



**Enhancing Road Connectivity in Southeast Europe:  
Facts, Needs and Challenges**

Sofia, 2024

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## Foreword

### **“Enhancing Road Connectivity in Southeast Europe: Facts, Needs and Challenges”**

Over many millennia roads have linked continents together and have defined the way how goods, people and ideas move around the world. Silk Roads, Roman Roads, Egyptian Roads are just few of the examples of how roads have become the symbol of motion.

Following the studies ‘Next Stop Europe: Railways in the Western Balkans’ and ‘Blue Connectivity: Maritime and Inland Waterways in the Balkans Peninsula’ both commissioned by Konrad-Adenauer-Foundation as well as the establishment of Burgas Connectivity Forum, this study is a logical continuation of the efforts of the Foundation in the field of connectivity research in Southeast Europe and an example of building bridges between nations. Our research initiatives are sharing strategical vision about the connectivity future of Europe with the forums in Brindisi (Italy) and Tirana (Albania).

We deeply believe that the prosperity in the world is positively correlated to the investments in creation of knowledge and in research and development and innovation.

In her 2021 State of the Union speech, Commission President Ursula von der Leyen highlighted the need to strengthen strategic connectivity within the European Union through Global Gateway partnerships and projects. The Russia’s war on Ukraine made it clear that security and stability are essential for stable development. The invasion disrupted global trade and enhanced the global community to rethink the geopolitical role of the Black Sea region.

The study ‘Enhancing Road Connectivity in Southeast Europe: Facts, Needs and Challenges’ is zeroing in on the road connectivity dynamics of 13 countries and is aiming to contribute to the building of a society of knowledge where critical thinking is built on solid and proven information. The individual country chapters are reviewing the current road infrastructure situation in each one of the countries, focus on cross-border connectivity and bottlenecks, summarize ongoing projects and outline expected investment and offer policy recommendations. Pivotal point of the study are the environmental impact and the sustainability. Following the road infrastructure

projects in Southeast Europe, the reader can get a wider picture of the presence and the future of the region. In fact, the success of all described road projects may be an engine for transformational change that will build a sustainable future for the continent. Furthermore, an immense potential for growth lies on the connection of Southeast Europe to Asia.

In 2024, Konrad-Adenauer-Foundation Bulgaria realized a survey with the research centre TREND. The results showed that around 73% of all Bulgarians consider that the connectivity and road infrastructure directly influence the development of their regions. Additionally, 53% of the population see the positive correlation between their own wellbeing and the connectivity and road infrastructure.

We thank all authors for their respective contribution. We want to give a special thanks to Yasen Georgiev and Mariana Trifonova from Economic Policy Institute – Sofia for their engagement and dedication as coordinators of this research project.

The narrative about the transformational force of the connectivity projects can catch one's imagination about tomorrow. Moreover, it demonstrates how all connectivity-related initiatives are greatly contributing to the achievement of the Sustainable Development Goals.

**Norbert Beckmann-Dierkes,**

Director of Konrad-Adenauer-Foundation Bulgaria

# Road Infrastructure in Albania

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## Road Infrastructure in Albania

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### 1. Introduction

Effective transport systems are fundamental for a modern country's ability to compete in the world economy. Even more so, for small countries which aim to boost regional development and depend on trade with the region and the European Union.<sup>1,2</sup>

Roads are one of the highest value public assets of Albania, estimated at about US\$ 6 billion.<sup>3</sup> Data from Structural Survey of Enterprises in 2021 produced by INSTAT show that 8,691 enterprises were engaged in the sector of transport and communication, employing over 42,302 workers or 8.1% of the total number of persons reported as employed, generating around 7.1% of the total turnover.<sup>4</sup> In 2021, the Gross Domestic Production increased in real terms with 8.91% compared to 2020. It is estimated that economic activity "Trade, transport, accommodation and food services" contributed 1.64% of the growth.<sup>5</sup> Nevertheless, the wages in the economic activity 'Wholesale and retail trade; re-pair of motor vehicles and motorcycles; transport and storage; accommodation and food service activities' remained during 2021 below the average level.<sup>6</sup> The wage trend changed in 2023. Although the turnover volume index for the second quarter of 2023 for transport and storage (which include as well, rail transport of goods, sea transport, air transport, storage and post activity) decreased by 0.6% compared to the second quarter of 2022, the wage index increased by 16.1% compared to the second quarter of 2022.<sup>7</sup>

### 2. Review of Existing Road Infrastructure

Roads and highways are the predominant mode of land transport in Albania and provide essential connectivity for freight and personal mobility.<sup>8</sup> The roads are important public assets that should be improved and maintained continuously to serve to the needs of citizens and businesses.

<sup>1</sup> EU Delegation in Albania, "Stronger knowledge and skills for better roads in Albania"

<sup>2</sup> World Bank (2019)

<sup>3</sup> World Bank (2018b)

<sup>4</sup> INSTAT (2023a)

<sup>5</sup> INSTAT (2023b)

<sup>6</sup> INSTAT (2022a)

<sup>7</sup> INSTAT (2023c)

<sup>8</sup> World Bank (2018b)

Therefore, in the road transport, Albania should complete an efficient and modern road infrastructure network in order to achieve the connection of all types of transport and improve the inter-modality of the transport infrastructure. The access of service centres, production, and processing (logistics centres, areas and agricultural bases) located along the transport flows should be supported by the development of their infrastructure connections with the core transport network.

### **2.1. Length, Quality class and Capacity of the Road Network**

Classification of roads in Albania is done according to the Law No 8378 of 22.7.1998 "Road Code of the Republic of Albania", as amended (point 6, article 2 of the Road Code).<sup>9</sup> The Code defines that "a road" constitutes an area for public use destined for the movement of pedestrians, vehicles and animals. The Code classifies the roads according to their constructive, technical and functional characteristics as follows:

- A. Highway,
- B. Main inter-urban roads,
- C. Secondary inter-urban roads,
- D. Main urban road,
- E. Secondary urban roads,
- F. Local roads.

According to the definitions of the Road Code, INSTAT calculated that the road network in use in 2021 and 2022 was 3,606 km.<sup>10,11</sup> In this calculation, INSTAT includes only the roads managed by the Albanian Road Authority (ARA). The draft Strategy of Transport 2025 provides some additional data following the classification made from INSTAT. The roads are classified as in the following table.

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<sup>9</sup> Road Code (1998)

<sup>10</sup> INSTAT (2022b)

<sup>11</sup> INSTAT (2023d)



Table 1: Classification of roads according to the Road Code

Road categories	Length (km)				Density per 100 km <sup>2</sup>			
	2019	2020	2021	2022	2019	2020	2021	2022
Highway	-	21.60	24.70	24.70	-	0.08	0.09	0.09
Main inter-urban road	185.20	267.90	260.10	260.10	0.64	0.93	0.90	0.90
Secondary inter-urban road	1,439.80	2,821.25	2,675.75	2,675.75	5.01	9.81	9.31	9.31
Main urban road	-	7.00	9.60	9.60	-	0.02	0.03	0.03
Secondary urban road	19.10	23.55	48.50	48.50	0.07	0.09	0.17	0.17
Local roads	444.65	532.30	587.40	587.40	1.55	1.85	2.04	2.04
Other	1,626.20				5.66			
Total	3,714.95	3,675.60	3,606.05	3,606.05	12.92	12.78	12.54	12.54

Source: Draft Strategy of Transport 2025

To many observers, the length of roads in Albania classified as highways seems questionable. These misconceptions are based on lack of knowledge on road classification and improper terminology used in the past by the Ministry responsible for transport and ARA. Several sections of roads were categorised by the government institutions as highways, whereas INSTAT categorises these as main inter-urban roads, as they do not fulfil certain criteria such as minimum design speed, median width, marking, etc. However, INSTAT seems consistent in its methodology and results and the data provided in the draft Strategy of Transport 2025 seems to corroborate this.<sup>12</sup>

Data provided by INSTAT<sup>13</sup> show that the road density per 100 km<sup>2</sup> decreased from 12.9 in 2019, to 12.8 in 2020 and to 12.5 in 2021 including in this indicator only the national road network managed by ARA. The decrease can be explained that the new roads under construction cut through the terrain increasing traffic speed. In comparison, the Western Balkans has an average of 54 km of road per 100 km<sup>2</sup> of land, compared with 126 km per 100 km<sup>2</sup> in other Central and Southeast European countries in the EU (excluding Romania and Bulgaria).<sup>14</sup>

The quarterly statistics published by INSTAT for the first, second and third quarter of 2023, show that the length of the main roads has not changed since 2021. The length remains the same (3,606 km) and the secondary inter-urban roads constitute around 74.2% of the overall main road net-

<sup>12</sup> INSTAT (Draft Strategy of Transport 2025)

<sup>13</sup> INSTAT (2022b), INSTAT (2023d)

<sup>14</sup> EU in Action: Transport

work.<sup>15,16,17</sup> This seems odd taking into consideration that the Albanian government continued to invest heavily in the road transport during the period 2022 – 2023 as well.

For its own purposes, the Albanian Road Authority divides the roads under its administration in two main categories:

*Primary roads*, which are numbered from Sh1 to Sh9 plus highways (A1 Mitlot – Morinë, A2 Levan – Vlora and the highway A3 Elbasan – Tirana), and;

*Secondary roads*, numbered from Sh20 to Sh99 as well as some road axes without any reference number. With the construction of new segments within the road network Sh1 to Sh9, the old matches should also be introduced in the secondary network.

The primary network consists of main roads and some main secondary roads and since it connects all major cities and tourist centres, it holds most of the traffic in Albania. According to ARA, all the primary roads in the main network and about 2/3 of the total length of the secondary network are paved roads. About 48% of the total length of the primary network and 21% of the secondary network is on flat ground, while 34% of the primary network and 56% of the secondary road network is located in mountainous terrain. The national road network under the jurisdiction of ARA also includes a total of 803 bridges (with a total length of over 10 m).<sup>18</sup> A survey carried by ARA in 2018 on key backbone corridors and connecting roads on the national road network has shown the worrisome conditions of the bridges, and levels of deterioration of their key structure, particularly on the secondary roads. Several of these had already passed their design life span several decades ago, while others did not receive any or limited maintenance during the last two decades.<sup>19</sup> While few, recently constructed bridges are in reasonably good condition, others are either in extremely poor conditions requiring major upgrades to full reconstruction, or their design traffic volumes and/or bearing capacity has been reached, requiring widening/dualling and/or structural strengthening to accommodate increased traffic volumes and changing axle loads induced by the country's actual and future growth.

The World Bank Roads Maintenance and Safety Project Based on Results<sup>20</sup>

<sup>15</sup> INSTAT (2023e)

<sup>16</sup> INSTAT (2023f)

<sup>17</sup> INSTAT (2023g)

<sup>18</sup> Draft Strategy of Transport 2025

<sup>19</sup> World Bank (2021)

<sup>20</sup> World Bank (2014)

identified the following functional road categories based on the network features under consideration:

Primary roads (P), means Albania highways and main road corridors (including here the core network in Albania);<sup>21</sup>

Primary-secondary roads (PS), meaning the roads of Albania - except the primary roads - that connect the main cities and tourist centres, as well as lead to border crossings with neighbouring countries, within Albania;

Secondary roads (S);

Roads built by the Albanian Development Fund (ADF).

According to a study carried by the World Bank and quoted by the draft Strategy of Transport 2025, roads P and PS hold the largest share of national road traffic, with an average daily traffic of 6,695 vehicles per day and carrying 76% of vehicle use, while roads S and ADF have an average traffic of 1,705 vehicles per day and carry only 24% of vehicle use, despite making up 56% of the network length. The network carries about 4,523 million vehicles-km per year consuming about 595 million litres of fuel per year resulting in 1.48 million tons of CO<sub>2</sub> per year.

Table 2: Vehicle traffic and use

Network	Traffic		Use (million vehicles-km)	
	% Network	Average	Use	Use
	< 1,000 AADT	AADT	(m auto-km/ year)	(%)
<b>P</b>	5%	7,194	3,064	67.7%
<b>PS</b>	31%	4,212	361	6.9%
<b>S</b>	68%	1,757	1,072	24.8%
<b>ADF</b>	100%	751	25	0.7%
<b>Total</b>	43%	3,916	4,523	100.0%

Source: World Bank

However, the overall length of Albania's road network is approximately 15,000 kilometres (km) according to World Bank<sup>22</sup> and UNECE,<sup>23</sup> which include in their calculations even the roads managed by the local authorities. Both, World Bank and UNECE conclude that approximately 11,000 km of secondary (regional) roads and local roads are managed by local authorities. The draft National Transport Strategy 2025 puts this figure to around

<sup>21</sup> Core roads are the ones that are classified into the TEN-T Core Network

<sup>22</sup> World Bank (2018b)

<sup>23</sup> UNECE (2020)

9,500 km.<sup>24</sup> This is more in line with data provided from other sources.<sup>25</sup> UNECE provides a classification of these roads: Regional roads, 4,411 km; rural roads, 4,980 km and urban roads 2,500 km.<sup>26</sup> Other authors provide different data for the entire road network, such as 18,000 km and a road density of 62 km per 100 km<sup>2</sup>.<sup>27,28</sup>

The differences in the data provided by the government authorities, and various international institutions/ studies can be caused by the inaccuracy of data provided by the Albanian authorities due to lack of a central database of road infrastructure and the different date of collection of data. The necessity of a Road Asset Management System (RAMS) was identified several years ago and in 2017, a World Bank project and CONNECTS were working on the setup of this system.<sup>29</sup> In May 2021, the consultancy contract for the Road Asset Management System was signed as part of a project run by the World Bank. However, in December 2022, it was reported that the World Bank recommended to the Albanian Road Authority to terminate the contract with the consultant. It was assessed that the consultant had not managed to complete the system according to the required specifications, causing the system to be considered as unfinished.<sup>30</sup> The termination of the contract was considered a major setback from the Transport Community.<sup>31</sup> The design of the System, its implementation population with data, completed with observations in the ground, will serve to provide a clear picture of the Albanian road network, its length and quality.

The state of this regional and local network represents an obstacle to the development of the private sector in rural areas, especially as it acts as a barrier to agricultural growth and competitiveness.

Transport is one of the main sectors affected by climate change showing how vulnerable the entire region is to climate change, due to lower resilience and adaptive capacity. The World Bank's project "Construction of Resilient Bridges in Albania" carried out a thorough assessment of the national road network, identifying 100 bridges requiring intervention out of a total of 803 bridges. The study on the condition of the bridges was done immediately after the earthquake of November 26, 2019.<sup>32</sup> In the first phase, the focus

<sup>24</sup> Draft Strategy of Transport 2025

<sup>25</sup> Bardhi, Golgota, Lule and Golgota (2013)

<sup>26</sup> UNECE (2020)

<sup>27</sup> Vela (2013)

<sup>28</sup> Velaj, Koprencka and Petanaj (2013)

<sup>29</sup> National Transport Strategy 2016

<sup>30</sup> Kote (2022)

<sup>31</sup> Transport Community (2023a)

<sup>32</sup> Tema (2023)

will be on the construction or restructuring of the 27 most critical bridges, including five entirely new constructions. The total cost of the project is USD 100 million. The project was intended to start in September 2023.<sup>33,34</sup> However, the start was postponed in 2024. The first bridges to be built are the bridge of Beshiri over the Erzeni river, the bridge of Viroi over the Drino river connecting Gjirakastira and Tepelena and the Dragoti bridge over the Vjosa river connecting Përmeti to the rest of the country.

However, ARA assess that in the national road network, there are about 80 priority bridges (with a traffic flow of 100 to 2500 vehicles per day) and canals under the road which will require intervention within the next seven years.<sup>35</sup>

### 2.2. Number of Vehicles and Their Characteristics

Albania is not a vehicle producer. Vehicles are imported from other countries/regions, mainly Europe, with fewer from Asia and the United States of America. The number of vehicles in Albania has increased for each year. In 2020, there were 676,811 active or temporarily deregistered vehicles, in 2021, 740,669 and in 2022, 796,438 vehicles. Category M1 of vehicles constituted 80.3% of all the vehicles in Albania in 2022. The number of M1 vehicles increased by 7.8% in 2022 compared to 2021.<sup>36</sup>

However, the vehicles imported and used in Albania are rather old, equipped with manual gear shift, petrol based with a heavy impact on the environment and outdated safety features. 60.8% of all M1 vehicles in 2022 were equipped with manual gear shift. The M1 vehicles which were between 11 and 20 years old constituted 51.1% of the total number M1 vehicles registered or temporarily deregistered in Albania in 2022. In 2021, this indicator was 54.2% of all M1 vehicles. In 2022, there were 261,698 M1 vehicles in use in Albania which were more than 20 years old, up from 221,968 M1 vehicles in 2021. 73.7% of all M1 vehicles in 2022 were petrol based compared to 73.6% in 2021 and 73.5% in 2020. The number of M1 vehicles that use petrol was increased with 7.8% in 2022 compared to 2021.<sup>37</sup>

According to the Decision of Council of Ministers No 633 of 26.10.2018 "On measures against air pollution from motor vehicle exhausts and the reduction of air emissions of gaseous and suspended solid pollutants from positive ignition engines and those with compression ignition burning natural gas or liquid for use in vehicles", as amended, the import of M1 vehicles below Euro

<sup>33</sup> Transport Community (2023b)

<sup>34</sup> Monitor (2022)

<sup>35</sup> ACP (2022)

<sup>36</sup> INSTAT (2022c), INSTAT (2023h)

<sup>37</sup> Ibid.

4 was forbidden starting from 1 January 2019. In 2018, the Albanian Ministry of Tourism and Environment calculated that almost 80% of all vehicles in use were Euro 0-3 and that only 5% of M1 vehicles registered in Albania were new. Unfortunately, the taxation system used in Albania stimulates the import of old vehicles.<sup>38</sup> According to data from the General Directorate of Road Transport Services, during the period 2020 – 2022, the average age of imported used M1 vehicles was close to 12 years while the average age of the Albanian vehicle fleet was 17.5 years old. During the period May 2021 – March 2023, there were deregistered 10,422 vehicles older than 22 years.<sup>39</sup>

Albania has fully transposed the Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers which establishes minimum requirements for a regime of periodic roadworthiness tests of vehicles used on public roads. Data published from the General Directorate of Road Transport Services show that around 31% of 282,743 vehicles checked in January – December 2023, did not pass the roadworthiness test: 30.2% of these due to defects in the gas exhaust system, 12.4% due to issues related to braking system and 12.3% due to issues related to steering system.<sup>40</sup>

Data show that the number of fully electric vehicles has increased in the last years. In 2015, there were only 9 electric cars registered in Albania. In 2021, the number of electric vehicles increased to 624 in 2021 and to 1,245 in 2022. During the period January – September 2022, there were registered almost 1,200 new electric vehicles.<sup>41</sup> During 2022, the full electric vehicles represented around 17% of all the new vehicles registered in Albania, while the full electric + hybrid vehicles represented 31% of all new vehicles registered in Albania.<sup>42</sup> The taxation system in Albania supports the registration of new electric vehicles, through favourable fiscal incentives such as the removal of VAT, reduction of registration fees and exemption from taxes of these environmentally friendly vehicles.<sup>43</sup>

However, Albania has not approximated the Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure. Currently, there are 60 electrical vehicles charging stations (EVCS) for a density of around 0.46 per 100 km.<sup>44</sup> For the

<sup>38</sup> Balkanweb (2018)

<sup>39</sup> GDRTS (2023a)

<sup>40</sup> GDRTS (2023b)

<sup>41</sup> Probizz (2023)

<sup>42</sup> Monitor (2023)

<sup>43</sup> Transport Community (2023b)

<sup>44</sup> Transport Community (2023b)

EVCSs installed by the municipalities and owned by them the e-charging services are free for the electrical vehicles' owners. However, there are no EVCS on the TEN-T road network contained in Albania. If Albania follows the EU rules regarding EVCSs in the TEN-T road network, it should construct 23 EVCSs.<sup>45</sup>

In the short term, Albania plans to amend existing legislation to align with European Union directives, approve in national legislation request for appropriate number of refuelling points for LNG and CNG, specify technical requirements for LNG and CNG usage, assess current alternative fuel usage, and enhance human resources capacity. In the mid to long term, the country aims to promote hydrogen as a replacement for fossil fuels and fully transpose the Directive 2014/94/EU while considering related EU regulations and standards. (Transport Community 2023b)

### 2.3. Part of Pan-European Corridors and/or TEN-T Network

In December 2023, the Council adapted its General Approach for TEN-T network and included for the first time, the Western Balkan corridors as part of TEN-T corridors.<sup>46</sup> Part of this list in the territory of Albania were (i) the Adriatic - Ionian Highway Corridor as the Indicative Extension of the EU TEN-T MED (Mediterranean) Corridor as well as (ii) Corridor VIII (both in road and rail). Albania with the Law No 103/2023 of 21.12.2023 "On the ratification of the high-level agreement between the Republic of Albania and the European Union on indicative maps of the Trans-European transport network in Albania", adopted these indicative maps for the territory of the Republic of Albania.<sup>47</sup>

The Albanian strategic objectives in the draft National Transport Strategy 2025 concerning the network of road and railway corridors are:

Reconstruction according to TEN-T standards of the railway line Vora-Hani Hotit, Tirana-Durres and the railway branch with Tirana International Airport and Durres-Rrogozhina, to requalify the Adriatic-Ionian Highway Corridor in full road / rail / port corridor airport Indicative Corridor Extension MED TEN-T. Construction according to TEN-T standards of the Corridor VIII Durrës-Elbasan-Qafë Thanë and Reconstruction according to TEN-T standards of the railway line Rrogozhinë-Elbasan-Lin Pogradec, to requalify (Core Network) Corridor VIII Durrës-Qafë Thanë in Indicative of the TEN-T Orient / East Med Corridor through the indicative extension of the Orient / East Med in the territory of North Macedonia.

<sup>45</sup> Ibid.

<sup>46</sup> European Council (2022)

<sup>47</sup> Law No 103/2023

## 2.4. Road Safety

Road safety used to be a major problem related to road transport in Albania. The increase in the number of vehicles after 1992, poor training of new drivers, poor quality of roads and used vehicles increased the number of accidents and fatalities in Albania. It is estimated that in 2009, there were 1,465 accidents, 378 fatalities and 1,462 injured or maimed. A large part of them remained disabled for the rest of their lives, increasing the financial hardship for their families. The road accidents costed Albania in 2009 around 106 million euro or roughly 1% of the GDP. If the trend of the years before 2009 was going to continue, it was calculated that Albania was going to have some 600 fatalities by 2020.<sup>48</sup>

Facing this situation, the Albanian government approved the Decision of Council of Ministers No 125 of 23.02.2011 "On the implementation of objectives for the improvement of road safety". The National Road Safety Strategy was based, and it was in harmony with the Regional Road Safety Strategy developed by Southeast Europe Transport Observatory (SEETO). Its preparation was supported by a project managed by SEETO. The Strategy focused on controlling speed and aggressive driving, improving law enforcement, education of road users and creation of a safe and friendly road environment (road safety audit and improvement of black spots). The objective of the National Road Safety Strategy was to reduce by 50% the number of fatal accidents and injuries per year 2020, compared to 2009.

The analysis shows that, in 2020, the number of victims decreased compared to 2010, from 352 to 181 in 2020, expressed in percentage a decrease of 48.5%. Data show that the goal regarding fatal accidents was basically reached, as shown in the table below.

*Table 3: Road Accidents in Albania (2018 – 2022)*

Road accidents	Year				
	2018	2019	2020	2021	2022
No of accidents	1,711	1,498	1,234	1,376	1,165
No of fatalities	213	227	181	197	164
No of injuries	2,078	1,817	1,417	1,663	1,435

*Source: Road transport (2022)*

The same decreasing trend continued in the first half of 2023. Data from INSTAT show that in the first six months of 2023, there were 528 road accidents in comparison with 581 accidents that occurred in the same period of the previous year. The number of road accidents decreased by 9.1%. There

<sup>48</sup> NSRS (2011)



were 722 accident victims as opposed to 821 accident victims in the first half of 2022. In 2022, only 14.3% of accidents were due to pedestrian behaviour or a 20.5% decrease compared to 2021.<sup>49</sup> In the first half of 2023, it was noticed a change regarding the pedestrian behaviour compared to the entire 2022. Road accidents, in 15.2% of cases, in the first half of 2023, occurred because of pedestrian behaviour. The number of accidents according to pedestrian behaviour for the six-month period increased by 9.6%.<sup>50</sup> However, it remains to be analysed if this is a sign of a trend or simply coincidental. The first fines for jaywalking were imposed in August 2023.<sup>51</sup> However, after several days, those were forgotten, only to restart in January 2024.<sup>52</sup> According to the Albanian Road Code, wrongful behaviour from the pedestrians can be punished with fine from 500 to 2,000 ALL (roughly 4.90 – 19 euro).<sup>53</sup>

INSTAT prepares the statistics on road safety based on data provided by the General Directorate of State Police which are gathered by the traffic police at the scene of accident. The data collected there are entered first into the Accident Database System developed in MS Access which now can be considered obsolete. The database is organised in 12 tables that cover 32 different accident variables. The entire process is carried out according to the provisions of the Decision of Council of Ministers No 153 of 7.04.2000 "On the approval of the implementing regulation of the Road Code of Republic of Albania", introduced in 2015.<sup>54</sup> Over a year ago, the terms of reference were prepared for the design and implementation of a new IT system for the General Directorate of State Police which will collect data compatible with the EU road crash database (CARE). However, until now the procurement for the new IT system has not started.

However, there is some confusion regarding the data on road accidents because different data are collected and publicised by the Albanian National Centre for Health Emergencies. For example, for the period January – September 2019, INSTAT based on police data reported 1,136 road accidents with 157 casualties, while the National Centre for Health Emergencies reported a staggering 5,146 accidents with only 136 casualties.<sup>55</sup> National Centre for Health Emergencies reported on 27.12.2023 that in 2023, there were 3,858 accidents compared to 3,293 accidents in 2022, or roughly 11 accidents each day in 2023, compared to nine each day in 2022.<sup>56</sup> This

<sup>49</sup> INSTAT (2023i)

<sup>50</sup> INSTAT (2023h)

<sup>51</sup> Gijotina (2023)

<sup>52</sup> Shqiptarja.com (2024)

<sup>53</sup> Road Code (1998)

<sup>54</sup> UNECE (2018)

<sup>55</sup> Newspaper Si (2019)

<sup>56</sup> Ditar (2023), Top Channel (2023)

confusion should be resolved as pointed out by the Commission during the meeting of the Stabilisation and Association Subcommittee on Transport, Environment, Energy and Regional Development in 2023.

The European Commission in its latest report on Albania published on 8.11.2023 recommended to Albania to prepare and adopt the new Road Safety Strategy in compliance with the Transport Community Road Safety Action Plan.<sup>57</sup> This is a repeated recommendation from the previous years.<sup>58</sup> However, although the previous Strategy ended in 2020, Albania has still not initiated the preparation of the new Strategy citing capacity issues.

The draft Strategy of Transport 2025 foresees that the new Road Safety Strategy will start to be prepared in 2024 and it will be eventually approved in 2025. Foreign assistance is required to prepare the Strategy for the coming years. This seems to be a common issue for the Albanian public administration since very few strategic documents are prepared by the state institutions without technical assistance.

Currently, Albania has finalised the Terms of Reference for drafting the Road Safety Strategy. The Technical Assistance is supported by EU Delegation in Tirana. The same project foresees the restructuring of the Authority of Roads in Albania.<sup>59</sup>

The new Road Safety Action Plan should address the main issues identified in the draft National Transport Strategy, such as the lack of awareness by the road users despite the administrative measures taken against them, practical implementation of the current legislation by all the institutions, proper knowledge of the legislation, approval or update of bylaws and the necessary capacity for the rigorous implementation of applicable legal obligations. The draft National Transport Strategy foresees as well, the setup of a joint group with experts of the field to draft and harmonise the Albanian legislation with the EU legislation, standards and best practices.

### **3. Review of Strategic National Documents Related to Road Infrastructure and Connectivity**

The first Albanian National Transport Strategy covered the period 2008 – 2013. The strategic objective of this Strategy was to create a unique road network that would serve to connect the country together to gradually realise the levelling of economic development by, bringing the markets closer,

<sup>57</sup> European Commission (2023)

<sup>58</sup> European Commission (2021), European Commission (2022)

<sup>59</sup> Transport Community (2023b)

avoiding the creation of super-populated spots or regions and distributing the traffic optimally, which would reduce the level of pollution and accidents.<sup>60</sup>

To this purpose, the Strategy included almost the entire primary national network in the Regional Core Network. The Strategy foresaw the construction of the East-West (Corridor VIII) and North-South corridors (currently labelled Adriatico - Ionian), as well as the Durrës-Morina Corridor, according to the international standards (about 850 km long) and the construction of the axis Milot-Rrëshen-Kalimash-Kukës-Morina (about 114 km long) financed by the Albanian government and the foreign donors. The preparation of the Strategy was supported by a project run by the South-East Europe Transport Observatory (SEETO).

The Sectorial Transport Strategy and Action Plan 2016 – 2020 was the second strategic document in the transport sector. The Strategy was prepared in alignment with the National Strategy for Development and Integration 2015 – 2020 (NSDI II). NSDI II defined Albania's vision for its national social, democratic and economic development during the period 2015 – 2020, including a plan for integration into the European Union after the granting of candidate country status on June 27, 2014. Therefore, the National Sectorial Transport Strategy 2016 – 2020 was in full compliance with the program and objectives of the Government for the development and integration of the country in the EU. The monitoring of the Strategy showed that out of 40 tasks in the road transport, there were completed 26, 12 were in progress by mid-2021 and the implementation of two measures had not started.<sup>61</sup>

The approval of the Sectorial Transport Strategy made Albania eligible to receive budget support from the European Union in the transport sector. All the investments in the road sector financed by the state budget or foreign assistance were mainly concentrated in the Albanian core network.<sup>62</sup> However, Albania failed to use in full the budget support provided by the European Union. Out of 10 million euro for the first and second variable tranche, Albania received only around 7.5 million euro because not all the indicators were fulfilled.<sup>63</sup>

Similar to the Road Safety Strategy, the European Commission recommended the preparation of the third National Transport Strategy.<sup>64</sup> However, due to lack of resources and the need to secure foreign assistance, the preparation of the Strategy was rather protracted. The preparation of the third

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<sup>60</sup> (National Transport Strategy 2008)

<sup>61</sup> 4th Monitoring Report May 2021

<sup>62</sup> National Transport Strategy 2016

<sup>63</sup> 4th Monitoring Report May 2021

<sup>64</sup> European Commission 2021, European Commission 2022, European Commission 2023

National Sectorial Transport Strategy 2025 was initiated before the preparation of the National Strategy for Development and Integration III. Therefore, in its first phase of drafting, it was based for the main objectives on the National Transport Plan - Second Review (ANTP3), approved by order of the Minister of Infrastructure and Energy in February 2020.<sup>65</sup>

The National Transport Strategy and Action Plan 2025 further considered the National Package of Priority Projects prioritised under the SSPP (Single Sector Project Pipeline) system in the transport sector.

These Projects of Strategic Significance are approved annually by the Strategic Planning Committee / Strategic Investment Council chaired by the Prime Minister. Other cross-cutting strategies promoted and approved by the Government of Albania in the field of business, trade, tourism, environment, spatial planning, energy and social inclusion were also used.

The most important key EU documents (prepared by DG MOVE) that have been used to draft this Strategy are the Sustainable & Smart Mobility Strategy 2020, the Economic and Investment Plan for the Western Balkans 2020p Green Agenda 2020 (Western Agenda) for the Western Balkans in line with the EU Green Deal Agreement (Green Deal).<sup>66</sup>

The draft National Sectorial Transport Strategy 2025 defines the long-term vision for the transport of Albania which is: Development of the Albanian national transport system on the basis of a cleaner, safer, smarter, greener, more flexible and competitive mobility which ensures a stable transport, interconnected, interactive and widely integrated with the international system and European transport as well as the Western Balkans Region.

However, the National Transport Strategy 2025 was delayed due to the fact that support was needed for its finalisation by CONNECTA. In the meantime, the National Strategy for Development and European Integration 2022 – 2030 was approved taking into consideration the latest developments in Albania and in the relations with the European Unions and the neighbouring countries. A quick analysis reveals that the strategic goal and the strategic priorities of the draft National Sectorial Transport Strategy are aligned with the National Strategy for Development and European Integration. During the second half of 2023, the Transport Community Secretariat provided assistance for the finalisation of the Strategy. Juxtaposing the document prepared in 2021 and the one prepared in the late 2023, reveals that several projects that were planned to be implemented according to the 2021 version, during

<sup>65</sup> Draft National Transport Strategy and its Action Plan 2021 - 2025

<sup>66</sup> Draft National Transport Strategy and its Action Plan 2021 - 2025

the period 2021 – 2023, are still under construction, such as the road Qukës – Qafë Plloçë or the Tirana Ring, or started to be implemented only in 2023, such as the reconstruction of the road from Elbasani to Përrenjasi, or are planned to start in 2024 or latter such as the Elbasani bypass. Therefore, the list of activities in the 2023 version of the draft National Sectorial Transport Strategy remains to be updated removing the completed projects from the list of planned ones, such as the Vlora bypass, road Palasë – Dhërmi, etc.

It seems that even for this period, Albania is repeating the experience of the National Transport Strategy 2016 – 2021. As the Monitor magazine observed on the implementation of this Strategy, that out of 21 road projects that were expected to be completed in four years, 11 of them were still in progress, for four projects the works had not started and only six were completed. Meanwhile, the funds planned for the completion of all projects were exceeded by 17%.<sup>67</sup>

Currently, the activities in the road transport sector are being guided by the Albanian National Transport Plan (ANTP3), approved by Order of the Minister for Infrastructure and Energy No 40 of 21.01.2020. The overall objective of ANTP3 is to provide a safe, reliable, efficient and fully integrated transport and infrastructure system, in order to meet the needs of freight and passenger customers, while being environmentally and economically sustainable. ANTP3 has been necessary to support the strategies of the Albanian Government for economic and social development, as well as an optimal integration of the country's transport systems within the international, European and regional transport networks.

Based on these principles, the main specific objectives or goals of ANTP3 are:

- Establishment of a regulatory and legal system that promotes the optimal functioning of the transport system;
- Supporting the development of the economy;
- Ensuring equal access to transport throughout the country leading to an improved balance of regional development of the country;
- Reduction of traffic jams;
- Promoting integration with the European Union and meeting the transport requirements in the Southern Balkan region;
- Improving the safety, quality and reliability of the transport system;
- Greater focus on carriers of passengers and goods, both customers and users;

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<sup>67</sup> Monitor (2021)

- Establishment of a transport system with a sustainable environment;
- Ensuring transparency in the decision-making process.

#### 4. Cross-border Connectivity and Bottlenecks

Currently, Albania has land-based border crossing points with four countries, namely Montenegro (four) (two new border crossing points are planned with Montenegro), Kosovo<sup>68</sup> (six), North Macedonia (five) and Greece (six). In total, Albania has 21 border crossing points with its neighbouring countries. The border crossing points are managed by the Department of Border and Migration under the General Directorate of State Police.<sup>69</sup>

Road crossing points (BCPs) show a significant increase in the movement of trucks and buses, not to mention the use of individual vehicles leading to blockages even though the crossing time has been reduced to 5 - 20 minutes per truck or individual car during normal traffic conditions. The number of passings in road transport was increasing constantly during the 2014 – 2019. For example, before Covid-19, there were over 19 million passings of border through road transport (which basically means with Kosovo, Montenegro, North Macedonia and Greece). During Covid-19, the number of passings was reduced and there were around 9 million passings in 2020. The number of passings arrived at around 15 million in 2021, and almost 20 million in 2022. INSTAT regularly publishes the data on border passings based on the administrative data provided by the State Police.

*Table 4: Cross-Border Crossings (2020 – 2022)*

Border crossing point	2020		2021		2022	
	Entry	Exit	Entry	Exit	Entry	Exit
Total	4,528,412	4,670,958	7,664,197	7,733,468	9,804,647	10,178,820
Qafë Botë	73,691	122,321	117,480	115,041	298,525	326,536
Rips	1,048	1,124	0	0	637	696
Kakavijë	347,143	355,286	453,528	433,341	816,230	777,416
Sopik	2,669	2,676	2,514	3,011	8,113	9,018
Tri Urat	6,096	7,618	8,981	9,681	23,872	26,356
Kapshticë	299,986	309,211	374,168	304,138	763,514	771,773
Goricë	101,666	99,861	105,319	137,903	114,205	114,143

<sup>68</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

<sup>69</sup> Unfortunately, the page of the Department: <https://www.asp.gov.al/wp-content/uploads/2022/03/Kufiri-Shtet%C3%ABror-dhe-Pikat-e-Kalimit-Kufitar-n%C3%AB-Republik%C3%ABn-e-Shqip%C3%ABris%C3%AB.docx> has been down for several months and does not provide any data on the border crossing points, their placement, working hours, only for pedestrians, etc.

Tushemisht	60,452	62,863	100,800	98,637	153,419	138,049
Qafë Thanë	559,933	525,457	792,141	709,776	845,520	767,602
Billade	216,283	220,378	256,742	268,828	350,968	353,916
Shishtavec	14,551	14,156	43,674	50,257	29,989	32,833
Orgjost	23,160	23,345	38,138	39,488	36,902	39,751
Morinë	1,754,200	1,840,183	3,258,287	3,372,296	3,882,764	4,248,525
Qafë Prush	137,196	142,080	182,120	206,534	170,900	245,145
Qafë Morinë	184,005	181,026	255,863	274,171	280,265	288,763
Bashkim	14,408	13,096	66,832	61,790	86,610	82,680
Hani Hotit	356,128	362,227	603,807	584,396	640,232	604,683
Vicisht	19,455	19,412	40,404	40,350	21,391	21,176
Grabon	0	0	0	0	46,238	47,200
Ura e Bunës	191	191	0	0	0	0
Muriqan	356,151	368,447	963,399	1,023,830	1,234,353	1,282,559

Source: INSTAT 2023d

However, the volume of traffic is constantly increasing, and the number of border lanes is not enough, thus leading to long waiting times in inadequate infrastructure (due to non-existence of parking spaces, parking in emergency lanes, or simply in roads thus blocking the remaining mostly individual traffic). This situation leads to hygienic problems and other sanitary problems. In the specific case of buses, the crossing time is even longer as the border police still do not use portable electronic data transmission to check passenger documentation. According to the World Bank, “delays at crossings in the Western Balkans are five times longer than in many EU countries and trucks spend some 26 million hours at crossings in the region each year – that’s nearly 3,000 years”.<sup>70</sup>

To this purpose, in 2016 with the support of SEETO, Albania entered into a dialogue with the authorities of bordering countries to propose the setup of “joint” border crossing points where police and customs control can be done in a “single window” based on the agreements and protocols already approved for the Muriqan-Sukobina border crossing point between Albania and Montenegro. The Muriqan-Sukobin border crossing point between Albania and Montenegro is probably the “reference” of best practice for all the participating countries in the Transport Community.

In June 2023, the parliament approved the opening of a new joint border crossing point between Albania and Montenegro (Shën Nikolla – Pulaj) and

<sup>70</sup> EU in Action: Transport

in almost in the same period the Qafë Thanë (Pogradec) – Kafasan (North Macedonia) begun to function as a “joint” border crossing point.

It should be noted that road border crossings are in dire need of a dedicated parking infrastructure, as they are located at points that, historically, have never been designed to be national borders. This is also due to the significant increase in road transport in the region (to the detriment of rail transport). For example, parking in the emergency lane of the E 851 highway at the Albania-Kosovo border leads to blockages and in addition blocks the emergency lane in case of danger (road safety and sanitary issues). The Vienna Summit for the Western Balkans also identified the issue as a priority intervention for the road sector in the Balkan region.

### **5. Summary and Outlooks for Major Road Infrastructure Projects**

According to the Albanian National Strategy for Development and European Integration, the vision for the future of Albania until 2030, is “Albania 2030: A dynamic economy, part of the European Union and region, which offers equal conditions for the increase of welfare for all its citizens, supported by functional democracy that guarantees the fundamental human rights and freedoms”. (National Strategy for Development and European Integration 2030)

As part of this vision, Albania aims the development and modernisation of the transport infrastructure as one of its main priorities, in order to create the preconditions for the development of the other sectors of the economy, especially tourism, to increase the access of goods and passengers to trade and the provision of services, in the regional and European market, to contribute significantly to the overall economic growth and development of the country, and to fulfil Albania’s commitments in the framework of the Transport Community Treaty.

During the implementation of the Transport Sector Strategy and Action Plan 2016 – 2020, significant public and private investments were made including PPP / concessions in transport infrastructure for its rapid integration into the European Transport Networks TEN-T and as a key support for the development of all other sectors of the Albanian economy. Investments in road infrastructure have been of particular importance, especially in the Adriatic-Ionian Highway Corridor, Indicative Extension of the Mediterranean Corridor MED TEN-T, in the Albania-Kosovo corridor connecting Durrës port with Prizren, the Port of Durrës, the Arbri road (connecting Tirana with Di-



bra region in North East, and then with North Macedonia) and Corridor VIII connecting Durrës port with North Macedonia north of Ohrid lake, as well as in the tourist areas throughout the country.

To this purpose, during the period 2016 – 2020, Albania invested 915.98 million euro in the transport sector. Almost 96% of these investments, some 883 million euro, were dedicated to road transport.

During this period, investments were focused on the Adriatic-Ionian Highway Corridor, where there were finalised the Fier bypass, Vlorë bypass, the road Kardhiq – Delvine, bypass Plepa – Kavaje – Rrogozhinë, the Ring of Tirana (the southwest part), Shkodra bypass, and last Tepelena bypass.

In the Corridor VIII, there were finalised the segment Qafë Thanë – Lin – Pogradec and the road Tirana – Elbasani, while works continued in the segment Qukës – Qafë Pilloçë.

These investments have significantly contributed to the development of the Balkan infrastructure network, with a view to future integration into the Trans-European Transport Network (TEN-T), and in addition have improved transport services and provided a more stable connection for both businesses and citizens. In the 4<sup>th</sup> Report (Year 2020) of the Monitoring of the Transport Strategy and Action Plan 2016 – 2020, the realisation of the tasks and projects foreseen in this strategy are given in detail. (4<sup>th</sup> Monitoring Report May 2021, Draft National Transport Strategy 2021 – 2025)

The following table taken from the draft National Transport Strategy 2021 – 2025 provides more information on the investments in transport infrastructure.

Table 5: Investments in the transport sector during the period 2018 – 2022

Transport sector		Road transport	Maritime transport	Rail transport	Air transport	Total
2018	Total current expenses	1,921,430,287	91,199,423	413,861,856	1,166,732	2,427,658,298
	Capital expenditures	15,280,566,995	58,171,302	46,860,409	1,889,400	15,387,488,106
	Financial realization	6,309,100,000	9,315,000	0	0	6,318,415,000
2019	Total current expenses	1,765,922,730	93,578,894	413,815,541	10,251,590	2,283,568,755
	Capital expenditures	15,097,086,000	47,425,061	144,490,984	0	15,289,002,045
	Financial realization	6,533,038,000	0	86,495,602	0	6,619,533,602
2020	Total current expenses	21,630,124,000	47,425,061	230,986,586	0	21,908,535,647
	Capital expenditures	1,281,599,103	95,478,217	413,542,994	9,062,440	1,799,682,754
	Financial realization	20,607,109,906	36,718,430	66,862,436	34,635,999	20,745,326,771
2021	Total current expenses	7,041,941,000	0	119,495,607	0	7,161,436,607
	Capital expenditures	27,649,050,906	36,718,430	186,358,043	34,635,999	27,906,763,378
	Financial realization	2,796,309,000	94,856,127	413,970,000	8,712,235	3,313,847,362
2022	Total current expenses	25,677,910,000	47,339,281	198,673,000	93,327,063	26,017,249,344
	Capital expenditures	6,866,286,000	0	470,748,000	0	7,337,034,000
	Financial realization	32,544,196,000	47,339,281	669,421,000	93,327,063	33,354,283,344
2022	Total current expenses	3,375,849,000	97,737,000	515,213,766	2,009,031,000	5,997,830,766
	Capital expenditures	20,552,957,160	34,083,000	394,327,281	76,232,000	21,057,599,441
	Financial realization	3,478,706,000	3,167,000	1,622,870,000	0	5,104,743,000
	Financial realization	24,031,663,160	37,250,000	2,017,197,281	76,232,000	26,162,342,441

Source: 4th Monitoring Report May 2021, Draft National Transport Strategy 2021 – 2025

However, besides the state budget and the foreign assistance, Albania has experimented with the construction of the road infrastructure through public-private partnerships. There were two main reasons for the government to choose these form of construction and maintenance. First, in the first mandate (2013 – 2016), the Government of Prime Minister Rama was criticised for not being able to finish the roads that were under construction and initiate new road construction projects. Second, the high public debt that before Covid-19 was above 70% limited the fiscal space to take new loans even under the best concessionary conditions.

Therefore, in 2018, the Albanian government announced the first two projects: the Arbri road and the road Orikum – Dukat. The Arbri road connects Tirana with Peshkopia. It is 75 km long and it was foreseen to cost some 240 million euro. The contract was signed in February 2018 and the construction was to be finalised in April 2022. However, the construction cannot be considered as completed because although the road was opened a year ago, the Murrizi tunnel is still not completed. It is estimated that the cost of the road has increased to 330 million euro, although the government officials have denied this.<sup>71</sup>

The road Orikum – Dukat is around 15 km long and it will cost the Albanian taxpayers over 67 million euro + VAT. The contract was signed in 2018 stipulating a construction period of 3 years and maintenance for another 10 years. The road was opened provisionally in the summer 2023 during the tourism season. However, the construction will be fully completed in June 2024.<sup>72</sup>

However, many observers and journalists have questioned the selected form of procurement, i.e. public-private partnership, their cost, and profitability of the project taking into account the form of procurement. In addition, the companies that have won the concession contracts have made available minimal capitals, and have relied on bank loans while the government has given “sovereign guarantees” to these companies. For example, the company that signed the contract for the construction of the Arbri road had a signed capital of only 80 million ALL (about 625,000 euro).<sup>73</sup>

Thanks to significant investments in road infrastructure in recent years in the network of local and regional roads, the quality of road transport infrastructure in Albania has increased significantly but significant regional disparities still remain in terms of access to markets and basic services. The

<sup>71</sup> Indeksonline 2018, Gjoka 2023

<sup>72</sup> Kryeziu 2023, Pena 2023

<sup>73</sup> Erebara 2018, Monitor 2023c

economic infrastructure in the country tends to be concentrated in the core urban centres, while the outer peripheral sub-regions of the country suffer from significant connectivity and access problems that hinder sustainable and inclusive growth. The logistical constraints of transportation to receive and transport more products to mountainous areas and - to a lesser extent - central areas to major urban centres and ports, have impacted the growth of some specific agricultural sectors.

### 5.1. Ongoing Projects

With the budget allocated and projected from 2021-2025 some facilities are being/going to be financed. Construction and Systematisation of roads, as follows:

1. Completion of the construction of Bypass Vlora;
2. Construction of the Outer Ring Road Tirana, northeastern part (seg Sauku - River Bank) Lot 2 (additional works);
3. Construction of the Outer Ring Road Tirana, northeastern part (seg Sauku - River Bank) Lot 2;
4. Asphaltting system of the road Boboshtica – Dardhë;
5. Rehabilitation and engineering measures of Spille road;
6. Construction of the road Kardhiq - Delvinë, (Lots 4, 5, 6 and 7);
7. Rehabilitation of the road segment, the overpass of the palace with the roundabout arrows location EAGLE or “Shqiponja”, (Lots 1, 2);
8. Construction by Western, Shkodra, Lot 1, 2;
9. Construction of the road segment Qukës - Qafë Plloçë Lot 1, 2;
10. Road construction By Pass Tirana;
11. Construction by Pass Elbasan;
12. Construction of Muriqan - Balldre road;
13. Road construction By Pass Gjirokastra.

### 5.2. Expected Investments with a Horizon until 2027

Despite the major investments carried out in the last 30 years, the Albanian government aims to continue to invest heavily in the transport sector, in particular in the road transport. The Medium-Term Budgetary Programme 2024 – 2026 shows clearly that the budgetary allocations for the Ministry of Infrastructure and Energy will remain high. The Mid-term Budgetary Programme stipulates as one of its goals, the expansion of the national road network through the construction, rehabilitation and systemisation of the

national roads and in addition, development of performance-based road maintenance practices. (Mid-term Budgetary Programme 2024 – 2026)

*Table 5: Expenditures of the Ministry of Infrastructure and Energy (in million ALL) and in % to GDP 2024 – 2026*

	Total expenditures			
	2023	2024	2025	2026
<b>In % to GDP</b>	2.52%	2.51%	2.61%	2.53%
<b>In % to the Total Expenditures of the Government</b>	7.84%	8.23%	8.57%	8.42%
<b>In nominal value</b>	54,757	57,407	62,641	63,968
<b>In nominal value only road transport</b>	26,238	23,591	25,845	25,545

*Source: Mid-term Budgetary Programme 2024 – 2026*

The data above show that the Albanian government is planning to use substantial resources in the road transport.

The approved budget of 2024, has some minor differences compared to the Mid-term Budgetary Programme 2024 – 2026. Nevertheless, the expenditures remain high for the entire infrastructure programmes, and in particular for the road transport.<sup>74</sup>

*Table 6: Total expenditures, opex and capex expenditures for the road transport in 2024, 2025 and 2026 (in million ALL)*

	2024	2025	2026
<b>Total budget for the Ministry of Infrastructure and Energy</b>	52,777	59,277	61,873
<b>Total budget road transport</b>	23,084	25,312	26,382
<b>Operational expenditures (opex)</b>	2,993	3,052	3,352
<b>Capital expenditures (capex)</b>	20,091	22,260	23,030
<b>Capital expenditures from state budget</b>	17,603	19,262	19,532
<b>Capital expenditures from foreign sources</b>	2,488	2,998	3,498

As it is planned, almost all the investment in this sector would come from the state budget. The EU assistance in the road sector has drastically decreased after the approval of the EU Green Deal and Green Agenda for the Western Balkans. After the approval of these documents, the Western Balkans Investment Framework revised his policies to address these new

<sup>74</sup> State Budget 2024

requirements and so did the international financial institutions. Considering this currently we only have one project which is being implemented in the road sector which is the Tirana Bypass.

The 2024 budget foresees the following major projects:

- 3,532 km of roads maintained according to standards during the period 2024 – 2026,
- The number of kilometers constructed, rehabilitated, systemised, asphalted and equipped with road signs will reach 762 km in 2026 from 418 km that are expected until the end of 2024,
- Concession contract for the construction of Arbri Road,
- Concession contract for the construction of Milot - Morin Road,
- Concession contract for the construction of the Orikum - Dukat Road, Bypass-Yacht Port,
- Implementation and financing of the "Llogara Tunnel Construction" project, which is expected to be completed in mid-2024.

Furthermore, the Albanian government, prepared and approved in 2023, the National Single Project Pipeline which is the main list of priority projects for the country.<sup>75</sup> From a total of 156 projects, 15 are in the sector of road transport as listed below:

1. Construction of the interstate bridge over river Buna/Bojana (matured - 14,000,000 Euro)
2. Improvement of the secondary and local roads (matured – 810,000,000 Euro)
3. Expansion of the highway Tiranë-Durrës (matured – 205,000,000 Euro)
4. Construction of the road Tiranë-Ndroq-Plepa (matured – 39,827,760 Euro)
5. Construction of the Tirana bypass (matured- 133,410,276 Euro)
6. Implementation of the project Intelligent Transport Systems (matured-10,000,000 Euro)
7. Infrastructure programme – improvement of regional connections (matured-195,145,000 Euro)
8. Adriatic – Jonian Corridor: Segment Murriqan - Lezhë (Balldren) (Partially Matured, 364,000,000 Euro)
9. Adriatic – Jonian Corridor: Segment Milot – Balldren (partially matured, 213,600,000)

<sup>75</sup> Priority Policies Document 2024 – 2026

10. Adriatic – Jonian Corridor: Segment Fier Bypass (Levan) - Pocer (Partially Matured, 205,000,000 Euro)
11. Adriatic – Jonian Corridor: Segment Pocer – Memaliaj (partially matured- 753,000,000 Euro)
12. Adriatic – Jonian Corridor: Segment Memaliaj – Ura e Subashit (Partially Matured- 326,000,000 Euro)
13. Adriatic – Jonian Corridor: Gjirokastra Bypass (Partially Matured - 81,480,000 Euro)
14. Corridor VIII: Construction of the Elbasani bypass (Not matured- 97,300,000 Euro)
15. Construction of the Old Caravan Road Vlorë-Berat-Voskopojë-Korçë (Not matured- 118,000,000 Euro).

### **5.3. Role of national and EU funding. Other sources of infrastructure investments**

In the Western Balkans region, a variety of funding sources exist and play an important role:

- Loans from International Financial Institutions (IFIs), namely from the World Bank (WB), European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD);
- National Budgets - In Albania, the Medium-Term Budget Program (MTBP) has been and is an instrument to align the budget with general and / or sector policies and has represented one of the key achievements of the Public Financial Management (PFM) reform 2007 – 2013;
- EU funds - Potential EU funds that can be used in the Western Balkans are: Instruments for Pre-Accession Assistance (IPA), Western Balkans Investment Framework WBIF (Western Balkans Investment Framework), Connect Europe Facility (CEF), macro regional programs, etc.;
- Concession / PPP (Public Private Partnership) - A form of cooperation between public authorities and the private sector in order to introduce new mechanisms for providing and modernising strategic public infrastructure and services. In the Western Balkans this is most present at junctions and terminals such as airports and Maritime ports;
- Other sources, which include bilateral loans from governments of different countries (Russia, Japan, Italy, Germany, Turkey, France, Azerbaijan, etc.), China Exim Bank, IDB, OPEC, Kuwait Fund, Saudi Fund, Abu Dhabi Fund, United Emirates Fund, commercial bank loans, domestic resources, etc.

An important donor coordination effort is underway around the Western Balkans Investment Framework (WBIF) which is developing increasingly especially in the context of the Berlin Process and the Connectivity Agenda. WBIF has supported 33 projects with an estimated value of € 2.3 billion in Albania in the transport, water / sewerage, and energy sectors. The signed loans have reached € 470 million for a total of 15 projects.

The country benefited from 46 grants for technical assistance and co-financing of investments with a total value of € 143.8 million. € 6.2 million grants for technical assistance were approved in 2019.

### **5.4. Main Problems Affecting Roads in Albania**

According to an inspection of the national road network that was overseen by the World Bank in 2019, over 558 kilometres or 41 percent of national roads in the country are in very poor condition.<sup>76</sup> This requires not only massive investment, but also the institutional capacities to handle the planning, development of project and their monitoring. In most cases this cannot be achieved successfully.

In most of the new road projects, the design and the construction of the road are procured separately. Normally, the contract for the design is signed with one company and the contract for the construction is awarded to a second one. Therefore, during the implementation, there are often conflicts related to the quality of the design and accompanying studies, such as geological study of the terrain. This delays the implementation and increases the total cost of projects.

Poor overall planning and design of the projects impact the timetable of the projects. Further, land property issues delay the process of expropriation impacting the entire project.

Almost all the road projects in the last years are marred by budget overshooting. There are several reasons for this, starting with poor planning for the state bodies, delays in designing and construction, delays related to land issues, etc.

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<sup>76</sup> Monitor (2023a)



## 6. Mapping of Existing Challenges. Recommendations for Enhancing Road Infrastructure in Albania and Regional Connectivity

The Western Balkans region has been affected by **climate change** and has already seen severe consequences of climate change. The Albanian Sustainable Transport Plan has identified in advance a number of good, effective and affordable practices, as most appropriate to the Albanian context, listed as follows:

- Annual registration fee on an efficient basis;
- Financial incentives for cleaner and more efficient vehicles;
- Goods management;
- Improving public transport;
- Intelligent transport systems;
- Soft and intelligent measures;
- Roundabouts.

In 2015, the Ministry of Transport and Infrastructure approved the Strategy for Road Tolls (STRR) which will determine the optimal use of road tariffs in Albania. Funded by the European Bank for Reconstruction and Development (EBRD), the STRR:

- i) assessed the normative and operational aspects related to road tariffs, in the context of the ongoing reform and the development of a work plan for the country's road infrastructure;
- ii) assisted MEI and other actors at a level of strategic planning in assessing the sustainability of road tolls, in relation to their plans for future developments in the road sector;
- iii) and in addition paved the way for the application of the principle of payment to road users, giving recommendations for the timing and implementation of a road toll strategy.

1. Overall, despite major investments over the last 30 years, **Albania still has a road infrastructure which lags behind even its neighbouring countries, let alone the EU Member States, in both quality and density.** Albania should invest even more in order to reach the level of the least developed EU Member States in order to boost economic and social development in the country and increase its integration within the region and with the EU Member States.

2. Albania should start this process by enhancing its **overall institution-**

**al capacities**, and in particular its capacities to plan and prepare strategic plans for the future. At the moment, the capacities of the Ministry of Infrastructure and Energy and Albanian Road Authority to prepare such documents seem rather limited. All the strategic documents produced and approved in the last 10 or 15 years were prepared with the assistance of foreign projects financed by EU, WB, etc.

3. Albania should pay more attention to the **collection and processing of statistics on transport and in particular on road infrastructure**. The statistics should be based on clear methodological criteria preferably in accordance with those used by the EU Member States. The database should include not only the roads managed by the Albanian Road Authority, but as much as possible the roads managed by the local authorities. The data provided by the managers should be verified on the terrain. These are going to be the base for new studies and planning of resources.

4. Concerning **road safety**, further measures should be taken to improve the collection of statistics, including the design and implementation of a new IT system for the General Directorate of State Police. The confusion between the data provided by different government agencies should be eliminated. The improved IT system would allow better identification of black spots in the road infrastructure and the most pressing causes of accidents and fatalities.

5. The information and statistics on transport and studies that are completed should be made available to researchers, civil society and the public in general (**open data and public accessibility**). More concretely, the page of the Institute of Transport lists the projects that are completed until 2018/2019 but not the recent studies and their texts. The same is true for diverse projects in the transport sector.

6. Albania needs to **improve its long-term planning system related to infrastructure projects**. The approval and the publication for the first time of the National Single Project Pipeline was a step in the right direction.

7. Concerning **decarbonisation**, Albania should continue to approximate its legislation with the EU acquis, in particular related to biocarburants. Tax incentives should be given to new cars. A lump sum of money should be paid to car-owners that agree to take out of circulation old cars with high level of pollution. Further, additional measures should be taken to increase substantially the number of electric charging stations.

8. Albania should improve the preparation of projects aiming to **increase the number of projects supported by the WBIF**. If the rules of the WBIF do not encourage the financing of road projects due to the Green Agenda, then it should aim to finance through WBIF projects in the other sectors freeing national funding for road transport.

9. Albania has **the highest debt levels in the region** and this contributed to decrease of public investment in the road sector as well as gradually lead to seizing different opportunities/options such as Public Private Partnerships. However, the use of public-private partnership should be analysed carefully taking into consideration the results of projects under construction.

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# **Road Infrastructure in Bosna and Herzegovina**

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# Road Infrastructure in Bosnia and Herzegovina

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## 1. Introduction

Planning, construction, maintenance and management of the Bosnia and Herzegovina road infrastructure is divided between two entities of Federation of Bosnia and Herzegovina (FBiH) and Republika Srpska (RS), as well as the Brčko District. Last comprehensive research in the field of the road network in Bosnia and Herzegovina was carried out within the project Support to Bosnia and Herzegovina in upgrading Framework Transport Strategy<sup>77</sup>, which was used throughout the Bosnia and Herzegovina chapter of this document. Although the institutions at the state and entity level were regularly consulted during the preparation of the documents, and it was expected that the updated framework strategy would be adopted at the state and entity level, including Brčko District, this has not happened to date.

## 2. Overview of Existing Road Infrastructure

According to the documents provided within the mentioned services, the road transport network in BiH has a total length of 9,110 km and is composed of motorways (2.39%), main roads (46.51%) and regional roads (51.10%).

*Table 1: Basic figures for BiH Road Transport Infrastructure during 2016-2020*

<b>BiH Road Transport Network</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Total length of Roads (Km)	8,794	8,776	10,158	8,733	9,110
Motorways (Km)	163	172	198	198	218
Main roads (Km)	3,870	3,870	4,787	4,039	4,237
Paved with asphalt	3,783	3,783	4,704	3,973	4,171
Paved with macadam	87	87	83	66	66
Regional roads (Km)	4,761	4,734	5,173	4,496	4,655
Paved with asphalt	3,841	3,830	4,248	4,009	4,192
Paved with macadam	920	904	925	487	463
Bridges	1,663	1,665	1,699	1,675	1,784
From 5m to 10m	423	422	443	422	457
From 10m to 30m	677	681	690	689	704
Over 30m	416	415	419	417	393
On Motorways	147	147	147	147	230

*Source: Thematic Bulletin: Transport 2021<sup>78</sup>*

<sup>77</sup> Framework Transport Strategy Bosnia and Herzegovina, PLANET SA – IMC Worldwide Ltd for EU Delegation in BiH, December 2022,

<sup>78</sup> Agency for Statistics of Bosnia and Herzegovina. Sarajevo, 2022

Motorways still constitute a very small part of the total national road network, although their length has been increased by 33.74% over the past five (5) years (from 163 to 218 km). A total of 1,784 bridges currently exist on the road network of BiH, since 121 new ones have been gradually added since 2017. Domestically, in terms of usage, road transport is still by far the most utilized mode of transport for passengers and freight. Both the vehicle kms covered in passenger and in freight transport suggest a further intensification of road transport activities within the 2015-2019 interval. Over the same period, cross-border passenger traffic also experienced an analogous trend. In contrast, regarding cross-border freight transport, imports recorded a significant drop while exports remained relatively unchanged during the 2015-2019 period. It is worth noting that border crossing procedures especially for freight cargo are quite time consuming, posing a significant barrier to the further increase of trade and mobility in BiH. As border-crossing points do not have the physical or technological capacity (ITS solutions) to process international traffic flows efficiently, waiting times may exceed the 1 hour in all three major crossing points to the neighbouring countries.

### 2.1. Pan-European Corridors and TEN-T network

In Bosnia and Herzegovina (BiH), the main transport route is Intermodal Corridor Vc, the TEN-T Mediterranean Corridor and South-East Europe Transport Observatory (SEETO) Core Network extension to the Western Balkans, which starts in Budapest (Hungary) in the north, runs via northern Croatia (Osijek), through BiH as Corridor Vc via Dobož, Zenica, Sarajevo and Mostar, and ends in the south in the Croatian port of Ploče, which serves as the primary seaport for BiH.



Figure 1: Corridor Vc in Bosnia & Herzegovina

Source: WBIF<sup>79</sup>

<sup>79</sup> <https://wbif.eu/corridor-vc-bosnia-and-herzegovina-road-europe>

This Corridor, in combination with the other TEN-T Core Network Corridors (Orient-East Med and Rhine - Danube IWW CNCs), enables the inclusion of BiH into the TEN-T and the transportation system of South-Eastern and Central Europe, as well as the enhancement of cross-border cooperation and integration to the Euro-region, one of the most important parameters in advancing the country's cohesion with the EU.

Part of the BiH road network assumed strategic international relevance, within the Western Balkans Region, due to its inclusion in the SEETO (South-East Europe Transport Observatory) Core and Comprehensive network. The international TEN-T road network through BiH consists of the following six courses:

- Corridor Vc: HR border/Bosanski Samac - Sarajevo (BiH) – Doljani/HR border;
- Route 1: HR border/Neum Northwest – Neum (BiH) – Bar (Montenegro);
- Route 2a:HR border/Gradiska - Banja Luka (BiH) – Lasva (BiH);
- Route 2b: Sarajevo (BiH) – Podgorica (Montenegro) – Vore (Albania);
- Route 3: Sarajevo (BiH) —Uzice (Serbia);
- Route 9a: Novi Sad – Ruma (Serbia) Banja Luka–Novi Grad/Banja Luka - Doboј – Tuzla- Orasje (BiH).

*Figure 2: Map of the TEN-T Extension of Core and Comprehensive Road Network to Western Balkans*



*Source: Transport Community (2022)<sup>80</sup>*

<sup>80</sup> Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans Report, Transport Community Permanent Secretariat, November, 2022

## 2.2. Intelligent Transport Systems (ITS)

This analysis of the existing national ITS conditions is based on desktop study, carried out within the Framework Transport Strategy for BiH in 2022, by analyzing collected data from relevant reports and studies mainly within the period 2016 – 2020 that refer to BiH and the Western Balkans. The current ITS status in BiH is described in detail in the following paragraphs covering primarily the strategical, legal and deployment aspects regarding road transportation.

The preparation of national ITS Strategy for BiH is underway and started on 4 April 2022 in the context of CONNECTA's subproject "Technical Assistance for preparation of national ITS strategy for Bosnia and Herzegovina, Kosovo (all modes), Albania (railway and maritime) and Montenegro (railway) and deployment of road traffic management centres in Bosnia Herzegovina and Kosovo". However, currently, there is no completed national ITS strategy and a national ITS Action Plan to develop a clear path for the future national ITS development, to ensure stakeholders' commitment by different BiH Entities and authorities and to foresee coordinated system deployment and integration. Such a strategy would ensure the coordinated development among the BiH entities.

Some significant ITS deployment initiatives have recently been taken in BiH. Currently, in BiH, ITS are deployed over road segments, which have a total length of 153 km and the traffic supervision is conducted in four (4) motorway Traffic Management Control Centres (Drivusa, Zvirici, Laktasi, Kladari)<sup>81</sup>.

None of the pre-mentioned Traffic Management Control Centres (TMCC) function as national ITS centre, so that all ITS services and data within the TMCC can be monitored and managed by a single point.

The ITS Directive 2010/40/EU as well as the Directive 2004/54/EC (on road tunnel over 500 m in length) have not been transposed yet and they are adopted on specific project basis<sup>82</sup>. For instance, deployment of ITS in some tunnels and tolling systems follows the provisions of relevant Directives on the level of safety and electronic road tolls.

Based on available data<sup>83</sup>, ITS is introduced in the following legislative acts: (a) Law on Road Safety in Bosnia and Herzegovina and (b) Rulebook on

<sup>81</sup> State Of Play: Analysis Of The Transport Sector In Bosnia And Herzegovina, Annex to the Framework Transport Strategy, Planet S.A. for EU Delegation in BiH, December 2022

<sup>82</sup> GAP Analysis - Strategy for Sustainable And Smart Mobility In The Western Balkans, Transport Community, 2020

<sup>83</sup> Strategic Framework for implementation of ITS on TEN-T Core/Comprehensive Network on the WB6, December 2018.

traffic signalization and signalization on roads, signaling of works, obstacles on roads, and signaling. It is worth to be mentioned that BiH has fully harmonized with the EU legislation its rules on driving, working, and rest time for professional drivers.

Furthermore, BiH as a member of ISO has already transposed and published 76 CEN/ISO ITS standards as addressed in a recent report<sup>84</sup>. However, BiH needs to adopt the EU interoperability framework and a mechanism for the exchange of ITS data at national and regional level (DATEX II, ERTMS, C-ITS, EETS29). The inconsistent deployment of various systems for electronic exchange between different providers makes necessary the adoption of common data exchange and communications standards.

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<sup>84</sup> CONNECTA (2018)

Table 2: ITS Interventions in BiH

Entity	Federation of Bosnia & Herzegovina (FBiH)	Republica Srpska (RS)
Oparator/ Supervisor	Supervised by JP Autoceste	Public Enterprise Autoceste Republike Srpske
TCC Locations	Drivusa, Zvirici	Laktasi, Kladari
Road Sections	Highway A1 part of corridor Vc passing through FBiH	Gradiska – Banja Luka (E-661), Banja Luka – Doboj (BL-DO), Prnjavor – Doboj, Corridor Vc passing through R. Srpska
ITS Systems/ Services		
Traffic Management	<ul style="list-style-type: none"> <li>• traffic counters</li> <li>• ANPR cameras</li> <li>• Variable Message Signs (VMS) and information displays</li> <li>• traffic signalling system</li> <li>• vehicle height measurement system</li> </ul>	<ul style="list-style-type: none"> <li>• traffic counters (inductive loops)</li> <li>• ANPR cameras</li> <li>• Variable Message Signs (VMS) and information displays</li> </ul>
Incidents Emergency Management	<ul style="list-style-type: none"> <li>• video surveillance with Automatic Incident Detection (AID)</li> <li>• telephone call system (TPS)</li> </ul>	<ul style="list-style-type: none"> <li>• video surveillance with Automatic Incident Detection (AID)</li> <li>• SOS telephone call system</li> </ul>
Weather Management	<ul style="list-style-type: none"> <li>• weather stations, RWIS (ongoing)</li> </ul>	<ul style="list-style-type: none"> <li>• weather stations</li> </ul>
Tunnel Management	<ul style="list-style-type: none"> <li>• VMS</li> <li>• variable signalling</li> <li>• video surveillance with AID</li> <li>• traffic counters</li> <li>• security systems</li> <li>• fire alarm (tunnel fire reporting system),</li> <li>• communication systems (sound system, radio, mobile and internet connection systems, telephone call system – TPS)</li> <li>• remote control and monitoring system of supplementary systems such as electricity supply, lightning, ventilation and hydrant networks.</li> </ul>	<ul style="list-style-type: none"> <li>• tunnel systems that collect information about the conditions in the tunnels (CO2 level, airflow rate, visibility, incidental situations)</li> </ul>
ETC Management	<ul style="list-style-type: none"> <li>• ACC (Autoceste Card) on-board unit</li> </ul>	<ul style="list-style-type: none"> <li>• Tag services within vehicles and antenna in toll station</li> </ul>
Asset Management	<ul style="list-style-type: none"> <li>• Road Asset Management System (ongoing/ under development)</li> </ul>	-
Data Management	<ul style="list-style-type: none"> <li>• Remote Monitoring Systems of on-site ITS equipment</li> <li>• Data Collection and Processing Centre (ongoing/under development)</li> </ul>	-

Source: Framework Transport strategy for Bosnia and Herzegovina, State of the art, Planet S.A, December 2022

According to the available information, the development of a single national supervision centre will be an issue to be addressed, because the individual stakeholders focus on planning and developing their own supervision centres.

There were 68 traffic counters operative on main roads in Federation of Bosnia and Herzegovina (FBiH) in 2021<sup>85</sup>. Main roads in Federation of Bosnia and Herzegovina have installed and operated 13 meteo stations on the main roads network and the Road Weather Information system RWIS, providing free meteorological data for road users in real time. There is also a mobile application ACC, providing the information regarding meteorological conditions on FBiH motorways.

According to the available data, 55 traffic counters are operating on main and regional roads network in Republika Srpska<sup>86</sup> (last official data from 2017). There is no available data on any existing meteorological stations on Republika Srpska and Brčko District road networks.

### 2.3. Road Safety

Bosnia and Herzegovina (BiH) faces a serious problem of road safety, with a significant number of road accidents annually and with approximately 70 fatalities per million inhabitants every year<sup>87</sup>. The frequency of traffic accidents in Bosnia and Herzegovina decreases over the years, reaching 29.678 accidents reported in 2020. However, the number of fatalities and seriously injured people remains significantly high.

Research done by the EuroRAP characterized the roads of Bosnia and Herzegovina as the least safe, and more than half of the roads are said to be high-risk roads, where traffic accidents with fatal outcomes happen two to three times more often than on the roads of Europe. Efforts have been made by the Ministries towards reversing this situation, for example in the frame of the global "Decade of Action for Road Safety 2011-2020". However, the results so far have not met the expectations, since deaths and seriously injured in the country remain high and the road safety level is still low. Thus, UNECE, in cooperation with UNDP Bosnia and Herzegovina, has implemented a two-day workshop to assist the Ministry of Transport and Communications to make a first step in the preparation of the country's Framework Road Safety Strategy and the Action Plan for 2021–2025, in line with the Sustainable Development Goals.

<sup>85</sup> Traffic Intensity on the main Roads Network of Federation of Bosnia and Herzegovina in 2021, Public Company Roads of FBH, Sarajevo, 2022

<sup>86</sup> Vehicle Counting on the Road Network of the Republic of Srpska in 2017, Public Company "Republic of Srpska Roads", Banja Luka, 2020

<sup>87</sup> Western Balkans Road Safety Observatory

Western Balkans Road Safety Observatory (WBRSO)<sup>88,89</sup> in the Annual Statistics Report 2020 includes the most recently available data regarding the number of road fatalities in Bosnia and Herzegovina and all six Western Balkan countries in general. The most important conclusions regarding Bosnia and Herzegovina are as follows:

- there were 69 fatalities per million inhabitants in 2020 in Bosnia and Herzegovina (BiH), which is higher than both average rates in EU and WB6,
- BiH reported a -31% reduction of road deaths compared to the baseline year of 2010,
- Bosnia and Herzegovina has the 2nd highest number of fatalities among the 6 Western Balkan countries during these 10 years,
- the largest percentage of casualties caused by traffic accidents concerns the car occupants, either drivers or passengers, representing 62%. Pedestrians follow with 20%, motorcyclists with 9%, cyclists 6%, while other road users represent 3% of the casualties.

World Bank Group, Global Road Safety Facility (GRSF)<sup>90</sup> collects and summarizes national information, so the main conclusions for the case of Bosnia and Herzegovina for 2016 are:

- 65% of road crash fatalities and injuries concern the economically productive age groups (15-64 years);
- 4:1 ration of male to female fatalities with the age group 15-49 being the most vulnerable one;
- 555 life years have been affected due to disability caused by road crash injuries per 100.000 people.

In the frame of the EU-funded "Technical Assistance to Connectivity in the Western Balkans – CONNECTA"<sup>91</sup>, a review of the current status of the crash data collection-analysis processes within the Western Balkans Region was undertaken, along with a relevant assessment of the crash database systems based on the basic CADaS datasets.

<sup>88</sup> Transport Community, Western Balkans Road Safety Observatory (WBRSO). FATALITIES FOR 2020, ANNUAL STATISTICS FOR WESTERN BALKANS.

<sup>89</sup> Transport Community, Western Balkans Road Safety Observatory (WBRSO). REGIONAL PARTNERS' PROFILES, 2019 DATA

<sup>90</sup> World Bank Group, Global Road Safety Facility (GRSF). Road Safety in Bosnia and Herzegovina | Traffic accidents, crash, fatalities & injury statistics. <https://www.roadsafetyfacility.org/country/bosnia-and-herzegovina>

<sup>91</sup> CONNECTA Consortium (2018). Preparation of Road Safety Inspection and Audit Plans for core/comprehensive road network in Western Balkans (WB6) and Pilots. TA to Connectivity in the Western Balkans, EuropeAid/137850/IH/SER/MULTI. CONNECTA-TRA-CRM-REG-01.



In Bosnia and Herzegovina, the police forces of each entity are responsible for investigating road crashes and collecting crash statistical data (still in paper form). The major problems with paper-based approaches are that:

- Data entry is a significant waste of resources when there are more efficient electronic methods available;
- Validation is often performed by a person who did not attend the incident, so they may incorrectly interpret the information; not communicating with the original collector and simply select any option.

According to available data on the total number of registered vehicles, the average age of motor vehicles in Bosnia and Herzegovina is 16 and a half years. According to available statistics, the roadworthiness (technical compliance) of a motor vehicle is the cause of traffic accidents in about 3-5% of the total number of traffic accidents.

By combining the data from the insights from the Global Status Report on Road Safety 2018 of WHO<sup>92</sup> and the Annual Statistics Report 2020 of the WBRSO<sup>93</sup>, audits or star-rating is not obligatory for new road infrastructure all over the country, but only partially required in certain entities. The same applies both to the design standards for the safety of pedestrians and cyclists, and to the investments to upgrade high risk locations, which do not follow a national approach. For example, in the entity Republika Srpska, no investments on black spots have been identified yet, while in Federation of BiH, black spot management is included in the recently completed Program of modernization of the main roads network in FBH.

Apart from the national Law on Fundamentals of Road Traffic Safety in BiH, the country does not have a nationwide road safety strategy. Each entity has its own document setting safety targets and action plan.

In 2015, a study was conducted, and 364 dangerous sites were considered on the road network. Based on data of traffic accidents during the period 2013-2014, 31 black spots were identified (Figure 3). The modernization program covered the reconstruction and rehabilitation of 7 black spots. In 2019, remediation work on 5 black spots was completed. In the next planning period 2020-2023, it is planned to continue activities on the rehabilitation of black spots and hazardous sites.<sup>94</sup>

In 2018, the European Commission launched a Technical Assistance (TA)

<sup>92</sup> World Health Organization (WHO). Global Status Report on Road Safety 2018. ISBN 978-92-4-156568-4

<sup>93</sup> Transport Community, Western Balkans Road Safety Observatory (WBRSO). REGIONAL PARTNERS' PROFILES, 2019 DATA.

<sup>94</sup> Framework Transport Strategy of Bosnia and Herzegovina, 2016-2030.

project on the "Preparation of Road Safety Inspection and Audit Plans for core/comprehensive road network in the Western Balkans (WB6) and Pilots"<sup>95</sup>. The aim was to prepare short-term plans (2018-2020) for road safety inspections and audits for the Core and Comprehensive Road Network in the Western Balkans, including BiH. The consultancy also delivered a part of these plans as pilots in 2018.

*Figure 3: Identified Black Spots on the Motorways and Other Major Roads in BiH*



*Source: Framework Transport Strategy of Bosnia and Herzegovina, 2016-2030.*

The Road Safety Inspections carried out showed overall lack of maintenance leading to many of the road safety problems. Crash barriers (missing, inadequate, damaged, etc.), property accesses and high operating speed vehicles passing through villages are the most common hazards identified in all Regional Participants, including Bosnia and Herzegovina.

<sup>95</sup> CONNECTA Consortium (2018). Preparation of Road Safety Inspection and Audit Plans for core/comprehensive road network in Western Balkans (WB6) and Pilots. TA to Connectivity in the Western Balkans, EuropeAid/137850/IH/SER/MULTI. CONNECTA-TRA-CRM-REG-01.

### 3. Review of Strategic National Documents and Plans

The adoption of the countrywide Framework Transport Policy in 2015 and of the Bosnia and Herzegovina (BiH) Framework Transport Strategy and Action Plan (FTS) for the period 2015-2030 in 2016, was a positive step forward. Following the Protocol on Land Transport built into the Stabilisation and Association Agreement<sup>96</sup>. The objectives set by the Policy and associated Strategy were:

- Ensuring institutional efficiency,
- Ensuring financial sustainability,
- Stimulating economic development, and
- Addressing the environmental and social impacts.

The approach of the Framework Transport Strategy of BiH considers the four main pillars of transport, which are infrastructure, services, regulations, and technology, and sets out the actions to be undertaken to meet the objectives. Its implementation is embedded in the agreements on an extension to the Western Balkans region of the Trans European Transport (TEN-T) Core Network and calls for major improvements of the links between the Western Balkans countries and the EU as made explicit in the Western Balkans 6 (WB6) Beneficiary countries (Albania, Bosnia and Herzegovina, the North Macedonia, Kosovo, Montenegro and Serbia) Connectivity agenda.

In this context and under the IPA II program, the emphasis in BiH has been on improving the transport infrastructure of the core/comprehensive network, especially of Corridor Vc and its feeders, as well as on measures to remove barriers, create open markets and establish a propulsive regulatory framework as key prerequisites for economic growth and for enabling the potential accession to the EU<sup>97</sup>.

Despite the clear objectives set out in the Transport Policy and associated Strategy, the 2016 FTS focuses on infrastructure creation but generally overlooks the need for institutional efficiency seconded by financial sustainability, for a well aligned legislative framework, and for social and environmental sustainability. For this reason, in addition to the Framework Transport Strategy of Bosnia and Herzegovina, recently developed documents

<sup>96</sup> Council of the European Union (2008): "Stabilisation and Association Agreement between the European Communities and their Member States, of the one part, and Bosnia and Herzegovina, of the other part"; Brussels, 6 June 2008 Interinstitutional File 2008/0073 (AVC); , Protocol 3, pp 283 - 305

<sup>97</sup> "Annual Action Programme Bosnia and Herzegovina for the year 2017", Instrument for Pre-Accession Assistance (IPA II) 2014-2020 Bosnia and Herzegovina : EU support for transport sector development;

as annexes to the updated Framework Transport Strategy<sup>98</sup>, also aligned framework transport strategies of the Federation of Bosnia and Herzegovina, of the Republika Srpska, and of Brčko District, are provided. Adopting the documents is expected on different governance levels.

Efficient sector governance and sustainable transport system development should be facilitated via:

- An overall Strategy Framework with Action Plans with a time horizon of 15 years for aligning the BiH transport system to the vision of the Core and Comprehensive networks and working towards its full integration into the Single European Transport Area, with concrete sub-sector strategies that focus on integration and interconnectivity;
- A governance framework with functional and integrated (aligned) institutional and legislative tools for closer integration within the BiH and between Bosnia and Herzegovina, the Region, and the EU to achieve actual progress towards integrated transport system development in an effective and sustainable manner;
- Improvements in Public Investment Management via modern investment planning and efficient project evaluation procedures;
- A framework for considering the social and environmental needs of sustainable mobility, including a realistic timeline for the implementation of the appropriate measures.

The complex political system of BiH causes uncertainty regarding the adoption in the near future of the strategic document(s) on state and lower levels.

As of January 2024, the following strategic documents related to road traffic safety have been prepared in Bosnia and Herzegovina:

- Baseline Strategy of Traffic Safety in Federation of Bosnia and Herzegovina (2008 - 2013);
- Strategy for Road Traffic Safety of the FBiH (2011 - 2020);
- Strategy for Road Traffic Safety of the RS (2009 - 2013), (2013-2022).

A strategy for road traffic safety in BiH is thus not in place. The internal institutional setting, the political situation and the hesitant attitude and weak competence or sense of responsibility of the institutions towards road traffic safety are the principal reasons that Bosnia and Herzegovina still has no Road Traffic Safety Strategy.

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<sup>98</sup> "Support to Bosnia and Herzegovina in upgrading Framework Transport Strategy and related documents", Planet S.A for EU Delegation in BiH, December 2022,

#### 4. Cross-Border Check Points and Connectivity

Out of the total number of 81 border-crossing points in BiH, there are 50 road border crossings with Croatia (out of which 7 are permanently closed), 13 road border crossings with Serbia and 10 road border crossings with Montenegro.<sup>99</sup> The most popular entry points in 2020 were Brod (9.40%), Gradiška (8.42%), Orašje (7.08%) (BiH-Croatia borders), and Rača (8.06%), Šepak (6.61%), and Karakaj (4.61%) (BiH- Serbia borders)<sup>100</sup>. Analysis in the same set of documents shows that, regarding cross-border freight transport, imports recorded a significant drop while exports remained relatively unchanged during the 2015-2019 period. It is worth noting that border crossing procedures especially for freight cargo are quite time consuming, posing a significant barrier to the further increase of trade and mobility in BiH.

Because border-crossing points do not have the physical or technological capacity (ICT solutions) to process international traffic flows efficiently, waiting times may exceed the 1 hour in major crossing points to the neighbouring countries.

In 2020, there were 4,973,288 passenger road motor vehicles, which crossed borders to enter BiH from Croatia, Serbia and Montenegro (Table 3). These vehicles carried a total of 11,811,876 passengers, both domestic (39.12%) and foreign (60.88%), with a mean occupancy rate of 2.4 passengers per vehicle. However, the figures for the year 2020 are not representative due to the COVID-19 related travel restrictions. In fact, during the period 2015-2019, the number of border crossing passengers had increased by 23.64% and reached 25,379,051 passengers in 2019. Most of these passengers entered BiH from Croatia (73.64%) and Serbia (22.41%). This composition remained relatively unchanged over the period of 2015-2020. The most popular entry points in the year 2020 were Brod (9.40%), Gradiška (8.42%), Orašje (7.08%) (BiH-Croatia border), and Rača (8.06%), Šepak (6.61%), and Karakaj (4.61%) (BiH- Serbia border).

<sup>99</sup> Strategy for Integrated Border Management in Bosnia and Herzegovina for the period 2019–2023, Council of Ministers BH, adopted document, <http://www.msb.gov.ba/PDF/121020204.pdf> Page 9.

<sup>100</sup> "Support to Bosnia and Herzegovina in upgrading Framework Transport Strategy and related documents", Planet S.A for EU Delegation in BiH, December 2022,

*Table 3: Cross-border traffic of passenger road motor vehicles and passengers on entry (Million)*

	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Total passenger vehicles	7.850	8.559	9.054	9.547	10.309	4.973
BiH -Croatia border	5.491	6.257	6.576	7.091	7.886	3.524
BiH -Serbia border	1.710	1.973	2.150	2.099	2.044	1.310
BiH- Montenegro border	0.648	0.329	0.329	0.357	0.379	0.139
Total passengers	20.526	23.038	23.035	25.106	25.379	11.812
BiH -Croatia border	14.735	16.374	15.895	18.021	18.690	7.801
BiH -Serbia border	5.044	5.787	6.260	6.129	5.688	3.656
BiH- Montenegro border	0.747	0.877	0.880	0.957	1.001	0.355

*Source: Thematic Bulletin: Transport 2021<sup>101</sup>*

Table 4 shows the respective figures for passenger and vehicles exiting from BiH, which, as expected, indicate similar findings to the aforementioned ones.

*Table 4: Cross-border traffic of passenger road motor vehicles and passengers on exit (Million)*

	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Total passenger vehicles	7.383	8.346	8.932	9.660	10.471	5.162
BiH-Croatia border	5.404	6.114	6.571	7.259	8.019	3.612
BiH-Serbia border	1.692	1.910	2.042	2.048	2.080	1.415
BiH-Montenegro border	0.287	0.321	0.319	0.353	0.373	0.135
Total passengers	20.178	21.928	22.470	24.763	25.494	11.810
BiH-Croatia border	14.478	15.629	15.750	17.768	18.795	7.843
BiH-Serbia border	4.974	5.447	5.873	6.068	5.697	3.615
BiH-Montenegro border	0.726	0.851	0.847	0.927	1.002	0.352

*Source: Thematic Bulletin: Transport 2021<sup>102</sup>*

Regarding cross-border freight transport, if the year 2020 is not considered due to the COVID-19 restrictions, indicates that the volume of goods which was imported to BiH dropped by 24.53%, while the volume of exported goods remained relatively unchanged during the period of 2015-2019.

These import/export trends are also reflected in the number of loaded freight motor vehicles over the same interval.

<sup>101</sup> Agency for Statistics of Bosnia and Herzegovina. Sarajevo, 2022

<sup>102</sup> Ibid.

Table 5: Cross-border traffic of freight road motor vehicles and goods on entry and exit points of BiH

Year	Entry			Exit		
	Loaded freight motor vehicles	Empty freight vehicles	Goods in freight vehicles (tons)	Loaded freight motor vehicles	Empty freight vehicles	Goods in freight vehicles, (tons)
2015	74,966	105,607	2,702,055	151,052	132,598	3,404,331
2016	73,952	129,155	2,429,097	157,003	148,490	3,613,022
2017	63,425	131,834	1,777,834	121,213	142,022	2,693,311
2018	69,555	133,621	1,994,329	167,452	135,839	3,816,339
2019	66,404	133,400	2,039,156	150,451	147,329	3,365,618
2020	42,882	151,654	1,717,468	111,185	144,340	2,539,486

Source: Thematic Bulletin: Transport 2021<sup>103</sup>

Since the beginning of the COVID-19 pandemic, the Transport Community Secretariat monitors the situation at border crossings, in parallel to its other activities that include planning of measures for border crossing facilitation in collaboration with CEFTA organization (Central European Free Trade Agreement) presents very recent data on waiting times at borders, demonstrating that they may exceed 1 hour at all three major crossing points of BiH with the neighbouring countries.

Table 6: Cross-border waiting times for freight road motor vehicles (February 2021-February 2022)

Border Crossing Point Peak		Average waiting time (minutes)	
		Off-Peak	
BiH - HR	Gradiska/Stara Gradiska	54-108	26-48
	Samac/Slavonski Samac	28-47	23-25
	Bijaca/Nova Sela	22-27	19-20
SRB - BiH	Sremska Raca/Raca	60-75	30-45
BiH - MNE	Klobuk/Ilino Brdo	60-75	30-45

Source: Transport Community: Monitoring of the Transport situation in Western Balkans by TCT Secretariat<sup>104</sup>

<sup>103</sup> Ibid.

<sup>104</sup> <https://www.transport-community.org/monitoring-of-the-transport-situation-in-western-balkans-by-tct-secretariat/>

## 5. Major Road Infrastructure Projects

### 5.1. Ongoing Projects

Overall, Corridor Vc is the most ambitious investment program in Bosnia and Herzegovina, requiring significant financial and human resources. So far, the European Union has allocated more than €220 million in grants under the Connectivity Agenda for the construction of 12 motorway subsections on Corridor Vc in the country, while the EU also co-finances other important infrastructure projects in BiH, such as the construction of Gradiška bridge over Sava River on the Core networks Route 2a (R2a) and the rehabilitation of the Brčko Port.

The grants are channelled through the Western Balkans Investment Framework and, together with loans from the European Investment Bank and the European Bank for Reconstruction and Development, help finance investments of more than €1.2 billion in BiH.

Table 7 presents the road sections which are currently under construction and those, which are tendered for construction in BiH. In FBiH, most of these road segments pertain to the completion of the A1 motorway, which is part of the TEN-T network indicative extension to the Western Balkans. Bypass roads for Sarajevo and Mostar are also foreseen that would alleviate the traffic congestion problems within the respective urban areas.

*Table 7: Description of on-going and under tendering process Road transport projects in BiH*

Entity	Status	Road ID	Road segment	Length (Km)	Estimated Investment Cost	
					BAM	EUR
FBiH	Road sections under construction	A1	Poprikuše - Nemila	5.5	356,579,918	182,314,553
		A1	Vranduk - Ponirak	5.3	132,108,163	67,545,140
		A1	Ponirak - Vraca;	3.2	120,128,576	61,420,138
		A1	Tarčin - Ivan - Lot 1.	4.9	134,330,881	68,681,587
		A1	Tarčin - Ivan - Lot 2.	2	116,400,284	59,513,912
		A1	Počitelj - Zvirovići	11.1	172,949,609	88,426,827
		BC	Sarajevo bypass road (lot 3B)	1.5	21,359,977	10,921,071
	Road sections tendering for construction	A1	Putnikovo brdo - Medakovo	8.5	188,737,595	96,499,013
		A1	Nemila - Vranduk	5.7	113,990,662	58,281,904
		A1	Tunel Kvanj - Buna	5.2	200,639,211	102,584,151
		A1	Mostar South - tunnel Kvanj	9.2	129,554,179	66,239,323
		A1	Medakovo - Ozimica	21.7	340,500,000	174,093,105
		BC	Vitez - Nević Polje LOT 5.	4.78	74,900,000	38,295,370
RS	Road sections under construction	E-661	Bridge over Sava (Gradiška)	:	:	:
		Vc	Johovac-Rudanka	5.65	123,218,739	63,000,000
		Vc	Rudanka-Putnikovo Brdo	5.6	183,200,000	93,667,715
			Rača-Bijeljina	:	258,200,000	132,014,214

Source: JP Autoceste FBiH<sup>105</sup>

<sup>105</sup> <https://www.jpautoceste.ba/plan-gradnje/>



The estimated investment cost for the entire list of FBiH projects (under construction and in tendering process) is almost 1 billion euro. So far, a total of EUR 709.3 million in grants for the construction of Corridor Vc in the Federation has been officially approved through applications. The remaining funds are secured mainly from own revenues and the budget.

*Table 8: Amount of grants for construction of motorways in Federation of Bosnia and Herzegovina*

Motorway Section	Grant amount (Mil.€)	Implementer - financial institution
Svilaj – Odžak	19.60	EIB
Putnikovo brdo – Medakovo	16.55	EBRD
Medakovo – Ozimice	79.00	EIB
Ozimice – Poprikuše	141.35	EIB
Poprikuše – Nemila	41.17	EBRD
Tunel Zenica – Donja Gračanica	12.06	EBRD
Ponirak – Vraca (Tunnel Zenica)	19.00	EIB
Tarčin –Tunnel Ivan (Lot 1)	11.78	EIB
Tunnel Ivan (Lot 2)	11.48	EBRD
Mostar north – Mostar south	155.90	EIB
Mostar north – Mostar south	110.90	EBRD
Tunel Prenj	3.50	EBRD
Mostar south – Tunnel Kvanj	30.33	EBRD
Tunnel Kvanj – Buna	43.80	EIB
Buna – Počitelj	8.78	EBRD
Počitelj – Zvirovići	5.00	EIB
TOTAL	709.30	

*Source: JP Autoceste FBiH<sup>106</sup>*

In Republika Srpska, the major road projects include the bridge over Sava River (Gradiska), the Corridor Vc segment that connects Johovac – Rudanka - Putnikovo Brdo, and the upgrade of the nearby-border (CRO) segment of Rača - Bijeljina, which will also enhance the road access of the respective regions to Banja Luka. Projects in Republika Srpska, financed by international financial institutions, included construction of the Gradiska - Banja Luka highway, Mahovljani interchange and Banja Luka-Doboj highway. All those projects financing included EBRD support, which totals 320 million euros. There is no public information regarding details, but some of projects financed include Mahovljani interchange, 25 Mil.€ and Corridor Vc; Doboj Bypass – subsection: Rudanka – Putnikovo brdo, WBIF, 30.8 Mil €.

According to the information available, completion of works on Corridor Vc is expected by 2028. The longest and most challenging structure, Prenj Tunnel L=10km, is co-financed by the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB), which

<sup>106</sup> <https://www.jpautoceste.ba/eu-projekti>

will finance the construction of the Prenj tunnel and access sections with EUR 300 million each (EUR 600 million in total). Construction of this structure is estimated to last for 6 years, so the declared finalization of the whole Corridor Vc by 2028 is not likely to happen.

Other TEN-T routes are still in an earlier stage of development. The EU Delegation to BiH has financed the development of designs and studies for Route 2a, Route 2b and Route 3, which is currently under tendering procedure for detailed design. However, there is no available information regarding timing of works on these corridors, since strategic documents are not adopted and consequently planned action plans not developed yet.

### 5.2. Funding

Investment in transport infrastructure is funded from domestic resources through the budget but the main sources of finance remain the International Financial Institutions (European Investment Bank, EBRD and World Bank). In the current decade, increased financing would be required in order to recover from decades of underinvestment in maintaining the existing infrastructure as well as providing new infrastructure in line with the evolution of demand.

The IFIs have been involved in 45 transport projects allocating about €3.5BN in loans over the last 20 years<sup>107</sup>. All major transport projects have been financed to a large extent by IFIs including Corridor Vc upgrades, urban sustainable mobility projects and railway restructuring. Additional resources have been made available by WBIF and other donors. The RS is engaging with Chinese investors for highway sections (excluding Corridor Vc). Beyond International Financial Institutions (IFI), EU and public funds, a limited number of projects have been prepared for financing in the context of non-concession PPP model but not all of them have been implemented: Dobož - Vukosavlje Motorway in 2012, Corridor 5c between Karuše and Poprikuše in 2013. Most of PPP projects and concessions are in the energy, social and health sectors with isolated cases in transport<sup>108</sup>. However, not a single concession has been awarded at the national level.

The EU Economic and Investment Plan sets out a substantial investment package for the Western Balkan region<sup>109</sup>, mobilising up to €9 billion of funding projects that support sustainable connectivity as well as major flagship

<sup>107</sup> Analysis of data by the study team from IFIs' sources.

<sup>108</sup> EBRD (2018) <https://ppp-ebd.com/review.php?country=Bosnia%20and%20Herzegovina>

<sup>109</sup> European Commission (2020) An Economic and Investment Plan for Western Balkans, Communication COM (2020), 641 Final, 6.10.20.

projects. The EU will prioritise projects and programmes on the indicative extension of the Trans-European Transport Network (TEN-T) core network which are of strategic interest to the region and to the EU.

The funded projects must also contribute to the sustainable mobility priorities of the EU, considered an essential element in building a transport infrastructure that is fit for the future. In that context, the Commission will promote for each road infrastructure project the development of green multimodal transport solutions.

For Bosnia and Herzegovina, this implies the following priority roads projects to be completed or advanced by the end of 2024<sup>110</sup>:

- (a) 75% of the main north-south road corridor linking central Europe capitals through Sarajevo in Bosnia and Herzegovina to the port of Ploče on the Adriatic coast (Corridor Vc) will be completed to motorway standards.
- (b) The Sarajevo to Podgorica capital to capital connection will be enhanced, linking further to the existing and planned networks in Bosnia and Herzegovina, and providing more direct links between neighbours.

At present, the development of the transport infrastructure is predominantly realized via public funding programs while the use of alternative financing tools and techniques is limited. It will be essential to address the underlying reasons which inhibit the use of these alternative financing methods to ensure the realization of the infrastructure development targets, considering that public budgets are insufficient to meet increasing investment needs.

Transport infrastructure is also financed by extra budgetary funds and public corporations, and this is reported in budget documents. These funds are mainly pension and disability insurance funds, health insurance funds, employment funds and road directorates. Furthermore, some projects are financed from accumulated profits of public sector companies. For instance, the Hranjen road tunnel is mainly financed from BH Telecom profit.

However, in all sub sectors “the necessary investments are being delayed by limited borrowing capacity, financial constraints, lack of focus on key priorities and coordination and cooperation between government levels<sup>111</sup>.”

In 2018, at the insistence of the IMF, the BiH parliament adopted an increase in excise rates on fuel products including LPG, biofuel, and heating

<sup>110</sup> European Commission (2020) op.cit. Annex p. 1-2.

<sup>111</sup> European Commission (2021) Bosnia and Herzegovina 2021 Report, Commission Staff Working Document, Chapter 14, p.96.

oil, by 15 pfenings per litre in order to channel the additional revenues to ensure highway and road infrastructure financing.

The increase was seen as a catalyst for the attraction of additional loan financing for infrastructure projects and in particular to support the construction of the strategically important highway "Corridor V", while two World Bank projects will support local road and railway connectivity<sup>112</sup>. The resulting additional tax revenue was split between entities FBiH and RS and directed towards debt service for financing the above-mentioned projects.

In the case of the FBiH Highway and Road companies, the above revenues have been essentially used to cover operating expenses, maintenance activities and debt servicing. The same is true for many cantons, where the revenues often barely cover the cost of road maintenance and other minor upgrades<sup>113</sup>.

Furthermore, only in 5 cantons independent cantonal directorates for roads with their own accounts have been formed to manage transport related expenditure including maintenance. EBRD, through loan agreements, is supporting Bosnia and Herzegovina in preparing sustainable funding strategies for road maintenance. However, up until 2021 only 33% of the required funding for maintenance has been secured<sup>114</sup>.

Moreover, the overall institutional setting requires major adjustments<sup>115</sup>. The implementation of the Transport Community Treaty (TCT) action plans remains weak. The country is moderately prepared for road transport market opening.

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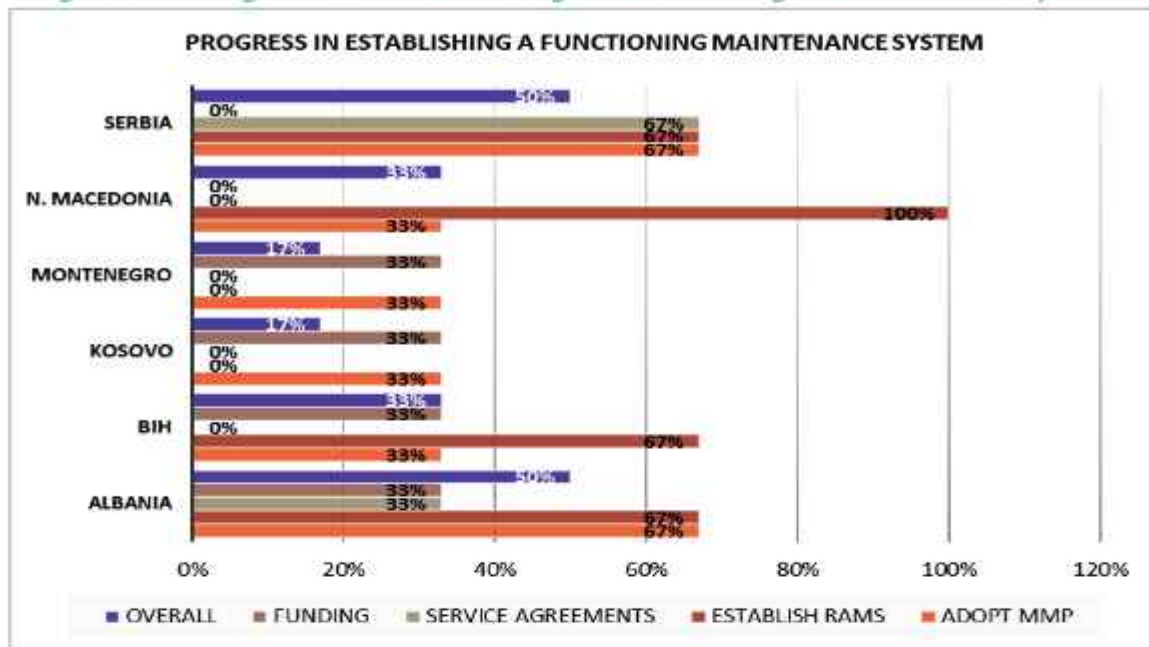
<sup>112</sup> Statement by Anthony De Lannoy, Executive Director for Bosnia and Herzegovina and Zorica Kalezic, Advisor to the Executive Director February 9, 2018, p.3.

<sup>113</sup> Taz Chaponda, Fazeer Rahim, Suzanne Flynn, Bobana Cegar, Nihad Nakas, Adrien Tenne (2018) Bosnia and Herzegovina, Public Investment Management Assessment, p.36.

<sup>114</sup> Transport Communities (2021), Action Plans, First Year Progress, p.43.

<sup>115</sup> European Commission (2021) Bosnia and Herzegovina 2021 Report, Commission Staff Working Document, p.96.

Figure 4: Progress in establishing a functioning maintenance system



Source: State of Play: Analysis of the Transport Sector in Bosnia and Herzegovina; Annex to the Framework Transport Strategy, Planet S.A for EU Delegation in BiH, December 2022

In the context of the TCT Road Action Plan, countries have committed to establish a functioning and efficient road maintenance plan comprising of several actions including the adoption of a multiannual maintenance plan (MMP), establishing Road Asset Management System (RAMS) the signing of Service Level Agreements between MoT and Road authorities and adopting an efficient funding strategy for maintenance.<sup>116</sup> In general, the establishment of a unified fully functioning RAM system is facing many challenges due to the administrative structure of the country and especially the autonomy of cantons in FBiH. BiH has made limited progress as the results indicate in comparison with other countries in Western Balkans.

<sup>116</sup> Transport Communities (2021) Action Plans- First Year Progress report, p.42.

Transport sector's operations are dominated by SOEs (State Owned Enterprises) or public enterprises. A larger SOE footprint is usually associated with a smaller public capital stock and lower infrastructure quality<sup>117</sup>.

An indication of the level of financing required to cover existing infrastructure needs comes from the PIMIS data base which includes 218 candidate transport projects with a total cost of 12.4 Bn BAM. Out of this amount, 10.4 Bn KM is related to the road transport projects, which dominate prospective investment activity with 85%.

Taking into consideration the many challenges facing the transport sector in protecting and renewing infrastructure, it is essential to broaden and differentiate the sources of financing in order to sustain transport investment activity and accomplish the targets set by FTS.

## **6. Mapping of Challenges to Road Connectivity**

### **6.1. SWOT Analysis**

The abovementioned document<sup>118</sup> contains a consolidated view of investments and financing, including the SWOT analysis, which is presented to the authorized local government representatives, and illustrates challenges in front of the whole transport sector, but also roads and road connectivity.

The complexity of challenges facing the transport sector requires the mobilization and efficient management of adequate resources and their allocation in accordance with the objectives of the Framework Transport Strategy of BiH and current policy priorities.

Furthermore, investment appraisal and selection of projects should ensure that existing transport assets are protected and upgraded, become resilient to the impacts of climate change are financially sustainable over the lifetime of the infrastructure and adapted to shifting travel patterns and evolving industrial and economic uses.

According to the SWOT analysis, the potential of the transport sector and roads subsector is promising, opportunities exist but overcoming weaknesses is of critical importance for the effectiveness of the investment effort in a period that the level of threats is increasing and requires constant vigilance.

<sup>117</sup> Richmond Christine et.al. (2019) Reassessing the Role of State-Owned Enterprises in Central, Eastern and Southeastern Europe, IMF Paper, 19/11, p.48.

<sup>118</sup> "Support to Bosnia and Herzegovina in upgrading Framework Transport Strategy and related documents", Planet S.A for EU Delegation in BiH, December 2022,

*Table 8: SWOT Analysis Finance and Investment filtered for Road sector*

<b>STRENGTHS</b>
<ul style="list-style-type: none"> <li>✓ Long term prospects for the key demand drivers are positive.</li> <li>✓ Economic activity is concentrated in sectors that are transport intensive.</li> <li>✓ Transport sector has the potential to grow faster than the GDP.</li> <li>✓ International financing is readily available through IFIs and debt to GDP ratio is low.</li> <li>✓ Access to EU and international funding schemes for transport network development is secured.</li> <li>✓ Existing extensive financing schemes for transport projects over the last two decades has created a conducive environment for attracting more financing and possibly private investments.</li> <li>✓ Participation in the Transport Communities provides the framework for benchmarking with peers and accelerating reforms in the transport sector.</li> <li>✓ Asset Management Approach has been introduced and gradually implemented.</li> </ul>
<b>WEAKNESSES</b>
<ul style="list-style-type: none"> <li>✓ In terms of transport infrastructure and efficiency of services BiH is ranked 108th in the world.</li> <li>✓ Low mobilisation of domestic resources for investment in Transport.</li> <li>✓ Maintenance budgets inadequate while the creation of a unified fully functioning RAM System is facing many challenges due to administrative structure.</li> <li>✓ State owned enterprises in the transport sector require restructuring, improved mechanisms for allocation of funds and increased oversight.</li> <li>✓ Private sector involvement limited as transport markets are dominated by state owned enterprises.</li> <li>✓ Procurement law not yet fully aligned with EU acquis.</li> <li>✓ PPP framework fragmented requiring major overhaul.</li> <li>✓ Appraisal and selection of projects processes uneven and PIMA recommendations not yet implemented.</li> <li>✓ Unclear principles for prioritization of projects.</li> <li>✓ Administrative complexities undermine the potential for implementation of complex multi-purpose integrated sub sector strategies.</li> </ul>
<b>OPPORTUNITIES</b>
<ul style="list-style-type: none"> <li>✓ The strategic position of BiH regarding the North - South and East West transport connections provides opportunities for the development of logistics hubs and operations.</li> <li>✓ Prospective EU integration and alignment with EU acquis will strengthen investment possibilities in transport related activities following the opening of market segments.</li> <li>✓ Access to EU €9 billion of funds directed to projects that support sustainable connectivity in the region.</li> <li>✓ Exploit the opportunities arising from allocation of \$600 billion by 2027 in global infrastructure investments through the G7 Partnership for Global Infrastructure and Investment.</li> <li>✓ International Financial Institutions are active in BiH. Involvement in many critical transport projects has helped develop capacities to fully support the sector both in terms of investment and reforms.</li> <li>✓ Exploit relocation of supply chains of major international companies and attract FDI in transport related activities.</li> </ul>

THREATS
✓ Global economic developments including inflation dynamics, rate hikes and relocation of supply chains.
✓ Changing geopolitical climate.
✓ Rapidly changing competitive environment in the subsector.
✓ Increased competition for transport services and investments from other countries in the region.
✓ Migration dynamics including brain drain and emigration of specialised personnel.
✓ Capability and capacity of sector to adjust to new demands and challenges, introduce new financing instruments and initiate reforms.

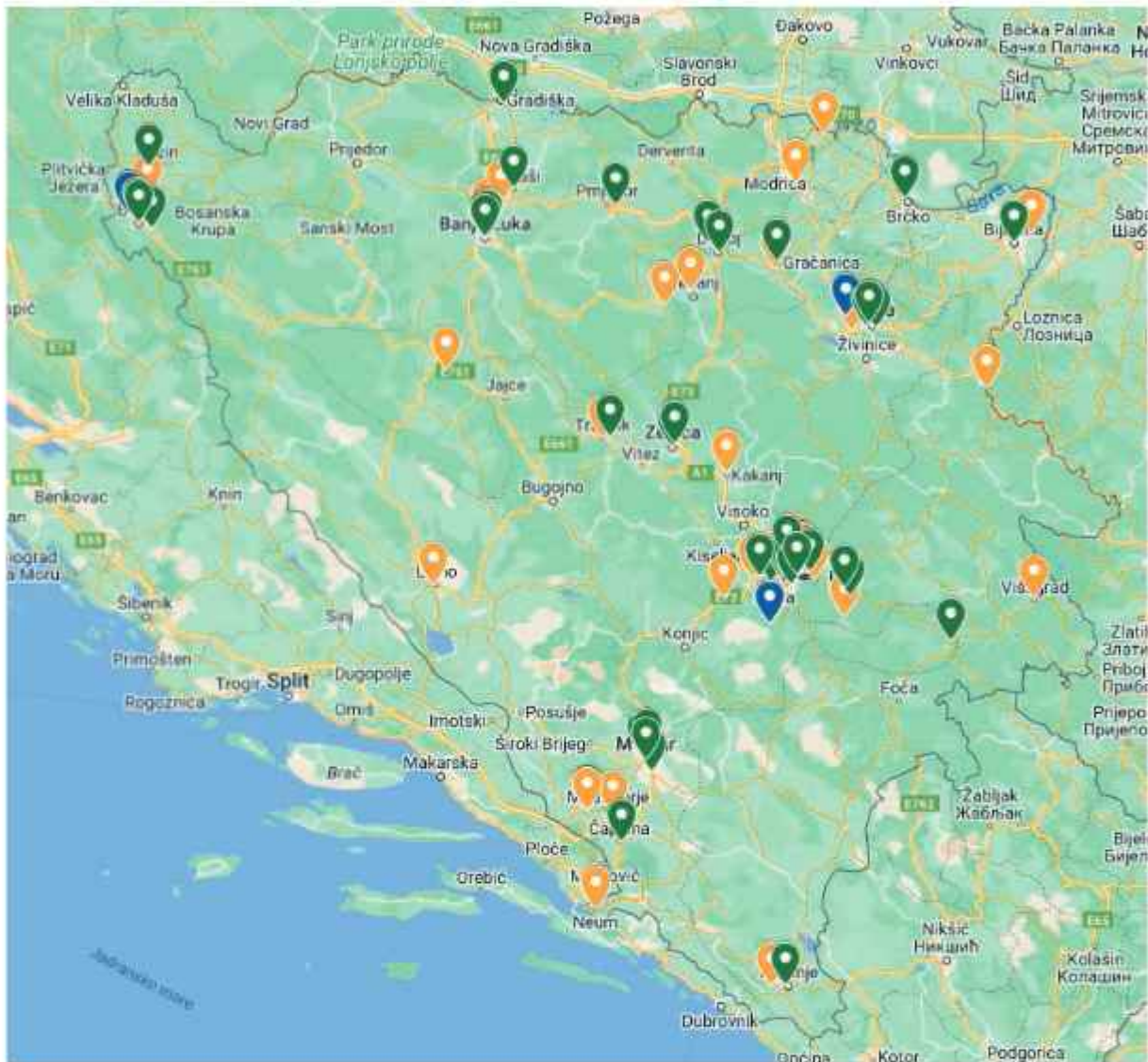
*Source: "Support to Bosnia and Herzegovina in upgrading Framework Transport Strategy and related documents", Planet S.A for EU Delegation in BiH, December 2022.*

### 6.2. Decarbonization and Electric Vehicles Infrastructure

In Bosnia and Herzegovina, there are 173 charging stations for electric vehicles, with 205 connectors. Most of them are in cities, in places where there are larger parking lots, within shopping malls, restaurants, hotels. Most are AC and slow chargers. The need to open charging stations on important traffic corridors is recognized, as well as need to increase the number of DC or fast charging stations, and first steps were recently made. On the motorway section Mostar - Sarajevo, at the Lepenica rest stop, a DC charging station for electric vehicles has been put into operation in 2023. It can charge two electric vehicles at the same time, with three different connections. The project was financed by JP Autoceste FBiH and Elektroprivreda FBiH. Until now, no EU projects have been implemented in this area.



Figure 5: Map of electric chargers in BiH



Source: <https://chargerbih.ba/>

Despite EU legislation applicable since 2010 and the transport sector being included in Member States' targets under the Effort Sharing Regulation, emission reductions has not been fast enough in this sector. While CO<sub>2</sub> emissions standards bring new and cleaner cars to the market, it is important to decarbonize transport fuels, which serve the existing fleet. The system, which will put a price on carbon emissions from road transport (and heating) fuels, will not apply at the level of the individual transport user, but at the level of the fuel supplier as the entity with control over the fossil carbon content of the fuel. First steps are recently made. In the budget for 2023, the Government of the Federation of Bosnia and Herzegovina provided 1 million. KM (approx. € 0.5 million) to encourage the purchase of electric cars, half of which is intended for small and medium-sized enterprises, and the other half for citizens. For now, no deadline has been set in which all vehicles should be replaced by electric vehicles.

Another subject of the future Green agenda for circular economy, addressing in particular waste, recycling, sustainable production and efficient use of resources, is not appropriately considered in the current road activities. Some examples of good practice can be found around the sector (described below), but strategic approach of comprehensive planning and realization of measures is missing.

The procurement of an electric vehicle for the transportation of children with developmental disabilities is in progress. This is one of the projects of the City of Sarajevo that received financial and technical support from the "EU4 Energy Transition" project. In the past year, 25 new trolleybuses were purchased in Sarajevo, and the purchase of 30 new buses was announced, in order to modernize the fleet but it is not yet known whether they will be electric buses or not.

### **7. Recommendations for Enhancing BiH's Road Infrastructure and Cross-Border Road Connectivity**

Efficient sector governance and sustainable transport system development should be facilitated via:

- **An overall Strategy Framework with Action Plans with a time horizon of 15 years** for aligning the BiH transport system to the vision of the Core and Comprehensive networks and working towards its full integration into the Single European Transport Area, with concrete sub-sector strategies that focus on integration and interconnectivity;
- **A governance framework with functional and integrated (aligned) institutional and legislative tools** for closer integration within the BiH and between Bosnia and Herzegovina, the Region, and the EU to achieve actual progress towards integrated transport system development in an effective and sustainable manner; Improvements in Public Investment Management via **modern investment planning and efficient project evaluation procedures**;
- **A framework for considering the social and environmental needs of sustainable mobility**, including a realistic timeline for the implementation of the appropriate measures.

Aiming to embrace the global attempt and guidelines on the issue, the BiH Framework Transport Strategy document and the strategic documents of the Entities and of the District should be adopted to successfully promote the "Safety First" principle, while holistically adopting the "Safe System Approach", especially for

vulnerable road users and in urban areas, since significant part of the road network, apart from motorways and expressways, passes through settlements.

Legislative interventions in the areas of **traffic safety**, strengthening the institutional capacity for efficient implementation of road safety laws and enforcement, systematization of audits and inspections, improvement of vehicle safety, safer infrastructure, public transport, collection and report of accurate, comparable and disaggregated road safety related data, performance of road safety impact assessments and indicators, should be implemented.

A strategy for road traffic safety in BiH is not in place. The internal institutional setting, the political situation and the hesitant attitude and weak competence or sense of responsibility of the institutions towards road traffic safety are the principal reasons that Bosnia and Herzegovina still has no Road Traffic Safety Strategy.

Since a considerable share of the main and regional road network is already characterized by medium or poor maintenance conditions (i.e., border crossing points of BiH with Serbia (via Kotroman) (M5), with Croatia (via Samac) (M17), and with Montenegro (via Hum) (M18)), a comprehensive and reliable monitoring, modernization and maintenance program for the road infrastructure should be designed, coordinated and followed on BiH level. This program should also ensure that compliance with safety and road tunnel Directives (Directive 2008/96/EC and Directive 2004/54/EC) is met across the BiH road network which is under the TEN-T designation

The available information suggests that the development of a single national road supervision centre (ITS) will be an issue to be addressed because the individual stakeholders focus on planning and developing their own supervision (operation, managing, maintenance) centres.

The Technical Assistance to Connectivity in the Western Balkans (CONNECTA) once more confirmed that the **border crossing procedures** are a significant barrier to trade and mobility in the Western Balkans<sup>119</sup>.

The main objective of CONNECTA's assignment was *"to propose measures for implementing one-stop-shops for the core and comprehensive road network and an electronic border queuing management system for a number of border crossing points/common crossing points"*. The CONNECTA team indicates that such measures *"require effective inter-related engineering and technology and institutional and legal actions, as well as full commitment and close cooperation of the Western Balkans partners' authorities"*.

<sup>119</sup> CONNECTA website: <https://connecta-info.eu/border-crossing-facilitation-and-improvement-of-the-cross-border-road-transport-in-the-western-balkans/>

In the same context, the Transport Community Permanent Secretariat in 2019 defined priority measures on border crossing points (BCPs) - common crossing points (CCPs) with accompanying action plans. Table 9 and 10 show these respective priorities for BiH border crossing points, comprising legal actions, physical investments and ITS technologies.

*Table 9: Recommended activities for improving border-crossing procedures at Bijaca/ Prud point*

<b>BCP name</b>	<b>BCP location</b>	<b>Description of activities</b>	<b>Expected outcome</b>
Bijaca/ Prud	BiH/HR Corridor Vc MED Corridor	<p>Soft (legal and institutional measures) for establishing One stop shop (OSS) and joint controls:</p> <ul style="list-style-type: none"> <li>- Bilateral agreement signing</li> <li>- Formation of inter-state working group to work towards implementation of OSS with joint facility</li> <li>- Pre-clearance using Advance Notification</li> <li>- Alignment of legal frameworks to mutually recognize certificates, especially veterinary and phytosanitary, given the volumes of livestock and produce passing through the BCP Bijaca/Prud</li> <li>- Plan for physical implementation of OSS (including migration plan to selected site, procurement of goods and installation of necessary IT equipment)</li> </ul>	<p>Higher rates of physical inspections whilst achieving against quicker processing times (i.e. win-win for security and trade). Shortening processing time for trucks for about 10 min per truck. Faster processing while at the same time improving detection, as part of the anti-narcotics and smuggling effort.</p>
		<p>Physical investments (including traffic technology and equipment):</p> <ul style="list-style-type: none"> <li>- Preparation of design and installation of a mobile truck scanner so the Customs and Border Police can carry out 100% physical examination and eliminating the need for the visual checks.</li> <li>- Preparation of design and installation of weigh bridge in other lanes so trucks can use more than one lane</li> <li>- Preparation of design and installation of automatic number plate recognition (ANPR) system</li> <li>- Preparation of design for secondary vehicle inspection facility and consolidated Police and Customs booth</li> <li>- Preparation of design of a dedicated bus passenger facility with particulate detection equipment given the high volume of coaches passing through Bijaca/Prud</li> </ul>	<p>Faster, safer and more efficient bus passenger checking. Saving between 10 to 20 minutes each bus. Increased performance by Customs and Border Police staff sharing same booth Increased vehicle throughput and time savings of up to 30 minutes processing time per truck.</p>

*Source: Transport Community Permanent Secretariat: Priority measures on border crossing points (BCPs) - common crossing points (CCPs) for endorsement at the Western Balkans Summit in Poznan in 2019*

Table 10: Recommended activities for improving border-crossing procedures at specific border-crossing points of BiH

BCP name	BCP location	Description of activities	Expected outcome
Gradiska/ Nova Gradiska; Bosanski Samac/ Slavonski Samac; Doljani/ Metkovic* *for peak season	BiH-HR Route 2a and Corridor Vc MED Corridor	ITS investments for establishing electronic queuing system: - Preparation and Development of the specifications of the IT system for eQMS - Preparation of Procurement procedures - Deployment/Commissioning and testing of the system	Completely reducing queues-removing the trucks and buses from the general circulation lanes as they will be parked at a dedicated waiting area. Huge benefits in terms of safety of users at the BCP, security (of the cargo), environment, health (of drivers).

Source: Transport Community Permanent Secretariat: Priority measures on border crossing points (BCPs) - common crossing points (CCPs) for endorsement at the Western Balkans Summit in Poznan in 2019

The border crossing procedures, which are currently associated with multiple weaknesses, should be accordingly treated at BiH level. An integrated and horizontal toolbox of actions must be designed to tackle the existing bureaucratic, physical capacity and technological deficiencies. The enhancement and simplification of border crossing procedures is expected to importantly increase the competitiveness of BiH and improve economic cooperation and activities with neighbouring countries.

**Policy decisions on financing should take into consideration** the current developments in the economic environment, especially the **high and persistent inflationary pressures and the increase in interest rates across the globe**. In the current global economic environment and given a relatively low debt-to-GDP level, BiH can accommodate additional public sector investment in infrastructure financed by low-cost IFI loans. As the IMF recommends, “investment should be complemented by reforms, to improve budget execution and project implementation in the FBiH and contain current spending and prioritize capital spending in the RS”<sup>120</sup>.

**Environmental issues** are generally underrepresented, from development of appropriate standards and regulations to coping with climate resilience and CO2 emissions. There is a need to plan and implement charging stations for electric vehicles outside of cities and shopping malls.

<sup>120</sup> IMF (2022) Article 4 Consultation Staff Report, June 2022, p.18.

# Road Infrastructure in Bulgaria

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## Road Infrastructure in Bulgaria

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**Yasen Georgiev**

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### 1. Introduction

Bulgaria's efforts to improve the quality of road infrastructure and to increase its length and capacity are a focal point in civil engineering construction since the country joined the European Union in 2007. Nevertheless, for various reasons many of the big road projects continue to witness slow progress. In terms of regional road connectivity, Bulgaria has an important location being at the same time a European, Balkan, Black Sea and Danube country. However, if regional connectivity is considered, the country reveals a significant catching-up potential that has not been utilised despite the availability of options for EU funding and the presumably easy access to other funding sources. Against the backdrop of Russian aggression in Ukraine, regional connectivity projects also in the field of road infrastructure, which for different reasons were delayed, put on hold or existed only as concepts over the last decade, are about to receive an additional boost in the years to come. In order to succeed in a foreseeable future, though, they have to take into account the lessons learnt from previous periods and opt for bold and long-term solutions that go way beyond the existing concepts in the field of road construction and road connectivity.

### 2. Overview of Existing Road Infrastructure

#### 2.1. Main Road Network

The national road network in Bulgaria consists of roads that are classified as motorways (highways) and roads of the first, second and third class<sup>121</sup>. According to road category motorways are roads designed exclusively for high-speed vehicular traffic. They have separate carriageways for traffic in each direction with a dividing strip inbetween and emergency stopping lane. The maximum speed is 140 km/h. First category roads are designed for transit traffic on big distances, mainly from border to border. This category of roads is meant to service big territories and coincide with the major transport routes in the country. The second category roads are designed for transit traffic on medial distances. They have distributing functions and provide optimal routes for transit traffic to different country regions. The

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<sup>121</sup> National Statistical Institute

third category consists of roads that provide connection between different municipalities as well as between municipalities and local roads.

According to the latest annual data the total length of the national road network in Bulgaria reaches 19,942 km (Table 1). Motorways are 825 km in length, which is 4.1% of the overall road network. First class roads cover 14.4% (2,879 km), second class – 20%, while third class roads account for 61.3% of it (12,219 km). For a period of five years, the length of motorways increased by 9% or 68 km, whereas first and second class roads registered an average decrease of almost 1% because they were either downgraded to the respective lower category or substituted by newly built motorways. The density of the road network, measured as the total per 100 km<sup>2</sup> of the total land area, stands at 18.13 km. Along with the overall increase in the length of motorways, their density grew to 0.75 km in 2022 from 0.69 km in 2018. This corresponds to an overall growth of 9% in the length of the motorways, while the road network grew by 0,3% within the same period.

A closer look on regional level shows a more nuanced picture (Table 2). According to EUROSTAT classification the territory of the country is divided into 6 statistical regions that correspond to the NUTS 2 level.<sup>122</sup> The South Central region, which has the second highest population density and is geographically important for the overall road connectivity between Türkiye and Europe, hosts the longest road network in Bulgaria – 4105km or 20,6% of the the total road length. The second place is for the South-West and the North-West region, the most densely and most sparsely populated regions in Bulgaria, respectively. 17,2% of the road network is located in each of both regions, which have, though, a varying breakdown in terms of road categories. 34% of the motorways in Bulgaria are on the territory of the South-West region, while merely 2% of the total length of highways is in the North-West region. Thus, it comes as no surprise, that the South-West region reveals the highest density of motorways per 100 km<sup>2</sup> of its territory– 1,39 km. In contrast, the North-West region is on the last but one place with 0,09 km of motorways per 100 km<sup>2</sup>. The North Central region is on the bottom in this regard with 0 km of motorways on its land area.

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<sup>122</sup> NUTS - Nomenclature of territorial units for statistics



Table 1: Overview of national road network in Bulgaria (as of the end of 2022)

Road categories	Length (km)					Density per 100 km <sup>2</sup>				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Motorways	757	790	806	806	825	0,69	0,72	0,73	0,73	0,75
Category I roads	2925	2900	2883	2883	2879	2,66	2,64	2,62	2,62	2,62
Category II roads	4022	4019	4019	4019	4019	3,66	3,65	3,65	3,65	3,65
Category III roads	12172	12170	12209	12217	12219	11,07	11,06	11,10	11,11	11,11
<b>Total</b>	<b>19876</b>	<b>19879</b>	<b>19917</b>	<b>19925</b>	<b>19942</b>	<b>18,07</b>	<b>18,07</b>	<b>18,11</b>	<b>18,11</b>	<b>18,13</b>

Source: National Statistical Institute

Table 2: National road network at NUT 2 level in Bulgaria (as of the end of 2022)

NUT 2 regions	Length (km)					Density per 100 km <sup>2</sup>				
	Total	Motorways	Category I roads	Category II roads	Category III roads	Total	Motorways	Category I roads	Category II roads	Category III roads
North-West	3428	17	392	764	2255	17,97	0,09	2,06	4,01	11,82
North Central	2976	0	462	635	1879	20,08	0,00	3,12	4,28	12,68
North-East	2700	111	486	467	1636	18,44	0,76	3,32	3,19	11,18
South-East	3312	223	606	746	1737	16,73	1,13	3,06	3,77	8,77
South-West	3421	282	517	622	2000	16,85	1,39	2,55	3,06	9,85
South Central	4105	192	416	785	2712	18,35	0,86	1,86	3,51	12,13
<b>Total</b>	<b>19942</b>	<b>825</b>	<b>2879</b>	<b>4019</b>	<b>12219</b>	<b>18,13</b>	<b>0,75</b>	<b>2,62</b>	<b>3,65</b>	<b>11,11</b>

Source: National Statistical Institute

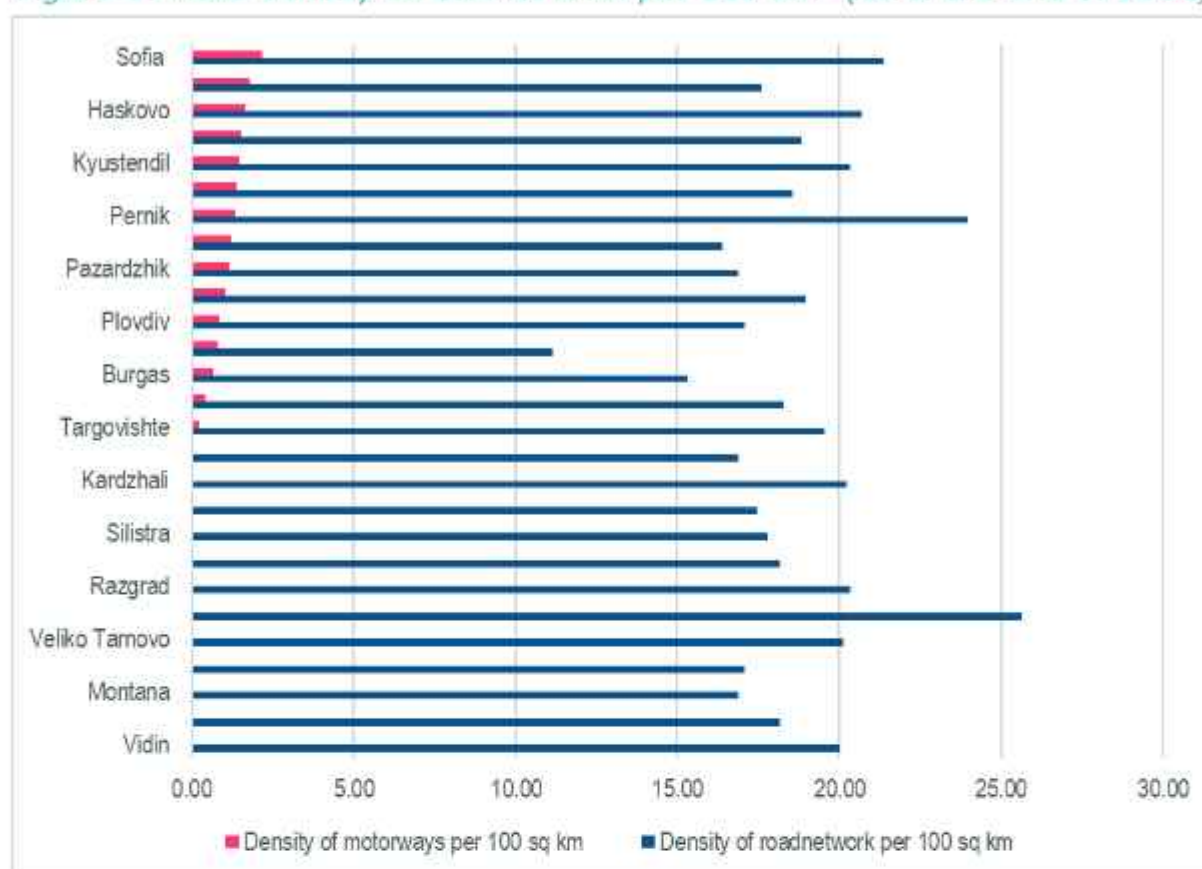
A greater territorial breakdown, that goes on a district level, provides further insights into the existing road infrastructure. The above-mentioned six NUT 2 regions comprise of 28 districts (области – *oblasti*) that are used for national spatial planning purposes and which correspond to the NUTS 3 level of the NUTS classification. As shown on Table 3, there are 12 districts that do not have a single kilometer of motorways on their territory. The biggest share of motorways in the respective district road network are registered in Stara Zagora (10,25%), Sofia (10,21%) and Varna (8,08%), whereas the combined share of motorways and category I roads is the highest in Shumen (37,20%), Sofia (30,17%) and Stara Zagora (28,67%). Logically enough, Sofia as well as Stara Zagora are the districts with the highest density of motorways per per 100 sq km of their territory. At the same time, outliers in terms of density of the road network per 100 sq km are Gabrovo and Pernik, with 25,6 km and 29,3 km, respectively (Figure 1).

*Table 3: National road network at district level in Bulgaria (as of the end of 2022)*

District	Region	Total	Motorways	Category I roads	Category II roads	Category III roads
Vidin	North-West	607	0	69	91	447
Vratsa	North-West	658	0	65	232	361
Lovech	North-West	755	17	105	78	555
Montana	North-West	614	0	56	158	400
Pleven	North-West	794	0	97	205	492
Veliko Tarnovo	North Central	937	0	153	141	643
Gabrovo	North Central	518	0	86	30	402
Razgrad	North Central	506	0	56	162	288
Ruse	North Central	509	0	110	155	244
Silistra	North Central	506	0	57	147	302
Varna	North-East	718	58	139	43	478
Dobrich	North-East	823	0	83	242	498
Targovishte	North-East	530	6	77	105	342
Shumen	North-East	629	47	187	77	318
Burgas	South-East	1187	51	258	242	636
Sliven	South-East	581	44	85	202	250
Stara Zagora	South-East	907	93	167	215	432
Yambol	South-East	637	35	96	87	419
Blagoevgrad	South-West	719	52	73	152	442
Kyustendil	South-West	621	44	84	54	439
Pernik	South-West	573	32	59	66	416
Sofia	South-West	1508	154	301	350	703
Kardzhali	South Central	649	0	73	81	495
Pazardzhik	South Central	753	51	59	203	440
Plovdiv	South Central	1020	50	129	240	601
Smolyan	South Central	539	0	0	110	429
Haskovo	South Central	1144	91	155	151	747
<b>Total</b>		<b>19942</b>	<b>825</b>	<b>2879</b>	<b>4019</b>	<b>12219</b>

*Source: National Statistical Institute*

Figure 1: Road density on district level per 100 km<sup>2</sup> (as of the end of 2022)



Source: National Statistical Institute

Construction of motorways in Bulgaria as the backbone of transport connectivity has a track record of app. 50 years. Initially, plans for construction of motorways in Bulgaria date back to the early 1970s when on a government level a resolution was adopted for building a ring of motorways, which was meant to encompass the country by connecting three motorways - 'Trakia', 'Hemus' and 'Cherno More'. The ring that remained the basis of the highway system of the country, was thereafter complemented with the addition of branches to serve busiest transit routes to neighbouring countries. These include the motorways 'Maritsa', 'Struma', 'Europe' and 'Ruse - Veliko Tarnovo' as well as the expressway 'Vidin - Vratsa'.

As of March 2024 motorways are built at 63.3% of their total projected length. There are two motorways in operation that are completely built and cover the entire length of their routes - 'Trakia' and 'Maritsa', both in Southern Bulgaria (Table 4 and Figure 2). Currently, 'Struma' and 'Europe' in South-Western Bulgaria are completed at 86% and 65.6%, respectively, whereas 'Hemus' in Northern Bulgaria stands at 45.7% and 'Cherno More' in Eastern Bulgaria is ready at 7.8%. 'Struma', 'Europe' and 'Hemus' witnessed extensions in 2023-2024, hence, the higher length of motorways in early 2024 compared

## Bulgaria

to the annual data presented above. In contrast, there were no extensions on 'Cherno More' for many years due to a permanent lack of funding, while the groundbreaking ceremony for the first stage of the 'Veliko Tarnovo-Ruse' motorway in Northern Bulgaria (8 km) took place in late 2023.

*Table 4: Motorways in Bulgaria (as of February 2024)*

Sign	Name	From	To	Length (km)	In operation (km)	Under active construction	Completion rate (%)
A1	Trakia	Sofia	Burgas	360	360	0	100%
A2	Hemus	Sofia	Varna	418	191	52	45.7%
A3	Struma	Sofia	BCCP <sup>123</sup> Kulata/ border with Greece	172	148	0	86%
A4	Maritsa	A1/Chirpan	BCCP Kapitan Andreevo/ border with Türkiye	117	117	0	100%
A5	Cherno More	Varna	Burgas	103	8	0	7.8%
A6	Europe	Sofia	BCCP Kalotina/ border with Serbia	48	31,5	16,5	65.6%
A7	Veliko Tarnovo - Ruse	Veliko Tarnovo	Ruse/BCCP Ruse, border with Romania	133	0	8	0.00%
				1351	855,5	76,5	63.3%

*Source: National Statistical Institute*

<sup>123</sup> BCCP - border control checkpoint

Figure 2: Map of motorways in Bulgaria. Legend: highways in green are ready, highways in red are under active construction, highways in yellow are at project stage or in an early construction stage



Source: Wikipedia<sup>124</sup>

### 2.2. Road Quality

The latest available data by the State Agency Road Safety on the quality of road infrastructure shows that 42% of road surface/road pavement is in an excellent or good condition, one third is considered to be in a satisfactory one, while the remaining almost 30% are either in a unsatisfactory or bad condition (Figure 3). Compared to 2019, roads with excellent condition of the surface decreased by 2.5%, whereas the ones with a surface of good or satisfactory quality increased by 5% and 7%, respectively. Roads with an unsatisfactory condition of the surface took a share of 8% in 2022 compared to 13% in 2019, the same trend is witnessed in roads with a bad condition of the pavement – they decreased from almost 25% in 2019 to 20% in 2022. While the above-mentioned assessment relates to existing road infrastructure, the quality of new road sections seems not to always meet the expected standards. According to checks by the National Road Infrastructure Agency in September 2023 more than 50% of the inspected sections of newly built or repaired roads show deviations from the quality prescriptions and the corresponding technical requirements.<sup>125</sup>

<sup>124</sup> [https://it.wikipedia.org/wiki/Autostrade\\_in\\_Bulgaria#/media/File:Bulgaria\\_Highways.png](https://it.wikipedia.org/wiki/Autostrade_in_Bulgaria#/media/File:Bulgaria_Highways.png)

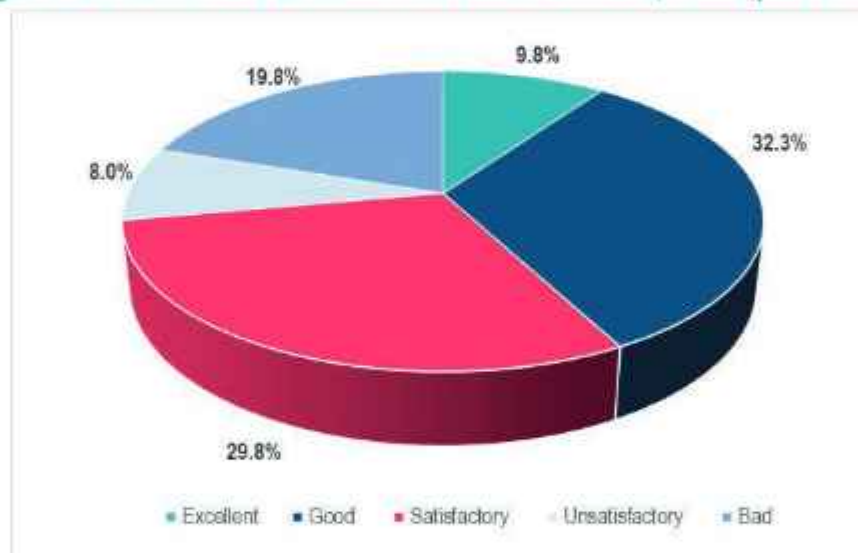
<sup>125</sup> Minister Tsekov: The first inspection of roads under guarantee found quality deviations in more than 50% of sections, accessed February 9, 2024 <https://www.api.bg/bg/novini/ministur-tsekov-purvata-inspektsiya-na-putishcha-v-garantsiya-ustanovi-otkloneniya-ot-kachestvoto-pri-nad-50-ot-uchastutsit.html>

## Bulgaria

A snapshot on the remaining features of the existing road network reveals a good condition of 60% of road restraint systems, 57% of road signs, 55% of road shoulders and 37% of road surface marking. In fact, the category of road surface marking has the less favourable performance and this is considered to be valid not only for the quality but also for the high share of roads that lack a surface marking. (Table 5).

By international standards, in terms of road quality Bulgaria achieves modest to poor scores. In 2019, the latest, albeit outdated as of 2024 Global Competitiveness Report by the World Economic Forum ranked Bulgaria 34th out of 40 countries in Europe, between Serbia (33<sup>rd</sup>) and North Macedonia (35<sup>th</sup>) and Romania (37<sup>th</sup>). In 2019 the country got 3.4 points in the category where the quality of roads is in the range between 1(low) - 7(high). For comparison, the world average in 2019 based on data for 141 countries was 4.07 points. Nevertheless, this ranking shows an improved performance compared to the lowest performance of the country of 2.08 points in 2010.

*Figure 3: General condition of road surface/road pavement*



*Source: State Agency Road Safety, Report on the state of road safety in the Republic of Bulgaria for 2022, Appendix 2.1.*

*Table 5: General condition of features of the national road network*

Road signs	Road surface marking	Road shoulders	Road restraint systems
Good: 57.2%	Good: 37.4%	Good: 54.6%	Good: 60.5%
Bad: 30.5%	Bad: 42.1%	Bad: 37.9%	Bad: 31.4%
Missing: 12.3%	Missing: 20.5%	Missing: 7.5%	Missing: 8.1%

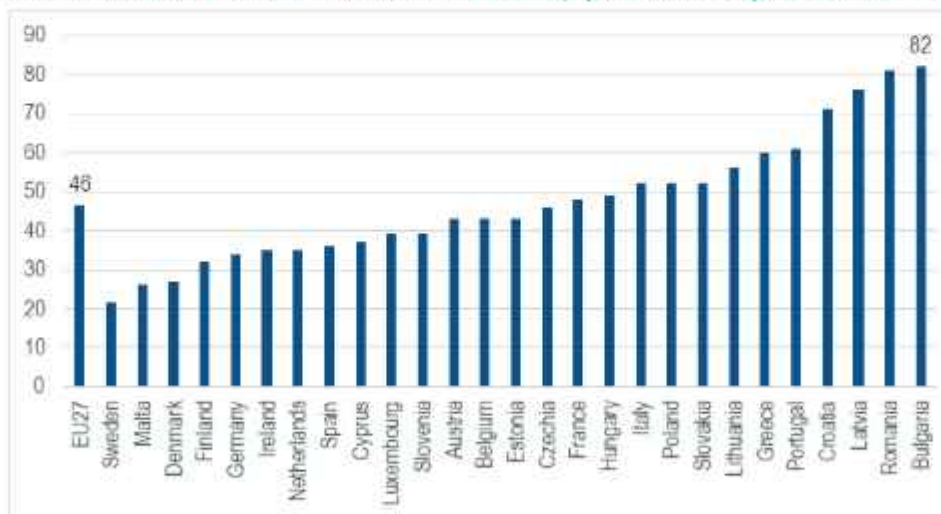
*Source: State Agency Road Safety, Report on the state of road safety in the Republic of Bulgaria for 2022, Appendix 2.1.*

### 2.3. Road Safety

It is the quality of infrastructure that is considered as one of the main reasons for road accidents. Thus, the above-mentioned deficiencies in road surface and the corresponding road features play a significant role in the number of road fatalities that occur in Bulgaria. With 82 died in road accidents per million inhabitants, the country takes the first place in the European Union in 2023 (Figure 4). For comparison the average for the EU is 46, while neighbouring EU countries in the region show rather a diversified performance with Greece reporting 60 road fatalities and Romania - 81. What is more, Bulgaria performs worse compared to the EU average when the rate of fatalities per 10,000 registered vehicles is considered – as shown below, the average number of passenger cars per in Bulgaria is still far from the EU average.

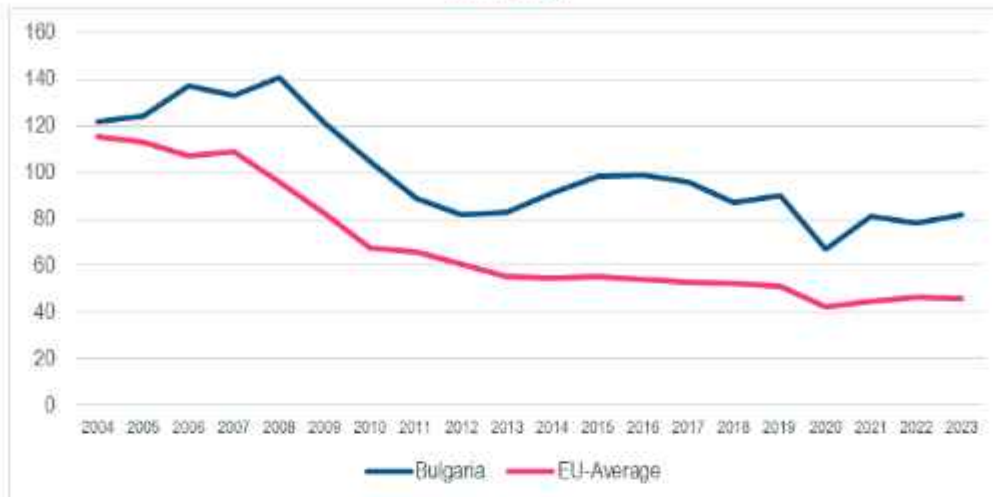
A positive trend, though, is that both the absolute number of road fatalities and the corresponding number of fatalities per million inhabitants in Bulgaria are on the decrease in the last almost two decades (Figure 5). However, the pace of decrease should be accelerated in the future and the sporadic fluctuations in the direction of the tendency are to be minimised.

Figure 4: Number of people died in road accidents per million inhabitants in EU member states, preliminary data for 2023



Source: Eurostat

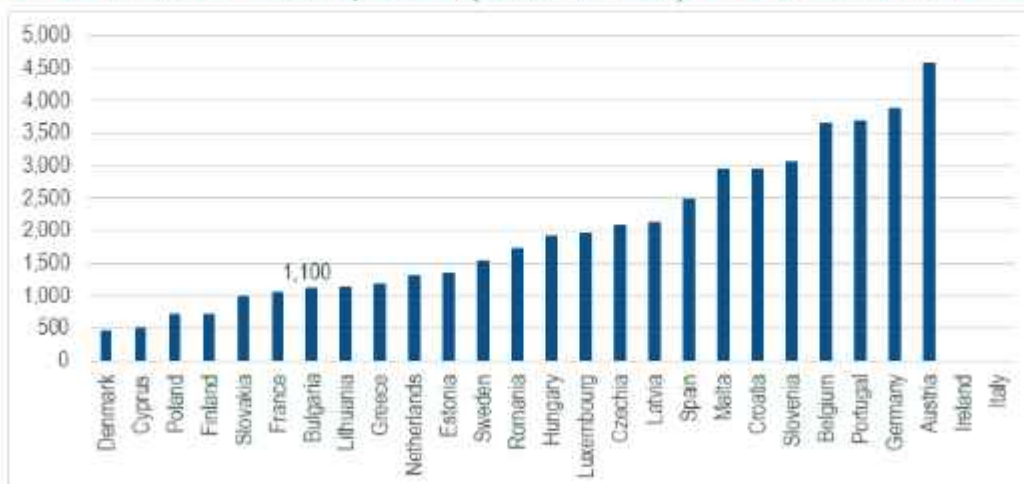
Figure 5: Long-term trend in the number of people died in road accidents per million inhabitants in Bulgaria and on average in the EU, 2004-2023 (data for 2023 are preliminary)



Source: Eurostat

In contrast to the comparatively high number of people who died as a follow up on road accidents, which places Bulgaria among the worst performing EU members, in terms of number of people injured in road accidents per million inhabitants (1100), the country scores well below the EU average (1959) – Figure 6 and 7.<sup>126</sup> The historic overview reveals an overall decrease, yet not as steep as the trend in the EU. When looking at data for 2020 and 2021 alone, however, one should take into account the COVID-19 imposed travel restrictions that affected negatively traffic volumes especially in 2020.

Figure 6: Number of people injured in road accidents per million inhabitants in EU member states, 2021 (data for Italy and Ireland not available)

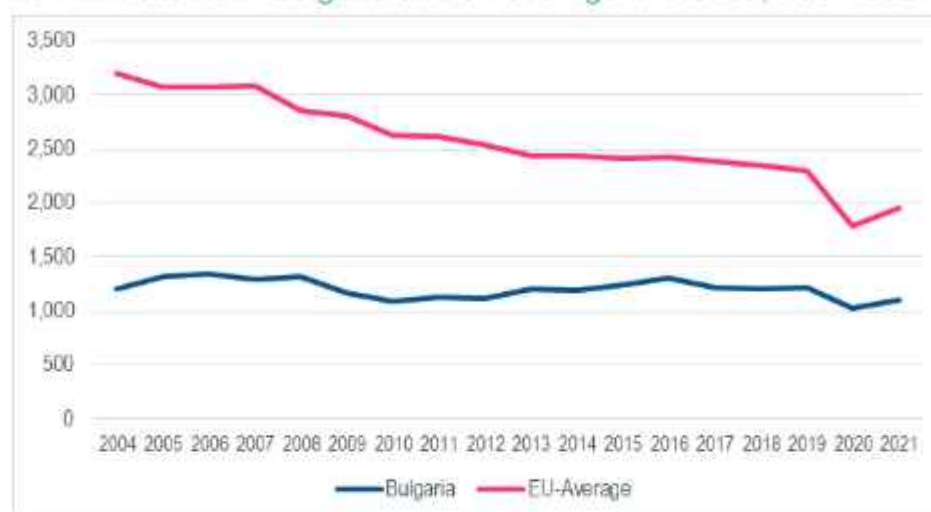


Source: Eurostat

<sup>126</sup> The latest available data is for 2021



Figure 7: Long-term trends in the number of people injured in road accidents per million inhabitants in Bulgaria and on average in the EU, 2004-2021



Source: Eurostat

The breakdown on NUT 2-regions reveals a particularly diverging picture according to 2021 data. Despite the fact that the South-West region is the most populated one in the country, the number of people who died in road accidents per 1 ml. inhabitants (75) and of the injured people (705) are below the national average, which is 81 and 1100 for 2021, respectively. On the contrary, the least populated of North-West Bulgaria registers the highest numbers – 113 and 1523. As the second worst performing NUT 2 region in Bulgaria in both categories ranks the North Central one.

Data on the road accidents by type of the road show that the majority of road fatalities in Bulgaria occurred on rural roads (57%) compared to 53% in the EU on average. The percentage of fatalities that occurred on urban roads in Bulgaria (29%) is lower than the EU average (39%). Over the period between 2012 and 2021, the number of fatalities and serious injuries decreased on all road types in Bulgaria except for motorways, which is considered mostly due to the significant increase in motorways in Bulgaria in 2012-2021 and the increase of traffic on motorways.<sup>127</sup>

### 2.4. Number of Vehicles

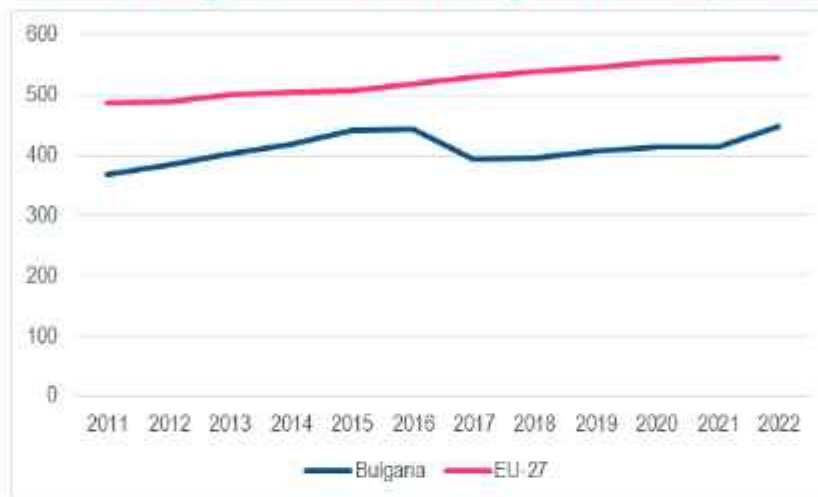
In 2022, the average number of passenger cars per 1 000 inhabitants in Bulgaria was 449 compared to 560 in the EU on average.<sup>128</sup> Compared to 2018 an increase of 13.4% is witnessed, while for the EU it was under 4.5%, which is due to the comparatively low base in Eastern Europe in general (Figure 8). An observation of this short-term dynamics confirms

<sup>127</sup> European Commission, European Road Safety Observatory

<sup>128</sup> Eurostat

the lower pace of road network development that fails to meet the speed of motorisation rate of passenger cars – the overall length of the road network in the country increased by 0.33% in 2022 on 2018, motorways alone by almost 9%, which is still below the above-mentioned growth of the number of passenger cars per 1 000 inhabitants of 13.4%. What is more, in 2003 the number of cars per 1 000 inhabitants stood at 298, thus the growth in two decades totals more than 50%, while the overall network length increased in this period by merely 3.5%.

*Figure 8: Long-term trends in the number of passenger cars per 1 000 inhabitants in Bulgaria and on average in the EU, 2011-2022*



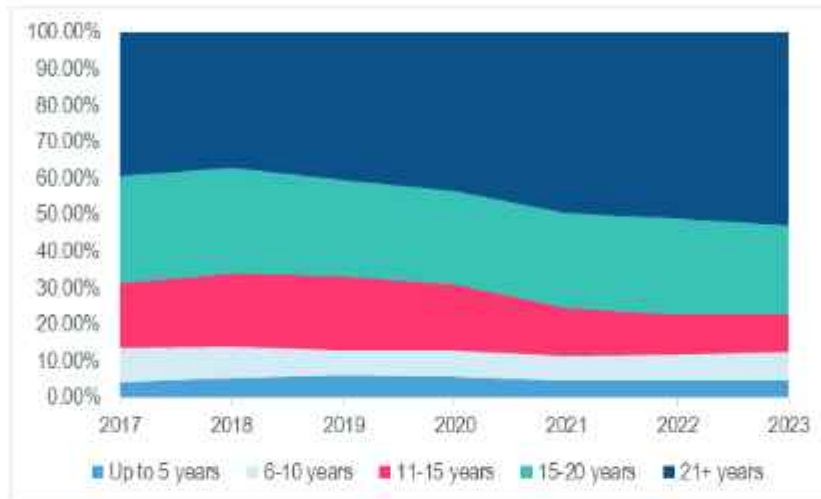
Source: Eurostat

According to the latest data by the Ministry of Interior of the Republic of Bulgaria, in 2023 the absolute number of passenger cars in Bulgaria was 3 006 214 that accounts for nearly 75% of all registered road vehicles in the country. Of all passenger cars, diesel cars continue to dominate, reaching a record of 1 456 845, while petrol cars were 1 071 600. The trend shows that since 2020 the number of diesel vehicles continuously overtakes the one of petrol ones. At the same time, hybrid and electric cars are on a steady increase. On an annual basis hybrids increased by almost 52% (to 39 574) and electric vehicles by 82% (11 472). Nevertheless, as of the end of 2023 they constitute 1.35% and 0.38% of all registered passenger cars, respectively.

In terms of age, the total stock is dominated by vehicles that are over 20 years old, which make up more than 53% of all 4 mln registered road vehicles. They account for 2.1 mln, while those of up to five years of age are 190 797 or 4.7%. Statistical data for 2017-2023 show a clear tendency of an overall ageing of the road fleet in the country (Figure 9). The share of 21+

years old vehicles grew from 40% in 2017 to 53% in 2023, which happened at the expense of the three preceding age groups (15-20 years, 11-15 and 6-10 years old ones), while the share of the vehicles at the age of up to 5 years remains relatively constant. New registrations in 2023 alone were still dominated by cars 10 years and older with a total number, which was three times higher than cars that are less than 6 months old.

*Figure 9: Age composition of registered road vehicles in Bulgaria, 2017-2023*



*Source: Ministry of Interior of the Republic of Bulgaria*

### 2.5. Tolling Service

The present system of road taxation is based on reform recommendations provided by the the World Bank within a tailor-made report that was prepared in 2015. The implementation of the first part of the reform, the introduction of an electronic vignette for passenger cars, took place four years later, while the toll collection system for vehicles over 3.5 tonnes was launched after several delays in 2020. The price of e-vignettes depends on the duration of the respective vignette (weekend, weekly, monthly, three-month, annual), whereas the tolls for heavy vehicles are paid for the distance travelled. In general, the electronic vignette for cars is required on roads beyond urban areas, while the toll system for heavy vehicles covers app. 6100 km of the national road network - 2322 km of first category roads, 2932 km of second category ones as well as all motorways.

The initially envisaged revenues from the operation of the entire system were app. EUR 500 mln per year. This target in 2020 and partially in 2021 was not met mainly due to the spread of the COVID-19 pandemic and the corresponding decline in economic activity. However, the road taxation system continued to under-perform in 2022 and 2023. In 2023 alone, the rev-

venues reached EUR 413 mln – EUR 258 mln came from the toll taxes, EUR 138 mln from e-vignettes and the rest from compensation fees and fines.

Data from the Road Infrastructure Agency (RIA) that is responsible for the operation of the tolling system, reveal that tolls were paid for vehicles over 3.5 tonnes that used to travel mostly on motorways. The most preferred routes were from Sofia to the BCCP Kulata/border with Greece on the Struma Motorway, from the capital to BCCP Kapitan Andreevo/border with Türkiye on the Trakia Motorway and from Ruse/BCCP Ruse, border with Romania over the Maritsa Motorway to BCCP Kapitan Andreevo/border with Türkiye.

### **3. Review of Strategic National Documents Related to Road Infrastructure and Connectivity**

Road infrastructure and connectivity in the field of road transportation are included in a number of strategic national documents, the majority of which fit in the domains of transport and regional development. However, first and foremost, they are addressed by the National Development Programme BULGARIA 2030 (adopted in December 2020) – a strategic framework document of the highest order in the hierarchy of national programming documents, determining the vision and general goals of the development policies in all sectors of general government, including their territorial dimensions. The document sets out three strategic goals with a 2030 horizon – accelerated economic development, demographic upswing as well as reduction of inequalities. For the implementation of these goals the document groups the government intentions into five areas (axes) of development – 1) Innovative and Intelligent Bulgaria; 2) Green and Sustainable Bulgaria; 3) Connected and Integrated Bulgaria; 4) Responsive and Just Bulgaria and 5) Spirited and Vital Bulgaria. These five areas are decomposed in 13 national priorities, number seven of which is entitled to 'Transport connectivity', which fits under the 'Connected and Integrated Bulgaria' axis. This priority focuses on rail and road transport as well as on water and air transport.

The road transport sub-priority puts an emphasis on channeling efforts for the improvement of the quality of the country's road infrastructure, as well as on further providing more efficient transport services with the aim of effectively integrating the national transport network into the European transport network of timely constructing the Trans-European Road Network on the territory of Bulgaria. The performance indicators to be monitored are the quality of roads – to reach the EU average by 2030, and the share of

motorways in the total road network – to reach 7% by the end of the decade (value of 3,8% in 2019, 4,1% in 2022).

The specified areas of impact under the road transport sub-priority include road infrastructure, traffic safety and intelligent transport systems (Table 5). The first area sees a continuation of the construction of the Trans-European Transport Infrastructure, with a focus on the completion of the motorway connections in Northern Bulgaria, with a view to increasing road safety in this part of the country and providing conditions for the passage of traffic along the direction Sofia-Varna and North-South along the directions Danube Bridge 1-Ruse-Veliko Tarnovo-tunnel under Shipka-Southern Bulgaria and Danube Bridge 2-Vidin-Sofia-Southern Bulgaria, as well as Varna-Burgas. An opportunity will also be sought for the construction of a third bridge over the Danube river. Efforts will continue to improve the quality of the network by effectively maintaining the roads in the republican road network.

In the field of road safety, efforts will focus on achieving safe universal mobility that integrates vital knowledge and skills to protect human life and health when interacting with the road system, does not create preconditions for traffic risk situations, minimises human errors on the road and mitigates their consequences. Full integration of road safety in the management of road infrastructure will contribute to limiting the negative effects of the transport sector, effective development of human error-tolerant republican road infrastructure, ensuring universal mobility in the "safe system" approach, including the implementation of measures for securing sections with concentration of road accidents and roadside space, update of the current organization of priority traffic to motorways, construction of complex parking lots and buffer parking lots near border crossing points, increase of border crossing capacity of the border Control posts etc.

In light of the intelligent transport systems efforts will focus on upgrading the road infrastructure by deploying and integrating smart transport systems and providing coverage with Wi-Fi connectivity. To a large extent, smart transport systems will be deployed to serve traffic along the main transit routes. Work will also be actively undertaken on the establishment of single platforms providing real-time traffic information services, safe and secure parking places, multi-modal transport, etc., as well as on the introduction of electronic communication in freight transport. Efforts will also be focused on building smart transport systems on sections of republican roads that are outside the Trans-European Road Network, with the aim of increasing traffic safety and timely signalling of road conditions to drivers.

*Table 5: Road infrastructure and connectivity as part of the National Development Programme BULGARIA 2030*

Areas of impact	Relevant UN Sustainable Development Goals	Assessment of the financial resources required	Sources of financing
<b>Road infrastructure</b>	Goal 3 Good health and well-being Goal 9 Industry, innovation and infrastructure	EUR	State budget
	Goal 11 Sustainable cities - Sub-goal 11.2	2 351 000 000	European funds and instruments
<b>Traffic safety</b>	Goal 3 Good health and well-being - Sub-goal 3.6	EUR	State budget
	Goal 11 Sustainable cities - Sub-goal 11.2	1 790 000 000	European funds and instruments
<b>Intelligent transport systems</b>	Goal 9 Industry, innovation and infrastructure	EUR	State budget
	Goal 11 Sustainable cities - Sub-goal 11.2	41 000 000	European funds and instruments

*Source: National Development Programme BULGARIA 2030*

Another flagship document with focus on transport connectivity is Bulgaria's Recovery and Resilience Plan (RRP) with a horizon up to 2026 that was prepared within the Recovery and Resilience Facility (RRF) - a temporary instrument on an EU level that has been the centerpiece of NextGenerationEU - the EU's plan to emerge stronger and more resilient from the COVID-19 crisis. The plan is structured in four pillars and the receptive component on transport connectivity is part of the third one - Connected Bulgaria. According to the RRP, the carbon intensity of the transport sector in the country is 3.5 times higher than the EU average, reaching 2.8 kg of greenhouse gases (GHG) per EUR 1 gross value added in 2019. The sector is a major GHG emitter with 26% of total GHG quantity. Therefore, in the context of the decarbonization efforts, the plan sees it necessary to intensify investments in sustainable transport aiming at reducing the sector's carbon footprint. In order to achieve this, the majority of its reforms and investments in the transportation field are concentrated in the sphere of rail transport. Nevertheless, road transportation firstly comes also in the spotlight thanks to measures in a form of reforms and investments for improving road safety. The specific objective is to reduce the risk of road accidents and injuries through targeted impact on key road safety management processes. Measures will be taken to optimize the activities on safety management of the national and municipal roads, development and integration of software applications for management and prioritization of road activities to ensure road safety, on establishment of national electronic system for submitting and processing signals related to road infrastructure safety, and on procurement of equipment for current

repair and maintenance of the national roads. Specialized equipment will be provided to assess road safety during road inspections, including inspections of sites close to the road, in order to establish specific design characteristics, performance of the road surface and its functional condition. The traffic conditions in the area of border checkpoints are planned to be improved by introducing a system that manages the cross-border traffic of heavy goods vehicles through a specialized mobile application intended for road users. The total planned funding is EUR 6 mln.

Further on, Bulgaria's RRP includes reforms in the field of electric mobility that will seek to accelerate the construction of charging infrastructure and electrification of vehicles. First of all, the reform aims to overcome the challenges with the missing infrastructure, as well as to unlock, through reasonable information and educational work, the promotion of electric mobility in Bulgaria and through it to increase the number of purchased electric vehicles to 30,000 purchased new and imported "second hand" electric cars and plug-in hybrids by mid-2026

The reform aims to stimulate the construction of charging infrastructure, leading to the construction of at least 10,000 public charging points for electric vehicles located on the intercity road network, in the central parts of the 50 main Bulgarian cities and in the apartment areas of these cities. The indicator includes at least 30 fast charging stations located in TEN-T highway centers at 1-2 MW DC and at least at least 325 fast charging stations - with a minimum power of 50 kW - built in the intercity road network and cities.

The sectoral documents on road infrastructure and road connectivity are concentrated in the domains of transport and regional development. The former include the Integrated Transport Strategy 2030; National Strategy for Road Safety in the Republic of Bulgaria 2021-2030; Concept for road safety training and National Plan for the Development of Combined Transport in the Republic of Bulgaria until 2030. Guiding documents that are in the field of regional development but have a relation to road infrastructure and road connectivity are the National Spatial Development Concept for the Period 2013-2025 as well as six Integrated Territorial Development Strategies that are valid till 2029 for each of the six NUT-2 regions in Bulgaria. There is also one strategic document that directly refers to road transportation – the National Ambient Air Quality Improvement Programme (2018 - 2024).

Last but not least, to be mentioned here is also the Governance Programme of the Republic of Bulgaria for the period June 2023-December 2024. Among other things it features plans for an active policy for good neighbourly re-

lations, regional security and cooperation. More specifically, the Governance Programme says that Bulgaria will continue to focus on key infrastructure projects, implemented jointly with Romania and Greece, which respond to EU sectoral policies in areas such as energy, transport, ecology, digitisation. The programme also features plans for an active participation in regional cooperation mechanisms to create cross-border connectivity, infrastructure and other joint projects. With the programme, the government confirmed the commitment to build a third bridge on the Danube at Ruse - Giurgiu and to preliminary studies for four more bridges. The Governance Programme of the Republic of Bulgaria seeks to strengthen strategic planning processes in regards to road infrastructure, which also includes a start of the elaboration of a new Strategy for the Development of Bulgaria's Road Infrastructure until 2030.

### **4. Cross-Border Connectivity**

#### **4.1. Pan-European Corridors**

What is featured in the first slides of literally each and every presentation about investment opportunities in Bulgaria is the geographical location of Bulgaria and more precisely the fact that half of the ten Pan-European corridors cross its territory (Figure 10). Indeed the talk is about the five Pan-European corridors IV, VIII, VIII, IX and X that connect Europe with the Middle East and Asia. A direct linkage to road connectivity have all of the above-mentioned except for Pan-European corridor VII, which is entirely along the Danube River and stretches from Rotterdam to the Black Sea and connects the Rhine and the Main rivers through the Rhine-Main-Danube Canal with the Danube.



Figure 10: Pan-European Corridors that cross Bulgaria



Source: [www.industrial-zones.com](http://www.industrial-zones.com)

The Corridor IV follows the route Dresden / Nuremberg – Prague – Vienna – Bratislava – Győr – Budapest – Arad – 1) Bucharest – Constanța / Craiova – 2.1.) Sofia – Pernik –Thessaloniki and 2.2.) Sofia – Plovdiv – Istanbul. This corridor is the shortest land connection between Greece and Central Europe completely on EU territory. It bypasses the countries of former Yugoslavia and the former Brotherhood and Unity Highway, which is part of Pan-European Corridor X. The Corridor IV enters Bulgaria in the North through the Vidin-Calafat bridge across Danube river, which is one of the two bridges connecting Romania and Bulgaria. From Vidin to Botevgrad the route goes over a first category road that is undergoing a gradual upgrade to an expressway. From Botevgrad to Sofia the corridor overlaps with the existing 'Hemus' motorway. From Sofia to the BCCP Kulata/border with Greece the corridor covers the not fully completed 'Struma' motorway. From Sofia to Istanbul Corridor IV goes over 'Trakia' and 'Maritsa' motorways that bring the route to the border with Türkiye via the BCCP Kapitan Andreevo.

The Corridor VIII comprises both road and rail routes. Both start on the Adriatic coast in Italy at Bari or Brindisi, with a ferry crossing to Durrës in Albania. From there the routes cross the southern Balkans into Bulgaria and thence to Varna, on the Bulgarian Black Seacoast. The road corridor follows the route Tirana/Durrës/Vlorë – Elbasan –Skopje – Pernik – Sofia – Plovdiv – Burgas – Varna. The corridor enters Bulgaria via the BCCP Gyueshevo and covers a 2-lanes single-carriageway that connects Kumanovo in Northern Macedonia with Radomir in Bulgaria. From Radomir to Pernik it is upgraded

to a 4-lane dual-carriageway. Close to Pernik, the route joins 'Struma' motorway for about 20 km to Sofia. After passing through the Sofia Ring Road, the route joins 'Trakia' motorway for 360 km to Burgas on the Black Sea coast bypassing Pazardzhik, Plovdiv, Stara Zagora and Yambol on the way. At Burgas, the route turns to the north, running along the Black Sea coast mainly as a single-carriage road). The route joins the 'Cherno More' motorway 8 km before reaching its final destination – Varna, also on the Black Sea coast.

The Corridor IX between Helsinki in Finland and Alexandroupolis in Greece. On Bulgarian territory it follows the route Ruse – Stara Zagora – Dimitrovgrad. In Northern Bulgaria the corridor is expected to use not yet constructed 'Veliko Tarnovo-Ruse' motorway. Then the route goes over the Stara Planina mountain range and will be in the future substituted by the to be built 'Shipka' tunnel. From Stara Zagora to the Greek Border it is a 2-lanes single-carriageway that crosses the 'Trakia' and 'Maritsa' motorways. The Corridor X stretches between Salzburg in Austria and Thessaloniki in Greece. It has four branches marked with Xa, Xb, Xc, and Xd. Branch C or Corridor Xc runs from Niš – Sofia – Plovdiv – Dimitrovgrad – Istanbul via Corridor IV. In Bulgaria, Corridor Xc connects Sofia with BCCP Kalotina/border with Serbia through the not yet fully built 'Europe' highway. From Sofia the route continues to Istanbul via 'Trakia' and 'Maritsa' motorways thus covering the final part of Corridor IV. As road statistics show, on the territory of Bulgaria the busiest corridors are Corridor Xc to Sofia, and from there Corridor IV to Greece and Türkiye.

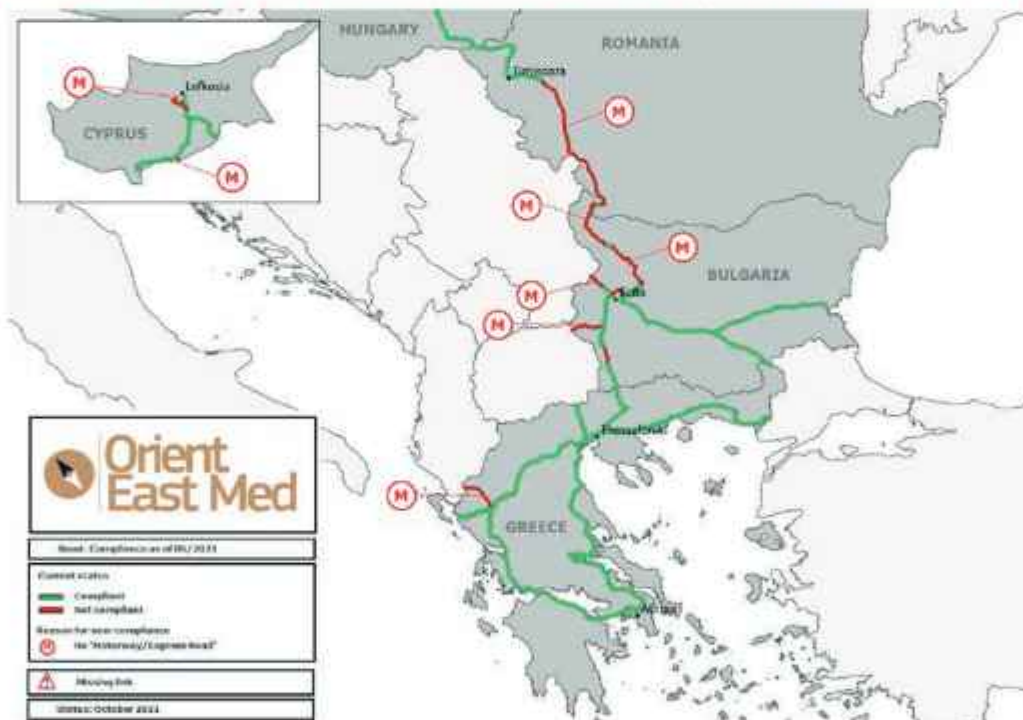
### 4.2. TEN-T Network

Pan-European corridors, which were firstly defined in 1994 and edited in 1997, cover vast territories in all countries in Central and Eastern Europe. On the level of an EU member state, it is the Trans-European Transport Network (TEN-T) that creates an EU-wide network of rail, inland waterways, short sea shipping routes, and roads. The inclusion of national projects into the network serves as a major precondition for mobilising financial funds for EU infrastructure, such as from the Connecting Europe Facility, European Investment Bank and private loans. In comparison, the Pan-European corridors are not eligible for benefiting from a single source of funding and their exploitation and development is mainly in the capacity of the respective countries.

Out of all nine European transport corridors embedded in the Trans-European Transport Network there are two core network corridors that cross the country – the Rhine-Danube Corridor and the Orient/East-Med Corridor (OEM). While the former has no direct road linkage, the latter, the OEM, is pivotal for increasing regional road connectivity with the participation of Bulgaria.

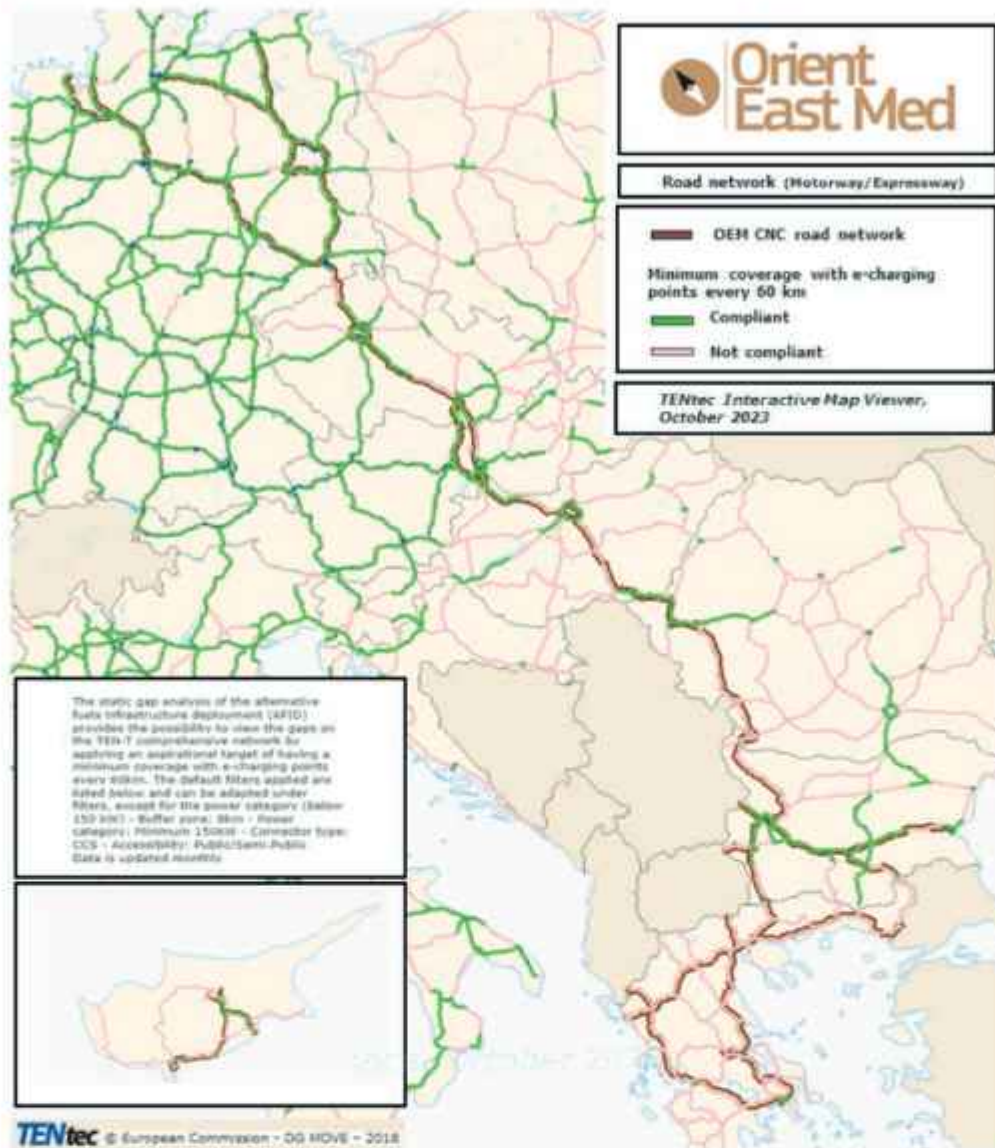
However, as the latest Orient - East Med TEN-T Corridor Final report from 27 November 2023 finds out, non-compliant sections with regard to motorway/express road standards are located predominantly in Bulgaria (and Romania) (Figure 10). These two OEM countries together with Greece lack certain Electric Charging supply infrastructure. (Figure 11). What is more, the report comes up with the finding that Intelligent Transport Systems (ITS) for road traffic and interface with other modes of transport deployed along the entire Corridor provide relatively limited real-time traffic and weather information. Furtheron, a clear lack of Safe and Secure Truck Parking Areas (SSTPA) along the entire OEM Corridor is identified. Last but not least, the report concludes by highlighting the poor prospect of rail-road terminals for developing a modern and robust network of freight terminals that facilitate modal shift from road in the southern part of the Corridor that includes Bulgaria as well. As a result, what is specific for this part of the corridor, and for Bulgaria too, is that urban nodes miss seamless connection between long-distance TEN-T infrastructure and access points for last-mile connections.

Figure 11: OEM Southern road network – Compliance December 2021



Source: Orient - East Med TEN-T Corridor Final report, 27 November 2023

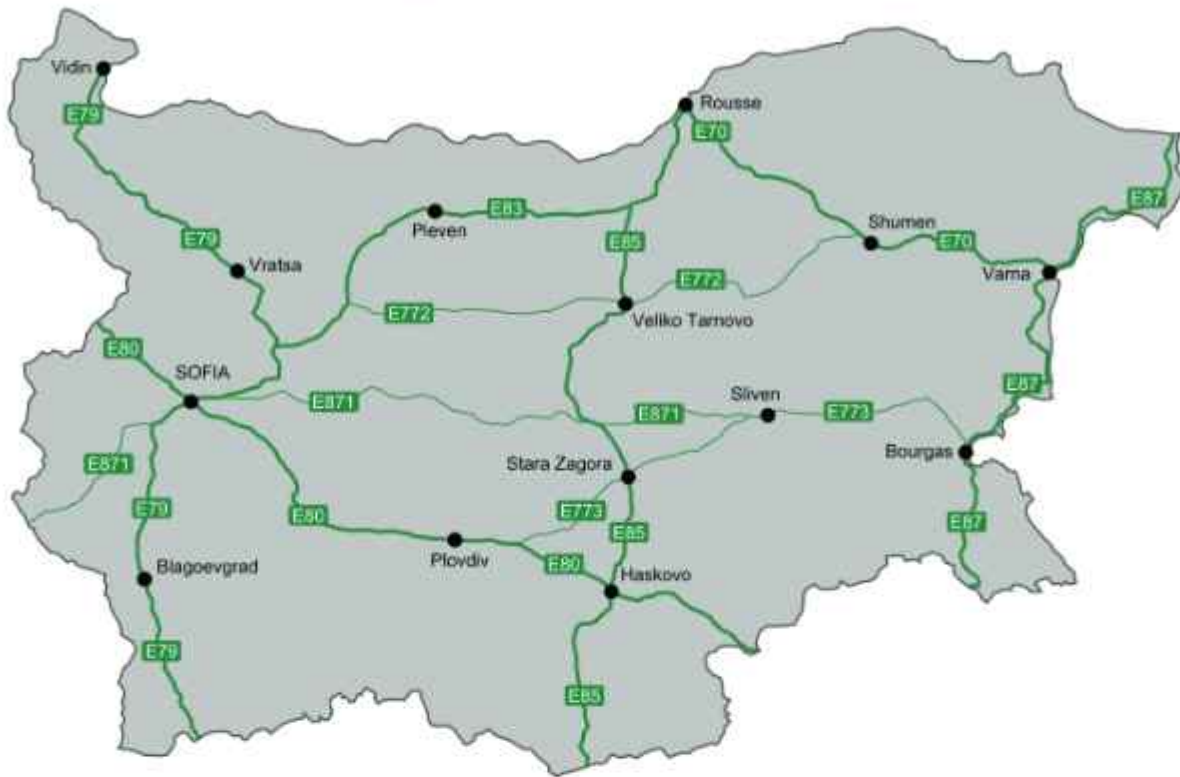
Figure 12: OEM road network – E-mobility charging supply compliance



Source: Orient - East Med TEN-T Corridor Final report, 27 November 2023

There are nine roads crossing or entering Bulgaria that are part of the international E-road network. The so called e-roads in the country have a total length of 2 904 km, are in general well signposted and have the following numbers: E70, E79, E80, E83, E85, E87, E772, E773 and E871. As it can be seen, sometimes e-roads in Bulgaria follow other routes that are different from the existing or future motorways (Figure 13).

Figure 13: E-road network



Source: Wikipedia<sup>129</sup>

### 4.3. Cross-border Check Points

For many decades Bulgaria was lagging behind if road connectivity to its neighbouring countries is considered. The most obvious manifestation of this was the limited availability of border crossings, especially during socialist times. However, in the early 2000s connectivity between Bulgaria and its neighbouring countries started to significantly improve. Most notably this has been linked to the country's EU accession in 2007, which enhanced connectivity between Bulgaria and its neighbouring countries that are EU members, Romania and Greece. 2017 and 2018 witnessed the inauguration of 2 new border control checkpoints on the land border between Bulgaria and Romania, while 4 border crossings between Bulgaria and Greece were put into operation between 2005 and 2013. The opening of one more checkpoint (Rudozem-Xanthi) is still pending - Bulgaria fulfilled its commitments as early as 2022, and on the Greek side, the 8-km section to the border has not been completed. In fact, this border post is about to become redundant when Bulgaria enters Schengen. Last but not least, the importance of the country as an external border of the EU grew consecutively and led to the opening of 1 more border crossing with Türkiye in 2005 and the continuous upgrade of the remaining 2 border checkpoints.

<sup>129</sup> [https://it.wikipedia.org/wiki/Autostrade\\_in\\_Bulgaria#/media/File:E-road\\_BG.png](https://it.wikipedia.org/wiki/Autostrade_in_Bulgaria#/media/File:E-road_BG.png)

As a result of the above-mentioned dynamics in 'opening' the country to the region, as of Q1 2024 there are 26 crossings between Bulgaria and its neighbouring countries that allow for transportation of passengers and freights over roads, bridges and/or ferries. In fact, the number of border control checkpoints is higher if river and sea ports as well as airports are considered. Out of these 26 border crossings, 9 are located on the border between Bulgaria and Romania, which has the biggest overall length of 609 km, of which 23% or 139 km are a land border. The second longest border is with Greece and the majority of it is a land one. This border is equipped with 6 border control checkpoints – a number that tripled in less than 8 years. The third and fourth longest borders of Bulgaria are with Serbia (5 crossings) and Türkiye (3 crossings). The shortest border, which is entirely a land border, is the one with North Macedonia that has 3 existing border control checkpoints (Table 6). In fact, the penetration of border crossings is the highest on the border between Bulgaria and North Macedonia and even surpasses the border with Romania, where the highest absolute number is compensated by the by far longest border. (Table 7).

*Table 6: Main characteristics of Bulgarian borders and border control checkpoints<sup>130</sup>*

Neighboring country	Total border length (km)	Land border (km)	River border (km)	Sea border (km)	Number of existing BCCP
Romania/to the North	609	139	470	-	9
Black Sea/to the East	378	-	-	378	-
Türkiye/to the South	259	133	126	-	3
Greece/to the South	493	429	64	-	6
North Macedonia/to the West	165	165	-	-	3
Serbia/to the West	341	315	26	-	5
<b>Total</b>	<b>2245</b>	<b>1181</b>	<b>686</b>	<b>378</b>	<b>26</b>

*Source: Geography of Bulgaria. Physical and socio-economic geography, FORCOM, 2002; Ministry of Interior of the Republic of Bulgaria*

*Table 7: Average length between two border checkpoints on the Bulgarian border with the respective neighbouring country*

Neighbouring country	Romania	Türkiye	Greece	North Macedonia	Serbia
<b>Length, km</b>	67,7	86,3	82,2	55,0	68,2

*Source: Own calculations; Geography of Bulgaria. Physical and socio-economic geography, FORCOM, 2002; Ministry of Interior of the Republic of Bulgaria*

<sup>130</sup> The listing includes border control checkpoints that include road connectivity including border bridges and ferry connections for passenger cars and trucks

In recent years, the country’s border crossings have to process a constantly increasing passenger and freight traffic, which results from the rebound of tourism and trade as a follow-up on the post COVID-19 recovery as well as from Russia’s war in Ukraine. The latter leads to re-routing of transport streams in the wider Black Sea region and changes in the transportation means in favour of road transportation, which is comparatively more adaptable to force majeure and/or rapid market changes.

The growing workload of border control checkpoints is evident from the number of processed freight vehicles at Bulgarian borders (to be differentiated from the number of vehicles that passed the borders without being processed, which is the case with BCCPs like the Vidin – Calafat one/Danube bridge 2). In 2023 alone 4.7 mln trucks were processed by the Bulgarian Customs Agency, which is an annual increase of almost 3% that followed another yearly growth of 9% in 2022. The top ten busiest border crossings accounted for 91% of all processed freight vehicles, while the remaining 16 had a share of only 9% in 2023. (Table 8). The busiest border crossing point is Kapitan Andreevo – Kapikule, where 22% of all trucks crossing Bulgaria are handled. The second busiest BCCP is Ruse – Giurgiu (Danube bridge 1) with a share of 20% of all trucks. While the workload in the case of the former is linked to processing freight vehicles inbound from Türkiye, the latter is to trucks outbound to Central and Eastern Europe. For the outbound freight traffic to Western Europe major crossings are Kalotina – Gradina on the border with Serbia and Vidin – Calafat (Danube bridge 2) on the border with Romania.

*Table 8: Main border control checkpoints by number of processed freight vehicles, 2023*

<b>BCCP</b>	<b>Neighboring country</b>	<b>Trucks (number)</b>
Kapitan Andreevo – Kapikule	Türkiye	1 037 632
Ruse – Giurgiu (Danube bridge 1)	Romania	954 082
Kulata – Promachonas	Greece	668 338
Kalotina – Gradina	Serbia	496 322
Lesovo – Hamzabeyli	Türkiye	485 234
Vidin – Calafat (Danube bridge 2)	Romania	259 642
Gyueshevo – Deve Bair	North Macedonia	109 674
Oryahovo – Bechet (ferry)	Romania	103 039
Kardam – Negru Voda	Romania	98 581
Kapitan Petko Voyvoda – Ormenio	Greece	78 572

*Source: National Customs Agency of the Republic of Bulgaria*

## 5. Summary and Outlooks for Major Road Infrastructure Projects

According to the government's vision for development of road infrastructure, by 2040 the ring of motorways and the corresponding branches of expressways should be fully operational. What is more, this vision goes hand in hand with the development of several large-scale tunnel and bridge projects that will contribute to enhancing internal connectivity but also connectivity to neighbouring countries.

As per interactive data provided by the Ministry of Regional Development and Public Works, the construction of major road infrastructure projects is divided in three groups depending on the time horizon for implementation – projects to be implemented in 2022-2025; in 2026-2030 and strategic projects in preparation for feasibility study phase and scheduled implementation in 2030-2040.

As shown on Figure 13, existing road connections are marked in blue – the fully built 'Trakia' and 'Maritsa' motorways as well as operational sections of 'Hemus', 'Cherno More', 'Struma', and 'Europe' motorways. Red is the color of ongoing projects with scheduled completion by 2025 like remaining sections of 'Hemus', 'Struma' and 'Europe' motorways as well as two sections of the expressway 'Vidin - Vratsa'. Green is the marking of projects that are to be implemented in 2026-2030 such as 1) the section between the towns of Montana and Vratsa as part of the 'Vidin - Vratsa'; 2) the 'Ruse - Veliko Tarnovo' motorway; 3) completion of the 'Hemus' motorway; 4) the remaining part of the 'Cherno More' motorway; 5) the Gabrovo-Stara Zagora and Stara Zagora-Haskovo road sections; 6) the Krupnik-Kresna section of the 'Struma' motorway and 7) the road between Dupnitsa and the Gyueshevo border crossing with North Macedonia. Last but not least, projects that are scheduled for 2030-2040 are marked in orange – 1) an express way from Sofia to Botevgrad (on the way to the second Danube bridge by Vidin), which includes also the construction of the Petrohan tunnel; 2) an expressway between Varna and the Durnakulak border crossing with Romania; 3) an expressway between Yambol and the Lessovo border crossing with Türkiye; 4) an expressway between Haskovo and the Makaza border crossing with Greece as well as 5) 'Rila' motorway that is to connect 'Trakia' and 'Hemus' motorways with the 'Struma' motorway, thus surpassing Sofia and facilitating transportation links between neighbouring countries on the territory of Bulgaria.



Figure 13: Development of the road infrastructure of the Republic of Bulgaria in the period up to 2040



Source: Ministry of Regional Development and Public Works

This projected development is to build upon the existing infrastructure of motorways with a total length of 855,5 km as of Q1 2024 (Figure 14), which accounts for 63.3% of their projected scope. As indicated in Table 4, another 76,5 km of motorways or 5.7% are under active construction, while 419 km (31%) are in one or another pre-construction phase (feasibility studies, project design, land expropriation, permitting, etc.) or await funding before the start of any of these procedures. If completed according to the announced schedules, which is, though, less likely based on previous track record, the total length of motorways by 2030 is to reach 1353 km. However, one should admit the recent efforts in motorways' development that register a 7,7% increase in 2023 on 2019 or almost a 40% growth within a decade.

Figure 14: Dynamics in the construction of motorways (2000-2023)



Source: National Statistical Institute, Own estimations

Road infrastructure development in the country is to a large extent reliant on EU funding (and the corresponding national co-financing) and to a lesser extent on national funding only. International financial institutions play little to no role in the implementation of large-scale projects in recent years, the same is valid for third-countries' funding in form of loans or credit lines as well as public private partnerships with companies. In fact, in the past there were very preliminary bilateral discussions and vague proposals for instance for loans from countries like Qatar ('Cherno More' motorway) and public private partnerships with a Chinese company ('Ruse - Veliko Tarnovo' motorway and 'Shipka' tunnel), which never advanced beyond the headlines in the news.

What hampers road construction is the fact that not all road construction projects are eligible for EU funds since in general they either do not have a European added value or have been excluded from EU funding due to significant delays in implementation or violations against EU-related rules. For instance, an important precondition for the use of EU funding for construction road projects is linked to obeying good governance and environmental standards, which is the case of 'Struma' motorway from Sofia to the Kulata border crossing with Greece. It experienced several setbacks because of un-transparent contracting practices, technical bottlenecks and risks of biodiversity loss. There are ongoing construction works on its Blagoevgrad-Krupnik 15km long section (EUR 96.3 mln) with scheduled completion in 2025. This section includes a 2 km tunnel construction with two separate tunnels, each for every direction, and a 5 km of motorway, which were opened in February 2024. The Krupnik-Kresna section (Lot 3.2) is expected to be built in 2026-2030 and the latest publicly available data points at its subdivision in two lots (EUR 255 mln and EUR 243 mln, amount without VAT). In March 2024 the European Commission approved design and construction of the carriageway from Kulata to Sofia outside the Kresna Gorge, which allows for design and construction of the route in the direction of Kulata - Sofia along the eastern slope of the Kresna Gorge to start. At the same time, a pre-investment study for a new Sofia-Kulata route outside the Kresna Gorge is to be commissioned.

Another important road connectivity project in South West Bulgaria is the 'Europe' highway between Sofia and the border with Serbia (total length of nearly 50 km are divided into 3 sections). Construction works are ongoing on two sections, Dragoman-Kalotina (14.5 km) and Slivnitsa-Sofia (16.5 km), while the Slivnitsa-Dragoman one is already operational. The entire highway, which benefits from EU funding under the prolonged implementation of the Operational Programme 'Transport and Transport Infrastructure' 2014-2021, is to be completed in late 2024/early 2025.

EU funding from the ongoing Operational Programme 'Transport Connectivity' 2021-2027 is directed to a major project in Northern Bulgaria, which is historically underdeveloped from a road infrastructure perspective – the motorway between the towns of Ruse and Veliko Tarnovo with a length of 133 km and scheduled completion by 2028 (EUR 940 mln).

With the completion of the above-mentioned road infrastructure, there are no other road projects in the pipeline that are eligible for EU funding. One major and most recent exception is the 'Cherno More' motorway that for many years was excluded from EU funding through the operational programmes due its perceived purely national importance. Nowadays, the inclusion of Corridor VIII, a part of which is the 'Cherno More' motorway, in the Trans-European Transport Network, makes this road infrastructure project eligible for EU fundings through instruments such as the Connecting Europe Facility (CEF).

If big scale road projects that are implemented completely with national funding are considered, their construction usually exceeds previously announced schedules and is affected by fluctuations in the funding that is often affected by political factors. For example this has been the case with the construction of the 'Hemus' motorway in North Bulgaria that connects the capital Sofia with the third biggest city of Varna on the Black Sea coast. The remaining 227 km are divided into 9 sections totalling EUR 1.18b In and are in phases of project preparation, expropriation or construction:

1. sections 1, 2, 3 from Boaza to Pleven (total length of 52 km) are currently under construction and have reached different stages of preparedness - 80%, 26% and 47%, respectively. Thus, their completion is expected for 2024 and 2025.
2. sections 4, 5, 6 from Pleven to Veliko Tarnovo (total length of 82 km) need to be modified since technical audits recommended technical revisions, thus, construction works can only start on a later stage.
3. sections 7 and 8 (total length of 78km) necessitate modification of the routes due to landslides. They can be completed in 2027 at the earliest.
4. section 9 from Loznitsa to Buhovtsi (total length of 11km) is in a procedure of expropriation, no construction periods are announced.
5. Another feature of projects that are implemented solely with national funding is the lack of transparency regarding their specificities. In the case of the 200 km-long expressway between Vidin and Botevgrad, despite its overall progress, information neither on the completion date nor on the final construction costs of the entire project are available.

## 6. Summary and Outlooks for Road and Road - related Infrastructure Projects

Road connectivity bottlenecks, particularly with neighbouring countries, result from numerous reasons and/or the combination of them. For instance, geopolitical confrontation was instrumental in keeping connectivity as low as possible to Greece and Türkiye, both NATO members at times when Bulgaria was part of the Warsaw Pact. Economic reasons were also in place since the country's foreign trade and tourism flows were linked to the Soviet Union and Eastern Europe but not necessarily with its socialist neighbours. After 1989 the above-mentioned reasons started to gradually fade away and pave the way for an enhanced regional connectivity, which resulted in opening of new border checkpoints with Greece (3), Romania (2 border crossings and newly built bridge over the Danube between Vidin and Calafat) and Türkiye (1). However, the opening of new border checkpoints proved to be a comparatively easier task than building the corresponding connecting infrastructure. As a result, as of early 2024 inter-state highway connections are almost entirely absent. The only one exception for a fully built motorway connection from Bulgaria's capital to the border of a neighbouring country are the 'Trakia' and 'Maritsa', both in Southern Bulgaria, that allow for an uninterrupted motorway connection to the border with Türkiye via the Kapitan Andreevo BCCP. The three border crossings to Greece that were built between 2005 and 2013 still do not have the corresponding connecting infrastructure, while the motorway from Sofia to the Kulata – Promachonas border crossing is ready at 86% and it is less likely to be fully operational before 2030. Similarly, the app. 50 km long motorway from Sofia to Serbian border is yet to be completed, whereas the road connections to the three border crossings with North Macedonia, located in mountainous areas, are to be partially improved with the construction of a speedway to one of them (Gyueshevo) not earlier than the late 2020s.

Almost identical is the case of the cross-border connectivity with Romania – the existing two Danube bridges are practically isolated from the modern road network of the country that concentrated the development of motorways in its Southern half. What is more, the capacities of the current bridges, especially of the old one between Ruse and Giurgiu, were exceeded many years ago. This road-rail bridge was built in 1954 and since then did not see any major renovation on the Bulgarian side, while the Romanian section of the facility was repaired in 2015. At that time plans for the overhaul of the bridge on the Bulgarian part started. The real renovation is to be launched in H1 2024 once a delay of several months with securing construc-

tion supervision is resolved. During the implementation of the repair works (730 calendar days), the traffic on the Danube Bridge will not be completely stopped. The technical design provides for a major renovation of the road facility only, complete replacement of the asphalt pavement, panels, waterproofing, new safety fencing, restraint systems, signage, etc.

On another note, in September 2023, Bulgaria and Romania initiated concrete actions for the construction of a third bridge over the Danube. The two countries submitted a joint project to the European Commission, requesting a feasibility study on a second combined 'road and rail' bridge over the Danube, connecting Ruse and Giurgiu. So, the study is to assess the various routes and the points from which the bridge will start in Ruse and Giurgiu, respectively, and will support the selection of a technical solution. In January 2024, the European Commission approved funding for the feasibility study in the amount of EUR 6.9 mln, with the remaining EUR 7 mln. to be provided by both countries.

Simultaneously, there are very early-staged proposals for the construction of four more bridges between both countries over the Daube (Figure 15) – close to Oryahovo, Nikopol, Svishtov and Silistra. What is needed for these projects to happen at this point is a formal agreement between Bulgaria and Romania on exact location and obligations on project preparation, construction and maintenance, but most firstly and foremost on their financing.

*Figure 15: Development of the transport infrastructure of the Republic of Bulgaria in the period up to 2040*



*Source: Ministry of Regional Development and Public Works*

Another reason for the lack of enhanced road connectivity, particularly internally, is purely geography and relief based. Stara Planina or the Balkan Mountain range, stretching from the Black Sea in the East to the border with Serbia in the West, forms a natural divide between Northern and Southern Bulgaria. This divide can be hardly bridged by the existing road passes, some of which cannot handle the ever increasing domestic and international freight traffic, while others are chronically underserved in terms of maintenance. All this explains the construction of the three proposed tunnels under the Stara Planina (Figure 15). The most advanced of them is the 'Shipka' project with 10.5 km of roads and 5 tunnels (the longest of which with a length of 3.2km, as well as four shorter tunnels of 171 m, 240 m, 90 m, and 290) under the Balkan Mountain range. It will immensely improve the connectedness between Northern and Southern Bulgaria and in this way the connectivity between Northern Europe with Greece's Aegean port of Alexandroupolis (Corridor IX). Construction is likely to be finalized not earlier than 2027 and is estimated at EUR 184 mln (provided by the EU-funded Operational Programme 'Transport Connectivity' 2021-2027). According to preliminary estimates, the tunnel under Shipka should reduce twice the travel time between Gabrovo district in the North and Stara Zagora in the South.

A proposed tunnel with a significant international significance (between Türkiye and Romania) is the one at Voneshta Voda that is meant to connect Veliko Tarnovo in Northern and Dimitrovgrad in Southern Bulgaria under the Pass of the Republic. The project is to be materialized in 2030-2040 and funding for it is not yet secured.

A project with a potential completion by 2030 is the tunnel under the Petrokhan pass. In Q1 2024 the Road Infrastructure Agency accepted offers for conceptual design, full engineering-geological studies and a detailed spatial plan for the Montana-Sofia expressway that includes the respective tunnel. Ideas for its construction date back to the 1960s but so far it has never been a priority. The tunnel under Petrokhan pass, which is to be 7 km in length with two lanes, design travel speed of up to 90 km per hour, will become part of Corridor IV and will considerably reduce travel time between Montana and Sofia, thus providing a faster connection between the borders of the two EU neighbouring EU countries – Romania and Greece.

Worth mentioning is also a project for a tunnel (950 m) between the Black Sea major cities of Varna and Burgas, which is to be an integral part of the 'Cherno More' motorway. One-year long contracts for the preparation of environmental impact assessment and compatibility assessment reports are expected to be signed in H1 2024. Optimistically, construction works can start not earlier than

early than 2026 provided that there is a smooth process of application and approval within the Connecting Europe Facility and/or another EU funding scheme. The expected progress in increasing transport connectedness through the road and road-related projects mentioned above fits into the most recent efforts for enhancing regional connectivity, which were prominently demonstrated during a trilateral meeting on prime-minister level in October 2023 between Bulgaria, Greece and Romania in Varna (Bulgaria). The main focus of the talks was on regional connectivity and, particularly, on a project for a corridor from Thessaloniki via Kavala, Alexandroupolis (Greece), Burgas and Varna (Bulgaria) to Constanta (Romania), with a possible extension to the Republic of Moldova. The objective is to establish a modern infrastructure for transport but also for communication and energy along the route, which will boost economic and political ties between the three EU countries. The high-level meeting was followed by several ministerial and working group discussions between Bulgaria and Greece. As a result, plans for the preparation of an intergovernmental agreement were publicly announced in January 2024. This agreement is to ensure that connectivity will be in place and built jointly by both countries. However, in light of domestic political dynamics in Bulgaria and elsewhere, it remains to be seen, what practical solutions to regional connectivity bottlenecks will come out from this momentum.

### **7. Mapping of Existing and Potential Challenges for Road Connectivity. Recommendations for Enhancing Road Infrastructure in Bulgaria and Regional Connectivity**

Based on Bulgaria's most recent track record in developing road infrastructure, a non-exhaustive list of challenges could be provided. These hurdles used to hamper, slow down or sometimes block progress in enhancing connectivity and delivering modern, resilient and future-oriented road infrastructure. A considerable part of them could be tackled with a set of actionable recommendations that will eventually contribute to enhancing road connectivity in the wider region also in the light of Bulgaria's full-fledged membership in the Schengen area. The identified challenges and the respective proposals can be grouped in the following sections:

#### **7.1. Political Challenges**

The most recent history of Bulgaria is full of examples for (road) infrastructure and regional connectivity projects that were ambitiously announced and inaugurated with considerable media attention but were afterwards

significantly delayed or put on hold for reasons related to lack of continuity, changes of the domestic political setting or of political priorities. In this regard, notable examples include the absence of any advancement in opening of new border checkpoints with North Macedonia, the sluggish progress in the construction of the 'Hemus' motorway, the persistent bottlenecks in completing the 'Cherno More' motorway and many more.

*A clear political consensus on the main transport connectivity projects that need continuous public investment among political parties and stakeholders in general should be achieved, which will allow for the completion of major road infrastructure regardless of political changes.*

### **7.2. Administrative Governance**

Nowadays, road infrastructure and transport policies are implemented by several institutions. For instance, the Ministry of Regional Development and Public Works is responsible for completing the road network and rehabilitating road infrastructure, administrative-spatial planning and decentralization, regional development among other policy fields. The Ministry is the managing authority of the EU-funded Operational Programme 'Regions in Growth' 2014-2020 and Operational Programme 'Development of the Regions' 2021-2027 as well as of the programmes for territorial cooperation 2021-2027 with neighbouring EU and non-EU countries. Among the subordinated institutions under its supervision is the Road Infrastructure Agency, which is a specialized agency that is responsible for the construction and maintenance of highways, first-, second- and third-class roads.

Against this backdrop, the Ministry of Transport, Information Technology and Communications is in charge of policies in the field of transport, communication and digital connectivity. In the sphere of transport policies it deals with TEN-T network topics both at national and European Union level. It is the managing authority of other EU-funded programmes – Operational Programme 'Transport and Transport Infrastructure' 2014-2021 and Operational Programme 'Transport Connectivity' 2021-2027. One of the subordinated bodies of this Ministry is the Executive Agency 'Automobile Administration'. Its tasks are related to the implementation of control and regulation of the public transport of passengers and freight, road transport of dangerous goods, the roadworthiness of vehicles, approval of vehicles, psychological selection and other activities determined by national or European regulations.

Besides, there is a State Agency for Road Safety that is established by a decree of the Council of Ministers from 2019. It is meant to introduce a new model



of road safety management in the Republic of Bulgaria based on analysis and shortcomings identified in road traffic safety policies. It was established in line with best practices and upon recommendations by international institutions, which considered the existence of a coordination unit to develop, coordinate, and oversee the implementation of this government policy an important success factor. The Agency is entitled to work for improving coordination among institutions involved in improving traffic safety and ensuring monitoring and control of results of traffic safety policy implementation among other things.

*The interplay in the work of the above-mentioned institutions sometimes leads to administrative bottlenecks and prolonged time for coordination that could be better handled if a better division of labour is achieved. Therefore, measures for streamlining and simplifying this institutional landscape for the sake of better coordination should be implemented after thorough analysis but also after a considerable amount of efforts for foresight and scenario planning regarding future needs of road infrastructure.*

### **7.3. Good Governance Challenges**

One of the persistent challenges in the field of road construction is linked to allegations for mismanagement of national and/or EU funding that could be easily tracked even by an outsider. The most typical examples include projects that exceed by far initial costs and that were prolonged through additional contract annexes (which increased significantly the initially agreed price of contracts); poor quality of construction works, insufficient pre-project preparation that fails to timely take into account potential environmental issues or delays linked to work on archaeological sites, to name just a few.

*The interplay of these public governance setbacks and project management bottlenecks should be addressed by better project preparation, introduction of more effective supervision and control by the respective authorities during the project lifecycle and within the post-contract warranty period.*

### **7.4. Breaking of Laws**

In order to compensate for delays or to register progress before elections, there are examples of large-scale road projects that are implemented by breaking domestic laws and/or without all corresponding permitting documents. There are also cases when expropriation procedures related to the construction of road infrastructure reveal certain judicial deficiencies, which, if addressed by landowners, lead to construction delays.

*Compliance with laws should always have the highest priority regardless of delays of flagship projects.*

### **7.5. Deficiencies in Public Tenders**

The ambiguity of requirements in public tenders or pre-definition of eligible contractors are often cited as an alarming issue by construction companies. There are also cases when tenders are won by companies that have a limited to no track record in the given field. In certain cases companies fail to meet their obligations but continue to apply for public projects.

*Improvement of tendering procedures should include not only assessment of financial and quality parameters but also apply a merit-based approach that will allow for the selection of contractors with a proven track record. Contractors that failed in previous public procurement(s) are to be included in a special register. They are not to be excluded from participation in public procurements, but their bids should be considered with utmost attention by contracting authorities.*

### **7.6. Potential Market Distortions or Free Market Failures**

As the practice from recent years comes to show, public procurements for large infrastructure projects are won and executed by a limited number of companies. At first glance, it seems logical that big projects demand expertise and capacity that only several companies can offer.

As OECD data show, Bulgaria registers an unproportionally high level of public tenders with only one bidder, which is not only higher than the OECD average, but also much higher than peer countries in Europe.

On another note, there are projects that do not start according to schedule due to lack of a single applicant, which necessitates that tenders are modified and launched again. This also raises valid concerns about potential free market failures.

*Mechanisms for protection of competition are needed so that concentration of public procurements in a handful of companies is carefully examined. Measures are needed also in an attempt to increase competition among potential contractors.*

### **7.7. Increasing the Added Value of Projects that are Subject to Public Tenders**

Often there are cases that show a lack of ambition in tendering procedures for road projects. Assessments of submitted proposals traditionally give preference to the offers with the lowest price proposed by construction companies.

*Evaluations of tenders should constitute a composite assessment that takes into account not only the price factor but also the application of the latest*

*technology in the given field. Thus, priority should be given to assessing the ratio between price and quality.*

### **7.8. Limited Financing**

Among the most direct challenges towards building road infrastructure is the overreliance on EU funding practically in road construction that deprives projects of national importance of financing. On the one hand, the long-term and deeply embedded focus on conducting a conservative fiscal policy and preventing the economy from running in budget deficits seems reasonable in the light of the country's plans to join the euro area any time soon. On the other hand, the insufficient investment in public infrastructure results in an inadequate maintenance of the existing road infrastructure, hence in deteriorating road quality as well as in slow progress of new projects, which is considered an obstacle to attracting investments in the manufacturing industry, to increasing tourism volumes and eventually to an accelerated economic growth. It is beyond any doubt that good roads are among the cornerstones of a modern economy since they facilitate domestic transportation and literally connect countries to the rest of the world.

*Since the country's prudent financial policy limits public spending/investments, other forms of funding should be sought for and applied. The lack of a single public private partnership and/or concessions in the field of infrastructure is notorious. Testing the applicability of these concepts with small scale projects could be a step forward.*

### **7.9. More Active Utilization of Third-party Funding Options**

Beside the traditional sources of funding road infrastructure and road connectivity projects, there are also other supranational funding options that are barely considered. This is the case with the Three Seas Initiative – while the majority of its member countries responded with a high number of potential connectivity projects, Bulgaria only submitted four in total, with two of them in the field of road connectivity.

*In order to bridge the existing gaps by limited or absent funding from EU or national sources, the relevant national authorities should be ready to explore and utilize other potential sources.*

### **7.10. Availability of Projects with an Advanced Stage of Design and Pre-execution Preparedness**

Design and pre-execution readiness of connectivity projects that do not have a secured funding is in general at a very low level. This proves to be a limitation factor that hampers the quick start of road connectivity projects in the event of funding availability. For instance this was the case when the

National Recovery and Resilience Plan was drafted – due to the limited time for its preparation and implementation, projects in the field of (intermodal) connectivity had to be withdrawn.

*The technical readiness of connectivity projects is to be increased even if there is no funding for them at the given stage of preparation. Should funding for these projects emerge at a later stage, the country would be better prepared to quickly launch construction works and thus to utilize one-time financing opportunities.*

### 7.11. Development of E-Mobility

The overall process of decarbonization will increasingly impact transport of passengers and goods as well as development of road infrastructure. However, despite the EU-wide plans for a massive installation of charging stations on motorways and first category roads, in Bulgaria there is still no information about when and how is this electrification to happen along the main road network outside big cities. This hampers investments in electric vehicles both for personal and business purposes.

*Therefore, clear and timely-bound plans for further development of e-charging infrastructure along the main road network should be available and properly disseminated. This will contribute to increasing the general predictability of public investment plans in the field of road construction.*

### 7.12. Environmental Challenges

Potential challenges to road construction and road connectivity are likely to arise from extreme weather events such as heat waves, wildfires and flooding. Extreme rainfall in particular is a major source of damage to road infrastructure in two ways – rainfall intensity exceeding infiltration capacity (pluvial flooding) and high-water levels in river channels exceeding bank heights and/or causing dyke breach (fluvial flooding).<sup>131</sup>

Most recent examples of the devastating effects of flooding on transport infrastructure were observed in South-Eastern Bulgaria and in Northern Greece in September 2023.

*Against this backdrop, further increases in flood risk are projected for the future, and urgent action is needed to ensure that long-lived infrastructure is climate-resilient. Well-maintained infrastructure with built-in redundancy is less likely to fail during an extreme event than ageing infrastructure that was already at its limit under past climate conditions.*<sup>132</sup>

<sup>131</sup> European climate risk assessment, EEA Report XX/2023

<sup>132</sup> Ibid.

### 7.13. Enhancing Dual Use Capabilities

In light of the ongoing war of Russia against Ukraine, there are discussions about the need of having quick and easily accessible transport linkages among NATO members. Although the talk is mainly on railway infrastructure, there are calls for adaptation of road infrastructure for a dual use e.g. through upgrading bridge gross weight limit and its corresponding technical standards in order to improve both civilian and military mobility.

*Given the country's location as an external border of NATO, the upgrade of its core road network should also consider the necessity for developing dual use solutions for transportation that allow for civilian and military mobility and ensure a smooth road traffic under proper technical conditions.*

# Road Infrastructure in Croatia

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## Road Infrastructure in Croatia

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### 1. Introduction

Croatia's dependence on tourists who reach its coast by car makes both international road connectivity and smooth internal road traffic flow essential to its economic success. Its position as a key road transit country for goods and travelers from and to the Western Balkans as a whole and Southeast Europe in particular makes unimpeded passage through it by road vital to regional economies, while its possession of Rijeka, the best port on the Adriatic Sea, makes such passage of great importance to both Central European countries and the Croatian economy.<sup>133</sup>

### 2. Croatia's Roads: Current State and Planned Development

#### 2.1. How Croatia Classifies its Roads

Croatia's Law on Roads divides the country's roads into the five classes shown in the following table.

*Table 1: Croatian road classes-Law on Roads<sup>134</sup>*

Class Name	Definition
Motorway	Public roads with the technical characteristics of a highway determined by the regulations governing the safety of traffic on roads, which have the function of connecting the Republic of Croatia to the European transport system, of establishing the continuity of a road designated as a European road by international and interstate agreements (an E-road), of connecting regions of the Republic of Croatia or of enabling transit traffic, which are classified as highways in accordance with the Law on Roads
State road	Public roads that have the function of connecting the Republic of Croatia to the European transport system, of establishing the continuity of an E-road, of connecting regions of the Republic of Croatia, of connecting county seats with each other, of connecting county seats with larger regional seats of neighboring countries (cities larger than 100.000 inhabitants), of enabling transit traffic, that form the framework for the road networks of large islands or that ensure the continuity of state roads through cities, and which are classified as state roads in accordance with the Law on Roads

<sup>133</sup> Revalorization of the Geotrafic Position of the Republic of Croatia, Marko Saric, Sch J Arts Humanit Soc Sci, September 2023, provides a useful if sometimes tendentious overview of the importance of roads to Croatia, pp. 240-246.

<sup>134</sup> Croatian Law on Roads, as amended.

County road	Public roads that connect county seats with cities and community seats, that connect city and community seats with each other or through which a city or parts of a city are connected to state roads, and which are classified as county roads in accordance with the Law on Roads
Local road	Public roads that connect the seat of a city or community with settlements of more than 50 inhabitants within the city or community, roads in urban areas that connect city districts with county roads and roads that connect neighboring city districts with each other, which are classified as local roads in accordance with the Law on Roads
Unclassified road:	Roads used for vehicle traffic which anyone can freely use in the manner and under the conditions determined by the Law on Roads and other regulations, including urban and rural roads, which are not classified as public roads by the Law on Roads

Croatia's National Bureau of Statistics (DZS) does not, however, report statistics on the country's road infrastructure using these definitions. Rather it divides Croatian roads into the types described in the following table.

*Table 2: Croatian road types-DZS135*

Type Name	Definition
Motorway	Public road specially built and intended for the traffic of motor vehicles, having two non-adjointing carriage ways (green area, protective fence, etc.) for traffic in either direction with at least two lanes considering the configuration of the terrain as well as one lane for stopping the vehicle in need, with no crossing with roads, railways or tramways at the same level and with specially constructed lanes for speeding or slowing down and junctions for access or exit that makes traffic safer and easier. Being a motorway, it is marked with a prescribed traffic sign.
Motorway – Express Road	Public road specially built and intended for the traffic of motor vehicles, having one or two non-adjointing carriage ways for traffic, with crossings with roads at two or more levels (railways or tramways), without a stop lane. The express road is marked with a prescribed traffic sign.
State road	Public road that connects the whole territory of the Republic of Croatia and connects it with the network of main European roads.
County road	Public road that connects the territory of one or more counties.
Local road	Public road which belongs to the network of county roads and connects the territories of a town (city) and/or municipality.
Unclassified road:	A road not included in the road classification system, including roads in cities that are categorized as "urban roads".

## 2.2. Responsibility for Croatia's roads

Motorways and motorway-express roads are designed, built, maintained and operated by Autocesta Zagreb-Macelj d.o.o., which is responsible for the 59km Zagreb-Macelj motorway (the Croatian A2/UNECE<sup>136</sup> E59),<sup>137</sup> Bi-

<sup>135</sup> <https://podaci.dzs.hr/media/wvtjnjf0/transport-02-cestovna-infrastruktura-obu-jam-cestovnog-prometa.xlsx>, DZS, accessed 2023-11-25, 1530h CET, which provides the definitions and also notes that the definitions are taken from the Glossary for Transport Statistics (UNECE, ITF and Eurostat – 4th edition).

<sup>136</sup> United Nations Economic Commission for Europe.

<sup>137</sup> <https://www.azm.hr/en/about-us>, Autocesta Zagreb-Macelj d.o.o. (AZM), accessed 2023-11-26, 1155CET. AZM is a private limited liability company owned 49% by the Republic of Croatia and 51% by a holding company apparently in the control of a Strabag group company.



na-Istra d.d., responsible for the 141km Istrian Y (the Croatian A8 and A9/E751),<sup>138</sup> and Hrvatske autoceste d.o.o. (HAC), responsible for the remaining 1.140km<sup>139</sup> (A1, A2, A3, A4, A5/E73, A6, A10 and A11)<sup>140</sup>. Hrvatske ceste d.o.o. undertakes these tasks for state roads, individual counties for county and local roads, and local authorities for unclassified roads (which include urban and rural roads).<sup>141</sup> The Ministry of the Sea, Transport and Infrastructure (MMPI) has primary central governmental authority over and responsibility for Croatian roads.<sup>142</sup>

## 2.3. Croatia's current road network

### 2.3.1. Road length

Table 3 shows the current length of Croatian roads by DZS-defined type.

*Table 3: Length of Croatian roads by type<sup>143</sup>*

<b>Class</b>	<b>Total length</b>
Motorway	1.341km <sup>144</sup>
of which Express Road	60km
State road	7.215km
County road	9.410km
Local road	8.506km
<b>Total</b>	<b>26.471km</b>

<sup>138</sup> <https://www.bina-istra.com/en/o-nama/istarski-ipsilon>, BINA-ISTRA d.o.o., accessed 2023-11-26, 1153CET. BINA-ISTRA is a private corporation.

<sup>139</sup> <https://www.huka.hr/en/motorways-network>, Croatian Association of Toll Motorways Concessionaires (HUKA), accessed 2023-11-26, 1237h CET.

<sup>140</sup> <https://www.hac.hr/en/interactive-map>, HAC, accessed 2023-11-26, 1150h CET.

<sup>141</sup> Croatian Law on Roads, as amended.

<sup>142</sup> <https://mmpi.gov.hr/djelokrug-9/9>, MMPI, accessed 2023-11-26, 1710h CET.

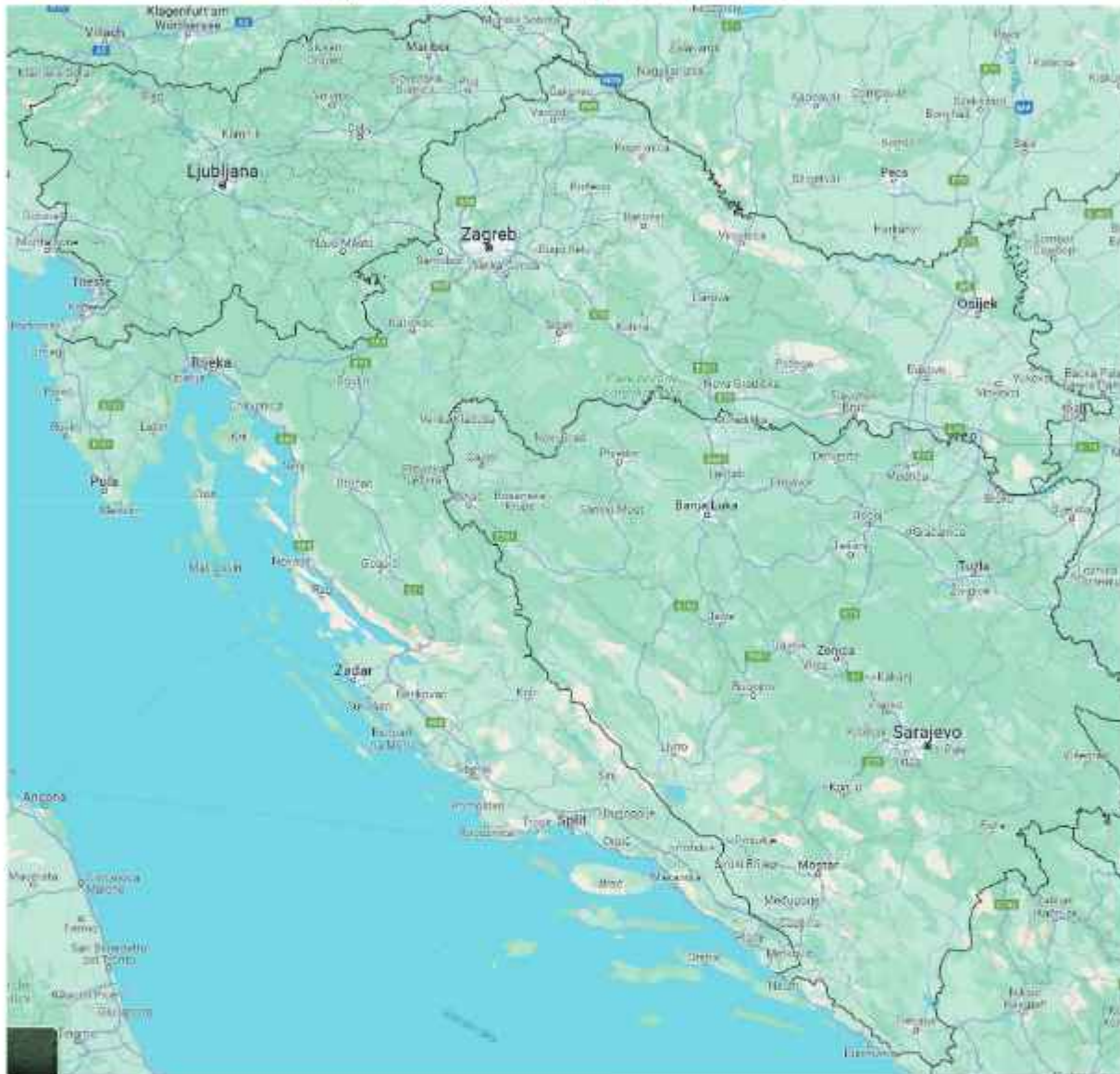
<sup>143</sup> <https://podaci.dzs.hr/media/wvtjnjf0/transport-02-cestovna-infrastruktura-obu-jam-cestovnog-prometa.xlsx>, DZS, accessed 2023-11-26, 1228h CET. (Individual numbers do not sum to the total because of rounding.) Croatia also classifies its roads as E-roads (public roads included in the international road network under international agreements), of which it has 2.447km and paved roads, of which 24.910km. Ibid.

<sup>144</sup> Of which 20,8km are bi-directional with three lanes in each direction (2x3), 1305km are 2x2 and 15,3km 2x1. Key Figures 2022, HUKA, 2022, p. 2.

### 2.3.2. Important Croatian roads

The following map shows Croatia's current network of important roads.

Map 4: Croatia's important roads<sup>145</sup>



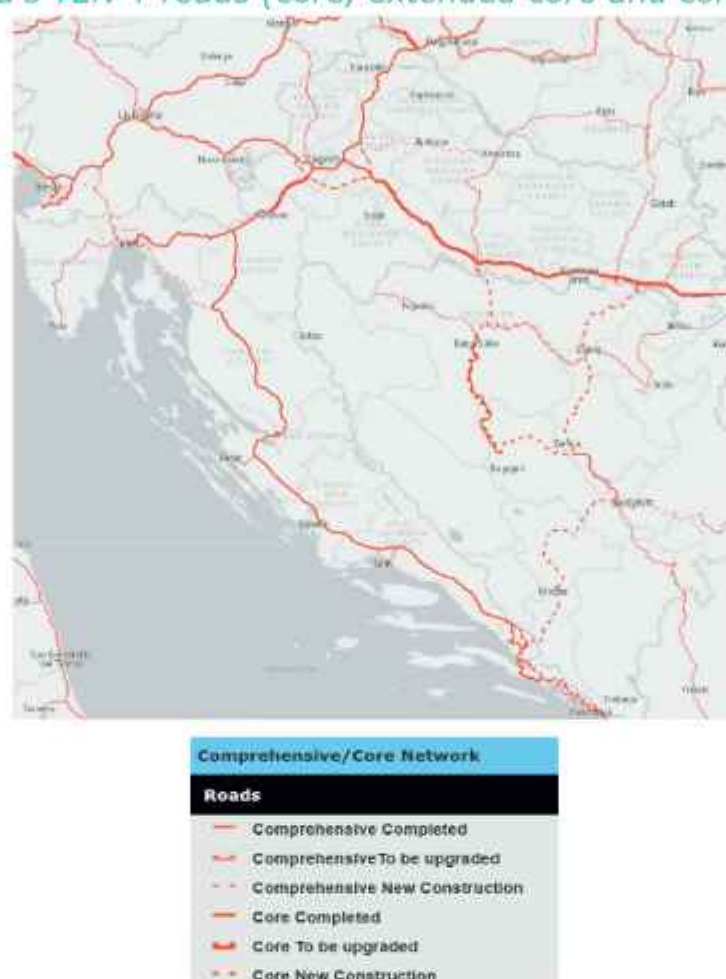
### 2.3.3. Croatia's TEN-T roads

Map 5 shows Croatia's TEN-T roads. The network is, with some significant exceptions, mostly completed. Currently, two TEN-T corridors pass through Croatia, the Mediterranean and the Rhine-Danube. Croatia is very likely to add two more corridors, the Baltic Sea-Adriatic Sea and the Western Balkans-Eastern Mediterranean, in the near future pursuant to a revision of the TEN-T network that will greatly expand it in Croatia.<sup>146</sup>

<sup>145</sup> <https://www.google.com/maps/@44.7993784,19.1052247,8z?entry=ttu>, Google Maps, accessed 2023-11-25, 1608h CET.

<sup>146</sup> Proposed modifications to the TEN-T network were provisionally agreed by the European Parliament and the Council of the European Union (the Council) in December 2023. <https://www.consilium.europa.eu/en/press/press-releases/2023/12/18/trans-european-trans->

Map 5: Croatia's TEN-T roads (core, extended core and comprehensive)<sup>147</sup>



#### 2.3.4. Croatia's bridges and tunnels

Croatia has engaged in significant bridge and tunnel construction and renovation over the last few years. The Peljesac Bridge (which, by connecting North and South Dalmatia directly, eliminates a troublesome 9km passage through [port-network-ten-t-council-and-parliament-strike-a-deal-to-ensure-sustainable-connectivity-in-europe/](https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html), Council of the EU, accessed 2024-01-16, 1050h CET. If the modifications are finally adopted (scheduled to occur in April 2024), two TEN-T Corridors (the Baltic Sea-Adriatic Sea and the Western Balkans-Eastern Mediterranean) will be extended to Croatia (giving Croatia a total of four such Corridors with Croatia's key port of Rijeka lying on three of them), Croatia's ports of Ploče and Split will become Core TEN-T ports, and the country will add eight TEN-T ports (Korčula, Stari Grad, Hvar, Supetar, Preko, Rogac, Rab and Cres) to the five already so designated (Pula, Rijeka, Zadar, Sibenik, Ploče, Dubrovnik and Split). Further, five Croatian cities (Zagreb, Split, Rijeka, Osijek and Varazdin) will be added as TEN-T urban nodes, and 450km of Croatian rail lines and 430km of Croatian roads will become part of the TEN-T network. <https://mmpi.gov.hr/vijesti-8/povijesna-odluka-za-hrvatsku-izmjena-eu-uredbe-uvrstena-na-dva-dodatna-prometna-koridora/24336>, MMPI, accessed 2024-01-16, 1059h CET. Among the roads added to TEN-T will be the Zagreb-Maribor-Graz motorway, the Trieste-Rijeka road and motorways linking Zagreb and the Kvarner region with Dubrovnik and Montenegro. <https://mmpi.gov.hr/vijesti-8/izmijene-ten-t-uredbe-hrvatski-prijedlog-uključen-u-radni-tekst-ten-t-karti/23627>, MMPI, accessed 2024-01-16, 1113h CET.

<sup>147</sup> <https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html>, accessed 2023-11-26, 1522h CET.

Bosnia-Herzegovina) is the pearl of Croatian bridge construction, but several cross-border bridges have been built to connect Croatia with Bosnia-Herzegovina,<sup>148</sup> and a number of bridges in Zagreb and other cities have been renovated. As to tunnels, Croatia has built the great majority of tunnels on its TEN-T routes and important domestic roads, and others (e.g., the Ucka tunnel's second tube) are now under construction.

### 2.3.5. Quality of Croatia's roads, bridges and tunnels

Croatia's motorways are of world-class quality, ranked by the World Economic Forum as tied for twelfth in quality worldwide.<sup>149</sup> Its bridges and tunnels vary in quality, but most on routes important to international travelers are either new or newly renovated. That said, the poor condition of some city bridges has knock-on effects that greatly increase congestion on certain international routes, notably those passing by Zagreb. A number of Croatia's road tunnels, including some on internationally important roads, do not meet current EU safety standards and so will have to be reconstructed over time.

### 2.3.6. Road safety in Croatia

Croatia reduced its total accidents by 29% from 2010 to 2019, although accidents with fatalities and serious injuries fell by only 21,5%.<sup>150</sup> Deaths, on the other hand, fell by 30%, significantly better than the EU average of a 24% drop.<sup>151</sup> Statistics for 2020 showed dramatic improvement because of the COVID-19 epidemic, but rose in 2021 to close to 2019 levels.<sup>152</sup> In 2022 the situation grew worse except for fatalities: Croatia recorded 32.561 traffic accidents, 10.005 of which involved injuries (respectively, 1,3 and 0,4 per million vehicle-km and 841 and 258 per 100.000 inhabitants).<sup>153</sup> In these, 275 people died and 13.329 were injured (0,01 and 0,54 per million vehicle-km and 7 and 344 per 100.000 inhabitants).<sup>154</sup>

<sup>148</sup> <https://mmpi.gov.hr/vijesti-8/potpredsjednik-vlade-i-ministar-butkovic-u-nastupni-posjet-primio-ministra-komunikacija-i-prometa-bosne-i-hercegovine/23869>, MMPI, accessed 2023-11-26, 1717h CET.

<sup>149</sup> <https://www.hac.hr/hr/odnosi-s-javnoscu/novosti/autoceste-u-hrvatskoj-medu-najboljima-u-svijetu>, HAC, accessed 2023-11-26, 1623h CET.

<sup>150</sup> National Road Safety Plan of the Republic of Croatia for the Period 2021-2030, Government of Croatia, 2020 (Road Safety Plan), p. 6.

<sup>151</sup> Ibid, p. 18.

<sup>152</sup> 31.453 accidents, 9.146 involving injuries, with 292 fatalities and 11.918 injuries. Bilten\_o\_sigurnosti\_cestovnog\_prometa\_2022\_WEB.xlsx, available at <https://tinyurl.com/ytiz2bko>, Ministry of Internal Affairs, accessed 2023-12-03, 1927h CET.

<sup>153</sup> Ibid. and <https://podaci.dzs.hr/media/jhzh4ald/stan-2023-3-1-population-estimate-of-the-republic-of-croatia-2022.pdf>, DZS, accessed 2023-12-03, 1927h CET. The per inhabitant figures are somewhat misleading, since foreign tourists account for a large portion of Croatian road traffic.

<sup>154</sup> Ibid.

Croatia has set a target of reducing traffic accidents resulting in serious injuries to 1.106, in fatalities to 139 and fatalities to 148 by 2030.<sup>155</sup>

### 2.3.7. Border Crossings

Croatia became a member of the Schengen Area on January 1, 2023, which would ordinarily mean that road travel between Croatia and fellow Schengen Area members would require no border checks. This remains the case for road travel to and from Hungary, one of the two Schengen Area members with a land border with Croatia. On the other hand, road connections with Slovenia, the other Schengen Area member with a Croatian land border, are now impeded by re-imposed border inspections (passport only for passenger vehicles; more intense for freight) on road traffic leaving Croatia. Slovenia put these measures in place on October 21, 2023, because of the large number of refugees and migrants entering Slovenia from Croatia by road.<sup>156, 157</sup> They are scheduled to remain in place at least until June 22, 2024.<sup>158</sup>

Slovenia's inspections, while brief compared to those undertaken before Croatia's entry into Schengen, can lead to significant delays for vehicles. For passenger vehicles, these delays can be five to ten minutes when traffic is light and considerably more than an hour when it is heavy (e.g., around holidays and during tourist season). For freight vehicles delays can be considerably longer even during light traffic periods. Even without inspection, traffic slowdowns and delays occur at Croatia's Schengen border crossings, a result of the border police kiosks not having been removed and the chicane-like lane arrangements now in place. This is a particular problem during the tourist season and around holidays, when delays can exceed an hour.

Croatia's border crossings with Serbia, Bosnia-Herzegovina and Montenegro, none of them EU members, became considerably more restrictive in the run up to and after Croatia's entry into the Schengen Area, since after that entry Croatia's borders with those countries formed part of the Area's external border.<sup>159, 160</sup> Croatia has not until recently had much interest in improving the infrastructure of those crossings, and so increasing their ability to process vehicles. Partly this is for political reasons.<sup>161</sup> Partly it is due to the poor job these

<sup>155</sup> Road Safety Plan, p. 28.

<sup>156</sup> <https://n1info.hr/regija/u-sloveniji-se-u-prosloj-godini-udvostrucio-broj-ilegalnih-migranata-na-ivise-ih-dolazi-iz-hrvatske/>, N1, accessed 2024-01-13, 1321h CET.

<sup>157</sup> <https://www.gov.si/en/registries/projects/zacasni-nadzor-na-notranji-meji/>, Slovenian Government, accessed 2024-01-10, 1128h CET.

<sup>158</sup> Ibid.

<sup>159</sup> <https://balkaninsight.com/2023/02/02/caught-on-camera-croatias-schengen-border-with-serbia/>, Balkan Insight, accessed 2024-01-15, 1830h CET.

<sup>160</sup> <https://www.france24.com/en/live-news/20231117-croatia-cracks-down-on-migrants-as-europe-beefs-up-border-checks>, France 24, accessed 2024-01-09, 1742h CET.

<sup>161</sup> Croatia's relations with Serbia and Bosnia-Herzegovina's Republika Srpska entity have

countries have done in preventing crossings of refugees and migrants into Croatian territory.<sup>162</sup> Economics has also been an important factor: Modernizing border facilities would be expensive, particularly if they were expanded to fully accommodate the intermittent traffic tsunamis that now overwhelm those facilities during tourist seasons and holidays and lead to crossing times measured in hours rather than minutes.<sup>163, 164, 165, 166, 167</sup>

EU pressure has led to updated facilities for Serbia and Bosnia-Herzegovina being planned for new construction of (e.g., the Gradiska bridge and border crossing).<sup>168</sup> Given the EU's apparent stiffening of view regarding Serbia and the Republika Srpska, it is not clear whether this pressure will continue to be applied. Croatia, now that it is a Schengen member, will likely significantly increase its road connections with Hungary<sup>169</sup> and, over time, improve those with Slovenia, which, while numerous, are not always in the best condition.

Cross-border road passenger traffic in Croatia is heavily tilted toward foreign vehicles, with 24,1 million passenger cars entering the country in 2022, of which 16,7 million (69%) were foreign registered compared to only 7,4 million (31%) domestic. For passenger cars exiting Croatia in 2022, the numbers were 23,9 million total, 16,6 million (69%) foreign and 7,3 million domestic (31%). Goods vehicles show a similar pattern. The 2022 numbers were 2,8 million total entries, of which 2,0 million (71%) foreign and 0,81 million domestic (29%), and 2,8 million departures, of which 2,0 million foreign (72%) and 0,78 million domes-

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been quite strained due to their governments' aggressively nationalistic (and in the case of the Republika Srpska, separatist) political stances. Relations with Bosnia-Herzegovina's Federation, while better, have been plagued by issues relating to the status and political rights of the Federation's ethnic Croatian citizens. Re the latter, see <https://sarajevotimes.com/croatian-and-bih-officials-discussed-the-facilitation-of-border-crossing/>, Sarajevo Times, accessed 2024-01-15, 1823h CET (noting that Croatian ministers held discussions with the head of a BiH political party representing primarily ethnic Croats in BiH without the involvement of BiH governmental representatives).

<sup>162</sup> <https://www.france24.com/en/live-news/20231117-croatia-cracks-down-on-migrants-as-europe-beefs-up-border-checks>, France 24, accessed 2024-01-09, 1742h CET.

<sup>163</sup> <https://daljine.rs/kamera-batrovci-granicni-prelaz/>, Daljine.rs, accessed 2024-01-15, 1807h CET.

<sup>164</sup> <https://www.blic.rs/vesti/drustvo/guzve-na-granicnim-prelazima-za-uskrsnje-praznike-na-ovim-granicnim-prelazima-se/ec267gt>, Blic, accessed 2024-01-15 1814h CET.

<sup>165</sup> <https://www.rts.rs/lat/vesti/drustvo/5234105/guzve-na-granicama-na-gradini-kilometarska-kolona--tokom-noci-granicni-prelaz-presevo-preslo-24000-putnika.html>, RTS, accessed 2024-01-15, 1816h CET.

<sup>166</sup> TripAdvisor.com: [https://www.tripadvisor.com/ShowTopic-g635648-i11070-k14479128-Any\\_updates\\_regarding\\_Dubrovnik\\_Montenegro\\_Border\\_Crossing-Montenegro.html](https://www.tripadvisor.com/ShowTopic-g635648-i11070-k14479128-Any_updates_regarding_Dubrovnik_Montenegro_Border_Crossing-Montenegro.html), TripAdvisor.com, accessed 2024-01-15, 1818h CET.

<sup>167</sup> <https://sarajevotimes.com/passengers-wait-up-to-five-hours-to-cross-the-bih-border-crossing/>, Sarajevo Times, accessed 2024-01-15, 1835h CET.

<sup>168</sup> <https://total-croatia-news.com/news/gradiska-border-crossing/>, Total Croatia News, accessed 2024-01-15, 1833h CET.

<sup>169</sup> <https://total-croatia-news.com/news/schengen-croatia/>, Total Croatia News, accessed 2024-01-15, 1802h CET. (Note that the article's byline date may be incorrect.)

tic (28%). Croatian road border crossings are highly seasonal. Only 1,3 million passenger cars entered Croatia in January 2022 compared to 3,6 million in August of that year, or 282% of the January number. Goods vehicle traffic also shows strong seasonality although with different peak and trough months. In December 2022, 193 thousand goods vehicles entered Croatia compared to 261 thousand in May 2022, or 135% of the December number.<sup>170</sup>

### 2.3.8. Alternative Fuels Availability

Although the situation may be changing, Croatia currently has few domestic electric vehicles (EVs) compared to other EU countries.<sup>171</sup> It also has limited charging facilities for EVs on roads heavily utilized by foreign vehicles, including motorways, with the lack of fast and ultra-fast chargers particularly acute.<sup>172</sup> The two key categories of publicly available EV charging stations in Croatia, those on or near main roads and those in malls or on other private property, are all growing in number, but there are still far too few to support widespread use of EVs in Croatia domestically or to alleviate foreign drivers' range anxiety when traveling to or through Croatia.<sup>173</sup> As to other alternative fuels, while Croatia has an ambitious hydrogen production strategy,<sup>174</sup> it currently has essentially no hydrogen road vehicles or refueling stations.<sup>175</sup> It continues to consider gas-based fossil fuels as alternative fuels, but, perhaps for the best, they, too, have little penetration.<sup>176</sup>

<sup>170</sup> Calculated from: [https://web.dzs.hr/PXWeb/Menu.aspx?px\\_language=en&px\\_type=PX&px\\_db=Transport+i+komunikacije](https://web.dzs.hr/PXWeb/Menu.aspx?px_language=en&px_type=PX&px_db=Transport+i+komunikacije), DZS, accessed 2024-01-10, 0834h CET.

Numbers for 2023, which are available only through November of the year, are incomparable with those of 2022, since Croatia's entry into the Schengen Area means that the 2023 figures do not include entries and exits from Schengen countries. The relationship between Schengen and non-Schengen traffic is indicated by the ratio between 2022-I-XI and 2023-I-XI numbers, with 2023 passenger car entries and exits about 50% of 2022 numbers and goods vehicle entries and exits a bit more than 40%.

<sup>171</sup> <https://www.thedubrovniktimes.com/news/croatia/item/15897-electric-vehicle-adoption-surges-in-croatia-despite-absence-of-2023-co-financing-tender>, The Dubrovnik Times, accessed 2024-01-16, 1759h CET.

<sup>172</sup> "With 34 chargers per 100,000 inhabitants, Croatia is currently 20 times weaker than the most developed market in the European Union – the Netherlands, and three times under the EU average." <https://balkangreenenergynews.com/greenway-network-to-install-300-ultra-fast-chargers-in-croatia/>, Balkan Green Energy News, accessed 2024-01-30, 1958h CET, and Pandzic et al, Journal of Energy, 2022 (anecdotal and somewhat dated, but useful in suggesting the extent of the charging problem and its international nature).

<sup>173</sup> Ibid. and <https://www.expatincroatia.com/electric-vehicle-ev-charging-stations/>, Expat in Croatia, accessed 2024-01-31, 0622h CET, and sources cited (showing charger locations in Croatia and thus the many gaps in charger coverage).

<sup>174</sup> <https://balkangreenenergynews.com/croatia-adopts-2050-hydrogen-strategy/>, Balkan Green Energy Newsletter, accessed 2024-01-31, 0658h CET.

<sup>175</sup> <https://alternative-fuels-observatory.ec.europa.eu/transport-mode/road/croatia>, European Alternative Fuels Observatory, accessed 2024-01-31, 0658h CET.

<sup>176</sup> Ibid.

### 3. Croatia's Road-building Strategy and Plans

#### 3.1. Croatia's strategic documents

Croatia's primary strategic document regarding road transport is its Transport Development Strategy 2017-2030 (TDS) issued in August 2017.<sup>177</sup> The Strategy was prepared for a specific purpose, obtaining EU funds, at a time when Croatia's expertise in both transport development and EU funding was less well developed than it now and before the occurrence of many important developments affecting Croatia's transport sector generally and the road sub-sector specifically. It is, nonetheless, insightful in its identification of factors relevant to Croatian transportation policy and of the problems facing the Croatian transport system. Problems the Strategy notes confront the Croatian road transport system include the need to unify its motorway toll systems and to introduce EETS,<sup>178</sup> the impediments to Croatia's international connectivity caused by Zagreb traffic congestion, the consequences of Croatia's joining the Schengen Area and the implications of tourism-associated traffic flow surges for the design and operation of Croatia's road network.<sup>179</sup>

The general, cross-sectoral, public transit, zero emissions and road-transport-specific objectives that the Strategy establishes remain relevant and indeed in most cases need little adjustment to be appropriate to present circumstances.<sup>180</sup> The same is true of many of the measures the Strategy recommends Croatia take to improve its transport system.<sup>181</sup> A large number of the general and urban, suburban and regional transport measures remain unimplemented,<sup>182</sup> and while some of the road-specific measures are being undertaken<sup>183</sup> many others have not or have not even been addressed.<sup>184</sup>

<sup>177</sup> Croatian Transport Development Strategy 2017-2030, MMPI, August 2017.

<sup>178</sup> European Electronic Toll Service.

<sup>179</sup> Other factors and problems that the TDS identifies include Croatia's steady population decline and its causes, changes in population patterns due to internal migration, disparities in economic development among regions, the need to harmonize transportation strategy with spatial use strategy, the importance of the TEN-T network to Croatia's international interconnectivity and the flaws and potential in Croatia's public transportation systems.

<sup>180</sup> TDS, pp. 195-197. E.g., CO7 (improve the interoperability of the Croatian transport system (PT, rail, road, maritime, inland water and air)), SC4 (optimize and harmonize the different tolling systems in Croatia) and SC9 (reduce congestion in heavily burdened agglomerations taking into account the specific requirements of protection of National Heritage).

<sup>181</sup> TDS, pp. 202-206 (general measures), 207-210 (urban, suburban and regional transport) and 217- 222 (road transport).

<sup>182</sup> E.g., G.1 (develop a national concept for cargo logistics) and U.6 (provide filling stations for alternative fuel for public transport vehicles).

<sup>183</sup> E.g., Ro.1 (construct Gradiska bridge connection) and Ro.2 (build A5 from Osijek to the Hungarian border).

<sup>184</sup> E.g., Ro.8 (optimize Zagreb main road network) and Ro.20 (develop a resting station concept for the high level road network).



### 3.2. Summary and outlook for roadbuilding projects

Croatia plans to undertake several major roadbuilding projects in the next few years. One of the most important<sup>185</sup> is completion of the Croatian portions of the Adriatic-Ionian Corridor which will, among other things, link Rijeka with Dubrovnik and ultimately Montenegro. This project will include work on Croatia's A1 and A7 roads both to upgrade them in their entirety to motorway standards and to extend them.<sup>186</sup> Finishing these two projects would complete the Croatian motorway network.<sup>187</sup>

The work on the A1 will focus on the segment from Metkovic to Dubrovnik.<sup>188</sup> The project will be funded by HAC's refinancing of €1,6 billion in existing loans and borrowing an additional €600 million.<sup>189</sup> Contracts for the project's first phase, the 28km Rudine-Osojnik segment, are planned to be entered into in H1 2024,<sup>190</sup> with the project as a whole to be completed in 2030.<sup>191</sup> The Rudine-Osojnik segment will be the most expensive motorway segment ever built in Croatia, with a currently estimated cost of around €27 million/km, because of the extremely difficult terrain through which it will pass (as many as 21km of the segment are in buildings and tunnels).<sup>192</sup>

Work on the A7 motorway will include its extension from Krizisce to Zuta Lokva,<sup>193</sup> where it will join the A1. Tenders for construction of the Krizisce-Jadrano-vo and Jadranovo-Senj segments were recently announced,<sup>194</sup> with tenders for the remaining segments up to Zuta Lokva to be announced within the

<sup>185</sup> Revaluorization of the Geotrafic Position of the Republic of Croatia, op. cit., pp. 244-245.

<sup>186</sup> <https://www.croatiaweek.com/motorway-all-the-way-to-dubrovnik-to-be-completed/>, Croatia Week, accessed 2024-01-16, 0742h CET, and <https://vlada.gov.hr/vijesti/autocesta-krizisce-zuta-lokva-projekt-vrijedan-300-milijuna-eura-omogucit-ce-puni-jadransko-jonski-cestovni-koridor/40694>, Croatian Government, accessed 2024-01-16, 1303h CET.

<sup>187</sup> <https://vlada.gov.hr/vijesti/autocesta-krizisce-zuta-lokva-projekt-vrijedan-300-milijuna-eura-omogucit-ce-puni-jadransko-jonski-cestovni-koridor/40694>, Croatian Government, accessed 2024-01-16, 1303h CET.

<sup>188</sup> <https://mmpi.gov.hr/vijesti-8/otvoren-10-kongres-drustva-za-ceste-i-zeljeznice-via-vita/24261>, MMPI, accessed 2024-01-16 1225CET. Presumably the A1 will at some point be extended to the Montenegrin border.

<sup>189</sup> <https://www.novolist.hr/novosti/gospodarstvo/sprema-se-natjecaj-za-autocestu-krizisce-selce-doznali-smo-detalje/>, Novi List, accessed 2024-01-16, 1242h CET.

<sup>190</sup> <https://total-croatia-news.com/news/investment-in-croatian-roads/>, Total Croatia News, accessed 2024-01-16, 1139h CET.

<sup>191</sup> <https://net.hr/danas/hrvatska/hrvatske-autoceste-raspisuju-natjecaje-860-milijuna-eura-za-43-ki-lometra-autoceste-1e676716-578d-11ee-92e8-3a50bfc1e71d>, Net.hr, accessed 2024-01-16, 1223h CET.

<sup>192</sup> <https://www.trade.gov/market-intelligence/croatia-infrastructure-two-highway-projects-worth-860-million-euros>, US International Trade Administration, accessed 2024-01-16, 1229h CET.

<sup>193</sup> <https://mmpi.gov.hr/vijesti-8/otvoren-10-kongres-drustva-za-ceste-i-zeljeznice-via-vita/24261>, MMPI, accessed 2024-01-16, 1245h CET.

<sup>194</sup> <https://eojn.nn.hr/SPIN/application/ipn/Mobile/DokumentPodaciFrm.aspx?id=8442812> and <https://eojn.nn.hr/SPIN/application/ipn/DocumentManagement/DokumentPodaciFrm.aspx?OznakaDokumenta=2023/S+0F2-0055207>, Narodne Novine, accessed 2024-01-16, 1309h CET.

next two years.<sup>195</sup> The Krizisce-Zuta Lokva segment as a whole is expected to be completed in 2030.<sup>196</sup>

Croatia has finally entered into a contract for extending its A5 motorway (the EU's E73) to the Hungarian border.<sup>197</sup> Construction of the 5km segment will cost €46 million and be completed by early 2025.<sup>198</sup> It will form part of the TEN-T Comprehensive Network and Pan European Corridor Vc, the latter of which runs from Budapest to the Croatian port of Ploce via the Bosnia-Herzegovina capital of Sarajevo.<sup>199</sup>

Additional work related to Croatia's motorways and express roads has been announced by Croatia's Minister of MPI, who said, "[a] tender has also been announced for the connection of Pozega to the motorway, there is the Ilocka transversal, the Srijem transversal, the Vukovar bypass, the Zagvozd-Imotski section, a series of expressways in Zagorje, Koprivnica and Virovitica, and expressways where we haven't connected individual county centres on the continent to the expressway. Financial planning is underway for all of this, and some of it will be financed from EU funds."<sup>200</sup>

### 3.3. Summary and outlook for road-related projects

#### 3.3.1. Bridges and Viaducts

Croatia continues to build and modernize its smaller bridges now that the giant Peljesac project has been completed. The most important of these smaller projects are bridges connecting Croatia with Bosnia-Herzegovina,<sup>201</sup> some of which have been long delayed.<sup>202</sup> Among the most economically important of these is the bridge at Gradiska,<sup>203</sup> which forms part of the E661 route from Hungary through Croatia to Bosnia-Herzegovina. It could be

<sup>195</sup> <https://www.trade.gov/market-intelligence/croatia-infrastructure-two-highway-projects-worth-860-million-euros>, International Trade Administration, accessed 2024-01-16, 1310h CET.

<sup>196</sup> Ibid.

<sup>197</sup> <https://www.hac.hr/hr/odnosi-s-javnoscu/novosti/potpisan-ugovor-za-izgradnju-posljednje-dionice-beli-manastir-granica-s-madarskom-autocestom-a5>, HAC, accessed 2024-01-16 1416CET.

<sup>198</sup> Ibid.

<sup>199</sup> Ibid.

<sup>200</sup> <https://total-croatia-news.com/news/investment-in-croatian-roads/>, Total Croatia News, accessed 2024-01-16, 0759h CET.

<sup>201</sup> <https://mmpi.gov.hr/vijesti-8/potpredsjednik-vlade-i-ministar-butkovic-u-nastupni-posjet-primorsko-istarskoj-komunikacija-i-prometa-bosne-i-hercegovine/23869>, MMPI, accessed 2024-01-16, 1516h CET.

<sup>202</sup> <https://total-croatia-news.com/lifestyle/bridge/>, Total Croatia News, accessed 2024-01-16, 0759h CET.

<sup>203</sup> <https://total-croatia-news.com/news/gradiska-border-crossing/>, Total Croatia News, accessed 2024-01-16, 1402h CET.

completed by summer 2024.<sup>204</sup>

A number of purely domestic projects are also being undertaken. One of the largest is the €63 million viaduct over Zagreb's rail marshaling yard.<sup>205</sup> The two spans of the viaduct, each more than 700m in length, will provide the city with a new entrance on its east side from the A11 motorway.<sup>206</sup>

### 3.3.2. Tunnels

Croatia's most important current tunnel project is the second tube of the Ucka tunnel on the Istrian Y motorway,<sup>207</sup> drilling for which was completed in September of 2023<sup>208</sup> and completion of which is expected before the 2024 tourism season.<sup>209</sup> Numerous shorter tunnels are being built in connection with various road building projects, including especially the Rudine-Osojnik segment of the Metkovic-Dubronik upgrade to the A1 motorway which will have many short tunnels in its 21km length.<sup>210</sup>

## 4. Croatia's Challenges to Road Infrastructure and Connectivity

### 4.1. Strategic planning

Croatia has not updated its TDS since August 2017, its Reform of the Road Sector since January 2018<sup>211</sup> or its National Transport Model since 2020.<sup>212</sup> While, as noted at *Croatia's strategic documents* at 3.1. above, Croatia's TDS correctly identified many of Croatian road transport's problems and proposed many solid recommendations as to their solution and while the National Transport Model is a great improvement on the 2017 version, all three planning tools are nonetheless dated and do not reflect the many significant developments since they were prepared. Among these develop-

<sup>204</sup> Ibid.

<sup>205</sup> <https://seenews.com/news/croatia-launches-623-mln-euro-viaduct-tender-844939>, SEE News, accessed 2024-01-16, 1530h CET.

<sup>206</sup> Ibid.

<sup>207</sup> <https://n1info.hr/english/news/minister-current-investments-in-transport-infrastructure-are-worth-e3-5-billion/>, N1, accessed 2024-01-16, 1538h CET.

<sup>208</sup> <https://www.geoengineer.org/index.php/news/drilling-for-the-563-kilometer-long-ucka-tunnel-in-croatia-has-been-completed>, Geoengineer, accessed 2023-10-30, 1407h CET.

<sup>209</sup> <https://www.glasistre.hr/istra/2023/11/30/druga-cijev-tunela-ucke-bi-mogla-biti-otvorena-do-sljedece-sezone-899647>, Glas Istre, accessed 2024-01-16, 1546h CET.

<sup>210</sup> <https://www.trade.gov/market-intelligence/croatia-infrastructure-two-highway-projects-worth-860-million-euros>, International Trade Administration, accessed 2023-11-22, 1343h CET.

<sup>211</sup> The Reform of the Road Sector document is mostly a list of projects and financial measures rather than a true strategic plan.

<sup>212</sup> [https://www.ey.com/en\\_hr/consulting/national-transport-model-as-a-tool-to-inform-policy-making](https://www.ey.com/en_hr/consulting/national-transport-model-as-a-tool-to-inform-policy-making), EY, accessed 2024-01-15, 1933h CET.

ments are the enormous growth in both Croatia's expertise in transport-related matters and its ability to obtain and use EU and other funding.<sup>213</sup>

### 4.2. Effective, efficient administration

Croatia faces an enormous near-term roadbuilding challenge. On the one hand it will have considerably more money to spend on roadbuilding over the short and medium term than could have been imagined even a few years ago. On the other hand, it will find it difficult to spend this money effectively and efficiently.

The money comes from three main sources, all EU financed. They are (i) EU financial support for Croatia's National Recovery and Resiliency Plan (NRRP), (ii) the Connecting Europe Facility and (iii) European Structural and Investment Funds.<sup>214</sup> Money will also be available from InvestEU, Cohesion Policy, Horizon Europe and the European Investment Bank.<sup>215</sup> Money from all these sources will go towards funding transportation-related aspects of the European Green Deal as well as purely transportation-oriented expenditures.<sup>216</sup>

The amounts available to Croatia for transportation investments as a whole are larger than expected, in part because the EU has been very generous in financing Croatia's NRRP,<sup>217</sup> which calls for significant transportation-related spending.<sup>218</sup> Even though much of Croatia's EU funding under its NRRP will

<sup>213</sup> These developments also include, e.g., Croatia's adoption of a new National Development Strategy to 2030 and a Strategy for Adaptation to Climate Change, Croatia's tourism explosion, Croatia's entry into the Schengen Area and the Eurozone, the European Green Deal (including, among many other things, the even sharper shift it mandates from road to other transport modalities), the financing provided under Croatia's NRRP, the massive changes proposed to the TEN-T network including particularly to Croatia's portion of that network, the work-from-home movement, actual as opposed to predicted population shifts within Croatia, actual as opposed to predicted differential economic development of Croatia regions, how development trends may have changed and how transportation infrastructure has and can affect those trends as well as the many, significant technological developments in the road and automotive sectors (batteries, EVs, AVs, charging technology, etc.).

<sup>214</sup> Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013.

<sup>215</sup> Ibid.

<sup>216</sup> Ibid.

<sup>217</sup> Referring to Croatia's original NRRP EU Commission President von der Leyen noted that "[w]ith €6.3 billion [in grants], Croatia will be the largest recipient of the Recovery and Resilience Facility compared to the size of its economy". [https://commission.europa.eu/system/files/2021-07/com-2021-401-croatia\\_press-release\\_en.pdf](https://commission.europa.eu/system/files/2021-07/com-2021-401-croatia_press-release_en.pdf), European Commission, accessed 2024-01-14, 1803h CET. The revised Croatian NRRP, adjusted for the exceptionally good performance of the Croatian economy after the peak of the COVID-19 pandemic as well as for high inflation and supply chain disruptions, remains quite generous at €5,8 billion in grants and €4,2 billion in loans. [https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/croatias-recovery-and-resilience-plan\\_en](https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/croatias-recovery-and-resilience-plan_en), European Commission, accessed 2024-01-14, 1810h CET.

<sup>218</sup> See projects discussed in Commission Staff Working Document Analysis of the recovery and resilience plan of Croatia Accompanying the document Proposal for a Council Imple-

be spend on transportation modalities other than roads (especially rail), the NRRP money devoted to other modalities will free up Croatian government funds for road projects<sup>219</sup> while some will go directly towards improving current road networks.<sup>220</sup> In addition, the EU intends to provide strong financial support for the implementation of its highly ambitious plans for an expanded and improved TEN-T network.<sup>221</sup> When combined with Croatia's remarkable success in broadening that network in Croatia, this means that Croatia could potentially receive €26 billion in EU TEN-T-network funding.<sup>222</sup>

The problem is, though, that while EU-provided finance will go far towards solving Croatia's acknowledged difficulty in simultaneously funding both road and rail projects,<sup>223</sup> it will not eliminate the political, administrative, and technical difficulties that have prevented Croatia from implementing major projects, particularly major rail projects, effectively and efficiently. These difficulties will be exacerbated by the large number and varied nature of the transport projects that the EU is now pressuring Croatia to rapidly undertake and complete.<sup>224, 225</sup> It is accordingly crucial that Croatia take a thoughtful approach to its road projects, seeking maximum returns for the non-financial as well as financial resources that it devotes to them. In particular, it must strive to accommodate the special characteristics of its tourism-focused economy and simultaneously diversify that economy (to

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menting Decision amending Implementing Decision (EU) (ST 10687/21 INIT; ST 10687/21 ADD 1) of 28 July 2021 on the approval of the assessment of the recovery and resilience plan for Croatia.

<sup>219</sup> See *ibid.* regarding significant rail and rail-related projects.

<sup>220</sup> See *ibid.* regarding projects discussed, including financing of the introduction of tolls on all Croatian motorways, the provision of chargers for electric vehicles and pilot projects for hydrogen-fueled transport.

<sup>221</sup> Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013.

<sup>222</sup> <https://total-croatia-news.com/news/croatia-transport-connections/>, Total Croatia News, accessed 2024-01-15, 0547h CET. Since the TEN-T project extends to 2050, the allocation of funds across transport modalities could change over time.

<sup>223</sup> <https://mmpi.gov.hr/vijesti-8/otvoren-10-kongres-drustva-za-ceste-i-zeljeznice-via-vita/24261>, MMPI, accessed 2024-01-15, 0600h CET.

<sup>224</sup> Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013 and <https://www.europarl.europa.eu/news/en/press-room/20230411IPR79503/trans-european-transport-projects-first-go-ahead-to-new-rules>, EP, 2024-02-01, 0814h CET (in the event of a significant delay, MEPs suggest the Commission should immediately launch an infringement procedure and reduce or terminate funding).

<sup>225</sup> From August 2023, the whole permit-granting process must not exceed 4 years, and when a project involves pre-identified cross-border links and missing links, Member States must designate one main point of contact for all project promoters. Directive (EU) 2021/1187 of the EP and the Council of 7 July 2021 on streamlining measures for advancing the realisation of the trans-European transport network (TEN-T).

develop its regions and provide protection against tourism downturns) all while accomplishing the difficult task of future proofing its decisions against such risks as global warming and rapid technological progress.

### **4.3. The effects on international connectivity of policy choices regarding Croatia's domestic road network**

#### **4.3.1. Urban congestion**

The roads connecting Croatia internationally, particularly motorways, are often highly congested, especially around cities, a problem that is increasing in both frequency and severity.<sup>226</sup> It should be noted in this regard that it is not just Zagreb that needs to implement these measures, although the fact that "Zagreb as the most important and largest traffic intersection in Croatia is the origin and destination point of most road traffic flow"<sup>227</sup> means that keeping municipal traffic off routes important to international connectivity is critically important. But coastal cities like Split also need to do so, since reducing congestion caused by local traffic in and around those cities will reduce congestion on the routes that connect them with other countries as well as diminish pollution and the emission of greenhouse gasses (GHGs).<sup>228</sup>

#### **4.3.2. Road tolls**

Croatia will soon change the tolling systems used on all of its motorways,<sup>229</sup>

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<sup>226</sup> A major cause of this problem is changing residency and employment patterns. As household wealth grows, more and more families are moving into new homes, often (because of cost and availability considerations) in locations that require a commute to work that cannot be made via public transportation or that is simply longer than before. More frequent changes of employer have exacerbated this problem, since a residence that once provided a short commute may no longer do so after a job change. An increase in the number of two-worker families has also added a large number of commutes. In addition, the modern trend to furnish children with enrichment activities has resulted in more automobile trips to accommodate them. Further, increased wealth has led to the purchase of more automobiles, with two-car and even three-car families more and more common. Increased wealth has also led to more goods-related road traffic. The post-COVID-19 work-from-home movement is not strong in Croatia (EECFEA Construction Forecast Report Vol. 17 2023 Winter, Eastern European Construction Forecast Association, December 2023, p. 56) and so does not compensate much for the congestion increasing factors, although developments in other countries suggest that this may change. <https://www.axios.com/2024/01/16/ceo-return-to-office-wars>, Axios, accessed 2024-01-17, 0719h CET.

Roads important to international connectivity are affected by these developments both because they are often routes used by commuters, delivery vehicles and others traveling from one part of a city to another and because entry and exit from them is made difficult by congestion on other roads.

<sup>227</sup> TSD, pp. 125-126.

<sup>228</sup> Reducing coastal congestion can also improve the tourist experience. And tourists, given that they are on holiday, may be more amenable to using bicycles and light electric vehicles instead of fossil-fuel-powered cars.

<sup>229</sup> <https://total-croatia-news.com/news/new-toll-system-on-croatian-higways-to-be-introduced-hac-receives-bids/>, Total Croatia News, accessed 2024-01-16, 1648h CET.

in a project to be largely paid for by the EU.<sup>230</sup> If done right, and indications are that it will be,<sup>231</sup> this will greatly facilitate Croatia's connectivity with surrounding countries, since the country's current systems lead to massive traffic congestion, including kilometers long tailbacks, around holidays and during tourist seasons, when foreign vehicles enter the country in large numbers. An encouraging sign is that Croatia and its neighbor Serbia have agreed to implement an integrated system of electronic toll collection that will permit the payment of road tolls in each country using the other country's technology.<sup>232</sup> The problem, though, is that a simplistic implementation of the EU's "user pays" principle, which would call for charging vehicles tolls based on the number of kilometers they travel on Croatian roads, is unfair to at least some of Croatia's inhabitants. That's because in order to accommodate traffic surges caused by foreign vehicles entering and leaving the country during peak traffic periods, Croatia's roads must be oversized compared to what would be adequate for purely domestic traffic.<sup>233</sup> While all Croatians benefit from tourism, they do not do so to the same degree. The result is that charging tolls on a pure kilometer-driven basis means that many road users, e.g., workers commuting to Zagreb from its suburbs, end up paying for road capacity that they do not need, capacity that benefits not them but rather foreigners and coastal towns reliant on tourism revenues from those foreigners. This in part (plus presumably a typical destination country desire to soak the tourists) explains the strong push in Croatia for the use of vignettes, an alternative that the EU's "user pays" principle would not permit.

There is also an issue of generational unfairness. Many of Croatia's toll roads, e.g., those linking northeastern Croatia with Slovenia and Hungary, have considerably more traffic capacity than is currently required. One can

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<sup>230</sup> Commission Staff Working Document Analysis of the recovery and resilience plan of Croatia Accompanying the document Proposal for a Council Implementing Decision amending Implementing Decision (EU) (ST 10687/21 INIT; ST 10687/21 ADD 1) of 28 July 2021 on the approval of the assessment of the recovery and resilience plan for Croatia.

<sup>231</sup> Available information indicates that the system will be cashless and multilane free flow, use automatic license plate readers and be open to a variety of toll chargers.

<sup>232</sup> <https://seenews.com/news/serbia-croatia-to-launch-joint-e-toll-system-in-sept-828406>, SEE News, accessed 2024-01-16, 1711h CET.

<sup>233</sup> "As part of the National Traffic Model for the Republic of Croatia two separate models were developed, one for the average daily traffic (ADT) that covers off-season period and the other for the average daily seasonal traffic (ASDT). Comparing the models, it can be concluded that the overall demand on country level in season is 20% higher than the demand off-season. Traffic demand in season, results with 2 times higher traffic demand on the main touristic routes, especially on the motorways that leads to the Adriatic coast and on the primary roads in the Adriatic Region." TDS, p. 113. These figures are out of date given the passage of time and, especially, the revision of the National Traffic Model, but they indicate the magnitude of the effect, which is likely considerably greater now that Croatia's tourism has boomed.

speculate as to the reasons for this, but the fact is that while this capacity will likely be needed in the future, once these regions develop, it goes unused now. Accordingly, a strict per-kilometer toll designed to pay off these roads' financing costs imposes a burden on current users of these roads that equitably should be borne by future users.

### 4.3.3. Alternative fuels

Croatia must rapidly increase the number and quality of the chargers available for EVs not just to meet its obligations to the EU, especially those under TEN-T criteria, but also to increase the adoption of EVs domestically and to encourage the use of EVs by foreigners, particularly tourists and, ultimately, long-haul goods carriers, driving on Croatia's roads.

### 4.3.4. Maintenance

While maintenance of Croatian roads has been a problem in the past, involving both under- and, somewhat questionable, over-maintenance, HAC at least seems to now be including future maintenance requirements in its plans from the start.<sup>234</sup> That said, Croatia has not had a good record regarding timely, cost-effective road maintenance.

## 4.4. Schengen issues

### 4.4.1 Reimposed border controls; border infrastructure

Slovenia imposed the controls discussed at *Border crossings* at 2.3.7. above because of pressure from Italy and Austria. This pressure will be removed only once Croatia succeeds in greatly reducing the number of asylum seekers and migrants using Croatia as a route to richer countries further west.

### 4.4.2. Connectivity with Hungary

Croatia's road network is significantly less well connected with Hungary's than it is with those of the former Yugoslav republics that border Croatia.

### 4.4.3. Connectivity with Serbia, Bosnia-Herzegovina and Montenegro

The failure of Serbia and Bosnia-Herzegovina to deal effectively with asylum seekers and migrants and the virulently nationalist politics of the leaders of Serbia and the Republika Srpska entity of Bosnia-Herzegovina are considerable disincentives to Croatia's upgrading border infrastructure with them. This situation is not likely to improve in the near future and may indeed get worse.

<sup>234</sup> <https://www.croatiaweek.com/motorway-all-the-way-to-dubrovnik-to-be-completed/>, Croatia Week, accessed 2024-01-16, 0748h CET.



### 4.5. Multimodal facilities

#### 4.5.1. Generally

Croatia has an increasing, although still inadequate number of logistics facilities, but it has a real dearth of multimodal facilities. This is most likely because the weakness of its rail system rendered such facilities of very limited value in the past. Now that the country's rail system is improving, the construction of more multimodal facilities is at least being discussed. But it is important for several reasons that many more actually get built: Multimodal facilities are essential to meeting the EU Green Deal's targets for shifting both goods and passenger traffic away from road to rail and other transport modalities. Also, in Croatia cargo-oriented multimodal facilities are particularly important for the country's larger seaports and, if Croatia succeeds in making them significant cargo hubs, potentially for river ports as well. Croatia's smaller seaports, more oriented toward passenger traffic, could also find multimodal facilities useful if passenger traffic can in fact be transferred to public transit. Split provides a good example of how this could be done.

#### 4.5.2. Urban nodes

Well-conceived and implemented multimodal facilities are especially important for urban nodes. They are essential to making commuter and other passenger journeys convenient, freight deliveries swift and non-disruptive and both of them environmentally sound as well as economically rational. Croatia has until now given limited thought as to how best to achieve these goals (Split is a notable exception<sup>235</sup>), which often requires close cooperation between competing politicians and political entities. It is now, though, essential that all relevant levels of government coordinate closely on matters relating to urban nodes and that municipalities' Sustainable Urban Mobility and Monitoring Plans (SUMPs) benefit from all relevant and useful input. Whether such cooperation will in fact be possible and in what forms will depend greatly on the political alignments that result from Croatia's upcoming 2024 parliamentary elections.

#### 4.5.3. Safe and Secure Parking

Croatia lacks Safe and Secure Parking facilities.<sup>236</sup> While it is by no means alone in this,<sup>237</sup> while there has been some recent construction of these

<sup>235</sup> <https://total-croatia-news.com/news/travel/split-airport-6/>, Total Croatia News, accessed 2024-01-16, 1901h CET, and <https://mmpi.gov.hr/infrastructure/news/govt-supports-3-infrastructure-projects-for-split-worth-eur-405-mn-36505/19410>, MMPI, accessed 2024-01-16, 1905h CET.

<sup>236</sup> <https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html> Safe and Secure Parking overlay, TENtec, accessed 2024-02-01, 0905h CET.

<sup>237</sup> Only 3% of parking places in the EU were certified as safe and secure in 2022. <https://>

facilities<sup>238</sup> and while to an extent it is understandable that Croatia has not emphasized building them, given that the country is relatively safe for both travelers and commercial drivers and given the tensions between Croatia and Serbia and the Republika Srpska in Bosnia-Herzegovina (to which some of the main goods routes through Croatia run), providing such facilities would be a relatively inexpensive way to speed the movement of goods through the country, including to and from Croatia's northeast, which shows signs of becoming increasingly industrialized.

### 4.6. Climate change and other emerging threats

The dramatic global warming of the last few years, the COVID-19 pandemic and the Russian aggression against Ukraine show that what once were considered tail risks can pack quite a sting. Croatia must do what it can to defend against these threats.

#### 4.6.1. Climate change

The dangers of global warming, already severe, may be increasing even more rapidly than previously feared and with unpredictable consequences.<sup>239</sup> For Croatia, this presents a number of threats, including coastal and river flooding, changes in tourism patterns due to increased weather variability and more frequent extreme weather, climate migration and resultant political complications, drought and resulting increased wildfire hazards, etc.<sup>240</sup> Unfortunately, Croatia's strategy for mitigating the effects of climate change on road transport is dated and poorly developed.<sup>241</sup>

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[www.iru.org/news-resources/newsroom/eu-council-ten-t-approach-good-passengers-falls-short-freight](http://www.iru.org/news-resources/newsroom/eu-council-ten-t-approach-good-passengers-falls-short-freight), IRU, accessed 2024-01-15, 1420h CET.

<sup>238</sup> E.g., on the motorway to Zagreb from the Bregana border crossing with Slovenia.

<sup>239</sup> <https://www.axios.com/2024/01/12/climate-change-hottest-year-record-2023>, Axios, accessed 2024-01-15, 0648h CET.

<sup>240</sup> See as to flood risk, e.g., [https://environment.ec.europa.eu/news/will-more-frequent-river-floods-cause-widespread-malfunction-european-road-networks-2023-01-25\\_en](https://environment.ec.europa.eu/news/will-more-frequent-river-floods-cause-widespread-malfunction-european-road-networks-2023-01-25_en), EU Directorate-General for Environment, accessed 2024-01-31, 2050h CET and as to wind risk <https://duckduckgo.com/?q=bura+closes+bridge+in+croatia&t=ffab&atb=v342-1&ia=web>, accessed 2024-01-31, 2128h CET listing news articles about the closure of roads and bridges by the bura wind.

<sup>241</sup> The TDS, issued in 2017, is the operative document for Croatia's climate mitigation strategy for transportation infrastructure. Climate Change Adaptation Strategy in the Republic of Croatia for the Period until 2040 with a view to 2070, Ministry of Economy and Sustainable Development, April 2020, p. 8. The TDS limits itself to declaring, p. 252, that "[a]ll infrastructure projects arising from the measures of the Strategy shall be planned with taking into account the potential climatic phenomena in the area of implementation of the measure. Project design needs to be implemented in accordance with non-formal guidelines: "Non-paper Guidelines for Project Managers: making vulnerable investments climate resilient" European Commission, Climate Policy Directorate-General" and, p. 206, as part of General Measure G.13, stating that "[a]t the same time, the transport infrastructure and business shall be built, taking into account possible consequences of climate changes and extreme weather conditions on them."

### 4.6.2. Emerging diseases

One extraordinarily important, but often neglected and occasionally ridiculed, threat that climate change makes both more likely and more dangerous<sup>242</sup> is the potential for a new pandemic. The World Health Organization has very recently reiterated its long-standing warning about this danger.<sup>243</sup> No clear and simple defense against this danger exists, and the consequences of major disease-caused disruptions to transportation systems can be economically devastating as the COVID-19 pandemic clearly showed. One key, and troubling, problem in addressing the dangers of pandemics is that the current push to move passengers from personal vehicles to public transport, while it helps fight the climate change that can contribute to the rise of pandemics, can also contribute to their spread once they have arisen.

### 4.6.3. Security risks

Critical infrastructure has become a target of both private and national actors, both digitally<sup>244</sup> and physically.<sup>245</sup> The increasing reliance of Croatia on digital systems for its roads (ITS, tolling, etc.) makes the country increasingly vulnerable to a cyberattack. One need only ponder the societal and economic consequences of an outage during Croatia's tourism season of the country's new national tolling system to recognize the potentially devastating consequences of such an assault.

## 5. Policy Recommendations

### 5.1. Strategic Planning

It is high time that Croatia prepared a new TDS and a new National Transport Model, as well as action plans based on them. These strategic planning tools would guide not just road construction, improvement, and mainte-

<sup>242</sup> Because climate change leads to the migration of pathogenic organisms to new regions unprepared to deal with them, see, e.g., <https://oxsci.org/climate-change-and-diseases-how-does-it-end/>, The Oxford Scientist, accessed 2024-01-31, 2146h CET, and also increases the likelihood of animal to human transmission of pathogens, see, e.g., <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8776135/>, W.L. Filho et al, Int J Environ Res Public Health, January 2022, and sources cited.

<sup>243</sup> See, e.g., <https://www.axios.com/2024/01/19/disease-x-plan-world-economic-forum>, accessed 2024-01-31, 2138h CET, and <https://www.theguardian.com/society/2024/jan/21/arctic-zombie-viruses-in-siberia-could-spark-terrifying-new-pandemic-scientists-warn>, accessed 2024-01-31, 2136h CET.

<sup>244</sup> E.g., among many others, [https://www.theregister.com/2021/05/10/colonial\\_pipeline\\_ransomware/](https://www.theregister.com/2021/05/10/colonial_pipeline_ransomware/), The Register, accessed 2024-01-31, 2256h CET; [https://www.theregister.com/2023/05/25/china\\_volt\\_typhoon\\_attacks/?ref=biztoc.com](https://www.theregister.com/2023/05/25/china_volt_typhoon_attacks/?ref=biztoc.com), The Register, accessed 2024-01-31, 2257h CET, and [https://www.theregister.com/2024/01/29/satellite\\_navigation\\_jamming\\_now\\_a/](https://www.theregister.com/2024/01/29/satellite_navigation_jamming_now_a/), The Register, accessed 2024-01-31, 2258h CET.

<sup>245</sup> E.g., <https://www.npr.org/2022/12/09/1141937948/north-carolina-attacks-highlight-the-vulnerability-of-power-grids>, NPR, accessed 2024-01-31, 2300h CET.

nance, but also inform work in other transportation sectors, which themselves have undergone many changes in the last few years. Ideally, Croatia would also prepare a strategy document and an action plan focused solely on the road sector, as it has done for the inland waterway transportation sector.<sup>246</sup> Without such detailed, subsector-specific planning documents, Croatia is vulnerable to ad hoc and short-term decision making inconsistent with its, and the EU's, long-term goals.<sup>247</sup>

### 5.2. Effective, efficient administration

Preparation of the strategic planning documents called for at *Strategic planning* at 4.1. would be a great help in enabling Croatia's government to deal with the challenge of implementing the highly costly and complex transportation projects it has committed to undertake in the next five years. Beyond that, it is essential that Croatia does not overextend itself administratively, since doing so would be fatal to accomplishing its objectives. Better to move at a slower pace effectively and efficiently than faster but chaotically.

### 5.3. The effects on international connectivity of policy choices regarding Croatia's domestic road network

#### 5.3.1. Urban congestion

Simply building more roads or adding more lanes to existing roads does not solve the urban congestion problem.<sup>248</sup> Rather, a more complex mixture of policy measures must be employed.<sup>249</sup> Although they have numerous mod-

<sup>246</sup> Strategija razvitka riječnog prometa u Republici Hrvatskoj za razdoblje od 2022. do 2032., Government of Croatia, July 2022; Srednjoročni plan razvitka vodnih putova, luka i pristanista Republike Hrvatske za razdoblje od 2022. do 2031. godine, Government of Croatia, August 2022, and Akcijski plan 2022. – 2024. za provedbu Srednjoročnog plana razvitka vodnih putova, luka i pristanista Republike Hrvatske za razdoblje od 2022. do 2031. godine, Government of Croatia, August 2022.

<sup>247</sup> Given the relative disorder in Croatia's railway planning processes versus that for road planning and given the interaction between railway renovation and expansion and road network improvement, it may make sense to first prepare a subsector strategy document and action plans for the country's rail sector and then move on to planning tools for roads.

<sup>248</sup> Providing more road capacity cost-free to users does not result in a decrease in congestion but rather leads users to increase their usage until the limit of the new capacity is reached and congestion again occurs. The Fundamental Law of Road Congestion: Evidence from US Cities, Giles Duranton and Matthew A. Turner, <https://www.nber.org/papers/w15376>, National Bureau of Economic Research, accessed 2024-01-15, 1349h CET.

<sup>249</sup> These include ensuring that urban multimodal facilities are available to allow passengers and freight to switch transport modalities for the "last mile". They also include ensuring and expanding the availability of urban mobility solutions, including public transportation, taxis, private hire vehicles and personal mobility solutions (e.g., bicycles and light EVs such as bikes and scooters). It also requires the provision of the infrastructure, such as bike lanes and bike parking and EV chargers, to support these solutions. ITS plays a role (e.g., in timing traffic lights) as does city planning (e.g., the fifteen-minute-city concept to ensure walkable, energy-efficient, uncongested neighborhoods).

els<sup>250</sup> and significant research<sup>251</sup> to support them, it is not clear that Croatia's cities are up to the political, administrative and technical challenge of devising and implementing such measures.<sup>252</sup>

One policy measure useful for reducing congestion is congestion pricing. The economics of internalizing the externalities created by congestion are clear and have been for decades.<sup>253</sup> So have the equity and political issues.<sup>254</sup> The former are relatively easy for municipal governments to deal with but the latter often kill projects. Still, more and more cities are deciding that the benefits outweigh the political costs.<sup>255</sup> Zagreb, with its extremely dense traffic, seems a particularly good candidate.

Autonomous vehicles (AVs) have a role to play in reducing urban traffic congestion, but it is not yet clear how or when. In particular, the technology is far from adequate for crowded city streets,<sup>256</sup> and it is uncertain when it will be. Given that Croatia is supporting a local contestant in the AV technology contest,<sup>257</sup> it is essential that it avoid the danger that local boosterism will lock it into a technology that in the end may not be widely adopted.

### 5.3.2. Road tolls

Congestion pricing is a potential solution to the quandary of how to price road access to fairly apportion the cost of the additional traffic capacity required to accommodate Croatia's tourist waves. The per-kilometer price of

<sup>250</sup> E.g., Paris, Copenhagen and Amsterdam, among many others.

<sup>251</sup> E.g., <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/infrastructure-technologies-challenges-and-solutions-for-smart-mobility-in-urban-areas>, McKinsey, accessed 2024-01-15, 1111h CET.

<sup>252</sup> Some of this challenge is cross-jurisdictional. For example, improving Croatia's secondary roads will attract local traffic from roads that carry significant international traffic, thus improving Croatia's connectivity. But this requires coordination among municipalities and between municipalities and the national government. This highlights the importance of high quality SUMP.

<sup>253</sup> See, e.g., Road Pricing: The Economic and Technical Possibilities, United Kingdom Ministry of Transport, Her Majesty's Stationery Office, 1964; The Economics of Road User Charges, Alan A. Walters, International Bank for Reconstruction and Development and International Development Association, January 11, 1968, and Principles of Efficient Congestion Pricing, William Vickrey, June 1992, <https://www.vtpi.org/vickrey.htm>, accessed 2024-01-31, 1554h CET.

<sup>254</sup> E.g., Equity and Congestion Pricing: A Review of the Evidence, Liisa Ecola and Thomas Light, The Rand Corporation, 2009.

<sup>255</sup> E.g., Singapore, London and New York City.

<sup>256</sup> As the problems experienced by Cruise (<https://www.theguardian.com/technology/2024/jan/25/self-driving-car-cruise-probe-gm-collision>, The Guardian, accessed 2024-01-31, 0944h CET) and Tesla (<https://apnews.com/article/tesla-investigations-justice-department-musk-self-driving-29a68864f-75c9fabbd0417a87d169444>, AP News, accessed 2024-01-31, 0944h CET) demonstrate. But see *contra* the success of Waymo (<https://jabberwocking.com/waymos-driverless-cars-are-really-safe/>, Kevin Drum, accessed 2024-01-31h 0949h CET).

<sup>257</sup> <https://n1info.hr/english/news/ec-approves-croatias-state-aid-of-e179-5-m-for-rimacs-robo-taxi-project/>, N1 Info, accessed 2024-01-31, 1619h CET.

road use could be raised during high usage periods and lowered it during periods of lower use.<sup>258</sup> It is less clear how generational issues can be dealt with, especially given that these are less specific to Croatia's particular circumstances.

### 5.3.3. Alternative fuels

Croatia has the financing required to rapidly and significantly expand its EV charging capabilities.<sup>259</sup> The question is which locations and what technologies to prioritize. The where seems clear: coastal municipalities and the international routes leading to them, international cargo routes and densely populated urban areas. As to the what, the focus should be for now on personal vehicles and smaller commercial vehicles, since the technology to be used for larger, long-distance goods and passenger vehicles is not yet mature.

Many of the decisions as to the where and what can be left to the private sector, which is well positioned to assess market demand and increasingly interested in rolling out charging facilities in Croatia. Accordingly, Croatia should focus on ensuring that the chargers on its key tourist and goods international routes are adequate in number and technology and providing appropriate subsidies to the private sector to fund a rollout considerably more rapid than would occur without them. To ensure that vehicle electrification contributes as fully as possible to reduction in the emission of GHGs, Croatia must also remove the roadblocks that currently exist to implementation of solar and wind power plants in the country.

Hydrogen and biofuels should not at this time be emphasized. Although Croatia has funding for a number of projects in this area,<sup>260</sup> both technologies are still in development, and given the speed at which battery technology is evolving it is not clear how competitive they will be in the long term, even for heavy, long-range, goods-transport road vehicles.<sup>261</sup>

### 5.3.4. Maintenance

To keep maintenance costs down, and to ensure that maintenance money are spent effectively and efficiently, Croatia should rapidly conform to the EU's recommendations regarding good maintenance practices, including but not limited

<sup>258</sup> The prices would of course not adjust on an hourly or daily basis but would rather be set significantly in advance for specific, longer time periods.

<sup>259</sup> Commission Staff Working Document Analysis of the recovery and resilience plan of Croatia Accompanying the document Proposal for a Council Implementing Decision amending Implementing Decision (EU) (ST 10687/21 INIT; ST 10687/21 ADD 1) of 28 July 2021 on the approval of the assessment of the recovery and resilience plan for Croatia.

<sup>260</sup> Ibid.

<sup>261</sup> Trains and ships are another matter.

to preparation and implementation of five-year maintenance plans and full implementation and careful use of a high quality road asset management system.

### **5.4. Schengen issues**

#### **5.4.1. Reimposed border controls; border infrastructure**

Croatia's Schengen problem involves both permitted and unpermitted border crossers. Regarding permitted border crossers, Croatia should make it as easy as possible for vehicles to enter Croatia (something which it has significant ability to influence), including by, to the extent consistent with border security, removing border police kiosks and straightening traffic lanes at the main border crossings with Slovenia and encouraging Slovenia to do the same. As to vehicles exiting Croatia, Croatia should streamline traffic movement on its own side of the border, try to agree a work-sharing arrangement with Slovenia for the inspection of vehicles and otherwise take measures to speed the inspection process. The problem of unpermitted border crossers is too broad and too intractable to be addressed here. But it is clear that Croatia, like other countries on the Schengen frontier, must find a way to humanely and effectively prevent asylum seekers and migrants from entering and/or transiting it in ways unpermitted by law.

#### **5.4.2. Connectivity with Hungary**

Now that Croatia has entered the Schengen Area, Croatia should make increasing and improving its road network's connectivity with Hungary a priority. This should be relatively simple and low cost since many of the roads involved will be upgraded as part of Croatia's planned improvements of its express road and secondary road networks.

#### **5.4.3. Connectivity with Serbia, Bosnia-Herzegovina and Montenegro**

While Croatia's slow walk in improving connectivity with these countries is understandable for the reasons given at *Connectivity with Serbia, Bosnia-Herzegovina and Montenegro* at 4.4.3. above, speeding the transport of goods transiting these countries would economically benefit Croatia as well as Western Balkan countries not responsible for Croatia's border problems. Given the lack of political issues with Montenegro and given Croatia's plan to extend its A1 motorway to Montenegro's border, it would make sense for Croatia and Montenegro to significantly improve their border crossing infrastructure and so reduce the long wait times, see *Border crossings* at 2.3.7. above, that can impede transport between them.

## **5.5. Multimodal facilities**

### **5.5.1. Generally**

For economic and administrative efficiency, and to make use of scarce construction resources, the building of multimodal facilities will in most cases need to be timed to correspond with improvements to Croatia's rail network. This will be a difficult task for Croatia, but one that it is important for it to get right. Building multimodal facilities too slowly will impede the country's economic growth, while building them too quickly will be a waste and misallocation of resources.

### **5.5.2. Urban nodes**

The initial focus regarding multimodal facilities in connection with urban nodes should be on Zagreb, because it is the city whose congestion most disrupts Croatia's international connectivity and domestic traffic flow. Other urban nodes should be prioritized based on feasibility (is the other infrastructure, e.g., rail, in place to make a multimodal facility useful?) and economic and traffic impact (e.g., would construction of a multimodal facility significantly increase the utility of a port or reduce road congestion?).

### **5.5.3. Safe and Secure Parking**

While Croatia's TEN-T obligations require it to build Safe and Secure Parking facilities, they should be a priority for Croatia only to the extent that they are also a priority for the other countries through which the relevant TEN-T routes run, since the economic benefit to the Croatia from constructing them is limited.

## **5.6. Climate change and other emerging threats**

### **5.6.1. Climate change**

In general, Croatia should make itself intimately familiar with, and assiduously follow, the EU's recommendations on climate proofing transportation infrastructure,<sup>262</sup> including by updating its TDS to reflect those recommendations and others. Flood and wind risks pose particular hazards for Croatian roads and those driving on them, and must be addressed in road design and construction far more carefully than they often have been in the past.

### **5.6.2. Emerging diseases**

The speed and unexpectedness with which pandemics can arise and spread in the modern world means that Croatia's planning and coordination, including with other countries and international organizations, as to how to

<sup>262</sup> E.g., Commission Notice: Technical guidance on the climate proofing of infrastructure in the period 2021-2027, European Commission, July 29, 2021.



deal with them must be constant and comprehensive. This is especially important in the area of transportation, since transportation plays a key role both in spreading diseases and in distributing the medications and other supplies needed to defeat them. Croatia must learn from the COVID-19 experience,<sup>263</sup> including being fully prepared to rapidly implement the EU's Contingency Plan for Transport.<sup>264</sup>

### 5.6.3. Security risks

The ability of digital attackers to penetrate critical computer systems of even sophisticated organizations makes it clear that Croatia must devote considerable resources to defending its infrastructure, including its road infrastructure, from cyberattack. Physical security cannot be ignored, either.<sup>265</sup> Given Croatia's increasing prominence as an ally of, e.g., Ukraine, the threat is likely to grow with time, not shrink.

<sup>263</sup> See, e.g., <https://www.cambridge.org/core/journals/european-journal-of-risk-regulation/article/abs/good-the-bad-and-the-rest-how-the-european-union-responded-to-the-covid19-pandemic-in-the-transport-sector/C5C9EEDDA08689C87686244DC63E2351>, Pierpaolo Settembri and Rishi Kumar, *European Journal of Risk Regulation*, March, 1, 2023, and sources cited for a useful description of this experience.

<sup>264</sup> [https://transport.ec.europa.eu/news-events/news/protecting-eu-transport-times-crisis-commission-adopts-contingency-plan-transport-2022-05-23\\_en](https://transport.ec.europa.eu/news-events/news/protecting-eu-transport-times-crisis-commission-adopts-contingency-plan-transport-2022-05-23_en), European Commission, accessed 2024-01-31, 2250h CET.

<sup>265</sup> <https://www.theguardian.com/world/2023/mar/16/poland-arrests-nine-over-alleged-plot-to-sabotage-ukraine-arms-supplies>, *The Guardian*, 2024-01-31, 2314h CET.

# Road Infrastructure in Greece

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## Road Infrastructure in Greece

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## 1. Overview of Existing Road Infrastructure

### 1.1. Main Road Network

The Greek road network spans a total length of 117,000 kilometers. Breaking this down, it averages out to 0.01 meters per person for each of the country's 10.57 million inhabitants, placing Greece in the 46th position worldwide. However, it's essential to consider Greece's relatively small size and population density of roughly 80 inhabitants per square kilometer. Countries with larger land areas and fewer residents naturally yield different results, as they need to offer accessibility to remote areas, despite being less populated. *Table 1* provides an overview of the road network in Greece and Europe in terms of length, km per 1 million inhabitants and m per km<sup>2</sup>.<sup>266</sup>

*Table 1. Overview of Greek and European road and highway network*

Location	Total Length of Roadways	Per 1 million inhabitants	Per km <sup>2</sup>
Greece	117,000 km	11,072.70 km	0.89 m
Europe	8,475,010 km	1,091.97 km	0.37 m

The primary road network of Greece is comprised of the following motorways:<sup>267</sup>

- **P.A.TH.E. motorway:** This is the major road axis that links the northern and southern regions of the country, covering a total distance of 550 km. It connects the country's major urban agglomerations (Athens, Thessaloniki, Larissa) and the border with Northern Macedonia. It is also part of the trans-European transport network (TEN-T).
- **Egnatia Odos motorway:** Stretching across 670 km, Egnatia Odos traverses Northern Greece, running from Igoumenitsa in the west to Kipi at the Turkish border in the east. Numerous branches extend from Egnatia Odos, connecting various cities in Northern Greece, including Kozani, Veria, Drama, and Alexandroupoli.

<sup>266</sup> <https://www.worlddata.info/europe/greece/transport.php>

<sup>267</sup> <http://tlobservatory.imet.gr/en/thecorridor>

- **Central Greece motorway:** This motorway serves the areas of Fthiotida, Karditsa, Trikala, and Grevena, offering a connection between the P.A.TH.E. and Egnatia Odos motorways, spanning from Lamia to Kipoureio. Its total length is anticipated to reach 174 km. This motorway is partially constructed and expected to be completed by 2025.
- **Olympia Odos motorway:** Extending for 205 km, Olympia Odos is the principal road axis connecting the northern part of the Peloponnese with the prefecture of Attica. It links Patras and Athens via the Corinth isthmus.
- **Ionia Odos motorway:** Serving the western part of Greece from north to south, this motorway, upon completion, will span a total of 417 km, linking Ioannina with Patras and Kalamata, passing through the Rio-Antiriro bridge.
- **Moreas motorway:** Covering a distance of 155 km, Moreas Motorway is the primary road axis of central Peloponnese, connecting Corinth with Tripoli and Kalamata.
- **Northern Road Axis of Crete (Motorway 90):** This road axis is under construction and will facilitate interregional transport on the island of Crete, linking the cities of Chania, Rethymno, Heraklion, and Agios Nikolaos.

### 1.2. Road Quality

As for the Road Quality Indicator,<sup>268</sup> Greece averaged a score of 4.27 points, between years 2006 and 2019, with the lowest score recorded at 3.98 points in 2011 and the highest at 4.7 points in 2018. The most recent data point from 2019 equals to 4.6 points. To put this in context, the global average in 2019, which is based on data from 141 countries, was 4.07 points. The Road Quality Indicator is a component featured in the annual Global Competitiveness Index, which is released by the World Economic Forum (WEF). This indicator serves as an evaluation of road infrastructure quality within a specific country and relies on data collected through the WEF Executive Opinion Survey. The score for the road quality indicator is derived from just one question posed to survey respondents who are requested to assess the condition of the roads in their respective countries, rating them on a scale ranging from 1 (indicating underdeveloped roads) to 7 (representing roads that meet international efficiency standards).<sup>269</sup>

<sup>268</sup> As reported by [https://www.theglobaleconomy.com/Greece/roads\\_quality/](https://www.theglobaleconomy.com/Greece/roads_quality/) based on 2019 Global Competitiveness Index, World Economic Forum

<sup>269</sup> Ibid.

### 1.3. Electronic Tolling Service and Interoperability

Tolls are imposed for most motorways in Greece (incl. PA.TH.E. Odos, Aegean Odos, Attiki Odos, Egnatia Odos, Ionia Odos, Kentriki Odos E65, Moreas Odos and Olympia Odos), Rio-Antirrio Bridge and Aktio-Preveza Tunnel.<sup>270</sup> In terms of interoperability, the electronic tolling service implemented on Greece's entire network of toll roads has facilitated seamless coordination among the participating toll infrastructures. Drivers are able to pass through electronic toll lanes at any toll station throughout Greece, regardless of the issuer of their transponder. Transponder accounts and invoices are managed by the transponder issuer, and topping up accounts is easily done electronically, eliminating the need for physical visits to issuer facilities.<sup>271</sup>

### 1.4. Road Safety

Greece maintains a relatively high level of road safety with an average of 980 traffic fatalities annually from 2013 to 2019. This translates to 9.1 accident-related deaths per 100,000 inhabitants each year. To provide context, the corresponding figures are 12.3 in the United States and 17.0 globally<sup>272</sup>.

### 1.5. Number of Vehicles

Finally, over the past 5 years the number of registered vehicles in Greece has been increasing on a yearly basis. In December 2022, 7,158,543 vehicles were registered in Greece, marking an increase compared to the earlier figure of 7,022,617 vehicles recorded in December 2021.<sup>273</sup>

## 2. Strategic National and International Documents Related to Road Infrastructure and Connectivity

### 2.1. Strategic Framework for Investment in Transport (SFIT) and National Transport Plan for Greece

In November 2014, Greece's Ministry of Infrastructure, Transport, and Networks published the Strategic Framework for Investment in Transport (SFIT), outlining capital investment needs over the period from 2014 to 2025. This framework aimed to meet requirements for EU funds and included various infrastructure projects. However, it lacked clear links between investments and specific problem analyses or objectives.

To address this, in 2015, the Ministry initiated the development of a National

<sup>270</sup> <https://www.tolls.eu/greece>

<sup>271</sup> <https://www.hellastron.com/greek-toll-road-interoperability-improved-user-experience/>

<sup>272</sup> <https://www.worlddata.info/europe/greece/transport.php>

<sup>273</sup> <https://www.ceicdata.com/en/indicator/greece/number-of-registered-vehicles>

Transport Plan for Greece, focusing on sustainable transport infrastructure and services from 2027 to 2037. This plan would analyze the transport sector comprehensively, include a Strategic Environmental Assessment (SEA), and establish a National Transport Model. The Ministry collaborated with the European Commission's Structural Reform Support Service (SRSS) and the European Investment Bank (EIB) to develop the National Transport Plan.<sup>274</sup>

### 2.2. TEN-T Network in Greece

The plan's development aligned with EU directives and strategies, such as the EU 2011 White Paper, TEN-T Network and the Orient/East Med Corridor Work Plan. Indeed, as per the EU 2011 white paper, the European Commission approved a plan consisting of 40 specific actions for the following ten years. This plan's target was to construct a competitive transportation system that enhanced mobility and stimulated economic growth and job creation. Simultaneously, the proposals aimed in minimizing Europe's reliance on imported oil and the reducing carbon emissions in the transport sector by 60% by the year 2050.<sup>275</sup> TEN-T consists of two distinct network "tiers":

- The Core Network encompasses critical connections that link pivotal nodes and is scheduled for completion by 2030.
- The Comprehensive Network spans across all European regions and is planned for completion by 2050.

The foundation of the Core Network consists of nine Core Network Corridors. The only corridor present in Greece is the Orient – East Med Corridor, integrating various modes of transportation, including road, rail, air, and maritime routes, stretching from the Southeastern Mediterranean Sea (Cyprus and Greece) to the North Sea, encompassing the city-port of Hamburg. Covering approximately 5,400 km of roads, 5,800 km of railway networks, and 1,700 km of inland waterways, the Orient/East-Med Corridor links substantial portions of Central Europe with ports along the North, Baltic, Black, and Mediterranean Seas. It connects 12 core ports: Hamburg, Bremerhaven, Bremen, Wilhelmshaven, and Rostock in Germany; Burgas in Bulgaria; Lemesos in Cyprus; and Piraeus, Heraklion, Thessaloniki, Igoumenitsa, and Patras in Greece. The corridor spans nine EU Member States from north to south, including Germany, Czech Republic, Slovakia, Austria, Hungary, Romania, Bulgaria, Greece, and Cyprus.<sup>276</sup>

<sup>274</sup> EIB (2019), National Transport Plan for Greece, Final Transport Plan Report, TA2017028 GR GRS, June 2019

<sup>275</sup> [https://transport.ec.europa.eu/white-paper-2011\\_en](https://transport.ec.europa.eu/white-paper-2011_en)

<sup>276</sup> <http://tlobservatory.imet.gr/en/thecorridor>

In addition, it is worth mentioning the Adriatic-Ionian Corridor (AIC), also known as the “Blue Corridor,” which is a planned highway that will establish a connection between Northern Italy and Southern Greece. This connection will traverse several countries, including Slovenia, Croatia, Montenegro, and Albania.<sup>277</sup>

### 2.3. Connected and Autonomous Mobility

Also, in 2021 the Hellenic Ministry of Digital Governance issued a request for information (RFI) for establishing 5G corridors across Greece to support the requirements of Connected and Autonomous Mobility (CAM).<sup>278</sup> The project’s objective is to examine, identify, and establish the necessary components of network infrastructure to enable smart vehicle functionalities on Greek highways mentioned in *Table 2*, while ensuring compliance with national, European<sup>279</sup>, and international laws and regulations, such as ITU and GDPR.

*Table 2* provides an overview of the interlinked highways connecting major points of interest such as airports and border crossings, including their respective lengths, which constitute major components of the core Trans-European Transport Networks (TEN-T).

*Table 2. List of Greek TEN-T motorways and their corresponding lengths<sup>280</sup>*

Road axis	Length (km)
Egnatia Odos (Igoumenitsa- Thessaloniki – Kipoi Evrou)	670
A.T.E (Athens – Thessaloniki –Evzonoï)	550
Ionia Odos (Tsakona- Patra-Ioannina- Kakavia)	417
Olympia Odos (Athens – Korinthos – Patra)	205
Thessaloniki – Serres- Promachonas	105
Attiki Odos (Elefsina- El Venizelos International airport)	64
Central Peloponnisos (Moreas – Korinthos- Tripoli- Kalamata)	205
Central Greece	181
TOTAL	2,397

Use cases to be assessed as per the RFI include the following<sup>281</sup>:

- **Vehicles platooning:** Facilitates the formation of vehicle groups that travel together in a dynamic manner. All vehicles within the platoon receive regular data updates from the lead vehicle to support platoon oper-

<sup>277</sup> <http://systema.com.gr/en/adriatic-ionic-road-corridor-in-albania-and-montenegro-murriqan-lezhe-section/>

<sup>278</sup> <https://mindigital.gr/archives/2536>

<sup>279</sup> More details on EU level actions on connected and automated mobility: <https://digital-strategy.ec.europa.eu/en/policies/connected-and-automated-mobility>

<sup>280</sup> Ibid.

<sup>281</sup> <https://mindigital.gr/archives/2536>

ations. This data enables vehicles to maintain extremely short distances between them, with minimal time gaps (often less than a second).

- **Advanced driving:** Facilitates semi-automated or fully automated driving with a greater distance between vehicles. Each vehicle or Road Side Unit (RSU) shares data collected from its own sensors with nearby vehicles. This data exchange enables vehicles to synchronize their paths and allows each vehicle to communicate its driving intentions to others in close proximity, offering advantages such as enhanced safety during travel, collision prevention, and increased traffic efficiency.
- **Extended sensors:** Allows sharing of raw or processed data collected from onboard sensors, live video feeds, or other sources between vehicles, Road Side Units (RSUs), pedestrian devices, and V2X application servers. This data exchange enables vehicles to augment their environmental perception beyond the capabilities of their own sensors, providing a more comprehensive understanding of the local conditions.
- **Remote driving:** Allows remote operation of a vehicle by a distant driver or a V2X application, catering to passengers who are unable to drive themselves or in situations where it's safer to operate a vehicle remotely, such as in hazardous environments. In cases where there is minimal variation and well-defined routes, like in public transportation, cloud-based driving can be employed.
- **Vehicle quality of service support:** Facilitates the V2X application to receive advance notifications regarding anticipated or estimated changes in service quality, allowing the 3GPP System to adjust the quality of service in accordance with the requirements of the V2X application.
- **Situation awareness:** Facilitates Back Situation Awareness for emergency vehicles public service (BSA). It's important for drivers to have back situation awareness to avoid collisions or accidents when maneuvering a vehicle in reverse.

The introduction of intelligent driving is expected to result in a decrease in car accidents and human casualties. Also, smart driving is anticipated to lead to enhancements in the efficiency of road transport, both in terms of time and cost, while also reducing CO<sup>2</sup> emissions and improving the overall environmental impact of transportation.



### 3. Cross-Border Connectivity and Bottlenecks

#### 3.1. Main Pan-European Corridors

The following are the main Pan-European roads that traverse or originate in Greece<sup>282</sup>:

- E65: North-south route that passes through Greece and connects the PATHE Motorway close to Lamia with the Egnatia Motorway near Grevena, passing through towns such as Karditsa, Trikala, and Kalambaka.<sup>283</sup>
- E75: North-south route that crosses Greece, commencing at the Greek-North Macedonian border in the north and proceeding southward through major Greek cities such as Thessaloniki, Larissa and Athens.
- E90: East-west route that traverses Greece, linking the western coast of the country to the eastern coast. It initiates in the port city of Igoumenitsa on the Ionian Sea and progresses eastward, passing through Ioannina and Thessaloniki before reaching Türkiye.
- E55: North-south route that crosses the western part of Greece passing through major cities such as Patra and Kalamata.

#### 3.2. Cross-border check points

In addition, Greece has several cross-border checkpoints (border crossings) that connect the country with neighboring countries (i.e., Bulgaria, North Macedonia, Albania and Türkiye). The following are the main road cross-border checkpoints in Greece:

- **Greek - Bulgarian Border (6 checkpoints & 1 planned):** Kulata - Promachonas, Ilinden - Exochi (or Gotse Delchev - Drama), Makaza - Nymfaia, Zlatograd - Thermes, Ivaylovgrad - Kyprinos, Svilengrad - Ormenio<sup>284</sup> and Rudozem -Xanthi (planned)<sup>285</sup>
- **Greek - North Macedonian Border (2 checkpoints):** Evzoni - Gevgelija/ Bogorodica, Medžitlija - Niki<sup>286</sup>
- **Greek - Albanian Border (4 checkpoints):** Kakavia - Gjirokaster, Kapshtica - Korca, Qafe Bote, Përmeti - Konica<sup>287</sup>
- **Greek - Turkish Border (2 checkpoints):** Kastanies - Pazarkule, Kipi - İpsala.<sup>288</sup>

<sup>282</sup> <https://unece.org/DAM/trans/conventn/MapAGR2007.pdf>

<sup>283</sup> <https://aecom.com/gr/projects/central-greece-motorway-e65/>

<sup>284</sup> <https://www.ferryhopper.com/en/blog/featured/guide-bulgaria-greek-ports-by-car>

<sup>285</sup> [https://ec.europa.eu/regional\\_policy/en/projects/Greece/new-greece-bulgaria-border-checkpoint-makes-for-safer-faster-travel](https://ec.europa.eu/regional_policy/en/projects/Greece/new-greece-bulgaria-border-checkpoint-makes-for-safer-faster-travel)

<sup>286</sup> <http://alltrafficcams.com/live/border-crossings/north-macedonia/greece/bogorodica-evzonoj/>

<sup>287</sup> <https://www.albania-holidays.com/travel-to-albania>

<sup>288</sup> <https://www.Türkiyevisaeasy.com/news/how-to-enter-Türkiye-via-its-land-borders>

Indicatively, *Table 3* presents the number of non-residents' arrivals from abroad per road cross-border checkpoint in 2015.

*Table 3. Arrivals of non-residents from abroad per road cross-border checkpoint (2015)*<sup>289</sup>

Road Cross-Border Checkpoint	Non-residents' arrivals
Evzoni	2,070,155
Kakavia	259,319
Kipi	514,263
Promachonas	1,493,598
Other	2,930,673
Total	7,268,008

Cross-border connectivity bottlenecks in Greece can vary over time and depend on factors such as infrastructure development, geopolitical conditions, and transportation needs. Some of the potential bottlenecks include:

- **Road Infrastructure:** The state of certain roads may necessitate upgrades or expansion to improve cross-border connections. In particular, motorway segments crossing the Athens and Thessaloniki metropolitan areas exhibit severe traffic congestion and strongly affect travel times.
- **Border Crossing Efficiency:** Delays and congestion at border checkpoints, especially during busy times or due to administrative procedures, often hinder smooth cross-border movement. Also, stringent customs and regulatory procedures slow down the movement of goods and people across borders. Furthermore, access to several border crossings is possible by the secondary road network, worsening connectivity with the country's motorways.
- **Geopolitical Factors:** Geopolitical dynamics and diplomatic relations with neighboring nations impact Greece's border connectivity.

#### 4. Summary and Outlooks for Major Road Infrastructure Projects

Currently, over 500 kilometers of new road infrastructure, including highways, bypasses, upgrades and enhancements are in the process of being constructed throughout Greece. Relevant investments cover both segments of the major road network and numerous improvements of regional and local roads. Funding for these initiatives come from the Partnership Agree-

<sup>289</sup> <https://www.statistics.gr/el/statistics/-/publication/STO04/2015-Q4>

ment 2014-2020 between Greece and the European Union, as well as from other domestic resources. The goal is to finalize these projects by the year 2027. Some of the major road infrastructure projects under construction are the following<sup>290</sup>:

- Southern (Xyniada-Lamia) and northern (Grevena-Trikala) segments of the A3 (Kentriki Odos) motorway, which will be part of the E65 route, connecting the A1 and A2 motorways (with a combined length of 94 kilometers);
- Egnatia Odos' vertical routes extending to Greece's borders with neighboring nations;
- A new 75-kilometer expressway connecting Patra and Pyrgos;
- The North Crete Road Axis (A90 motorway) spanning 200 kilometers, which will be a four-lane motorway stretching from Chania to Agios Nikolaos and passing through Rethymno and Heraklion; additional upgrades in vertical axes also involved;
- The 'Amvrakia Odos' motorway, covering a distance of 48.5 kilometers, will serve as a connection between the A5 (Ionia Odos) motorway, Aktio Airport, Preveza, and Lefkada;
- Road bypasses for major cities, including projects such as the Thessaloniki Western Internal Ring Road, Katerini Ring Road, and bypasses for the cities of Chalkida, Larissa, and Karditsa.

## 5. Summary and Outlooks for Road and Road - related Infrastructure Projects

### 5.1. Other Road Infrastructure Upgrades

In addition to the aforementioned major road infrastructure projects, other section upgrades/ local improvements have been planned for completion by 2027. Indicatively<sup>291</sup>:

- Road section Thessaloniki-Kilkis-Doirani;
- Route Potidaia-Kassandra in Chalkidiki;
- Improvement of Lamia-Karpenissi national road;
- Upgrade of Agrinio-Karpenissi national road;
- Construction of new connection from Patra bypass road to Patra-Tripoli national road;

<sup>290</sup> EIB (2019), National Transport Plan for Greece, Final Transport Plan Report, TA2017028 GR GRS, June 2019

<sup>291</sup> Ibid.

- Connection from Aigio Port to A8 motorway;
- Construction of road Lasteika-Ag. Ioannis bypass-Katakolo;
- New connection from A5 Terovo I/C to provincial road Ioannina-Plaka Bridge;
- Construction of Trikala-Arta road (section Pyli Bypass Road - Paleomonastiro) and road Delta-Palamas;
- Construction of Provincial Road Rizomylos-Koroni (section Tzane Bridge-Kalamaki);
- Upgrade of Provincial Road Gytheio – Areopoli – Gerolimenas;
- Completion of road works on Heraklio-Viannos axis.

### 5.2. Tunnels

Also, major infrastructure projects including two tunnels, namely the underwater links of Lefkada – Aitolokarnania<sup>292</sup> and Salamina - Perama<sup>293</sup> have scheduled completion by 2030. Finally, certain planned infrastructure projects in Athens, including the Kymi Avenue project extension with planned completion by 2030, have already been approved. This project is anticipated to bring notable traffic improvements to Athens and will involve the construction of a sizable tunnel, which is set to become the largest urban tunnel in the Mediterranean nation.<sup>294</sup>

## 6. Mapping of Existing Political, Ecological, Financial and Other Potential Challenges for Road Connectivity

Aiming in enhancing road connectivity both within a country and between different nations, it is important to analyze challenges affecting road infrastructure and road transport. The Greek National Transport Plan outlines existing challenges related to political, ecological, financial, and other factors.<sup>295</sup>

In Greece, the **institutional and organizational structure governing road management**, including development, maintenance, and operation, is needlessly complex. At the ministerial level, there are a minimum of four Directorates and two special services (EYDE) involved in road infrastructure projects.

<sup>292</sup> <https://www.capital.gr/oikonomia/3710066/orimazei-to-ergo-tis-zeuxis-leukadas-aitoloakarnanias/>

<sup>293</sup> <https://ypodomies.com/poia-einai-ta-deka-nea-emvlimatika-erga-ypodomis-tis-attikis-me-oriental-to-2030/>

<sup>294</sup> <https://greekcitytimes.com/2023/05/04/largest-inner-city-tunnel-greece/>

<sup>295</sup> EIB (2019), National Transport Plan for Greece, Final Transport Plan Report, TA2017028 GR GRS, June 2019

At the regional level, road management is divided among the Departments of Technical Works for each Region and its Regional Units. This complex organization results in none of the Directorates/ Regional Departments having a comprehensive perspective on road infrastructure matters, complicates responsibilities and obstructs logical planning and scheduling of road related projects.

**Transport related legislation is overly fragmented**, the legal and contractual framework regulating the operation and services of motorways contains uncertainties and it is occasionally outdated. Passing laws that do not comprehensively or clearly supersede previous laws unnecessarily complicates the tasks of both public officials and private operators. Instances of laws being overly broad and requiring multiple supplementary regulations to introduce or clarify specific concepts are often a fact. Sometimes, this complexity is justified by changes in EU legislation, while in other cases, it stems from hastily drafted legislation. Additionally, the system for enforcing road transport legislation is characterized by significant heterogeneity, a lack of suitable training, insufficient coordination, and inadequate monitoring of regional personnel. Regardless of the cause, the transport sector would benefit from a comprehensive legal revision.

**The road freight transport sector is highly inefficient**, primarily relying on aging and environmentally harmful trucks with limited carrying capacity. **The passenger vehicle fleet is aged**, with a few (yet increasing in numbers) hybrid or electric vehicles in operation. While recent government initiatives have initiated some change, there is an urgent need for the development of electric charging infrastructure networks and the implementation of ambitious strategies for fleet renewal. Additionally, in terms of road transport, intercity bus transportation services are notably pricier than the EU country average, i.e. 2 to 5 times higher than in other EU member states. Also, disparities among regions exist in relation to the quality of intercity bus transport services, including factors such as accessibility, pricing, and the range of commercial services offered. **The current intercity bus transport monopoly presents inefficiencies**, necessitating a revamp of the bus network to prioritize cost reduction for the end-user while enhancing public transport accessibility.

Engaging with local communities and stakeholders is essential for the success of road infrastructure projects. It helps address concerns and ensures that the road developments align with the needs and expectations of the people affected. The Greek transportation system endeavors to maintain a **minimum acceptable level of accessibility and social inclusion**. This

is achieved through the provision of various mobility benefits and the establishment of numerous Public Service Obligation agreements. However, this approach is costly, prompting the need for a reassessment of the current structure of transport networks and services. The goal is to uphold or enhance accessibility while simultaneously reducing expenses (and the fees paid by end-users). Public Service Obligation programs aim in optimizing the utilization of the limited available funds.

Adding to the challenges related to road infrastructure, **the absence of a centralized and comprehensive road database** including road inventory and condition data at both central and regional levels, coupled with the lack of systematic traffic data and the absence of modern tools for systematic planning, hinders obtaining a clear understanding of the road network, its state, and the volume of traffic it accommodates. Also, although there is a lack of comprehensive inventory and condition data for the national and provincial road network, it is evident that road maintenance suffers from inadequate funding, a common issue in many countries. This may lead to accelerated deterioration of road assets and increased road safety concerns.

Finally, targeting **road safety** improvement, several factors need to be addressed, including law enforcement, driver behavior, state and composition of the vehicle fleet, and condition and features of the road infrastructure. It should be noted that the Greek road network displays significant variation in relation to its geometric features, leading to safety concerns at locations where there are abrupt transitions between different road profiles or issues with road signage.

## 7. Proposals and Recommendations for Enhancing Road Infrastructure and Cross-border Connectivity

In recent years, there have been endeavors to enhance the Greek road infrastructure and reduce travel distances through significant investments and large-scale initiatives. These investments primarily concentrate on modernizing the current network by improving its infrastructure (such as road enhancements and the construction of tunnels and bridges), networks, and operational models. Nonetheless, there is still untapped potential for growth and development before Greece can establish itself as a significant transit hub in global trade.

Proposals and recommendations to further enhance road infrastructure and cross border connectivity could be split into 5 pillars namely<sup>296</sup>:

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<sup>296</sup> EIB (2019), National Transport Plan for Greece, Final Transport Plan Report, TA2017028 GR GRS, June 2019

- Improving the safety, sustainability, efficiency, and competitiveness of transportation
- Transforming PATHE into a highly efficient multimodal corridor
- Strengthening international land transport links
- Creating a well-functioning urban and suburban public transportations system to support the National Transport System
- Promoting regional mobility and development

Table 4 presents detailed issues and corresponding recommendations to enhance road infrastructure and connectivity per pillar.

*Table 4 National Transport Plan Proposals to enhance road infrastructure and connectivity<sup>297</sup>*

#	Issue	Recommendation
Pillar 1: Improving the safety, sustainability, efficiency, and competitiveness of transportation		
1	Non comprehensive and up-to-date road database including road inventory and condition information	Establishment of a Road Database and Pavement Management System (PMS) on both regional and central scales
2	Inefficient decision-making processes are a result of inadequate data collection methods due to factors such as absence of applicable legal frameworks, lack of centralization and data processing, limited use of standardized analysis methods and failure to generate Road Transport Industry KPIs	Development of a detailed and complete state-level database for the road transport sector
3	Maintaining both national and regional road networks would require approx. 550 million euros annually <ul style="list-style-type: none"> <li>• 150 million euros needed for 8,500 kilometers of national roads</li> <li>• 400 million euros needed for 30,000 kilometers of regional roads</li> </ul>	Establishment of mechanism for securing funds for road maintenance; make use of all financing options e.g., Public-private partnerships (PPPs), EC funding, project bonds and asset recycling
4	The Greek vehicle fleet is one of the oldest in Europe, and its aging has been exacerbated by the economic crisis since 2008; this situation negatively impacts the competitiveness, efficiency, safety, and environmental sustainability of Greece’s road transport sector	Renewal of the vehicle fleet; Tax and incentive system (bonus-malus) applied to vehicles categorized either as environmentally friendly or polluting vehicles
5	Limited institutional visibility at political level for road safety; existing penalties/ fines in Greece relatively lower than in other EU countries	Improvement of road safety awareness and revision of penalties for violations of road traffic rules
Pillar 2: Transforming PATHE into a highly efficient multimodal corridor		
6	According to the Transport Model, by 2027, there will be a traffic bottleneck on the southern section of A1, stretching from Schimatari (junction A1/A11) to Thiva; This bottleneck is projected to expand further, covering the route from Athens to Lamia by 2037	Construction of a new, high-quality road link connecting A1 and A8 motorways; This new road is expected to redirect traffic traveling between the northern and southern regions, as well as west of Athens, thus bypassing the Athens metropolitan area and reducing congestion issues

<sup>297</sup> EIB (2019), National Transport Plan for Greece, Final Transport Plan Report, TA2017028 GR GRS, June 2019

#	Issue	Recommendation
7	<p>The Transport Model predicts that:</p> <ul style="list-style-type: none"> <li>By 2037, there will be a traffic bottleneck on the southern segment of the A1 motorway, stretching from Schimatari (junction A1/A11) to Lamia</li> <li>By 2027, there will be a traffic bottleneck on the section Elefsina - Korinthos (jct with A7 Moreas motorway) of A8 motorway (Olympia Odos)</li> </ul>	<p>Capacity increase of:</p> <ul style="list-style-type: none"> <li>Existing A1 South, Schimatari (junction A11) to Lamia section</li> <li>existing A8 (Olympia Odos), Section: Elefsina - Korinthos (junction A7)</li> </ul> <p>The need for these projects will be further assessed during the feasibility study phase, taking into account observed traffic demands and related forecasts.</p>
Pillar 3: Strengthening international land transport links		
8	<p>The extension of the A5 (Ionia Odos) motorway to the Greek-Albanian border is part of both the Core TEN-T network and the Adriatic-Ionian Transport Corridor.</p> <p>Kakavia serves as a crucial border crossing, accommodating a significant volume of traffic between Greece and Albania, totaling approximately 1.75 million passengers annually; in Albania, the existing road is linked to the national highway network, which does not meet motorway standards</p>	<p>Construction of a new, high-quality road link between Ioannina, Kakavia, and the Albanian border (A5 North)</p>
9	<p>The road connecting Igoumenitsa with the Albanian border would create a direct route to the border avoiding the city center; the existing cross-border road connection requires significant improvements</p>	<p>Upgrade of the road connection between Igoumenitsa and the Albanian border via Sagiada and Mavromati</p>
10	<p>Egnatia Odos Vertical Axis 50 (A27) from Kozani to Florina, extending to the border with North Macedonia, is a segment of the Pan-European Axis X.</p> <p>Section Ptolemaida-Florina's significance is to provide connectivity to densely populated areas such as Filotas, Amyndeo, Perdika and essential facilities operated by PPC (DEI)</p>	<p>Upgrade of A27 North to motorway standards; this road extends to the border with North Macedonia (Section: Ptolemaida - Florina)</p>
11	<p>The Egnatia Odos Vertical Axis 70 commences in Xanthi and extends to the Greek - Bulgarian border at Echinós, constituting an integral part of the extensive TEN-T network.</p> <p>The current segment spanning from Xanthi to Dimario requires significant improvements; the road between Dimario and the Bulgarian border remains an unpaved forest road</p>	<p>Upgrade of route Xanthi - Echinós - Bulgarian border</p>
12	<p>The northern segment of A1, commencing from its intersection with A2 in Chalastra and extending to the North Macedonian border, is part of the Core TEN-T network.</p> <p>The southern segment from Chalastra to Polykastro is classified as an expressway and requires upgrades to meet motorway standards</p>	<p>Upgrade of A1 North to motorway standards; this road extends to the border with North Macedonia (Section: Chalastra - Polykastro)</p>
13	<p>Border crossings with neighboring countries (North Macedonia and Bulgaria) face delays for various reasons, including technical, operational, administrative, and organizational factors</p>	<p>Facilitation and enhancement of border crossings</p>



#	Issue	Recommendation
Pillar 4: Creating a well-functioning urban and suburban public transportations system to support the National Transport System		
14	Congestion in the vicinity of Markopoulo and Lavrio; bypass needed for the city of Lavrio to ensure direct access to the port of Lavrio	Attica metropolitan road network upgrades: <ul style="list-style-type: none"> <li>• Markopoulo bypass</li> <li>• Markopoulo - Lavrio</li> <li>• Sounio - Lavrio (incl. Lavrio bypass)</li> </ul>
15	The Transport Model indicates that by 2027, there will be traffic congestion issues in the broader metropolitan region of Attica, affecting significant sections of the two primary motorway routes (A1 and A8) and the ring road (A6)	Extention of Kymis Avenue to connect with A1 motorway
Pillar 5: Promoting regional mobility and development		
16	All sections are part of the comprehensive TEN-T network; The suggested upgrades are necessary because the corresponding road sections will either serve districts with poor accessibility, are predicted to face congestion issues within the next 15 years, or exhibit substandard conditions raising safety concerns	Recommended Upgrades: <ul style="list-style-type: none"> <li>• Road axis Lamia - Amfissa - Itea - Antirrio</li> <li>• Road accesses of Astakos and Agrinio to A5 Ionia Odos</li> <li>• Road axis Pyrgos - Kalo Nero - Tsakona</li> <li>• VOAK Eastern (Agios Nikolaos - Siteia) &amp; Western (Chania - Kissamos Kastelli) road sections</li> <li>• North - South Evvia road axes</li> </ul>
17	Both sections are predicted to face congestion issues within the next 10 years	Recommended Upgrades: <ul style="list-style-type: none"> <li>• Road Axis Thessaloniki - Chalkidona - Giannitsa - Mavrovouni</li> <li>• South Road Axis of Crete (NOAK) and its Vertical Axes (Heraklio - Agioi Deka and Pachia Ammos - Terapetra)</li> </ul>

# Road Infrastructure in Kosovo

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## Road Infrastructure in Kosovo<sup>298</sup>

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### 1. Introduction

Improvement of Kosovo's transportation infrastructure is crucial to its future prosperity as well as to its integration into the European Union (EU), a fact recognized by Kosovo itself.<sup>299</sup> While Kosovo's road network is in far better shape than the country's rail system,<sup>300</sup> significant upgrades and extensions to it and extensive regulatory and administrative reforms are needed to enable Kosovo to meet EU standards and to achieve the connectivity that it and the EU seek. The European Commission (EC) staff rates Kosovo as having made only "limited progress" in improving road and railway infrastructure," which has "delay[ed] the implementation of major projects"<sup>301</sup> and is one factor that limits Kosovo's ability to "cope with competitive pressure and market forces in the EU."<sup>302</sup>

Improving connectivity within Kosovo depends primarily on administrative, political and other governmental constraints (including as to necessary skills) and on the availability of financing, although political and safety considerations could affect full integration of roads in the northern part of the country into the national road network. Internationally, Kosovo has made important progress in achieving connectivity, but further progress depends not just on actions that Kosovo can itself take (e.g., further aligning its customs laws and procedures with EU standards<sup>303</sup>) but also on internal and international political developments relating to border crossing points (BCPs) with Serbia.

<sup>298</sup> \*This designation is without prejudice to positions on status and is in line with UNSCR 1244 and the ICJ opinion on Kosovo Declaration of Independence

<sup>299</sup> Multimodal Transport Strategy 2023-2030, Ministry of Environment, Spatial Planning and Infrastructure, 2022, p. 4.

<sup>300</sup> Kosovo's rail network remains in poor shape, with worn-out track and other facilities and outdated regulations on, among other things, safety and interoperability. Kosovo's air transportation facilities, on the other hand, have already been improved significantly, including by the 2002 and 2009 reconstruction and expansion of Prishtina's Adam Jashari airport's apron and terminal facilities and the ongoing enhancements (e.g., a runway extension and better landing systems) that are being undertaken to upgrade its air operations capabilities. Other barriers to air connectivity remain, including Kosovo's slow adoption of regulatory reforms identified by the EU as needed.

<sup>301</sup> Commission Staff Working Document Kosovo\* 2023 Report, EC Staff, November 8, 2023 (KR 2023), p. 68 (emphasis removed).

<sup>302</sup> *Ibid.*, p. 67.

<sup>303</sup> Here, Kosovo is "moderately prepared" and making "some progress." *Ibid.*, p. 107 (emphasis removed).

## 2. Kosovo's Roads: Current State and Planned Development

### 2.1. How Kosovo Categorizes its Roads

Kosovo intends to divide its roads into five categories pursuant to a draft Law on Roads (Draft Law on Roads) now under consideration.<sup>304</sup> These categories are motorways and four types of roads: national, regional, connecting and local.<sup>305</sup> Their defining characteristics are shown in the following table.

*Table 1. Kosovo road categories<sup>306</sup>*

Category Name	Criteria
Motorway	A public road <sup>307</sup> specially designed and built for motor vehicle traffic which does not serve the properties around its borders, which is marked with a special traffic sign and which has two road lanes physically separated for movement from opposite directions. The road lane must have at least two traffic lanes with one emergency stop lane on both sides of the highway. Highway intersections are part of the highway.
National road	A public road officially categorized as a national road which connects two or more cities and which can serve as a connection to regions outside Kosovo.
Regional road	A public road officially categorized as a regional road which connects the economically important centers of two or more municipalities.
Connecting road	A public road that connects settlements with railway stations, roads to an airport, health spas, recreation centers, national parks, historical monuments and complexes and the like.
Local road	A public road officially categorized as a local road, which connects residential areas within the settlements of a municipality or parts of two different municipalities.

<sup>304</sup> <https://konsultimet.rks-gov.net/viewConsult.php?ConsultationID=41868>, Government of Kosovo, June 14, 2023, Article 3. The categorization is already in use in Kosovo, but the Draft Law on Roads will, when adopted, codify them.

<sup>305</sup> Kosovo's road categorization differs from that used by the Transit Community Permanent Secretariat, which divides TEN-T roads into (i) motorways, (ii) expressways and (iii) conventional, strategic, high quality roads. Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans, Transport Community, October 2023 (TEN-T Report 2023), p. 27.

<sup>306</sup> *Ibid.*, Article 3, which also defines "Uncategorized road" as "a road that is used for the circulation of vehicles that can use them without obstacles according to the manner and conditions provided by this Law and other rules, which are not categorized as public roads according to this Law," "Ring road" as "part of a public road categorized as part of a national, regional or local road which replaces a road through a settlement or a road segment through a city," "Road segment through a city" as "part of a national, regional, connecting road that passes through a city, the borders of which are defined and marked with traffic signs," "Road in a settlement" as "the part of a public road within the boundaries of a settlement, the characteristics of which are determined by a spatial plan, namely the urban plan of the municipality," "Street in a neighborhood" as "a public road within a settlement which connects parts of the settlement" and "Road outside a settlement" as "part of a road outside the boundaries of a settlement."

<sup>307</sup> "Public road" is defined as "a road categorized as a state or municipal public road where anyone can use it without obstacles in the manner and conditions provided by this Law." Draft Law on Roads, Article 3.

Motorways and national, regional and connecting roads are under the administration of the Ministry of Infrastructure.<sup>308</sup> Local roads, which include urban and rural roads, are administered by municipalities.<sup>309</sup>

The following table provides the total length of each category of roads in 2022.

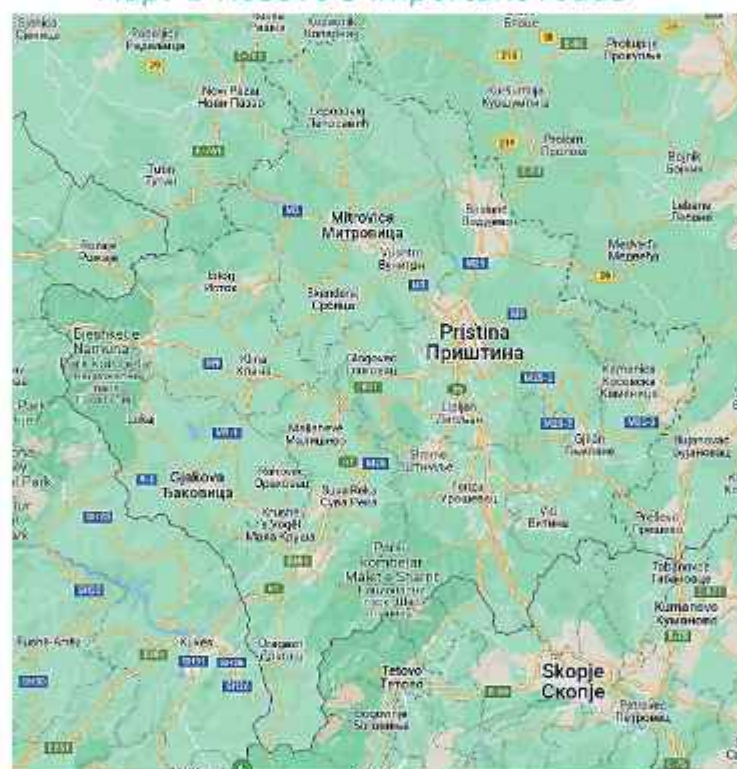
Table 2. Total length of Kosovo roads by category (km)<sup>310, 311</sup>

Motorway	National	Regional	Connecting	Local-Urban	Local-Other	Total
137	753	1.495	49	570	4.355	<b>7.359</b>
<b>Total National:</b>		<b>2.434</b>	<b>Total Local:</b>		<b>4.925</b>	

## 2.2. Kosovo’s current road network

The following map shows Kosovo’s current network of important roads.

Map. 1 Kosovo’s important roads<sup>312</sup>



A number of roads within Kosovo’s road network are part of the Western Balkans indicative extensions of the EU’s TEN-T network. The Albania-Prizren-Pristina-Merdare motorway is a TEN-T Core road. It is part of the “indic-

<sup>308</sup> Ibid., Article 4.

<sup>309</sup> Ibid., Article 4.

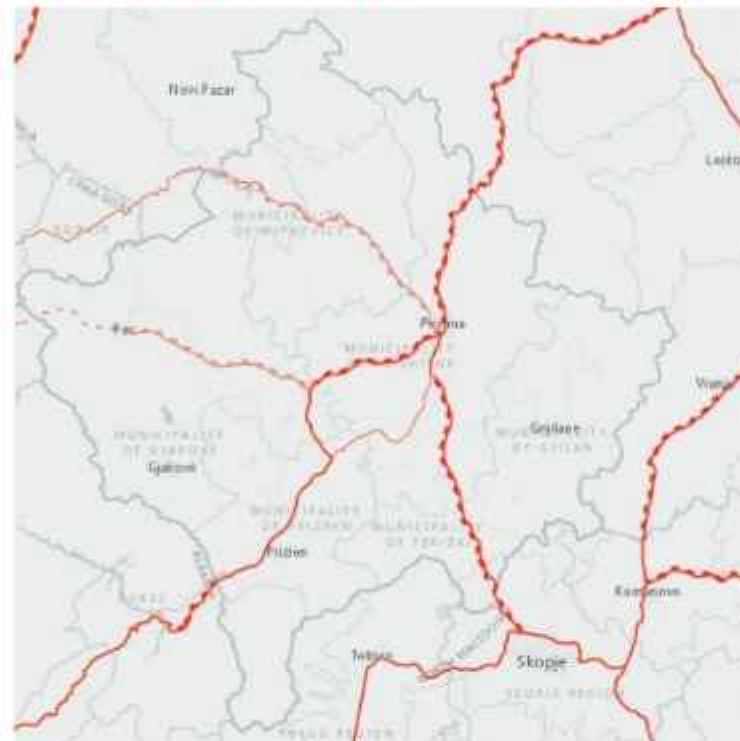
<sup>310</sup> The figures for roads other than local roads are from the Kosovo Agency of Statistics, <https://tinyurl.com/yu6knv67>.

<sup>311</sup> The figures for local roads are approximate. They are based on estimates from the Sectorial Strategy and Multimodal Transport 2015-2025 and the Action Plan for 5 years, Ministry of Infrastructure, October 2015 (MTS 2015), p. 24.

<sup>312</sup> Google maps, <https://tinyurl.com/yvs9j24u>, accessed October 1, 2023.

ative extension of the TEN-T Orient/East-Med corridor [and] is the shortest route from the Port of Durrës (Albania) on the Adriatic coast to south-eastern and central Europe, as well as to countries around the Mediterranean and Black Seas.”<sup>313</sup> The Pristina-Mitrovica motorway segment is also a TEN-T Core road.<sup>314</sup> The remaining TEN-T routes in Kosovo form part of the TEN-T Comprehensive network. Kosovo’s TEN-T roads are shown on the map below.

*Map 2. The TEN-T network’s indicative extensions in the Western Balkans<sup>315</sup>*



<sup>313</sup> Economic and Investment Plan-Endorsed Flagship Investments 2020-2023, Western Balkans Investment Framework, June 2023, p. 7.

<sup>314</sup> TEN-T Report 2023, pp. 58.

<sup>315</sup> After <https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html>.

The table below lists Kosovo’s important roads and their connectivity.

*Table 3. Kosovo’s main roads and their routes<sup>316</sup>*

<u>Road Identifier</u>	<u>Directional Orientation</u>	<u>TEN-T Corridor, if any</u>	<u>Municipalities Connected</u>
Route 6	N - S	TEN-T Core road Route 6a Route 6b	Prishtina - Lipjan - Ferizaj - Kacanik - Hani i Elezit - Skopje
Route 7 NE - SW		TEN-T Core road Route 7	Nis (Under construction) - Merdare (Under construction) - Podujeva - Prishtina - Lipjan - Suhareka - Prizren - Tirana - Durrës
Route 7.1 (under construction)	NW - SE	Not TEN-T	Prishtina - Gjilan - Dheu i Bardhë - Konçul
Route M2	NW - SE Serbia -Prishtina N - S Prishtina - Skopje	TEN-T Route 6 Comprehensive and Core from Prishtina to Macedonia	Goes from northern border with Serbia, through Prishtina, and up until the southern border with North Macedonia
Route M25	NE - SW	TEN-T Core Route 7 Prishtina -Medare	Goes from Nis to the northeastern border with Serbia, continues through Prishtina and Prizren up until the southern border with Albania
Route M9	E - W	TEN-T Comprehensive Route 6b	From the eastern border with Serbia, through Prishtina and Peja, and ends at the western border with Montenegro

### 2.3. Bridges and tunnels

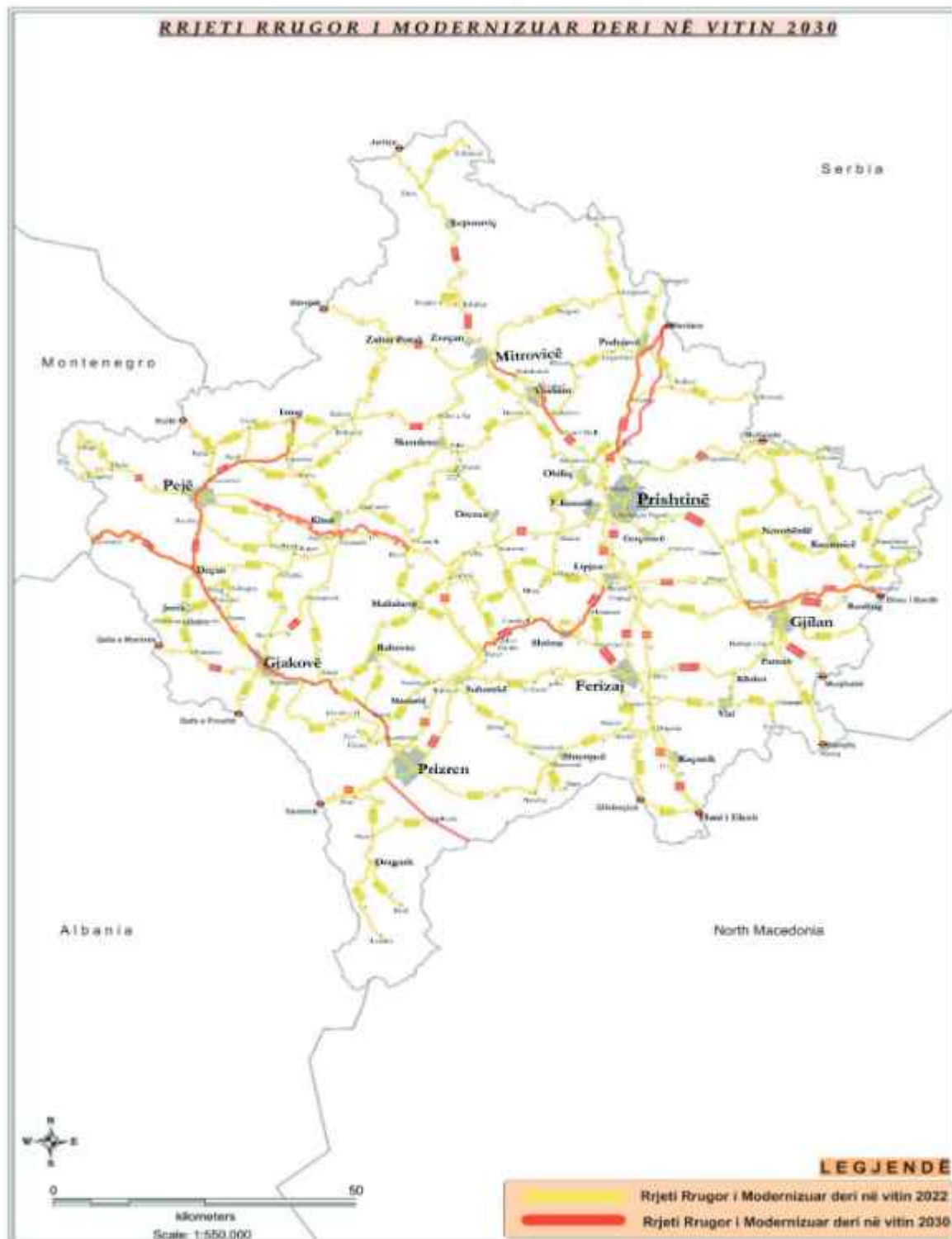
Kosovo does not report information on its bridges and tunnels separately.

### 2.4. Road Projects in Kosovo

The following map shows recently completed Kosovo roadbuilding projects and those planned for the future up until 2030.

<sup>316</sup> Multiple sources.

Map 3. Kosovo road construction plans to a 2030 horizon<sup>317</sup>



"Kosovo is currently implementing a total of 2 TEN-T projects, with a combined value of EUR 74 million, one on the Core Network (EUR 42 million)

<sup>317</sup> Multimodal Transport Strategy 2023-2030, Ministry of Environment, Spatial Planning and Infrastructure, 2022 (MTS 2022), p. 23. Translations: Of title: Road network modernization until 2030. Of legend: Yellow: Road network modernization until 2022. Red: Road network modernization until 2030.



and one on the Comprehensive Network (EUR 32 million) The combined project length is 32.8 km.”<sup>318</sup>

Other than TEN-T projects, “[t]he biggest possibilities for improved connection to highways are of Gjilan, Mitrovica and Peja region and connection between Prizren and Tetova, North Macedonia.”<sup>319</sup> As Map 3 shows, projects are also planned that will improve Prizren’s connections with the rest of Kosovo, including with Pejë through Gjakovë and with Pristina through Shtime. Municipal roadbuilding is harder to assess, but there will certainly be considerable effort devoted to dealing with the increased municipal congestion as Kosovo’s population both migrates to Pristina and other built-up areas and acquires more motor vehicles.

Specific projects now or scheduled to soon be underway are:

*Table 4. Road construction ongoing and planned*<sup>320</sup>

Project	Cost	Funder
Highway Prishtina - Gjilan - Konqul	96.427.999	Kosovo Gov
Extension of Dollc - Gjakovë road	45.910.404	Kosovo Gov
Construction of the Pristina - Podujevë road	41.358.761	Kosovo Gov
Extension of M2 road Prishtina - Mitrovica	40.470.855	Arab Fund
Expansion and rehabilitation of Route 7		EBRD
Expansion and rehabilitation of the M9 Prishtina - Pejë highway	32.000.000	Kosovo Gov
Extension of regional road R102 Komoran - Skenderaj (GQ)	12.973.936	Kosovo Gov
Rehabilitation of road N25.2 segment Kishnic - Bresallic	5.000.000	Kosovo Gov
Rehabilitation of road R129 segment Mitrovica - Bajgore - Kaçandoll - Kerpimeh	4.000.000	Kosovo Gov
Continuation of the expansion of the Gjilan - Bujanovc road (from the roundabout of the battery factory to the highway junction)	3.224.773	Kosovo Gov
Rehabilitation and asphaltting of the Regional Road R124 Shipashnic - Desivojce - Terrstene	3.400.000	Kosovo Gov
Design and construction of a road connecting Vitia with Highway R6	2.683.200	Kosovo Gov
Repair of the regional road Istog - Pejë - Deçan - Gjakovë	1.557.597	Kosovo Gov
Rehabilitation of underpasses on national and regional roads	1.000.000	Kosovo Gov
Construction of the road Prizren - Border with North Macedonia (Tetovo)	Awaiting contract	
Construction of the bridge (overpass and underpass for cars and vehicles) in Veternik on Road A	Awaiting contract	
Resurfacing and repairing the slopes of the Morine - Merdare highway	Awaiting contract	Kosovo Gov

## 2.5. Funding of Kosovo’s roads

Kosovo has in the past received funding for road construction from the European Investment Bank, the West Balkans Investment Framework and oth-

<sup>318</sup> TEN-T Report 2023, p. 83.

<sup>319</sup> MTS 2022, p. 8.

<sup>320</sup> Ministry of Infrastructure.

er EU programs as well as from the European Bank for Reconstruction and Development (EBRD) and the Arab Fund. The World Bank has also provided road-related funding in the Western Balkans through, e.g., its Trade and Transport Facilitation Project.<sup>321</sup> Future EU and international financial institution (IFI) funding seems likely to be focused on improving Kosovo's railway infrastructure, given the EU's desire to shift most freight and much passenger traffic to rail from road. IFI funding for road construction will likely be limited to the remaining TEN-T projects,<sup>322</sup> while other road-related funding will likely shift to financing the implementation of the EU's Green Agenda and, hopefully, the maintenance of existing roads. Accordingly, in the future the Kosovo government will probably have to bear more of the burden of funding the building of new roads and the renovation of older ones.

### 2.6. The condition of Kosovo's roads

Kosovo's MTS 2022 concludes that "Thanks to major investments into the state-owned road infrastructure in the last 10+ years, the majority of indicative extension of TEN-T roads are in very good or good condition and comply with the TEN-T road condition regulations by Transport Community estimation. Most state-owned roads also have enough capacity to cater to the traffic demand."<sup>323</sup> It notes, though, that "these are expert estimations by the Department for the Road Management within the MESPI. Kosovo does not have a road asset management system. . . ."<sup>324</sup>

### 2.7. Cross-border connectivity

Kosovo has BCPs with four neighbors, Albania, Montenegro, North Macedonia and Serbia. Table 4 below gives the names, types and locations of certain of these facilities. Kosovo also has customs facilities not at BCPs, which facilitate customs clearance and other administrative matters for, primarily, commercial purposes.

<sup>321</sup> Action Plans and the EU Acquis Progress Report, Transport Community Permanent Secretariat, November 2022 (Action Plans Progress Report 2022), p. 38.

<sup>322</sup> The EBRD has, for example, committed to funding the Pristina-Merdare segment of TEN-T Route 7. <https://tinyurl.com/yr6rrk6a>, EBRD.

<sup>323</sup> MTS 2022, p. 8. This conclusion is borne out by comments from logistics firms. Ibid., p.28.

<sup>324</sup> Ibid., p. 8.

Table 5. Kosovo border crossings<sup>325</sup>

Name	Type	Country	Comments
Krushevë – Shishtavec	BCP	Albania	
Qafa e Morines	BCP, CS <sup>326</sup>	Albania	
Qafa e Prushit	BCP	Albania	
Vermice	DD <sup>327</sup> , CCP, CS	Albania	CCP, "represents a good example in the region" <sup>328</sup>
Kulla	BCP, CS	Montenegro	Preparations for a CCP have commenced
Mitrovica	DD	N/A	
Peja	DD	N/A	
Podujeva	DD	N/A	
Gllloboqice	BCP	North Macedonia	
Hani i Elezit	DD, BCP, CS	North Macedonia	Rail and road. Rail CCP completed and to be made operational once the refurbishment of the rail line that runs through it finishes <sup>329</sup>
Bërnjak	BCP	Serbia	Agreed to be CCP and steps taken relating to construction but not yet utilized jointly
Delta	BCP	Serbia	Zubin Potok
Dheu i Bardhë	DD BCP	Serbia	Agreed to be CCP, but no action yet taken
Jarinje	BCP	Serbia	Agreed to be CCP, but no action yet taken
Leshak	BCP	Serbia	Rail. Not currently operating. To be a CCP after the rail line is renovated
Merdare	CCP, CS	Serbia	Operating
Muqibabë	BCP	Serbia	Agreed to be CCP, but no action yet taken
Mutivodë	CCP	Serbia	Operating

Political considerations have made it hard to implement the agreement between Kosovo and Serbia to establish at least six permanent CCPs on their border, but progress has also been slow on implementation of other border crossing elements of the Transportation Facilitation Action Plan.<sup>330</sup> On the

positive side, "[s]ignificant progress has been made in finalising the nego-

<sup>325</sup> Ministry of Infrastructure and Action Plans Progress Report 2023. The State Strategy of the Republic of Kosovo Integrated Border Management [sic] 2020-2025, Government of Kosovo, undated, at pp. 17-18, identifies several other border crossings. They are Gllloboqicë-Borje and Orqushë (Albania) and Stanqiq-Bellanovc (North Macedonia). The Albania facilities are used intermittently.

<sup>326</sup> "CS" indicates a customs station that can deal with commercial matters.

<sup>327</sup> "DD" indicates a customs headquarters. These are not necessarily located at a BCP.

<sup>328</sup> Action Plans and the EU Acquis Progress Report 2023, Transport Community, October 2023 (Action Plans Progress Report 2023), p. 91.

<sup>329</sup> "CCP" is a Common Crossing Point, one where the authorities of both countries are co-located and process border crossers jointly.

<sup>330</sup> Action Plans Progress Report 2022, pp. 36, 38.

tiations and signing the Agreement between Kosovo and North Macedonia for joint border crossing points Hani Elezit/Blace and Jazince/Globochica” and “the Technical Assistance on the preparation of the design for physical improvements on the [road CCP at] Hani I Elezit/Blace was completed.”<sup>331</sup>

### **3. Kosovo’s roads: Policy Matters**

#### **3.1. Kosovo’s road regulators**

The Department of Road Management of Kosovo’s Ministry of Infrastructure has the following responsibilities countrywide for roads other than local roads. It proposes technical, developmental and organizational solutions for maintenance, construction, reconstruction and safety of roads as well as supervising and managing their construction and maintenance work, researching and regulating roads and bridges, proposing and executing the annual plan for seasonal road maintenance, maintaining the road belt, improving existing roads based on approved plans, offering advice to municipalities for maintenance, management and building of local roads, proposing categorization of existing public roads into national or regional roads, reporting and advising the Ministry on the state of the road network, its safety and factors that can affect it and gathering information regarding traffic and safety.<sup>332</sup> The Ministry’s Department of Road Infrastructure’s Directorate of Kosovo Roads has sectors dealing with Projects, Road Belts, Planning and Bridges.<sup>333</sup>

The Draft Law on Roads provides for the establishment of the Kosovo Roads Agency as an executive agency within the Ministry of Infrastructure.<sup>334</sup> It will, among other things, “create[] and maintain[] the system for the administration of state roads and bridges.”<sup>335</sup> It will also manage tunnels.<sup>336</sup> It sets safety parameters and undertakes action to fulfill minimum safety requirements in tunnels and to reduce tunnel risk, inspects, reviews, implements and establishes tunnel security requirements, has the authority to close tunnels or restrict their traffic flow if safety requirements are not met and establishes the procedures for doing so, drafts tunnel emergency contingency plans and trains and equips tunnel emergency services.<sup>337</sup>

Municipalities build and manage their own roads.<sup>338</sup>

<sup>331</sup> Action Plans Progress Report 2023, p. 92.

<sup>332</sup> Our translation of key points from <https://www.mit-ks.net/sq/departamenti-i-menaxhimit-te-rrugeve>.

<sup>333</sup> Ibid.

<sup>334</sup> Draft Law on Roads, Articles 36 and 37.

<sup>335</sup> Ibid. Article 37.

<sup>336</sup> Ibid., Article 31.

<sup>337</sup> Ibid., Article 31.

<sup>338</sup> Ibid., Article 4.

### 3.2. Interoperability and ITS

Regarding interoperability of toll roads Kosovo currently has no toll roads.<sup>339</sup> This is in contrast to Kosovo's neighbors North Macedonia and Serbia, which "have a significant toll motorway network and operate several toll plazas."<sup>340</sup> In these countries "over the past decade, e-tolling has been widely deployed."<sup>341</sup> Albania and Montenegro have "limited tolled motorways network [...] and therefore toll collection market is still underdeveloped."<sup>342</sup> "Albania and Montenegro have also started to deploy 5.8 GHz DSRC e-tolling schemes, in compliance with the 2019/520 European Directive, and same technology might be adopted by Kosovo when will start implementing tolling."<sup>343,344</sup>

Kosovo has done relatively well in digitization relating to connectivity. "The Customs Administration of Kosovo is taking steps forward to foster transport digitalisation and improve data sharing systems. Green Lanes in Kosovo have been extended to all BCPs/CCPs, ensuring now the pre-arrival information through the SEED system for all goods requiring phytosanitary, veterinary, or food inspections."<sup>345</sup>

As to ITS, Kosovo, like its neighbors, has been slow to implement it. That said, "the preparation of ITS Strategy for all modes of transport, as well as the operational concept for Road Traffic Management Centres, were finalized by CONNECTA in August 2023," and the steps to be taken for their adoption were agreed upon.<sup>346</sup> The EU's goals and strategy for implementing ITS are in flux,<sup>347</sup> which to some extent mitigates any problems Kosovo's delay in pursuing ITS might have caused.

### 3.3. Road safety

Kosovo is performing reasonably well in the area of road safety. Fatality rates are falling, as the table below shows.

<sup>339</sup> Toll interoperability in Western Balkans, Transport Community, November 2020, p. 3.

<sup>340</sup> Ibid., p. 3.

<sup>341</sup> Ibid., p. 3.

<sup>342</sup> Ibid., p. 3.

<sup>343</sup> Ibid., p. 3 (internal reference removed).

<sup>344</sup> Action Plans Progress Report 2023 notes that Kosovo has not transposed the annual vehicle tax *acquis*, p. 167, or any of the three tolling *acquis*, p. 178.

<sup>345</sup> Ibid., p. 92.

<sup>346</sup> Ibid., p. 87.

<sup>347</sup> Intelligent road transport systems, European Parliamentary Research Service (Monika Kiss), September 2023.

Table 6. Fatalities per million for Kosovo and the Western Balkans<sup>348</sup>

Country/Region	Fatalities per million			
	2019	2020	2021	2022
Kosovo	60	43	59	59
Western Balkans	73	66	70	

In 2020, Kosovo's road transport death rate per million was comparable to that of the EU27 countries.<sup>349</sup> While Kosovo's rate rose sharply in 2021, as it did in most countries after the COVID-19 pandemic became less intense, Kosovo was one of only two West Balkan countries<sup>350</sup> in which road deaths decreased in 2021 compared to 2020 (106 compared to 111), a decrease per million inhabitants of 5%.<sup>351</sup> "[T]his is while total mileage of road transport has increased, which means that in relative terms the situation has improved."<sup>352</sup>

Kosovo has adopted a Road Safety Strategy, although it is not based on UN and EU targets,<sup>353</sup> while the new Law on Roads is to provide for the creation of a new Road Safety Department in the Ministry of Transport.<sup>354</sup> Action Plans Progress Report 2023 "recommend[s Kosovo] start aligning and transposing the legislation with the EU Directive 2008/96/EC on Road Infrastructure Safety Management."<sup>355</sup>

### 3.4. Green Agenda

Kosovo has recorded some advances in pursuing the EU's Green Agenda. It has introduced incentives for electric and hybrid vehicles,<sup>356</sup> and Pristina has a Sustainable Urban Mobility Plan.<sup>357</sup> Notably, an electric taxi fleet has been introduced in Pristina, funded by an EBRD loan and an EU grant.<sup>358</sup> The city itself has purchased 30 new buses, 24 of which will meet Euro 6 emission standards, and six of which will be electric.<sup>359</sup> SMSS Progress 2022

<sup>348</sup> [https://www.transport-community.org/wp-content/uploads/2023/02/Fatalities-for-2022-Transport-Community\\_V2.pdf](https://www.transport-community.org/wp-content/uploads/2023/02/Fatalities-for-2022-Transport-Community_V2.pdf).

<sup>349</sup> MTS 2022, p. 9.

<sup>350</sup> Albania was the other. The increase in fatalities for the remaining West Balkan countries ranged from 3% to 33%, with Montenegro reporting the highest rise.

<sup>351</sup> [https://www.transport-community.org/wp-content/uploads/2023/02/Fatalities-for-2022-Transport-Community\\_V2.pdf](https://www.transport-community.org/wp-content/uploads/2023/02/Fatalities-for-2022-Transport-Community_V2.pdf).

<sup>352</sup> MTS 2022, p. 9, referring to the 2020-2021 decrease. The observation applies equally to the 2021-2022 changes.

<sup>353</sup> Action Plans Progress Report 2023, p. 90.

<sup>354</sup> *Ibid.*, p. 90.

<sup>355</sup> P. 91 (emphasis removed), identifying a number of other action items for Kosovo regarding road safety.

<sup>356</sup> Sustainable and Smart Mobility Strategy in the Western Balkans Progress Report, Transport Community, December 2022 (SMSS Progress 2022), p. 6.

<sup>357</sup> *Ibid.*, p. 6.

<sup>358</sup> <https://tinyurl.com/bdzbcnhw>, EBRD.

<sup>359</sup> <https://www.sustainable-bus.com/news/ebd-pristina-kosovo-trafiku-urban/>, Sustainable Bus.

Possibly the Euro 6 buses are actually less polluting than the electric, given that Kosovo relies on lignite to produce electricity.

noted that Kosovo had an ongoing project for the establishment of a Road Asset Management System (RAMS),<sup>360</sup> while Action Plans Progress Report 2022 observed that the country had budgeted funds for technical assistance<sup>361</sup> and was “exploring options for technical assistance to prepare the Terms of Reference for the RAMS.”<sup>362</sup> Other than meetings with the World Bank to seek support for developing a RAMS, though, it does not seem to have made any additional progress in this regard.<sup>363</sup> It is in the process of establishing a new agency responsible for road maintenance<sup>364</sup> and in 2022 entered into new, three-year road maintenance contracts.<sup>365</sup>

Kosovo, like its neighbors, has otherwise made little to no progress on the Strategy’s other Flagships.<sup>366</sup> It has only thirteen Electric Vehicle Charging Stations (EVCS), just one of which is on the TEN-T network, and no CNG, LNG or H<sub>2</sub> refueling points at all.<sup>367</sup>

#### **4. The EU’s view of Kosovo’s progress regarding road transport**

As a prospective EU member, Kosovo must deal with its transportation challenges in a manner consistent with the EU’s priorities. Regarding Kosovo’s obligations under Chapter 14 (Transport policy) under its Stabilization and Association Agreement (SAA), the EC staff believes that “Kosovo is in an early stage of preparation” in the area of transport policy, and has made “limited progress, notably with the adoption of the multimodal transport strategy.”<sup>368</sup> After noting that most of the recommendations from its 2022 report remain open, the EC staff suggests that Kosovo, among other things:<sup>369</sup>

- invest in road maintenance and inspections, organize prevention campaigns and establish a systematic monitoring mechanism for the collection of crash data,
- adopt and roll out the action plan 2023-2025 of Kosovo’s multimodal transport strategy and

<sup>360</sup> SMSS Progress 2022, p. 26.

<sup>361</sup> Action Plans Progress Report 2022, p. 41.

<sup>362</sup> *Ibid.*, p. 41.

<sup>363</sup> Action Plans Progress Report 2023, p. 86.

<sup>364</sup> *Ibid.*, p. 86.

<sup>365</sup> *Ibid.*, p. 86.

<sup>366</sup> These include transposition of the Alternative Fuel Infrastructure Directive on Deployment of e-Chargers on the Busiest Corridors, use of renewable energy in transport, using modern software at border crossing points/common crossing points, shifting freight and passenger transport to rail, etc.

<sup>367</sup> TEN-T Report 2023, pp. 31-32.

<sup>368</sup> KR 2023, p. 109 (emphasis removed).

<sup>369</sup> *Ibid.*, p. 109.

- adopt the ITS strategy and its action plan and ensure sufficient capacity and resources for its implementation.

As to Kosovo's Chapter 21 obligations regarding Trans-European Networks, the EC staff views Kosovo as "ha[ving] some level of preparation" and assesses that Kosovo has made "limited progress", in part as a result of the "implementation of the Transport Community action plans on road, road safety, rail, and transport facilitation."<sup>370</sup> After again noting that its recommendations from the prior year have been only partially addressed, the EC staff advises Kosovo to implement the pending connectivity projects and strengthen institutional and administrative capacities for the implementation of strategic infrastructure projects.<sup>371</sup>

Regarding Chapter 27 (Environment and climate change),<sup>372</sup> the EC staff says that Kosovo is "at an early stage of preparation" and that it has "made limited progress."<sup>373</sup> In the EC staff's view, "Kosovo needs to increase its political commitment and administrative capacity to address the issues related to environmental degradation and climate change as well as to improve the implementation and enforcement of its legislation. These efforts should be aligned with the goals of the Green Agenda for the Western Balkans."<sup>374</sup> It points out that "the recommendations from the previous report have not been implemented."<sup>375</sup> (KR 2022 observed that most of KR 2021's recommendations had not been implemented, while KR 2021 noted that all recommendations from KR 2020 were still pending.) In particular, KR 2023 advises Kosovo to "implement the climate change strategy and the action plan on climate change; prepare a roadmap for alignment with the Green Agenda for the Western Balkans and the *acquis* on climate; adopt the national energy and climate plan, in line with the Energy Community requirements, and finalise drafting the long-term de-carbonisation strategy, and prepare for alignment with the EU Emissions Trading System."<sup>376</sup>

It also calls on Kosovo to "revise and adopt strategies, action plans, and relevant legislation to ensure coherence with the objectives of the Green Agenda" and observes that "[t]here are challenges to implement the strategic framework due to the lack of sufficient funding, low administrative and technical capacities, and heavy reliance on donor support,"<sup>377</sup> that "[t]he adoption of the Strategy for Environmental Protection and Sustainable Development

<sup>370</sup> Ibid., p. 113 (emphasis removed).

<sup>371</sup> Ibid., p. 113.

<sup>372</sup> We treat matters relating to the environment and climate change in detail here because of the strong and increasing emphasis that the EU is putting on them, including particularly with regard to transport.

<sup>373</sup> KR 2023, p. 114 (emphasis removed).

<sup>374</sup> Ibid., p. 114.

<sup>375</sup> Ibid., p. 114.

<sup>376</sup> Ibid., p. 114.

<sup>377</sup> Ibid., p. 114.



2022-2030 is still delayed,” that Kosovo “needs to amend the Law on Strategic Impact Assessment” and that “Kosovo adopted the legislation on inspections, but inspection capacities and implementation needs to improve.”<sup>378</sup> Of particular relevance to road transport, the EC staff points out that “[a]ir quality, notably pollution, continues to be a major health threat” and that “Kosovo needs to implement adequate measures to remedy and curb air pollution.”<sup>379</sup>

## 5. Kosovo’s road transportation strategy

### 5.1. Kosovo’s National Development Strategy

Kosovo’s National Development Strategy 2030 (NDS), published in May 2022,<sup>380</sup> recognizes the importance of road transportation to Kosovo’s economic success and overall wellbeing,<sup>381</sup> but acknowledges that Kosovo’s road network needs work, especially regarding connectivity with other countries.<sup>382</sup> It sets “Quality, sustainable, and integrated infrastructure” as one of Kosovo’s eleven development goals<sup>383</sup> and establishes three transportation-related Strategic Objectives:<sup>384</sup>

- “2.3 Improve infrastructure and transportation services;
- 2.4. Establish seamless connections in multimodal international transportation;
- 2.5. Enhance transportation security”

and the following road-related Impact Indicators:

*Table 7. Impact Indicators for road-related Strategic Objectives<sup>385</sup>*

Strategic Objective	Impact Indicator	Baseline	Target 2026	Target 2030
2.5	Number of traffic accidents with casualties (per million inhabitants)	4.026 (2021)	<80%	<90%
2.5	Traffic accidents with victims (per million inhabitants)	43.00 (2020)	<80%	<90%

The NDS does not, however, set a goal for “Length of modernized road network (km/1000 m2)” as it does for Kosovo’s rail network.

<sup>378</sup> Ibid., p. 114 and 115.

<sup>379</sup> Ibid., p. 115 (emphasis removed).

<sup>380</sup> National Development Strategy 2030, Office of the Prime Minister-Strategic Planning Office, May 1, 2022.

<sup>381</sup> “Transportation, energy and communication infrastructure is essential to ensure sustainable and inclusive economic development. Increasing productivity in the economy, integration and enhancement of wellbeing in general, require investment in infrastructure development.” Ibid., p. 24.

<sup>382</sup> “Despite investments in road transportation, integration into pan-European transportation corridors remains below a satisfactory level.” Ibid., p. 11.

<sup>383</sup> Ibid., p. 17.

<sup>384</sup> Ibid., p. 18. These Objectives relate to Chapters 14 and 21 under Kosovo’s SAA.

<sup>385</sup> Ibid., p. 25.

Regarding Kosovo's Green Agenda as it relates to transportation, the NDS establishes Development Goal 3, Clean environment and efficient use of resources.<sup>386</sup> Goal 3's Objective 3.6, Promotion of sustainable digital mobility,<sup>387</sup> affects road transport directly, since it requires the implementation of ITS and the achievement of sustainability. Strategic Objective 3.3, Increased share of renewable resources in the energy mix,<sup>388</sup> indirectly affects the transportation sector, road transport included, since increasing the share of renewable energy sources in Kosovo's energy mix will require both a shift of transportation from road to electrified rail transport and an increased use of electric road vehicles. Strategic Objective 3.4, Improved energy efficiency,<sup>389</sup> will have a similar indirect effect on transportation.

The relevant Strategic Objectives and their associated Impact Indicators are:

*Table 8. Impact Indicators for environment-related Strategic Objectives<sup>390</sup>*

Strategic Objective	Impact Indicator	Baseline	Target 2026	Target 2030
3.3	Share of renewable sources in gross final energy consumption (%)	24,40% (2020)	?	?
	RES share (%)	5,26% (2020)	?	35%
3.4	Energy savings (Ktoe)	2,70 Ktoe (2020)	?	257 ktoe
	Energy intensity	1,50 (2020)	?	?
3.6	Intelligent transportation system (%)	0,00% (2021)	40%	100%
	Freight by rail (ton/km) <sup>391</sup>	23,47 (2021)	>50%?	>150%?
	GHG emissions in transportation (Mt CO <sub>2</sub> equivalent)	1.337 GG CO <sub>2</sub> eq. (2019)	12%	30%

A more general environmental Impact Indicator will also affect road transport given that it is a very large source of PM<sub>2,5</sub> particulates:

*Table 9. Impact Indicators independent of Strategic Objectives<sup>392</sup>*

Impact Indicator	Indicator Description	Baseline	Target 2026	Target 2030
Lost life years per 100.000 inhabitants attributed to PM <sub>2,5</sub> particles	The indicator represents the total number of years lost per 100.000 inhabitants as a result of exposure to fine PM <sub>2,5</sub> particles	2.458	1.846	1.229

<sup>386</sup> Ibid., p. 18.

<sup>387</sup> Ibid., p. 27. This Objective relates to Chapters 14 and 27 under Kosovo's SAA.

<sup>388</sup> Ibid., p. 27.

<sup>389</sup> Ibid., p. 27.

<sup>390</sup> NDS, p. 27.

<sup>391</sup> Included because increased usage of rail for shipping will reduce the use of roads for that purpose.

<sup>392</sup> Ibid., p. 26.

The NDS also references the World Economic Forum's Global Competitiveness Index's Pillar II (Infrastructure) and sets as a goal reaching the average score of the Western Balkan countries.<sup>393</sup>

### 5.2. Kosovo's Multimodal Transport Strategy

The key sectoral strategic document for Kosovo's road transportation policy is Kosovo's MTS 2022,<sup>394</sup> while the responsible and supporting institutions for that policy are the Ministry of Infrastructure and the Ministry of Economy.<sup>395</sup> The MTS 2022 notes that "although the strategy foresees a shift from road to rail, the improvements to road transport still constitute major benefits for transport users in Kosovo" given that "[r]oad transport remains by far the most important mode of transport domestically [and] is also a very important mode for regional cargo and passenger transport."<sup>396</sup>

Regarding road construction, the MTS 2022 recommends that the length of roads that meet international standards be increased from 249km in 2022 to 337km in 2026 and 471km in 2030.<sup>397</sup> "The priority is the completion of TEN-T core and comprehensive networks according to the [Transport Community Treaty]. The development of the roads that will connect Pristina with the other main centers of Kosovo, should be done by expanding the existing roads by providing services to spatial developments along the road and by providing development of the maximum speed of at least 80 km/h for road users."<sup>398</sup> In the MTS 2022's view, the "biggest possibilities for improved connection to highways are of Gjilan, Mitrovica and Peja region and connection between Prizren and Tetova, North Macedonia."<sup>399</sup>

As to road quality, the MTS 2022 recommends that motorways "shall be developed to service an average annual daily traffic exceeding 17 000 vehicles."<sup>400</sup> Roads being built or improved should incorporate "infrastructure safety management, speed reduction at dangerous spots and villages, dual carriageways with at grade crossings, safety barriers and road marking, road works safety."<sup>401</sup>

<sup>393</sup> "Global Competitiveness Index (Pillar II), measures road connectivity, quality of road infrastructure, density of railways, efficiency of train services, connection of airport, efficiency of air transport services, connection of line transport, efficiency of port marine services, electricity access, quality of electricity supply, exposure to unsafe drinking water and reliability of water supply. The results (points) range from 0-100, where the higher the score the better." Ibid., Appendix A, Objective and Indicator Matrix.

<sup>394</sup> Ibid., Appendix C, List of strategic documents to be maintained and developed.

<sup>395</sup> Ibid., Appendix C.

<sup>396</sup> MTS 2022, p. 21.

<sup>397</sup> Ibid., p. 15.

<sup>398</sup> Ibid., p. 22.

<sup>399</sup> Ibid., p. 8.

<sup>400</sup> Ibid., p. 22.

<sup>401</sup> Ibid., p. 25.

Regarding road maintenance, the MTS 2022 calls for the implementation of a road asset management system (RAMS) "to harmonize the criteria for road condition and repair works tendered in the maintenance contracts" which are now defined by visual inspection by regional managers.<sup>402</sup> "This will enable to better compare the feasibility of different repair works and thus improve the cost effectiveness of tendered works."<sup>403</sup> "As for routine maintenance (winter and summer maintenance) new technologies should be introduced to reduce the negative effects of maintenance on environment and long-term road condition."<sup>404</sup>

Regarding the relationship between road and rail, the MTS 2022 notes that "by increasing railway infrastructure investments, more traffic is guided to railway, thus alleviating the pressure on road infrastructure."<sup>405</sup> The MTS 2022 sets ambitious goals of reaching 400.000 passengers traveling by rail per year in 2026 and 2 million in 2030 against a 2021 level of 64.000 and of increasing the share of international freight carried by rail from 1,9% in 2019 to 12% in 2026 and 35% in 2030.<sup>406</sup>

As to the infrastructure that multimodality requires, the MTS 2022 points out that multimodality for freight transport makes sense for a small, land-locked country like Kosovo mainly for international freight and then primarily for road-rail intermodality.<sup>407</sup> It suggests that in these circumstances development of multimodal freight terminals should be undertaken in parallel with the modernization of Kosovo's railways.<sup>408</sup>

Regarding passenger transport multimodality, "it is critical to incorporate multimodality solutions into the planned railway projects [...] Railway would be the backbone of fast international and intercity transport between regional centres. The location of railway stops and stations, the facilities there (short- and long-term parking for cars, bicycles, bus stops, toilets etc.) and access to them with different transport modes must all be thoroughly planned."<sup>409</sup>

Beyond construction, the MTS 2022 asserts that "[e]nsuring better connectivity and high-quality transport requires not just hard infrastructure investments but also reform of the systems, development of services and implementation of soft measures."<sup>410</sup> It notes in this regard that "improvement of

<sup>402</sup> Ibid., p. 23. These contracts are now apparently three-year contracts as desired by the EU.

<sup>403</sup> Ibid., p. 23.

<sup>404</sup> Ibid., p. 24.

<sup>405</sup> Ibid., p. 15. This conforms to the EU's policy of shifting transport from road to rail as adopted by the MTS 2022. Ibid., p. 18.

<sup>406</sup> Ibid., p. 16.

<sup>407</sup> Ibid., p. 20, asserting that "[m]ultimodality in freight transport is generally considered economically viable over distances exceeding 300 km."

<sup>408</sup> Ibid., p. 20.

<sup>409</sup> Ibid., p. 21.

<sup>410</sup> Ibid., p. 15.

border crossing procedures and introduction of joint stations could significantly cut waiting times and consequently travel times<sup>411</sup> and suggests that “[t]he next steps for improvement should be ‘one-stop shop’ on the border crossing with North-Macedonia (Hani i Elezit/Blace).”<sup>412</sup> Simplifying and speeding administrative procedures also matters to connectivity, especially for freight. “This includes improving periodic checks of operators, their permits, cargo and vehicles, working towards membership in international organizations and fair bilateral agreements and permits, streamlining border, customs, licencing and permits procedures especially by providing digital service, helping digitalize the sector improving access to terminals.”<sup>413</sup>

Effective integration of transport modalities is essential to implementing multimodality for passenger transport as well, but this is difficult in Kosovo. “Passenger transport is provided by intercity buses (including international coaches) and local buses. Around 300 companies are providing interurban bus transport in Kosovo. Many of them are very small with only 3 vehicles or even less. With so many small companies operating on fully commercial base with relatively low revenue, the stiff competition has not led to higher quality service but the opposite. The vehicles are generally old and in poor state even if they seem safe. The network is not connected well with other transport modes, there is no regional comprehensive network planning and both information and ticketing systems are fragmented and outdated. Modernizing bus transport can be called major challenge is establishing a well-connected (intercity, regional, local) transport system which provides seamless mobility options to all people. That requires a reform of the whole system, modern vehicles, real-time information systems and electronic ticketing systems. Also more needs to be done to make the transport services accessible and easy useable for everyone (notably to people with disabilities and reduced mobility).”<sup>414</sup>

This will remain a problem even after Kosovo’s rail infrastructure is improved. “With railway access being limited to major cities and settlements along the railway connecting to Prishtina, a large portion of travel demand would still be covered by bus connections. As the regulation and provision of public transport is divided between national and local governments it is critical that they cooperate to increase the attractiveness of public transport because the latter is is [sic] very much dependent on an integrated seamless system. . . . Public transport management and provision needs a major

<sup>411</sup> Ibid., p. 15.

<sup>412</sup> Ibid., p. 8.

<sup>413</sup> Ibid., p. 24.

<sup>414</sup> Ibid., p. 9.

reform in order to consolidate the currently fragmented and unprofitable sector while at the same finding ways to provide better connections to under-serviced areas. However this cannot be done haphazardly. . . . [A] comprehensive plan - a public transport development program" is required.<sup>415</sup>

The MTS 2022 recognizes that digitalization, including the wide-spread adoption of ITS, is essential not just to effective implementation of multi-modality but to Kosovo's achieving its transportation-related goals in general. "[A]n ITS program shall be adopted. The first priorities in this field will be the implementation of road related ITS systems (variable road signs, road cameras, road weather, traffic counting etc.). . . . [A] concept shall be drawn for the establishment of a nation-wide electronic ticketing system in Kosovo, which will be part of the public transport development program. . . . Regulation (EU) 2020/1056 on electronic freight transport information . . . needs to be transposed and certification system put in place to enable an interoperable electronic freight information exchange, reducing administrative burden for logistics operators, and facilitating multimodal transport."<sup>416</sup>

The implementation of ITS is important to Kosovo's implementation of the EU's Green Agenda in the MTS 2022's view, as is "[a] shift to more sustainable transport modes (rail transport, public transport)."<sup>417</sup> Increased use of alternative fuels is another important step to be taken.<sup>418</sup> The MTS 2022 recommends that private companies and local municipalities cooperate to establish a network of regular and fast charging options, that further incentives for the introduction of zero-emission vehicles be considered, emission testing of conventional vehicles be improved and where applicable a EURO 6 standard be established.<sup>419</sup> It establishes two indicators: increasing the share of alternative fuel vehicles from 0,85% in 2022 to 5% in 2026 and 10% in 2030 and raising the share of EUR 5 or higher lorries (N2 and N3) and buses (M2 and M3) of the total fleets of such vehicles from 17,3% in 2022 to 20% in 2026 and 25% in 2030.<sup>420</sup>

As to other aspects of the Green Agenda relating to road transport, the MTS 2022 notes that Kosovo will adopt a Resilience Action Plan for Road on Core/ Comprehensive Network that a Transport Community-led project is preparing.<sup>421</sup> "In addition, [to] "better understand[] . . . the effectiveness of dif-

<sup>415</sup> Ibid., p. 24.

<sup>416</sup> Ibid., p. 26.

<sup>417</sup> Ibid., p. 26. The MTS 2022 establishes three pillars for implementing the EU's Green Agenda: "1) a shift from road to rail . . . 2) management of mobility demand and the promotion of sustainable transport modes [and] (iii) promoting cleaner vehicles." Ibid., p. 18.

<sup>418</sup> Ibid., p. 18.

<sup>419</sup> Ibid., p. 26.

<sup>420</sup> Ibid., p. 18.

<sup>421</sup> Ibid., p. 27.

ferent measures towards reducing transports [sic] environmental effect . . . a system for collecting data, making impact and cost-benefit analyses and monitoring shall be improved and awareness raising projects initiated."<sup>422</sup>

The MTS 2022 sets a goal of Kosovo's becoming "one of the best performers in the West Balkan countries regarding traffic safety" and its being "at least on average level compared to EU countries."<sup>423</sup> In addition to the infrastructure measures described above, it recommends that Kosovo institute educational programs, "technical vehicle inspection, control-system for vehicles on the road by the Police and the Inspectorate of the Ministry of Infrastructure, control of overloading and cargo safety" and "gathering and dissemination of traffic safety data based on CADAS, efficient transposition and enforcement of safety regulations (including EU Acquis applicable for tachographs, transport of dangerous goods, weights and dimensions, competence of professional drivers etc.), an efficient framework for cooperation between different authorities."<sup>424</sup>

### **6. Challenges facing Kosovo's road transport policy**

In devising and implementing policies for reaching its road transport goals, Kosovo must take into account a host of factors, a number of which the MTS 2022 identifies.<sup>425</sup> Demographically, Kosovo's population is not expected to change significantly in the next five years, but more and more of it will migrate to urban areas. This will create transportation challenges not just within and between the growing urban areas themselves but also between those areas and the original places of residence of their new residents. These challenges will not be limited to the technical difficulties of enabling such travel. They will include as well the environmental problems caused by the increase in infrastructure construction, vehicle miles, traffic congestion and the like that new residence patterns will provoke.

Economic factors will also have large impacts on Kosovo's transport systems. The country's per capita GDP has grown rather rapidly since 2009, from the equivalent of EUR1.656 in 2009 to EUR3.800 in 2020,<sup>426</sup> an 8,7% CAGR. Further strong growth is expected in the medium term, which will reduce unemployment and increase personal income. The result of these otherwise positive developments will be a considerable rise in work-related and personal travel, in each case both intra- and international. Given Kosovo's limited rail network, much of

<sup>422</sup> Ibid., p. 27.

<sup>423</sup> Ibid., p. 25.

<sup>424</sup> Ibid., pp. 25 and 26 (internal citation removed). CADaS is the Common Accident Data Set. <https://www.itf-oecd.org/sites/default/files/docs/3-yannis.pdf>.

<sup>425</sup> Ibid., pp. 6-8.

<sup>426</sup> Eurostat estimate from KR 2022, p. 126.

this travel will be by road, exacerbating the problems caused by urbanization, including regarding road construction and congestion. And because Kosovo's electrical power is produced primarily by using lignite, transport electrification, whether of rail or road vehicles, will not produce the environmental benefits that it would if Kosovo's electrical energy came from renewable sources.

Kosovo is confronted with funding, administrative, technical, political and focus challenges in devising and implementing its road transport policy.<sup>427</sup> Funding in that its own financial resources are small and those of donors are likely to be scarce for road projects given that the EU is now emphasizing rail transport and that many of the road projects most important to donors, including especially TEN-T projects, are completed or nearing completion. Administrative in that Kosovo has limited administrative resources, staff time, staff focus, staff skills, etc., to devote to preparing road transport policy, implementing it and monitoring the results of its implementation, particularly since with the physical completion of much of Kosovo's road network the country must now address far-less-easy-to-understand-and-deal-with issues like electrification, digitalization and multimodality. Technical because Kosovo lacks staff capable of devising, implementing, operating and maintaining the advanced, complex systems it is now being required to put in place.<sup>428</sup> Political in that externally Kosovo faces potentially existential threats, complex diplomacy relating to its declaration of statehood and the specific issues of navigating the EU accession process while internally it must deal with the vast number of issues that confront a lower-income country transitioning to free markets and democracy as well as internal communitarian and regional divisions. Focus in that road policy is just one of a vast array of issues that are competing for the attention of Kosovo's administrators and political decision makers.

Specific challenges that Kosovo must deal with include its topography (which can make road projects expensive and time consuming), electrification (in a county that generates its electrical power from lignite and distributes that power through antiquated transmission and distribution grids), urbanization (with its implications for, e.g., congestion and pollution) market structure considerations (e.g., for bus and other mass transport solutions but also rail) and relations with the EU.<sup>429</sup>

<sup>427</sup> See, e.g., KR 2023, p. 68 (inadequate administrative capacity), p. 70 (public procurement weaknesses), p. 76 (poor financial controls), etc.

<sup>428</sup> These include ICT, but also mechanical, electrical and other advanced devices and systems.

<sup>429</sup> One of the greatest obstacles that Kosovo currently faces in conforming to EU requirements and desires, not just in the area of roads but generally, are the sanctions that the EU has itself imposed on the country. These include cessations of both funding and provision of advice. See KR 2023, p. 123, for a description of some of these sanctions. Grant for the sake of discussion



## 7. Policy Recommendations

The MTS 2022 does a good job of identifying the policy considerations, primarily EU requirements, that must drive Kosovo's road transport policy and the actions that Kosovo must take to address them. It and the NDS also propose useful indicators for measuring the success of those actions. The MTS 2022 does not, though, attempt to prioritize in terms of importance and timing of the actions that it recommends. This leaves a crucial gap in the guidance it gives policymakers, a gap that is addressed below.

*Given the scarcity of its financial, legislative, administrative and technical resources, Kosovo, and those advising it and assisting it to set goals and priorities, should keep in mind that trying to do too much at the same time will lead to failure to do anything well.* This would have serious negative consequences not just in terms of the loss of the benefits expected from a particular project but also in terms of shattered public and donor/lender confidence in Kosovo's ability to successfully undertake ambitious projects in general. This in turn could lead to other important projects not being undertaken, with concomitant large economic, social and environmental losses. *Accordingly, large projects, particularly large construction projects, must be carefully analyzed to critically assess their feasibility and value compared to alternative uses of Kosovo's scarce resources of all types.*

*On the other hand, Kosovo should be very aggressive in the short term in undertaking the reforms and other actions that will expand its resources, particularly its non-financial resources, or eliminate roadblocks to progress.*<sup>430</sup> This would enable it to engage in more ambitious projects, road and

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the merits of the EU's case against Prime Minister Kurti, whose actions the EU has strongly objected to. It is still questionable whether the tools that the EU has chosen to use to try to change his behavior and the ways in which it has employed those tools, however well intentioned, are best suited to attaining the goals that the EU presumably wishes to attain. This is true whether those goals are limited to the instrumental goal of altering Kurti's behavior or the ultimate goal of achieving peace and prosperity in Southeast Europe. Depriving a government keen to root out corruption and lawlessness, to correct the contracting and other deficiencies of the past and to comply with the vast majority of the technical requirements for joining the EU of the funding and advice required to do so seems at least at first glance counterproductive. It also smacks of collective punishment of the people of Kosovo, including of children then and now too young to have a political voice and of Serbs who boycotted the elections, since the great majority of the total Kosovo population did not vote for Kurti's party. Further, forcing a clash of wills with a locally important figure in the Balkans risks cementing positions on both sides in the firmest of stone. This is something that the EU has been careful to avoid in the cases of Serbia and the Republika Srpska, at least until very recently. Importantly, given the likely change in the composition of the EU Parliament after the upcoming EU elections, the time for any alteration in the EU's position regarding Kosovo sanctions would seem to be now.

<sup>430</sup> Note in this regard TEN-T Report 2023, which observes that "soft policy measures and small-scale projects offering quick and substantial benefits in terms of TEN-T compliance with limited financial investment have yet to materialise on the ground." P. 76 (emphasis removed).

otherwise, in the future. *Measures that Kosovo should take include capacity building<sup>431</sup> and reforms to contracting procedures, financial controls, etc.<sup>432</sup>* These actions may on their surface seem only tangentially related to progress in improving Kosovo's roads, connectivity and environment, but in fact they are the key to Kosovo's success not just in the road sector but in the transport sector as a whole (and in many others). As an example, many road-related projects and other activities cannot be pursued, because they depend on the enactment of the Draft Law on Roads, a procedure that is proceeding at a slow pace.

*Capacity building should be undertaken in, among other areas, the skills required to design, build and operate a modern road network.* These include not just modern civil engineering and construction expertise, but also digital skills such as those required to implement ITS, data interchange and the like. The legal, financial and other skills needed to negotiate often complex business arrangements and to document them in fair and well formulated contracts are also crucial. Particularly important, and often neglected, are the skills required to transpose EU acquis, since these will be needed not just in the road transport sector (for transposing, e.g., acquis relating to road safety or toll implementation) but in all areas for which acquis exist.

Moving from the general to the specific, one activity that is a clear priority for the Kosovan road sector is maintenance. Both the Transport Community<sup>433</sup> and the EC staff have emphasized this.<sup>434</sup> While less emotionally gratifying than large construction projects, maintenance projects are often by far the more rational choice.<sup>435</sup> They should be undertaken as a matter of the highest priority. *Practically, this means that Kosovo, and donors, should set aside enough money for maintenance to ensure that Kosovo's roads do not deteriorate. But it also means planning and execution which in turn require data and expertise. Data can be provided by Kosovo's implementing*

<sup>431</sup> KR 2023, at p. 121, notes the need for capacity building in Kosovo: "Regarding administrative capacities, significant efforts are required to allocate more human resources and to increase their capacities, particularly on planning and management of EU funds."

<sup>432</sup> See, e.g., footnote 137 above.

<sup>433</sup> "Sustainable progress is unattainable without proper care and maintenance of newly constructed assets." TEN-T Report 2023, p. 76.

<sup>434</sup> KR 2023, p. 110.

<sup>435</sup> "Compared with large projects, maintenance tends to be more cost-effective in the long run. Regular maintenance and timely repairs can extend the lifespan of infrastructure, thus reducing the need for costly replacements or extensive upgrades. Secondly, well-maintained infrastructure typically operates more efficiently and reliably, minimising disruptions and ensuring consistent service delivery. Moreover, maintenance projects are often quicker to implement and have a smaller environmental footprint than large-scale construction, contributing to sustainability goals." TEN-T Report 2023, p. 10.

*a RAMS, TODIS, CADAS and the other data gathering capabilities that the MTS 2022 and the EU recommend.*

As to other activities, it is not just activities that must be prioritized, it is sectors, too. It makes no sense to, e.g., pursue construction projects in sectors that provide lower or more distant returns than would projects in other sectors just in order to have sectoral “balance” or for short-sighted political reasons. The same holds for activity sequencing: *If activities in one sector take a long time to complete either because of their intrinsic nature or because Kosovo finds them hard, activities that depend on them should not be undertaken in other sectors.*

*For these reasons, while rail is favored by the EU, and for good cause, Kosovo should focus for the time being on roads.* Kosovo’s resource constraints are in themselves adequate reasons for this approach. But there are others that make it even more compelling. Kosovo has problems implementing rail projects. Its rail projects have proceeded slowly, and that slow progress has caused sequencing problems.<sup>436</sup> In its problems with rail, Kosovo is not alone. Other Western Balkans countries are progressing only slowly in modernizing their railways, limiting the value to international connectivity of an isolated stretch of improved Kosovan railway. In addition, because of its decrepitude Kosovo’s rail system is not greatly used internally for either passenger or freight traffic. Improving it to the point where it would be useful externally or internally for either type of traffic would require enormous, by Kosovan standards, investments in renovation and extension of tracks and electrification infrastructure, construction of multimodal facilities, implementation of advanced safety and interoperability technology, etc. It would also necessitate a massive cultural shift, since rail for good reason is not top-of-mind for Kosovan travelers or shippers. Worse, even if successful, a switch to rail would not bring the benefits in terms of reduced production of greenhouse gasses and other forms of pollution that it would in EU Member States, since for now the vast majority of Kosovo’s electricity is produced by burning lignite. Accordingly, while rail will someday be essential for Kosovo’s economy and that of the Western Balkans as a whole, that time is some years in the future.

Road improvement and extension should therefore be preferred in Kosovo over rail. It is less technically demanding than rail construction for Kosovo’s skill set, it will impose less burden on Kosovo’s weak electricity supply infra-

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<sup>436</sup> See, e.g., at *Cross-border connectivity* at II.A.7 above, regarding the delay in opening the completed Hani i Elezit CCP caused by schedule slippages in renovation of a rail line.

structure, it will improve internal productivity more rapidly than rail given that it is currently Kosovo's main cargo and passenger transport modality, it will facilitate international trade and passenger traffic (including holiday and seasonal passenger traffic surges) given that it is the region's main transport modality and if tolls are imposed on major motorways it will help pay for road construction and maintenance.

That said, road construction projects should also be approached with an eye to their prioritization and sequencing. Such projects have, for understandable reasons, proven difficult for Kosovo to complete successfully. *Accordingly, Kosovo should in the short term restrict its construction activities to a limited number of projects each of which is clearly feasible given the country's capabilities and has definite, outsized benefits in reducing travel times, minimizing congestion and/or linking regions.* It should prioritize those projects in accordance with their economic, social and environmental benefits, favoring those that enable other, valuable projects to be undertaken and avoiding those that are encumbered by political or other obstacles and uncertainties, including the slowness of other countries to finish activities important to the completion and utility of specific Kosovo projects.<sup>437</sup> *All other things being equal, smaller, easily completed projects should be preferred to larger, harder ones.*

*Care must also be taken with regard to ITS projects.* Kosovo lacks skilled ICT personnel and those that it is training will in many cases opt to take jobs abroad. Even if foreign contractors may perform the bulk of installation and initial implementation of ITS technology the question will then be how Kosovo will operate and maintain it.

*As to specifics road projects, Kosovo needs to ensure that its major municipalities are well connected by road, especially since its rail network will be limited to a single major corridor and one spur line for many years despite the current focus on improving it.* TEN-T-related construction should deal with much of this (Pristina-Mitrovica, Pristina-Prizren, Pristina-Pejë<sup>438</sup>) but not all. The Pristina-Gjulan road now under construction will fill one of the gaps, but consideration should be given to improving the connection between Prizren and Pejë via Gjakova as well as that between Prizren and Tetovo, North Macedonia.

To ensure full connectivity of its recently built roads, and so to facilitate

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<sup>437</sup> In particular, Kosovo needs to ensure that the physical products that it produces can be swiftly transported to foreign destinations no matter the political climate.

<sup>438</sup> The Pristina-Pejë road, which is now a TEN-T Comprehensive route, should be considered for elevation to a Core route, since it connects the capitals of Kosovo and Montenegro.

the commercially and socially important flow of goods and persons across its borders, *Kosovo should proceed as rapidly as possible to establish CCPs at all border crossings where this is politically feasible and desirable.* Construction of facilities for CCPs is obviously important, but a precondition to utilizing them is reaching agreements on staffing, data sharing and many other matters, the conclusion of which Kosovo should make a priority with those countries willing to do so.

*Kosovo should also consider charging tolls for the use of TEN-T routes.* This would at least partially implement the EU's "user pays" principle, but more importantly would provide a revenue stream for the maintenance and improvement of these routes. Care must be taken to avoid problems of nonpayment, traffic diversion to untolled roads less capable of handling large traffic volumes and overburdening of local commuters and others with travel costs, but these are problems that other countries have dealt with, and Kosovo can benefit from their experience. If Kosovo does implement tolls, it should use advanced technology compatible with that used by its neighbors, including as to e-tolling, and take advantage of the Transport Secretariat's technical assistance report on these issues.

*Thoughtful local road planning and timely construction will be crucial to ensuring that TEN-T routes are not clogged by municipal traffic as they are in, e.g., Zagreb and Vienna, and so are traversable at the speeds intended.* Avoiding traffic congestion is also important, because it results in drivers spending more time on roads, which greatly increases emission of GHGs, particulates and other pollutants, especially since much of that time is spent in highly polluting idling mode. Uncongested and well-laid-out urban and suburban road networks are also essential to the success of the planned shift to rail of road passenger traffic. Given the importance of free-flowing urban traffic, an affordable, convenient mass transit system needs to be established in urban areas to provide an alternative to the use of personal vehicles. *Congestion charges should be considered, initially on commercial vehicles and then, once mass transit is sufficiently developed, on private vehicles.*<sup>439</sup>

*An increase in the number of electric vehicle charging stations (EVCS) on main international routes, especially the Serbia-Pristina-North Macedonia TEN-T Corridor, is important to enabling the use of these routes for long-distance travel by EVs, particularly cargo hauliers.* EVCS are also im-

<sup>439</sup> Congestion charges also of course implement the user-pays principle. It will be politically advantageous to introduce them while relatively few Kosovars have automobiles in order to limit the sense of deprivation that might result from a later introduction.

portant for municipal bus, and potentially taxi, fleets. But because Kosovo generates its electric power by burning lignite (which is highly polluting in GHGs, particulates and other substances), Kosovo has a unique dilemma about how much to spend speeding its transition to electric mobility. Its and its donors' scarce financial resources would best be allocated in the short and even medium term to transitioning power generation to renewables and upgrading its transmission and distribution grids rather than subsidizing electric mobility.<sup>440</sup> This is especially true since Kosovar individuals and businesses (as opposed to government entities) are unlikely to buy EVs in significant quantities until EVs' prices decline considerably, which will take years.<sup>441</sup> That said, making municipal areas e-scooter and e-bike friendly is an unadulterated environmental win, since the cars that this would take off the road would be more polluting whether they were EVs or not<sup>442</sup> and since the two-stroke engine motor scooters that would be replaced are also highly polluting.

Kosovo's regional development plans and its municipalities' land use regulations are crucial, indirect aspects of its road transport policy that are often overlooked in analyses of that policy. If Kosovo can ensure the successful development of its regions, there will be less migration to urban areas, reducing pollution-causing congestion in those areas and the back-to-the-home-town weekend traffic that the MTS 2022 identifies as a likely consequence of increased urbanization.<sup>443</sup> *If Kosovo's municipalities can encourage vertical expansion rather than horizontal, that will reduce the urban sprawl that would otherwise clog their roads and transit systems and increase emission of GHGs and other pollutants.*

*Market structure analysis and adjustment also is important to limiting the burden on Kosovo's roads, reducing pollution and increasing traffic safety.* The MTS 2022 points out that Kosovo's intercity bus fleet, which is and will continue for the foreseeable future to be Kosovo's main form of intercity passenger transport other than personal vehicles, is divided

<sup>440</sup> Indeed it is arguable that until Kosovo has greatly expanded renewable energy production and renovated its transmission and distribution grids, it should eschew all electric-power-intensive projects that do not use renewable resources to generate the power that they need.

<sup>441</sup> This assumes that the very inexpensive EVs available in China will not be imported into Kosovo. If they are not, the incentives granted to buyers of EVs will create equity issues, since these incentives will then benefit only the wealthy.

<sup>442</sup> It should be noted in this regard that EVs produce significant particulate pollution. This is because their high weight (a consequence of their heavy batteries) causes rapid tire wear. This is, of course, especially dangerous in built-up areas. EVs' high weight also increases the damage and injuries that they can cause in collisions.

<sup>443</sup> MTS 2022, p. 6.

among many small, undercapitalized companies.<sup>444</sup> Consolidating these companies into fewer, stronger firms would allow them to buy less polluting, safer equipment while encouraging travelers to switch to them from personal vehicles.

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<sup>444</sup> Ibid., p. 9.

# Road Infrastructure in Moldova

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## Road Infrastructure in Moldova

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### 1. Review of Existing Road Infrastructure

#### 1.1. General Description

In order to ensure the financing of the activities of administration, maintenance and repair of national and local public roads of regional (municipal) interest in the Republic of Moldova, the Road Fund was established by Law no. 720/1996.<sup>445</sup>

An essential amendment to the Road Fund Law carried out by Law no. 172/2018 with a direct impact on the sources of accumulation and the annual volume of the road fund was the replacement of the provision:

*"(1) The sources for establishing the fund are:*

*a) not less than 50% in the year 2010, 65% in the year 2011, 80% in the year 2012 and in the following years of the total volume of excise duties on petroleum products subject to excise duties;"*

with the text:

*"(1) The sources for establishing the fund are:*

*a) annual breakdowns of the volume of excise duties on petroleum products subject to excise duties, except liquefied gas, in the amount established in the state budget law for the respective year;"*

It is possible to achieve the objectives of the Transport and Logistics Strategy for the years 2013-2022, approved by Government Decision no. 827 of 28.10.2013.

*General objective:*

To ensure adequate road infrastructure and the provision of quality and safe road transport services.

*Specific objectives:*

- continuous reduction of total road transport costs;
- ensuring appropriate rehabilitation, modernization, repair and maintenance;
- ensuring proper repair and maintenance of roads until 2022;

<sup>445</sup> [https://www.legis.md/cautare/getResults?doc\\_id=137550&lang=ro#](https://www.legis.md/cautare/getResults?doc_id=137550&lang=ro#)

- the continuation of the implementation of the Action Plan for the reform of the public road maintenance system;
- ensuring throughout the year access to the national road network on local/rural roads in all localities of the country;
- reducing the number of road accidents by 50% by 2020;
- ensuring the legal and institutional framework for the planning, operation and maintenance of the road network;
- integration of the road network of the Republic of Moldova into the European network;
- ensuring the safe transportation of goods and passengers.

The realization of the actions stated in the Strategy are extremely necessary in the current conditions of the technical state of the public road network.

### **1.2. Legal and Institutional Framework for Managing the Public Road Network**

In accordance with Art. 2 of the Road Law no. 509/1995 (with subsequent amendments and additions) national roads are state public property, and local roads of regional (municipality) interest are public property of second-level administrative-territorial units. Starting from April 2002 until January 1, 2017, public roads (national and local) in the Republic of Moldova were managed by the State Enterprise "State Administration of Roads" (SRA). After the transfer of local public roads of district (municipality) interest to the administration of level II local public authorities, the S.E. "State Road Administration" (SRA) manages only national public roads in accordance with the provisions of the aforementioned law. The patrimony of the enterprise belongs entirely to the state. SRA acts within the limits established by the legislation in force.

According to the Statute, SRA exercises the following functions:

- holding the title of possession and beneficiary in the construction and reconstruction, repair and maintenance of roads and road management objects, distributor of all the means allocated for these purposes from the State Budget, the Road Fund, and foreign investments;
- ensuring the efficient and effective use of financial and material resources, allocated for the development and maintenance of the road infrastructure;
- managing and ensuring the maintenance of the viability of national public roads.

Additionally, as a result of the negotiations carried out between 2006 and

2007 between the Government of the Republic of Moldova and the World Bank as part of the Project to support the Program of the Government of the Republic of Moldova in the road sector, it was agreed that SRA is to perform the functions of the implementation unit of the projects financed on the basis of credits and external technical assistance.

The activity of carrying out the functions of the beneficiary, as well as the management of national public roads, was financed according to the "Regulations on the required volume of labor and financial expenses for the management of public roads and the performance of the functions of the beneficiary by SRA, approved by Order of the Minister of Transport and Road Infrastructure no. 40/2016.

### 1.3. Overview of Moldova's Public Roads Network

The lists of public roads were approved by Government Decision no. 1468/2016 concerning the endorsement of the lists of national and local public roads in the Republic of Moldova.

In the course of investigating the public road network, both its length and functional classification were detailed. As of December 31, 2022, the aggregate length of public roads in the Republic of Moldova stands at 10,657 km, with the following distribution under administration:

- Ministry of Infrastructure and Regional Development (MIRD) (managed by SRA): **5,951 km of national public roads;**
- Level II local public bodies: **3,636 km of local public roads of regional (municipal) significance;**
- Public bodies of administrative-territorial units on the left side of the Dniester River (**Transnistria**): **1,070 km.**

According to the aforementioned data, SRA oversees 5,951 km, encompassing 631 km of express roads, 1,996 km of republican roads, and 3,324 km of regional roads.

The breakdown of the national public road network by types of road surface is depicted in Table 1, and further analysis will be presented in subsequent sections.

Table 1: Structure of the national public roads network <sup>446,447</sup>

Type of the roads structure	Total		Including:					
			Express roads		Republican roads		Regional roads	
	km	%	km	%	km	%	km	%
Total	5951	100	631	100	1996	100	3324	100
Concrete roads	273	5	222	35	29	1	22	1
Asphalt roads	4478	75	409	65	1928	97	2141	64
Crushed stone roads	1155	19	-	-	39	2	1116	34
Earth roads	45	1	-	-	-	-	45	1

In 2022, the length of national public roads with asphalt concrete surface increased by 48 km, compared to 2021, as a result of the execution of new construction works on the following roads that are located at the south part of Republic of Moldova and are also part of TEN-T Corridors:

- M3 Road Chisinau - Comrat - Giurgiulești - border with Romania, Porumbrei-Cimișlia sector, with a length of 19.0 km.
- M3 Road Chisinau - Comrat - Giurgiulești - border with Romania, Comrat bypass sector, 8.1 km long.

Also in the south-east part, was rehabilitated road G116 R30 – Alava – Volintiri – the border with Ukraine with a length of 20.9 km.

The total number of works at the road bridges, passages, two-level intersections, etc. located on national public roads is 879 pieces, with a total length of 21991 m, including bridges with a length of over 10 m - 541 pcs., with a total length of 19922 m.

The total number of platforms is 4665 pcs. with a total length of 64923 m.

<sup>446</sup> [https://midr.gov.md/files/shares/concept-strategie-mobilitate\\_6405e512eb101.pdf](https://midr.gov.md/files/shares/concept-strategie-mobilitate_6405e512eb101.pdf)

<sup>447</sup> <https://www.asd.md/despre-noi/>

Figure 1: Lengths of the components of the national public road network

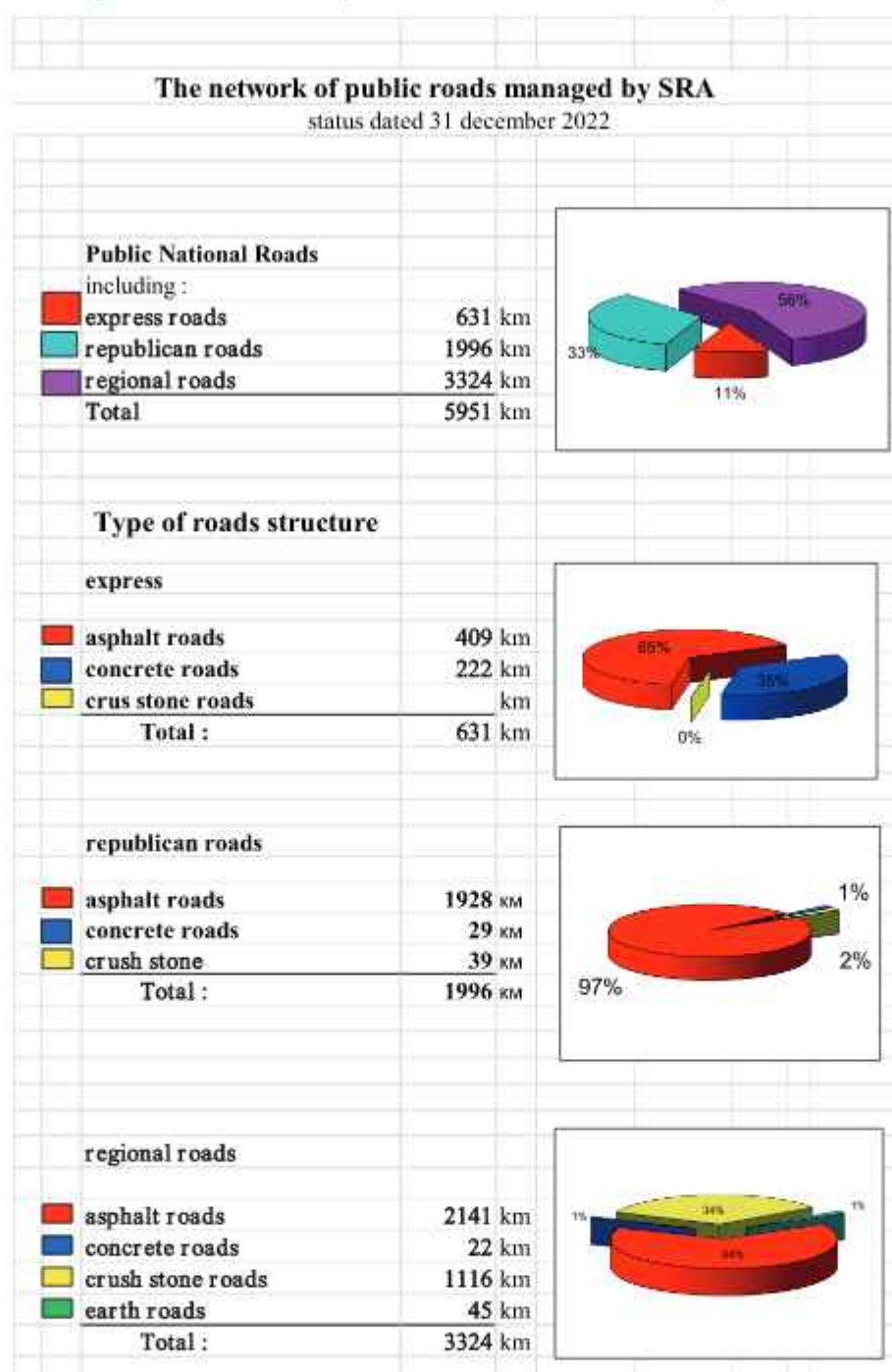


Figure 1: Lengths of the components of the national public road network

Source: State Road Administration

In accordance with the provisions of the Road Fund Law no. 720/1996 (with subsequent amendments and additions), the sources for establishing the fund are:

- a) annual breakdowns of the volume of excise duties on petroleum products subject to excise duties, with the exception of liquefied gas, in the

- amount established in the state budget law for the respective year;
- b) road taxes levied according to fiscal legislation, with the exception of the tax for the use of roads by vehicles registered in the Republic of Moldova;
- c) fees for issuing authorizations for international road transport of goods and occasional passengers;
- d) fines applied for non-compliance with passenger transport rules, damage to roads, constructions and road equipment, and plantations related to roads;
- f) the tax for the sale of natural gas intended for use as fuel for car transport units.

By the State Budget Law for the year 2022 no. 205/2021 (MO, 2021, no. 315-324, art. 478) initially breakdowns were approved in the road fund in the amount of 2,032,000.0 thousand lei, including 1,485,348.4 thousand MDL for national public roads and 56,651.6 thousand MDL for local public roads of regional interest. According to the provisions of art. 2, paragraph (1), letter a) from the Road Fund Law no. 720/1996 for breakdowns from the total volume of excise duties on petroleum products, with the exception of liquefied gas, a ceiling of 58.0% was established.

By Law 260/2022 on the amendment of the state budget law for the year 2022 no. 205/2021 (MO, 2022, no. 284-290, art. 581) breakdowns in the road fund were increased up to 2 357 551.5 thousand lei, by increasing the allocations for national public roads up to 1 810 899.9 thousand MDL and, respectively, the excise duty rate up to 67.85%.

The real volume of accumulations in the road fund was 2,285,635.3 thousand MDL.

#### **1.4. TEN-T Network and Moldova**

Given the presence of a well-established road network, immediate plans for expansion are not anticipated. Nevertheless, the Republic of Moldova is actively engaged in enhancing road sectors of international significance, collaborating with neighbouring countries and aligning its efforts with the broader European context.

Particular attention is directed towards aligning specific corridors that connect to the European networks with international standards and specifications. This strategic approach reflects the Republic of Moldova's commitment to fostering connectivity and interoperability within the broader European

transport infrastructure. Collaborative efforts with neighbouring nations underscore the shared goal of facilitating seamless and efficient transportation links, ultimately contributing to regional integration and economic development. The ongoing commitment to meet international standards demonstrates the Republic of Moldova's dedication to ensuring the smooth flow of goods and people across its road networks, fostering a more interconnected and resilient European transportation landscape.

### 1.5. Identification of the Priority Road Network

Considering the limited volumes of available funds and the growing needs of the road sector, the rehabilitation efforts were focused on the national road network consisting of main roads (M) and republican roads (R), as it was specified and classified above. Currently, depending on the volumes of passengers and goods transported on the roads, they are further divided into "priority network" and "other national roads".

In accordance with the Association Agreement that was signed with the European Union in 2014, the major goals in the transport area are:

- expand and strengthen their transport cooperation in order to contribute to the development of sustainable transport systems;
- promote efficient, safe, and secure transport operations as well as intermodality and interoperability of transport systems; and
- endeavour to enhance the main transport links between their territories.

The Association Agreement with the European Union entered into force on 1st of July 2016 and Moldova will transpose part of the European Acquis in the transport sector, as presented in annex 10 of the AA.

A revised EU-Moldova Association Agenda, covering the period 2021-2027, was FORMALLY adopted on August 22, 2022. This agenda encompasses mutually agreed-upon priorities for advancing the implementation of the Association Agreement and outlines an ambitious program of reforms. It is imperative that these reforms be thoroughly integrated into Moldova's forthcoming mobility strategy.

The ensuing section presents an updated vision for aligning Moldova with EU transport policy and transport acquis. The significance of these orientations is heightened by Moldova's deepened commitment to the European Union, notably marked by the European Council's decision on June 23, 2022, to grant Moldova the status of an EU candidate country. Furthermore, this endorsement paved the way for the initiation of accession negotiations, scheduled to commence on December 15, 2023.

Central to this transformative journey is the envisioned alignment of Moldova with EU transport policy and the transport acquis. The orientations presented in the updated agenda take on a more imperative tone due to Moldova's heightened orientation towards the European Union. As the country assumes the status of an EU candidate, the imperative for alignment with EU standards becomes even more pressing.

The transport sector is a key focal point within this realignment process. Recognizing the integral role that efficient and well-connected transportation systems play in fostering economic development, trade, and people-to-people exchanges, the EU-Moldova Association Agenda delineates a vision for the integration of Moldova into the EU's broader transport policy framework.

In line with the agenda's provisions, Moldova is expected to undertake substantial reforms and initiatives in its transport sector. These may include modernizing and expanding its road infrastructure, enhancing connectivity, and aligning regulatory frameworks with EU standards. The imperative for these measures is underscored by the fact that they are not just policy recommendations but represent crucial steps toward fulfilling the requirements for EU accession.

Moreover, the opening of accession negotiations in December 2023 signifies a critical juncture, demanding intensified efforts from Moldova to meet the transport-related criteria set by the EU. The negotiations will likely delve into specific areas such as the harmonization of transport regulations, the development of sustainable and environmentally friendly transportation systems, and the improvement of cross-border connectivity. The updated EU-Moldova Association Agenda serves as a blueprint for Moldova's transformative journey towards EU membership, with a particular emphasis on the alignment of its transport sector with EU standards. The imperative nature of these orientations is heightened by Moldova's attainment of EU candidate country status and the commencement of accession negotiations, making the realization of a comprehensive and effective mobility strategy a key component of its path to European integration.

Subsequently, the Government of the Republic of Moldova has meticulously crafted a comprehensive package of project proposals slated for presentation to International Financial Institutions in 2024. These proposals are geared towards securing funding for the construction, rehabilitation, and thorough modernization of the Trans-European Transport Network (TEN-T) corridors that traverse the Republic of Moldova. In this strategic initiative, the initial phase encompasses the submission of proposals covering approximately 400 kilometres of roads.



Within this ambit, certain sectors have already undergone extensive feasibility studies, with corresponding technical projects meticulously developed. These studies and projects serve as a testament to the meticulous planning and groundwork undertaken by the Moldovan government, laying the foundation for a robust and well-executed initiative. The proposed projects are poised not only to enhance the overall transportation infrastructure but also to align it with international standards, fostering economic development and regional connectivity.

Moreover, the submitted proposals reflect a nuanced understanding of the multifaceted challenges and opportunities inherent in the modernization process. The technical details incorporated in these proposals are a testament to the government's commitment to ensuring that the projects not only meet but exceed international standards for efficiency, safety, and sustainability.

The section 16 of the agenda put emphasis on the further implementation of the EU legislation mentioned in the annexes to the Association Agreement and to support the Republic of Moldova with the focus on connectivity, road safety and sustainable transport systems.

Respectively, in the field of connectivity:

- Implement the provisions of the EU- Republic of Moldova Common Aviation Agreement which has a potential of boosting the tourism and thus the economic development of the country.
- Cooperate with the Republic of Moldova in developing and implementing a new national transport (mobility) policy document, including a national maritime policy document.
- Raise the safety, security and marine environmental standards, which would lead to an improved Flag State performance of the Republic of Moldova under the Paris Memorandum of Understanding on Port State Control.
- Cooperate with the Republic of Moldova in reforming its inland waterways transport sector, including through capacity and institutional building.
- Implement infrastructure projects identified by the extension of the indicative core TEN-T network and included in the Commission January 2019 Indicative TEN-T Investment Action Plan. Implementation of priority projects identified in the Action Plan should lead to completion of the indicative core TEN-T network by 2030 leading to better, more efficient and safer transport links between the EU and the Republic of Moldova
- The implementation of these projects not only strengthens the transporta-

tion infrastructure but also plays a significant role in bolstering the bridge-like function of the Black Sea Basin. By fostering continuous development of connectivity in this region, the Republic of Moldova can assume a central role in facilitating trade exchanges and collaboration among the Black Sea neighboring countries. This endeavor not only solidifies Moldova's candidate status for EU accession but also reinforces regional cooperation, thereby promoting stability and prosperity throughout the area.

- It is crucial to underscore that this initiative extends beyond being a mere step towards Moldova's European integration; it stands as a key element in regional development and the fortification of cross-border ties. The ongoing commitment to enhancing connectivity within the Black Sea Basin aligns with the broader European goal of fostering closer ties between neighboring nations and creating a more integrated, cooperative regional landscape.
- In the context of a European report, the strategic importance of Moldova's role as a facilitator of trade and collaboration in the Black Sea region should not be understated. This initiative not only aligns with the European Union's overarching vision for a well-connected and cooperative neighbourhood but also showcases Moldova's commitment to contributing actively to the broader European agenda. As the Republic of Moldova progresses towards European integration, its impact on regional stability, economic cooperation, and transnational linkages cannot be overlooked. The ongoing projects represent a tangible commitment to these objectives, demonstrating Moldova's potential to act as a catalyst for positive change in the Black Sea Basin and beyond.<sup>448,449</sup>

## **2. Review of Strategic National Documents and Plans with Relation to Road Infrastructure and Connectivity**

Given the fact that the Transport and Logistics Strategy 2013-2022 is expired, the Government of the Republic of Moldova is in the process of developing and approving a new strategy, namely the National Mobility Strategy 2023-2030. The strategy is to be developed and promoted in accordance with the provisions of Government Decision no. 386/2020 regarding the planning, development, approval, implementation, monitoring and evalu-

<sup>448</sup> [https://mfa.gov.md/sites/default/files/cap.\\_21\\_retele\\_transeuropene\\_pna\\_2023-2027.pdf](https://mfa.gov.md/sites/default/files/cap._21_retele_transeuropene_pna_2023-2027.pdf)

<sup>449</sup> <https://eur-lex.europa.eu/legal-content/RO/TXT/HTML/?uri=CELEX:52022PC0069&-from=EN>

ation of public policy documents and Law no. 100/2017 with regard to the normative acts.

The purpose of developing the Strategy is to ensure sustainable development and a safe transport system as well as the establishment of efficient domain management that will allow quick resolution of the major problems in the sector, but also the identification of optimal solutions for their quick and efficient solution. In the vision of the Ministry, the transport system towards the year 2030 must meet the following criteria:

### *1. Sustainable and Safe Transport:*

- Ensure transport affordability, sustainability, interoperability, and safety.
- Enhance Moldova's strategic transport network, especially the TEN-T, for improved connectivity.
- Minimize environmental impact for a sustainable future.

### *2. Sustainable Infrastructure Development:*

- Integrate Moldova's strategic transport network with TEN-T and regional networks.
- Allocate adequate budgetary resources to enhance the safety of transport infrastructure.
- Incorporate accessibility standards for individuals with special needs.

### *3. Normative and Institutional Framework:*

- Consolidate normative and institutional frameworks for effective governance.
- Strengthen capacities for holistic planning across road, rail, naval, and air transport.
- Foster private investments to boost overall connectivity.

### *4. Optimal Mobility of People and Goods:*

- Review and interconnect regional road transport programs to enhance efficiency.
- Streamline regular services to improve public access.
- Establish support mechanisms for carriers and promote interoperability.
- Contribute to increased accessibility, balanced transport development, and enhanced service quality.

### *5. Accelerating Digitization of Transport:*

- Spearhead the digitization of transport systems for enhanced efficiency.

- Improve intelligent transport systems (ITS) and information technology.
- Implement open data, electronic services, and integrated management systems.

### 6. *Transition to Environmentally Friendly Transport:*

- Implement best European practices for sustainable transport models.
- Encourage the adoption of eco-friendly modes, such as railways, naval transport, electric vehicles, bicycles, and scooters.
- Establish mechanisms to facilitate the use of environmentally friendly transport options.

## 3. **Cross-border Connectivity: Bridges and Border Crossings**

In 2023, Commissioner for Transport Adina Vălean and Moldova's Minister for Infrastructure and Regional Development signed an agreement in Chisinau, associating Moldova with the Connecting Europe Facility (CEF) programme. This agreement will enable Moldovan project promoters to apply for EU funding for projects of common interest in the transport, energy, and digital realms, ultimately enhancing the country's connectivity with its EU neighbours. The initiative will actively support Moldova's integration within the EU Single Market, fostering growth, job creation, and competitiveness.

On May 23, 2023, the official inauguration of the border crossing point between the Republic of Moldova and Romania took place at Leova-Bumbăta, along the Prut River. The phased opening of the Leova-Bumbăta border has commenced for minibuses, cars, and freight weighing up to 3.5 tons. Moldova is planning to enhance the existing infrastructure and construct a permanent border crossing point from Bumbăta to Leova. This initiative aims to facilitate the efficient flow of people and goods between the two countries and contribute to the strengthening of bilateral relations. Furthermore, Moldova is committed to adhering to international standards and providing a safe and friendly environment for all individuals utilizing this border crossing point. The country will continue to closely collaborate with the competent authorities in both countries to ensure the smooth operation of this border point and efficiently address the needs of the community.<sup>450</sup>

It is essential to mention a very important aspect that Moldova has faced

<sup>450</sup> [https://mfa.gov.md/sites/default/files/raport\\_anual\\_public\\_al\\_maeie\\_decembrie\\_2023\\_2.pdf](https://mfa.gov.md/sites/default/files/raport_anual_public_al_maeie_decembrie_2023_2.pdf)

profound repercussions stemming from Russia's aggressive war against Ukraine. The European Union remains steadfast in its solidarity with the country, committed to bolstering its resilience. The agreement reached today serves to further align Moldova with the European Union, intricately integrating the nation into these interconnected trans-European networks. It is crucial to note that these responses are generated by me and are not directly extracted from existing sources.

Commencing on April 15, 2023, the border and customs authorities of the Republic of Moldova and Romania are implementing coordinated control at the Leușeni-Albița border crossing point for inbound traffic into Romania. On May 9, 2023, in Chișinău, three bilateral agreements were signed, outlining the reconstruction and rehabilitation of cross-border bridges over the Prut River: Leușeni (MD) - Albița (RO), Cahul (MD) - Oancea (RO), and Sculeni (MD) - Sculeni (RO). The modernization of these bridges aims to streamline traffic between the two banks of the Prut, facilitate trade in both domestic and international markets, and yield tangible benefits for enhancing connectivity with EU member states. The repair works for these three cross-border bridges will be financed by the Romanian Government until the end of 2027 and are part of the national strategy "Moldova Europeană 2030." Likewise, an important topic is the signing between the Ministry of Infrastructure and Regional Development (Moldova) and the Ministry of Infrastructure (Ukraine) of the Agreement on the construction of the cross-border road bridge over the Dniester River, at the Moldovan-Ukrainian border, in the area of the towns of Cosauti - Yampil.

The construction of the border road bridge will interconnect the road infrastructures between the two states, on the route T-02-02 Mohyliv-Podilsky-Yampil-Kryzopil-Bershad-Uman (Ukraine) and the national road R14.1 R14-Kosăuți - the border with Ukraine (Republic Moldova). Also, the road network through the eastern part of the Republic of Moldova will be connected to the international traffic road network, thus facilitating trade on the domestic and international markets.

The Government of Ukraine will provide financing for the technical project of the bridge, including its construction, as well as the construction of the related infrastructure on its territory, and the Government of the Republic of Moldova will provide the construction of the related road infrastructure on the territory of Moldova.

The bridge will have a length of more than 1400 meters, two traffic lanes and two pedestrian sidewalks on both sides. The construction is to be put

into operation in 2025. All aspects related to the construction of the Cosauți - Yampil road bridge will be monitored by the Moldovan-Ukrainian Joint Commission, which will be created for this purpose.

For the purpose of improving connections with neighbouring countries and developing the TEN-T networks, Moldova has an ambitious plan for the construction of several bridges over the Prut and Dniester rivers. The detailed map can be seen below in Figure 2.

Figure 2: Modernization of New TEN-T Connection UA-RO-EU<sup>451,452</sup>



In light of recent developments, the Government of the Republic of Moldova has embarked on a proactive implementation process for significant infrastructure and connectivity projects. Please refer to the map and table below for detailed information. Additionally, in response to the proposal to include another crucial road sector in the TEN-T network, connecting Moldova and Ukraine through a road bridge (Cosauti - Yampil), the European Union granted approval in December 2023.

Consequently, two road sections within the Republic of Moldova have been incorporated into the trans-European network. Specifically, these sections include the route linking the towns of Soroca, Drochia, and the customs office of Costesti at the Romanian border, as well as the road from Anenii Noi to Causeni and Stefan-Voda, heading towards the border with Ukraine in the direction of Odesa.

<sup>451</sup> <https://www.moldpres.md/en/news/2023/12/27/23010454>

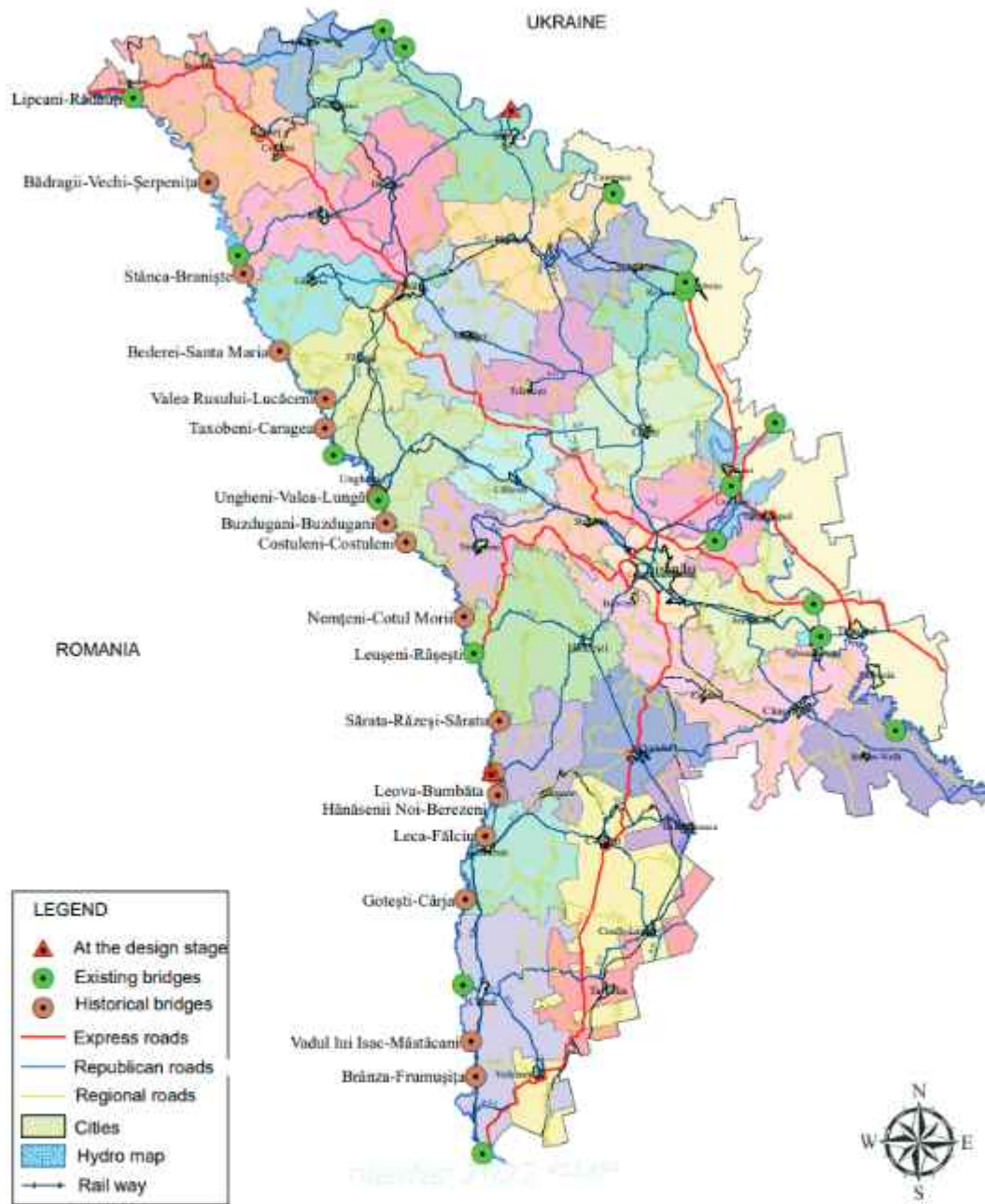
<sup>452</sup> <https://moldovalive.md/one-step-closer-to-europe-two-moldovan-national-roads-are-included-in-the-ten-t-trans-european-transport-network/>

The High-Level Memorandum of Understanding between the European Union and the Republic of Moldova, concerning the indicative maps of the Trans-European Transport Network (TEN-T) in Moldova, has been officially signed. Minister of Infrastructure and Regional Development, Andrei Spînu, and the Director-General of the European Commission's Directorate-General for Mobility and Transport (DG MOVE), Magda Kopczynska, signed the document online.

This memorandum outlines that the Chisinau-Cainari-Bessarabca and Balti-Ocnita railway sections will also be integrated into the trans-European transport network. This inclusion aims to facilitate the attraction of European investments for the modernization of transport infrastructure and the elimination of existing obstacles in logistics operations.

The indicative maps of the Trans-European Transport Network encompass European transport corridors extending to the Republic of Moldova and Ukraine. Consequently, the North Baltic Corridor has been extended through Lviv and Kyiv to Mariupol; the Baltic-Black-Aegean Corridor has been prolonged through Lviv, Chernivtsi (Romania and Moldova) to Odesa; and the Baltic-Adriatic and Rhine-Danube corridors will traverse Lviv. These developments mark significant progress in enhancing regional connectivity and fostering economic collaboration.

Figure 3: The bridges over the Prut and the D



453 <https://harta.asd.md/>

454 <https://msp.gov.md/?layer=bridges>



Table 2: Structure of the national public road network

Bridges over the Prut River					
No.	Crossing Point	Financing	Note	Dead-line	Cost (EUR)
1	Giurgiulesti (MD) - Galati (Ro)	The bridge was rehabilitated	The bridge has been rehabilitated, and the construction of the crossing point is necessary	2022	15 mln. EUR
2	Leuseni (MD) - Albita (Ro)	Government RM/ World Bank/ CEF	In the process of negotiating the agreement with the World Bank. Co-financing will be supported by CEF	2026	Estimated 11 mln. EUR
3	Ungheni (MD) - Ungheni (Ro)	Government RM/ World Bank/ CEF	In the process of negotiating the agreement with the World Bank. Co-financing will be supported by CEF	2026	Not estimated
4	Sculeni (MD) - Sculeni (Ro)	Government RM/ World Bank/ CEF	In the process of negotiating the agreement with the World Bank. Co-financing will be supported by CEF	2026	Not estimated
5	Cahul (MD) - Oancea (Ro)	Not identified		2026	Not estimated
6	Leova (MD) - Bumbata (Ro)	Not identified	It is necessary to develop the Feasibility Study for the construction of a permanent bridge	2030	Not estimated
7	Lipcani (MD)- Rădăuți (Ro)	Not identified	It is necessary to develop the Feasibility Study for the construction of a permanent bridge	2030	Not estimated
8	Stâncă (MD)- Braniște (Ro)	Not identified	It is necessary to develop the Feasibility Study for the construction of a permanent bridge	2030	Not estimated
9	Bădragii Vechi (MD) -Șerpeni (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
10	Bederei (MD)-Santa Maria (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
11	Valea Rusului (MD)-Lucăcen (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
12	Taxobeni (MD)-Caragea (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
13	Buzdugani (MD) - Buzdugani (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
14	Costuleni (MD) - Costuleni (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
15	Nemțeni (MD) - Cotul Morii (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
16	Sărata Răzeși (MD)-Sărata (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
17	Hănăsenii Noi (MD)-Berezeni (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated

18	Leca (MD)-Fălcu (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
19	Gotestii (MD)-Cârja (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
20	Vadul lui Isac (MD)-Măstăcanii (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
21	Brânza-Frumușita (Ro)	Not identified	it is a historical bridge that connects both countries and it is necessary to restore it.		Not estimated
Bridges over the Nistru river					
No.	Crossing Point	Financing	Status	Deadline	
1	Cosauti (MD) - Yampol (UA)	In discussions with IFI	The Feasibility Study is at the Finalization stage. It is necessary to identify the financing	2025	Estimated cost 50 mln. EUR
2	Otaci (MD) Moghilev Podolsk (UA)	Not identified	maintenance is required. The bridge is in mediocre condition	2026	Not estimated
3	Unguri (MD) - Bronitsa (UA)	Not identified	maintenance is required. The bridge is in mediocre condition	2026	Not estimated
4	Camenca	Not identified	Reconstruction of the bridge is necessary		Not estimated
5	Rezin - Rabnita	Not identified	maintenance is required. The bridge is in mediocre condition		Not estimated
6	Criuleni - Dubasari	Not identified	Capital repair is required		Not estimated
7	M5 Gura Bicului	Not identified	Capital repair is required		Not estimated
8	Tighina Bender	Not identified	Capital repair is required		Not estimated
9	Rascaietii - Hlinaia	Not identified	Capital repair is required		Not estimated

#### 4. Major Road Infrastructure Projects

The government of the Republic of Moldova has commissioned around 300 km of national public roads until the end of 2023. Also, this year, several financing agreements were negotiated and signed with the International Financial Institutions, which relate to the development of the TEN-T networks and priority roads in the national network of national public roads. At the same time, the Government of the Republic of Moldova is currently negotiating with the European Bank for Reconstruction and Development and with the World Bank with a view to signing other Agreements and Financing Contracts regarding the rehabilitation, modernization of the construction of national roads and local road corridors that create interconnectivity.

The priority is the development of the TEN-T networks, i.e. currently the works contracts for the Vulcanesti city bypass (with deadline for construction until

2026) and the construction of the Slobozieia Mare bypass (deadline by the end of 2024), both works being part of the TEN-T corridor (south of the country). Likewise, an important sector is the rehabilitation of the M5 road sector from Criva to Balti (financed by the EIB) with length of about 133 km, which is also part of the TEN-T. In 2024, the initiation of the tender procedures and commencement of construction activities are planned for the initial segments of the M5 Criva - Balti road. These endeavours encompass a range of intricate tasks, including the construction of grade-separated intersections, widening efforts, and complex operations related to bridges and road structures.

What is referred to as the national roads network is also underway on the road sector from Soroca to Otaci with a length of 40 km (deadline 2026), the road sector R34 Hincesti - Leova - Cahul with a length of 83 km. Other large priority projects worth listing are still in negotiations with the IFIs such as the M1 road sector Chisinau - Leuseni (85 km), Chisinau ring road, namely sectors 2 and 3 (18 km), which are part of the TEN-T and respectively the Continuation of the R34 road from Cahul to Giurgiulesti with a total length of approximately 70 km. Below are presented the road sectors mentioned above that are indicated on the map of the Republic of Moldova, showing the connection with the TEN-T network.<sup>455,456</sup>

Figure 4: M3 Road connection with TEN-T



<sup>455</sup> <https://gov.md/sites/default/files/document/attachments/subiect-06-nu-976-midr-2022.pdf>

<sup>456</sup> <https://midr.gov.md/noutati/100-milioane-euro-vor-fi-alocate-de-bei-pentru-continuarea-proiectului-moldova-drumuri-iii>

Figure 5: M5 and M1 Roads connection with TEN-T



## 5. Mapping of Existing Challenges to Road Connectivity - Internal and External Dimensions

### 5.1. Political Challenges

Moldova's complex **political landscape** can often lead to delays and uncertainties in road development projects. Political stability and cooperation are essential for efficient infrastructure development. The Transnistria Situation it should be emphasized that the unresolved Transnistria conflict can impede cooperation with Ukraine, affecting cross-border road connectivity and trade.

### 5.2. Financial Limitations

Limited budgetary resources pose a significant challenge to maintaining and expanding Moldova's road network. The country's economy is still in transition, which can affect its ability to fund major infrastructure projects. However, recently the Government of the Republic of Moldova is in the process of improving the legislation in the field of transport infrastructure, with an emphasis on the identification of quick and correct solutions for allocating the budget for construction, rehabilitation, modernization, road safety and road maintenance.

As previously mentioned, the Government is in negotiations with the International Financial Institutions regarding the identification of the necessary sources for the TEN-T road network and the internal network. And last but

not least, the construction of the **Targu Mures (RO) - Iasi (RO) - Ungheni (MD) - Chisinau (MD) - Odessa (UA) Highway** should be highlighted here. And here Moldova has the support of Romania and the entire European Union. The government applied to the EPIC Facility for Eastern Partnership Investment in Connectivity mechanism for the development of the Feasibility Study for the highway.

### **5.2.1 Multi-dimensional Impact Assessment of the Targu Mures - Iasi - Ungheni - Chisinau - Odessa Highway Project**

The construction of the highway will improve connectivity, facilitate the movement of goods, people, and services across these regions, fostering economic growth and cooperation and significantly reduce transportation times and costs for businesses engaged in cross-border trade.

Enhanced transportation links would promote increased trade between Romania, Moldova, and Ukraine, providing a boost to their economies. For Moldova, the highway represents a crucial step towards European integration, aligning its infrastructure with EU standards. The highway could facilitate cross-border cooperation and integration efforts, promoting stability and development in the region. Improved connectivity often leads to the development of logistics hubs, industrial zones, and other economic clusters along the highway's route. This can generate jobs and attract investments, contributing to the economic well-being of the regions involved.

The highway's construction would enhance tourism opportunities by making it easier for travellers to explore the diverse cultures, historical sites, and natural beauty of the regions it traverses. Increased tourism can stimulate local economies and cultural exchange.

The highway could also serve as a critical transportation route for energy resources, helping ensure energy security for the countries involved. It may facilitate the transportation of energy resources from Ukraine to Moldova and Romania.

Also, a modern highway, designed with sustainability in mind, can lead to more efficient transportation, potentially reducing the environmental impact of existing road networks. The use of eco-friendly construction materials and designs can further mitigate environmental concerns.

What is concerning to the regional stability, the highway will improve connectivity, and cooperation through the highway can contribute to regional stability by promoting dialogue, collaboration, and shared interests among the countries

involved. In conclusion, the construction of the Targu Mures - Iasi - Ungheni - Chisinau - Odessa highway is not just a transportation project; it represents a transformative initiative with numerous benefits. It will foster regional connectivity, boost economic development, facilitate trade, and strengthen ties between Romania, Moldova, and Ukraine. Moreover, the highway aligns with European integration goals and contributes to stability and environmental sustainability in the region. Overall, the necessity of this project is evident in its potential to bring prosperity and progress to Eastern Europe.

Based on the initial analysis and the subsequent request for more detailed, data-driven insights, here is a comprehensive elaboration on the impact of the Targu Mures - Iasi - Ungheni - Chisinau - Odessa highway project, incorporating findings from various studies and assessments:

### *Economic Impact and Development:*

A significant aspect of the highway's impact is its potential to drive economic development. According to a study by the European Bank for Reconstruction and Development (EBRD), the highway is projected to increase Moldova's Gross Domestic Product (GDP) by up to 2% annually. This economic boost is primarily due to the facilitation of trade and reduced transportation costs. The highway's role in connecting key economic zones across Romania, Moldova, and Ukraine is expected to streamline logistics, enhance market access, and attract foreign direct investment. The EBRD's analysis suggests that the highway could lead to a marked increase in intra-regional trade volumes, with an estimated 30% increase in trade efficiency.<sup>457</sup>

### *Energy Security:*

The International Energy Agency (IEA) conducted an analysis focusing on the highway's influence on energy security in the region. The highway is anticipated to play a critical role in the more efficient transportation of energy resources, particularly from Ukraine. This could lead to a significant reduction in energy costs and enhance the energy independence of the involved countries. The IEA projects that the highway could reduce energy transportation costs by approximately 15%, thereby contributing to the energy resilience of the region.<sup>458</sup>

### *Tourism Enhancement:*

A regional tourism board's impact assessment predicts a substantial boost in tourism due to the highway's construction. Improved accessibility is expected to increase tourist arrivals by 15-20%, emphasizing the highway's role in facilitating easier travel to various cultural and natural attractions.

<sup>457</sup> [When could the Ungheni - Chisinau - Odesa highway be ready - Moldova \(moldivalife.md\)](#)

<sup>458</sup> [Ambitious Infrastructure Revamp in Moldova To Boost Economy \(worldconstructiontoday.com\)](#)

This increase in tourism could lead to a corresponding rise in local economic activity, bolstering the hospitality and service sectors.

### *Environmental Considerations:*

Environmental impact studies emphasize the highway's potential for environmental sustainability. Incorporating eco-friendly design and construction materials, the project aims to reduce vehicular emissions by 10-12%. This reduction is significant in the context of global efforts to combat climate change and promote sustainable development practices. Additionally, the highway's design includes measures to minimize its ecological footprint, such as wildlife crossings and noise reduction barriers.

### *Regional Stability and Cooperation:*

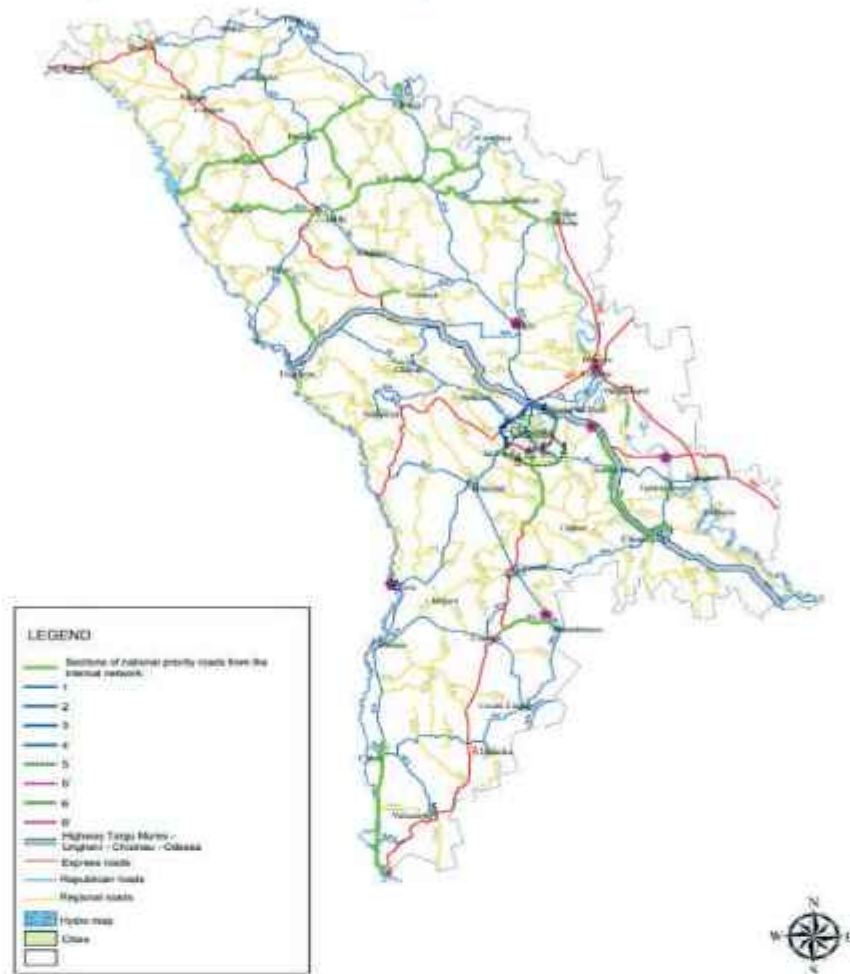
The United Nations Development Programme (UNDP) highlights the highway's potential in fostering regional stability and cooperation. The improved connectivity and economic interdependence among Romania, Moldova, and Ukraine could lead to enhanced political cooperation. The UNDP's report suggests that the highway could serve as a catalyst for regional integration, promoting shared interests and collaborative initiatives.<sup>459</sup>

In summary, the Targu Mures - Iasi - Ungheni - Chisinau - Odessa highway project represents a multifaceted initiative with far-reaching impacts. The project is not just a transportation development; it's a catalyst for economic growth, energy security, tourism expansion, environmental sustainability, and regional cooperation. These quantifiable benefits, as outlined in various studies, underscore the project's significance in driving progress and prosperity in Eastern Europe. The integration of this infrastructure with European standards further aligns the region's development trajectory with broader continental goals.

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<sup>459</sup> [TRM - Two million euros for a feasibility study of the Târgu Mureş - Iaşi - Ungheni motorway](#)

Figure 6: Targu Mures - Iasi - Ungheni - Chisinău - Odessa Highway



### 5.3. Environmental Challenges and Decarbonization of Road Transportation

If we go back to **Environmental**, it is worth mentioning that road development can have a substantial impact on Moldova's environment, including deforestation, soil erosion, and habitat disruption. Balancing infrastructure needs with environmental preservation is crucial. But given the fact that starting with 2021, the Republic of Moldova has fully applied the EU regulations, and step by step transposes the EU directives in the Environmental field, this means that all the necessary procedures will be strictly followed during the construction and rehabilitation of roads.

#### 5.3.1. Sustainable Road Design

Here we are also talking about the decarbonization of road infrastructure, and for this topic in road design the Recycled Construction Materials solution is used: The adoption of recycled materials in road construction can significantly reduce the carbon footprint of infrastructure projects. Moldova should explore sustainable sourcing and utilization of such materials.



### 5.3.2. Electric Vehicle Infrastructure

The development of electric vehicle (EV) infrastructure in Moldova, including charging stations, has been progressing, with significant strides made in recent years to promote sustainable transportation and reduce emissions. This development aligns Moldova more closely with neighbouring countries like Romania, which are also investing in electric mobility.

As of 2020, a national network of electric vehicle charging stations was launched in Moldova, with support from the United Nations Development Programme (UNDP) and the Government of Moldova. This project saw the installation of 22 charging stations across major urban routes, with additional installations planned to bring the total to 60 units by the end of that year. These stations are strategically located in parking lots of gas stations and are compatible with all types of electric vehicles, capable of charging two cars simultaneously.<sup>460</sup>

The growth in EV infrastructure has correlated with an increase in the registration of electric vehicles in Moldova. Between 2018 and 2022, over 27,000 electric and hybrid cars were registered in the country. The end of 2022 saw about 700 electric cars registered, which was double the number registered in 2021. This growth indicates a significant shift towards electric and hybrid vehicles in Moldova, supported by the development of charging infrastructure.<sup>461</sup>

In urban areas, the concentration of charging stations is higher, especially in the capital city, Chisinau. However, the expansion plan includes major national roads, aiming to create an electric corridor between Romania and Ukraine. This expansion is not only focused on urban areas but also aims to facilitate long-distance travel for EVs through the country, thus enhancing regional connectivity.

The Moldovan government's strategy towards decarbonization in the transport sector and the transition to EVs includes not only the development of charging infrastructure but also aligning its legal framework with EU standards. This alignment includes encouraging the use of electric vehicles and creating an attractive financial mechanism for purchasing and managing the charging stations. The government's efforts are part of a broader project aimed at creating a sustainable and ecologically friendly transport network in the country.<sup>462</sup>

<sup>460</sup> [Development of the Electric Vehicle charging infrastructure in Moldova, Phase II, EV fast-charging stations. \(ungm.org\)](https://ungm.org)

<sup>461</sup> [The number of electric cars registered in Moldova doubled last year \(green-forum.eu\)](https://green-forum.eu)

<sup>462</sup> [14 charging stations for electric vehicles will be installed on the main urban routes in the Republic of Moldova | United Nations Development Programme \(undp.org\)](https://undp.org)

Furthermore, the European Bank for Reconstruction and Development (EBRD) is involved in supporting Moldova's economic development through road rehabilitation projects. These projects include the development of an E-mobility Strategy for Moldova, which will promote the deployment of an electric vehicle fleet and charging infrastructure. This strategy is a critical component of Moldova's transition to more sustainable and environmentally friendly transportation methods.<sup>463</sup>

The European Investment Bank (EIB) plays a significant role in supporting the development of electric vehicle infrastructure and broader energy efficiency initiatives in Moldova. The EIB's involvement aligns with its commitment to advancing sustainable and green energy solutions.

EIB Global, the bank's development finance arm, has invested significantly in Moldova's electricity distribution sector. A key investment includes a \$30 million program to modernize, digitalize, and expand the electricity distribution grid in central and southern Moldova, including the capital, Chisinau. This investment aims to enhance the quality and reliability of the electrical power network, which is crucial for supporting the growth of renewable energy and the adoption of electric vehicles in the country. The project, co-financed by the European Bank for Reconstruction and Development (EBRD), aims to transform the conventional distribution grid into a digital smart grid, ensuring security of supply and improving services to end users.

Furthermore, the EIB, in collaboration with the European Union and the EBRD, is involved in a €75 million investment to improve energy efficiency in public buildings in Moldova. This initiative is part of a wider effort to support Moldova's green and sustainable economic growth, achieve energy independence, and decarbonize its economy. The project focuses on integrating renewable energy sources and introducing efficient energy management practices, which are crucial for supporting the electric vehicle infrastructure and the overall energy efficiency of the country.

Additionally, the EIB's portfolio in Moldova, which has reached €1.1 billion, includes projects aimed at enhancing infrastructure, energy efficiency, and support for small and medium-sized enterprises. These investments contribute to the improvement of the country's transportation units, road infrastructure, and the energy efficiency of public buildings, such as hospitals, schools, and kindergartens. These efforts are aligned with EU and EIB policy priorities and the country's National Energy Strategy to 2030.<sup>464</sup>

<sup>463</sup> [Moldova Roads Rehabilitation V \(ebrd.com\)](#)

<sup>464</sup> [Moldova: EIB Global invests \\$30 million to modernise electricity distribution grid](#)

Overall, the EIB's significant investments and collaborative efforts with Moldovan authorities and international partners underscore its commitment to supporting Moldova's transition to a more energy-efficient and sustainable future, which is essential for the development and adoption of electric vehicle infrastructure in the country.<sup>465</sup>

Moldova's progress in developing its EV infrastructure demonstrates a committed effort towards sustainable transportation and environmental protection, aligning with the trends in electric mobility seen across Europe. This development not only supports the reduction of emissions but also enhances connectivity with neighbouring countries and furthers Moldova's integration with European standards and practices in transportation.

### 5.4. Connectivity with Romania and Ukraine

Connectivity between Moldova and its neighbouring countries, Romania and Ukraine, is a critical aspect for enhancing trade, regional integration, and overall economic development. The cross-border road connectivity projects between these nations reflect their commitment to improving transportation infrastructure and facilitating smoother transit.

#### *a. Romania*

Moldova shares a significant border with Romania, and there are concerted efforts to improve road connectivity between the two countries. This is vital for trade and regional integration. Several projects have been initiated to modernize and enhance the road connections. For example, Moldova and Romania are working on joint projects to develop infrastructure that will provide Moldova with easier access to Western markets. This includes the modernization of three road bridges across the Prut River, which forms the natural border between Moldova and Romania. The European Union is contributing significantly to these projects, emphasizing the importance of Moldova's connectivity to the EU. The completion of these projects will not only facilitate trade but also symbolize the strong relationship between Moldova and Romania.<sup>466</sup>

#### *b. Ukraine*

Road connectivity with Ukraine is equally important for Moldova, especially for trade and transportation purposes. Despite the political challenges posed by the Transnistria conflict, both countries are committed to improving their connectivity. A notable project in this regard is the construction of

<sup>465</sup> [European Investment Bank Supercharges Moldova's Development with €1.1 Billion Portfolio - Moldova \(moldovalive.md\)](#)

<sup>466</sup> [A bridge to be built at Costești-Stânca \(radiomoldova.md\)](#)

a bridge over the Dniester River, linking Cosauti in Moldova and Yampil in Ukraine. This bridge, expected to be over 1,400 meters long and featuring two traffic lanes in each direction as well as footpaths, will provide a crucial link between Moldova and Ukraine. It will also contribute to the European initiative regarding Solidarity Lanes, designed to enhance transportation routes and support the movement of goods across Europe. The construction of this bridge, set to start in 2025, is a testament to the ongoing efforts by Moldova and Ukraine to overcome challenges and improve their bilateral relationship through enhanced connectivity.<sup>467</sup>

These projects, funded and supported by both national governments and international bodies, demonstrate a clear commitment to improving road infrastructure and connectivity in the region. The development of these transportation links is expected to have a significant positive impact on the economic and social well-being of Moldova, Romania, and Ukraine, fostering stronger regional ties and economic growth.

### 5.5. European Integration

The Republic of Moldova has actively sought closer ties with the European Union, a pursuit underscored by several key agreements and actions. One of the most significant of these is the Association Agreement (AA) between the European Union and the Republic of Moldova, signed in June 2014. This pivotal agreement, which includes a Deep and Comprehensive Free Trade Area (DCFTA), has been a cornerstone in Moldova's EU integration efforts. It demonstrates Moldova's commitment to align its legislation, standards, and practices with those of the EU across various sectors, including transportation and infrastructure development.<sup>468</sup>

Furthermore, Moldova's involvement in the Eastern Partnership (EaP) initiative, launched by the EU in 2009, is another clear indicator of its European aspirations. This initiative aims to strengthen and deepen political and economic relations between the EU and six Eastern European partners, including Moldova. It also facilitates comprehensive institutional reforms and aligns the partners more closely with EU policies and standards. Within this framework, specific attention has been given to infrastructure development and the enhancement of transport networks, crucial for Moldova's road development agenda.

Additionally, Moldova has been an active participant in the Trans-European Transport Network (TEN-T) project. This EU initiative aims to develop a Eu-

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<sup>467</sup> [Agreement signed for Ukraine-Moldova bridge - Bridge Design & Engineering \(Bd & e\) \(bridgeweb.com\)](#)

<sup>468</sup> [Association agreement with Moldova | EUR-Lex \(europa.eu\)](#)

rope-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports, and railroad terminals. The inclusion of Moldovan infrastructure projects in the TEN-T network is a significant step towards integrating the country's transport infrastructure with that of the EU.

In recent years, there have been concrete projects and investments that showcase Moldova's alignment with EU standards. For example, the EU has funded several road infrastructure projects in Moldova through instruments like the Neighbourhood Investment Platform (NIP), which supplements the European Neighbourhood Policy. These projects focus not only on improving the road quality but also on ensuring that these developments are sustainable and environmentally friendly, in line with EU directives.

Moreover, Moldova has been making efforts to harmonize its national transport legislation with that of the EU. This includes adopting EU standards in road safety, vehicle standards, and emissions. The adoption of the EU's Road Safety Policy Framework 2021-2030, which sets specific targets to reduce road deaths and serious injuries, is an example of such alignment.

Moldova's aspiration to join the European Union and align its road development standards with EU regulations is not just a strategic goal but is reflected in concrete actions and agreements. The signing of the Association Agreement, participation in the Eastern Partnership, involvement in the Trans-European Transport Network, and implementation of EU-funded infrastructure projects all exemplify Moldova's commitment to this path. These efforts are geared towards securing funding, enhancing connectivity, and ensuring that Moldova's road infrastructure development is sustainable, safe, and efficient, aligning with the broader goals of European integration.<sup>469</sup>

## **6. Proposals and Recommendations for Enhancing Moldova's Road Infrastructure and Cross Border Road Connectivity**

### **6.1. Development of Key Corridors**

By 2025, Moldova aims to significantly enhance its transport connectivity with neighbouring Romania and Ukraine by identifying and developing key corridors. This strategic move involves extending the Trans-European Transport Network (TEN-T), particularly focusing on connecting Chisinau with

<sup>469</sup> [The European Union and the Republic of Moldova | EEAS \(europa.eu\)](#)

major cities such as Bucharest and Odessa. This effort is part of the broader European Commission's initiative to strengthen transport connections in response to geopolitical changes, particularly the impacts of Russia's war against Ukraine. The Commission has proposed amendments to the TEN-T Regulation to include these vital corridors in Ukraine and Moldova, emphasizing the need for better integration with the EU's transport infrastructure. The project envisages a comprehensive network that not only improves trade and passenger transit but also aligns with the EU's broader goals of economic integration and connectivity. The preliminary feasibility studies have estimated the cost at around €500 million, a significant investment that underscores the corridor's potential impact on regional trade, tourism, and socio-economic development. These infrastructural enhancements are expected to yield substantial benefits, including a 30% reduction in travel time and a significant boost in trade volumes and tourism activities. The European Commission's commitment to revising the TEN-T maps to include Moldova and Ukraine reflects a strategic vision for a more interconnected and resilient Europe.<sup>470</sup>

### 6.2. Joint Infrastructure Projects

Moldova, in collaboration with Romania and Ukraine, is embarking on an ambitious infrastructure project scheduled for completion by 2030. This project involves constructing a new highway connecting Chisinau with Lviv in Ukraine and Iași in Romania, fundamentally transforming the region's transport landscape. The project, estimated to cost €1.2 billion, is a cornerstone of the broader strategy to enhance Moldova's connectivity with the European Union and neighbouring countries. It involves extensive upgrades to existing road infrastructure and the construction of new road segments. This initiative is part of a larger plan, as evidenced by recent grant agreements under the Connecting Europe Facility for Transport, which allocate nearly €45 million to improve transport connections between Moldova and Romania along the TEN-T network. These agreements focus on modernizing transport infrastructure at strategic border crossing points, facilitating smoother and more efficient trade and movement across borders. The new highway is expected to significantly ease traffic flow, reduce transit times, and increase safety standards. It represents a vital link in the region's transport network, promising to increase regional trade volumes by up to 20%. The project's phased implementation, with the Chisinau-Iași segment slated for completion by 2026, underscores its scale and complexity. This flagship

<sup>470</sup> [Commission amends TEN-T proposal to reflect impacts on infrastructure of Russia's war of aggression against Ukraine - European Commission \(europa.eu\)](#)

initiative symbolizes the collaborative spirit and shared vision of Moldova, Romania, and Ukraine in fostering regional integration and economic prosperity (Source: European Commission, 2023).

### 6.3. Funding and Investment Strategy

To support its ambitious cross-border infrastructure projects, Moldova is developing a comprehensive funding and investment strategy, set to be finalized by 2026. This strategy is multifaceted, involving various funding sources to ensure the financial viability and sustainability of these significant infrastructural developments. A key component of this strategy is securing €300 million from the European Union's Connecting Europe Facility (CEF), a crucial funding mechanism that supports the development of high-performance, sustainable, and efficiently interconnected trans-European networks. Additionally, Moldova is looking to allocate €200 million from its national budget towards these projects, demonstrating its commitment to improving regional connectivity and infrastructure. The strategy also involves seeking substantial financial support from international institutions, with plans to obtain €700 million in loans from the European Bank for Reconstruction and Development (EBRD). This financial mix underlines the importance of diverse funding sources, including EU grants, national investments, and international loans, to successfully implement large-scale infrastructure projects. The comprehensive financial plan is not just a blueprint for securing necessary funds but also a roadmap for efficient resource allocation, risk management, and ensuring long-term sustainability. The collaboration with the European Commission, as evidenced by the recent high-level understandings signed by the Commission with Ukraine and Moldova, is a testament to the European Union's support for enhancing transport connectivity in the region. These efforts align with the broader goal of bringing Moldova and its neighbours closer to the EU's internal market, facilitating economic exchanges and better connections for people and businesses.<sup>471</sup>

**Policy Harmonization and Border Management:** Work on policy harmonization and efficient border management practices. This includes aligning customs procedures and road transport policies with EU standards, potentially adopting the EU's Intelligent Transport Systems (ITS) by 2027 to streamline cross-border traffic and reduce waiting times at border crossings.

**Public-Private Partnerships (PPPs):** Explore PPPs specifically for cross-border infrastructure projects. Engage with private sector investors

<sup>471</sup> [EU signs grant agreements for transport infrastructure to better connect Moldova with EU - European Commission \(europa.eu\)](https://europa.eu/european-commission/en/eu-signs-grant-agreements-transport-infrastructure-better-connect-moldova-eu)

and multinational companies interested in the regional connectivity of Eastern Europe. A PPP framework tailored for cross-border projects should be established by 2026.

**Technical and Operational Cooperation:** Establish technical and operational cooperation with Romanian and Ukrainian road authorities. This cooperation might include joint training programs, exchange of best practices, and coordinated road maintenance strategies, aiming for implementation starting in 2025.

**Regional Integration Initiatives:** Align road infrastructure projects with broader regional integration initiatives. This could involve participating in initiatives like the Eastern Partnership Transport Panel, ensuring Moldova's road development plans are in sync with regional priorities.

**Community Engagement and Impact Assessments:** Conduct thorough community engagement and impact assessments, especially in border areas, to understand and mitigate any potential socio-economic and cultural impacts of the road projects. The first round of community consultations should be initiated by late 2024.

**Sustainable Financing Models:** Develop sustainable financing models for long-term maintenance and operation of cross-border road infrastructure. This could include setting up a cross-border road fund, contributed by Moldova, Romania, and Ukraine, operational by 2028.

**Monitoring and Evaluation Framework:** Establish a robust monitoring and evaluation framework to track the progress of cross-border road projects, assess their impact, and ensure accountability. This framework should be in place by 2025, with annual reports on project progress.

By focusing on these detailed strategies with specific timelines and terms, Moldova can significantly enhance its cross-border road connectivity, facilitating economic growth, regional integration, and alignment with European Union standards. **These strategies are critical for Moldova's integration with the EU's road network and for fostering regional cooperation and economic growth.**

### 6.4. Leveraging the Black Sea Basin Role:

As Moldova is strategically positioned within the Black Sea basin, it should consider further leveraging its geographical advantage for enhanced connectivity. This could involve participation in regional initiatives and coordination with Black Sea countries to promote more efficient maritime and road links. By embracing these recommendations, Moldova can make sig-



nificant strides in road infrastructure development, leading to safer, more efficient, and sustainable transport links. These improvements are not only essential for the country's economic growth but also for its integration into the broader European and regional transport networks.

# Road Infrastructure in Montenegro

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## Road Infrastructure in Montenegro

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### 1. Introduction

Montenegro (capital: Podgorica) is a sovereign state located in the western part of the Balkan peninsula, having a coast on the Adriatic Sea. The country shares borders with Croatia (West), Bosnia & Herzegovina (Northwest), Serbia (Northeast), Kosovo\* (East), Albania (East-Southeast) and Italy from which it is separated by the Adriatic Sea (Southwest). Montenegro's current population is approximately 620,000 (2021) inhabitants.

The territory suffers from the constraints of a difficult topography, which require increased investments and maintenance expenditures, particularly for railway and road infrastructure.

### 2. Review of Existing Road Infrastructure

The total length of main and regional roads is about 1.850 km, all paved with asphalt, but the relatively poor quality of the transport infrastructure hampers economic growth due to the low capacity and high cost of transportation, as well as low safety standards.

Road fatalities for 2022, as reported by the Transport Community (Road Safety Statistics), amounted to 73, an increase of 33% compared to 2021 and the number of fatalities per million inhabitants to 118, which is by far the worst score in the Western Balkans.

Improvement of transport connections currently underway will facilitate the integration of Montenegro in the regional trade flows, further political cooperation, and links between people.

A Memorandum of Understanding for the Development of the Basic Regional Transport Network in Southeast Europe (*SEETO<sup>472</sup> Memorandum*) was signed in Luxembourg on June 11, 2004, by the governments of Montenegro, Croatia, Bosnia and Herzegovina, Macedonia, Albania, Serbia and Kosovo\*, as well as by the European Commission. Accordingly, Montenegro was a participant and a full member, and in this way, it actively participated in regional cooperation, which is the cornerstone of the European

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<sup>472</sup> South-East Europe Transport Observatory

Union's policy of action towards the Western Balkan countries in the field of transport. The successor to this Memorandum is the Treaty establishing the Transport Community (in the Western Balkans region), signed by the Prime Ministers of the Western Balkans six in Trieste in 2017.

The core transport network in the Western Balkan region is encompassed in the extension of three key trans-European transport corridors to the Western Balkans region: Mediterranean, Orient (Middle East)-east Mediterranean, and Rhine-Danube corridor. Indicative extensions of Comprehensive TEN-T to the Western Balkans region and to the territory of Montenegro include:

**Route 1:** The project has been identified as one of strategic importance in Albanian and Montenegrin documents, such as the Albanian Transport Sectoral Strategy and National Transport Plan, and in Montenegro's Spatial Plan and Transport Strategy. Furthermore, it is included in the Economic and Investment Plan for the Western Balkans under Flagship 3 – Connecting the Coastal Regions.

The expressway along the Montenegrin coast, also known as the Blue Highway, passes through its hinterland. It starts near the border with Croatia, around Herceg Novi, and extends further to the following sections: Herceg Novi - crossing over the Bay of Kotor - Tivat - Budva - Bar - Ulcinj – Sukobin (Albanian border) with a total length of approximately 110 km.

**Route 2b:** The route connects Sarajevo with Podgorica and ends in Vorë, Albania, with a total length of 395 km. The northern part of Albania is included in the Blue Highway.

A Memorandum of Understanding between Bosnia and Herzegovina and Montenegro was signed for the construction of an interstate bridge over the Tara, at Scepan Polje/Hum. This bridge will be financed by the Parties in equal amounts (50%), according to the contract schedule to be signed by both Parties. Construction is expected to start sometime in 2024.<sup>473</sup>

**Route 4:** The route passes across Serbia and Montenegro, starting at Vrsac, next to the Romanian border, continuing through Belgrade and Podgorica and ending at Bar, Montenegro. The total length is 580 km (180 km in Montenegro, 400 km in Serbia). It also includes Project no. 2 (Belgrade – Bar motorway) of Flagship no. 2 – Connecting North to South.

The Bar – Boljare highway is the largest investment project in Montenegro. It is included in all relevant strategic documents such as the Montenegro

<sup>473</sup> Ministers of Transport of BiH and Montenegro met in Sarajevo, Sarajevo News (Dec. 8th, 2023): <https://sarajevotimes.com/ministers-of-transport-of-bih-and-montenegro-met-in-sarajevo/>

Spatial Plan and Transport Strategy. After the commissioning of Mateševo – Smokovac section, efforts are focusing to advance projects for sections from Smokovac – Tološi – Farmaci and Mateševo – Andrijevica.

The highway is a complex and expensive piece of infrastructure for Montenegro’s financial capabilities and therefore the timely and parallel development beyond its borders is vital to the *raison d’être* of the project.

**Route 6a:** The route connects Prishtina with Route 4 in Montenegro and with Corridor X through Skopje. The total length of the route is 259 km. The 84 km section Prishtina – Skopje is part of the Core TEN-T Network; the remaining sections are part of the Comprehensive Road Network.

The section from Prishtina to Hani e Elezit in Kosovo\* is currently completed to motorway standard, while the continuation in North Macedonia (the Blace –Skopje/ Stenkovec Interchange section, total length 12.5km) is currently under construction. North of Prishtina, approx. 20 km of the route to Mitrovica are currently undergoing rehabilitation.

The above list of routes is summarized in Table 1.

*Table 1: SEETO routes connecting Montenegro to neighboring countries*

Corridor / Routes (SEETO)	Comprehensive Road Network		Core Road Network	
	Nodes	Length (km)	Nodes	Length (km)
<b>Route 1</b>	HR border/Neum Northwest – Neum (Bosnia and Herzegovina) – Bar (Montenegro)	126	Neum Northwest/HR border/Debeli Brijeg – Bar (Montenegro) – Muriqan (Albania)-Lezhe (Albania)	147
<b>Route 2b</b>	Sarajevo (Bosnia and Herzegovina) –Podgorica (Montenegro) – Vorë (Albania)	395	Lezhe (Albania) – Vorë (Albania)	53
<b>Route 4</b>	Romanian border/Vatin –Belgrade (Serbia) –Podgorica (Montenegro) – Bar (Montenegro)	601	RO border/Vatin – Belgrade (Serbia) – Podgorica (Montenegro) – Bar (Montenegro)	601
<b>Route 6a</b>	Ribarevina (Montenegro) – Ribarice (Serbia) –Pristina (Kosovo*) –Skopje (North Macedonia)	259	Pristina (Kosovo*) – Skopje (North Macedonia)	84
<b>Route 6b</b>	Pristina (Kosovo*) –Peje/Pec (Kosovo*) –Kolasin (Montenegro)	205		

*Source: Transport Community (2021)<sup>474</sup>*

*Note: Shaded sections are completely outside the territory of Montenegro*

<sup>474</sup> Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans Report 2020 – Final version, Transport Community Treaty Permanent Secretariat, June 2021

Figure 1: Indicative Extension of TEN-T Core and Comprehensive Road Network to the Western Balkans



Source: Transport Community (2021)<sup>475</sup>

Figure 2: Ongoing Road Projects Map



Source: Transport Community (2021)<sup>476</sup>

Note: Ongoing projects coloured in purple.

<sup>475</sup> Five-year Rolling Work Plan for Development of Indicative TEN-T Extensions of the Comprehensive and Core Network in Western Balkans, Report 2020 – Final version, Transport Community, June 2021

<sup>476</sup> Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans Report 2020 – Final version, Transport Community Treaty Permanent Secretariat, June 2021

### 3. Review of Strategic National Documents and Plans

The most important national document publicly available is the Transport Development Strategy (TDS) which was submitted in December 2017. Public discussion on the Draft of Transport Development Strategy 2018-2035 was held in the period of November 29 to December 20, 2017. Two revisions were made in 2018 and a further one in 2019.

The final TDS plan was divided into two periods (plan for 2019-2027 and plan for 2028-2035), while action plans for the purpose of implementation of that document ought to be adopted successively every two years. Tables 2 and 3 summarize earmarked projects with their estimated costs.<sup>477</sup>

*Table 2: Plan of infrastructure measures and corresponding costs 2019-2027*

<b>Infrastructure Single Pipeline Projects</b>	<b>Cost (MC)</b>
Highway Bar-Boljare, section Mateševo – Andrijevica	249.8
Highway Bar-Boljare, section Andrijevica – Boljare	731.2
Adriatic-Ionian expressway coastal variant, Bypass Tivat	56.5
Adriatic-Ionian expressway coastal variant, Bay of Kotor corridor	68.0
Adriatic-Ionian expressway coastal variant, Bypass Budva	158.4
Reconstruction of the Šćepan Polje-Plužine highway (border crossing with Bosnia and Hercegovina)	198.5

*Table 3: Plan of infrastructure measures and corresponding costs 2028-2035*

<b>Infrastructure Single Pipeline Projects</b>	<b>Cost (MC)</b>
Adriatic-Ionian expressway coastal variant, section Border with Croatia - Bijela (Bypass Herceg Novi & Herceg Novi-Bijela)	193.0
Adriatic-Ionian expressway coastal variant, section Tivat – Sozina	150.0
Adriatic-Ionian expressway coastal variant, section Bar – Border with Albania.	188.0
Adriatic-Ionian expressway coastal variant, Bypass Bar	233.0
Highway Bar-Boljare, bypass Podgorica, section Smokovac – Tološi – Farmaci	460.7
Highway Bar-Boljare, section Đurmani – Farmaci	
Reconstruction of the Šćepan Polje-Plužine highway (border crossing with Bosnia and Hercegovina) (funds for 2028-2035 will be determined after the end of first phase)	N/A

<sup>477</sup> Ministry of Transport and Maritime Affairs of Montenegro, Transport Development Strategy – Montenegro 2019-2035.

#### 4. Cross-Border Connectivity

There are 20 road border crossing points on the territory of Montenegro, of which, towards the Republic of Croatia there are 2 border crossing points, Bosnia and Herzegovina – 8, the Republic of Serbia – 5, the Republic of Kosovo\* - 1 and the Republic of Albania – 4 border crossing points.

Although there are no publicly available data on border-crossing bottlenecks in Montenegro, data collected through various surveys for the purpose of examining border crossing facilitation and improvement of the cross border road transport on the indicative extension of TEN-T Road Core/ Comprehensive Network in the Western Balkans, suggest that freight forwarders and road transport companies are suffering from lengthy waiting times in excess of 160 minutes (occasionally stretching to 280 minutes, during peak periods stretching to 280 minutes or even over one day) on the extended Orient-East/Med corridor (along the Pan-European Corridor X). This problem is reported to be especially acute in the Western Balkans region and on EU-WB borders. Delays at crossings in the Western Balkans are five times longer than in many EU countries<sup>478</sup>.

Unofficial reports cite big traffic jams at all border crossings in Montenegro during summer, especially during August. There are severe bottlenecks at all toll booths near the Sozina tunnel extending along sections of the highway.

Progress in the implementation of border connectivity of the comprehensive TEN-T network was recorded in the final Report of the Transport Community "Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans" of June 2021.

There is a notable effort to upgrade border connectivity, especially along the difficult terrain towards Bosnia and Hercegovina, as reported in the table below.

*Table 4. Mature Comprehensive Connectivity Priority Projects*

Corridor / Route / Node	TEN-T Network	Project Name	Project cost (MC)	Expected Completion
Route 2b	Comprehensive	Reconstruction of the main way Šćepan Polje – Plužine (border crossing with Bosnia and Hercegovina)	139	2027

<sup>478</sup> Transnational Strategy for the Improvement of Multimodal Transport and Accessibility in the Adria Region – Update, Adriapass Plus Deliverable Dt.1.2.1, Version Final, 06 2022



## 5. Major Road Infrastructure Projects

Montenegro, as of June 2021, was implementing a total of 5 TEN-T projects, with a combined value of 1,133.39 million EUR (see Table 5). The combined length of road sections under various forms of upgrading was 130.8 km, as shown in the table 5.

On infrastructure development, several priority road projects were suffering delays. Works on the priority section of Bar-Boljare highway (Smokovac – Matesevo) continued. The section was finally opened to traffic in July 2022, with a three-year delay. The applicable toll rate for passenger vehicles on the completed section of the highway is 8 cents per km, 60% above the rate recommended by the EU-financed feasibility study and cost-benefit analysis for the entire Bar-Boljare highway (5 cents). The root cause of the increased cost recovery due to serious cost overruns is further discussed in section 7.1 of this chapter under policy challenges.

A study, which includes recommendations on construction standards, toll rates and means of financing for the remaining sections, was expected to be adopted in 2022.

The preliminary design work on Budva bypass section of the Adriatic-Ionian expressway progressed very slowly, hampered by Montenegro's legislation on preliminary design requirements for complex infrastructure, which led to excessive design costs and causes delays. As a result, the European Commission cancelled the investment grant of EUR 41.2 million, inviting for re-application should project maturity be attained.

Current and future infrastructure investments need to comply fully with the EU standards on public procurement, state aid and environmental impact assessment. The investments need to be duly justified and implemented in accordance with cost-benefit analyses carried out in line with the EU best practice.

Table 5: List of TEN-T projects in Montenegro

Name of the project	Core/Comprehensive-Network	Foreseen intervention	Total length (km)	Total Cost (MC)	Estimated completion deadline
Construction of motorway Bar - Boljare (Matesevo -Smokovac section)	Core Network	New infrastructure	40.8	868	2021
Construction of Budva bypass	Core Network	New infrastructure	13	187.39	2024
Reconstruction and widening of road section M-2 Rozaje - Spiljani, including works on 5 bridges and 10 tunnels.	Comprehensive network	Reconstruction/rehabilitation	20	19	2022
Reconstruction and widening of road section M-3 Danilovgrad -Podgorica in the length of 15 km (2+2 traffic lanes), including works on 5 bridges and 5 roundabouts .	Comprehensive network	Reconstruction/rehabilitation	15	23	2022
Reconstruction and widening of road section M-2 Berane - Bijelo polje - Mojkovac, in the length of 42 km	Core/ Comprehensive network	Reconstruction/rehabilitation	42	36	2023

Source: Transport Community (2021)<sup>479</sup>

## 6. Summary and Outlooks for Road and Road-related Infrastructure Projects

On transport networks, Montenegro, as already mentioned, takes part in the Transport Community Treaty (TCT) and is involved in the TCT Regional Steering Committee meetings as well as other TCT technical committees (the railway, road safety, transport facilitation and road technical committees). The Montenegrin authorities are encouraged to step up efforts to implement action plans on key Transport Community Treaty (TCT) and regional priorities.

Although the 2019-2035 Transport Development Strategy is in place, the adoption of the action plan for 2021-2022 was delayed.

In December 2021, the government adopted a new single project pipeline (SPP) document, which included numerous projects in the areas of energy and transport. However, the cost estimates and maturity statements on transport projects were not updated and reflect the data and prices from 2017. In view of the increases in construction costs, the initial pipeline of EUR 3.7 billion investments in transport projects ought to be evaluated with

<sup>479</sup> Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans, Report 2020 – Final version, Transport Community, June 2021

caution. The impact of such plans on the country's budget and fiscal space is yet to be assessed. Moreover, Montenegro needs to change its institutional approach to improve the efficiency of managing infrastructure projects, to increase its funding absorption capacities.

The strategy, which was expected to be reviewed in 2022, should align with the TCT obligations, notably the Strategy for Sustainable and Smart Mobility in the Western Balkans.

On infrastructure development, the construction of the Bar-Boljare highway on the priority section between Smokovac and Matesevo, which is being implemented with a Chinese loan, experienced continuous delays, partly due to COVID-19 pandemic, and cost overruns. The section was finally opened to traffic in July 2022, with a three-year delay.

The project is being implemented in the context of the trans-European transport network (TEN-T), which is part of the indicative extension of the Orient East-Med corridor in the Western Balkans. Under the Western Balkans Investment Framework, Montenegro applied for co-financing for the construction of the second section of the highway. However, the application was on hold pending the deliberations following the EIB-financed cost-benefit analysis for the entire Bar-Boljare highway, including on recommended construction standards and suggested means of financing for the remaining sections, which was delivered in 2022.

Ongoing projects in the region have been reviewed and presented in detail in the TEN-T Annual Report. Based on the scheduled completion date of these projects, the Annual Report included a forecast of the TEN-T compliance rate for the year 2027.

The status of Montenegro's TEN-T projects is listed in the tables below following the presentation format of the Permanent Secretariat of Transport Community's Report 'Five-year Rolling Work Plan for Development of the Indicative TEN-T Extension of the Comprehensive and Core Network in Western Balkans' (April 2022).

Table 6. Project Blue Highway / Section: Tivat – Sozina

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of a high quality connection between Tivat and Sozina on the Adriatic - Ionian corridor, (excluding Budva bypass)	Feasibility Study	FS for the entire AIH <sup>480</sup> corridor completed in late 2020	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and the fiscal space availability;</li> <li>- Set-up clear implementation strategy and timeline for the project</li> </ul>	Clear implementation strategy and timeline established	As per the agreed implementation timeline

Source: Transport Community (2021)

Table 7: Project Blue Highway / Section: Sozina – Bar

Project description	Technical maturity	Current stage	Action needed	Key Milestones	
				2023	2027
Construction of a high-quality connection between Sozina and the port of Bar on the Adriatic - Ionian corridor	Feasibility Study	FS for the entire AIH corridor completed in late 2020.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and fiscal space availability;</li> <li>- Set-up clear implementation strategy and timeline for the project</li> </ul>	Clear implementation strategy and timeline established	As per the agreed implementation-timeline

Source: Transport Community (2021)

<sup>480</sup> AIH: Adriatic-Ionian Highway

Table 8: Project Blue Highway / Section: Bar – Albanian border

Project description	Technical maturity	Current stage	Action needed	Key Milestones	
				2023	2027
Construction of a high quality connection between Bar bypass and the Albanian border	Feasibility Study	FS for the entire AIH corridor completed in late 2020.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and fiscal space availability;</li> <li>- Set-up clear implementation strategy and timeline for the project</li> </ul>	Clear implementation strategy and timeline established	As per the agreed implementation timeline

Source: Transport Community (2021)

Table 9: Project Blue Highway / Section: Tivat bypass

Project description	Technical maturity	Current stage	Action needed	Key Milestones	
				2023	2027
Construction of Tivat bypass (expressway route and access roads-connectors on the existing main roads)	Preliminary Design	Preliminary design prepared in 2009 - 2011. FS for the entire corridor completed in late 2020.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine the implementation strategy for the entire corridor based on the outcome of the revised FS and the fiscal space availability;</li> <li>- Set-up clear implementation strategy and timeline for the project</li> </ul>	Clear implementation strategy and timeline established	As per the agreed implementation timeline

Source: Transport Community (2021)

Table 10: Project Blue Highway / Section: Budva bypass

Project description	Technical maturity	Current stage	Action needed	Key Milestones	
				2023	2027
Construction of a 13 km long bypass around the city of Budva, including 3 interchanges and 8.6 km of access roads (connections to existing network)	Feasibility Study	FS for the entire AIH corridor completed in late 2020. Preliminary Design with ESIA and Detailed Design to be prepared with WBIF grant. WBIF financing for works ensured. Project is currently considering postponement (including grant cancellation) due to unavailability of national co-financing.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment on mid- to long term;</li> <li>- Set-up clear implementation strategy and timeline for the project;</li> <li>- Adapt ongoing TAs to fit the agreed implementation strategy</li> </ul>	Clear implementation strategy and timeline established	Financing ensured. Tender for works launched.

Source: Transport Community (2021)

Table 11: Project 1 – Blue Highway / Section: Bar bypass

Project description	Technical maturity	Current stage	Action needed	Key Milestones	
				2023	2027
Construction of a bypass around the city of Bar on the Adriatic Ionian Corridor	Preliminary Design	Preliminary design prepared in 2009 - 2011. FS for the entire AIH corridor completed in late 2020.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine the implementation strategy for the entire corridor based on the outcome of the revised FS and the fiscal space availability;</li> </ul> Set-up clear implementation strategy and timeline for the project	Clear implementation strategy and timeline established	As per the agreed implementation timeline

Source: Transport Community (2021)

Table 12: Project Belgrade - Boljare – Bar / Section: Boljare – Andrijevisa

Project description	Technical maturity	Current stage	Action needed	Key Milestones	
				2023	2027
Construction of a 52 km long motorway from SRB border to Andrijevisa, part of the Bar -Boljare highway	Feasibility Study	Feasibility Study prepared in 2008, revised in 2009. New Feasibility Study with CBA revision under WBIF <sup>481</sup> almost completed.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment in mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and fiscal space availability.</li> </ul>	Mid-term budgetary ceilings identified; Project's implementation strategy decided upon;	Works on-going on priority section(s)

Source: Transport Community (2021)

Table 13: Project Belgrade - Boljare – Bar / Section: Andrijevisa – Matesevo

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of a 21 km-long motorway on Andrijevisa - Matesevo section of the Bar - Boljare highway	Feasibility Study	Feasibility Study prepared in 2008, revised in 2009. New Feasibility Study with CBA revision under WBIF (almost completed). PD and ESIA currently under preparation with WBIF grant financing	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and fiscal space availability;</li> <li>- Close and pro-active monitoring of the on-going TA.</li> </ul>	Mid-term budgetary ceilings identified; Project implementation strategy decided upon; Financing ensured;	Works on-going

Source: Transport Community (2021)

<sup>481</sup> WBIF: Western Balkans Investment Framework

Table 14: Project Belgrade - Boljare – Bar / Section: Matesevo – Smokovac

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of a 42.5 km long motorway on Matesevo -Somovac section of the Bar -Boljare highway, including 20 km of tunnels and 4.5 km of bridges	Works completed	Section soon to be opened for traffic	Works commissioning	Section fully operational	N/A

Source: Transport Community (2021)

Table 15: Project Belgrade - Boljare-Bar / Section: Podgorica bypass (Smokovac-Tolosi- Farmaci)

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of an 18 km motorway bypass of Podgorica, part of the Bar -Boljare highway	Feasibility Study	Feasibility Study prepared in 2008, revised in 2009. New Feasibility Study with CBA revision under WBIF (almost completed). PD and ESIA currently under preparation with WBIF grant financing.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and fiscal space availability;</li> <li>- Close and proactive monitoring of on-going TA.</li> </ul>	Financing ensured; Tender for works finalised	Works completed

Source: Transport Community (2021)

Table 16: Project Belgrade - Boljare-Bar / Section: Farmaci -Djurmani

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of a 34 km motorway on Farmaci - Djurmani section of Bar - Boljare highway.	Feasibility Study	Feasibility Study prepared in 2008, revised in 2009. New Feasibility Study with CBA revision under WBIF (almost completed).	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment mid- to long term;</li> <li>- Determine implementation strategy for the entire corridor based on the outcome of the revised FS and fiscal space availability.</li> </ul>	Mid-term budgetary ceilings identified; Project implementation strategy decided;	Works on-going on priority section(s)

Source: Transport Community (2021)

Table 17: Project Belgrade - Boljare-Bar / Section: Preljina – Pozega  
(Regional Partner: Serbia)

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of a 30.96 long motorway section on the Belgrade - Bar corridor	Works on-going	Financing ensured through Chinese loan. Works are currently on-going	N/A	Works completed	N/A

Source: Transport Community (2021)

Table 18: Project Belgrade - Boljare-Bar / Section: Pozega - Boljare (Regional Partner: Serbia)

Project description	Technical maturity	Current stage	Action needed	Key milestones	
				2023	2027
Construction of a 107 km road section on challenging terrain	Pre-feasibility Study	Project ranked 7th in Serbia's SPP (transport projects). A Memorandum of Understanding was signed with a Chinese company in 2018 for preparation of technical documentations. Another MoU was signed with China in April 2019.	<ul style="list-style-type: none"> <li>- Fiscal space availability assessment under mid- to longer term scenarios;</li> <li>- Decide on technical implementation of project and financing strategy;</li> <li>- Progress with priority actions decided upon.</li> </ul>	Mid-term budgetary ceilings identified; Project implementation strategy decided upon;	Works on-going on priority section(s)

Source: Transport Community (2021)

## 7. Mapping of Challenges to Road Connectivity in Montenegro

### 7.1. Political Challenges: Legal Framework and Administrative Capacity

According to EU screening reports of the Chapters 14 and 21, Montenegro has reached a satisfactory level of alignment with the acquis in the field of transport policy. In this context, Montenegro needs to make further adjustments of the legal and institutional framework and strengthen its administrative and implementation capacities. Montenegro needs also to ensure further harmonisation and sound implementation of social, safety and technical rules in road transport, as well as the standards for the transport of dangerous goods by road.

Montenegro has not yet aligned its legislation with the Trans-European transport networks acquis, but has reached a satisfactory level of pre-



paredness regarding the strategic development of the transport networks in accordance with the design and objectives of the TEN-T. This policy has undergone major revision at EU level, including the *acquis* related to the implementation of the TEN-T Programme, which can only be implemented in practice after accession. During the negotiations on this Chapter, Montenegro must ensure compliance with the relevant provisions of the new legal framework. In that sense, the administrative capacity will need to be reinforced for the effective implementation of this EU policy.

### 7.2. Economic and Financial Challenges

Recent history should serve as a guide to regional policy-makers to avoid the perils of debt trap diplomacy: on October 30, 2014, Montenegro initially set a loan of 810 million US dollars with the Chinese Export-Import Bank, also known as the EXIM bank, for the first 41 kilometers of 163 km Bar-Boljare highway.<sup>482</sup>

The EXIM bank is state-funded as well as state-owned. The bank, which facilitates loans for the Belt and Road Initiative, had agreed to cover 85% of the expected cost for a six-year period and twenty years of repayment by the Montenegrin government. The other 15 percent would be covered by Montenegro.<sup>483</sup> The condition was that Chinese contractors must conduct 70% of the construction.

The highway was planned to finish in 2019. However, this was not the case. In 2018 the debt of the infrastructure project had already risen by around 20%, foremostly due to the increase in the US dollars exchange rate since the start of the project.<sup>484</sup>

In July 2021, the Montenegrin Ministry of Finance reached an agreement with three Western banks: Société Générale, Deutsche Bank and Merrill Lynch International and Goldman Sachs international.<sup>485</sup> The agreement consisted of converting the loan from US dollars to Euros and to cut the interest rate from two percent to 0.88 percent. This agreement was expected to save the Montenegrin government 8 million US dollars per year and decreases the risk of default.<sup>486</sup>

Environmental regulations also have been harmed by the construction of

<sup>482</sup> Reuters. (2014, October 30). Montenegro, China's Exim Bank agree \$1 billion highway deal.

<sup>483</sup> *Ibid.*

<sup>484</sup> Gray, E. (2018). *The European Silk Road: Montenegro's Decision to Build a New Highway*. Stanford: Stanford University.

<sup>485</sup> Reuters. (2021, July 21). Montenegro agrees hedging deals to ease Chinese debt burden-report.

<sup>486</sup> Paccalin, C., & Gilberg, D. (2021, November 26). Montenegro's billion-dollar road to nowhere.

the highway. The Tara River, protected by UNESCO world heritage, was damaged as a section of the riverbank had been traversed. This interferes with the Stabilisation and Association Agreement (SAA) Montenegro signed on the 15th of October in 2007 to be associated with the EU. The SAA obliges the country to reform its law to the EU acquis. The building of the Bar- Boljare highway obviously caused ecological concerns. Due to a lack of transparency, it was hard to monitor the oversight of the project.<sup>487</sup>

### 7.3. Environmental Challenges and Impact of Climate Policy. Decarbonization and Electric Vehicles

The greenhouse gas emissions road transport increased by 167.1% from 341.00 kt CO<sub>2</sub> equivalent in 1990 to 910.70 kt CO<sub>2</sub> equivalent in 2021.

The significant increase of GHG emissions is a result of growing mobility within cities but also between cities, growing freight transport due to increased national production but also due to imports and exports. In 2021 about 76.9% of the registered road motor vehicles and trailers were fuelled by gas/diesel oil.<sup>488</sup>

Montenegro has adopted a series of documents to tackle climate change such as 'National Strategy in the Field of Climate Change until 2030', Law on Protection from the Negative Impact of Climate Change, the Manual for the Preparation of the Low Carbon Development Strategy until 2050 is finalised, as well as the 'Road Map of Decarbonisation of Transport in Montenegro'. In addition, with the support of the EBRD, "The Road Infrastructure Climate Resilience Strategy for Montenegro and Action Plan" have been prepared.

With regard to **sustainable mobility**, Montenegro incentivised purchase of electric and hybrid vehicles to replace the old vehicle fleet. However, the legal and planning framework for deployment of alternative fuel infrastructure has not yet been adopted and its transposition should be prioritised in the upcoming period. There is a lack of coordination and clarity on planning of deployment of mobility solutions. With mostly unilateral uncoordinated actions between different Ministries (i.e. the Ministry of Environment, the Tax Authority, the Ministry of Transport) as well as between governmental and local level. If the communication and planning would be streamlined across all Ministries and urban administrative levels (each in their own field), transition to sustainable mobility would be accelerated.

<sup>487</sup> Sošić, M. (2021, April 4). Montenegro's road ahead: infrastructure between EU and China.

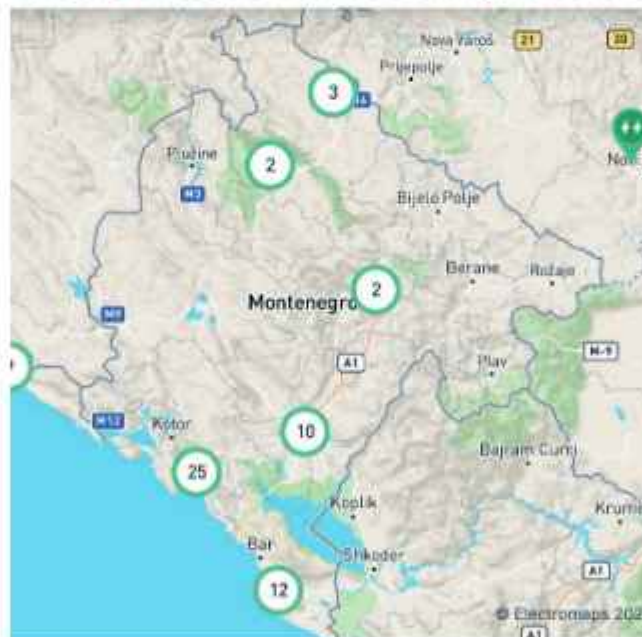
<sup>488</sup> National Inventory Report 2023 of Montenegro submission under the United Nations Framework Convention on Climate Change (UNFCCC) version 31.07.2023

The National Strategy for Sustainable Development until 2030 recognizes transport as a significant sector in energy consumption, and among the proposed measures is the introduction of hybrid and electric vehicles.<sup>489</sup>

Sustainable Urban Mobility Plan of the Capital City of Podgorica (SUMP Podgorica) attaches great importance to the topic of e-mobility. In his foreword, the mayor notes that the infrastructure for charging electric cars is being built, that electric cars are being driven on the streets of Podgorica, thus giving unequivocal support to this type of drive. The Sustainable Urban Mobility Plan recognizes the number of electric buses as indicators within the strategic goals balancing all modes of transport with an emphasis on the promotion of public urban and non-motorized transport, as well as the number of electric vehicles within the strategic goal plan reducing the negative consequences of environmental traffic and population health.<sup>490</sup>

Charging stations are multiplying throughout the territory and their location can be spotted in various platforms. See Figure 3 below.

*Figure 3: Map of Existing Electric Vehicle Charging Stations in Montenegro*



*Source: Electromaps<sup>491</sup> based on community reported data as of Jan. 31st, 2024*

Montenegro, as a candidate country for membership in the European Union, has obligations related to the adjustment of the legal and strategic-planning framework. In this regard, special emphasis is placed on the need to develop and adopt a National Energy and Climate Plan in accor-

<sup>489</sup> National Strategy for Sustainable Development until 2030

<sup>490</sup> Sustainable Urban Mobility Plan of the Capital City of Podgorica

<sup>491</sup> <https://map.electromaps.com/en/>

dance with the Regulation on Managed Energy Union, transposition of Directive 2014/94/EU on the establishment of infrastructure for alternative fuels and development of a National Policy Framework for infrastructure on alternative fuels.

The development of mobility, as a basis for sustainable and clean transport, is one of the key elements of the transition to a low-carbon economy.

### **8. Observations and Recommendations for Enhancing Road Infrastructure and Cross-border Connectivity**

The most visible current project is the Bar-Boljare highway, Montenegro's first modern highway which is designed to better connect the more developed South with the relatively underdeveloped North of the country as well as neighbouring Serbia and Kosovo\*. The highway, the first and most expensive portion of which was built by the China Road and Bridge Corporation and became operational in July 2022, has been widely criticized as a textbook example of PRC "debt trap diplomacy". The completion of the full four-stage project continues to pose challenges to Montenegro's fiscal position, given limited room to finance the construction of the three remaining sections.

In its key findings of the 2022 Report on Montenegro, the European Commission noted that there was limited progress on the review and implementation of the transport development strategy.

Montenegro, therefore, should take fast action in the following:

1. Review the Transport Development Strategy to align it with the Strategy for Sustainable and Smart Mobility in the Western Balkans, confirming a shift towards greener transport modes;
2. Revise institutional policies to improve the efficiency of managing infrastructure projects and increase the funding absorption capacities;
3. Ensure that capacitated staff is retained or hired for managing infrastructure projects.

On the other hand, Montenegro has made sufficient progress on many fronts such as the finalization of its Intelligent Transport System (ITS) strategy in November 2021. ITS Directive 2010/40/EU is now fully transposed in Montenegro and has adopted 5 by-laws related to the transposition of respective EU Directive 2010/40/EU and Directive 2004/52/EC. As for de-

ployment, Montenegro installed on the newly built highway section Smokovac-Matesevo section ITS equipment in the value of ca. 25 mil. EUR.

Montenegro already has a Road Safety programme for 2022 -2024 and has set out to develop a Road Traffic Safety Improvement Strategy for the period from 2024 to 2030.

Montenegro has set a strategic objective to reduce the number of fatalities and seriously injured persons by 50% by 2030, compared to 2021, without any children killed in traffic and in parallel it has achieved significant progress in developing the road crash database.

In the next 5 years, Montenegro should have established functioning Road Asset Management Systems as a crucial steppingstone in setting up efficient maintenance systems.

A Road Technical Committee with the support of the Transport Community Treaty Secretariat was mandated to elaborate and implement a coherent set of concrete actions (Road Action Plan) aiming at establishing an efficient maintenance system coupled with the exploration of possibilities for road financing mechanism (including e-tolling), deployment of ITS in accordance with EU Directives and interoperability standards and decarbonization of road transport including resilience aspects and smart mobility.

# Road Infrastructure in North Macedonia

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## Road Infrastructure in North Macedonia

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### 1. Introduction

#### a. Geography and Climate Migration

This **landlocked** country is a junction of the North-South route from the Danube River to the Aegean Sea and the ancient East-West routes connecting the Black Sea and Istanbul with the Adriatic Sea.<sup>492</sup> It has a moderate continental **climate** with relatively light annual precipitation. The high potential of unexpected extreme weather events should be considered when planning climate resilient transport infrastructure.

#### b. Geopolitics and Demographic

After the name issue resolution, on 27 March 2020 the Republic of North Macedonia became NATO's 30th member.<sup>493</sup> According to the Census of Population, Households and Dwellings in the Republic of North Macedonia, 2021,<sup>494</sup> the total resident population is 1,836,713 persons (50.4% women and 49.6% men). The number of households is 598 632, and the average number of household members is 3.06.

#### c. Economic and Social Context

This upper middle-income country has made great strides in reforming its economy over the last decade. Following growth slowdown in 2022 by the surge in global energy prices, the GDP growth dropped to an estimated 2.1% and inflation rose as a result of the increases in global energy and commodity prices.<sup>495</sup>

According to the World Bank the North Macedonia's population is 1.8 million with current GDP of 13.9 billion US\$ and the current GDP per capita is 7,557 US\$. The population life expectancy at birth, is 75.7 years.<sup>496</sup>

Emigration and population ageing are weakening the workforce. Sound **social** and **climate** resilience will reduce the country's vulnerability and give growth prospects and social stabilisation.<sup>497</sup>

<sup>492</sup> <https://www.britannica.com/place/North-Macedonia>

<sup>493</sup> NATO - Topic: NATO member countries

<sup>494</sup> State statistical office - Census 2021

<sup>495</sup> North Macedonia 2021 ERP assessment (europa.eu)

<sup>496</sup> North Macedonia Overview: Development news, research, data | World Bank

<sup>497</sup> North Macedonia Overview: Development news, research, data | World Bank

d. EU Accession and the Transport Community

Since 2009, the Commission continuously recommends start of the accession negotiations. In July 2022, the negotiations started by legislation screening. Regarding the accession, the **Treaty establishing the transport community** is the most important international agreement related to the transport sector.<sup>498</sup>

## 2. Review of existing road infrastructure

### 2.1. Responsible Institutions for Road Transport Infrastructure

In North Macedonia the **Ministry of Transport and Communications** is the institution responsible for the transport policy, but several other public institutions and independent bodies carry specific responsibilities for the road infrastructure, as well. The **Public Enterprise for State Roads** is responsible for design, planning, construction, maintenance and financing the roads. The **Public Enterprise "Makedonija pat"**, according to the Law on Public Roads is responsible for the protection and maintenance of the national and regional road network in the country.

### 2.2. Road Transport Infrastructure

The physical road transport infrastructure consists of about **14,182 km of public roads**. The road transport sector remains dominant, however, accounting for approximately 95% of transported goods. Two main regional transport Corridors are cutting through the territory of the Republic of North Macedonia, both part of the extensions of the EU TEN-T networks:

- *Trans-European – Transport Corridor 8*, which stretches from East to West and connects the ports on the Black Sea (Burgas and Varna) in Bulgaria with the port of Durres in Albania and further to the ports in Italy (Bari), and
- *Trans-European – Transport Corridor 10* in direction North-South, connecting Northern Europe through Serbia and North Macedonia with the ports in Greece.

Road Corridor 8 in the Republic of North Macedonia is 304 km long, but only 37% is built at highway level, so there is still work to be done to be upgraded to the level of highway or expressway. Road Corridor 10 is 174 km long and the entire length is at a highway level. The branch, Corridor 10d is with length of 110 km. Corridor 10d is part of the Comprehensive network of the TEN-T Indicative extensions towards the Western Balkans. The first part of it is a 25.70 km-long expressway

<sup>498</sup> Transport Community (transport-community.org)



which is currently under construction. The rest of the Corridor 10d is under design phase to be constructed as an expressway and/or highway.

*Only for comparison, the rail Corridor X is 213 km in length and is completely built and operational, but the rail Corridor VIII within the Republic of North Macedonia is with two missing links: towards Albania and Bulgaria. Within the railway infrastructure, the authority focus is on the Railway Improvement Project of Corridor X, as well as intensifying activities related to the Corridor VIII, i.e., construction of the missing railway links towards Republic of Bulgaria and after that possible investment to the missing links towards Albania.*

In terms of **interoperability**, the Directive 2004/52/EC of the European Parliament and of the Council of 29 April 2004 on the interoperability of electronic road toll systems in the Community (OJ L 166, 30.4.2004, p. 124) in the Republic of North Macedonia is partially transposed. The authorities are taking steps into implementation, under the Open Balkan project, to improve the interoperability of the road toll systems with the Republic of Serbia.

The types of road infrastructure are defined in the Law on public roads.

*Table 1: National road network infrastructure*

<b>Road Network:</b>	<b>Out of them:</b>	<b>With characteristics:</b>
Magistral Roads – 897 km.	Motorways – 335 km.	Mostly flexible asphalt pavement.
Regional Roads – 3794 km.	International E-Roads – 553 km.	
Local Roads – 9719 km.		Max. allowed axle load – 6 tones.
<b>Total:</b> 14410 km.		
<b>Bridges:</b>	Most of them are capable to withstand a V600 load scheme <sup>499</sup> .	
<b>Tunnels:</b>	Capable to withstand the Traffic Profiles of all vehicles	For the oversized and overweighed vehicles, it is a matter of approval by the institutions

*Source: Public Enterprise for State Roads*

<sup>499</sup>Tihomir Nikolovski, Dragan Ivanov. 11 Oct 2013, Bridge Engineering in Macedonia from: Handbook of International Bridge Engineering CRC Press Accessed on: 26 Sep 2023, <https://www.routledgehandbooks.com/doi/10.1201/b15520-14>

Table 2: Bridges

	Number of bridge structures	Length of bridge structures
<b>Total:</b>	1626	38993
<b>Magistral Roads</b>	482	22011
<b>Regional Roads</b>	632	6042
<b>Local Roads</b>	512	10940

Source: State Statistical office 2022

Table 3: Tunnels

	Number of tunnels	Length of tunnels
<b>Total:</b>	16	2926
<b>Magistral Roads</b>	10	2568
<b>Regional Roads</b>	6	358

Source: Public enterprise for state roads

The road network of the Republic of North Macedonia, from the spatial aspect is well established. Also, the routes of the roads are mostly along valleys and low passes.

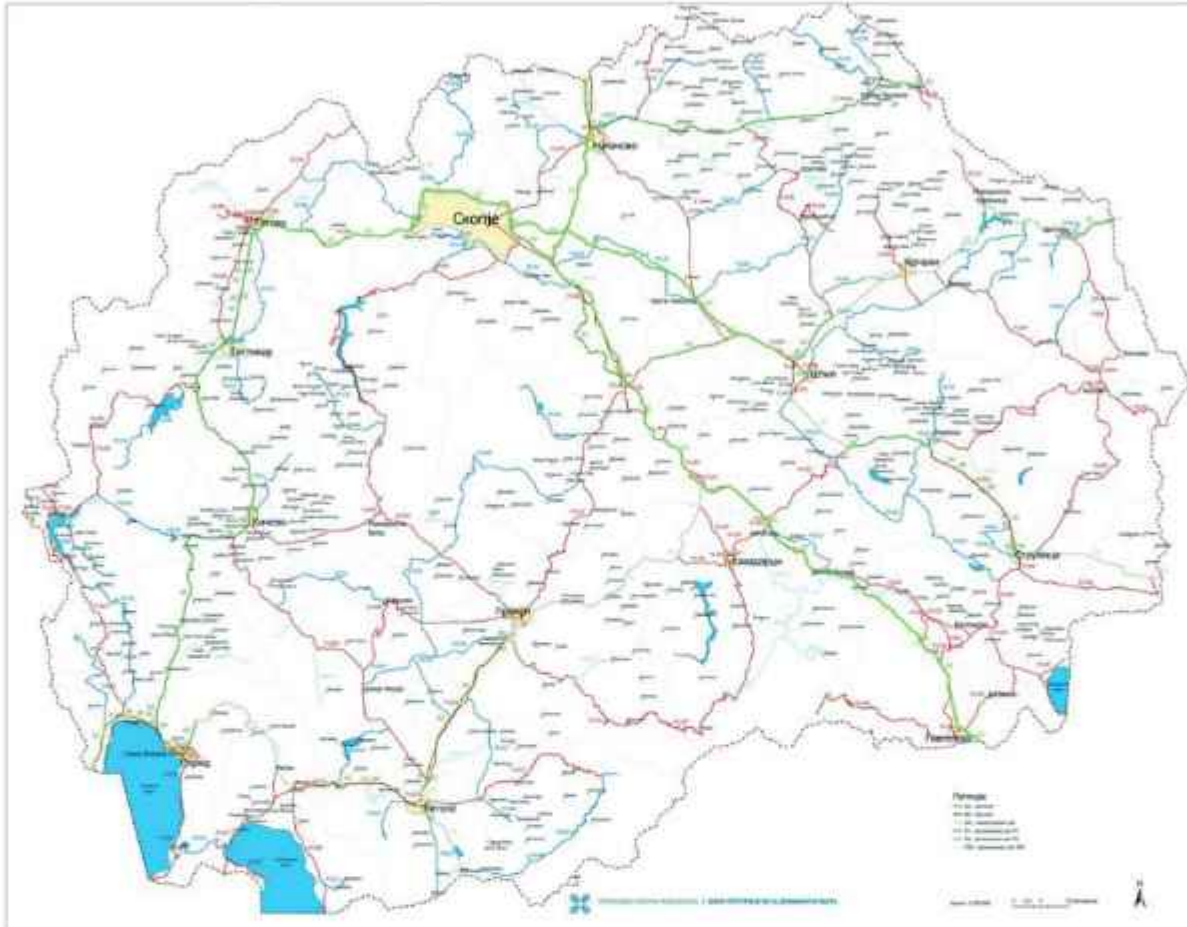
The roads in the Republic of Macedonia are classified into three categories: national roads connecting its territory with neighbouring countries, regional roads connecting adjacent municipalities according to the territorial division of the state and local roads within the frames of a single municipality. The national and the regional roads are administered by the Public Enterprise for State Roads of the Republic of North Macedonia (PESR).

The state roads marked A (motorways, expressways, magistral roads) are the four road corridors in the Republic of North Macedonia, with technical and service ability characteristics that are compatible with the European highway system:

- **North-South (A1):** Tabanovce (Serbian border)–Kumanovo–Miladinovci–Veles–Negotino–Demir Kapija–Gevgelija–Bogorodica (Greek border);
- **East-Southwest (A2):** Deve Bair (Bulgarian border)–Kriva Palanka–Stracin–Romanovce (Kumanovo)–Ring Road (Skopje)–Tetovo–Gostivar–Kicevo–Trebeniste–Struga–Qafe Tane (Albanian border);
- **East-Southwest (A3):** BCP Ramna noga (Bulgarian border)–Delchevo–Kocani–Stip–Veles–Prilep–Bitola–Resen–Ohrid–BCP Sv. Naum (Albanian border) and the section Bitola–Medzitlija (Greek border);

- **North-Southeast (A4):** BCP Hani Elezit/Blace (Kosovo border) – Stenkovec - Ring Road (Skopje) – Petrovec (Miladinovci) – Sv. Nikole – Stip – Radovis – Strumica – BCP Novo Selo (Bulgarian border).

Figure 1: Map of Road Infrastructure Network



Source: PE State roads <sup>500</sup>

<sup>500</sup> PE State Roads (High resolution map)

### 2.3. Major Road Infrastructure Projects

Below is a table of finished, ongoing and planned projects until 2027 year, funded by the EU's IPA, World Bank, EBRD, EXIM Bank of China, Budget and other IFI loans that are relevant to this study:

*Table 4: List of major projects*

<b>Project (title, type &amp; status)</b>	<b>Description (length, source of funding, amount &amp; notes)</b>
<b>Development of the National transport strategy 2018-2030</b> (the NTS)  <b>Type:</b> Policy <b>Status:</b> Finished.	IPA funded project that was implemented in 2017. The overall objective of the project was to develop a strategic document for the transport sector with main focus on the development of measures to provide guidelines for future development of the Transport sector in the country. The project was implemented and funded under the Operational Program for Regional Development 2007-2013.
<b>Regional and Local Roads Programme Support</b>  <b>Type:</b> Infrastructure <b>Status:</b> Finished.	Project was financed by World Bank in amount of 70 mil. EUR and EBRD in amount of 50 mil. EUR. It was completed in 2017. (various sections with various lengths)
Construction of new motorway section <b>Demir Kapija – Smokvica</b> <b>Type:</b> Infrastructure <b>Status:</b> Finished.	Major motorway construction with a length <b>28.2 km</b> , as part of the Trans- European Corridor X. Investment cost 218 mil. EUR, completed in 2018. The project was implemented and funded under the Operational Program for Regional Development 2007-2013.
Construction of A4 motorway section <b>Miladinovci – Sveti Nikole – Stip</b> <b>Type:</b> Infrastructure <b>Status:</b> Finished.	Major motorway construction with a length <b>47.1 km</b> , financed with loan from Export-Import Bank of China. Investment cost 185 mil. EUR.
Construction of A2 motorway section <b>Kicevo – Ohrid</b> <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	Major motorway construction with a length <b>56.7 km</b> , financed with loan from Export-Import Bank of China. Investment cost 411.3 mil. EUR, ongoing.
Reconstruction and upgrading of the motorway section <b>Smokvica – Gevgelija</b> , Corridor X  <b>Type:</b> Infrastructure <b>Status:</b> Finished.	Investment cost 4.2 mil. EUR, completed in 2017 with length of <b>10.1 km</b> . The project was implemented and funded under the Operational Program for Regional Development 2007-2013.
Construction of section <b>Farish–Drenovo</b> expressway, Corridor Xd <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	This section starts from km.0+000 – km.10+197 (length <b>10.2 km</b> ), financed by EBRD, Investment cost 31.8 mil. EUR.
Construction of section <b>Gradsko-Drenovo</b> expressway Corridor Xd <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	This project is financed by IPA 2, Investment cost around 30 mil EUR with length of <b>15.5 km</b> . The project is under implementation and funded under the Sector Operational Program for Transport 2014-2020.
Rehabilitation of State Road A2 <b>Kumanoovo – Stracin</b> , Corridor VIII. <b>Type:</b> Infrastructure <b>Status:</b> Finished.	The project was funded under the Sector Operational Programme for Transport 2014-2020 with length of <b>31.2 km</b>
Construction of highway section <b>Skopje-Blace</b> <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	Highway - loan funds are secured (Phase 1: 23MEUR - 12km length & Phase 2: 187 MEUR – 10 km length) Total length <b>22 km</b>

Construction of <b>Kichevo – Gostivar</b> <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	Highway - loan funds are secured (length <b>30.3 km</b> )
Local Roads Connectivity Projects  <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	Improvement of the road infrastructure in the municipalities in the Republic of North Macedonia through this project as part of the Country Partnership Framework, implemented by the World Bank PIU within the Ministry of transport and communications, EUR 70 plus 37 million will be disbursed to all 80 municipalities (plus City of Skopje) for construction and rehabilitation of local roads and streets, as well as other road infrastructure in local self-government units. From the point of view of regional development and improvement of the local road network, the Ministry of Transport and Communications, through the Ministry's Project Implementation Unit, is implementing a project for connecting local roads. Most of the loan funds relate to the rehabilitation and improvement of roads that support priority investments identified by municipalities for rehabilitation/reconstruction of municipal roads and streets. This investment to connect local roads strengthens the state's capacities in the management and supervision of development with local roads, and inevitably improves mobility and increases the quality of life at the local level. (various sections with <b>various lengths</b> )
<b>Rankovce - Kriva Palanka</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National Roads Programme (length <b>23 km</b> )
<b>Kriva Palanka – Bulgarian border</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National Roads Programme (length <b>13 km</b> )
<b>Construction of expressway Stip - Radovich</b> <b>Type:</b> Infrastructure <b>Status:</b> Finished.	National Roads Programme (length <b>40.5 km</b> )
Construction of a new expressway <b>Prilep-Lenishka River</b> and upgrade (third lane) <b>Belovodica - Mavrovo</b> quarry <b>Type:</b> Infrastructure <b>Status:</b> Planned.	IPA or different source of funding (length <b>7.5 km</b> )
Upgrade of section <b>Katlanovo-Veles</b> on Corridor X to motorway standards" <b>Type:</b> Infrastructure <b>Status:</b> Planned.	IPA 3 planned (length <b>8.5 km</b> )
Reconstruction of <b>Katlanovo – Petrovec</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National budget. This is a big reconstruction project that will improve this heavy traffic section. (length <b>5.5 km</b> )
Rehabilitation <b>Demir Kapija – Negotino</b> (Corridor X) <b>Type:</b> Infrastructure <b>Status:</b> Finished.	National budget. PESR is the implementation institution. (length <b>14.8 km</b> )
Construction of new motorway <b>Kicevo – Bukojcani</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	This is essential motorway that will improve the connection of the Corridor 8 to the west part connecting Skopje with Ohrid. (length <b>10.5 km</b> )

Rehabilitation <b>Skopje – Tetovo</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	This section also is heavy with traffic and the rehabilitation is essential. (length <b>33.5 km</b> )
Construction of motorway <b>Gostivar – Kicevo</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National Budget. PESR oversees the works of the Contractor Behtel&Enka (length <b>30.3 km</b> )
Construction of motorway <b>Tetovo – Gostivar</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National Budget. PESR oversees the works of the Contractor Behtel&Enka (length <b>17.5 km</b> )
Construction of motorway <b>Trebeniste – Struga – Kjafasan</b> (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National Budget. PESR oversees the works of the Contractor Behtel&Enka (length <b>21.7 km</b> )
Construction of Motorway <b>Prilep – Bitola</b> (Corridor Xd) <b>Type:</b> Infrastructure <b>Status:</b> Ongoing.	National Budget. PESR oversees the works of the Contractor Behtel&Enka (length <b>39.3 km</b> )
Construction <b>Stip – Krupiste Expressway</b> <b>Type:</b> Infrastructure <b>Status:</b> Finished.	National Roads Programme (finished) (length <b>28 km</b> )
Rehabilitation on sections on (Corridor VIII) <b>Type:</b> Infrastructure <b>Status:</b> Planned.	National Roads Programme – PESR (various sections with <b>various lengths</b> )
Rehabilitation on sections on (Corridor X) <b>Type:</b> Infrastructure <b>Status:</b> Planned.	National Roads Programme – PESR (various sections with <b>various lengths</b> )
Construction of new expressway <b>Radovish – Strumica</b> (A4 state road) <b>Type:</b> Infrastructure <b>Status:</b> Planned.	Length approx. <b>40 km</b> . Funding and construction still to be decided
Construction of new expressway <b>Strumica – Novo Selo</b> (Bulgarian border) (A4 state road) <b>Type:</b> Infrastructure <b>Status:</b> Planned.	Length approx. <b>30 km</b> . Funding and construction still to be decided.
Construction of new motorway <b>Veles – Prilep</b> (Corridor Xd) <b>Type:</b> Infrastructure <b>Status:</b> Planned.	Length approx. <b>60 km</b> . This project is in the Project pipeline but still a decision needs to be made on the prioritisation of this construction (reporting period until 2027)

Source: Single project pipeline and Public Enterprise for State Roads

## 2.4. More Road Infrastructure-related Projects

Essential project for the development of the road transport infrastructure is the following Project: *Development of Implementation Plan under the National Transport Strategy 2018-2030 with system tools and capacity for monitoring* under IPA II/SOP for Transport 2014-2020. One of the outcomes

of this project is to prepare a detailed Implementation plan for the National Transport Strategy 2018-2030 with supporting system and tools for its monitoring based on developing Appraisal framework for actions.

### **2.5. Projects related to the State Roads**

#### **2.5.1. Implementation of Intelligent Transport Systems (ITS) along Corridor X**

This is an additional major project that complements the road connectivity, safety of roads and road-related infrastructure foreseen to be implemented under the Western Balkans Trade and Transport Facilitation Project financed by a World Bank.

The project envisages implementation of ITS with several devices such as WIM (Weight In Motion) on A1 Motorway, part of Corridor X, section Tabanovce - Gevgelija in the length of 175 km, Road Weather Information Systems (RWIS), which are a road weather stations built to collect data on weather conditions and air pollution, including systems for monitoring GHG (SLCP) emissions. The ITS project will provide for a variety of traffic data (number/type of vehicles), as well as meteorological data. The ITS Strategy, part of this project, proposed the next steps in the legislative alignment. It will enable improved road connectivity up to EU standards and contribute to trade and transport facilitation. By developing ITS along road Corridor X, one of the strategic objectives stated in the National Transport Strategy of the Republic of North Macedonia will be met i.e. maintaining a high level of safety and traffic flow in all conditions. In addition, relevant legal changes related to the introduction of ITS are in preparation.

The project will be realized in two phases (North and South Corridor X). Within the WBTTFP project, the South part with a length of 98.0 km and the ITS Control Center in Negotino will be implemented first. For the implantation of the Deployment of ITS - north part of Corridor X and NTMC with all new ITS systems, additional sources of funds were requested in February 2023 through WBIF within the frame of the Investment Grant which will be implemented within the Safe and Sustainable Transport Program (SSTP) financed through the DG NEAR with lead IF-World Bank.

Regional aspect of this project: the expected project economic impact is reduction in travel time to the border crossing points. It is in line with the Multiannual Action Plan (MAP) which provides a structured agenda for furthering regional economic integration, focusing on regional circulation of goods, services and capital, mobility of skilled workforce, a dynamic investment space, and digital integration. This measure is part of regional project

“Reduce trade costs and increase transport efficiency in the Western Balkan 6”, Component 2: Enhancing transport efficiency and predictability. It includes Albania, North Macedonia and Serbia.

This project is essential in the road safety and in economic benefits of the users. Therefore, these indicators are essential (The expected results given in the):

*Table 5: ITS project indicators*

Indicator	Baseline (2018)		Target (2025)	
	No. of accidents	Percentage decreased	No. of accidents	Percentage decreased
Reduced number of traffic accidents expressed in % along Corridor 10	67	0%	56	16.6%
Indicator	No. of minutes	Percentage decreased	No. of minutes	Percentage decreased
Reduce travel time in % along Corridor 10	103	0%	85.5	17%

*Source: Economic reform programme (ERP)*

An EU report summarising evaluation results for ITS projects implemented in Europe between 1994 and 1998 finds that a dynamic signal control can reduce travel times by 17%, increasing to 20% when the dynamic signal control strategies are integrated with information and guidance. A US study indicates that one DMS (Dynamic Message Signs) is likely to reduce  $100 \times (1 - \text{EXP}(-0.181)) = 16.6\%$  of crashes per year, when other factors in the model are controlled.

The benefits of the ITS improvements will begin after 1 year once the systems are installed and the life cycle of the ITS equipment is 10 years (installation in 2023 benefits from 2023 to 2033). The annual growth of the average number of lorries on the corridor equals the projected GDP growth. In North Macedonia, it is considered that ITS will reduce the travel times by 17% based on the above-mentioned EU report, while the number of crashes by 16.6% based on the above-mentioned US study.

### **2.5.2. Road Asset Management System (RAMS)**

This is an essential project regarding the road infrastructure in the ‘long run’. The World Bank supported rehabilitation of national and regional roads and introduction of a Road Asset Management System (RAMS) for primary roads, through the recently closed National and Regional Roads Rehabilitation Project (NRRRP-P148023). The RAMS enables the Government to develop five-year rolling programs for road preservation works to address sustainability of the project investments. The ongoing Road Upgrading and Development Project (RUDP-P149955) will reconstruct sections of Corridor VIII between



Skopje and Deve Bair and continue to support PESR to enhance its capacity to manage primary roads with a focus on bridge management.

### **2.6. Project Related to Local Roads**

#### **2.6.1. Overview**

The Governance of the 9,000 km local road network is fully decentralized to municipalities, most of which have limited capacity to manage and preserve road assets. Local roads consist of a mixture of rural roads connecting villages and towns and streets within urban areas and villages. The local road networks suffer from a lack of systematic planning, neglected maintenance, and insufficient funding. Minimal central government support for the strategic development of local roads and local government resistance to inter-municipal cooperation also limits the potential. The main body that represents the interests to the municipalities is the Association of the Units of Self Government (ZELS). The World Bank and the European Bank for Reconstruction and Development has financed several programs for municipal roads. Though rehabilitation of local roads was just one of numerous types of possible municipal infrastructure and service improvements, these projects have rehabilitated 146 km of local roads with 415,000 direct beneficiaries.

#### **2.6.2. Sustainable Urban Mobility Plans (SUMPs) for five municipalities**

Within the Local Roads Connectivity Project of the WB a project for: Technical assistance for Development of sustainable urban mobility plans for five municipalities and providing training on developing and implementation of sustainable urban mobility plans, for the Municipalities of Kavadarci, Kocani, Struga, Strumica and Prilep SUMPs are planned to be developed.

The overall objective of these projects is transformation of municipalities' current urban transport system into a sustainable one through improving the efficiency and cost-effectiveness of the transport network, reducing the impact of transport on the environment, ensuring accessible transport options for all citizens, ensuring personal safety and security within the transport system and improving of the overall quality of life for the citizens, by applying a concept of sustainable urban mobility planning and involving policies and measures.

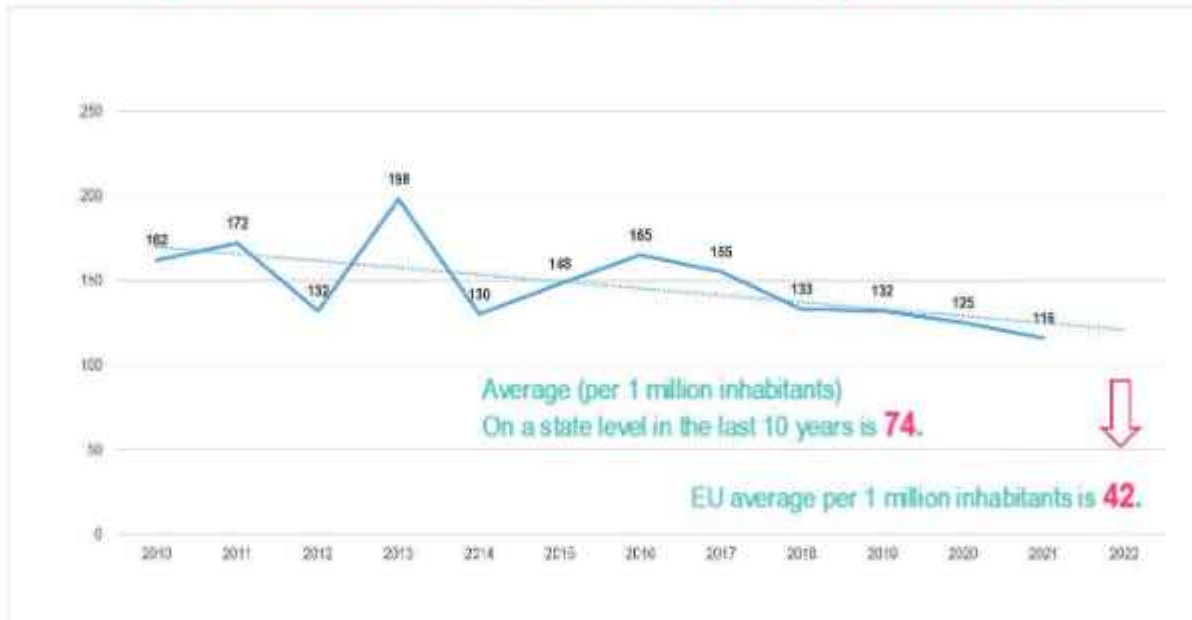
#### **2.6.3. Local Roads Connectivity Project (LRCP)**

The main objectives of the Local Roads Connectivity Project (LRCP) are to improve local government capacity to manage local roads and improve access to markets and services. Besides expected positive effects of improvements

of local roads, such as increased mobility and quality of life, unfortunately average travel speeds will be increased. This is a well-known fact and therefore additional road safety tools and measures shall be undertaken and applied.

#### 2.6.4. Road Safety

Figure 2: Road Casualties at Country Level (2010 – 2021)



Source: State statistical office

#### Road Safety Agency

Firstly, it is important to note the project for establishing the **Road traffic safety agency**. With the support of the European Union through the EUIF instrument, the project for “Technical assistance for establishment of an executive body for road traffic safety” was implemented. The general process for the establishment of the executive body in the form of an Agency is ongoing.

#### Road Safety Audit (RSA)

This is recognized as one of the most efficient and cost-effective engineering tools that can minimize the risk and severity of road traffic accidents that may be affected by road infrastructure projects. RSA is a part of Road Infrastructure Safety Management EC Directive 96/2008 (Amended on November 26, 2019 through EC Directive 2019/1936) and it means an independent, detailed, systematic and technical safety check of the design characteristics of a road infrastructure project and it covers all stages from planning to early operation. It is a formal process of safety examination of the road infrastructure project which affects road users, carried out by an independent qualified team of auditors who reports on the project`s accident potential and safety

performance for all types of road users. RSA is a pro-active approach with the primary aim of identifying potential road traffic safety problems, omissions and deficiencies as early as possible in the road design process or during the early phase of road operation so that decisions for their elimination or reducing their negative impact on traffic safety can be made.

For successful and sustainable conducting of RSA and other road infrastructure safety management procedures at local level (local communities) in the future, the Guidelines should be provided, and the training of the municipal staff should be undertaken in accordance with the best international/regional practice. In addition, activities for improving the road safety near primary schools should also be undertaken.

At the moment there is an ongoing World Bank-financed project for Technical assistance for Road Safety Audit of local road infrastructure projects, preparation of guidelines and providing training to the municipal staff and improving children`s traffic safety.

### **2.7. Other Road Infrastructure Related Projects**

- 1. Preparation of project documentation for a multi-modal node in Trubarevo*
- 2. Preparation of a Sustainable Urban Mobility Plan (SUMP) for Skopje, including an action plan for implementation and providing guidelines for sustainable urban planning and design of road infrastructure and transport services*
- 3. Bus Rapid Transit System project for the territory of the City of Skopje (revision on the decision)*
- 4. Preparation of technical documentation and implementation of measures to improve road safety*
- 5. Replacement of protective fences according to EN standards on 100 km of highway on Corridor 10 - SSTP*
- 6. Technical audit for the large project Construction of the road section Gradsko-interchange Drenovo as part of the road Corridor 10-d*
- 7. Technical assistance for the establishment of an executive road safety body – EUIF and the expected legislative changes*

#### **2.7.1. Single Project Pipeline for Transport Sector**

The project for the "Support in identification, assessment and selection of eligible projects for IPA Regional Development Component – part Transport was finished in 2011. The overall objective of the project was to contribute to the

effective management and implementation of the Operational programme for regional development (OPRD) as well as to high absorption of the IPA funds under the Regional Development Component. This project is also known as the **Project for creation of the Single project pipeline (SPP)**. This list<sup>501</sup> is regularly updated and adopted by the government on an annual level. The Sector working group for transport is a forum for discussion of the single project pipelines. This single project pipeline uses the multi criteria for ranking the projects for adequate and proper investment decision of the country. For this very important aspect, the road infrastructure projects ranked in this list were carefully integrated in the project table above.

### 2.7.2. Project for infrastructure for electric vehicles: E-mobility charging points - EBRD

In North Macedonia, EBRD is financing a project on supporting 'Electric Vehicle (EV) Transition through Development of EV pathway and Initial EV Charging Deployment' with the following components: institutional gap analysis; context for EV charging infrastructure- current state of play in region and Europe; pathway for EV development (with forecast and scenarios). This means the development of the E-mobility National Strategy and Action Plan for the road infrastructure in the Republic of North Macedonia.

*Table 6: Number of registered electric vehicles*

2019						
	Total	Motor Bikes	Passenger cars	Busses	Commercial Vehicles	
Country	no. of vehicles	487207	11999	425891	3144	38032
	EVs	143	86	51	0	6
Skopje	no. of vehicles	171731	4327	148891	941	15598
	EVs	77	39	37	0	1
2020						
Country	no. of vehicles	491966	12794	429196	2612	39202
	EVs	198	116	69	0	13
Skopje	no. of vehicles	178778	4466	155195	833	16258
	EVs	92	36	53	0	3
2021						
Country	no. of vehicles	549653	15786	477820	2946	43327
	EVs	243	96	128	0	17
Skopje	no. of vehicles	191465	5228	165566	887	17581
	EVs	147	44	100	0	3

*Source: State statistical office, Ministry of Internal Affairs*

<sup>501</sup> Single project pipeline on the website of the Secretariat for European affairs

### 3. Review of Strategic Documents and Plans

#### 3.1. List of the relevant treaties, agreements, strategic documents, and plans

- National transport strategy 2018-2030
- IPA III Programming Framework,
- Sector Operational Program for Transport and its Sectoral approach for project roadmap (draft version – working document)
- Single project pipeline for Transport
- Enlargement Package recommendations for Chapters 14, 21 and 22 (EC 2022 Report on North Macedonia)
- Treaty establishing transport community (plus the Annexes); - and its Action plans
- Stabilisation and Association Agreement
- National program for the Adoption of the Acquis (NPAA); and its annexes
- Economic Reform Programme (ERP), and its structural reform measures
- European Investment Plan (EIP) Europe for Western Balkan
- Green Agenda for the Western Balkans
- Strategic environmental assessment; and its final report
- European Green Deal
- Five-Year Rolling Work Plan for Development of the Indicative TEN-T Extension in the Western Balkans
- TEN-T Regulation, Core, and Comprehensive Network to the Western Balkans
- Safe and Sustainable Transport Programme – SSTP
- Sustainable and Smart Mobility Strategy

Currently a process for adoption of the Sector Operational Program for Transport is ongoing. The overall objective of the SOP – Transport is expected to enhance regional economic development and social cohesion through a modern, sustainable, and well-integrated transport infrastructure in North Macedonia.

Within the area of support of the IPA for the **Road Transport Infrastructure**, the Specific Objectives are expected to enhance road transport infrastructure on sections of state road A1, A2, A4 on TEN-T Corridors X, Xd, and

VIII, by increasing safety, efficiency, and sustainable connectivity through targeted works interventions and comprehensive project documentation, which ultimately will result in:

- Improvement of the road condition and safety standards on the connection area of X and VIII TEN-T corridor through: improvement of the technical condition of the motorway A1,
- Supporting enhancement of safety, reliability, and efficiency on Corridors X and Xd through elaboration of comprehensive technical documentation and obtaining permits together with other necessary implementation preparatory works according to EU standards.

### 3.2. Strategic documents with relation to connectivity

The EU influence on the creation of the North Macedonia's connectivity policy is also streamlined through the "**Connectivity agenda**". It was initiated with the Berlin process in 2014 and it created the so-called Connectivity reform measures. This agenda aims to improve the links within the Western Balkans and between the WB6 (Western Balkan 6) and the EU. Its continuation and developed was found through the establishment of the **Transport Community**. Upon establishing, the Permanent Secretariat of the Transport community took over the process of development of the extension of the TEN-T network. In order for the Connectivity Agenda to receive new momentum the Transport Community's Action plans were adopted. The envisaged projects in these action plans<sup>502</sup> are to some extent related to the goals of the National transport strategy. They are covering the regional aspect of this country's transport policy. Within the obligations, the transport policies' priorities of North Macedonia and the WB6 partners need to be aligned with respect to the Connectivity Agenda and the EU acquis for transport. The compliance is monitored through these action plans.

The Transport Community for the indicative extension of the Trans-European Transport network (TEN-T) oversees the pre-identified priority projects for infrastructure investment. Extending the TEN-T core network corridors to the Western Balkans ensures leveraging investment in infrastructure, such as EU support through the Western Balkans Investment Framework (WBIF) and the other transport financial stakeholders presented in the country. The NTS strategy subject to this project is in line with all of these EU aspects of development of the transport sector (more details in the next section of this research).

<sup>502</sup> Action Plans - Transport Community ([transport-community.org](http://transport-community.org))

### **3.3. Cross border connectivity**

#### **3.3.1. Transport Community Action plan on transport facilitation**

The Transport Facilitation Action Plan envisages actions for road/rail border crossing points in the Western Balkans. It aims to address inefficiencies and delays and improve/modernise/digitalise the operations and infrastructure along the indicative extension of the TEN-T Network in the Western Balkans. Its enforcement is overviewed by a technical committee for transport facilitation (TCTF) where the North Macedonia representatives are coming from the Transport Ministry, Custom Authorities and Border Police. This TCTF in 2023 was part of the Connectivity Summit and the Summer School held in Ohrid. The participation of neighbouring EU MS representatives at the TCTF meetings is essential for North Macedonia since it shares borders with two EU member states.

Republic of North Macedonia very actively participates in the EU-WB6 Green Lanes initiative. These lanes are operational with Greece and Italy, too, thus representing an exemplary regional initiative with recognized success. There were some positive developments in establishing one stop controls and preparation of technical documentation for improvements on some BCPs in North Macedonia. Good progress in border agencies' cooperation, coordination and capacity building is noted.

The border crossing points that are planned to be developed that are strategically found on the corridors:

Table 7: North Macedonia's border crossing points improvement plans

Border crossing points	Implementation of traffic technology measures	Physical improvements and equipment
<b>Qafe Thane – Kjafasan ALB – MKD (Corridor VIII)</b>	Automatic weighting system Extension of approach road capacity Real time data collection Pre-arrival information on road-side facilities Pre-arrival information on internet	New buildings (secondary vehicle inspection facility; combined customs and border guard booths) New layout (herringbone vehicle parking) Extra lanes (NCTS/TIR lanes) Detection equipment (ANPR, X-ray scanner, extra weighbridge etc.)
<b>Deve Bair – Gyesevo MKD – BG (Corridor VIII)</b>	Real time data collection Pre-arrival information on internet	Extra lanes (dedicated traffic lane) Detection equipment (ANPR, radiological and X-ray scanner, extra weighbridge, road signs etc.)
<b>Tabanovci – Presevo MKD – SRB (Corridor X)</b>	Lane management on BCP Automatic weighting system Provision of additional parking capacity Real time data collection Pre-arrival information on motorway sections Pre-arrival information on road-side facilities Pre-arrival information on highway radio system Pre-arrival information on internet	New buildings (bus passenger facility with baggage scanners and CBNE detection; secondary car inspection; combined customs and border guard booths) New layout (herringbone vehicle parking) Extra lanes (empty truck lane) Detection equipment (X-ray scanner, handheld passport and ID scanners, etc.)
<b>Bogorodica – Evzoni MKD – EL (Corridor X)</b>	Lane management on BCP Automatic weighting system Provision of additional parking capacity Real time data collection Pre-arrival information on motorway sections Pre-arrival information on roadside facilities Pre-arrival information on highway radio system Pre-arrival information on internet	New buildings (combined customs and border guard booths) New layout (herringbone vehicle parking) Detection equipment (X-ray scanner, hand held passport and ID scanners, CBRN detection, weighbridge, etc.)
<b>Medzitlija – Niki MKD – EL (Corridor Xd)</b>	Extension of approach road capacity Provision of additional parking capacity Real time data collection Pre-arrival information on internet	New buildings (bus passenger facility; combined customs and border guard booths) Detection equipment (CBNR scanner etc.)
<b>Blace - Hani i Elezit MKD – KOS (TEN-T route)</b>	Extension of approach road capacity Real time data collection Pre-arrival information on highway radio system Pre-arrival information on internet	New buildings (combined customs and border guard booths) New layout (herringbone vehicle parking) Extra lanes (empty truck lanes, slip lane to the secondary inspection facility) Detection equipment (ANPR, X-ray scanner, weighbridge, etc.)
<b>Novo Selo – Zlatarevo MKD – BG (TEN-T route)</b>	Real time data collection Pre-arrival information on internet	New layout (herringbone vehicle parking) Extra lanes (empty truck lanes which could be used for AEO) Detection equipment (ANPR, X-ray scanner, weighbridge, etc.)

Source: TCT Action plan on transport facilitation<sup>503</sup>

<sup>503</sup> <https://www.transport-community.org/wp-content/uploads/2020/11/Transport-Facilitation-Action-Plan.pdf>



Although the AP report<sup>504</sup> registers stagnation in implementing its adopted measures, once achieved on these key border crossing points on the TEN-T corridors and routes, the cross-border connectivity of North Macedonia will be extensively improved for in the SEE region.

### 3.4. Strategic national documents with relation to road infrastructure

- National Transport Strategy 2018-2030<sup>505</sup>; and its **indicative plan**
- Strategic environmental assessment; and **its final report**
- Sector Operational Program for Transport; and its Sectoral approach for **project roadmap**
- Three-year investment plan for railways infrastructure; - and its **budget**
- The five-year program for construction, reconstruction, rehabilitation, maintenance and protection of state roads<sup>506</sup>; - and its **budget**
- Transport community Treaty (plus the Annexes); - and the nationally adopted **Action plans**
- National program for the Adoption of the Acquis (NPAA); and its **annexes**
- Economic Reform Programme; and its **structural reform measures**
- Working programme of the Government<sup>507</sup>; and its **action plans**
- Single project pipeline for Transport; and its **list of projects**, and at least but not last
- The analysis of **the relevant legislation** as listed also in the strategy. These are the road, the rail, the inland navigation, air navigation laws etc.

#### 3.4.1. National Transport Strategy 2018-2030

The National Transport Strategy 2018-2030 (NTS) accompanied by its Indicative Implementation Plan was adopted in 2018. The aim of the National Transport Strategy is to develop a harmonized transport sector compatible with, and integrated in, the European transport networks.

The **overall objective** of the NTS is to develop a harmonised transport sector that is internationally compatible and integrated in the TEN-T system that stimulates the economic and social development of the country, preserves the environment, and secures the needs of future generations.

<sup>504</sup> Progress Reports on Action Plans and Acquis Implementation - Transport Community (transport-community.org)

<sup>505</sup> <http://www.mtc.gov.mk/media/files/2019/NTS-final%20EN.pdf>

<sup>506</sup> <http://www.roads.org.mk/312/petgodishna-programa>

<sup>507</sup> <https://vlada.mk/node/14647?ln=en-gb>

The **main goal** of the NTS is to improve economic efficiency, transport safety and accessibility, environmental management and future transport activities, as well as to ensure integration with other sectoral policies. The specific goals of the strategy are to develop measures that address the weaknesses in the transport sector at the national level, with implementation of infrastructure projects, policies and other related activities. The table below is created for better understanding of the strategy itself:

*Table 8: NTS general and specific objectives and targets*

N.	General Objectives	Targets	Specific Objectives
GO1	<b>Strengthen EU integration and promote regional cooperation</b> <i>International dimension of all transport modes</i>	<b>Complete Transport community Core and Comprehensive Road and Rail Network</b> passing through the national territory (defined as TEN-T Comprehensive Network in the South East Europe)	1.1. To complete the Transport Community Core and Comprehensive Network passing through the national territory and upgrade the standards of the existing road and rail infrastructure (road and rail); Infrastructure function (IF) 1.2. Reduce border crossing times and procedures (all modes); Operations and Services function (O&S) 1.3. Finalise the alignment of the Macedonian transport legislation to the EU acquis (all modes) Regulatory function (RF)
GO2	<b>Contribute to the improvement of the economic sustainability at the national level</b> <i>National dimension of all transport modes &amp; urban transport</i>	Increase <b>country ranking</b> in Transport UN Logistics performance index,	2.1. To improve the accessibility and quality of the national transport infrastructure and transport services (all modes) Operations and Services function (O&S) 2.2. To ensure the socio-economic and financial feasibility of transport development projects & initiatives (all modes); Infrastructure function (IF) 2.3. To improve the administrative and operational capacity of governance structures (all modes) Operations and Services function (O&S)
GO3	<b>To introduce green mobility and logistic focused to environmental performance of the Transport sector</b> <i>all transport modes &amp; urban transport</i>	Reduce the CO2 transport emissions with 5% in 2025 and 7% in 2030	3.1. To develop and improve environmentally friendly and low carbon transport systems (all modes) Crosscutting 3.2. To stimulate modal shift (all modes) Crosscutting 3.3. Increase the importance of intermodal and multimodal transport in national transport policy Crosscutting
GO4	<b>Establishment of reliable and safe transport system</b> <i>all transport modes &amp; urban transport</i>	Reduce of the death toll on the roads by 50% until 2030	4.1. Improve transportation safety (all modes, except roads) Crosscutting 4.2. Improvement of road traffic and infrastructure safety (incl. Urban transport safety) 4.3. To introduce IT technologies and Implementing Intelligent Transport Systems (ITS) in the transport sector (all modes); Crosscutting

Source: National Transport strategy (2018-2030)<sup>508</sup>

<sup>508</sup> <http://www.mtc.gov.mk/media/files/2019/NTS-final%20EN.pdf>

The first and second General Objectives are defined based on understanding that the efficient sector management is structured in **3 key functions** that reflect the responsibilities of modern Governments in guaranteeing mobility for all: (i) *Regulatory function*, (ii) *Infrastructure function* and (iii) *Operations and Services function*. Further, considering that the objectives related to environmental, economic performance and safety improvements in the Transport sector are cross-cutting by nature, the measures and respectively actions foreseen under the third and fourth General objectives, imply systematic translation of a broad scope of the goals into a set of mutually reinforcing packages of measures.

The **Specific Objectives (SOs)** found in the strategy are composed according to the analysis of specific needs of the transport system in the country and are considered as a crucial stage in developing of the transport sector. The specific objectives are subsequently detailed per transport mode.

The Annex 2 where the Indicative Implementation Plan is found includes 104 activities with an estimated budget of around 4.2 billion EUR. All of the activities are indicatively planned to be implemented by 2030.

The NTS proposes policy measures and actions to efficiently and effectively address the key challenges to improve the quality of transport infrastructures and operations.

For the accountability, monitoring and evaluation of the strategy, monitoring modalities and indicators are envisaged in order to assess the progress towards achieving the NTS objectives. These general requirements, similarly to any strategy, are formulated and presented in a structured way. The expected results between objectives and measures are now monitored for the strategy's implementation progress. Therefore, key performance indicators have been defined as a tool for evaluating the progress. In order to increase the monitoring efficiency of the implementation progress of the Strategy in the long term and based on the lessons learned during the past period, this project is the right next step.

## **4. Mapping Challenges and Exploring Solutions for Enhancing Road Infrastructure**

### **4.1. General remarks for the transport sector**

According to the European Commission evaluating this sector in the Eco-

conomic reform programme (2023-2025),<sup>509</sup> road transport continues to dominate the transport sector. There is limited investment in other means of transportation and no consistent and intelligent system to manage and control transport traffic. Road maintenance is carried out by state companies that operate with old equipment. In 2020, the transport sector's contribution to gross value added was 3.5%, which is lower than the EU average of around 5%. The World Economic Forum's 2019 Global Competitiveness Report ranks the country 84th out of 138 economies for transport infrastructure. Relatively low-quality transport infrastructure, as well as weak trade and transport logistics continue to present barriers for foreign companies aiming to invest in the country. These issues are also causing difficulties for domestic companies.

The flagship policy of the economic and investment plan is the further development of the Trans-European Transport Railway Corridor 8, which links North Macedonia with Albania and Bulgaria. This corridor will give the country's companies an alternative export option via Albanian and Bulgarian ports. To start the construction of the Corridor 8/10d highway, an independent and comprehensive feasibility study was undertaken to establish the fiscal cost and to manage fiscal risks (also as a structural benchmark under the IMF's Precautionary Liquidity Loan to North Macedonia). North Macedonia will have to amend legislation to rectify breaches of the provisions of the Transport Community Treaty regarding the opening up of the rail market at the national level.

The 32% fatality rate in traffic accidents is high and above the EU average. The law for the creation of a Road Safety Agency remains to be adopted. Road transport has a significantly higher modal share than rail: 96.7% compared to 3.3%. Road freight has a high 86% share of total freight in North Macedonia; this is higher than the EU average and has a negative environmental impact. Combined transport, which is more environmentally friendly and cost-efficient, is increasing but still accounts for only 1.3% of total freight.<sup>510</sup>

On the other hand, we can conclude that the objectives of the Strategy are following the EU transport policy under the Green Deal with the Green Agenda and the sustainable connectivity. So, the baseline for policy is here but what is missing is the precise large-scale investments.

<sup>509</sup> European commission SWD (2023) 109 final North Macedonia 2021 ERP assessment (europa.eu)

<sup>510</sup> OECD (2021)

### 4.2. Recommendations for the road infrastructure related projects

For preventing the usual issues of insufficient planning and the lack of funds for the projects as well as avoiding signing additional annexes to the contracts for repetitive reasons such as:

- Insufficient quality of the detailed designs,
- Lack of funds in the public procurement plan (example vat and dollar-euro exchange rate difference),
- An outdated project documentation,
- An outdated equipment specification,
- Lack of sound elaboration/evaluation of the Strategic environmental protection,
- Missing the logical need for phased implementation of the projects (by systems or by location).

An improved preparation of due diligence tender documentation, higher quality project documentations, along with the design of sound and precise control mechanisms, are an imperative.

### 4.3. Remarks on the funding of the projects

The country is using the funds available from the EU financial institutions plus uses loans from various international lender institutions. In the previous period for this matter a strategic decision was carried out with adopting the Law on determining public interest and nominating a strategic partner for implementation of the project for Construction of infrastructure on Corridor 8 (section: Tetovo - Gostivar - Bukojcani and the project for the highway Trebenishta - Struga - Kjafasan) and Corridor 10d (section of the highway Prilep - Bitola). This law derives from the Memorandum signed by the Government with the company "**Bechtel and Enka**" as a strategic investor for the construction of these highways' sections. This proposed legal solution regulates the design and construction of the infrastructure of Corridor 8 and the design and construction of the infrastructure of Corridor 10d, as individual projects for *capital investments of strategic national importance for the country*. This investment decision can imply that the value of the transport infrastructure projects might overburden the general financial decisions of the authorities.

### 4.4. Other potential challenges and mitigation options

A number of external risk factors can be mitigated with transfer of good

management skills and know-how to ensure timely and effective implementation of activities.

Conflicts in the national legislation can be mitigated with sound communication with the relevant institutions responsible for drafting the regulation in order to mitigate the eventual problems in the development of the projects.

The low **capacity of the administration** body can be improved with proper staffing and expertise.

Delay in adoption of **appropriate legislation and bylaws** for the adequate activities can be mitigated using EU instruments assistance in better and efficient legislation approximation for the subject matter.

### 4.5. Infrastructure and other types of challenges

- **Motorway Standards:** Only a part of road network, especially along Corridor VIII, meet motorway standards.
- **Infrastructure Damage:** Significant damage exists on heavily trafficked sections of the A1, A2, and A4 motorways. Aging road infrastructure requires substantial financial resources and planning for maintenance and rehabilitation.
- **Traffic Management:** With the average daily traffic (AADT) on major roads and motorways gradually increasing, managing this volume without causing congestion remains a significant challenge.
- **Road Safety:** The road traffic fatality rate is higher than the European average, indicating a critical need for improved road safety measures taking into consideration the Safe system approach and mainly focused on infrastructure improvement measures.
- **Documentation and Permits:** Comprehensive technical documentation and assistance in obtaining necessary permits for road infrastructure projects are needed.
- **Environmental projection:** Efforts are required to ensure environmental protection and sustainability in road infrastructure planning and implementation. This includes reducing vehicle emissions, promoting fuel efficiency, and minimizing the ecological impact of transportation activities.

## 5. Proposals for Future Plans Pertaining to Infrastructure Resilience

### 5.1. Horizontal Focus on Climate Change's Impact on Road Infrastructure

North Macedonia is highly vulnerable to natural hazards, including floods, droughts, forest fires, landslides, earthquakes, and extreme temperatures, several of which are amplified by climate change. It faces the highest flood risk in the Europe and Central Asia region. A major flood disaster could derail economic growth, damage, or destroy critical infrastructure, cause widespread agricultural losses, and severely disrupt rural livelihoods and welfare.<sup>511</sup> Agriculture is the most vulnerable sector to climate change. The annual damage to critical infrastructure from climate-related hazards is expected to increase fivefold by 2080.

From the aspect of critical infrastructure, the resiliency of the road network of the Republic North Macedonia, in narrative terms can be identified as resilient, because in case of disruption under various circumstances, there are alternative road routes. But regarding the resilience from the long-term influences from the changes of the climate (the unexpected weather events such are the frequent extreme high and low temperatures, flooding etc.) to the road infrastructure, a lot can be done.

The transport sector faces ongoing stresses related to climate change. Major flooding in 2015 drew attention to the risks to the primary road network in North Macedonia. Through support of the NRRRP, the PESR developed a Climate Resilient Design Guidelines in 2019, which recommended engineering and non-engineering measures focusing on institutional and legal arrangements, to enhance consideration of climate resilience in the planning, operation, and management of the primary road network. However, little effort was paid to development of measures to enhance resilience of local roads. The existing maintenance contracts pay insufficient attention to off-road measures such as slope stability and drainage. Similarly, the design of improvement works needs to take more account of the topography of the area surrounding the road, local knowledge from past flood events, and the need to design for sufficient side and cross drainage.

For that we recommend firstly to prioritize the current and future climate resilient investments in road assets.

<sup>511</sup> World Bank. 2018. North Macedonia Systematic Country Diagnostic, Report No. 121840.

The objective will be achieved through applying a climate vulnerability assessment on the national road network in North Macedonia, proposing mitigation measures and improving climate resilient design, construction and maintenance standards for national roads and local roads. This must be done from the project initiation, in the design phase (even in the Feasibility study). As such the recommendations can be divided in two parts, each consisting of the following steps:

- Information gathering and the development of datasets.
- Based on the available datasets, a risk analysis (i.e. the determination of network vulnerability, criticality and risk assessment) can be performed for the primary road network.
- The risk mitigation measures, i.e. hazard resilient interventions (robust, cost efficient) for the primary and secondary road network, should be investigated.

### **5.2. Findings and Recommendations for local road infrastructure**

What needs to be done for the improved local road infrastructure management?

- Building local government capacity to manage local road networks and promoting citizen engagement in management of local road networks, is needed.
- While there is limited data on the condition and extent of the local road networks, it is thought that most of the main links are in place, but the network requires renewal, improvement, and climate proofing. There is a need to introduce simple asset management tools.
- The overall governance for delivery of municipal services, including transport services, needs to be improved.
- Only a few of the 80+1 municipalities in North Macedonia can sustain a dedicated local roads department, and local roads programs are often criticized for lacking transparency.
- Insufficient and insecure funding accelerates deterioration of the local road network. Funding for local roads comes primarily from municipal revenues and a budget transferred to municipalities each year from the central government through the PESR. The annual fund transfers by the PESR amounts to Macedonian denar 300 million from 2012 to 2019 (equivalent to EUR 5 million) and could be used for construction, reconstruction, maintenance, and protection of local roads and streets. In reality, this amount does not even cover the basic maintenance needs of the municipalities.



- Maintenance is underfunded. Small rural municipalities use public multisectoral communal enterprises to carry out routine maintenance, while large municipalities outsource routine maintenance to private contractors using call-down contracts. Other mix both of those.
- The transport sector faces ongoing stress related to climate change. Major flooding in 2015 drew attention to the risks to the primary road network in North Macedonia. Therefore, a technical assistance for preparation of climate resilient projects was provided by World Bank<sup>512</sup>. We recommend the country to use these guidelines.

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<sup>512</sup> GUIDELINES FOR THE DESIGN OF ROADS RESISTANT TO CLIMATE CHANGE – Public Enterprise for State Roads

# Road Infrastructure in Romania

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## Road Infrastructure in Romania

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### **Victor Mester**

*Senior Infrastructure, Digitization, and Operations Expert at Civitta, Romania*

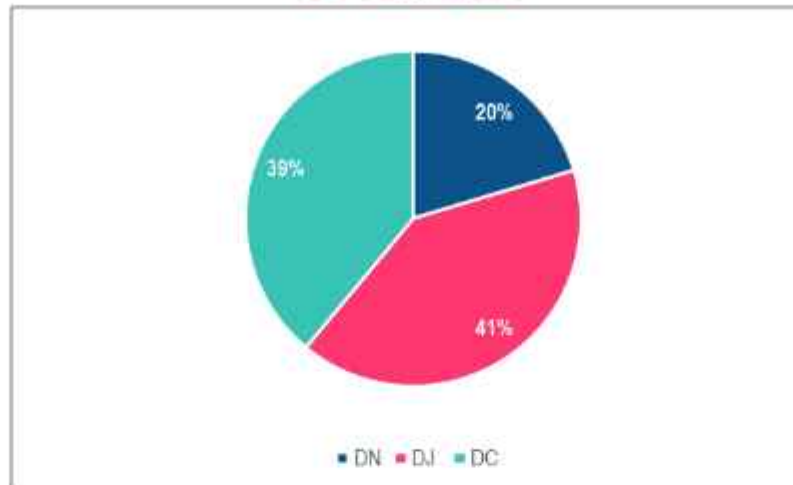
### **1. Review of Existing Road Infrastructure**

The total Romanian road infrastructure amassed to some 86k km by the end of 2022, of which 20% National Roads administered by the central government, while the rest of the 80% falls under local administration, specifically 41% administered by the counties (an intermediary authority between the central government and the local administration) and 39% administered by local authorities.

From an administrative standpoint the Romanian road infrastructure system is split in 3 main categories, according to the government ordinance 43/1997 namely:

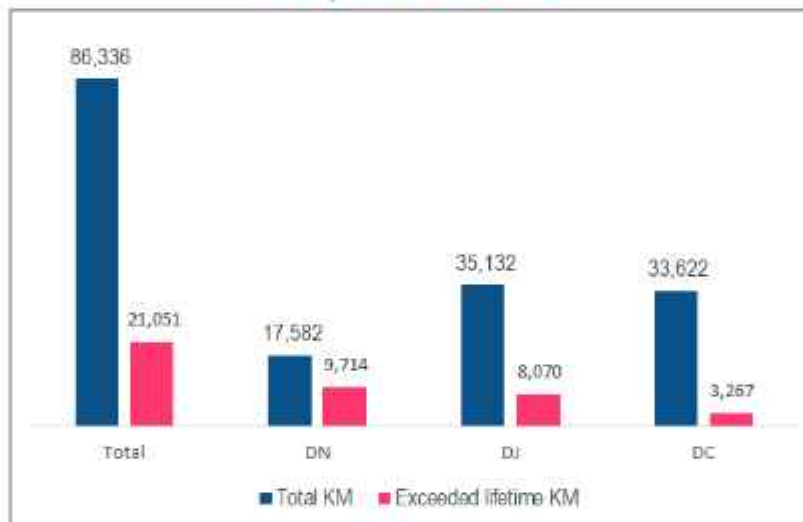
- **The DN Roads** (DN – Drum National/National Road)
  - specifically: highways, express ways, national European roads, primary national roads and secondary national roads
  - under administration of CNAIR (national company for road infrastructure);
  - central government funding for maintenance.
  - main purpose is to connect the capital city to county capitals, other countries, and key destinations.
- **The DJ Roads** (DJ – Drum Judetean/County Road)
  - administrated by counties;
  - county funding for maintenance;
  - main purpose is to connect the county capital to county cities, and key destinations.
- **The DC Roads** (DC – Drum Comunal/Communal Road)
  - administrated by communes;
  - funded by communes;
  - main purpose is to connect smaller communities with one another.

Figure 1: Administrative distribution of road Infrastructure in Romania, 31<sup>st</sup> Dec 2022



Source: INSSE (National Institute of Statistics)

Figure 2: Total roads vs roads with exceeded lifetime per admin distribution, 31 Dec 2022



Source: INSSE (National Institute of Statistics)

From a road quality standpoint, almost a quarter of the total Romanian road infrastructure has exceeded its service lifetime, which translates into deteriorated road surfaces posing an elevated risk factor to the safety of its users. A deep dive provided in Fig 2 showcases that almost half of these roads are main connectivity arteries (DN), which ultimately is a systemic weakness in the Romanian road infrastructure and economy.

The task to rehabilitate these roads falls on the shoulders of the central administration, a process which hasn't run smoothly over the last 35 years for reasons which will be explained below but first a short history of the road infrastructure company is needed.

2004 saw the birth of CNADNR a company under the tutelage of the ministry of transportation tasked with the administration, maintenance, and development of the Romanian road infrastructure.

Though its legal inception took place in 2004, the company inherited the personnel and equipment dedicated to road maintenance, an identity it kept, even though the primary objective it served was to become the main beneficiary of European funds for building new modern roads (highways and express ways).

Thus commenced a struggle between an inherited operational maintenance identity even showcased by the company structure (based in Bucharest, but with 8 regional administration centres housing most employees and equipment) and a rather more bureaucratic mission of resource management.

Oftentimes after the EU integration CNADNR has shown a low level of administrative capacity with new projects lagging behind in different stages of implementation, due to several reasons which will be addressed in this study.

To address the problem, the government reached the decision to split CNADNR into 2 companies in 2016, namely CNAIR which would maximize its resources specialized on road administration and maintenance and CNIR, a new entity which would be solely responsible for implementing new major infrastructure projects.

Though strategically sound, CNIR has only commenced its operationalization process in 2023 and has yet to take over any of the major projects from CNAIR.

The plan and hope at this point is that the major projects such as A8 and A3, will be taken over by CNIR, while major projects with local impact such as A11 will be taken over by local authorities, allowing CNAIR to focus on the systemic weakness of the already existing road infrastructure that needs immediate attention.

Getting back to Fig 2, the other significant chunk of the road infrastructure which has exceeded its lifetime falls under the administration of the counties, namely the DJs accounting for almost 40% of the total roads which have extended their service lifetime.

Historically, these intermediary authorities have had an unencouraging track record related to infrastructure investments, mainly due to low administrative capacity, corruption and poor access to funding, national available funding programs usually having political implications and EU funds not being accessed or available.

For the 2021 – 2027 programming period this challenge has been addressed with tailored investment programs specific to every region's needs. For the future, the aim would be a higher degree of decentralization so that projects of regional significance will no longer be stuck on a waiting list behind major infrastructure projects.

As this study will show, such a trend has commenced as of late with an entire highway and a transregional road being commenced and implemented at local level.

*Figure 3: DN Distribution*



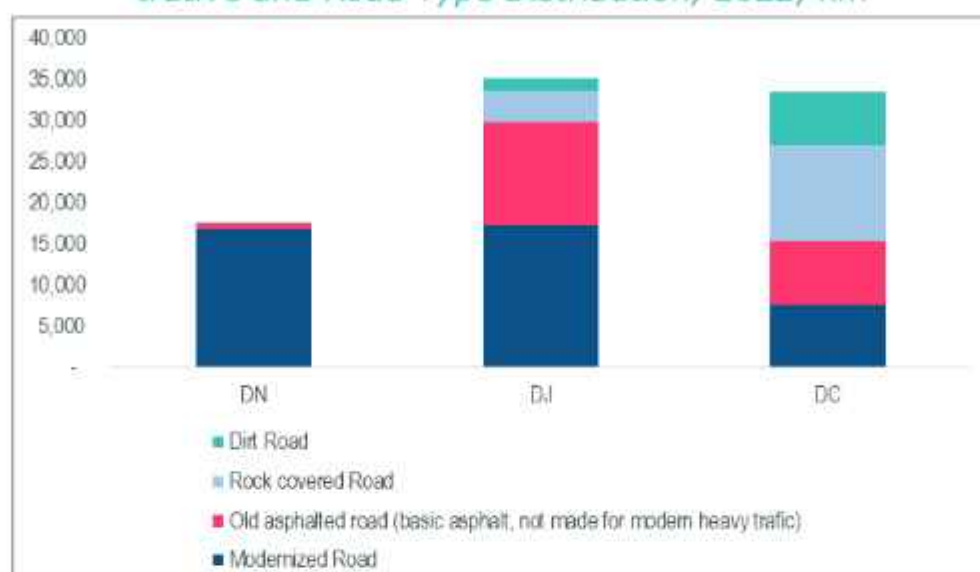
*Source: INSSE (National Institute of Statistics)*

With the Romanian economy almost doubling since the country's accession to the EU in 2007, the need for highspeed road connectivity to key economic centres, product hubs and neighbouring countries is ever-increasing.

This demand has been met sluggishly as can be seen in Fig 3. Currently only 5% of the main country roads are highways or express ways, having none of the main national connectivity corridors finished, but at least according to the national programme documents, things are about to see a significant positive turn.

Even though a decentralization policy has been a topic of debate for many years now, the current administrative model features the division in 41 counties plus Bucharest. This being said, the counties have limited powers and even more limited access to resources, which would make the task of modernizing the key road infrastructure on their own that more difficult.

Figure 4: Romanian Road Network Administrative and Road Type Distribution, 2022, km



Source: INSSE (National Institute of Statistics)

## 2. Review of Strategic National Documents and Plans with Relation to Road Infrastructure and Connectivity

Historically, Romania’s biggest challenge to tackle when talking about infrastructure projects, especially major ones, has been funding, specifically identifying and then securing it. But after a deep dive into the topic, this only seems to be a cause of what is actually a major systemic problem with cross-sectorial ramifications.

Political instability is something which has governed the country’s history ever since the 1989 Revolution. Over the course of the years this factor has materialized into a lack of unity, which, in turn, led to a lack of a national strategy / plan that can govern Romania’s economic development, irrespective of each government’s political orientation.

Empirically, it can be observed that in the course of 34 years, Romania has had 39 different governments, resulting in an average tenure of less than 1 year per prime-minister. The only Government which has served a full tenure (4 years) was the Nastase government between 2000 and 2004, which correlates with some initial continuous investments in major infrastructure projects.

The primary negative effect is that investments were not made based on a long-term development strategy but were driven by short-term political priorities. Given that the average government tenure was extremely short, it was often the case that even if a project ever broke ground, it would shortly

find itself abandoned or underfunded as financial resources would be reallocated to another political priority.

This symptom has manifested throughout Romania's recent democratic history, albeit in a more faded manner in the past 4 years. Instrumental to the change were the accession to the EU and, consequently, the appearance of the first national strategic documents, namely:

- The Romanian National Transportation Masterplan (MPGT, 2015)
- The Investment Plan for the Development of the Transportation Infrastructure 2021 – 2030 (2020)

### **2.1. MPGT (The Romanian National Transportation Masterplan, 2015)**

The Romanian National Transportation Master Plan is the first programmatic multi-annual strategy document in the transportation infrastructure sector, outside of a party-led government program, which brings forth quintessential development projects in each transportation segment, namely:

- Road Transportation
- Railway
- Naval
- Airway
- Multimodal Transportation.

The document presents Romania's development strategy keeping in mind an implementation time horizon spanning to the year 2040, with modelled data valid up until 2030. The plan only includes large scale interventions, leaving any type of maintenance projects or small-scale local interventions out of the scope of play and is also meant to provide an initial harmonization with EU legislation, infrastructure related prioritizations and standards.

The selection of projects is based on their membership to the TEN-T networks, be they core or comprehensive, prioritizing cross-regional connectivity (uniting all of Romania's historic regions through high-speed roads and railways), namely:

- Muntenia – South
- Oltenia – Southwest
- Dobrogea – Southeast
- Moldova – East
- Ardela – Center and West.



The masterplan was built on a two-step methodological approach.

The initial phase featured a prospective list of all projects which have been proposed throughout the years as a solution for Romania's cross-regional unification, building up a project pool which was then filtered in the second phase using multiple prioritization keys. These decided whether a project is featured in the masterplan and if it was, then it also allocated a spot on the strategical time horizon.

Specifically, the second stage filters were:

- The project's maturity (idea – feasibility study – environmental approval – technical project – implementation);
- Whether it coincided with the EU's sectorial prioritization (TEN-T Network);
- Source of funding (this ties to the prior point, seeing as the document prioritizes projects which are eligible for EU funding);
- Economic feasibility/performance of the investment.

One of the main results of this strategy was a map outlining the main major central connections on the East-West nexus as well as on the North-South one as depicted in the fig 4, where the central routes are highways or express roads part of the TEN-T network, either core (yellow) or comprehensive (purple)

Figure 4: Central Road Infrastructure MPGT<sup>513</sup>



<sup>513</sup> <https://support-mpgt.ro/harta-proiectelor-din-mpgt/>



to evolve through offering said project a bigger chance of completion and a minimum sustainability standard through the idea – feasibility study – environmental approval – technical project – implementation approach.

Still, this only served as a theoretical framework, the practical experience showcasing vulnerabilities along the procedural chain which translated time and again in significant delays and poor quality of work.

### **2.2. The Investment Plan for the Development of the Transportation Infrastructure 2021 – 2030 (2020)**

Published towards the end of 2020, the investment plan comes as an update to the MPGT, reiterating the importance of cross-regional connectivity and actually arguing for a more balanced transportation infrastructure development, since the current network was disproportionately developed, seeing regions as Ardeal and Muntenia boasting most of the operational highways, electrified and highspeed railways compared to regions such as Moldova and Oltenia with close to 0 km of modern highspeed infrastructure. Furthermore, the investment plan also places a bigger emphasis on sustainability, making it one of the key filters for project prioritization.

Moreover, the strategy tries to also update the total development costs for each transportation mode and observes that the main weakness since the MPGT was published was that the implementation of the projects has not respected a clear prioritization, which is why the national road infrastructure, for instance, ended up with short highway segments which are not connected to one another and cannot thus capitalize on a network benefit.

Finally, the investment plan also acknowledges the need for a dual-purpose infrastructure which ties into regional and continental geopolitical and economic ramifications.

In this regard the investment plan has come up with a clear multi-criterial prioritization methodology which it has applied on all infrastructure categories outlining the desired order in which projects need to be implemented in order to reap the most benefits:

1. Economic Efficiency – 35%
2. Strategic Connectivity – 25%
3. Carbon Emissions Reduction – 20%
4. Dual purpose infrastructure – 15% (civilian & military use)
5. Project Maturity – 5%.

The resulting prioritization is depicted in the table below.

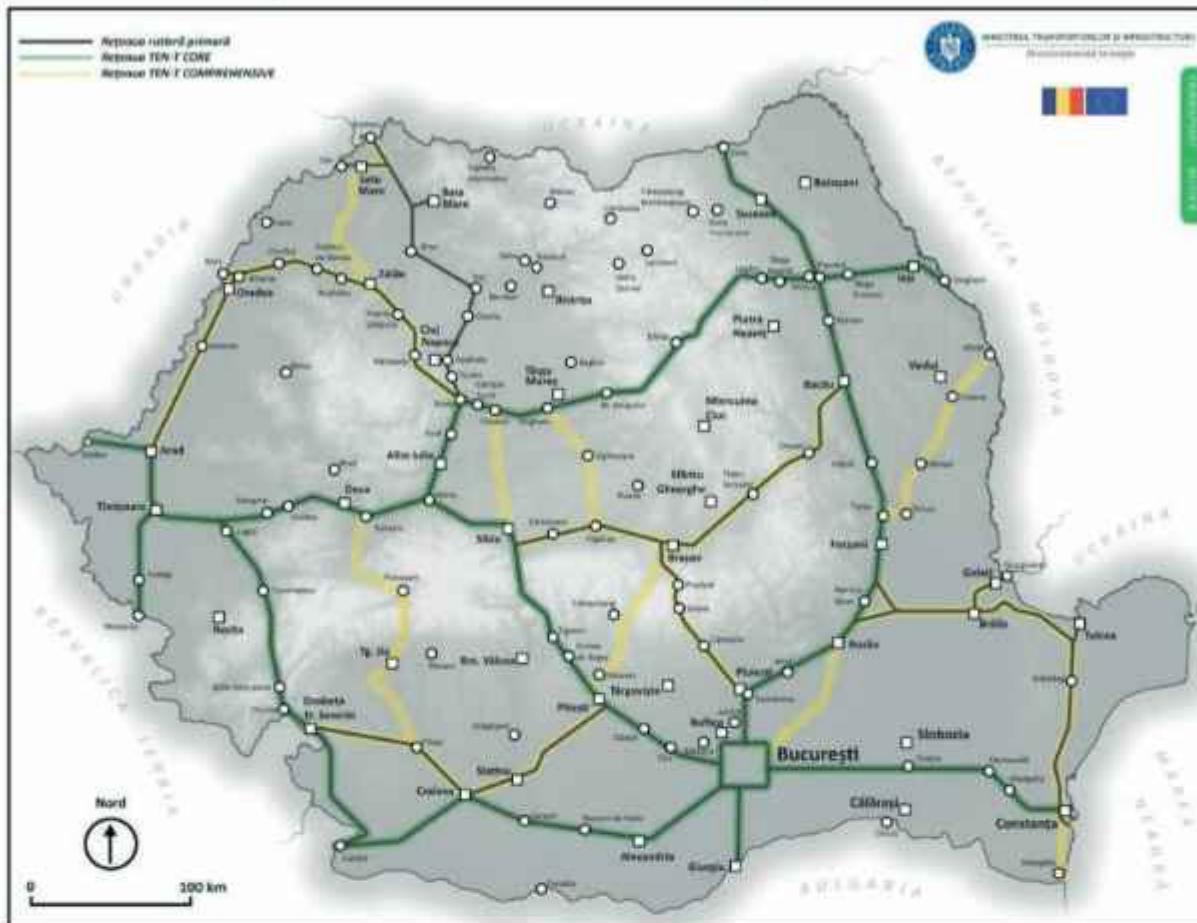
*Table 1: Infrastructure Projects Prioritization Outcome*

Nr. Crt.	Proiect	Tip proiect	Denumire proiect	Indicativ	Lungime (km)	Cost estimat (mil.EUR fără TVA)	Punctaj
1	Pitești - Sibiu (L2, L3)	A	Autostrada Transcarpați	A1	68.8	1847.0	100.00
2	Ploiești - Comarnic	A	Autostrada alpinei	A3	48.6	306.8	84.01
3	Comarnic - Brașov	A	Autostrada alpinei	A3	50.1	1264.9	82.52
4	Poarta Sătejuului - Biharia	A	Autostrada Transilvania	A3	110.0	1057.0	80.48
5	Giurgiu - București	DX	Drumul Siretului	DX7	55.2	289.8	79.72
6	Sibiu - Brașov	A	Autostrada Transilvania	A3	129.0	1479.9	77.05
7	Arad - Oradea	DX	Drumul Colariilor	DX11	134.0	922.6	76.43
8	Autostrada A7 (ramura Burdu și ramura Focșani) - Brăila	DX	Muntele Expres	DX3	102.1	464.0	71.89
9	București - Alexandria	DX	Danubius Expres	DX6	70.0	367.5	71.08
10	Alexandria - Craiova	DX	Danubius Expres	DX6	125.0	656.3	71.08
11	Inel București (Nord) + drumuri radiale	A	Orbita București (N)	A0	145.7	1112.3	70.18
12	Tg. Neamț - Iasi - Lingheni (Mătra - Uigheni)	A	Autostrada Montana	A8	100.0	875.5	66.89
13	Bypass Brașov Nord	A	Bypass Brașov Nord	A13	19.7	118.2	65.89
14	Brașov - Bacău	A	Autostrada Moldava	A12	159.9	2364.0	65.89
15	Pajzani - Suceava	A	Drumul Siretului	A7	60.5	423.8	65.60
16	Suceava - Siret	DX	Drumul Siretului	DX7	41.0	215.0	65.60
17	Tg. Mureș - Tg. Neamț (Miercurea Nirajului - Leghin)	A	Autostrada Montana	A8	151.9	5180.4	64.12
18	Craiova - Filiași - Dr.Tr.Severin	DX	Danubius Expres	DX6	104.0	700.5	60.50
19	Craiova - Calafat	DX	Tracia Expres	DX2	78.7	306.9	60.50
20	Dr.Tr.Severin - Cărmăneș - Lugoj	DX	Danubius Expres	DX6	142.0	1533.0	60.29
21	Dr.Tr.Severin - Calafat	DX	Tracia Expres	DX1	72.8	283.9	60.29
22	Timișoara - Mărința	DX	Autostrada Banat	A9	88.1	343.6	54.05
23	Macin - Tulcea - Constanța	DX	Dobrogea Expres	DX8	187.7	904.0	53.57
24	Bala Mare - Satu Mare	DX	Drumul Someșului	DX5	55.0	259.0	51.84
25	Cluj Napoca (Apoahida) - Dej	DX	Drumul Someșului	DX6	75.0	450.0	51.84
26	Dej - Bala Mare - Halmeu	DX	Drumul Someșului	DX7	95.3	608.9	51.84
	Total drumuri de mare viteză				2477.5	23934.8	

*Source: Investment Plan 2021 – 2030*

Some time has passed since the inception and adoption of the document and a preliminary conclusion is that it has solved the prioritization issue, but it doesn't bind ministers to follow said prioritization, as shall be elaborated in the next segments of this analysis.

Figure 6: Romania's Road Transport Network



Source: Investment Plan 2021 – 2030

### 3. Focus on Cross-Border Connectivity and Bottlenecks

Geographically, Romania borders 5 neighbouring countries, specifically:

- Bulgaria (entire south border) – mostly split by the Danube but with a land border towards the south-eastern part;
- Serbia (south-west) – land border;
- Hungary (west border) – land border;
- Ukraine (entire northern border) – land border;
- Republic of Moldova – (eastern border) – entirely split by the Prut river.

Currently, the only highspeed road connections are with Hungary at Nadlac (A1) and Bors (A3), respectively. New ambitious projects are expected to add at least 4 more highspeed road connections with Romania's neighbours by 2030, improving overall cross-border connectivity.

According to the border police report, 58.6 mil people travelled to and from Romania in 2022 alone, indicating a year-on-year growth of 62% compared to 2021. 32,7% was attributed to air travel, while a quarter of total border crossings occurred at the western border with Hungary. 15.5 mil vehicles crossed the border in 2022, signalling a 30,2% YoY growth, out of which almost a half (42,3%) were crossings to and from Hungary.

While some of the growth can be attributed to a situational recovery from the pandemic period, it also signals a strong cross-border transit, where the current infrastructure is showing its limitations. For instance, Nădlac and Ruse are most of the times showcasing hour-long cues, as well as the Albița border towards Moldova and the Siret one towards Ukraine.

This is why the government has taken measures to modernize our current cross-boarder connections and also build new ones. The next subchapters present the most important ongoing projects.

### **3.1. Timisoara Moravita (A9)**

As a result of multiple bilateral negotiations and a prioritization based on current regional defence strategies Romania will build a highspeed connection to Serbia through the new A9 highway, a project spanning 73 km starting from A1 (in the vicinity of Timisoara) and stretching towards the Moravita border with Serbia, which will then continue as a highspeed road to Belgrade.

The project is currently in the feasibility study stage, which according to the latest contract extension (12<sup>th</sup> one) is expected to be finished by October 2024, allowing for a construction public tender procedure sometime in late 2024.

The project is highly delayed having been started in March 2020, the feasibility study has currently taken more time than what is allocated as an execution period for the most complex mountain highway segment, namely 53 months for the study vs 50 months for the construction of the mountain highway.

The funding for the construction project will most likely be EU funding through POT 2021-2027 alongside national funds, seeing as the project was refused for funding through the CEF (Connecting Europe Facility) Fund.

The new highway will most likely be dual-purpose, becoming the first full highspeed connection with the Balkan region, helping spur on economic relations, whilst simultaneously facilitating military mobility through the region.

### **3.2. Salonta (Part of A11)**

Part of the new A11 highway, a new border crossing point will be set up near

Salonta, which once complete would become the 3<sup>rd</sup> highspeed connection with Hungary, after Nădlac (A1) and Borş (A3).

The crossing point is designed as a 10 km long express road with 2 lanes for each side stemming from A11 in the vicinity of Salonta and connecting to the Hungarian infrastructure which will also be modernized in the new future in order to accommodate the traffic volumes steered by the Romanian investment. Based on the current timeline which is elaborated in the next chapter, the expectation is to have the new border crossing operational sometime in 2027.

### 3.3. Siret (Part of A7)

As a part of A7, a new highspeed road to the border with Ukraine is expected to be built until 2027, with an expressway stemming out of Suceava until Siret. This route has now received intensive attention ever since the start of the Ukraine-Russia conflict and is expected to serve a dual purpose.

Alongside the defensive military role, the connection, part of A7, is expected to become the primary pathway that connects Ukraine to Southern Europe and the Eurasian region via land. The project is currently in the feasibility study phase, which will also offer a technical project upon completion, leaving only the construction to be tendered in the following procedure.

However, the current study faces massive delays, seeing as the current contract was signed in Oct 2020, with an initial due date in Oct 2022, currently expected to be finished at the end of December 2024, according to the 17<sup>th</sup> contract amendment.

Public statements made by the minister for Transportation announced that the tender for construction should be launched sometime in 2024, but given the actual progress this scenario rather seems unlikely.

### 3.4. Prut Ungheni (part of A8)

Part of the A8 highway, a new bridge is to be built at Ungheni between Romania and the Republic of Moldova. This will be the first high-speed road connection between the two countries, and it will also become Republic of Moldova's primary gateway to a highspeed road connection to Western Europe once A8 and A3 are finished.

Currently, the public tendering procedure for construction has been launched, with non-reimbursable EU financing ensured through the military mobility program, „CEF-T-2022-MILMOB – CEF 2 Transport – Adaptation of the TEN-T road network to dual civil-defence use, at a cost of some 17 mil EUR.

The bridge stems for some 260 meters from one end of the Prut River to

the other, features 2 lanes per side and sidewalks. Furthermore, the project encompasses 1 km of connection roads and a new border crossing.

With a tendering procedure for technical project and construction launched in August 2023, the bridge's operationalisation date is still uncertain, 3 offers having been submitted only 6 months later, because the procedure was halted for a longer period of time in order for the authority to address clarification requests.

The budgeted time consists of 6 months for the technical project and 18 for the actual construction. But until we get to that point, the offers first need to be evaluated and then the contract needs to be signed which historically has been an arduous process, given that constructors usually appeal the evaluation results. Often the appeal needs to be reviewed by 2 separate courts, since participants appeal the first court's decision.

All of this translates into some extra months of waiting, the worst-case scenario being that the appeal is finally successful and the evaluation process needs to be redone.

Current estimates point towards an inauguration in late 2027, should the procedure run smoothly.

### **3.5. Albita Leuseni and the Rep Moldova connectivity package**

Currently the primary border crossing between Romania and Moldova is at Albita, where the government is planning to modernize the current bridge and expand the road capacity from a 2-lane bridge to a 4-lane one. This comes as a part of a bigger project to construct a new express road stemming from the future A7 highway, near Focsani and stretching until the aforementioned Albita.

The express road is currently in a feasibility study phase, which is expected to be completed in Q3 2024, after almost a year of contract suspension, due to increased costs which needed to be covered by the government.

The new bridge at Albița should cost some 35 mil EUR, half of which CNAIR would like to cover through the military mobility program, „CEF-T-2022-MILMOB – CEF 2 Transport – Adaptation of the TEN-T road network to dual civil-defence use.

Additionally, the Romanian authorities have already signed memorandums of understanding with the Moldavian government, featuring the modernization of 2 additional bridges at Sculeni and Oancea, the later having been built around 1964 and currently in need of a revamp, which will also enable them to serve a military purpose.

Finally, the Romanian government aims to build more road connections to the



Republic of Moldova through 4 new bridges. In this sense a public tender for a feasibility study assessing the costs of this investment has been launched in Feb 2023, but got cancelled in Oct 2023, initially for only 3 bridges.

Currently a new tender has been launched with a deadline of offer submission on the 29<sup>th</sup> of February, this time for 4 bridges, namely:

- Stâncă (RO) – Costești (MD)
- Bumbăta – Leova
- Fălciu – Bumbăta
- Răducăneni – Barboieni

### **3.6. Giurgiu - Ruse (The Friendship Bridge)**

The friendship bridge is the most used crossing point on the southern border, facilitating road connectivity through a 2-lane bridge over the Danube river.

The current traffic largely exceeds the bridge's transit capacity, which is why bilateral negotiations have been opened to build a second Giurgiu-Ruse bridge. This initiative gained traction at EU level as well, with transport commissioner Adina Valean explaining at the beginning of October 2023 that the commission is looking into funding the project through the Connecting Europe Facility program.

In late January 2024, the EU Commission has confirmed that it will offer 7 mil EUR in funding for the feasibility study and technical project of this investment, with Ms. Valean criticising the Romanian government for not including a rail connection as well in the project.

In the meantime, ferry crossing has been reopened in order to ease the pressure on the bridge. This connectivity initiative would become a key part of Romania's OC2 corridor, which this study will develop on in the next chapter, offering North-South highspeed road corridor.

### **3.7. Vidin - Calafat (New Europe Bridge)**

Although the Friendship Bridge at Giurgiu Ruse is the primary border crossing between Romania and Bulgaria in terms of traffic volume, the Vidin Calafat bridge or the New Europe Bridge is the only highspeed 4-lane connection between the two countries.

Opened in June 2013, the bridge had a total cost of some 240 mil EUR, of which Romania had to finance some 67 mil EUR and Bulgaria the rest. For the Romanian side half of the cost was covered by the EU, while the rest was covered by the Romanian government.

While the bridge also features a railway crossing, the results are far off its expectations, seeing as both Vidin and Calafat are 2 declining cities. The road transit volumes have not seen significant increases, while the train transit only features two trains crossings per day compared to the projected 30 trains by 2030.

The reality is that the investment has gone down as a bilateral flop, but mostly because of the lagging adjacent investments, with infrastructure leading to the bridge on both sides of the Danube being a far cry from what it should have been.

On the Romanian side there is no highway in the entire region that would encourage both freight transporters and usual drivers to choose this crossing. Nonetheless, the situation is expected to change once the A6 highway connecting Bucharest to Craiova, Calafat and Lugoj will be implemented.

### 3.8. Oar

A new highspeed express road will be built that will also feature a border crossing with Hungary in the vicinity of Satu Mare (the north-western part of Romania). This decision comes as the current crossing using a 2-lane national road has exceeded current traffic volumes and will also offer an equivalent connection to a new highway constructed by Hungary which leads to Romania through Oar.

The new border will be set up as a part of the Satu Mare – Oar express road, which will stretch 15 km from the border to Satu Mare, where it will connect to the city's new 4-lane express road bypass.

Currently, the Oar Express Road, dubbed Someş Express has had its construction tender launched with an estimated cost of 800 mil RON, to be financed through the POT 2021-2027 program and from the state budget. The offers are expected to be submitted by the 14<sup>th</sup> of March.

### 3.9. Ukraine Connectivity package

Mureş county is currently building a new bridge over the Tisa River near Tepliţa, worth some 116 mil RON. The investment is a partnership between the county and CNAIR which has obtained EU Funding through POIM.

The project also features a new border crossing at the end of the almost 300 m long bridge, both objectives expected to be finished by the end of 2024.

As part of an agreement with the Ukrainian government signed in 2023, Romania will build a new bridge over the Danube at Isaccea as well, in order to modernize the current crossing done by boat.

### 3.10. The Techirghiol Alternative (Part of A4)

As a southern continuation of A4, the new highway dubbed the Techirghiol alternative will cost some 5.7 bn RON and is expected to massively improve road traffic on the Romanian touristic seaside, where the current infrastructure caves every holiday season in front of the transit it's supposed to accommodate.

After the feasibility study and technical project were finalized near the end of 2023, the Romanian government approved technical economic indicators for the 30 km long highway which will stretch from Agigea all the way to 23 August.

The project is expected to be funded through state funds and the POT 2021-2027.

Aside from a commercial interest to make the Romanian seaside destinations more attractive through highspeed road connectivity, which will save tourists from hour long ques on the current 20 km stretch between Agigea and 23 August, the A4 also serves a more strategic regional purpose.

In a recent interview, the Romanian Transportation Minister explained that the project will also feature a 2<sup>nd</sup> stage requested by NATO, which will see the new highway span to the Bulgarian border where it will connect to a new Bulgarian and Greek highway with the final destination being the Alexandroupolis harbor, one of quintessential strategic importance for the alliance. This being said, we have yet to receive a clear timeline for the implementation of the 2<sup>nd</sup> stage.

## 4. Major Road Infrastructure Projects

### 4.1. Romania's Current Highspeed Infrastructure and General Connectivity Routes

Currently, the Romanian national highspeed road network is comprised out of 1 074 km of highways and express roads.

As depicted in Table 2, except for the A2 Highway, spanning from Bucharest to Constanta and covering some 200 km and for the A10 highway from Sebes to Turda, covering 70 km, none of the other national highways have been finalized.

There are currently some 777 km of highspeed roads under construction with plans of contracting even more km in the next following years, the national ambition being to have all of Romania's historical regions connected with one another by the end of 2030.

Given the sluggish project development history, this is an ambitious target, especially seeing as the country would need to double the size of the actual

road network in the span of 6 years. An ambitious endeavour, to say the least, considering it took close to 50 years to reach its current size.

As explained in the previous chapter there are key corridors which are prioritized in order to provide much needed East-to-West and North-to-South connections, which shall be explored below.

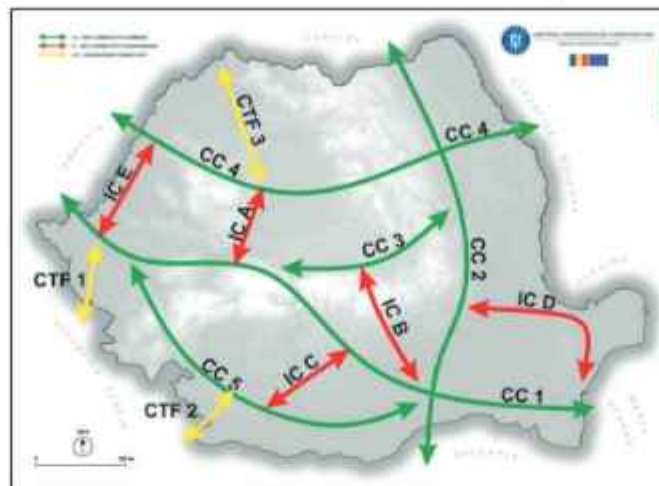
*Table 2: Current development status of national highways system, 2023 <sup>515</sup>*

HIGHWAY	KEY PLACES	STAGE	KM OPEN	KM UNDER CONSTRUCTION
<b>A0 - Centura Bucuresti</b>	Centura Bucuresti		18,2	82,5
<a href="#">A1 - Bucuresti - Nadlac</a>	Bucuresti - Nadlac		456,4	122,1
<a href="#">A2 - Autostrada Soarelui</a>	Buc. - Constanta		202,8	0,0
<a href="#">A3 - Aut. Transilvania</a>	Bucuresti - Bors		203,4	69,7
<a href="#">A4 - By-Pass Constanta</a>	Ovidiu - Agigea		21,8	0,0
<a href="#">A6 - Lugoj - Calafat</a>	Lugoj - Calafat		10,5	0,0
<a href="#">A7 - Ploiesti - Siret</a>	Ploiesti - Siret		16,3	319
<a href="#">A8 - Autostrada Unirii</a>	Tg.Mures - Ungheni		0,0	29,9
<a href="#">A10 - Sebes - Turda</a>	Sebes - Turda		70,0	0,0
<a href="#">A11 - Arad - Oradea</a>	Arad - Oradea		3,5	19,0
<a href="#">A13 - Sibiu - Bacau</a>	Sibiu - Bacau		0,0	68
<a href="#">Drum Expres DEx4</a>	Turda - Dej		0,0	4,96
<a href="#">Drum Expres DEx6</a>	Braila - Galati		0,0	12,3
<a href="#">Drum Expres DEx12</a>	Craiova - Pitesti		71,7	49,7
<b>TOTAL</b>			<b>1.074,6</b>	<b>777,2</b>

*Note: Green - in exploitation; Yellow - under construction; Black - planned*

<sup>515</sup> <https://www.130km.ro/autostrazi.html>

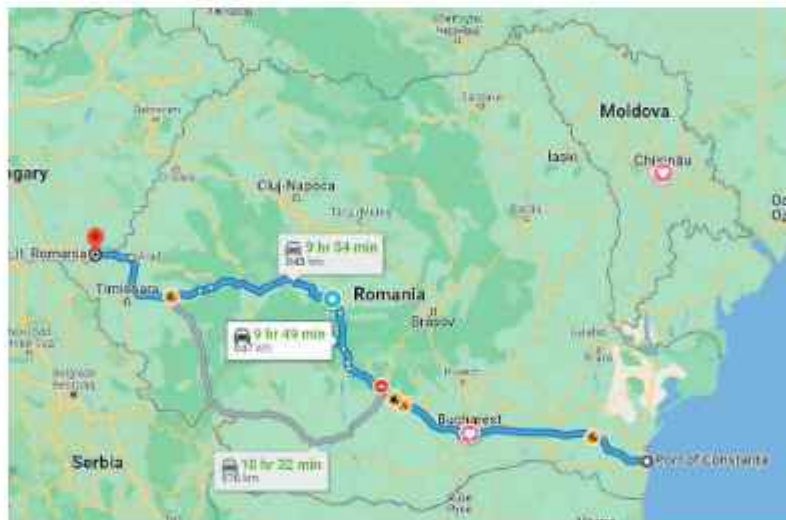
Figure 7: Romania's Main Connectivity Priorities



Source: Investment Plan 2021 – 2030

The key corridors for which Romania's road infrastructure development projects plan to offer a connection are illustrated in the figure above, with their priority being outlined from 1 to 4 and will be developed further in this chapter.

Figure 8: Constanța – Nădlac Corridor  
(A4 – 21.78 km, A2 – 202.8 km, A0 – 101 km, A1 – 578.5 km) – OC1



Source: Google Maps

This corridor is a national priority since it provides the direct connection between the country's main economic hubs and Western Europe, namely Constanța harbour, Bucharest and Nădlac, one of the busiest border crossing points.

Spanning some 900 km (including both sides of Bucharest's new ring road), this piece of infrastructure is the result of 2 programming periods' worth of investment, with some 700 km already in use and some 200 km still under construction, namely most of A0 Bucharest's full-circle ring road (80 km,

20km already being in use), Sibiu Pitesti (106 km) and 14 km between Margina and Holdea (near Deva).

Sibiu Pitesti is a milestone target for the country since early-stage project development has started over 10 years ago, but the project has been stuck for quite some time in bureaucratic proceedings, because of incomplete feasibility studies and difficulties in obtaining an environmental approval, since the highway passes several natural protected areas.

This would be the first highway crossing mountains and the first highspeed road connecting Transcarpathian regions, which would bring a significant reduction in travelling time and which is expected to bolster the national economy since it's the most used road for product transportation.

The project is split in 5 sections, with section 1, 14km long, close to Sibiu already finished in 2022 and sections 4 and 5 (40 km) already underway. Section 5, is estimated to be finished by 2024 (30km), while section 4 (9.6 km) is expected to be finished by 2026, featuring the first highway tunnel in Romania.

Furthermore, the A0 project features 2 connected 50km long semi-circles around Southern and Northern Bucharest. This project is quintessential for the Romanian infrastructure not only providing a fast road connection around Bucharest for freight transports on the Constanta – Nadlac corridor, but it will ultimately become the biggest road connection hub in the country bringing together some 6 high speed roads once the Investment Plan 2021 – 2030 is fully executed.

This project is another example of long implementation periods, blocked by bureaucratic burdens and constructor problems, but after more than 6 years of implementation a 10 km stretch of the southern ring road was inaugurated in December 2023 as well as a 10 km stretch on the northern semi-circle.

Expectations are that the entire southern part will hopefully see its full inauguration by the end of 2024, while the northern one will probably have to wait until the end of 2025, the earliest.

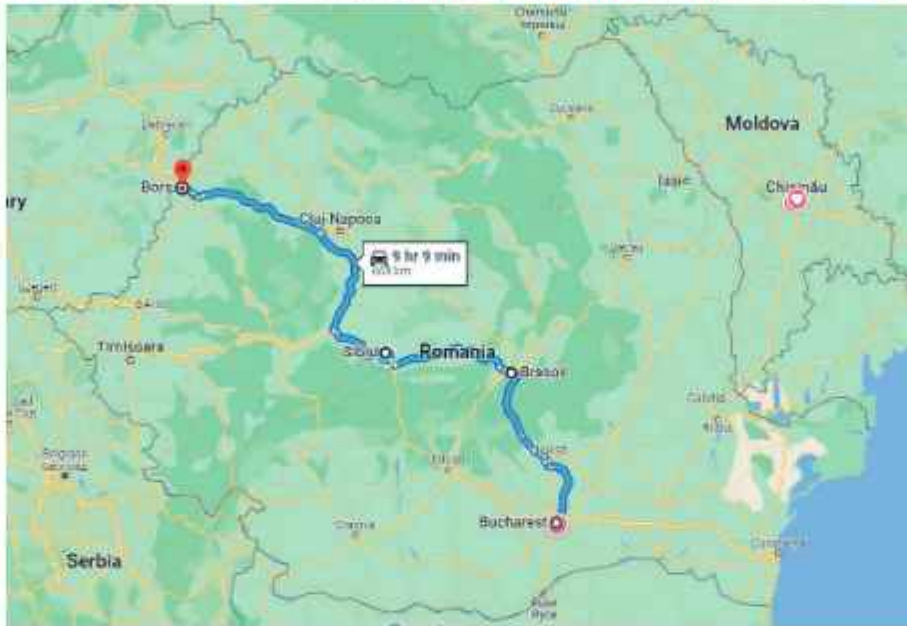
The final missing piece of the central East West corridor represents a 14 km gap between Margina and Holdea in the centre of the country which has been the subject of heated debates and endless bureaucratic burdens since the area crosses a protected natural site.

In order to be financed with EU funds, the initial project had to be revised and had to be granted new environmental approvals, changing the initial design to feature 3 cut and cover tunnels which will serve as animal crossing points.

After some 13 years of struggle, this segment's saga has come to an end, with the sector being funded through Romania's National Recovery and Re-

silience Plan (herein after PNRR) and having a serious local constructor determined to finish it by 2026.

*Figure 9: Bucuresti – Bors (A3 – 440 km, A10 – 70 km)  
– Part TEN – T Interconnectivity Comprehensive and OC3*



*Source: Google Maps*

A3 is probably the most popular highway in Romania's public dialogue scene, since it features the connection between Bucharest and Brasov, a journey that could span up to 8 hours on the existing road infrastructure for a distance of only 185 km.

From a logistical standpoint, it is one of the key national routes since it features a crucial Carpathian crossing which connects Bucharest and the wider Southern region to Brasov, Sibiu, Cluj and Targu Mures. Not only is this route important for freight transportation, but it also passes through some of Romania's most popular mountainside vacation destinations.

Seeing as the current road capacity is 4 lanes between Bucharest and the mountainside and 2 lanes from thereon out, it is prone to tragic incidents whenever the holiday season starts, spanning for the hour-long queues, to deadly car crashes.

Currently, the connection between Bucharest and Ploiesti is secured through the first stage of the A3 highway, a 60 km stretch which also features Romania's only 6 lane road, but from thereon out, the highway is only resumed for some 78 km between Cluj and Turda in the northern part of the country. While an additional highway border crossing point was opened in 2021 be-

tween Romania and Hungary at Bors II, that segment only features 4 km, which were expedited in order to provide the Hungarian new piece of infrastructure with an exit point in the Romanian road network.

The most crucial segment between Ploiesti and Brasov has been probably the most debated piece of transportation infrastructure in the country, being the subject of multiple political campaigns and national controversies as well as substantial media coverage of the events.

The reality is that the segment requires a big investment in order to be finalized which local authorities have tried to pass onto the private sector on 3 different occasions through public-private partnerships but have ultimately failed every time to close a deal, mostly because of the poor feasibility documentation and unsatisfactory prospects for generated toll revenues. This forced partners to either back out of the deal or to bid extremely high construction costs.

Finally, in order to secure EU funding for the project a new feasibility study has been contracted for this segment in 2021, but progress has been sluggish and after 2 full years of implementation it is still not even close to being over, several debates having been sparked by the costs of the project, since a full-highway project with designed speed of 130 km would require several tunnels and bridge crossings would bring the total costs to about 8 billion EUR.

A compromise has been reached between the consultant and the government to reduce the speed on some mountain segments to 80 km/h in order to bring down costs, but this still leaves the project at an estimated 4 bn EUR price tag.

The project has secured initial funding through the 2021 2027 EU POT program, but an actual precise delivery timeframe has not yet been forwarded. Even though the project is ranked one of the highest priority in the Investment Plan 2021 – 2030, the Romanian authorities are showing no signs that they will try to accelerate the implementation, showing once more that strategic documents don't actually dictate public policy.

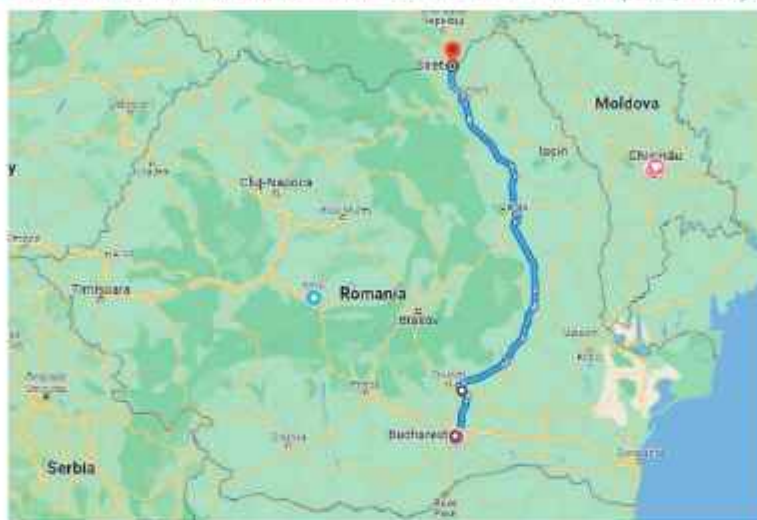
The segment between Cluj and Bors is partially under construction with 48 km expected to be finished by 2026, financed through PNRR, while another segment of 50 km is in a tender procedure, with little chances to be finished by 2027, seeing as this is the 4<sup>th</sup> tender for the project, the other 3 having ultimately been cancelled due to poor feasibility documentation provided by CNAIR.

There is one final segment between Turda and Targu Mures spanning some 80 km, which was fully completed by the end of 2023 in record time, the transition between Brasov and Turda being ensured by A10 (70 km between



Sebes and Turda), A1 from Turda to Sibiu and A13, from Sibiu to Brasov which is currently under construction.

*Figure 10: Bucuresti Pascani Suceava Siret (A3, A7) – OC2*



*Source: Google Maps*

This is the primary North-South connection, also a part of the Three Seas Initiative (3SI) and other military-economical agreements, ensured by A3 until Dumbrava (40 km) and A7 437 km. A7 is a very recently developed project between Dumbrava and Pascani which is entirely funded through PNRR.

In many ways, this particular project is pioneering major infrastructure projects in Romania, since it is the first highway being simultaneously built from one end to another. Furthermore, it is the first green highway, meaning that all service spaces will feature charging stations for electrical vehicles and additionally, a 700-hectare long forest curtain will be planted alongside the road in order to help combat emissions and protect the roadside from bad weather such as strong winds or rain/snowstorms.

Being funded through PNRR, A7 is an ambitious project since all construction contracts needed to be signed by the end of 2023, at least half of the project needs to be finalized by 2024 and the entire project needs to be operational by 2026 in order not to lose the funding.

Currently the project is split into 13 sectors, all of which have construction contracts signed and have also broken ground.

Accounting for the finalization of A0 and of a new express road connecting Bucharest to Giurgiu, this corridor will ensure the connectivity between Ukraine, Southern Europe (including Bulgaria, Türkiye and Greece) and Eurasia.

Moreover, the national significance of this project is major since it will represent the first highway that connects Moldova to another historic region of

## Romania

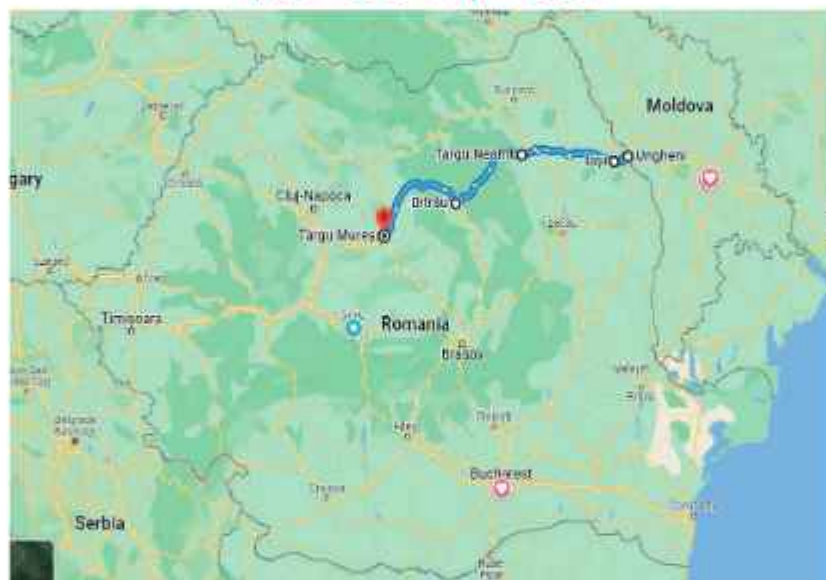
Romania, providing a safer alternative to the existing E85 road, one of the deadliest in Europe.

The segments between Pascani and Suceava and between Suceava and Siret are still in a design phase with public tenders most likely to be launched sometime in early 2025.

Finally, A7 will intersect with 2 major highways, namely A3 in the south at Dumbrava and A8 in the North-East close to Pascani.

Regarding the new express road from Bucharest to Giurgiu, it is featured in the Investment Plan 2021-2030, but no clear timeline for the project implementation has been announced.

*Figure 11: Ungheni – Iasi – Targu Neamt – Ditrau – Targu Mures (A8 – 310 KM) – OC4*



*Source: [Google Maps](#)*

A8 represents the second most important piece of East-West connectivity in Romania. Located more towards the northern area of the country, A8 will not only link Moldova to Transylvania through a Carpathian highspeed crossing but it will also provide a direct highspeed road connection to Western Europe for the Republic of Moldova.

This project has started a while ago and as most older projects it has faced multiple bureaucratic challenges, stemming from outdated feasibility studies which prompted entrepreneurs to bid high construction costs. Furthermore, the project crosses multiple natural protected areas and in order to receive EU funding the technical solutions needed drastic changes in order to receive the environmental approval.

Currently, the project is split into 5 segments: 2 of them are short stretches

of some 35 km each, one from Targu Mures spanning eastbound (segment 1) and the other from Targu Neamt westbound (segment 3). These initial segments have received funding from PNRR and are expected to be finished by 2026, one already having a signed construction agreement and the other pending the contract's signing. It has missed the initial end of 2023 target due to an appeal of the evaluation procedure, but it seems that the contract will be finally signed in mid-February.

The 2<sup>nd</sup> segment is the most complex one and will most likely become the most expensive highway project in Romania since it is a 160 km stretch through the mountains which will probably feature some 47 tunnels and 255 bridges, according to the newly revised feasibility study. The public auction for the construction of the project is expected to be launched early 2024, with an estimated initial cost of some 6 billion EUR.

The 4<sup>th</sup> segment stretches on a 93 km length from Targu Neamt to Ungheni (Romanian border with Republic of Moldova) and is also expected to serve as a pseudo-ring-road for Iasi, Moldova region's largest urban centre.

The feasibility study and technical project are currently entering the final stages and are expected to be finished by April 2024, at which point a public tender for construction can be launched. The project is expected to be finished by 2027 at a cost of some 3.5 bn EUR, to be financed out of the state budget and the POT 2021-2027.

The final segment of A8 is a bridge which will cross the Prut River and will ultimately provide a highspeed road border with the Republic of Moldova which has already been elaborated in the previous chapter.

A8's history began in its current format in 2011 and some 12 years later it seems likely that it has been set on a clear path to see the light of day.

The project is unique in Romania from this standpoint since it has been put on the public agenda by several local Moldavian civil society-led NGOs fighting for civilized highspeed and safe road infrastructure in Moldova.

Their efforts culminated with a law passed by parliament obliging each government to allocate a yearly budget for the project.

Although rather symbolic, the measure alongside public pressure materialized finally into a project which was mature enough to receive funding from the EU through both PNRR and POT and will most likely be finalized entirely this decade, promising Moldova a fresh economic growth opportunity through a direct highspeed connection to Western Romania and to Western Europe.

Figure 12: Bacau - Brasov - Sibiu (A13 - CC3)



Source: [Google Maps](#)

CC3 is an indirect connection between CC4 and CC1, stemming from Bacau to Brasov and then Sibiu, where it connects to A1. CC3 is entirely comprised of the A13 highway, which will be some 300 km long.

Currently the project is split in three parts, namely:

- Sibiu – Fagaras;
- Fagaras – Brasov;
- Brasov – Bacau.

Sibiu – Fagaras is a 70 km long highway split in four segments. The project already has a feasibility study and an environmental approval, which enabled the National Company for Road Infrastructure Administration (CNAIR) to launch the public tender for construction, presently all four having signed contracts with the same company, who is in the technical project phase of the contract.

At an approximate cost of 1.3 bn EUR, the financing is secured through the Operational Program for Transportation 2021 – 2027 (POT) and from the state budget. The contracts budget 12 months for the technical project and 36 months for the construction, so this segment should be operational sometime in 2028.

The Fagaras – Brasov segment features some 50 km of highway and is currently in the feasibility study phase, which is expected to be finished sometime in 2024, while overall constructions are expected to be complete by 2028, according to the supervising authority.

In reality, the feasibility study contract is already delayed, seeing as it was signed in the second half of 2021 and was expected to be finished in early 2024.

Finally, the Brasov – Bacau segment is the longest, boasting some 180 km. The project is currently in a feasibility study phase, but highly delayed.

Initially there was a feasibility study contract signed and underway for this project, which fell through after negotiations with the entrepreneur who couldn't cover the costs of the contract with the allocated budget due to economic conditions, to then be relaunched in a public tender procedure where the same initial company offered a bid.

Said procedure got cancelled and another one is currently underway, but the prospects of the project being entirely implemented by the end of 2027 are almost non-existent.

A6 is the primary southern highspeed road corridor, of which there are currently only 11 km built in the vicinity of Lugoj, out of a total 260 km. This project has been around since 2004 and had the purpose of connecting Bucharest, and by extension Constanta, to Craiova and Calafat, therefore to the Balkan region. Unfortunately, the project is highly delayed with the Craiova – Alexandria segment not even being in the plans for the next years. The current status is split in two major segments, namely Lugoj – Craiova and Bucharest – Alexandria.

In the case of the later, there is a feasibility study in the works, which is expected to end by April 2024, after which a public tender for construction will be launched.

As for the Lugoj – Craiova segment, there was a feasibility study public tender procedure launched at the beginning of 2021 for the entire segment, but that got cancelled when the government fell, the new minister pretexting that the length of the contract was too long.

A second public tender was then launched in 2022 which now saw the highway split into four sectors, each contract taking one year less to implement, but no longer rendering a high detail build plan for the highway (technical project).

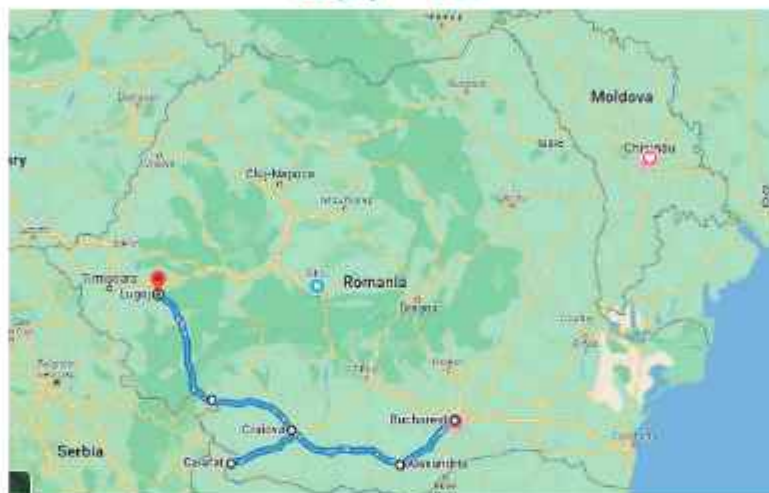
Unfortunately, only 3 of the 4 segments have signed contracts by the end of 2023, the tender procedure for the 4<sup>th</sup> one being cancelled and having to be relaunched at present.

Ultimately the new procedure was a waste of time and an overall delay to the entire project, the only reasonable argument was that it contained a segment from Craiova to Filiasi which was already covered by an on-going feasibility study for a highspeed connection between Craiova and Targu Jiu.

## Romania

CC5 I is quintessential to regional connectivity since it will also allow the Calafat New Europe bridge to be connected to a highspeed road, at least on the Romanian side, enabling then a faster and safer nexus for goods flowing from Romania to the Balkan region.

*Figure 13: Bucuresti – Alexandria – Craiova – Calafat - Dr Trunul Severin - Lugoj – CC5*



Source: [Google Maps](#)

## 4.2. Secondary Major Infrastructure Projects

### 4.2.1 DX12

A new express road connecting Pitesti to Craiova has been in the works for the past years which will provide a highspeed road connection for one of the biggest local exporters, the Ford factory at Craiova, to the rest of the Romanian highway system.

Spanning on a length of some 121 km, the express road was initially split into 4 segments whose implementation started around the year 2019. Currently only 2 out of 4 segments are operational with the 4<sup>th</sup> expected to be finalized by the end of 2024 and the 1<sup>st</sup> sometime in late 2024 or early 2025.

The project has had its fair share of delays, mostly due to bureaucratic complications such as the need to redo the technical project for the end segment which connects to A1 near Pitesti or very long wait times to get construction approvals or to allow forests which were in the way to be cut down.

The first segment also saw its first contract being annulled, due to a very weak work-rate of the constructor and has currently be resigned after a long waiting time with a Turkish entrepreneur who doesn't seem himself to have a strong mobilization ever since the official start of construction.

At a cost of some 570 mil EUR the express road has been financed through the POIM 2014 – 2020 EU Program, with the remaining segments being moved to POT 2021 – 2027 and of course from state funds.

### 4.2.2. A11 Arad – Oradea

The A11 highway is a milestone project, connecting 2 of the largest cities in western Romania, namely Arad and Oradea through 120 km of highway at an initial approximate total cost of 1 bn EUR.

As most projects, A11's inception began almost 2 decades ago with CNAD-NR, but was halted due to lack of funding, and stayed benched until not long ago. Today, the situation is radically different, though.

Seeing as the central authorities were already swarmed with nationally strategic priorities such as the finalization of A1, the local administrations of Bihor and Arad counties decided to team up with the ambition of implementing this project.

Having created a legal alliance, which was eligible to attract EU funding, the two took over the project from CNAIR which at that moment had an outdated feasibility study and a government decision evaluating the total investment to some 1 bn EUR.

The alliance commissioned the updating of the feasibility study and also a technical project for the construction. The results were truly impressive. 6 months into the launch of the public tender procedure for the feasibility study, the contract was already signed and the work was underway.

Not only were the contract terms upheld in terms of timeline (which is usually a rarity in Romania), but complex approvals, such as the environment one, were obtained in record time.

Currently the feasibility study and technical project were completed, based on which the government revised its initial 2008 decision, updating the total cost of the project to some 2.6 bn EUR, out of which 2.2 bn for building costs, to be funded using EU funds from the POT 2021-2027 and state budget.

Furthermore, the total length of the project has been updated to 120.47 km from the initial 134.63 km, with 17.85 km of connection roads also being built and 12 junctions.

Based on the current timeline, the public tender for execution should be launched in Q1 of 2024, with the expected construction time of 24 months after the contract for execution has been signed.

## **5. Mapping of Existing Challenges**

### **5.1. Funding Gap**

From a practical standpoint the biggest challenge which the actual and future governments face represents the massive funding deficit encountered when it comes to implementing the entire road investment plan, especially at a time when the EU is actively reducing non-reimbursable financing for conventional road infrastructure in an attempt to prompt the green transition in the transportation sector.

Romania's plans are ambitious, seeing as this is a country which after the fall of communism barely had 100 km of highway to begin with, it being a territory which covers almost 240k km<sup>2</sup>. By 2040, Romania aims to have a total highspeed road network of 3 200 km, which will at current estimates cost north of 39 billion EUR.

To solve this challenge, the current and future administrations will most likely need to prioritize investments, because doing everything simultaneously is no longer an option. POIM 2014 – 2020 covered 85% of eligible costs, while the new program only covers 40%.

Most importantly the government will need to learn how to diversify project funding sources, which would include debt funding and public private partnerships.

These later solutions require technical knowledge in the public companies responsible for project implementation to present the investments as attractive business case studies and prepare them in such a manner that they will further generate attractive returns, incentivizing private partners to join the endeavour.

Realistically speaking, this is a massive change seeing as the modus operandi of the current public sector is very far off from the private sector quality benchmark, which at the end of the day has its roots in the fundamental mentality that the two sectors operate on.

Specifically, the public sector needs to come to terms with the fact that financing is earned, not given and that this process requires a superior quality standard, which historically was not there.

### **5.2. Environment**

Compared to the period before the MPGT, there have definitely been changes in terms of projects' environmental sustainability, with more rigorous criteria in place to award constructions the environmental approval.

Still, this progress, like most positive changes in other sectors, has not been



implemented thanks to an internal pressure which amounted in a change in legislation, but rather to an external one.

Specifically, administrations have brought forth modernization in order to appease the EU and to be eligible to obtain non-reimbursable funding, which leaves a major risk open in the future.

What will happen when the EU will no longer be able/willing to fund major projects in Romania, seeing as the country is on track to reach a level of development advanced enough to no longer be a funding priority, compared to other less developed economies?

This could potentially leave the door open for other international donors such as China or countries from the Gulf region, which could in turn also materialize in a shift of public policy priorities, threatening the very progress achieved so far.

Although only a presumption, for this scenario to not come to fruition, there will be a need for a strong political class with healthy values and a good understanding of public policies, which Romania severely lacks and by current polls the 2024 super election year (EU parliament, local, general and presidential elections) might only bring more populists in the main decision-making seats. To date, there is no obligation for projects to use renewable or less polluting materials in road infrastructure construction sites.

Those projects which actually end up using them, either do so out of their own volition or in order to comply with financing requirements or obtain financing benefits (usually in the private sector housing/commercial/office space building industry – in order to obtain specific funds/better funding conditions/be able to obtain a bigger margin on sale/rent.)

Furthermore, going beyond Romania's road infrastructure, it can easily be observed that environmental sustainability is not a preoccupation of public administrations when tackling the development of the transportation system, be it local or national, since rail, which is probably the best alternative for sustainable long and short-distance travel has been continuously underfunded.

True multimodal transportation which would allow citizens and transporters alike to give up on their personal vehicles, respectively to receive better options in terms of railway/water freight transportation has also been underfunded.

With regards to spurring on e-vehicle adoption, the government did introduce a state subsidy of 10k EUR for the purchase of new EVs and multiple municipalities have granted facilities to EV owners ranging from tax breaks to free parking within cities, but the infrastructure allowing for EVs to run

on a national level is still lagging behind, most initial investments being actually made by the private sector, the public trying to play catch-up at this point.

### 5.3. Politization of Public Institutions

But probably by far and away the most problematic challenge facing the development of Romania on a multi-sectorial level amongst which the transportation sector, specifically in this case the road transportation network, is the politization of all key institutions, including the local private sector.

The current administrative layout for the national road infrastructure is formed out of:

- the Ministry for Transportation – executive governing body;
- CNAIR (National Road Infrastructure Company) – currently tasked with the maintenance of the national road infrastructure and with the development of new road infrastructure projects;
- CNIR (National Road Investment Company) – freshly formed and tasked to take over the new development of infrastructure projects responsibility from CNAIR.

While of these institutions only the top level of the Ministry for Transportation (Minister and state secretaries) should be politically appointed, with the rest being public servants specialized in the field, the reality is that appointments usually have a political background, which incapacitates these structures to operate in a professional, merit-based and efficient manner.

A recent reform compelled the companies to appoint board members based on professional merits, but in reality, former directors or board members which had political backing and not necessarily industry expertise found themselves reappointed.

This negatively impacts the development of the sector because project prioritization tends to happen based on political interests and not on objective benchmarks such as the ones illustrated by the MPGT or Investment Plan.

Moreover, it leads to these companies employing public servants rather based on political favours than merit which leads to processes such as public tenders being inefficiently run and lasting years instead of months.

Finally, the public sector ties to the local private sector, where former party members or directors of these public institutions set up own companies which then get awarded development contracts or even construction ones.

The most common example are consulting companies which get awarded feasibility study contracts and then deliver low quality materials which transform into poor terms of reference for actual construction projects, leading to lengthy public tendering procedures or even major complications during the construction, where, for instance, the developer discovers that the area where he was supposed to build the highway on, does not match what was described in the feasibility study.

In turn this type of situation leads to the need to change the technical solution, implying additional costs, which the state usually does not want to pay. Finally, the process usually ends with both parties submitting financial claims to one another, which are most of the times brought up in front of a judge.

The most recent proofs were a 22 mil EUR bribe received by the Bucharest Airport authority to allow commercial space leases to preferred participants and the Prahova County president being indicated for a 3 mil EUR bribe.

These events hinder the decentralization of projects and a much needed efficiency of the market, but all hope is not lost as in the case of A11, there are still local structures which pride themselves with professionalism which is then shown in their results.

Still, until there isn't such a thing as professionally run public companies and administrative structures, contracts being awarded on merit and so on, it's unlikely that the ambitious objectives set out by the two aforementioned strategic documents will be achieved.

### 5.4. Operational

Finally, from an operational standpoint the main problems and challenges can be summed up as follows:

- Long public tendering procedures, based on low quality terms of reference and poor evaluation committees and criteria;
- Poorly executed feasibility studies, which often do not feature public infrastructure networks such as pipelines, electricity cables, etc.;
- Poorly procedural structure which slows projects down, because of the time it takes to get approvals.

## 6. Proposals and Recommendations for Enhancing Road Infrastructure and Cross-border Road Connectivity.

The recommendations presented below are ranked according to ease of implementation, starting with the low hanging fruits, and finishing with the most challenging systemic overhauls.

Probably the easiest recommendation to implement is for each public administration that comes to power to **follow the project prioritization set out by the investment plan**, without interference of the political factor in the decision-making process. The main benefit of this change would be that the finalized projects will be able to offer visible results and connect dispersed highspeed road segments also providing the much-needed network effect generated by these investments.

The next recommendation is to **take full advantage of the new structure being created solely for road investment purposes (CNIR)** and to try to move as many **subject matter experts** and large projects currently at CNAIR as possible in order to enhance the administrative capacities of this public authority and to allow CNAIR to focus on its core competence which is road administration. The main benefit would be an improvement in Terms of Reference Documents (ToR), which would then trickle down into quicker public tendering procedures and would finally render better deliverables to then be quicker transformed into roads.

For the public tendering to run more smoothly, it would also be recommended to **reduce the price's weight in the overall tender evaluation** and to try to award contracts more based on the tender's quality. However, to implement this change, the ToR and evaluation commission's quality need to be considerably boosted. There needs to be a change in legislation that allows evaluation committees to factor in the performance of the developers if they already have projects underway during a tendering procedure. This way the low-quality developers will be filtered out instantly.

Otherwise, it is often the case that entrepreneurs which have a horrible track-record in building highways in Romania submit tenders for new projects which they then win based on competitive pricing and on the fact that the experts they bring in the offer, alongside their overall project portfolio, are enough to score them the most points.

There is already legislation in place which allows the contracting authority to sign with the winner of a public tender procedure in the case that the result of

the evaluation has been challenged by another participant and the first panel of judges has ruled in favour of the first winner, yet the contracting authority seldomly uses this tool, because the people in charge do not want to take responsibility in case the second instance court will favour the challenge. This costs precious time and leads to very lengthy tendering processes.

Finally, there needs to be **a complete personnel overhaul in the transportation public sector** which should bear in mind future market conditions where financing will become scarce and infrastructure projects will need to be presented as air-tight business cases. In this sense, a new employer branding needs to be implemented in the public transportation sector which would attract the people with the necessary knowledge.

# Road Infrastructure in Serbia

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## Road Infrastructure in Serbia

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### 1. Review of existing Road Infrastructure

#### 1.1. Traffic and Technical-operational Characteristics of the Road

The geographical location and topographical characteristics have influenced those important corridors between Western and South Eastern Europe to pass through the Republic of Serbia over time. In accordance with the above, today a large number of E-roads pass through the territory of Serbia.

According to the importance of traffic connection, public roads are divided into<sup>516</sup>:

1. State roads:
  - State roads of the first category (they connect the territory of the state with the network of European roads, that is, they are part of the network of European roads, the territory of the country with the territory of neighboring states, the entire territory of the state, as well as economic significant settlements on the territory of the state);
  - State roads of the second category (transport connecting the area of two or more administrative districts or area of the administrative district, as well as border and border areas crossings with the national road network);
2. Municipal roads (they connect the territories of the municipalities, the territory of the municipality, i.e. the city, as well as the territory of the municipality, i.e. the city with a network of state roads);
3. Streets (they connect parts of the settlement by traffic).

In the Republic of Serbia's territory, there are 371 state roads, of which 42 are roads of the first category, and 329 roads of the second category (Table 1).

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<sup>516</sup> „Law on roads”, National Assembly of the Republic of Serbia, accessed September 10, 2023, <https://www.paragraf.rs/propisi/zakon-o-putevima.html>.

Table 1: Total number of state roads by category

State road category	Total number of state roads on the territory of the Republic of Serbia
<b>I and II</b>	<b>371</b>
I	42
II	329
IA	6
IB	36
IIA	159
IIB	170

Source: «Reference system of the national road network of the Republic of Serbia»<sup>517</sup>

The road network of the Republic of Serbia includes 16.999,152 km of state roads of the I and II category. Table 2 shows the total length of the national road network, including built and total infrastructure.

Table 2: The Total length of the state road network

State road category	Length (km)	
	The territory of the Republic of Serbia (TRS)	
	Total	Built
<b>I and II</b>	<b>16.999,152</b>	<b>16.436,013</b>
I	5.559,271	5.418,106
II	11.439,881	11.017,907
I A*	1.080,117	962,872
I B**	4.479,154	4.455,234
II A	7.928,287	7.822,546
II B	3.511,594	3.195,361

Source: «Reference system of the national road network of the Republic of Serbia»<sup>518</sup>

Note: \* - Highway profile = 1070.315 km; Built highway profile = 953.070 km

\*\* - A 5.212 km route was built in the profile of 1/2 highway along route 35, as the future route of the Nis - Priština highway

The lengths of built and unbuilt highways (roads of IA category) that are located in the territory of the Republic of Serbia are shown in Table 3.

<sup>517</sup> "Reference system of the national road network of the Republic of Serbia", Public enterprise Putevi Srbije, accessed December 3, 2023, chrome-extension://efaidnbmnnnib-pcajpcglclefindmkaj/https://www.putevi-srbije.rs/images/pdf/referentni-sistem/ Reference\_system\_text.pdf.

<sup>518</sup> Ibid.



Table 3: Length of highways in traffic function

Serial number	Road sign	Description	Length (km)	
			built	unbuilt
1	A1	state border with Hungary (border crossing Horgoš) - Novi Sad - Belgrade - Niš - Vranje - state border with Macedonia (border crossing Preševo)	613.156	
2	A2	Belgrade - Obrenovac - Lajkovac - Ljig - Gornji Milanovac - Preljina - Čačak - Požega	140.067	19.68
3	A3	state border with Croatia (Batrovci border crossing) - Belgrade	95.444	
4	A4	Niš - Pirot - Dimitrovgrad - state border with Bulgaria (border crossing Gradina)	105.434	
5	A5	Pojate - Kruševac - Kraljevo - Preljina	23.184	97.325
		<b>The network of state roads of the Republic of Serbia</b>	<b>977.285</b>	<b>117.005</b>

Source: Department for Motorways, Public enterprise Putevi Srbije <sup>519</sup>

Figure 1 shows the total length of built and planned highways and expressways.

Figure 1: The network of state roads of the Republic of Serbia



<sup>519</sup> „Department for Motorways”, Public enterprise Putevi Srbije, accessed September 10, 2023, <https://www.putevi-srbije.rs/index.php/en/organisation/sector-for-the-maintenance-of-public-roads-of-i-and-ii-category/department-for-highway-preservation-and-maintenance>.

On the state roads of the Republic of Serbia, 3.465 bridges with a total length of over 154 kilometres and an area of over 1.760.000 m<sup>2</sup> are currently recorded, the value of which is estimated at around 1,69 million euros. Of that number, 953 bridges are on highways.

The bridges are of different ages, of various shapes and construction methods, made of wood, stone, concrete, prestressed concrete, steel, and different static systems, layouts, and lengths from 5 to 2212 meters, which is the length of the bridge over the Beška River. The Republic of Serbia has 297 large bridges over 100 meters long on state roads.

109 tunnels totalling 31.81 kilometres were built and operated on state roads in Serbia. There are 32 tunnels on the highways (16 with two tunnel tubes). The tunnels are of different ages and construction technologies in different geological environments. The longest tunnel is Manajle, on the A1 road (Predejane interchange – Vladičin Han interchange), 1815 m long. The largest concentration of these facilities is on the Đerdap highway, there are 25 of them. A total of 66 road tunnels in Serbia are longer than 100 m<sup>520</sup>.

According to the latest available data on road quality, collected for 2019, the Republic of Serbia is in 33rd place out of 40 in Europe. The average value for Serbia in the period from 2006 to 2019 was 2.81 points with a minimum of 2.36 points in 2008 and a maximum of 3.5 points in 2019<sup>521</sup>.

Figure 2 shows the value of Average Annual Daily Traffic (AADT) on the road network of the Republic of Serbia. Different colours of roads mark different values of AADT. One can see that the highest volume of traffic flows is on corridor 10 and it branches out towards Montenegro and South Adriatic Sea area.

<sup>520</sup> „About Us”, Public enterprise Putevi Srbije, accessed August 23, 2023, <https://www.putevi-srbije.rs/index.php/en/about-us>.

<sup>521</sup> “Serbia: Roads quality”, The Global Economy. com, accessed August 23, 2023, [https://www.theglobaleconomy.com/Serbia/roads\\_quality/](https://www.theglobaleconomy.com/Serbia/roads_quality/)

Figure 2. The value of Average Annual Daily Traffic on the road network of Serbia



Source: Public enterprise Putevi Srbije <sup>522</sup>

### 1.2. Republic of Serbia as part of Pan-European Corridors

Serbia is at the crossroads of two large European corridors in Southeast Europe (road-rail corridor X and river corridor VII "Rajna-Danube"). Transport Corridor X, which is part of the Pan-European transport corridors, also forms part of the road network of the Republic of Serbia. It stretches from Austria in the north to Greece in the south, passing mostly through Slovenia, Croatia, Serbia, and North Macedonia. Also, thanks to its location, Corridor X represents the backbone of the expansion of the TEN-T network (the European Union's north-south, east-west transport connection strategy) in the Western Balkans. In addition to the main route that stretches from Salz-

<sup>522</sup> „Average Annual Daily Traffic“, Public enterprise Putevi Srbije, accessed December 3, 2023, <https://www.putevi-srbije.rs/index.php/en/traffic-counting>.

burg to Thessaloniki, 2 of the existing 4 legs of Corridor X pass through Serbia. The cities through which the main route of this pan-European corridor extends are Salzburg (A) – Ljubljana (SLO) – Zagreb (HR) – Belgrade (SRB) – Niš (SRB) – Skopje (MK) – Veles (MK) – Thessaloniki (GR). Its branches extend through the following states and road routes (Figure 3):

- Leg A: Graz (A) – Maribor (SLO) – Zagreb (HR)
- Leg B: Budapest (H) – Novi Sad (SRB) – Belgrade (SRB)
- Leg C: Niš (SRB) – Sofia (BG) – Dimitrovgrad (BG) – Istanbul (TR)
- Leg D: Veles (MK) – Prilep (MK) – Bitola (MK) – Florina (GR) – Igoumenica (GR)

Figure 3. Pan-European Corridor X and VII <sup>523</sup>



### 1.3. Republic of Serbia as Part of the TEN-T Network

Serbia is currently implementing a total of 5 TEN-T projects, with a combined value of 2,263 million EUR (912 million EUR on the Core Network and 1,351 million EUR on the Comprehensive Network). An overview of TEN-T projects currently being implemented in Serbia is presented in the format of Table 4 and Figure 4 below.

<sup>523</sup> „Pan-European corridor X.svg”, Wikimedia.org, accessed December 3, 2023, <https://commons.wikimedia.org/w/index.php?curid=24628978>.

Table 4: List of TEN-T projects in Serbia

Name of the project	Core/ Comprehensive Network	Foreseen intervention	Length (km)	Cost (MC)	Estimated completion deadline	EIP
Novi Sad – Ruma Expressway	Comprehensive network	New infrastructure	16.4	606	2025	No
Pojate – Preljina Motorway	Comprehensive network	New infrastructure	112.3	745	2023	No
Belgrade bypass (sector B)	Core Network	New infrastructure	19.5	207	2022	No
Niš - Merdare Highway	Core Network	New infrastructure	33	255	2026	Yes
Preljina – Požega Motorway	Core Network	New infrastructure	30.96	450	2022	No

Source: "Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans», Transport Community Permanent Secretariat <sup>524</sup>

Figure 4: Map of TEN-T Projects in Serbia



Source: "Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans», Transport Community Permanent Secretariat <sup>525</sup>

Of the mentioned 5 TEN-T projects, the ring road around Belgrade (sector B) was completed and opened for traffic on June 28, 2023. year, with a year delay compared to the planned completion period. Also, the Pojate – Preljina motorway and Preljina – Požega motorway projects have not yet been completed, regardless of the expected completion dates.

#### 1.4. Interoperability

The total length of toll highways in Serbia is 829km. The basis for the toll is the length of the public road that the vehicle travels, expressed in kilometres

<sup>524</sup> „Development of indicative TEN-T extensions of the Comprehensive and Core Network in Western Balkans”, Transport Community Permanent Secretariat, accessed December 3, 2023, [chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://www.transport-community.org/wp-content/uploads/2022/11/TEN-T-Report\\_2022.pdf](chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://www.transport-community.org/wp-content/uploads/2022/11/TEN-T-Report_2022.pdf)

<sup>525</sup> Ibid.

(km). The toll price is determined in relation to three criteria: the toll price per kilometre, the vehicle category, and the length of the route travelled. Users are allowed to opt for the toll payment system either manually (with the obligatory download of a magnetic card) or electronically (using the ENP device).<sup>526</sup>

The initiative under the name Open Balkans, is implementing the plan that will enable the Western Balkans to achieve electronic toll collection interoperability, first at the regional level and then at the European Union level, ensuring consistency with the current systems and taking into account the evolutions necessary to make the scheme compliant with the European Union directives. This type of interoperability has already been implemented since July 16, 2023, between North Macedonia and Serbia.<sup>527</sup>

### 1.5. Road Safety and Casualties

In the period from 2017 to 2021, 2,674 people were killed in traffic accidents in the Republic of Serbia, 16,474 people were seriously injured, and 83,280 people were slightly injured (Table 5). In the observed five-year period, a total of 173,360 traffic accidents occurred, of which 2,451 were traffic accidents with fatalities, 66,887 traffic accidents with injured persons, and 104,022 traffic accidents with only material damage.

*Table 5: Basic indicators of traffic safety in R. Serbia, period 2017-2021*

Year	Type of traffic accident (TA)			Total traffic accident	Consequences of traffic accident			
	TA with fatalities	TA with injuries	TA with material damage		Died in a traffic accident	Serious physical injuries	Minor bodily injuries	Injured in traffic accidents
2017	525	14.286	21.664	36.475	579	3.514	17.849	21.363
2018	491	13.744	21.583	35.818	548	3.338	17.508	20.846
2019	494	13.735	21.541	35.770	534	3.322	17.068	20.390
2020	459	11.849	18.410	30.718	492	2.953	14.297	17.250
2021	458	13.273	20.824	34.579	521	3.347	16.558	19.905
Total	2.451	66.887	104.022	173.360	2.674	16.474	83.280	99.754

*Source: Agency for Traffic Safety, Republic of Serbia* <sup>528</sup>

Graph 1 shows the total number of traffic accidents (including those with fatalities, injuries, and material damage) for the observed period of 5 years,

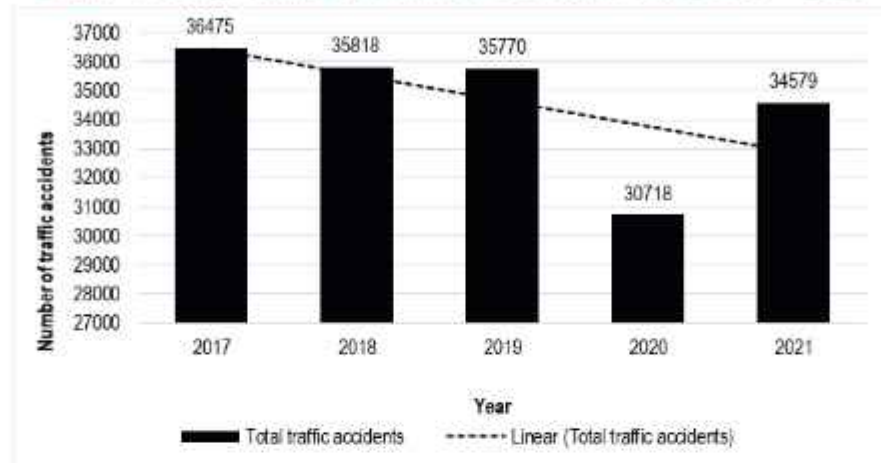
<sup>526</sup> „Sector for Toll Collection”, Public enterprise Putevi Srbije, accessed December 3, 2023, <https://www.putevi-srbije.rs/index.php/en/organisation/sector-for-toll-collection/department-for-operative-tolling>

<sup>527</sup> „Integrated toll collection between Serbia, Croatia as of September”, The Government of the Republic of Serbia, accessed December 3, 2023, <https://www.srbija.gov.rs/vest/en/209700/integrated-toll-collection-between-serbia-croatia-as-of-september.php>

<sup>528</sup> „Statistical report on the state of traffic safety in the Republic of Serbia in 2021”, Agency for Traffic Safety, Republic of Serbia, accessed December 3, 2023, [chrome-extension://efaidnbnmnibpcjpcglclefindmkaj/https://www.abs.gov.rs/admin/upload/documents/20220915105252-statisticki\\_konacno\\_2021.pdf](chrome-extension://efaidnbnmnibpcjpcglclefindmkaj/https://www.abs.gov.rs/admin/upload/documents/20220915105252-statisticki_konacno_2021.pdf)

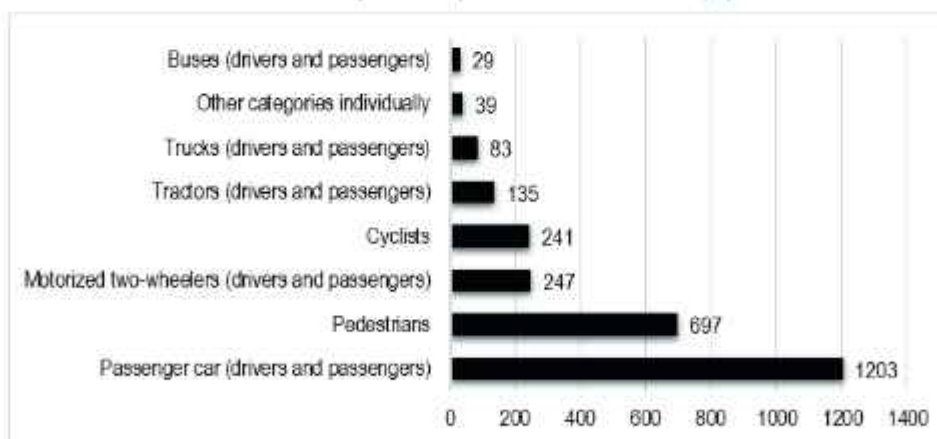
i.e. from 2017 to 2021. The graph shows the trend of decreasing the number of traffic accidents, i.e. the highest number was in 2017 (36.475), and the lowest in 2021 (34.579) if 2020 and the Coronavirus pandemic are excluded.

Graph 1: Total number of traffic accidents from 2017 – 2021



The categories of participants in traffic accidents in this report are observed and divided in accordance with the practice applied in IRTAD (The International Road Traffic and Accident Database), an international group for the analysis and database of traffic accidents that was formed within the OECD (Organization for Economic Co-operation and Development). In relation to the practice in IRTAD, there is a difference in the Statistical Report in that the data for trucks and buses were observed individually. Graph 2 shows the number of deaths according to previously defined categories in the period from 2017 to 2021.

Graph 2: The number of people killed in relation to the category of vehicle and the nature of participation in traffic, period 2017-2021



A detailed analysis of the data in Graph 2 shows that the largest number of people killed were drivers and passengers in passenger cars, which numbered 1.203, which is 45% of the total number of people. Pedestrians followed, of which there were 697, which accounted for about a quarter of the fatalities

(26%), then motorized two-wheelers and cyclists, of which there were 247 and 241, respectively, which accounted for 9% of the fatalities. The World Health Organization (WHO) declared pedestrians, cyclists and drivers and passengers on motorcycles and mopeds as vulnerable categories of road users. This is the result of the increased probability that they will be seriously injured in the event of a traffic accident, compared to drivers and passengers in vehicles (passenger cars, buses, trucks and other categories of motor vehicles). Therefore, earlier road users account for 44% of traffic fatalities. They were followed by drivers and passengers on tractors, 135 of whom died, which is 5% of the dead. In the observed five-year period, 83 drivers and passengers in cargo vehicles (3%) and 29 drivers and passengers in cars (1%) were killed.

## **2. Review of Strategic National Documents and Plans in Relation to Road Infrastructure and Connectivity**

Serbia is committed to aligning its road infrastructure and connectivity plans with EU plans and strategies. This alignment is a crucial step in the country's efforts to integrate with the European Union and foster regional cooperation. However, many national documents and plans are outdated and need to be updated to align them with new EU standards and policies, as these plans may have evolved in response to changing EU policies and priorities. Below are presented existing national documents and plans for Serbia related to transport and road infrastructure.

### **2.1. The Strategy for the Development of Rail, Road, Water, Air, and Intermodal Transport in the Republic of Serbia from 2008 to 2015**

Given that the Strategy for the development of railway, road, water, air and intermodal transport in the Republic of Serbia is being developed for the next period until 2030, it is important to highlight the goals and achievements defined by the previous strategy. The current Strategy, which refers to the period from 2008 to 2015, determines the situation in the areas of rail, road, water, air and intermodal traffic, determines the concept of infrastructure and traffic development, defines long-term and fixed goals for the development of the transport system and an action plan for their implementation, bearing in mind the need for sustainable development of traffic in the Republic of Serbia.<sup>529</sup>

<sup>529</sup> "Strategy for the development of rail, road, water, air and intermodal transport in the Republic of Serbia from 2008 to 2015", Government of the Republic of Serbia, accessed December 3, 2023, <chrome-extension://efaidnbnmnibpcjpcglclefindmkaj/https://www.>



Taking into account the basis for the implementation of the Strategy and the conclusions of the SWOT analysis of road transport in the Republic of Serbia, and respecting the vision of the transport of the Republic of Serbia in 2015, the general objectives of the Strategy were defined, namely:

1. The transport network of the Republic of Serbia integrated into the Trans-European transport network;
2. Effective use of the comparative advantages of each type of traffic;
3. Improving the quality of transport system services;
4. Increasing the level of safety and security of the transport system;
5. Strengthening the transport market and its gradual deregulation;
6. Reducing the negative impact of transport on the environment, in accordance with the principles of sustainable development;
7. Establishment of stable financing for the development of the transport system.

The priorities of works on the network of public roads defined by the Strategy are:

1. Construction of the second carriageway on the Horgoš-Belgrade section (Corridor Xb arm);
2. Construction of sections of highway Leskovac - Macedonian border (Corridor X) and Niš - Bulgarian border (Corridor-Xc branch);
3. Main road corridors Basic networks have priority in rehabilitation/reconstruction: Corridor X, with its branches-Xb and Xc, Route 3, Route 4, Route 5, Route 6, Route 7 and transversal connections Pojate-Kruševac-Kraljevo-Čačak and Subotica - Bačka Palanka;
4. Identification of bottlenecks on the Basic network of public roads in the Republic of Serbia - roads through and around Belgrade, bridges on the Danube and Sava in Belgrade and its vicinity, bypass around Belgrade, road Belgrade-Novı Sad (bridge near Beška), Ibarska highway;
5. Reconstruction of bridges on the road network in order to improve their structure, stability and carrying capacity;
6. Preparing studies on priority measures to increase traffic safety on international roads in the Republic of Serbia;
7. Stabilization of landslides that cause occasional traffic interruptions and slow down traffic;

8. Completion of the construction of the ring road around Belgrade;
9. Completion of the construction of the highway Horgoš - Novi Sad - Belgrade;
10. Construction of the Belgrade-Požega road.

Of the mentioned priority works on the road network, Serbia has managed to carry out almost all the planned infrastructure works to date. What remains from this Strategy as a task for the next period is the construction of the last two sections of the road route Belgrade - Požega, whereby the entire planned road network for the defined period would be completed.

The specific goals of the Strategy are:

1. Polycentric development of the local road network;
2. Establishment of a roadway management system on the entire network of public roads;
3. Membership in specialized international bodies and organizations;
4. Establishment of bodies/authorities for traffic safety management;
5. Introduction of intelligent transport systems, electronic billing system and interoperability in the toll collection system.

Based on the defined goals, concrete conclusions can be made that are crucial for decision-making. Taking into account all the defined goals, the following could be concluded:

1. In conditions of limited means for financing, rehabilitation and maintenance of transport networks must have priority over modernization and construction. Funding sources for infrastructure maintenance must be stabilized and defined in relation to fuel prices, so that they enable maintenance according to European standards. It is necessary to apply an effective system of fee collection for the construction and use of commercial facilities that have access from the public road;
2. Most of the problems in the field of traffic safety are related to road safety. It is necessary to reduce the number of people killed on the roads in the Republic of Serbia;
3. The goal is to bring the amount of harmful emissions into line with the goals set by the EU. The use of renewable fuels must be increased. It is necessary to adopt measures to improve the efficiency of transport systems for both passenger and goods transport. Efforts must be continued to adapt the approach to infrastructure development and maintenance to environmental requirements, in order to ensure harmony with the natural and cultural environment;

4. Increased role of the private sector and regulation of the public sector and institutions in the direction of integration with the EU with clearly defined responsibilities, professional management and staff and effective control procedures;
5. Political support and consensus are needed in the direction of alignment with the White Paper of the EU and the concept for which it advocates, adjustment in accordance with the Agreement on European Convergence and other political changes necessary for joining the EU;
6. Procedures and inspections must be simplified and coordinated in order to reduce border crossing time and detention costs, which applies to both passengers and goods. The volume of exports and imports and revenues of the Republic of Serbia will increase with the reduction of obstacles and the simplification and acceleration of border crossing procedures;
7. With the implementation of bilateral agreements on border crossing, transit will increase faster than the general development of the economy of the Republic of Serbia. The revenues of the Republic of Serbia will increase not only due to charging for the use of infrastructure in international transport, but also due to an increase in revenues in the field of services.

### **2.2. Traffic Safety Strategy of the Republic of Serbia for the period from 2023 to 2030 with the Action Plan for 2023 to 2025**

With the goal of effective traffic safety management, based on science and data, the Government of the Republic of Serbia adopted the First National Strategy for Traffic Safety on the Roads of the Republic of Serbia from 2015 to 2020. In the first strategy, the following, very challenging goals were defined: 1) that there be no children killed in traffic by 2020; 2) to halve: the annual number of fatalities, the number of seriously injured children, the number of seriously injured persons in 2020 and 3) to halve the total, annual socio-economic costs of traffic accidents in 2020, compared to 2011. It was estimated that by implementing the measures from the first national strategy, 2.121 lives will be saved, that is, the number of seriously injured persons will be reduced by 9.528, and thus a total saving of at least 926,6 million euros will be achieved. However, the goals above of the first national strategy were not achieved. In this regard, significantly more people died in traffic accidents. Namely, in the period from 2016 to 2020, there were 730 deaths (of which 66 were children) and 5.122 seriously injured persons more than was forecast by the previous strategy. Also, the set goals for performance indicators of the traffic safety system have not been achieved. The worst indicator values are:

- percentage of seat belt use on the back seat (only 19,1%, instead of 85%);
- percentage of passenger car drivers under the influence of alcohol (0,68%, instead of 0,10%);
- percentage of speeding (51,1%, instead of 19,0%) and
- the percentage of use of the child protection system (only 48,7%, instead of 96,0%).

Adopting the cross-sectoral Traffic Safety Strategy of the Republic of Serbia for the period from 2023 to 2030 lays the groundwork for creating a system in which traffic safety would be one of the social priorities of all citizens, and the Republic of Serbia would be among the 10 safest countries in Europe. By adopting the Strategy, they want to achieve goals that were not previously achieved, and therefore they can be described through:

- *ambition*: To be among the 10 safest countries in Europe, according to the values of public risk of death and public risk of serious injuries in road traffic;
- *mission*: Road traffic safety system that enables safe access and sustainable mobility of all traffic participants, with minimal harmful consequences;
- *vision*: Road traffic without fatalities and without seriously injured persons in traffic.

The general goal of the Strategy for the period from 2023 to 2050 refers to the reduction of the number of dead and seriously injured persons by 50 percent by 2030 compared to 2019, and from 2030, no children will be killed in traffic.

Five specific goals lead to the achievement of the general goal:

- a) A functional traffic safety system in which institutions and individuals are committed to achieving goals, successfully cooperate, and act in harmony;
- b) Improved planning, design, construction, and maintenance of roads, so that at least 75% of trips are made on roads with high standards of traffic safety, under the approach of the safe system and the requirements of autonomous vehicles;
- c) Renewed and improved in terms of safety features of vehicle fleet;
- d) Knowledge, attitudes, and behavior of road users at the level of leading European countries in the area of road safety;

e) A system of rescue and treatment that maximizes the possibility of survival and the success of the health recovery of those injured in traffic accidents<sup>530</sup>.

### 2.3. Traffic Safety Action Plan of the Republic of Serbia for the period from 2023 to 2025

The action plan represents a set of concrete measures and activities, systematized through the five pillars specified in the Strategy. The action plan for the implementation of the first national strategy (2018 – 2020) envisaged a total of 95 activities for five areas of action. The analysis of implemented activities determined that the highest percentage of implemented activities was within Pillar 1. *Traffic safety management* and Pillar 3. *Safer vehicles*, where a third of the activities were fully implemented. The lowest percentage of activities was implemented within Pillar 5. *Action after a traffic accident*, where almost half of the activities (43%) were not implemented at all, and for 16% of activities no data was obtained. Over 90% of the activities were partially or fully implemented within Pillar 2. *Safer roads* and Pillar 4. *Safer road users*. The action plan for the first three years of the implementation of the Strategy foresees specific activities that will be undertaken in order to ensure the conditions for the above-mentioned goals and measures of the Strategy to be realized. Also, the Action determined the holders and partners for the implementation of those activities, as well as the deadlines and means for their implementation<sup>531</sup>.

## 3. Cross-border Connectivity and Bottlenecks

The Republic of Serbia borders eight countries, eight of which have border road crossings for passenger and freight traffic. The aforementioned eight countries include Hungary and Croatia in the north, Romania in the north-east, Bulgaria in the southeast, North Macedonia and Albania in the south, and Montenegro and Bosnia and Herzegovina in the west. Serbia's borders with the mentioned countries are divided into primary and secondary (or alternative) depending on the capacity and flow of vehicles on them<sup>532</sup>. There-

<sup>530</sup> "Traffic strategy of the Republic of Serbia for the period from 2023 to 2030 with the Action Plan from 2023 to 2025", Government of the Republic of Serbia, accessed December 3, 2023, [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.putevi-srbije.rs/images/pdf/strategija/strategija\\_bezbednosti\\_sao2023-2030.pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.putevi-srbije.rs/images/pdf/strategija/strategija_bezbednosti_sao2023-2030.pdf)

<sup>531</sup> "Traffic strategy of the Republic of Serbia for the period from 2023 to 2030 with the Action Plan from 2023 to 2025", Government of the Republic of Serbia, accessed December 3, 2023, [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.putevi-srbije.rs/images/pdf/strategija/Strategijatransport\\_lat.pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.putevi-srbije.rs/images/pdf/strategija/Strategijatransport_lat.pdf)

<sup>532</sup> "Border crossings of Serbia - working hours, alternative routes and required documentation", PutujSigurno.rs, accessed December 3, 2023, <https://putujsigurno.rs/magazin/granicni-prelazi-srbije/>





In the Serbian budget for 2023, large funds have been allocated for investment in border crossings (Table 7). Following border crossings will be reconstructed in the form of increasing their capacities and expanding facilities<sup>535</sup>. Those border crossings are Horgoš (Serbia – Hungary), Đerdap II (Serbia – Romania), Neštin (Serbia – Croatia) and Gostun (Serbia – Montenegro).

*Table 7. Sources of financing for the reconstruction of border crossings*

Border crossing	Project	Countries	Source of finance	Value In EUR	Contractor
Horgoš	Project 5061 „Reconstruction and extension of the border crossing Horgoš“	Serbia – Hungary	The budget of the Republic of Serbia for 2023	12,42 M	Jadran d.o.o. Belgrade
Đerdap II	Project 5004 „Construction of the Đerdap II border crossing“	Serbia – Romania	The budget of the Republic of Serbia for 2023	913.424	/
Neštin	Project 5005 „Construction of the Neštin border crossing“	Serbia – Croatia	The budget of the Republic of Serbia for 2023	913.424	/
Gostun	Project 5001 „Construction of the Gostun border crossing“	Serbia – Montenegro	The budget of the Republic of Serbia for 2023	25.602	/

*Source: "Draft law on the budget of the Republic of Serbia for 2023", Government of Republic of Serbia <sup>536</sup>*

#### – Horgoš border crossing

On the basis of project 5061 („Reconstruction and extension of the border crossing Horgoš“), which is of importance for the Republic of Serbia, the objectives of the reconstruction of the border crossing Horgoš, between Serbia and Hungary, were defined. Due to the existing workload, capacity expansion is planned by building six new lanes at the passenger terminal, two new lanes at the cargo terminal, widening the highway with one more traffic lane for freight vehicles and building an additional traffic connection from the cargo terminal Horgoš II.

#### – Border crossing Đerdap II

Project 5004 envisages the construction of the Đerdap II border crossing. A container facility has been installed at the border crossing, while other facilities and infrastructure do not exist. The border crossing construction project should begin with the preparation of planning documentation, which is the basis for obtaining location conditions and construction permits.

<sup>535</sup> <https://plutonlogistics.com/spedicija/granicni-prelazi-u-srbiji-2023-kakvi-su-planovi-sta-se-gradi-sta-se-prosiruje-a-sta-rekonstruise/>

<sup>536</sup> "Draft law on the budget of the Republic of Serbia for 2023", Government of Republic of Serbia, accessed December 4, 2023, [chrome-extension://efaidnbmnnnibpcajpcgclefindm-kaj/http://www.parlament.gov.rs/upload/archive/files/cir/pdf/predlozi\\_zakona/13\\_saziv/Budzet%202023..pdf](chrome-extension://efaidnbmnnnibpcajpcgclefindm-kaj/http://www.parlament.gov.rs/upload/archive/files/cir/pdf/predlozi_zakona/13_saziv/Budzet%202023..pdf).



### – **Border crossing Neštin**

Like all other border crossings towards Croatia, the Neštin border crossing has seen a constant increase in traffic in the past period, so it is necessary to build the facilities necessary for the functioning of the border services. There is no infrastructure at the border crossing. It is necessary to draw up planning documentation, which is the basis for obtaining location conditions and a building permit, i.e. for the preparation of technical documentation. The construction of the aforementioned contents of the border crossing is foreseen by project 5005.

### – **Border crossing Gostun**

Since its opening (in 2005), the existing Gostun border crossing has been operating in inadequate conditions. Planned construction works include: construction of new traffic lanes, police and customs administration (CA) control facility, police and CA support facilities, control cabins, canopies, forwarding facility, inspection facility, truck terminal with parking space for trucks with trailers and tow trucks and fenced area for impounded vehicles, truck scales, warehouse and platforms for truck inspection, facility for detailed inspection of vehicles, public sanitary facility, etc. The construction of the aforementioned contents of the border crossing is foreseen by project 5001.

### **3.1. Border crossings Serbia – Hungary**

On the border between Serbia and Hungary, in addition to road crossings, there are also river and railway border crossings. The road border crossings between the mentioned countries are the busiest, so there are seven border crossings to Hungary in Serbia, namely Horgoš, Kelebija, Bački Breg, Rastina, Bački Vinogradi, Bajmok and Đala. Bearing in mind that some border crossings do not have a cargo terminal, they are intended for the passage of passenger vehicles and/or buses only. Therefore, five border crossings are intended for the crossing of passenger vehicles only, namely Horgoš II (SRB) – Roszke (HU), Rastina (SRB) – Bačsentđerđ (HU), Bački Vinogradi (SRB) – Asottholom (HU), Bajmok (SRB) – Bacalmaš (HU) and Đala (SRB) – Tisaziget (HU). On the other hand, only two border crossings are adapted for the simultaneous crossing of passenger vehicles and freight vehicles, namely Horgoš Serbia Hungary AP A1 (SRB) – Roszke (HU) and Kelebija (SRB) – Tompa (HU), while only one is adapted for the crossing of passenger vehicles and buses (Bački Breg (SRB) – Hercegsanto (HU)). The Horgoš border crossing (Figure 6) located on the E75 route (Corridor Xb) to Hunga-

ry is one of the busiest border crossings in the Republic of Serbia especially during the summer months and on holidays. The passenger vehicles as well as trucks during this month occasionally may experience waiting and queues at this border crossing due to the high intensity of traffic.

### **3.2. Border crossing Serbia – Romania**

As with Hungary, on the Serbian border with Romania, there are river and railway border crossings, in addition to road crossings. There are a total of eight road border crossings on the border between Serbia and Romania. Border road crossings such as Đerdap II (SRB) – Portile de Fior 2 (RO), Vrbica (SRB) – Valcani (RO), Jaša Tomić (SRB) – Foeni (RO), and Nakovo (SRB) – Comlosu Mare (RO), are available for the crossing of passenger vehicles only, while the border crossing Kaluđerovo (SRB) – Naidas (RO) is available for the crossing of passenger vehicles and empty cargo vehicles. The remaining three border crossings (Srpska Crnja (SRB) – Jimbolia (RO), Vatin (SRB) – Moravita (RO), and Đerdap I (SRB) – Portile de Fior (RO)) are intended for the crossing of both passenger and cargo vehicles. Of the above, the Srpska Crnja (SRB) – Jimbolia (RO) border crossing (Figure 7) is one of the main border crossings from Serbia to Romania. Drivers who use border crossings with Romania do not experience crowds and long waits, due to the low intensity of traffic and the use of these border crossings.

### **3.3. Border crossing Serbia – Bulgaria**

Between Serbia and Bulgaria, there are a total of six border crossings, of which one is a railway and five are road crossings. The Gradina (SRB) – Kalotina (BGR) and Ribarci (SRB) – Oltomanci (BGR) border crossings are available for the crossing of passenger and cargo vehicles from Serbia to Bulgaria, with the Gradina border crossing being the most important. In addition to the above, the border crossings that are intended for the crossing of passenger vehicles, and are also alternatives, are Strezimirovci (SRB) – Strezimirovci (BGR) and Mokranje (SRB) – Bregovo (BGR). The border crossing Vrška Čuka (SRB) – Kula (BGR) is available for the crossing of freight vehicles and goods that do not require a phytosanitary inspection. The Gradina border crossing (Figure 8) located on the E65/E80 route (Corridor Xc) to Bulgaria is one of the busiest border crossings in the Republic of Serbia especially during the summer months and on holidays. During these months, passenger vehicles, as well as cargo vehicles, may experience waiting and queues at this border crossing, considering the traffic flows that go towards Bulgaria at a higher intensity.

### 3.4. Border crossing Serbia – North Macedonia

There are five roads and one railway border crossing at the border between Serbia and North Macedonia. The border crossing Preševo (SRB) – Tabanovce (MKD) is the main one, while the border crossing Prohor Pčinjski (SRB) – Pelince (MKD) is an alternative border crossing. Both are intended for the crossing of passenger and cargo vehicles. Also, the Đeneral Janković (SRB) – Dolno Blace (MKD) border crossing is available for the crossing of passenger and cargo vehicles, while the Globočica (SRB) – Jažince (MKD) crossing is available for the crossing of passenger vehicles and buses carrying passengers. Goleš (SRB) – Golema Crkovića (MKD) is a border crossing intended for the population living 30 kilometres from the border. The border crossing Preševo (Figure 9), located on route E75 (Corridor X) towards North Macedonia, is one of the busiest border crossings in the Republic of Serbia, especially during the summer months and holidays. During these months, passenger vehicles, as well as cargo vehicles, may experience waiting and queues at this border crossing due to the increased volume of traffic. This border crossing is the busiest, bearing in mind that it is the most common option for the movement of tourists from Serbia to the coastal states, such as Greece.

### 3.5. Border crossing Serbia – Montenegro

Border crossings between Serbia and Montenegro are mostly road (there are four of them, and 3 are planned), while there is only one railway. The busiest border crossing is Gostun (SRB) – Konatar (MNE) (Figure 10) which is intended for the crossing of passenger and cargo vehicles. Alternative crossings from Serbia to Montenegro are the Jabuka (SRB) – Ranče (MNE), Mehov Krš (SRB) – Dračenovac (MNE), and Kula (SRB) – Rožaje (MNE) border crossings, which are mainly used by passenger vehicles. Drivers that use border crossings with Montenegro do not experience congestion and long waiting. This is mainly due to the non-existence of the highway and the border crossing on the highway, and therefore the non-existence of a high intensity of traffic flows. Also, traveling by air is becoming more and more popular.

### 3.6. Border crossing Serbia – Bosnia and Herzegovina

There are nine road border crossings between Serbia and Bosnia and Herzegovina (the largest number for any of Serbia's neighbours), as well as one railway crossing. The border crossings aimed at the crossing of passenger and cargo vehicles are Uvac (SRB) – Rudo (BiH), Kotroman (SRB) – Vardišta (BiH) (Figure 11) and Sremska Rača (SRB) – Bosanska Rača (BiH), while Ljubovija (SRB) – Bratunac (BiH), and Bajina Bašta (SRB) – Skelani

(BiH) intended for the crossing of passenger and empty cargo vehicles. The border crossing Trbušnica (SRB) – Šepak (BiH) is available for the crossing of passenger vehicles only, while the border crossing Mali Zvornik (SRB) – Karakaj (BiH) is primarily available for the crossing of all cargo vehicles. The border crossing Badovinci (SRB) – Popovo Polje (BiH) should enable the passage of passenger and cargo motor vehicles that can enter Bosnia and Herzegovina only empty, while both full and empty cargo vehicles can enter Serbia. Crossing from Serbia to Bosnia and Herzegovina can also be done with the help of a scaffold at the Jamena (SRB) – Jamena (BiH) border crossing. The border crossing works so that the ferry departs from Serbia at odd hours every day, and from Republika Srpska at even hours. Drivers that use border crossings with Bosnia and Herzegovina do not experience congestion and long waiting, given that there is no high intensity of traffic.

### 3.7. Border crossing Serbia – Croatia

It is possible to cross the Serbian border to Croatia at eight road border crossings and one railway border crossing. Most of the border crossings are intended for the crossing of passenger and cargo vehicles, namely at the crossings Batrovci (SRB) – Bajakovo (CRO), Bezdan (SRB) – Batina (CRO), Bogojevo (SRB) – Erdut (CRO), Bačka Palanka (SRB) – Ilok (CRO), Šid (SRB) – Tovarnik (CRO) and Ljuba (SRB) – Principovac 2 (CRO). On the other hand, the Neštin (SRB) – Ilok (CRO) border crossing can only be used by passenger and empty cargo vehicles. Also, the Sot (SRB) – Principovac 1 (CRO) border crossing is accessible for passenger vehicles, buses, and empty trucks. The Batrovci border crossing (Figure 12), located on the E70 route (Corridor X) towards Croatia, is characterized by a large flow of traffic. This makes it one of the busiest border crossings in the Republic of Serbia, especially during the summer months and holidays. During the mentioned period, passenger and cargo vehicles may have to wait longer at this border crossing due to frequent lines of vehicles and increased traffic demands.

## 4. Major Road Infrastructure Projects

Currently, 10 projects with a total length of 447.7 km are being implemented, of which 244.3 km are highways. The planned projects, the completion of which is expected in the coming period, are road infrastructure routes that are of great importance for the Republic of Serbia. The design of 13 corridors and roads with a length of over 1100 km is underway, of which 428 km are highways.

#### 4.1. Ongoing Road Infrastructure Projects

Figure 6 shows, in addition to built highways, highways and expressways under construction, not including bypasses around cities that are exclusively of national importance.

To finance the construction of the shown highways and expressways, the Republic of Serbia, in addition to sources of income from the budget, had to take loans from banks from different countries. For the sake of a comprehensive presentation, Table 8 provides information on both the source of financing and the contractors for the aforementioned infrastructure projects.

Figure 6: Highway and expressways under construction



Table 8: Source of funding for infrastructure projects

Highway/ Expressway	L km	Source of finance	Date of contract signing	Value (M C)	Contractor
Fruška Gora Corridor <sup>537</sup>	47,7	Loan from the Chinese Export-Import Bank	26.01.2022	565,2	Chinese company „CRBC“
Section Pojate - Preljina (highway E-761) <sup>538</sup>	112	Loan from J.P. Morgan AG as Agent and JPMorgan Chase Bank, N.A., London Branch, as Arranger and JPMorgan Chase Bank, N.A., London Branch, as Originator. Lender, with the support of the Export Credit Agency of Great Britain	June 2021	431,7	American-Turkish consortium „Bechtel and Enka“
			December 2021	400 (+100 <sup>539</sup> )	
			October 2023	700 <sup>540</sup>	
Section Preljina - Požega (highway E-763) <sup>541</sup>	31	Loan from the Chinese Exim Bank	25.04.2019	414 (85%)	Chinese company „CCCC“ Ltd
		The budget of the Serbia	/	(15%)	
Highway/ expressway Ruma - Šabac - Loznica	80	Loan from Unicredit Bank A.D. Belgrade	30.11.2020	96,26 <sup>542</sup>	Azerbaijan company „Azvirt“
			19.11.2021	127 <sup>543</sup>	
			06.06.2023	128 <sup>544</sup>	
Section Sremska Rača - Kuzmin (highway E-761) <sup>545</sup>	18	Loan from Turkish banks Ziraat and Denizbank	30.12.2019	219,2 (80%)	Turkish company „Tasjapi“
		The budget of the Serbia	/	(20%)	

<sup>537</sup> „Law on confirmation of loan agreement“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\_zakona/2022/137-22%20-%20Lat..pdf

<sup>538</sup> „Law on confirmation of loan agreement“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\_zakona/2021/2502-21%20-%20Lat..pdf

<sup>539</sup> „Law on confirmation of loan agreement“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\_zakona/13\_saziv/748-23%20-%20Lat..pdf

<sup>540</sup> „Law on confirmation of loan agreement“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/cir/pdf/predlozi\_zakona/13\_saziv/1921-23.pdf

<sup>541</sup> „Law on confirmation of loan agreement“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\_zakona/2019/1634-19%20-%20LAT.pdf

<sup>542</sup> „Law on borrowing of the Republic of Serbia“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\_zakona/2020/2004-20%20-%20Lat..pdf

<sup>543</sup> „Law on borrowing of the Republic of Serbia“, National Assembly of the Republic of Serbia, accessed December 5, 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\_zakona/2021/2142-21%20-%20Lat..pdf

<sup>544</sup> „Law on borrowing of the Republic of Serbia“, National Assembly of the Republic of Serbia, accessed December 5, 2023, http://demo.paragraf.rs/demo/combined/Old/t/t2023\_07/SG\_062\_2023\_013.htm

<sup>545</sup> „DRŽAVA SE ZADUŽUJE 219 MILIONA EVRA KOD TURSKIH BANAKA“, Kamatica.com,

Highway/ Expressway	L km	Source of finance	Date of contract signing	Value (M €)	Contractor
Highway Niš - Pločnik – Merdare <sup>546</sup>	77	Loan from European Bank for Re- construction and Development	25.11.2020	85	Austrian company „Strabag“
		Loan from European Investment Bank	12.10.2019	100	
		Donations from the European Union through the Investment Framework for Western Balkans	/	40,6	
		The budget of the Serbia	/	Rest	
Iverak - La- jkovac ex- pressway <sup>547</sup>	18,3	Loan from Chinese Export - Import Bank	26.11.2021	134,3 (85%)	Chinese com- pany „China Shandong“
		The budget of the Serbia	/	(15%)	
Expressway Požarevac – Golubac	68	Loan from NLB Komercijalna bank A.D. Belgrade	14.11.2022	136,2 <sup>548</sup>	Chinese „Shandong Hi-Speed Group“
		Loan from OTP bank Srbija A.D. Novi Sad	20.03.2023	136,2 <sup>549</sup>	

#### 4.1.1. Fruška Gora Corridor

The Fruška Gora Corridor is part of the Novi Sad - Ruma – Šabac – Loznica – border with Bosnia and Herzegovina (BiH). The route of the Fruška Gora Corridor is divided into 4 sections, with a total length of 47,7 km, with two important buildings, one of which is a tunnel (7 km of two pipes), and the other a bridge over the Danube, about 1.770 meters long. Work on the two-tube tunnel under Fruška Gora, and therefore on the Fruška Gora Corridor, officially began on May 1, 2021, and the completion of the project is scheduled for April 2025.<sup>550</sup>

#### 4.1.2. Section Pojate - Preljina (Moravian Corridor), highway E-761

The Moravian Corridor, with a length of 112 kilometres, will connect the highways Belgrade-Niš near Pojate and “Miloš Veliki” near Preljina. It is the first digital highway, but at 30 meters it is also the widest in Serbia, that is, about

accessed December 5, 2023, <https://www.kamatica.com/vest/drzava-se-zaduzuje-219-miliona-evra-kod-turskih-banaka/60583>

<sup>546</sup> „Law on validation of financial agreement”, National Assembly of the Republic of Serbia, accessed December 5, 2023, [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.mfin.gov.rs//upload/media/wrxuKJ\\_6018125e41749.pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.mfin.gov.rs//upload/media/wrxuKJ_6018125e41749.pdf)

<sup>547</sup> „Law on confirmation of loan agreement”, National Assembly of the Republic of Serbia, accessed December 5, 2023, [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi\\_zakona/2021/2217-21%20-%20Lat..pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi_zakona/2021/2217-21%20-%20Lat..pdf)

<sup>548</sup> „Law on borrowing of the Republic of Serbia”, National Assembly of the Republic of Serbia, accessed December 5, 2023, [http://demo.paragraf.rs/demo/combined/Old/t/t2022\\_12/SG\\_138\\_2022\\_015.htm](http://demo.paragraf.rs/demo/combined/Old/t/t2022_12/SG_138_2022_015.htm)

<sup>549</sup> „Law on borrowing of the Republic of Serbia”, National Assembly of the Republic of Serbia, accessed December 5, 2023, [http://demo.paragraf.rs/demo/combined/Old/t/t2023\\_07/SG\\_062\\_2023\\_015.htm](http://demo.paragraf.rs/demo/combined/Old/t/t2023_07/SG_062_2023_015.htm)

<sup>550</sup> „Fruška Gora Corridor”, Ministry of Construction, Transport and Infrastructure of the Republic of Serbia, accessed December 5, 2023, <https://www.mgsi.gov.rs/cir/projekti/frushkogorski-koridor>

two meters wider than the others. The projected maximum speed is 130 kilometres per hour. The Pojate-Preljina highway consists of 3 sections: Pojate – Kruševac (about 28 km), Kruševac – Adrani (about 54 km), and Adrani – Preljina (about 30 km)<sup>551</sup>. This project will regulate the regulation of riverbeds and the telecommunications corridor. This implies that along the highway there will be telecommunications devices through which drivers will receive information important for traffic safety. It is also planned that free internet will be available to passengers. On LED screens or digital radios in cars, drivers will know exactly if there are weather problems, traffic jams, pedestrians, objects thrown on the road, traffic accidents and the like. All digital devices, portals, VMS boards, meteorological stations, surveillance cameras, traffic counters, toll booths will be interconnected. It is planned to build a total of 11 interchanges and 130 other facilities (bridges, overpasses, underpasses, etc.). The road from Pojate to Preljina is extremely important because it connects the central parts of Serbia with the two most important road routes – Corridors 10 and 11. The construction of the Moravian Corridor began at the end of 2019, and the first section from Pojate to Makrešan with a length of 16,8 kilometres was opened on 29.04.2023. years. The Moravian Corridor is an investment worth around 900.000.000 euros, and the investor is the state enterprise Corridors of Serbia. Completion of the work on the Moravian Corridor is planned for 2025<sup>552</sup>.

### 4.1.3. Section Preljina - Požega (highway E-763, Miloš Veliki)

Highway E-763, Preljina-Požega section is 31 km long and is divided into three smaller sections. The first stretches from Preljina to Prijedor along the Čemernica River and a small part next to the Zapadna Morava with a length of up to 8,3 km. Then the second, from Prijedor to Lučani, should be asphalted for 15,51 km, and 20 bridges should be built, which will be longer than 3 km. The construction of the 1.750 m Laz tunnel was also designed. The third subdivision from Lučani to Požega will stretch for 7 km and three bridges, a 2.040 m long tunnel, a loop in Lučani and a bridge over the Bjelica river should be built on it. The Preljina – Požega section is a part of the E-763 highway, i.e. a part of the Belgrade – South Adriatic highway, which connects Serbia and Montenegro, i.e. Belgrade and the South Adriatic, and in a wider context, it will connect Romania, Serbia, Montenegro, and Italy<sup>553</sup>. The deadline for the

<sup>551</sup> „CONSTRUCTION OF HIGHWAY E-761”, Ministry of Construction, Transport and Infrastructure of the Republic of Serbia, accessed December 5, 2023, <https://www.mgsi.gov.rs/lat/projekti/izgradnja-auto-puta-e-761-deonica-pojate-preljina-moravski-koridor>

<sup>552</sup> „The amended plan for the Moravian Corridor has been published”, eKapija.com, accessed December 5, 2023, <https://www.ekapija.com/news/4250655/objavljen-izmenjeni-plan-za-moravski-koridor-kraljevo-dobija-kracu-vezu-na-autoput>

<sup>553</sup> „CONSTRUCTION OF HIGHWAY E-763”, Ministry of Construction, Transport and Infra-



completion of the works that began in May 2019 on the entire section to Pože-  
ga is 36 months, however, due to the delay in the works, the deadline for the  
completion of the works has currently been moved to June 30 in 2024.<sup>554</sup>

#### 4.1.4. Construction of the highway/expressway Ruma - Sabac - Loznica

The total length of the highway/expressway is about 80 km and consists of  
three sections: the section of the Ruma-Šabac highway with a length of about  
22 km, a bridge over the Sava River (with access structures) with a length  
of 2.7 km and Šabac-Loznica section, which will be built in the profile of a  
high-speed road with a length of 55 km. The construction of this road con-  
nects Corridor X with Corridor IV via state roads IB lines 12 and 21 (partly  
Romanian border - Zrenjanin - E-75 - Novi Sad - Ruma - E-70). The concep-  
tual project for the bridge on the Sava River near Šabac was adopted by the  
revision commission. A building permit was issued for the preparatory works,  
which began on December 5, 2019. After two years of construction, at the  
end of July 2021, the bridge over the Sava was connected<sup>555</sup>. On that occa-  
sion, officials emphasized that the Ruma-Šabac highway will be completed by  
October 2023 at the latest (the highway was opened on October 14, 2023),  
while the construction of the Šabac-Loznica expressway will be completed by  
the end of 2024.<sup>556</sup>

#### 4.1.5. Construction of the Section Sremska Rača - Kuzmin (highway E-761, Belgrade - Sarajevo)

The Sremska Rača - Kuzmin section, with a total length of about 18 km  
with a bridge over the Sava River, is part of the E-761 Belgrade - Sarajevo  
highway construction project. The Sremska Rača - Kuzmin highway section  
is designed for a maximum speed of 130 km/h and will have two lanes and  
a one-way lane in both directions. It is planned that the future road will pass  
through the inhabited place of Kuzmin all the way to the existing border  
crossing near Sremska Rača, where a bridge over the Sava will be built with  
a length of about 1,3 km<sup>557</sup>. In December 2019, detailed regulation plans

structure of the Republic of Serbia, accessed December 5, 2023, <https://www.mgsi.gov.rs/cir/projekti/izgradnja-auto-puta-e-763-milosh-veliki-deonica-preljina-pozhega>

<sup>554</sup> „COMPLETION OF THE PRELJINA-POZEGA HIGHWAY POSTPONED TO THE END OF JUNE NEXT YEAR”, energetskiportal.rs, accessed December 6, 2023, <https://energetskiportal.rs/zavrsetak-autoputa-preljina-pozega-pomeren-za-kraj-juna-sledece-godine-produsen-ugovor-firmama-za-nadzor-radova/>

<sup>555</sup> <https://www.mgsi.gov.rs/lat/projekti/izgradnja-auto-putabrze-saobracajnice-ruma-sabac-loznica>

<sup>556</sup> „The Ruma-Šabac highway opens for traffic in October”, eKapija.com, accessed December 6, 2023, <https://www.ekapija.com/news/4309587/autoput-ruma-sabac-otvara-se-za-saobracaj-u-oktobru-do-kraja-2024>

<sup>557</sup> „CONSTRUCTION OF HIGHWAY E-761”, Ministry of Construction, Transport, and Infra-

were adopted for the entire highway route in the Republic of Serbia. The Urban Project was also adopted as a planning document for the construction of a bridge on the Sava. The location conditions for the Sava Bridge were obtained, and the justification study with the conceptual solution was adopted by the Audit Commission on June 24, 2019. The preparation of the project for the construction permit of the first stage of the Sava Bridge was completed and a positive report from the Technical Control was received<sup>558</sup>. Although the construction of the Sremska Rača - Kuzmin section is underway, completion of the works cannot be expected at the end of 2024.

### 4.1.6. Construction of the highway Niš – Pločnik – Merdare

The corridor of the planned highway E-80, the Niš-Merdare section, is divided into two sectors with a total of eight sections, namely: the first sector from the interchange "Merošina" to the settlement of Pločnik with five sections and the second sector from Pločnik to the administrative crossing of Merdare, is indicated in the Spatial Plan of the special purpose area of the E-80 highway infrastructure corridor, Niš Merdare section. The Niš - Pločnik section will have six tunnels, 12 bridges, and a large number of overpasses, underpasses, and viaducts and will be built in four sections: the Merošina – Merošina 1 loop 5,5 kilometres long, the Merošina 1 loop - Prokuplje East loop 8,8 kilometres long, the Prokuplje East – Prokuplje West loop is 12,8 kilometres long and the Prokuplje West – Beloljin loop is 5,5 kilometres long. The deadline for the completion of the works is December 31, 2026. The first section of the Niš – Merdare highway, 5,5 kilometres long, was opened to traffic on July 26, 2023, in a semi-profile. On that section Merošina-Merošina 1, the interchange "Merošina East", two bridges and two overpasses were built.<sup>559</sup>

### 4.1.7. Iverak - Lajkovac expressway

The length of this expressway, which connects Valjevo to the "Milos Veliki" highway, is 18,3 kilometres. In this section, there will be as many as 19 bridges with a total length of 2,5 kilometres and one traffic interchange. The expressway will have two lanes in both directions with a maximum speed

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structure of the Republic of Serbia, accessed December 6, 2023, <https://www.mgsi.gov.rs/lat/projekti/izgradnja-auto-puta-e-761-beograd-sarajevo-deonica-sremska-raca-kuzmin>  
<sup>558</sup> „The highway Kuzmin-Sremska Rača connects the two countries”, nsuzivo.rs, accessed December 6, 2023, <https://nsuzivo.rs/novi-sad/auto-put-kuzmin-sremska-raca-povezuje-dve-drzave-deonica-puta-duga-je-18-kilometara-i-vredi-225-miliona-evra-foto-video>  
<sup>559</sup> „The first section of the Niš-Merdare highway, 5.5 kilometres long, was opened”, danas.rs, accessed December 6, 2023, <https://www.danas.rs/vesti/ekonomija/otvorena-prva-deonica-autoputa-nis-merdare-duzine-55-kilometara/>

limit of 100 kilometres per hour. Works on the Iverak – Lajkovac road started on June 17, 2020 and the deadline for completion is March 31, 2024.<sup>560</sup>

### 4.1.8. Bypass around Gornji Milanovac

The construction of the bypass around Gornji Milanovac represents a new connection between the Ibarska highway and the "Milos Veliki" highway near the Takovo interchange. The length of the ring road is about 9,5 km and it is designed for a speed of 60 kilometres per hour<sup>561</sup>. The construction of the bypass is the largest investment in the municipality of Gornji Milanovac in the last 60 years.

### 4.1.9. Bypass around Užice

The bypass route, as planned, will be about 4,8 kilometres long. A bridge over Đetinja, about 260 meters long, will be built on it, as well as five other shorter bridges<sup>562</sup>. By signing the Commercial Agreement (March 2022) for the construction of the bypass around Užice with the Chinese company Power China, the City of Užice received funds of 29.8 million euros for the construction of the bypass<sup>563</sup>. Construction work has not yet started, but the start is planned for the spring of 2024.

### 4.1.10. Expressway Požarevac – Golubac

The expressway Požarevac - Golubac (the so-called Danube Corridor) will be 68 km long and will connect Požarevac, Golubac, and Veliko Gradište with Corridor 10. The Danube Corridor will have two lanes in both directions and 52 bridges and overpasses, five traffic loops will be built and 16 roundabouts, and is designed for a speed of 100 kilometres per hour. Construction began in November 2021 and the deadline for the completion of the work is the end of 2025.<sup>564</sup>

<sup>560</sup> „Works on the Iverak - Lajkovac expressway are progressing”, va014.info, accessed December 6, 2023, <https://va014.info/napreduju-radovi-na-brzoj-saobracajnici-iverak-lajkovac/>

<sup>561</sup> „The bypass around Gornji Milanovac will be ready by May 2023”, moravainfo.rs, accessed December 6, 2023, <https://moravainfo.rs/momirovic-obilaznica-oko-gornjeg-milanovca-bice-gotova-do-maja-2023/>

<sup>562</sup> „Užice bypass since spring with construction permit”, politika.rs, accessed December 6, 2023, <https://www.politika.rs/scc/clanak/536988/Uzicka-obilaznica-od-proleca-s-gradevinskom-dozvolom>

<sup>563</sup> „A contract was signed for the construction of the ring road around Užice”, radioluna.info, accessed December 7, 2023, <https://www.radioluna.info/potpisan-ugovor-za-izgradnu-obilaznice-oko-uzica/>

<sup>564</sup> „Completion of the high-speed road from Požarevac to Golupca announced for 2025.”, eKapija.com, accessed December 7, 2023, <https://www.ekapija.com/news/4293822/zavrsetak-brze-saobracajnice-od-pozarevca-do-golupca-najavljen-za-2025-u-planu>

#### 4.2. Planned Road Infrastructure Projects

Figure 7 shows, in addition to built highways, planned highways and expressways, not including bypasses around cities that are exclusively of national importance.

Figure 7: Planned highway and expressways



##### 4.2.1. Šumadija Corridor

Although not defined in detail, the planned route of the Šumadija Corridor (the so-called Vožd Karađorđe highway) includes the territories of the municipalities of Sopot, Mladenovac, Lazarevac, Arandelovac, Topola, Račan, Lapovo, Velika Plana, Svilajnac, Despotovac and Bor. The construction of this corridor will enable the connection of eastern Serbia with central and western Serbia and the corridors E-75 and E-763. It is estimated that the length of the planned Šumadija corridor will be approximately 220 km. Currently, the Project task for the creation of the Spatial Plan and Conceptual

Project has been completed. This is followed by the preparation of planning and technical documentation. The start time for the construction of the corridor is still unknown.<sup>565</sup>

### 4.2.2. Section: Požega - Boljare (highway E-763 "Miloš Veliki")

The section of the Požega-Boljaara highway, with a total length of about 107 km, represents the final section of the E-763 highway. The section of the Požega – Boljare highway connects Serbia and Montenegro, i.e. Belgrade and the southern Adriatic, and in a wider context, it will connect Romania, Serbia, Montenegro, and Italy. The preparation of the Spatial Plan of the area of special purpose infrastructural corridor Belgrade - South Adriatic, Požega-Boljaara section (border with Montenegro), highway E-763 is in progress. The preliminary value of the investment is around 1.83 billion euros.

### 4.2.3. Construction of the Belgrade Bypass on the E-70/E-75 highway, sector C, section: Bujanj Potok - Vinča - Pančevo

The project represents the completion of the ring road around Belgrade. The length of the section is 31 km in the full profile of the highway from Bujanj Potok to Pančevo, including the combined road-railway bridge over the Danube (between the Vinča settlement on the right and the Starčevo settlement on the left bank). The preliminary estimate is around 500.000.000 euros.

### 4.2.4. Expressway Sombor – Kikinda

The expressway Sombor – Kikinda will be 175 kilometres long and will connect two border crossings, but between them the cities of Sombor, Kula, Vrbas, Bečej, Novi Bečej, and Kikinda. The road is designed for a speed of 100 kilometres per hour, in four traffic lanes, each 3,5 meters wide. The assumption is that the construction will cost around 430.000.000 euros and that the work will start in 2023. The planned construction time is 2 to 3 years.<sup>566</sup>

### 4.2.5. Expressway Slepčević – Badovinci

The planned route of the IB state road, Slepčević - Badovinci border crossing, begins immediately after entering the route of the IB state road Šabac

<sup>565</sup> „Šumadija Corridor“, Ministry of Construction, Transport and Infrastructure of the Republic of Serbia, accessed December 7, 2023, <https://www.mgsi.gov.rs/lat/projekti/sumadijski-koridor>

<sup>566</sup> „Smile of Vojvodina: This fast road will bring Sombor, Kikinda and Novi Sad closer together.“, [gradnja.rs](https://www.gradnja.rs/osmeh-vojvodine-ova-brza-saobracajnica-priblizice-sombor-kikindu-i-novi-sad/), accessed December 7, 2023, <https://www.gradnja.rs/osmeh-vojvodine-ova-brza-saobracajnica-priblizice-sombor-kikindu-i-novi-sad/>

- Loznica in the territory of the municipality of Bogatić, where it connects to the Pavlović bridge where it joins the state road IB-20. The total length of the section is 15,4 km. The road elements enable a speed of 100 km/h with a cross-section of two physically separated road lanes, with two traffic lanes. Four surface intersections with roundabouts are planned. Eight bridges bridging local roads, smaller watercourses, and canals were also designed<sup>567</sup>.

#### 4.2.6. Corridor Paraćin – Zaječar – Negotin

The corridor of the planned IB state road starts from the existing Paraćin interchange on the E-75 Belgrade-Niš highway Corridor. From this loop, the corridor passes through the territories of the municipalities of Paraćin and Boljevac and the town of Zaječar, after which it goes in the north direction and passes through parts of the territories of the town of Bor and the municipality of Negotin until entering the Negotin. The Infrastructure Corridor of the IB State Road Paraćin-Zaječar – Negotin will connect Corridor X (highway E-75) and Corridor VII (Danube River), which connects the planning area with other parts of Serbia as well as Bulgaria and Romania. For the entire route of the IB state road, a road route for a speed of 80 to 100 km/h is planned and designed.<sup>568</sup>

#### 4.2.7. Đerdap Corridor

This corridor will consist of the IB road Golubac - Donji Milanovac - Brza Palanka and Kladovo - Negotin. The length of the Expressways from Golubac to Brza Palanka will be about 89,32 km, to Kladovo and Negotin 54,22 km, and the total length of the corridor will be 143,54 km, according to the plan. Expressways will have 4 lanes with a width of 3,50 m. The width of the edge strip is planned to be 4 x 0,50 m, the width of the dividing strip is 1 x 3-4 m, the width of the bank is at least 2 x 1,50 m, the width of the inflow/outlet strip is 3,50 m and the width of the additional strip on the slopes is 3,50 m. The calculated speed of 80 km/h (in hilly terrain) to 100 km/h is planned for the entire route of expressways<sup>569</sup>.

<sup>567</sup> „The well-known route of the expressway from Bogatić to the border with Bosnia and Herzegovina”, eKapija.com, accessed December 7, 2023, <https://www.ekapija.com/bs/news/4358204/real-estate/news>

<sup>568</sup> „New route of the corridor through eastern Serbia”, zajecaronline.com, accessed December 7, 2023, [https://zajecaronline.com/nova-trasa-koridora-kroz-istocnu-srbiju-pogledajte-kuda-ce-prolaziti-drzavni-put-paracin-zajecar-negotin/#google\\_vignette](https://zajecaronline.com/nova-trasa-koridora-kroz-istocnu-srbiju-pogledajte-kuda-ce-prolaziti-drzavni-put-paracin-zajecar-negotin/#google_vignette)

<sup>569</sup> „The finished plan for the Đerdap Corridor”, b92.net, accessed December 7, 2023, <https://www.b92.net/biz/vesti/srbija/gotov-plan-za-derdapski-koridor-evo-kuda-ce-proci-mapa-2310986>

### 4.2.8. Expressway Kraljevo – Novi Pazar

The spatial plan will include the corridor of the planned high-speed road in the Kraljevo-Novı Pazar direction, which is 83,4 km long. The expressway corridor starts from the Adrani interchange on state road IA number 5 (highway E-761, under construction) and extends south along the new route, bypassing the construction area of the city of Kraljevo on the western side and crossing the existing Čačak – Kraljevo road. For the entire route of the expressway, a road route is planned and designed for a speed of 80 km/h to 100 km/h.<sup>570</sup>

### 4.2.9. Expressway Ostružnica – Obrenovac

The corridor of the planned high – speed road, in the direction from Ostružnica to the connection with the state road IA line E-763, will have a total length of about 14,8 km and a width of 50 m to 300 m, which includes the route with protective belts of the high-speed road. In the area of the spatial plan, for the entire route of the expressway, the road route is planned and designed for a speed of 100 km/h.<sup>571</sup>

### 4.2.10. Expressway Kragujevac – Mrčajevci

The expressway Kragujevac – Mrčajevci will have a length of 37 km. The road route is conditionally divided into three sections: section 1 (km 0 + 000 - km 23 + 150), section 2 (km 23 + 150 - km 32 + 000) and – section 3 (km 32 + 000 – km 35 + 955). For the entire route of the expressway, a road route for a speed of 100 km/h is planned and designed.<sup>572</sup>

### 4.2.11. Highway Požega – Užice – Kotroman

The Požega – Užice – Kotroman highway is the second branch that connects to the Miloš Veliki highway in Požega. The planned route is 61 kilometres long, there will be 134 bridges and 27 tunnels. On this section, there will be 26 tunnel tubes with a total frame length of 34,950 m and one tunnel in a wide excavation with a length of 250 m for both directions<sup>573</sup>. The estimated value of the project is 830 million euros.<sup>574</sup>

<sup>570</sup> „The Kraljevo-Novı Pazar expressway will be 83 km long”, eKapija.com, accessed December 7, 2023, <https://www.ekapija.com/news/4269913/brza-saobracajnica-kraljevo-novi-pazar-bice-duga-83-km-kuda-ce-sve>

<sup>571</sup> „The Ostružnica-Obrenovac expressway will be almost 15 km long”, eKapija.com, accessed December 7, 2023, <https://www.ekapija.com/news/3764780/brza-saobracajnica-ostruznica-obrenovac-bice-duga-gotovo-15-km-trasa-preko-klizista>

<sup>572</sup> „The fixed route of the expressway Kragujevac - Mrčajevci”, ozonpress.net, accessed December 7, 2023, <https://www.ozonpress.net/ekonomija/utvrđjena-trasa-brze-saobracajnice-kragujevac-mrcajevci/>

<sup>573</sup> „Požega-Kotroman highway: As many as 134 bridges and 27 tunnels on 61 km”, nova.rs, accessed December 7, 2023, <https://nova.rs/vesti/biznis/auto-put-pozega-kotromana-61-km-cak-134-mosta-i-27-tunela/>

<sup>574</sup> „BY HIGHWAY FROM POŽEGA TO THE BORDER WITH BIH”, blic.rs, accessed December

#### 4.2.12. Highway Beograd – Pančevo – Vatin

The road route Belgrade – Pančevo – Vršac – Vatin to the border with Romania is part of the transverse connection between two adopted European corridors, the modernization of which would create more favorable conditions for road traffic between Timisoara and the port of Bar. The length of the route on the Serbian side is about 65 kilometres, and the estimated value of the project is about 450 million euros. The planned start of the works is in 2024, and the deadline for completion is in 2027.

#### 4.2.13. Northern bypass around Kragujevac

The northern bypass around Kragujevac is planned as a 22.2 kilometer-long highway. The construction contract is worth 265,2 million euros. The route of the future expressway will stretch over hilly terrain and be designed for a speed of up to 100 km/h.<sup>575</sup>

### 4.3. Role of National, EU and Third-party Road Infrastructure Funding in Serbia

The European Union stands out as the largest grants-based donor in the Republic of Serbia in terms of funds in all areas: from the rule of law, public administration reform, social development, environment, and agriculture. The financial assistance is provided through the Instrument for Pre-Accession (IPA) which aims to help Serbia prepare for assuming and effectively implementing obligations of its future membership in the EU. In addition, EU member states also provided significant bilateral assistance. Serbia is the largest recipient of EU funds among the countries of the Western Balkans with 200 million euros per year. In recent years, support has been increasingly oriented towards preparations for EU membership<sup>576</sup>. When it comes to road infrastructure, the EU is helping Serbia build new key roads. In this regard, in December 2021, the construction of the Nis-Merdare highway (part of the Peace Highway) began. For the construction of the first phase, from Niš to Pločnik (34 km), 40,6 million euros of grants were provided through the Investment Framework for the Western Balkans, while 185 million euros were provided from EIB and EBRD loans.<sup>577</sup>

7, 2023, <https://www.blic.rs/vesti/drustvo/auto-putem-od-pozege-do-granice-sa-bih-evo-kuda-ce-prolaziti-nova-saobracajnica-mapa/b7w122m>

<sup>575</sup> „Five bridges will be built on the first section of the Northern Ring Road around Kragujevac”, eKapija.com, accessed December 7, 2023, <https://www.ekapija.com/news/4341117/na-prvoj-deonici-severne-obilaznice-oko-kragujevca-gradice-se-pet-mostova-pogledajte>

<sup>576</sup> “GROWING TOGETHER, Most Successful EU Funded Projects in Serbia”, European Union, accessed December 7, 2023, [chrome-extension://efaidnbnmnnibpcajpcglcdefindmkaj/https://europa.rs/images/publikacije/Growing\\_Together.pdf](chrome-extension://efaidnbnmnnibpcajpcglcdefindmkaj/https://europa.rs/images/publikacije/Growing_Together.pdf)

<sup>577</sup> “Traffic”, EU projects in Serbia, accessed December 7, 2023, <https://www.euzatebe.rs/rs/sektori/povezivanje-saobracaj-o-sektoru>



In addition to the European Union, among the main financiers for the construction of infrastructure projects are loans from Chinese banks. Namely, the Republic of Serbia took a loan for about 1.113.500.000 euros for the construction of highways that are currently being built. That is, from the Export-Import Bank of China, Serbia received a loan of 565,2 million euros for the construction of the Fruška Gora corridors, while a total of 414 million euros was invested in the construction of the Preljina - Požega highway (highway E-763). Also, as 85% of the financing of the expressway Iverak - Lajkovac, the Republic of Serbia decided on a loan from the mentioned Chinese bank for around 134,3 million euros. Also, Serbia took a significant amount of credit from J.P. Morgan AG as Agent and JPMorgan Chase Bank, N.A., London Branch, as Arranger and JPMorgan Chase Bank, N.A., London Branch, as Originator. lender, with the support of the Export Credit Agency of Great Britain for the construction of the Preljina - Pojate highway section (E-761). Taking it in stages, in certain time periods, Serbia took a loan of 431,7 million euros, then 400 million euros and an additional 100 million euros, and in 2023, as the last, a loan of 700 million euros was taken. In addition to the above, Serbia took a loan from Turkish banks, Ziraat and Denizbank, for the construction of the Sremska Rača - Kuzmin highway section (E-761) in the amount of 219,2 million euros. However, this amount refers to 80% of the project value.

The World provide \$388 million loan to Serbia for the Corridor X Highway Project<sup>578</sup>. The project is used to build three missing links on the Corridor X highway, improve road safety and support better management in the transport sector. This loan is the largest ever World Bank loan to Serbia.

Commercial banks operating in the Republic of Serbia had a share in the financing of infrastructure projects such as the expressways Ruma - Šabac - Loznica and Požarevac - Golubac. Namely, the Republic of Serbia took a loan from Unicredit Bank A.D. Belgrade for 127 million euros, and from Banca Intesa A.D. Belgrade 128 million euros for the construction of the high-speed road Ruma - Šabac - Loznica. Also, from NLB Komercijalna bank A.D. Belgrade and OTP bank Srbija A.D. In Novi Sad, a loan of 136,2 million euros was taken for the construction of the expressways road Požarevac - Golubac.

<sup>578</sup> <https://www.worldbank.org/en/news/press-release/2009/07/09/World-Bank-Approves-388-Million-for-Highway-Project-to-Improve-Trade-and-Road-Safety>

## **5. Summary and outlooks for road and road-related infrastructure projects (bridges, tunnels) of regional significance**

### **5.1. Roads**

The following road infrastructure projects (described in the sections above) have bilateral and/or regional importance:

1. Bilateral importance between Serbia and Bosnia and Herzegovina:
  - Construction of the highway/expressway Ruma - Šabac - Loznica
  - Sremska Rača - Kuzmin (highway E-761, Belgrade - Sarajevo)
  - Expressway Slepčević – Badovinci
  - Bridge over the Sava (Kuzmin – Sremska Rača highway)
2. Bilateral importance between Serbia and Montenegro
  - Požega - Boljare (highway E-763 "Miloš Veliki")
  - Highway Požega – Užice – Kotroman
3. Bilateral importance between Serbia and Albania
  - the highway Niš - Pločnik – Merdare
4. Bilateral importance between Serbia and Romania
  - Corridor Paraćin – Zaječar – Negotin
  - Expressway Sombor – Kikinda
  - Đerdap Corridor
5. Bilateral importance between Serbia and Bulgaria
  - Corridor Paraćin – Zaječar – Negotin
  - Đerdap Corridor

### **5.2. Tunnels**

The following two tunnel projects have bilateral significance between Serbia and Montenegro.

#### **5.2.1. Tunnel Laz**

The Laz tunnel is one of the two existing tunnels within the route of the Preljina - Požega highway section. The length of the tunnel is 2,843 km, which makes it one of the longest tunnels in Serbia, and in March 2023, its right pipe was breached.<sup>579</sup>

<sup>579</sup> "The longest tunnel in Serbia: After 36 months, the right tube of the tunnel was broken", b92.net, accessed December 7, 2023, <https://www.b92.net/biz/vesti/srbija/naj-duzi-tunel-u-srbiji-nakon-36-meseci-probijena-desna-cev-tunela-laz-foto-2306913>

### 5.2.2. Tunnel Munjino Brdo

The "Munjino Brdo" tunnel is the second tunnel within the section of the Preljina – Požega highway. Its length is 2,740 km, similar to the length of the Laz tunnel.

## 5.3. Bridges

The following two bridge projects have bilateral significance between Serbia and Bosnia and Herzegovina.

### 5.3.1. Bridge over the Sava (Highway Ruma – Šabac – Loznica)

The bridge over the Sava, one of two over this river that is currently under construction, was connected in July 2022. The bridge is part of the Ruma-Šabac highway that continues to the Šabac-Loznica expressway. The bridge over the Sava is 1,327.5 km long and was put into operation on 14.10.2023.

### 5.3.2. Bridge over the Sava (Kuzmin – Sremska Rača highway)

The Bridge over the Sava River is located on the Kuzmin – Sremska Rača highway section, which is a part of the future highway to Bijeljina. The total width of the standard cross-section is 30.00 m<sup>580</sup>. While the section of the highway Kuzmin - Sremska Rača is part of the construction project of the highway Belgrade - Sarajevo, the bridge on the Sava represents a direct connection between the two countries with the full profile of the highway. This reflects its regional importance, connecting Serbia and Bosnia and Herzegovina. The works are mostly financed from the budget of the Republic of Serbia (80%) and 20% from the budget of the Republic of Srpska.<sup>581</sup>

## 5.4. Sources of Funding for Bridges and Tunnels

As bridges and tunnels are an integral part of road infrastructure projects, in the existing documentation these facilities are classified as road projects in terms of financing (Table 8). Table 9 provides a summary of funding sources and contractors. In addition to the mentioned contractors, subcontractors from Serbia are also involved in the construction.

<sup>580</sup> "Bridge over the Sava River on the Kuzmin – Sremska Rača highway", Traffic Institute CIP d.o.o., accessed December 7, 2023, <https://sicip.rs/en/projekti/bridge-over-the-sava-river-on-the-kuzmin-sremska-raca-highway/>

<sup>581</sup> "The bridge over the Sava to Republika Srpska will be built by the end of the year", danas.rs, accessed December 7, 2023, <https://www.danas.rs/vesti/ekonomija/vesic-most-preko-save-do-republike-srpske-bice-izgradjen-do-kraja-godine/>

Table 9: Sources of funding for bridges and tunnels

Tunnel/ Bridges	Length (km)	Source of finance	Date of contract signing	Contractor
Tunnel Laz	2,843	Loan from the Chinese Exim Bank (85%) and the budget of the Serbia (15%)	25.04.2019	Chinese company „CCCC“ Ltd
Tunnel Munjino brdo	2,740			
Bridge over the Sava (Highway Ruma – Sabac – Loznica)	1,327.5	Loan from Unicredit Bank A.D. Belgrade	30.11.2020	Azerbaijan company „Azvirt“
		Loan from Banca Intesa A.D. Belgrade	19.11.2021 06.06.2023	
Bridge over the Sava (Kuzmin – Sremska Rača highway)	1,312	Loan from Turkish banks Ziraat and Denizbank (80%) and the budget of the Serbia <sup>582</sup> (20%)	30.12.2019	Turkish company „Tasjapi“
		The budget of the Republic of Srpska (20%)		

## 6. Mapping of Existing Challenges to Road Infrastructure and Connectivity

Below is presented the existing challenges in enhancing road connectivity in Serbia from both internal and external dimensions, while also highlighting cooperation with the European Union (EU) and Serbia’s membership aspirations. Additionally, it addresses the imperative need for decarbonization in road infrastructure, focusing on the utilization of recycled construction materials and the development of infrastructure for electric vehicles (EVs).

### 6.1. Challenges

Mapping the political, financial, ecological, and other challenges related to road connectivity in Serbia is essential for decision-making, particularly within the context of Serbia’s EU integration. Addressing these challenges requires a multi-faceted approach involving cooperation with neighboring countries, securing EU funding, and prioritizing sustainability and decarbonization efforts.

#### 6.1.1. Political Challenges

Serbia’s road connectivity is contingent on regional cooperation, often subject to geopolitical situations in the Balkans. Resolving political disputes among neighbouring countries is essential to ensure smooth cross-border connectivity, a priority in Serbia’s EU accession process. Serbia must align its road regulations and standards with those of the EU to ensure compatibility with the broader European transport network. This paper shows numerous successful

<sup>582</sup> The Republic of Serbia finances 80% of the works.

bilateral cooperation examples between Serbia and neighbouring countries in chapter 5. Another successful exhibit of regional cooperation is the „Open Balkan“ initiative that implements interoperability in road tolling.

### **6.1.2. Financial Challenges**

#### *a. Funding Constraints*

Financing large-scale road infrastructure projects can strain the national budget. Serbia’s cooperation with the EU and other non-EU funding programs (Chapter 3, Chapter 4 and Chapter 5) can provide access to grants and loans that alleviate this financial burden. Limitation in National budget can be alleviated also with Public-Private Partnership (PPP).

#### *b. EU Funding Programs*

Serbia can benefit from EU funding programs like the Instrument for Pre-accession Assistance (IPA), which supports infrastructure development in aspiring EU member states. Good example of EU road funding is highway E-80, the Niš-Merdare where 40 million euros of grants were provided through the Investment Framework for the Western Balkans, in combination with 180 million euros of loans from the EIB and the EBRD.

### **6.1.3. Ecological Challenges**

#### *a. Environmental Impact*

Road expansion and construction can have detrimental environmental effects, including habitat destruction and increased emissions. Comprehensive environmental impact assessments are necessary to meet EU environmental standards.

According to the INFORM risk index from 2024, Serbia is exposed to natural hazards (Figure 8). The main natural hazards in Serbia are, among others, (torrent and river) floods, storms, droughts, landslides, and earthquakes.

Figure 8: INFORM risk index in the countries of the Western Balkans<sup>583</sup>

The risks are not the same throughout the territory of Serbia, they differ depending on the type of danger, exposure, vulnerability, and capacity to act in emergencies. However, floods represent the main hydrometeorological hazard. The valleys of larger watercourses, where settlements, agricultural land, infrastructure, and industry are located, are exposed to a high risk of floods, which most often occur in the Vojvodina region and along the Sava, Drina, Velika Morava, Južna Morava, and Zapadna Morava rivers. Floods in the main river basins are caused by long periods of precipitation and/or sudden melting of snow.

Extreme rainfall during April and May 2014 caused the most destructive floods recorded in more than a hundred years. Floods destroyed 30 bridges, and about 50 bridges were damaged on categorized roads, while on municipal and uncategorized roads, about 200 bridges were destroyed and damaged. As a result of landslides, about 20 categorized and hundreds of local roads were damaged, and the flood swept away about 10 kilometres of railway in Tamnava in the Uba area.<sup>584</sup>

The floods that occurred in the Republic of Serbia threatened the lives, health, and property of more than 1,6 million people, or 22% of the total population. In December 2014, the Government adopted the National Program of the Republic of Serbia for the management of the risk of natural disasters to determine measures and determine a higher level of protection of people and property<sup>585</sup>. For the implementation of the Weather Preven-

<sup>583</sup> „Map Explorer“, European Commission, accessed December 7, 2023, <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Map-Explorer>

<sup>584</sup> „Report on the natural disaster - the flood that hit the Republic of Serbia and the measures taken to save the population and protect vulnerable places from flooding“ <https://otvoreniparlament.rs/akt/2371>

<sup>585</sup> „National program of elementary disaster risk management“, Government of Republic

tion Program, over 100 million euros were provided for the construction of flood protection facilities. In addition to the Government of Serbia, the World Bank and the delegation of the European Union participated in the financing.

### *b. EU Green Initiatives*

The EU places emphasis on green infrastructure and sustainability. Serbia's efforts to align with EU green initiatives can accelerate decarbonization efforts in road infrastructure.

### **6.1.4. Other Potential Challenges**

#### *a. Land Acquisition*

Land Acquisition can slow down or significantly delay road project construction. Acquiring land for road projects can be contentious. Serbia has a new law that tackles this issue successfully. The amendment to the Law on Expropriation enables expropriation to be carried out in the service of the common good, but at the same time sets strict conditions and guarantees owners fair compensation for their property. Given this, the Law on Expropriation in the Republic of Serbia regulates the procedure of forced confiscation of private ownership of immovable property in cases where there is a public interest. Public interest in expropriation can be established for various purposes, including infrastructure construction. The introduction of these changes influenced the faster construction of highways due to the accelerated expropriation of land on significant road routes.

#### *b. Infrastructure Resilience*

Ensuring the resilience of road infrastructure to climate change and natural disasters is important for all road infrastructure. The following natural hazards and climate events have the greatest impact in the field of road infrastructure on the territory of the Republic of Serbia:

- Floods (activation of landslides and slope instability, damage to drainage systems, soil erosion under bridge piers);
- Snow drifts - storms (traffic interruptions and traffic safety);
- Increase in maximum temperatures (durability of pavement structures).

The direct consequences in the field of road infrastructure were reflected in the damage to bridges and roads and the activation of numerous landslides

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of Serbia, accessed December 7, 2023, <https://www.obnova.gov.rs/uploads/useruploads/Documents/Nacionalni%20program%20upravljanja%20rizikom%20od%20elementarnih%20nepogoda.pdf>

and slope instability.. All new bridges and roads are now designed to be climate disasters (floods) resilience as the consequences of experience with 2014 floods.

### 6.2. Decarbonization of Road Infrastructure

#### 6.2.1. Recycled Construction Materials

The existing infrastructure for the treatment of construction and demolition waste in the Republic of Serbia includes crushing plants and recycling less than 1.000 tons of waste per year. The treatment of construction and demolition waste as a substitute for primary resources for construction activities is quite underdeveloped in the Republic of Serbia. Bituminous material is used to some extent for roads or reused on the construction site itself for road maintenance. In Serbia, there is currently no practice of separate collection of construction and demolition waste, and no scheme for its recycling. Only small amounts of construction and demolition waste and asphalt are recycled. According to the data of the Republic Institute for Statistics of the Republic of Serbia, 301.705 tons of construction and demolition waste were generated in 2022, of which only 1.351 tons were recycled. By 2029, the recycling of construction waste should increase from the current 3-5% to 40%. The final goal is to treat 70 percent of construction and demolition waste by the end of 2034<sup>586</sup>. In this regard, the Waste Management Program<sup>587</sup> in the Republic of Serbia for the period from 2022 to 2031 was adopted.

Encouraging the use of recycled construction materials is in line with EU sustainability goals and contributes to Serbia's compliance with EU construction standards.

#### 6.2.2. Electric Vehicle Infrastructure

Serbia is one of five countries in Europe whose governments have issued a Level 3 (Highly Automated Driving) license for autonomous vehicles. This means that the driver sits in the driver's seat and supervises the driving on the road and the automated driving system, whereby he must be ready to take control of the vehicle in all cases where road traffic safety would be endangered. In September 2023, the Law on Amendments to the Law on

<sup>586</sup> "What to do with construction waste? We only recycle 5%", Građevinarstvo.rs, accessed December 7, 2023, <https://www.gradjevinarstvo.rs/vesti/20102/810/zatrpava-nas-gradjevinski-otpad-recikliramo-samo-5>

<sup>587</sup> "WASTE MANAGEMENT PROGRAM IN THE REPUBLIC OF SERBIA FOR THE PERIOD 2022 – 2031", Government of Republic of Serbia, accessed December 7, 2023, [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ekologija.gov.rs/sites/default/files/2022-02/program\\_upravljanja\\_otpadom\\_u\\_rs\\_za\\_period\\_2022-2031.\\_god\\_0\\_2.pdf](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ekologija.gov.rs/sites/default/files/2022-02/program_upravljanja_otpadom_u_rs_za_period_2022-2031._god_0_2.pdf)



Road Traffic Safety<sup>588</sup> ("Official Gazette of RS", No. 76/2023) was adopted, in which the concept of an autonomous vehicle is defined. The Rulebook on conditions for autonomous driving<sup>589</sup> ("Official Gazette of RS", No. 104/2023) explains in detail the way and place of testing autonomous vehicles and the required permit. A permit can be issued for one or more autonomous vehicles for a period of no longer than one year, and the first permits have already been issued. The use of these vehicles is in the beginning, so it is expected that in the coming period, with a greater use of them, there will be positive effects on the capacity of roads and traffic safety.

According to the data of the Ministry of Internal Affairs, a total of 2,100 electric and 17,000 hybrid vehicles are registered in Serbia. For the purchase of a new electric passenger vehicle, the state provides a subsidy of 5,000 euros per vehicle<sup>590</sup>. The Government of Serbia announced that every year more and more such vehicles are purchased with the help of state subsidies, so in 2020, 112 were purchased, in 2021, 504, and in 2022, a record 715 vehicles were purchased.<sup>591</sup>

By developing an extensive network of charging stations for electric vehicles Serbia will meet EU directives and promote sustainable transportation options. According to the Planning and Construction Act,<sup>592</sup> owners of fuel pumps for motor vehicles, located on highways, are obliged to install chargers for charging electric vehicles. Public company "Roads of Serbia" installed 8 chargers for electric cars at strategically key points on highways in the Republic of Serbia (Figure 9). Of the mentioned 8, 5 electric chargers are 22-50kW, while the remaining 3 are 175kW. It is planned that 20 rest stops on the highways will be converted into "green" pumps with at least 10 fast electric chargers.<sup>593</sup>

<sup>588</sup> "Law on Amendments to the Law on Road Traffic Safety", National Assembly of the Republic of Serbia, accessed December 7, 2023, [https://www.paragraf.rs/izmene\\_i\\_dopune/070923-zakon-o-izmenama-i-dopunama-zakona-o-bezbednosti-saobra-caja-na-putevima.html](https://www.paragraf.rs/izmene_i_dopune/070923-zakon-o-izmenama-i-dopunama-zakona-o-bezbednosti-saobra-caja-na-putevima.html).

<sup>589</sup> "Rulebook on conditions for performing autonomous driving", Ministry of Interior, Republic of Serbia, accessed December 7, 2023, [chrome-extension://efaidnbmnnnibpcajpc-gclefindmkaj/https://www.ekapija.com/dokumenti/autonomna\\_voznja.pdf](chrome-extension://efaidnbmnnnibpcajpc-gclefindmkaj/https://www.ekapija.com/dokumenti/autonomna_voznja.pdf)

<sup>590</sup> "UREDBA O USLOVIMA I NAČINU SPROVOĐENJA SUBVENCIONISANE KUPOVINE NOVIH VOZILA ", National Assembly of the Republic of Serbia, accessed December 7, 2023, <https://www.paragraf.rs/propisi/uredba-o-uslovima-subvencionisane-kupovine-elektricnih-hibridnih-vozila.html>

<sup>591</sup> "Srbija bogatija za 500 električnih vozila, najskuplji 135.000 evra", bloombergadria.com, accessed December 7, 2023, <https://rs.bloombergadria.com/ekonomija/srbija/44179/najskuplji-elektricni-auto-u-srbiji-kostao-135000-eur/news>

<sup>592</sup> "Law on Planning and Construction", National Assembly of the Republic of Serbia, accessed December 7, 2023, [https://www.paragraf.rs/propisi/zakon\\_o\\_planiranju\\_i\\_izgradnji.html](https://www.paragraf.rs/propisi/zakon_o_planiranju_i_izgradnji.html)

<sup>593</sup> "SRBIJA GRADI "ZELENE" PUMPE", kurir.rs, accessed December 7, 2023, <https://www.kurir.rs/vesti/politika/4222358/srbija-gradi-zelene-pumpe-vesic-od-sledece-nedelje-tender-za-uredjenje-20-odmorista-sa-elektropunjacima-na-autoputevima>

## Serbia

The installation of electric chargers on highways is carried out by the company Putevi Srbije, while on other parts of the network and in urban areas it is done by private companies. The increasing penetration of these electric chargers throughout the country is evidenced by the large number of chargers installed in smaller cities, such as Subotica, Novi Sad, Kragujevac, Čačak, Niš and in the tourist destinations of Kopaonik and Zlatibor. In addition to the aforementioned cities, the largest number of chargers has been installed in the capital Belgrade, and along Corridor X.

*Figure 9. Stations with electric chargers*



Serbia is the only country in the region where the import of used cars with the Euro 3 standard is still allowed, however, from January 1, 2024, the import of used cars of the Euro 3 and Euro 4 standards will be prohibited. Also, the Government of the Republic of Serbia announced that from the beginning of 2025, it will be possible to import only used cars produced after 2014, i.e. with the Euro 6 standard. The country also intends to introduce a subsidy program for owners of older cars with diesel engines from 2025. to reduce pollution in that way.

### **6.2.3. Sustainable Road Design**

Embracing sustainable road design principles in line with EU recommendations to minimize environmental impact and energy consumption is import-

ant in the design stage of project delivery. Experts are aware of this fact and apply the latest EU standards and guidelines in the design process. New law on waste management (April 2023) impose that designs need to define use of recycled materials as well as in stage of construction waste materials need to be recycled.

### **7. Proposal and Recommendations for Enhancing Road Infrastructure and Cross-Border Road Connectivity in Serbia**

Serbia, as a country in the Balkan region, plays an important role in regional trade and connectivity. To promote economic growth, improve living standards, and facilitate cross-border trade, it is imperative to enhance road infrastructure and cross-border road connectivity in Serbia.

**The primary objectives** for enhancing road infrastructure and cross-border road connectivity are as follows:

- **Upgrade Existing Road Networks:** Improve the quality and capacity of existing roads, focusing on key transport corridors, that connects Serbia with neighbouring countries. This is achieved by finishing construction of highway Corridor 10 that enable quality links with Croatia, Hungarian, Romania and Bulgaria. New highways are under construction to Montenegro and to Bosnia and Herzegovina. New highway toward Romania is in stage of design and it is planned to that construction starts in near future. When new highways to Montenegro Bosnia and Herzegovina and Romania are constructed and open to traffic, quality and capacity highways will connect Serbia to all neighbouring countries.
- **Facilitate Cross-Border Trade:** Enhance connectivity with neighbouring countries, including Montenegro, Bosnia and Herzegovina, Croatia, Hungary, Bulgaria, North Macedonia, Albania, and Romania. To achieve this goal Serbia is planning to reconstruct border following border crossings: Horgoš border crossing, Border crossing Gradina, Border crossing Kusjak, Border crossing Neštin, Border crossing Gos-tun.
- **Boost Economic Growth:** Promote economic development through improved logistics and transportation efficiency. This can be achieved with improved border crossing operations thus decreasing waiting time for trucks and lorries.

- **Enhance Road Safety:** Implement safety measures to reduce accidents and fatalities on Serbian roads. New roads will provide better safety thus reducing the number of traffic accidents.

**The primary recommendations** for enhancing road infrastructure and cross-border road connectivity in Serbia are as follows:

*A. Road Network Expansion and Rehabilitation*

**Highway Development:** Continue to expand the highway network, focusing on critical corridors.

**Maintenance and Rehabilitation:** Allocate resources for the regular maintenance and rehabilitation of existing roads and bridges to ensure safety and longevity.

**Regional Road Upgrades:** Invest in upgrading regional roads to enhance connectivity between rural areas and urban centres.

*B. Cross-Border Connectivity*

**Cooperation with Neighbours:** Collaborate closely with neighbouring countries to improve cross-border road infrastructure and customs procedures.

**Customs and Border Facilitation:** Implement efficient customs procedures and reduce waiting times at border crossings to facilitate trade.

**Corridor Development:** Prioritize the development of international transport corridors, including the Adriatic-Ionian Corridor and the Danube River Corridor.

*C. Investment and Funding*

**Public-Private Partnerships (PPPs):** Encourage private sector participation through PPPs to fund and manage road projects.

**Access International Funding:** Seek grants and loans from international financial institutions such as the European Investment Bank (EIB), the World Bank and other financial institutions.

**Transparent Budgeting:** Maintain transparency in budget allocation for road infrastructure projects to ensure efficient utilization of resources.

*D. Road Safety*

**Road Safety Audits:** Conduct regular road safety audits and implement recommended safety measures on high-risk sections.

**Driver Education:** Promote road safety awareness campaigns and driver education programs to reduce accidents.

**Traffic Enforcement:** Strengthen laws to enforce traffic regulations.

*E. Environmental Considerations*

**Environmental Impact Assessment:** Prior to road construction, conduct thorough environmental impact assessments and incorporate eco-friendly measures into infrastructure projects.

**Green Infrastructure:** Integrate green infrastructure practices to mitigate the environmental impact of road development.

Serbia's commitment to these infrastructure enhancements will not only benefit the nation but also foster stronger ties with neighbouring countries and further integrate the Balkan region into the global economy.

# Road Infrastructure in Türkiye

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## Road Infrastructure in Türkiye: Brief Overview

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### **1. Summary and Outlooks for Major Road Infrastructure Projects until 2027**

Road transportation is a popular transportation sector that is preferred over all other modes of transportation in the Republic of Türkiye due to its ability to provide uninterrupted transportation between points, its flexible structure, speed, and compatibility with intermodal transitions, which also maintains its investment appeal.

The road transportation infrastructure of the Republic of Türkiye has improved in terms of quality and quantity over the last 20 years thanks to targeted investments made during this period. In Türkiye, similar to European countries, road transportation holds a significant share in terms of the distribution of transportation modes, with a higher proportion of passenger and freight transport compared to other modes. On the other hand, while car ownership in EU countries has reached saturation, in Türkiye there are approximately 169 cars per thousand people, which is one-third of the EU27 average (532 cars per 1000 people in terms of car ownership). It is anticipated that within the next 20 years Türkiye will catch up in this regard but achieving this level necessitates continuous and increased development of road transportation infrastructure, which holds significant importance.

After 2003, investments in road construction and infrastructure in the country gained momentum to provide uninterrupted and comfortable transportation services. These investments have improved accessibility between regions and cities, easing transportation with enhanced infrastructure. During this period of a 169% increase in mobility, the investments made in passenger and cargo safety have reduced road fatalities by 4.3 times, ensuring safer travel.

As of July 1, 2023, the General Directorate of Highways (GDH) managed a total road network of 68,640 kilometres, consisting of 3,633 kilometres (5%) of expressways, 30,855 kilometres (45%) of state highways, and 34,152 kilometres (50%) of provincial roads.

Türkiye's motorways network consists of 2,282 kilometres built through equity financing and 1,351 kilometres through the Build-Operate-Transfer (BOT)

financing model. The highways completed using the BOT model and serving as crucial parts of the country's transportation network are as follows:

- Istanbul-Bursa-Izmir Motorway (including Osmangazi Bridge) - 426 km;
- Northern Marmara Motorway (including Yavuz Sultan Selim Bridge) - 398 km;
- Menemen-Aliğa-Çandarlı Motorway - 96 km;
- Ankara-Niğde Motorway - 330 km;
- Kınalı-Tekirdağ-Çanakkale-Balıkesir Motorway - 101 km.

Due to the success achieved in completed expressway projects using the BOT financing model, the efforts for completing the ongoing projects (395 km) and initiating the tender processes for planned expressway projects (242 km) have gained momentum, just like in the period between 2003 and 2023. In line with the vision of the Ministry of Transport and Infrastructure, under the U2053 vision, there is a targeted plan to increase the total length of operational expressways to 8,164 km by 2035 with the construction of 3,894 km of expressway projects planned after the year 2024.

The activities carried out in line with the objectives of the Ministry not only shape today's Türkiye but also design the future Türkiye, its position as a central hub for transportation corridors in the region and the world. In this regard, the published Transportation and Logistics Master Plan outlines the vision of the Ministry for the entire transportation sector until the year 2053. Accelerating its efforts in this direction, the General Directorate of Highways aims to reach a total of 31,260 km of Divided Road network, including 4,270 km of expressways, by the end of 2027. Important expressway projects, planned to be completed by the end of 2027 through the Build-Operate-Transfer (BOT) economic model, include:

- Aydın-Denizli Motorway;
- Northern Marmara Motorway Nakkaş-Başakşehir Section;
- Kınalı-Malkara Motorway;
- Çeşmeli-Kızkalesi Section;
- Ankara-Kırıkkale-Delice Motorway;
- Antalya-Alanya Motorway

## **2. Summary and Outlooks for Road-related Infrastructure Projects and Regional Connectivity**

Under the authority of the GDH, 9,733 bridges with a total length of 750 km have been constructed and put into service. Some of the significant bridges and viaducts that align with the objectives of the Ministry and have been opened to traffic are as follows:



- 1915 Çanakkale Bridge (2022);
- Osmangazi Bridge (2016);
- Yavuz Sultan Selim Bridge (2016);
- Kömürhan Bridge (2021);
- Adana 15 July Martyrs Bridge (2023);
- Bitlis Çayı Viaduct (2022);
- Eğiste Hadimi Viaduct (2022).

As part of tunnel construction efforts, between the years 2003 and 2023, a total of 403 tunnels with a combined length of 673 km have been completed. As of today, our roads are equipped with 486 tunnels, providing a total length of 723 km. Some of the significant tunnels that have been opened to traffic are as follows:

- Zigana Tunnel (2023);
- Badal Tunnel (2023);
- Hasankeyf Tunnel and Connection Roads (2022);
- Salarha Tunnel (2021);
- North Marmara Highway Tunnels (2020-2021);
- Buruncuk Tunnel (2020);
- Ovit Tunnel (2018).

Until 2027 the country's highway infrastructure is expected to gain additional 130 bridges and 140 km of tunnel length. Some of the important road-related infrastructure projects planned to be completed by the year 2027 are as follows:

- Kırık Tunnel (İspir-Erzurum, two tubes, 7.105 m);
- Dallıkavak Tunnel (Erzurum-Rize, two tubes, 3.100 m);
- There are 33 tunnels along the route between Mersin and Antalya, with a total length of 51.1 km, making it possible to cross the Mediterranean coast;
- Ordu Beltway Tunnels (6 double tubes, 9.492 m);
- Geminbeli Tunnel (Zara-Suşehri, two tube, 4.283 m);
- Eğribel Tunnel (Giresun-Şebinkarahisar, two tubes, 5.909 m);
- Kop Tunnel (Erzurum-Bayburt, two tubes, 6.500 m);
- Güzeldere Tunnel (Van-Hakkâri, two tubes, 3.137 m);
- Uşak Beltway 1<sup>st</sup> Section (29,4 km);
- Alacabel Tunnel and Access Roads (19,2 km);
- Yüksekova T1, T2 Tunnels (Yeniköprü-Yüksekova, four tubes, 8.530 m);
- Çıldır-Aktaş Highway (Aşık Şenlik Tunnel);
- Kemaliye-Dutluca Highway and Tunnels (6 single tubes, 16.704 m);
- Gelibolu-Eceabat Highway T1-T1A-T2-T3 Tunnels (5.351 m) T4-T5 Tunnels (3.061 m) Kilitbahir Tunnel (2.354 m);
- Şile-Ağva Highway T5-T6-T7 Tunnels.

### **3. Mapping of Existing Challenges to Road Connectivity**

Türkiye's vision in transportation was determined by the 2053 Transportation and Logistics Master Plan published by the 2023 Presidential Decree. The studies carried out in this context and the subsequent developments are detailed for all transportation sectors. The development corridors and planned roads specific to the highway sector are shown in Map 1.

Road transportation plays a pivotal role in the global transportation landscape, with increasing public demand for construction, maintenance, and repair services driven by evolving economic and social conditions. Upper-level policy documents endorse road investments and the sector's growth, further reinforced by the declaration of the Transportation and Logistics Master Plan aligned with sectoral goals. These policies also foster R&D and innovative products, aiming to balance transportation modes and alleviate road traffic congestion. New financial models have emerged in the transportation sector, with Public-Private Sector Collaboration contributing significantly to financial resources and expediting investments. The international and national levels place high expectations on traffic safety services, accompanied by efforts to improve traffic culture. Türkiye's strategic location places it within significant international road corridors, with road infrastructure investments working to reduce material and moral losses in traffic accidents. This era witnesses an upsurge in cooperation between government, local authorities, and the private sector, driven by policies emphasizing technology, science, and innovation. The rapid developments in construction and vehicle technologies worldwide, coupled with image-based information management systems and advancements in information, communication, mobile devices, artificial intelligence technologies, and transportation infrastructure, offer novel solutions for road safety and usage. These efforts align with global commitments to ensure a sustainable environment, emphasizing transportation modes that adhere to the Green Agreement, and promote the selection of routes and materials with minimal environmental impact in infrastructure projects.

Map 1: 2053 Transportation and Logistic Master Plan



Note:

Highway view for the respective target years

Motorways	State and Provincial Roads	Existing State and Provincial Roads
— Target 2025	— Target 2053	— Existing State and Provincial Roads
— Target 2028	— Target 2035	
— Existing	— Target 2028	

# Road Infrastructure in Ukraine

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## Road Infrastructure in Ukraine: Brief Overview

**Iryna Kosse**

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### 1. Summary and Outlooks for Major Road Infrastructure Projects until 2027

The unprovoked aggression by the Russian Federation, coupled with extensive damage inflicted on Ukraine's infrastructure due to shelling, has compelled a strategic re-evaluation of pre-war plans for infrastructure reconstruction and development. This paradigm shift has led to the suspension or re-design of certain significant projects alongside the emergence of new initiatives.

*Figure 1: Map of transport infrastructure and Western border crossings of Ukraine*



Source: [MapAction](#) as seen on [OCHA reliefweb](#)

Before the onset of the war, Ukraine was executing an ambitious road reconstruction program known as "Big Construction," championed by President Zelensky. Although the difficulties of war temporarily halted progress, Ukraine is likely to resume the program post-conflict, particularly given its inclusion in the indicative Trans-European Transport Network (TEN-T) maps.

Noteworthy projects within the Big Construction program<sup>594</sup> and the National Transportation Strategy through 2030 include:<sup>595</sup>

- New road construction:
  - Lviv bypass road (EUR 205.5 million);
  - Bridge across the Dnipro River in Zaporizhzhya (EUR 284 million);
  - N-31 Highway in Dnipropetrovsk region (EUR 544 million);
  - Ternopil bypass road and multi-level interchange at the intersection of highways M12/E50 and M19/E85 to improve connection Odesa-Lviv-Gdansk;
  - Multi-level interchanges at the intersection of highways in Rivne and Lviv regions, bridges in Lviv and Rivne regions<sup>596</sup> (EUR 50 million, with financing from EIB);
- Road reconstruction:
  - M-03 Kyiv-Kharkiv-Dovzhansky road (EUR 420 million);
- Road rehabilitation:
  - M-01 Kyiv-Chernihiv (EUR 196.6 million);
  - M-05 Kyiv-Odesa (EUR 604.8 million, with financing from EBRD<sup>597</sup> and EIB<sup>598</sup>);
  - M-06 Kyiv-Chop (EUR 562.5 million);
  - M-12 Striy-Znamyanka (EUR 556 million);
  - M-21 Vystupovychi-Mohyliv-Podilsky (EUR 196.6 million);
  - Roads near Kyiv<sup>599</sup> (2011-2041, EUR 1.12 billion, with funding from EIB).

<sup>594</sup> <https://zakon.rada.gov.ua/laws/show/382-2018-%D0%BF#Text>

<sup>595</sup> <https://zakon.rada.gov.ua/laws/show/321-2021-%D1%80#n14>

<sup>596</sup> <https://www.profi.gov.ua/projects/253684815>

<sup>597</sup> <https://www.profi.gov.ua/projects/255738608>

<sup>598</sup> <https://www.profi.gov.ua/projects/255761713>

<sup>599</sup> <https://www.profi.gov.ua/projects/234151258>

Figure 2: Map of Major Roads and Motorways in Ukraine



Note: The network of M-highways (some of which are expressways) of Ukraine is in blue, in green are identified motorways.

Source: By Gnesener1900 - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=12090885>

Moreover, as outlined in the Ukraine Recovery Plan devised by the National Council for Recovery,<sup>600</sup> Ukraine is poised to implement a system for levying charges on motor vehicles with a gross weight of 12 tons or more for their utilization of public motor roads, with an estimated value of EUR 28,405.

Furthermore, through the Repairing Essential Logistics Infrastructure and Network Connectivity (RELINC) Project,<sup>601</sup> Ukraine receives a substantial infusion of USD 585 million dedicated to restoring damaged road-to-bridge connections and vital rail lines. Despite unprecedented challenges, these concerted efforts and financial commitments signify an unwavering determination to fortify Ukraine's road infrastructure.

<sup>600</sup> <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/recovery-and-development-of-infrastructure-eng.pdf>

<sup>601</sup> <https://www.profi.gov.ua/projects/290931872>

## **2. Summary and Outlooks for Road-Related Infrastructure and Regional Connectivity until 2027**

A pivotal infrastructure endeavour of regional significance revolves around the modernization of existing border checkpoints, excluding those with Russia and Belarus, and the establishment of new ones. This initiative encompasses:

- Existing Checkpoints (Yahodyn, Ustyluh, Luzhanka, Uzhhorod, Chop, Vylok, Dzvinkove, Diakove, Kosyno, Porubne, Diakivtsi, Krasnoilsk): total investment EUR 69 million;
- New Checkpoints (Bila Tserkva, Dyida, Ruska): total investment: EUR 27.85 million.

Parallel to these efforts, a comprehensive plan exists for the modernization of border checkpoints within the framework of trans-border projects facilitated by the Connecting Europe Facility (CEF). These projects, undertaken in collaboration with Poland, Romania, Hungary, and Slovakia, are valued at EUR 200 million. This concerted approach reflects a strategic commitment to fortifying the regional infrastructure network, particularly bolstering border-related facilities, and connections.

## **3. Mapping of Existing Challenges to Road Connectivity**

Implementing infrastructure projects in Ukraine is confronted with multifaceted challenges, spanning political, financial, ecological, and logistical dimensions. This section delves into the intricacies of these hurdles, shedding light on internal and external factors that impede road connectivity in the region.

### **3.1. Political and Security Challenges**

A primary obstacle lies in the ongoing war between Ukraine and Russia, which has resulted in extensive damage to the existing road infrastructure. By June 2023, an alarming 25.4 thousand kilometres of public roads of state importance, along with 344 critical bridges and overpasses, laid in ruins.<sup>602</sup> This dire situation is further exacerbated by ongoing hostilities, rendering precise assessments of required rehabilitation efforts and demining operations unattainable.

### **3.2. Financial Constraints and Priorities**

The Ukrainian budget faces a severe resource shortage for road construction, reconstruction, repair, and maintenance. The prevailing warfare and urgent repairs exigencies have monopolized financial allocations, leaving little room for infrastructural development. Private sector participation, par-

<sup>602</sup> <https://damaged.in.ua/damage-assessment>



ticularly in public-private partnership (PPP) investment projects, has waned due to amplified security and financial risks arising from the conflict.

### **3.3. Logistical and Operational Disruptions**

The blockage of ports and the limited capacity of transshipment border railway stations have forced a surge in road-based freight transportation. Regrettably, this upswing in traffic has exacted a toll on road durability, precipitating an accelerated rate of deterioration under the weight of excessive loads. Additionally, disruptions in logistics routes have resulted in scarcities of vital road construction materials and structures.

### **3.4. Capacity Constraints at Checkpoints**

Inadequate capacity at car checkpoints poses yet another formidable challenge. Addressing this issue necessitates enhancements in the control and registration procedures for commercial motor vehicles and the construction and refurbishment of international road checkpoints. If effectively implemented, such measures promise to facilitate the seamless flow of freight and passenger road transport across the state border.

### **3.5. Legal and Regulatory Reforms**

Ukraine must embark on a comprehensive review and revision of its legislation, national standards, and regulations governing road management projects. These adjustments are crucial for streamlining project implementation processes and incorporating global best practices into the national framework.

### **3.6. Environmental imperatives and EU integration**

As Ukraine advances towards potential EU accession, aligning with stringent standards for pollutant emissions from internal combustion engine vehicles becomes imperative. The eventual transition to electric cars necessitates the development of an electric vehicle infrastructure tailored to accommodate the needs of cyclists and users of personal electric transport. Synchronizing efforts with EU member states in organizing transportation and shaping the TEN-T network will be instrumental in ushering Ukraine into a sustainable and smart mobility paradigm aligned with the principles of the European Green Course.

The challenges confronting road connectivity in Ukraine are complex and multifaceted, emanating from the ongoing conflict, financial constraints, logistical disruptions, and the imperative of aligning with EU standards. Addressing these issues demands a concerted effort, encompassing strategic policy reforms, financial reallocations, and collaborative initiatives with international partners. By navigating these challenges with precision and resolve, Ukraine can pave the way for a more connected, resilient, and sustainable future.

# **Road Infrastructure and Transport in the Policies of the European Union**

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## Road Infrastructure and Transport in the Policies of the European Union: Brief Overview and Focus on SEE

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### 1. Introduction

The development of road infrastructure in Southeast Europe (SEE) has been driven by geospatial processes that have been shaping the European continent for many centuries and that have been greater in importance and coverage than the region per se. Similarly to other parts of Europe, there are many examples of main routes in the wider SEE region that still follow the directions of major Roman roads (Figure 1). Back then, these roads were used for the overland movement of armies and transportation of goods for the sake of expansion and consolidation of the Roman Empire. Nowadays, these road corridors which cross the borders of numerous European countries are to a large extent covered by motorways or first category roads. A notable example in this case is Via Militaris (known also as Via Diagonalis) – an ancient Roman road, starting from Singidunum (today the Serbian capital Belgrade), passing by the Danube coast to Viminacium (near modern Kostolac), through Naissus (modern Niš), Serdica (modern Sofia), Philippopolis (modern Plovdiv), Adrianopolis (modern Edirne in Turkish Thrace), and reaching Constantinople (modern Istanbul). This road used to be connected directly or through secondary roads to other main Roman routes in the region such as Via Pannonia, Via Flavia and Via Egnatia. For instance, Via Militaris was connected to Via Egnatia through the road along the Axios (or Vardar) River, the road from Serdica to Thessalonica along the Strymon (or Struma) River, and the road from Philippopolis to Philippi (modern village of Filippoi).

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<sup>603</sup> The preparation of this chapter benefited from the research efforts of Gergana Kutelova, Intern at the Economic Policy Institute in October – December 2023.

Figure 1: Main Roman roads in Southeast Europe



Source: Holzner, Mario (2014)<sup>604</sup>

Nowadays, the wider SEE region consists of a dozen of countries, approximately half of which are members of the European Union (EU) and the remaining aspire towards membership. Regardless of their status, though, their respective road networks are largely impacted by the general transport flows and thus more or less by the EU's transport policy. The Union's goals of integrating the infrastructure of its members with those countries that are neighbouring or close to the EU influence the connectivity of the whole region and not a single country could afford to not participate.

## 2. A Snapshot of Transport and Road Infrastructure Policies of the European Union

Transport policy has been one of the EU's common policies for more than 30 years. In shaping transport policy, the European Union has shared competences, which means that Member States exercise their own competences unless the Union develops a unified transport policy and common strategies in this area.<sup>605</sup> In other words, the EU institutions exercise their competence when the specific topic of the policy area exceeds the national

<sup>604</sup> Holzner, Mario (2014) : The Effects of Highway Construction in the Balkans: Insights from the Via Militaris, wiiw Balkan Observatory Working Papers, No. 112, The Vienna Institute for International Economic Studies (wiiw), Vienna

<sup>605</sup> "THE COMPETENCE OF THE EUROPEAN UNION AND THE APPLICATION OF EU LAW BY THE NATIONAL COURTS", p. 33 -Kostov, Stanislav; Date: 12.11.2013; link: <http://www.stanislavkostov.eu/Download/books/1/Kompetentnostta%20na%20ES.pdf>

boundaries of the EU Member States and if they (the EU institutions) have adopted a relevant act on a topic of the policy area that falls under shared competence.

The legal basis is Article 4(2)(g) and Title VI of the Treaty on the Functioning of the European Union. As long ago as the Treaty of Rome, Member States stressed the importance of a common transport policy by devoting a separate title to it. Transport was therefore one of the Community's first common policy areas. The first priority was the creation of a common transport market, allowing freedom to provide services, and the opening up of national transport markets. As these processes were underway it became vital to create fair competitive conditions both within individual modes of transport and between them. Therefore, harmonisation has taken on ever increasing importance, and now covers national laws, regulations, and administrative provisions, and the technological, social and tax environment in which transport services are provided.<sup>606</sup>

From the perspective of the European Union, the transportation system is a fundamental element in the efforts to create an integrated European economy.<sup>607</sup> Transportation is a vital component of the European integration process, enabling the realization of the four freedoms of movement. Understandably, efficient transportation services and infrastructure are necessary to harness the economic advantages of all EU regions, support the internal market and growth, and promote economic, territorial, and social cohesion.<sup>608</sup> With transport contributing around 5% to EU GDP and employing more than 10 mln. people in Europe, the transport system is critical to European businesses and global supply chains. At the same time, transport is not without costs to our society: greenhouse gas and pollutant emissions; noise, road crashes and congestion. Today, transport emissions represent around one quarter of the EU's total emissions of greenhouse gases (GHG).<sup>609</sup> What is more, 30% of transport CO<sub>2</sub> emissions come from freight transport since 53% of freight is carried by road in the EU.<sup>610</sup>

Against this backdrop, the European Commission presented in December

<sup>606</sup> Common transport policy: Overview, European Parliament; Date: 27.01.2024; link: <https://www.europarl.europa.eu/factsheets/en/sheet/123/common-transport-policy-overview>

<sup>607</sup> "Policies of the European union" – Author: prof. Ingrid Shikova, Date: 2011, p. 255

<sup>608</sup> "Landscape review 2018 - Towards a successful transport sector in the EU: challenges to be addressed" by the European Court of Auditors; Date: 2018; link: <https://op.europa.eu/webpub/eca/landscape-review-transport/en/>

<sup>609</sup> "A fundamental transport transformation: Commission presents its plan for green, smart and affordable mobility" by the European Commission; 9 December 2020

<sup>610</sup> Factsheet on Greening Freight European Commission 2023

2020 its 'Sustainable and Smart Mobility Strategy' that lays the foundation for how the EU transport system can achieve its green and digital transformation and become more resilient to future crises. In the field of road transport, the emphasis is on an overall decarbonisation, which features change of the fleet and building the corresponding e-charging infrastructure. For instance, according to the Strategy, 30 mln. zero-emission cars and 80 000 zero-emission lorries in operation by 2030 and nearly all cars, vans, buses as well as new heavy-duty vehicles to be zero-emission by 2050. In terms of infrastructure, the following main deployment targets have to be met in 2025 or 2030:<sup>611</sup>

1) Recharging infrastructure for cars and vans has to grow at the same pace as vehicle uptake. To that end, for each registered battery-electric car in a given member state, a power output of 1.3 kW must be provided by publicly accessible recharging infrastructure. In addition, on every 60 km along the Trans-European Transport (TEN-T) network, fast recharging stations of at least 150 kW need to be installed from 2025 onwards.

2) Recharging stations dedicated to heavy-duty vehicles with a minimum output of 350 kW need to be deployed every 60 km along the TEN-T core network, and every 100 km on the larger TEN-T comprehensive network from 2025 onwards, with the aim to achieve complete network coverage by 2030. In addition, recharging stations must be installed at safe and secure parking areas for overnight recharging as well as in urban nodes for delivery vehicles.

3) Hydrogen refuelling infrastructure that can serve both cars and lorries must be deployed from 2030 onwards in all urban nodes and every 200 km along the TEN-T core network, ensuring a sufficiently dense network to allow hydrogen vehicles to travel across the EU.

### **3. Development of Transport Corridors in Europe**

#### **3.1. Pan-European Transport Corridors**

In the early 1990s, following the opening of the Eastern bloc, a series of Conferences on Pan-European Transportation emerged. Their aim was to assess the transportation infrastructure needs within Eastern Europe. The idea of a Pan-European transport policy and corridors originated during the preparations for the inaugural Pan-European Transport Conference held in Prague (1991). The goal was to expedite the development

<sup>611</sup> New Regulation for the deployment of alternative fuels infrastructure (AFIR), 2023

of transportation routes across Europe, fostering smoother economic exchanges. During the second Pan-European Transport Conference in Crete (1994), nine transport corridors spanning Central and Eastern Europe were identified as critical routes requiring significant investment over the next decade to fifteen years. However, during the subsequent conference in Helsinki (1997), a tenth corridor was incorporated following efforts by Baltic countries aiming for enhanced connectivity between Western Europe and the Balkans. This additional corridor emerged after the resolution of conflicts in the former Yugoslav states. Consequently, these Pan-European corridors are often termed as the 'Crete corridors' or 'Helsinki corridors', irrespective of their specific geographical positions (Figure 2).

*Figure 2: Map of the Pan-European transport corridors*



*Source: Wikipedia<sup>612</sup>*

<sup>612</sup> [https://en.wikipedia.org/wiki/Pan-European\\_corridors#/media/File:Pan-European\\_corridors.svg](https://en.wikipedia.org/wiki/Pan-European_corridors#/media/File:Pan-European_corridors.svg)

### 3.2. Trans-European Transport Network

In parallel, the Trans-European Transport Network (TEN-T) was first established in 1996 by the EU. It was introduced as a key instrument for the development of a coherent, efficient, multimodal, and high-quality transport infrastructure across the EU, including railways, inland waterways, short sea routes and roads connecting urban nodes, maritime and inland ports, airports, and terminals.<sup>613</sup>

Up to 2023, the TEN-T policy used to be based on Regulation (EU) No 1315/2013. According to the provisions in this TEN-T Regulation, it consists of two levels: *the core network* and *the comprehensive network*. *The core network* included the most important links connecting major cities and nodes and must be completed by 2030 and must meet the highest standards of infrastructure quality, whereas *the comprehensive network* connects all EU regions to the core network and must be completed by 2050.<sup>614</sup>

On 18 December 2023, the European Parliament and the Council reached a political agreement on a revised TEN-T Regulation. The revision is meant to support the transition to a cleaner, greener, and smarter mobility in line with the European Green Deal and the Sustainable and Smart Mobility Strategy. The revised TEN-T Regulation puts the transport sector on track to cut its emissions by 90%. It responds to the need to increase connectivity across Europe, to foster the resilience of the transport system, to shift more passengers and freight to the sustainable modes of transport and to focus more on sustainable urban mobility.

Together with the above-mentioned two categories, the revision of the TEN-T Regulation adds a third level - *the extended core network* - as an intermediate stage to be completed by 2040.<sup>615</sup> In addition, according to the revised TEN-T Regulation, transport links with neighbouring third countries will be improved by integrating Ukraine, Moldova as well as the six Western Balkan partners into the newly established European Transport Corridors (Figure 3 and Figure 4).

<sup>613</sup> "Trans-European Transport Network (TEN-T)" by the European Commission; Date: 2023; link: [https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t\\_en](https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en)

<sup>614</sup> Ibid

<sup>615</sup> Ibid



Figure 3: Indicative Extension to Neighbouring Countries  
Core & Comprehensive Networks: Roads, ports,  
rail-road terminals and airports  
Western Balkans Region



Source: European Commission TEN-T revision 2023,  
Annex IV: Indicative Extension to Neighbouring Countries

Figure 4: Indicative Extension to Neighbouring Countries  
 Core & Comprehensive Networks:  
 Roads, ports, rail-road terminals and airports  
 Eastern Partnership Transport Network: Moldova / Ukraine



Source: European Commission TEN-T revision 2023,  
 Annex IV: Indicative Extension to Neighbouring Countries

### 3.3. The Pan-European Transport Corridors and the Trans-European Transport Network

The Trans-European Transport Network and the ten Pan-European transport corridors are related concepts within the broader context of European transportation infrastructure development, but they serve different purposes and operate at different levels of scale and scope.

#### *Purpose and Scope*

**TEN-T:** The TEN-T is a comprehensive framework established by the European Union (EU) to improve transportation infrastructure and connectivity across Europe. It encompasses various modes of transportation (road, rail, air, maritime) and aims to create a seamless network facilitating the efficient movement of goods and people throughout the continent.

**Pan-European Transport Corridors:** The ten Pan-European transport corridors represent specific transportation routes across Europe that have been identified as crucial for regional and international connectivity. They are strategic corridors that require significant investment and development to address transportation challenges, promote economic growth, and enhance mobility.

#### *Coverage and Focus*

**TEN-T:** The TEN-T covers the entire European Union territory, as well as neighbouring countries participating in EU-funded projects. It provides a broad framework for the development of transportation infrastructure and connectivity at a continental level.

**Pan-European Transport Corridors:** The Pan-European transport corridors focus on specific routes connecting different regions and countries within Europe. They are broader in scope compared to the TEN-T and are strategically selected based on factors such as economic importance, traffic volume, and geographical considerations.

#### *Implementation and Funding*

**TEN-T:** The implementation of the TEN-T involves coordination among EU institutions, national governments, regional authorities, and various stakeholders. Funding for TEN-T projects is provided through EU financial instruments, such as the Connecting Europe

Facility (CEF), as well as national and private sector investments.

**Pan-European Transport Corridors:** The development and enhancement of Pan-European transport corridors involve specific infrastructure projects

within the identified corridors. Funding for these projects may come from various sources, including EU funding programs, national governments, international financial institutions, and public-private partnerships.

### *Strategic Framework*

**TEN-T:** The TEN-T provides a strategic framework and guidelines for the planning, implementation, and coordination of transportation infrastructure projects across Europe. It ensures coherence and synergy among different modes of transportation and promotes interoperability and sustainability.

**Pan-European Transport Corridors:** The Pan-European transport corridors operate within the broader framework of the TEN-T. They are aligned with the objectives of the TEN-T and contribute to its overall goals by focusing on specific transportation corridors deemed critical for regional and international connectivity.

## 4. EU Activities in the Field of Transport Connectivity Towards the Western Balkans

### 4.1. The Transport Community

In relation to transport connectivity between the EU and the Western Balkans, the Treaty establishing the Transport Community (TC) was signed on 9 October 2017. More specifically, this international organization related to transport and mobility consists of 33 participants (EU Member States, the Republic of Albania, Bosnia and Herzegovina, Kosovo\*, Montenegro, the Republic of North Macedonia, and the Republic of Serbia) and the three observers (Georgia, the Republic of Moldova and Ukraine).<sup>616</sup> The Transport Community Treaty covers road, rail, inland waterways, and maritime transport and develops a transport network. The treaty also stipulates environmental, public procurement, competition, and procedural rules that all parties involved must apply.

An important element of the establishment and functioning of the Transport Community is that, in order to fulfil its objectives, it provides for the use of the trans-European transport network (TEN-T) for each mode of transport, taking into account the relevant bilateral and multilateral agreements concluded between the Contracting Parties, including the development of key links and interconnectors necessary to eliminate bottlenecks and to

<sup>616</sup> The Transport Community, Section "About us"; Date: 2023; link: <https://www.transport-community.org/about-us/>

promote the interconnection of national networks with each other and with the TEN-T networks.

The Transport Community is supported by a Permanent Secretariat based in Belgrade, Serbia. It is charged with three tasks:

- 1) providing administrative support to the Council of Ministers, the Regional Steering Committee, the Technical Committees and the Social Forum;
- 2) acting as a transport observatory to monitor the results of the indicative TEN-T extension of the comprehensive and core networks to the Western Balkans; and
- 3) supporting the implementation of the Connectivity Agenda for the six Western Balkan countries aimed at improving links within the Western Balkans as well as between the region and the European Union.

Regarding road transport, Article 12 of the 2017 Treaty establishing the Transport Community requires the contracting parties from Southeast Europe to promote the efficient, safe, and secure functioning of road transport to achieve alignment with the operational standards and policies for road transport in the EU by applying the achievements of European Union law in the field of road transport. Every two years, the Transport Community is expected to develop a five-year current work plan for the development of the exemplary extension of the Trans-European Transport Network (TEN-T) along the comprehensive and core network to the Western Balkans. This plan aims to identify priority projects of regional interest, in accordance with EU best practices, contributing to balanced sustainable development concerning the economy, territorial integration, environmental impact, social effects, and social cohesion.<sup>617</sup>

On 26th October 2020, within the framework of the Transport Community, four action plans of the international organization in the field of transportation were adopted. These plans serve as guides with instructions for all crucial steps and stages accompanied by associated deadlines. They serve as a starting point for participating countries on the path to achieving specific goals and ambitions, such as safer roads, reduced waiting times at border points, reliable and modern railways, and roads of the future with integrated green and digital elements. The four documents are aligned with the Economic and Investment Plan of the European Commission for the Western Balkans.

<sup>617</sup> Article 9 of the Treaty establishing the Transport Community; Date: 2017; link: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A22017A1027%2801%29>

The Action Plan for road transport for the period 2020-2024 is directed towards the development of a climate-resilient, intelligent, and resource-efficient road network within the Trans-European Transport Network (TEN-T) in the Western Balkans. This involves incorporating green and intelligent elements into road investments. The ultimate goal is to stimulate innovative, low-emission, and digitally suitable operations in road transport. The Action Plan for the roads of the Western Balkans is divided into four types of actions:

- *Establishing a functional and efficient road maintenance system;*
- *Implementing intelligent transport systems in the core/extensive road network;*
- *Enhancing the sustainability of road transport and the use of alternative fuels;*
- *Strengthening regional cooperation and the exchange of experience.*

### 4.2. The New Growth Plan for the Western Balkans – Transport and Road Infrastructure Provisions

In light of shifting geopolitical and security realities, the European Commission proposed on 8 November 2023 a New Growth Plan for the Western Balkans<sup>618</sup> aimed at invigorating the stalling EU integration process of WB6 by supporting their economic convergence with the Union as well as between the Western Balkan countries themselves. The EC acknowledged the need “to jump-start and incentivise the Western Balkans’ preparations for EU membership by bringing forward some of its benefits especially in ways that can be felt directly by the citizens of the Western Balkan countries”.<sup>619</sup>

The Growth Plan for the Western Balkans consists of four pillars:

- 1) ***Enhancing economic integration with the European Union’s single market***, subject to the Western Balkans aligning with single market rules and opening the relevant sectors and areas to all their neighbours at the same time, in line with the Common Regional Market;
- 2) ***Boosting economic integration within the Western Balkans through the Common Regional Market***, based on EU rules and standards, which could potentially add 10% to their economies;

<sup>618</sup> EC COM(2023) 691 final, COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. New growth plan for the Western Balkans

<sup>619</sup> Ibid.

- 3) **Accelerating fundamental reforms**, including on the fundamentals cluster, supporting the Western Balkans' path towards EU membership, improving sustainable economic growth including through attracting foreign investments and strengthening regional stability;
- 4) **Increasing financial assistance to support the reforms through a Reform and Growth Facility for the Western Balkans**, a new instrument worth EUR 6 billion in non-repayable support and loan support, with payment conditioned on the Western Balkans' partners fulfilling fundamental reforms, and in particular specific socio-economic reforms.

Under the first pillar, it defines 7 Priority Actions for Western Balkans' integration into the EU's Single Market. Priority 4 specifically addresses "Facilitation of Road Transportation":

- Support Western Balkan countries to integrate their road transport in the region on the basis of the adoption of the relevant EU acquis.
- In parallel work towards granting access of the Western Balkan partners to the relevant EU information systems (IMI, ERRU) and consider further facilitation of bilateral transport operations, through a separate agreement complementing the SAAs.<sup>620</sup>

According to the European Commission the two actions specified above are intended to "accelerate the adoption of EU Road Transport acquis, provide significant economic benefits and progressively lead to further integration in the area of road transport".<sup>621</sup>

The plan has generated debate and faced mixed reviews both inside the EU and within the ranks of Western Balkan stakeholders with some criticizing the limited supply of additional funding – EUR 6 bln. in total with EUR 2 bln. in grants and EUR 4 bln. in loans – as well as the lack of substance in the proposed measures and the ambitious reform agendas required to access the funds.<sup>622</sup> Nevertheless, Western Balkans leaders have so far pledged their commitment to working together to speed up reform processes and regional cooperation in order to take advantage of the plan.<sup>623</sup>

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<sup>620</sup> Ibid.

<sup>621</sup> Ibid.

<sup>622</sup> Branimir Jovanović, The EU's new Growth Plan for the Western Balkans: solid foundations but shaky details (18 March 2023), wiiw: <https://wiiw.ac.at/n-622.html>

<sup>623</sup> Euronews, Western Balkans leaders pledge to speed up reforms for EU growth plan (1 March 2024): <https://www.euronews.com/2024/03/01/western-balkans-leaders-pledge-to-speed-up-reforms-for-eu-growth-plan>

## 5. EU's Security-driven Support for Transport Connectivity with Ukraine and Moldova

The full scale invasion of Ukraine on behalf of Russia resulted in a qualitative change in EU's political stance, solidarity and commitment to the EU membership of Eastern Partnership countries such as Ukraine, Moldova and Georgia. The first two, in particular, have featured much more prominently in European connectivity discussions which eventually led to a new road transport agreement in June 2022, allowing hauliers to transit through and operate in each other's territories without the need for permits, and a subsequent extension of the TEN-T network.<sup>624</sup> Two primary concerns have informed EU decision-making in the wake of Russia's aggression: the more immediate concern for global food supply and the need to support the agricultural sector as the backbone of Ukraine's economy and international trade portfolio. The country is among the top global suppliers of grain, thus the so called "EU-Ukraine Solidarity Lanes" were established – alternative routes via road, rail and waterways to ensure uninterrupted flow of goods despite ongoing hostilities and their devastating effect on Ukraine's infrastructure.

In May-June 2023 both Ukraine and Moldova were offered association agreements to the Connecting Europe Facility which paved the way for them to access up to 50% of funding of key infrastructural projects by participating in calls along EU member states. In November 2023, the Ministry for Communities, Territories and Infrastructure Development of Ukraine announced the ratification of the agreement and emphasized the availability of a 82 mln. EUR in grants for the implementation of projects which have already been greenlit by the European Commission and concern the modernization of road and rail crossings with neighbouring EU countries such as Romania, Poland, Hungary and Slovakia.<sup>625</sup> EU member states (particularly Romania from the SEE region) also have the option of securing funding for strengthening their connectivity with Ukraine and Moldova through calls under the Military Mobility Action Plans.

<sup>624</sup> EC, EU-Ukraine Solidarity Lanes: [https://eu-solidarity-ukraine.ec.europa.eu/eu-assistance-ukraine/eu-ukraine-solidarity-lanes\\_en](https://eu-solidarity-ukraine.ec.europa.eu/eu-assistance-ukraine/eu-ukraine-solidarity-lanes_en)

<sup>625</sup> Ukraine becomes full participant of EU's Connecting Europe Facility: Ministry for Communities, Territories and Infrastructure Development, 22 Nov. 2023: <https://www.kmu.gov.ua/en/news/ukraina-stala-povnotsinnym-uchasnykom-prohramy-ies-mekhanizm-spoluchennia-ievropy-mininfrastruktury>



## Enhancing Road Connectivity in SEE: Main Takeaways and Policy Learnings

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### **1. Road Infrastructure and Connectivity Dynamics in SEE: the Point of Departure**

#### **1.1. Initial Scope of Analysis and Primary Objectives**

Ground transport and road infrastructure are still considered the cornerstones of mobility and cross-border interactions in the wider region of Southeast Europe despite emerging trends towards increased use of railways and waterways as more sustainable passenger and freight transportation modes across Europe. This warrants the need for a better understanding of the internal and external regional dynamics shaping the status quo of road transportation. In that respect, the current publication strives to provide a streamlined, structured, and detailed overview of the existing ground networks of thirteen economies in Southeast Europe and its immediate vicinity – Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo\*, Moldova, Montenegro, North Macedonia, Romania, Serbia, Türkiye (brief) and Ukraine (brief) – while paying special attention to ways of enhancing cross-border connectivity and tackling regional bottlenecks. The specific goals of this cooperative research endeavour were as follows:

- to review existing road infrastructure in the thirteen economies in focus and offer a basic comparative perspective based on quantitative and qualitative indicators;
- to assist in identifying and addressing the current and potential transportation bottlenecks paying special attention to cross-border connectivity;
- to highlight key road infrastructure projects of regional significance and outline expected investments;
- to examine existing national strategic documents and plans in the field of road infrastructure and connectivity in the wider context of EU's engagement with the connectivity demands of the region and its people;

- to map current and prospective categories of challenges to the development of road infrastructure and regional connectivity;
- to identify and elaborate a set of practical, actionable recommendations and policy learnings leveraging the collective wisdom and insight of local experts from each of the economies in focus.

An overarching theme and a horizontal priority of the study became the shifting climate-related discourse on current and future risks and vulnerabilities for the SEE region as it is pegged to be disproportionately affected by climate change. Therefore, the authors of the national chapters also addressed the adequacy of present-day environmental standards and regulations in road infrastructure development in an effort to stimulate the upgrade towards forward-looking, sustainable and climate-resilient strategic planning and policymaking in the field of ground transportation. One key element of this is the need to improve inter- and multi-modality in passenger and freight logistics. Another one is the supplementary upgrade of road infrastructure to embrace e-mobility through improved accessibility of charging stations while boosting the demand for zero-emissions vehicles.

### 1.2. Study Limitations and Considerations

The diversity of local and national contexts as well as the plethora of interaction patterns and cooperation formats in the region made it challenging to present a completely uniform region-wide picture or to offer disaggregated comparative analysis.

Limited data accessibility and data credibility were two concomitant limitations across the research process. The national chapters reflect current developments and publicly available information on infrastructure projects and policymaking spanning between October 2023 and mid-March 2024.

## 2. Main Takeaways for Road Infrastructure Development at SEE and EU Policy Level

### 2.1. Interplay between Internal Sub-regional Dynamics and the European Union's Policy towards the Region as an External Driver

The wider region of Southeast Europe encompasses a complex network of intersecting sub-regional groupings with various degrees of internal and external interaction. One of the primary delimitating features between the countries examined in the study is their status quo and level of aspiration with regard to European integration. This factor has a substantial impact on the national

strategic thinking when it comes to the transportation sector and the prioritization of key infrastructural projects. Overarchingly, governments across the region recognize the importance of facilitating trade with and improving access to the more affluent and economically developed Western parts of the European continent. Thus, they have placed significance on advancing the construction along the Pan-European Transport Corridors spanning the region (Corridors 4, 5, 7, 8, 9 and 10) as well as integrating their countries into the Trans-European Transport Network whose most recent proposed expansion explicitly favours better connectivity of the EU Single Market with the Western Balkans and the Eastern Partnership countries of Ukraine and Moldova. This pull factor of the EU, coupled with its still unchallenged position as the largest provider of development funding in the region, emphasized the reliance of the SEE region on EU financing of projects despite the presence of alternative third party options (especially in the Western Balkans).

At the same time, stronger regional integration and internal regional connectivity appear to be driven in parallel by internal forces based on cultural and historical links as well as by pragmatic external considerations. Once again, this phenomenon is most pronounced in the case of the six Western Balkan states which have received a clear sign from the EU that deepening regional integration would be considered a preparatory stage towards their eventual integration in the European Union. The establishment of the Transport Community between the EU members and the Western Balkans embodies this principle but is also evident in other home-grown models of a smaller scale such as the Open Balkan Initiative: a Mini-Schengen of sorts between Albania, North Macedonia and Serbia.

Another distinct pattern in the decision-making of governments across the region with regard to key infrastructural projects is the tendency to prioritise road development and cross-border connectivity that directly further their foreign policy agendas. The status of good neighbourly relations, the presence of ethnic diasporas or the existence of unresolved territorial disputes are clearly reflected in the uneven road infrastructure development distribution across Southeast Europe. Such tendencies seem to have disruptive effects for the internal transportation cohesion in countries such as Bosnia and Herzegovina where the political tensions between the comprising entities – particularly, the Federation of Bosnia and Herzegovina, on one hand, and the Republika Srpska, on the other – impede cross-country connectivity. On the opposite side of the scale is the targeted interest of Belgrade (Serbia) in advancing its own cross-border connectivity projects with the BiH communities of ethnic Serbs (majority in Republika Srpska). Going away from the Western

Balkans and looking to the Eastern-most edges of the SEE region, similar historic, cultural and ethnic links are at the core of cross-border connectivity endeavours between the EU member Romania and its neighbouring Moldova. Again, looking to the East, the new security risks and geopolitical realities after Russia's full-scale invasion of Ukraine justify viewing the regional connectivity processes through a new lens. Ensuring the existence of sufficient alternative routes, including road infrastructure, which would allow for the uninterrupted flow of goods and global food supplies from Ukraine (the so-called EU Solidarity Links) appeared as a new priority consideration. The war in Ukraine also brought forward the notion of dual use roads for both civilian and military purposes, thus pushing military mobility as another prospective criteria when evaluating cross-border infrastructure projects for countries such as Bulgaria, Romania, Moldova and Ukraine.

### **2.2. Most Common Challenges for Road Infrastructure Development Across the Region. Viable Policy Responses**

#### **2.2.1. Domestic Political Challenges and Governance Deficiencies**

As the countries across the region continue to mature in their democratic processes and develop their political culture, local political elites often fail to reach national-level consensus on a single strategic vision and priority road infrastructure projects. It is often the case that consecutive governments undertake drastic course corrections or engage in reforms that completely disregard or render obsolete previous efforts and investments in the field of transportation and connectivity.

*Setting clear national priorities for the medium and long-term development of domestic infrastructure that need to be respected by all key political stakeholders despite government changes is of utmost importance. At the same time, local and national priorities need to take into account regional dynamics and serve to further cross-border synergy efforts in enhancing regional connectivity. The European Transport Corridors and the TEN-T routes should be the backbones of these efforts.*

#### **2.2.2. Strategic Planning, Administrative Capacity and Project Management**

All countries in the wider SEE region appear to struggle, albeit in different degrees, of the same challenges associated with strategic planning, administrative capacity, and poor project management. While rule of law deficiencies, high level political corruption and nepotism are often considered the

primary culprits for failure, there is a deeper underlying layer of insufficient institutional and human resource preparedness, coupled with legislative and administrative shortcomings.

### *Citizen Engagement*

Regardless of whether it concerns the implementation of major infrastructure projects with cross-border connectivity impact or smaller scale local road construction connecting municipal entities, citizen engagement and community accountability are of paramount importance. Gauging the public sentiments and taking stock of pragmatic real-life considerations of the local communities in the areas of infrastructure development should happen in the early stages of project planning to avoid complications and delays due to protests, land acquisition challenges or reversals due to negative repercussions on the community.

### *Inter-agency Cooperation*

With regard to administrative capacity, both the legal and institutional framework in some of the countries, including the EU member states, need to be streamlined and simplified. Otherwise, the inter-agency coordination and synchronization becomes an insurmountable challenge that leads to project freezes or significant delays as well as inefficient allocation of scarce financial resources.

### *Technical Preparedness*

An issue that is consistently pointed out by the local experts in the course of this study is the quality and adequacy of technical documentation that precedes any major infrastructure project implementation. Outdated technical documents, poorly conducted feasibility studies and the lack of adequate technical preparation prior to the onset of project execution often cause unsatisfactory outcomes. It is thus important to develop in advance all necessary documents for key infrastructure projects, so that realization could be sped up once funding opportunities emerge but at the same time the goal should be to avoid starting projects with outdated concepts and technical parameters.

### *Public Procurement Challenges*

The biggest and most complex issue outlined across the board in the region, regardless of the EU or non-EU membership status of the countries, appears to be problematic functioning of public procurement procedures and public tendering processes. It is directly linked to the administrative capacity and project management deficiencies identified above as poorly prepared tender documentation and requirements on behalf of the authorities limit the market competition and may dissuade prospective tender participants.

At the same time, the common practice of evaluating and ranking offers on lowest price as the primary criterion has been consistently viewed as problematic. It not only limits the interest in the procurement tender but also predisposes the bidders to provide cost-cutting offers that disregard the most up-to-date technological advancements or shift towards lower quality materials in order to secure the contract. In the end, this affect not only the overall quality and lifespan of the constructed infrastructure but also leads to unplanned delays, skyrocketing of project costs that have not been budgeted for or require more frequent and expensive maintenance works.

### **2.2.3. Road Safety, Intelligent Transport Systems and Road Assets Management**

Although road safety has improved in the past decades, the roads in South-east Europe continue to have higher number of accidents and fatality rates compared to the EU average. While road safety should be addressed through both hard and soft measures, including public road safety campaigns and stricter control of driver compliance with road regulations, there are policy measures tied to road infrastructure development that are closely tied to the outcome of these comprehensive road safety policies.

#### *Infrastructure Maintenance*

As mentioned in the previous point, imbedding proper infrastructure quality monitoring, maintenance planning and securing road maintenance funding in advance are key to preventing avoidable road accidents.

#### *Data and Intelligent Transport Systems*

Transport authorities in the region need comprehensive, high-quality data for better planning and maintenance of the national road infrastructure networks. The integration of Intelligent Transport Systems (ITS) is an absolute necessity and the countries in the region should make the most in terms of EU funding opportunities but also knowhow and technical capacity for the beneficial adoption and exploitation of ITS. This requires administrative changes and strengthening of human resource capacity alongside technological preparedness.

### **2.2.4. Financial Scarcity and Funding Modalities**

The infrastructural and connectivity needs of the SEE region exceed the availability of national financial resources for the construction of highways and other road categories, bridges and tunnels. In light of this resource scarcity, the countries of the region have had access to EU funding under their own national programmes (for EU members) or pre-accession financing for the countries with EU candidate status. For Moldova and Ukraine as

well as the Western Balkans, the potential utilization of opportunities from the Connecting Europe Facility is also of note.

However, long-term reliance on grants-based EU funding, especially in some of the EU members such as Bulgaria and Romania, has resulted in the under-employment of other prospective funding sources or more modern financial instruments. As the EU is moving away from support of basic road infrastructure and towards prioritisation of railway transport, those EU members and other countries in Southeast Europe may rapidly find themselves in a position where they have to look elsewhere for the remaining resources needed to accomplish their infrastructure development goals. While grants would gradually reduce in amount and availability, loan-based EU funding is expected to come with stricter requirements with regard to decarbonization and environmental impact. In view of the shifting geopolitical and security realities in the region due to the ongoing war in Ukraine, dual use capabilities of road infrastructure would also affect funding chances as the EU and NATO seek to secure alternative routes for the combined function of civilian and military mobility.

Alternative third-party funding is more common in the Western Balkans sub-region but its viability should be evaluated individually against the commercial feasibility of each project and the political risks associated with it in order to avoid high indebtedness as was the case with Montenegro.

*Other more modern financial modalities are significantly underutilized in the region but could serve as solutions to bridging the funding gaps. Such examples include concessions, tolling systems (based on the "user pays" principle) and Public-Private Partnerships.*

### **2.2.5. Environmental Challenges and Climate Resilience**

The region of Southeast Europe and its immediate vicinity is on course to be disproportionately affected by climate change with higher temperatures and droughts putting pressure on the durability and performance of road infrastructure. At the same time, floods are also becoming a more common occurrence in terms of extreme weather events.

Thus, all countries in the region should re-evaluate the technological preparedness, the standards and monitoring practices in terms of quality and durability of construction materials and ensure the climate-resilient design of infrastructure facilities. As pointed above, better planning, infrastructure assets management and regular maintenance are key in securing uninterrupted safe operation of the local, national and cross-border regional transportation routes.

At the same time, strict environmental standards and environmental impact

assessments need to address the negative effects of expanding transport infrastructure of the natural habitats, biodiversity and water sources such as river beds.

### 2.2.6. Decarbonization of Transportation and E-Mobility

Decarbonization is one of the biggest challenges and opportunities ahead of ground transportation and road infrastructure development globally. Given the EU's ambitions towards climate neutrality and the primary role that transport plays in air pollution, the countries in Southeast Europe would have to race against the clock to future-proof their road networks by upgrading their e-mobility capabilities. While the installation of charging stations for electric vehicles along major highways and in densely populated urban nodes is steadily progressing, governments across the region need uniform strategies that would allow for uninterrupted cross-border travel by electric vehicles (EV).

The private sector has seemingly taken the initiative in this regard with several examples of regional private initiatives for the installation and operation of such EV charging stations. It is, however, up to the governments and institutions across the region to create the optimal administrative environment and legal conditions for such business ventures. Governments could also work on the demand-side by creating tax rebates and other financial stimuli for the upgrade of the automotive fleet across the region towards EV and other zero-emission vehicles. Several countries in the region have already adopted bans on the future sale of new combustion engine vehicles but direct EV purchase subsidies are less common.

## 3.1. Concluding Reflections on Enhancing Regional Connectivity in Southeast Europe and the Wider Region

### 3.1.1. Big Picture Visions. Small Action Plans

Finding the political will and practical approach towards deepening regional cooperation for the purpose of enhancing connectivity in the wider region of Southeast Europe has not proven easy so far due to various considerations examined in the early sections of this chapter. Thus, region-wide strategic thinking and big picture visioning remains important but the more realistic modus operandi points towards continuing sub-regional integration dynamics and bilateral or trilateral cross-border connectivity initiatives.

This is not necessarily an unfavourable outcome as setting small yet achievable goals that have a clear impact on the quality of life of people, the eco-



conomic development of border communities, on regional trade and tourism promotion could gradually increase the appetite towards more ambitious regional connectivity endeavours. Starting small also has the benefit of staged learning and allows for frequent course correction that builds trust, administrative capacity and cross-border project management experience in preparation for tackling more challenging region-wide initiatives.

### **3.1.2. Increased Efficiency of Cross-Border Procedures**

While major capital investments across the region are often hindered by the lack of sufficient funding, other soft measures could have a sizable impact on improving regional connectivity. The local experts who have participated in this study emphasize the importance of simplifying and harmonizing cross-border crossing and customs procedures. Some of these are, of course, reliant on investments in technical interoperability and interaction of various systems but others pertain to bilateral or mini-lateral agreements to streamline and harmonize administrative practices.

# Researchers

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## Researchers

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### Ademi, Stela, (PhD)



Mrs. Ademi currently holds the position of Programme Manager at the Co-operation and Development Institute, a think tank based in Tirana, Albania.

Mrs. Ademi was born in Shkoder, Albania, in 1987 and lives in Tirana, Albania. She has a bachelor's degree in law from Luarasi University, Tirana, Albania, and an LL.M. from the University of Tirana. She is currently a Ph.D. candidate at the Institute of European Studies, University of Tirana.

Her research focuses on EU connectivity, the Berlin process, EU integration, and regional cooperation.

She used to work as a project manager of the project SAGOV Plus, which aimed to promote, advocate, and support primary nodes in the maritime sector in the South Adriatic Area as part of new TEN-T regulation as well as capitalizing the outcomes of the SAGOV project regarding regional governance and cooperation between relevant authorities in Puglia, Albania, and Montenegro. In addition, she assisted ministries of the Albanian Government in writing grant applications for WBIF in the transport and energy sector. She is a project coordinator in the "Connected we Can: Strengthening WB6 CSO-s agency in Economic and Investment Plan implementation" project. The project aims to increase the engagement of specialized SEE6 CSOs and Think Tanks in the policy-making cycle and in implementing the Economic and Investment plan and its Flagship projects.

Mrs. Ademi held the position of Head of Sector for over eight years (until June 2022) at the National IPA support Office. She was responsible for coordinating all regional programs financed by EU financial assistance. One of her key responsibilities was coordinating Albania's strategic infrastructure projects in transport, energy, and digital transformation. The project was financed through the Western Balkan Investment Framework. Furthermore, from April 2021 to May 2022, she served as the National Coordinator for the EU strategy for the Adriatic and Ionian Regions, corresponding to the Albanian Presidency of this strategy.

## Georgiev, Yasen



Mr. Georgiev is Executive Director of the Economic Policy Institute in Sofia, Bulgaria.

Mr. Georgiev was born in 1983 in Sofia, Bulgaria. He holds a bachelor's degree in international relations from the University of National and World Economy – Sofia and a master's degree in business administration from Sofia University St. Kliment Ohridski.

His research focuses on the intersection of economy, public policy, and international relations. Since 2012, he has been the author of the country's biannual report, "Bulgaria's Construction Forecast Report", prepared by the Economic Policy Institute (Bulgaria) in cooperation with the EECFA - Eastern European Construction Forecasting Association. In 2021 and 2022, Mr. Georgiev participated as a co-author of the policy papers 'Corridor VIII – East Gate: Promoting Flagship 1 Connecting East to West' and 'The New Trans-European Transport Network and the European Security Architecture: Corridor VIII in the Western Balkans European Corridor', both prepared by the Cooperation Development Institute (Tirana) in partnership with Economic Policy Institute (Bulgaria). His research activity in the field of connectivity also includes the policy paper 'The Three Seas Initiative and Southeast Europe. Striking a Balance between Ambition and Reality' (2021) and the policy brief 'Bulgaria's Contribution to Bridging Connectivity Bottlenecks in the Black Sea Region – Prospects for an Accelerated Catching-up after a Delayed Start' (2024).

He is a member of the National Advisory Board of the Diplomatic Institute and the Public Consultations Council within the Committee on European Affairs of the National Assembly of the Republic of Bulgaria. He is also a member of Team Europe Direct.

**Glavić, Draženko (Prof.)**



Mr. Glavić is a Full Professor at the University of Belgrade's Transport and Traffic Engineering Faculty. He started his career there in 1998.

He was born in 1971 in Požega, Croatia. He is currently living in Belgrade, Serbia.

Mr. Glavić received a B.Sc., M.Sc., and Ph.D. in traffic engineering from the University of Belgrade - Faculty of Transport and Traffic Engineering (FTTE) in 1997, 2000, and 2002, respectively.

Mr. Glavić is an expert in transport economy, PPP, road pricing and tolling, mobility management, ITS technology, and traffic analysis. He has over 150 feasibility studies and over 100 other studies and projects in Southeast Europe. His work focuses on feasibility studies, concession projects, traffic studies, tolling studies, data collection methodology, and technology. He has experience with projects funded by various institutions (H2020, EIT, IPA, EBRD, WB, EIB, ADB, KfW, and others).

Among his leading projects in the field of connectivity are the Albanian Transport Strategy 2021-2026 (2022, Mott MacDonald, Belgrade), the Transport study for the Danube macro-region (2016, TRT, Milan, Italy), and The Spatial Plan of Montenegro—Sectoral analysis of road traffic (SIMM engineering, Podgorica, Montenegro).

He is a member of the Serbian Road Association managing board, member of IRF, member of IEEE, member of Euro Working Group on Decision Support Systems, as well as member of the Serbian Chamber of Engineers.

### Glazer, Michael



Mr. Glazer is the Director of SEE Regional Advisors Ltd.

He was born in 1955 in California, USA, and lives in Brezice, Slovenia. Mr. Glaser holds a bachelor's degree in physics from the University of New Hampshire, Durham, USA, and a master's degree in public affairs from Princeton School of Public and International Affairs, Princeton University, USA. He holds a Jurist Doctor (J.D.) from Yale Law School, USA.

His research focuses on economic, political, policy, and business matters affecting trade and investment in Southeast Europe. Among his leading connectivity projects is the biannual analysis of transport projects and policy in Croatia for the East European Construction Forecasting Association. He also frequently works on reports to clients regarding developments in Southeast European countries relating to investment and trade, including specific assessments of connectivity of individual countries, regions, and municipalities. He worked as the Founding President of the United States Chamber of Commerce Board of Governors in Croatia, Founding Vice President of the Croatian Turnaround Management Association, and a Fulbright Professor of Economics at Zagreb University Faculty of Economics. He was awarded a Fulbright Professorship.

### Gronic, Alexandru



Mr. Gronic works as an External Consultant in Transport Infrastructure at the Ministry of Infrastructure and Regional Development of Moldova.

He was born on April 28, 1987, in Balti City, Republic of Moldova, and resides in Chisinau.

He holds a bachelor's degree in Road, Bridge, and Railway Engineering, a master's degree in Roads, Materials, and Mechanization in Construction, and a master's degree in management of construction projects.

His research focuses on developing the Trans-European Transport Network (TEN-T), including constructing bridges and Border Crossing Points between the Republic of Moldova, Romania, and Ukraine. Among his leading connectivity projects are 'Construction, operation, maintenance, and repair of border road bridges over the Prut River, between the localities of Ungheni (Moldova)—Ungheni (Romania) and Leuseni (Moldova)—Albita (Romania)' and 'Construction of the bridge over the Dniester between the towns of Cosauti (Moldova)—Yampol (Ukraine)'.

He used to work as a project officer within the State Road Administration, responsible for implementing international contracts related to the construction and rehabilitation of national roads, some of which are part of the TEN-T corridors.

### **Kepaptsoglou, Konstantinos (PhD)**



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His research focuses on transportation planning and modeling, public transportation, transport economics, sustainable mobility, and operational research. Among his leading connectivity projects can be found 'Renewal of the Urban Bus Fleets for the cities of Athens and Thessaloniki' contracted by SUEZ S.A. – NAMA S.A. /European Investment Bank in 2020-2021, 'Preparation of the National Transport Development Strategy of Montenegro,' contracted by SUEZ SA & ADK LTD / European Investment Bank in 2017 and 'Strategic Transportation Studies, Transport Modelling and Feasibility Stud-

ies for Public Transport in Lahore Region' contracted by Osmani & Co & ADK SA / Punjab Metrobus Authority in the period 2015-2017.

He is a member of the Technical Chamber of Greece, the Hellenic Institute of Transportation Engineers, the former Chair of the Institute (2016-2020), and the American Society of Civil Engineers (ASCE). 2011, the American Society of Civil Engineers (ASCE) awarded him the State-of-the-Art in Civil Engineering Award.

### **Inac, Hakan (PhD)**



Mr. Inac is currently the Head of the Investment Management and Control Department at the Ministry of Transport and Infrastructure of the Republic of Türkiye.

He was born in 1982 in Giresun, Ankara, Türkiye. He has a bachelor's degree in industrial engineering, a master's degree in transportation management, and a doctorate in 'Digital Transformation of Transportation Systems.'

His research focuses on Transportation Management and Planning, Intelligent Transportation Systems (ITS), Smart Cities, Digital Transformation, Building Information Modelling (BIM), Project Management, Infrastructure Investment Management and Control. His leading projects include 'Economic Impacts and Analysis of Infrastructure Investments,' 'Türkiye Transportation and Logistics Master Plan (U 2053)' and 'E-Scooter Micro-Mobility Application for Postal Service: The Case of Turkey for Energy, Environment, and Economy Perspectives'.

He was a faculty member at Istanbul Commerce University, an academic researcher at the University of the West of England (UWE Bristol -UK), and the Head of Department at the General Directorate of Communications.



### Kosse, Iryna



Mrs. Kosse is a Senior Research Fellow at the Kyiv Institute for Economic Research and Policy Consulting.

She was born in 1976 in Ukraine and lives in Kyiv, Ukraine. She holds a master's degree in economics, and her academic research interest lies in infrastructure economics. Among her leading research projects are 'Change of Road Logistics Routes in Ukraine as a Result of the War,' 'State of Ukraine's Infrastructure Before the War,' 'Infrastructure Needs for post-war Reconstruction and Combining Domestic Infrastructure Policies with EU Infrastructure Initiatives,' 'Ukrainian economy at war: State of play and pathways towards recovery' (co-author).

### Mester, Victor Dimitrie



Mr. Mester is a Senior Infrastructure, Digitization, and Operations Expert at Civitta, Romania.

He was born in 1996 in Bucharest, Romania. He holds a bachelor's degree from ASE Bucharest in International Business and Economics and a master's degree from AAU-Aalborg in Innovation Management Knowledge and Entrepreneurship.

His research focuses on infrastructure projects, public administration policy, strategy, and operations.

He was evaluating the Romanian Operational Program for Major Infrastructure 2014-2022 and the Romanian Operational Program for Regional Development.

He is an Alumni of the KAS Sur Place Scholarship Program and an Alumni of the Aspen Junior Seminar Program.

## Miceski, Darko



Darko Miceski works as a World Bank Project Implementation Unit-Transport Traffic specialist.

He was born in 1978 in Prilep and currently lives in Skopje, North Macedonia. He holds a bachelor's degree in Air Traffic/Transport Engineering and is in the final stage of his master's degree in mechanical engineering.

His research focus lies on transport connectivity in Southeast Europe. Among his leading connectivity projects can be listed 'Construction of a railway section from Kriva Palanka - border with the Republic of Bulgaria as part of the railway Corridor 8' (preparation of a project proposal-IPA application form for a major project and tender documentation), 'Construction of a new road section Gradsko-Drenovo as part of Corridor 10d", preparation of a project proposal (IPA application form), tender documentation (major project) and monitoring', 'Rehabilitation of state road A2, section Kumanovo - Stracin (phase 1) on Corridor ` - preparation of project proposal (Operation Identification Sheet-OIS), tender documentation and monitoring.

He used to be the Head of the working group for Chapter 21: Trans-European Transport Network (TEN-T), National coordinator within the Transport Community-TC, and an alternate member of the Steering committee of the Transport Community. He was a technical committee member for road safety and Western Balkans Road Safety Observatory-WBRSO focal point for Transport within the Transport Community-TC from July 2021 – March 2023. He was a co-chair of the PSC for the project Technical Assistance for Road Safety Management Capacity Review (RSMCR) and improvements of road safety management capacity at municipality level (Local Communities)-WB PIU project within MoTC (April 2022-31.03.2023), co-chair of the working group for establishing Road Safety Agency in the Republic of North Macedonia (2018-31.03.2023), co-chair of the Sector working group for transport-SWGT under IPA 2 (2015-31.03.2023). He is an IPA Trainer, member of the IPA Training Facility in the Republic of North Macedonia. He used to be Head of the Department for the Instrument of Pre-Accession (IPA) of the EU and IPA coordina-

tor-part Transport within the Ministry of Transport and Communications (01.02.2023-31.03.2023) and Head of the EU Department and IPA coordinator-part Transport within the Ministry of Transport and Communications (06.07.2021-31.01.2023).

**Stathopoulos, Antonios (Antony), (Prof. PhD D.Civ.Eng.)**



Mrs. Stathopoulos is Prof. Emeritus. at the National Technical University of Athens.

He was born in 1948 in Athens, Greece. He holds a degree in mathematics from the National and Kapodistrian University of Athens and a master's degree in civil engineering from the University of Manchester Institute of Science and Technology (UMIST). He is a Doctor of civil engineering at the National Technical University of Athens (NTUA).

His research focuses on transportation systems analysis, traffic modeling and control, port planning and operations, the environmental impact of transportation, and intelligent transportation systems.

In 2017, he participated in developing the Transport Development Strategy (TDS) of Montenegro's Ministry of Transport and Maritime Affairs (MTMA). Among his leading research works are 'The Public Transportation Studies - Transport Modelling and Feasibility Studies for Integrated Bus Operation in Lahore (The Punjab Mass Transit Authority)' (2016) and 'The Feasibility Analysis and Evaluation of the Viability of Multimodal Corridor of the Approved Action "Sea2Sea" under the Trans-European Transport Network (TEN-T)' (2014).

He is a member of the Steering Committee of the Joint Transport Research Centre of the Organisation for Economic Co-Operation and Development (OECD) and the International Transport Forum (ITF) in Paris and a member of the Editorial Board of the International Journal of Transportation Science & Technology (IJTST)

He used to act as a Professor of Transportation Systems at the Department of Transportation Planning and Engineering in the School of Civil Engineer-

ing, NTUA, and as a director of the Laboratory of Railways and Transport in the Department of Transportation Planning & Engineering at the NTUA. He conducted contract research for the EU, the UN, the UNDP, the Greek Government, and various Public and Private Sector Agencies on Advanced Transport Telematics, Environment and Safety, User Response, Demand Management, Combined Transport, Railway Engineering, and Technology Forecasting.

### Terzić, Fata (PhD.D.Civ.Eng.)



Mrs. Terzić heads the Studies and Design Department at Public Enterprise Roads of the Federation of Bosnia and Herzegovina. She is as a part-time lecturer in the Road Design course at the Faculty of Civil Engineering, University of Sarajevo.

She was born in 1964 in Orašac, Bihać, Bosnia and Herzegovina, and currently lives in Sarajevo, Bosnia and Herzegovina.

She holds a master's degree in civil engineering from the Faculty of Civil Engineering of the University of Sarajevo, Bosnia and Herzegovina, and a master's degree in civil engineering from the University of Zagreb, Croatia. In 2021, she became a doctor in civil engineering at the University of Sarajevo, Bosnia and Herzegovina.

Her research focuses on road network development. She is involved in planning this development, from collecting and analyzing data on road conditions to preparing and managing documents for the application process for projects for international loan funds and monitoring the implementation of those projects.

She was deputy team leader of the 'Bosnia and Herzegovina Road Management and Safety Project project and 'The Road Bridges and Tunnel Data Base.' Both projects were contracted by the Road Directorate of Federation BH (March 2004-March 2005). She is the author of Road Network Rehabilitation Project with a focus on the main roads of the Federation of Bosnia and Herzegovina, Customer: Road Directorate of Federation BH, (March 2006). Mrs. Terzic is a member of the Coordination Body for the TEN-T

network from the Federation of Bosnia and Herzegovina and a member of the Road Design Working Group within the Technical Committee TC22 Road Construction within the Institute for Standardization of Bosnia and Herzegovina.

### Trifonova, Mariana



Mrs. Trifonova is a Program Director and Senior Analyst at the Economic Policy Institute – Sofia.

She was born in 1988 in Shumen, Bulgaria, and currently lives in Sofia, Bulgaria. She holds a bachelor's degree in international relations from the University of National and World Economy—Sofia and a master's degree in international studies (Commerce) from the Korea University Graduate School of International Studies—Seoul. She is a Ph.D. candidate in international economics at the University of National and World Economy—Sofia.

Her research focuses on international economics and international relations, regional cooperation in CESEE and the wider Black Sea region, and the use of strategic foresight in governance and public policy innovation. Since 2020, she has facilitated and led all foresight endeavors in the framework of EPI's annual Summer Seminar for Young Public Policy Professionals from Central and Eastern Europe with regional cooperation and connectivity always at the core of the exercise. She was a head researcher and co-author of the Policy Paper "Climate Change and Security Dynamics in Southeastern Europe" (FNF, May 2023), which utilized strategic foresight and a regional expert pool to examine SEE's resilience towards climate change and its impact on economic security, including regional connectivity, energy, and transport infrastructure. She is the author of the paper 'Central and Southeastern Europe Navigating Uncertainty: Use of Foresight and Scenario-Building Techniques.'

She is a member & EPI representative at the European Think-tank Network on China; a member of WG2 "High Tech & Innovation," China in Europe Research Network; an alumna of the Aspen Young Leaders Program

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## Notes

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