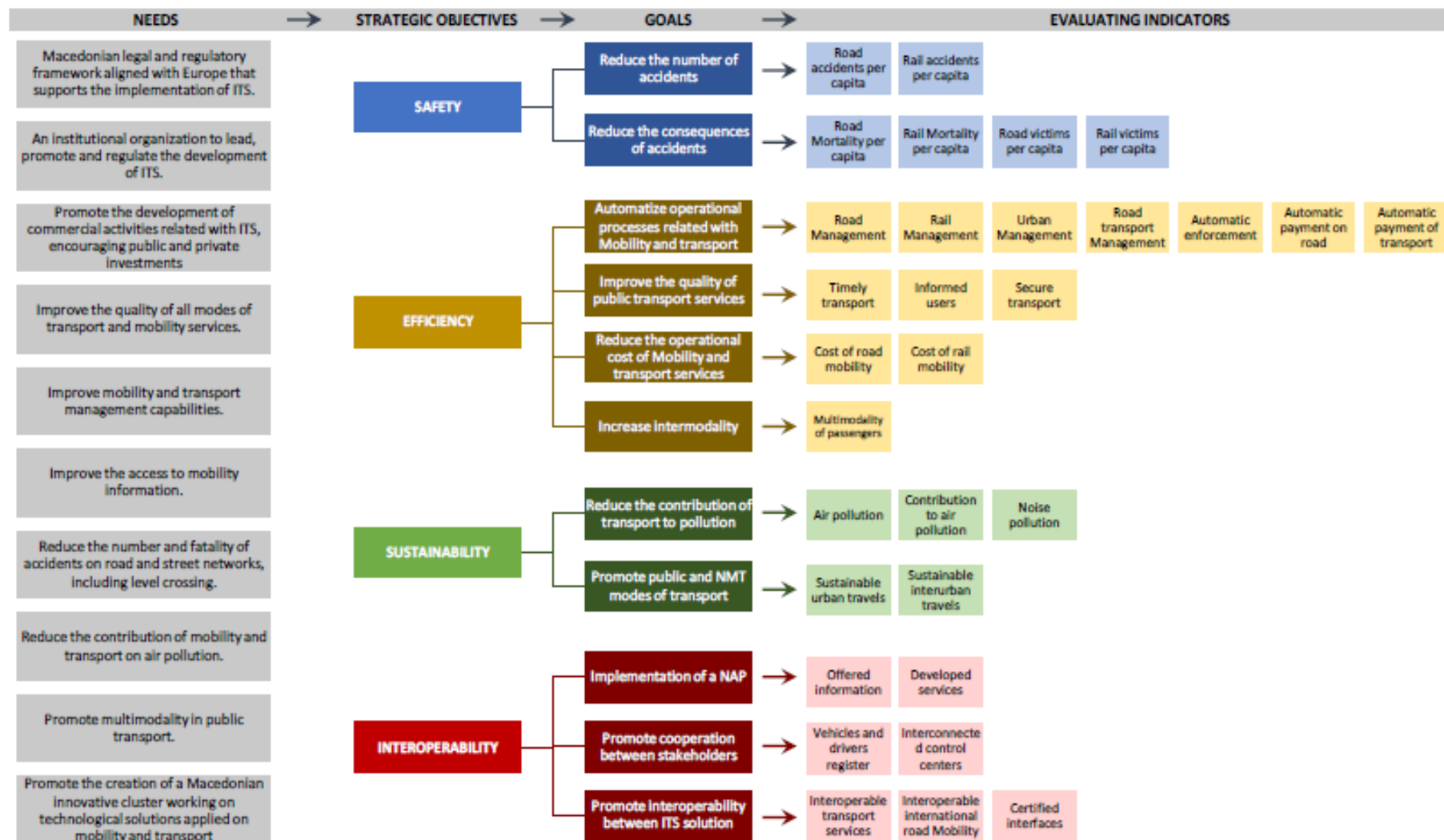
COMMUNICATION PLAN

COMMUNICATION CHANNELS	SPECIFIC TARGET GROUPS						
	National Government / Assembly / Government bodies	Public Enterprises	Investors	General Public	Mobility professionals, transport companies and associations	Local communities	Academic institutions
Strategy's website	✓	✓	✓	✓	✓	✓	✓
Related websites	✓	✓	✓	✓	✓	✓	✓
LinkedIn			✓	✓	✓		✓
Facebook		✓	✓	✓	✓	✓	
Instagram			✓	✓	✓	✓	
Interviews, reports on TV/ Radio	✓	✓	✓	✓	✓	✓	✓
Newspapers, magazines	✓	✓	✓	✓	✓	✓	✓
Factsheets/brochures/ posters			✓	✓			
Professional Publications			✓		✓		✓
Newsletters	✓	✓	✓	✓	✓	✓	✓
Press conferences	✓	✓	✓	✓	✓	✓	✓
Discussion platforms	✓	✓	✓	✓	✓	✓	✓
Conferences and fairs			✓	✓	✓		✓

Table 11 Tools & channels to be used to disseminate the information to the specific target groups

IMPLEMENTATION MONITORING AND EVALUATION FRAMEWORK

KEY PERFORMANCE INDICATORS





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	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25
Road accidents per capita	X	X	X			X	X	X	X						X	X	X		X	X	X		X	X	X
Rail accidents per capita	X					X	X		X								X								
Road mortality per capita	X	X	X			X	X	X	X						X	X	X		X	X	X		X	X	X
Rail mortality	X					X	X		X								X								
Road victims per capita	X	X	X			X	X	X	X						X	X	X		X	X	X		X	X	X
Rail victims per capita	X					X	X		X								X								
Road management	X	X	X	X	X	X	X	X			X			X	X	X		X			X				
Rail management	X			X		X	X				X						X								
Urban management		X		X	X	X	X				X				X				X				X		
Road transport management		X		X	X	X	X		X	X	X									X					
Automatic enforcement			X		X	X	X				X													X	
Automatic payment on road					X	X	X				X			X											
Automatic payment of transport					X	X	X				X	X													X
Timely transport						X	X		X	X		X	X		X				X					X	X
Informed users	X	X			X	X	X	X	X	X			X		X					X					
Secure transport						X	X				X											X			
Cost of road mobility	X	X			X	X	X	X		X	X	X			X	X	X	X			X				
Cost of rail mobility	X				X	X	X			X	X	X					X								
Multimodality of passengers						X			X	X		X	X							X		X	X		X
Air pollution			X			X	X	X							X			X	X		X			X	X
Contribution to air pollution			X			X	X	X							X			X	X		X			X	X
Noise pollution			X			X	X	X							X				X					X	X
Sustainable urban travels						X	X		X	X		X			X		X		X	X		X	X	X	X
Sustainable interurban travels						X	X		X	X		X	X		X		X			X		X		X	X
Offered information (NAP)		X				X			X																X
Developed services (NAP)		X				X			X	X			X							X					X
Vehicles and drivers register			X			X	X	X						X							X			X	
Interconnected control centers	X	X	X		X	X		X	X		X				X			X	X		X				X
Interoperable transport services	X				X	X						X													X
Interoperable international road mobility		X		X	X	X																			
Certified interfaces		X		X	X	X		X	X			X	X	X	X			X		X	X			X	X

Table 14: Cross-relationship between KPIs and Actions



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Thank you for your attention

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04 April 2023, Skopje