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KEY ASPECTS OF STRATEGIC INFRASTRUCTURE DEVELOPMENT

ABSTRACT

The strategic infrastructure is the backbone of every transport network. The development in the last several years changed its course following the geopolitical situation and the enormous growth of electrical and self-driving cars. It is no longer enough to connect borders, we need to connect them in a certain way to ensure that the transport from one country will not face difficulties to the final point. For example, in the current situation if we travel between the farthest points in Europe we will cross different roads, with different characteristics and different rules, but we will reach the final point. If we consider traveling with the electric car it will be impossible as we will need a charging station every few hundred kilometres. To meet society's needs we need to reorganize the ways we are thinking of the strategic infrastructure.

KEYWORDS: Strategic infrastructure, Electric cars, Self-driving cars, Challenges in front of road infrastructure

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INTRODUCTION

During the last few years, we faced different difficult situations all of which affected society. Maybe the worst hit was on the transport sector. During COVID-19 we saw that we cannot reorganize the traditional routes in such a manner not to have a huge impact on the free travel of the goods and people. We were unable to transport goods that were transported by road before COVID-19 on railways or another type of transport. We were unable to transport people who were transported by plane before on any other type of transport. So, the goods and people stopped to travel. Of course, a huge impact has on the restrictions all countries imposed, but if we had good connections to different kinds of transport the impact would be smaller.

After COVID the situation started to normalize but all the research shows that it will never be the same again (Tzonevska, 2022). The prices will stay higher (than before COVID), the transport, especially road transport will need decades to come back to the level before.

The second big problem we faced was the war in Ukraine. Ukraine cannot transport its grain any other way than by ship. Every problem on the route causes a huge impact. A lot of people are starving because of that and the price of the grain becomes unstable.

Now when we are talking about what will happen after the war we are saying that we must build transportation corridors to Ukraine to help it to recover faster. This once again shows that the infrastructure is not nearly enough.

So is the infrastructure planned in the best way? Maybe if we consider the times before COVID and the war, but now we must be sure that during the last 50 or more years, when we planned our infrastructure we didn`t take all the risk into account.

The goal of the paper is to examine the risks we are expected to face when planning the strategic infrastructure and to give a different view of the aspects we are usually missing or not taking into consideration.

1. Literature review

Strategic infrastructure development is essential for building connectivity (Tsonkov & Petrov, 2022). The improvement of communication networks and connections between different territories leads in turn to economic and social change in the long term (Ray, 2015). In the context of digital change, a digital connectivity approach is increasingly being adopted (Tsonkov, Petrov, Berberova-Valcheva, 2023).

Speaking of strategic infrastructure development, it is necessary to analyze and evaluate its various aspects. These aspects relate to the advantages of forming an adequate framework for managing the overall development process (Too, 2010); strategic planning in the context of sustainable development (Malekpour, Brown, De Haan, 2015); environmental impact assessment, and evaluation of infrastructure projects (Morrissey, Iyer-Raniga, McLaughlin, Mills, 2012).

All these aspects are largely combined in the choice of a model for the territorial development of regions to improve connectivity between them (Tsonkov, 2022). This process is also directly manifested in urban development and mobility models (Petrov, 2021). In a broader context, we can highlight a strong link that exists between strategic infrastructure development and regional development of national space (Shkarlet, Ivanova, Popelo, Dubyna, Zhuk, 2020).

The Bulgarian scientific literature on the issue related to the development of strategic infrastructure can be highlighted in the analyses of authors such as Petrov and Tsonkov. In their works, several policies and concrete solutions are proposed in the area of strategic infrastructure development.

Figure 1. TEN-T network and Corridor № 9.

According to the authors, the route will play the significant role of the crossing point of two of the ten Pan-European corridors - Pan-European Corridor VII (Danube), which connects Western Europe with the Black Sea and Central Asia, and Pan-European Corridor IX, which connects Scandinavia and the Russian Federation with Southern Europe and Asia Minor, respectively. As a result of its geographical position, more than 80% of the transit of goods between Romania, Bulgaria, Greece, and Turkey, or about 23 billion euros per year, passes through Bucharest-Giurgiu-Ruse and Craiova-Beket-Orjáchovo (Tsonkov & Petrov, 2023).

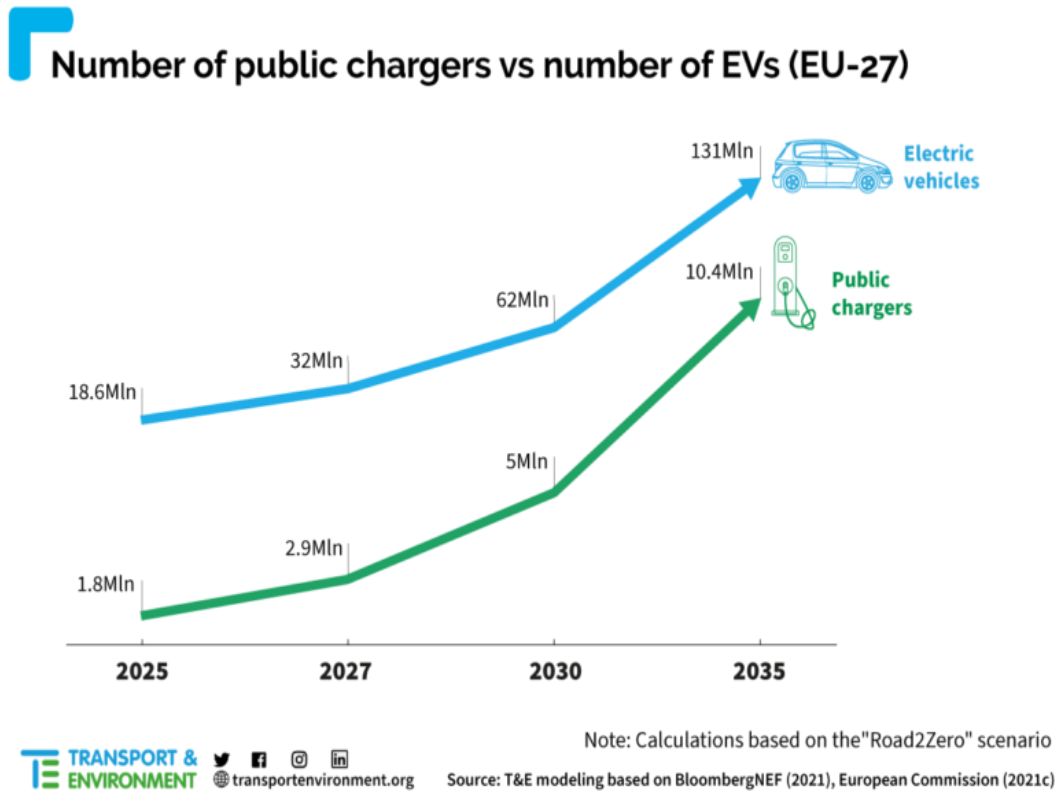
Figure 2. Parallel route of Corridor № 9

2. THE RISKS WE WILL FACE SHORTLY

What we will face in the next few years? Are we ready and do we learn our lessons? When searching the scientific literature there are not enough papers examining the future risks. If we search deeper with a view from the year 2019 we will see that there are very few papers examining the strategic infrastructure and its ability to be replaceable following different situations including war. So the situation now is pretty much the same, we don`t know the risk, or we don`t care about them and definitely, we are doing nothing to face the future with our heads up.

But what do we expect from the future, what new we face? Mainly in road transport, we are in front of a big change. The automotive industry is changing in such a big manner that maybe only the first cars at the end of the XIX century had on the transport. We will need to fully change our approach and understanding of the roads to meet the car`s needs. Of course, we are not ready. Even in a highly developed region like the USA and Europe, there are places we can`t reach with electric vehicles. Of course, the situation is worse in lower-developed regions. Some research (Figure 3) shows that the growth of electric cars will be faster than the growth of new charging stations, which will even make the problem bigger. The road authorities are still planning, building, and maintaining the infrastructure using standards that don`t cover the needs of electric cars.

Figure 3. Number of public chargers and number of electric vehicles (Figure by EC)



Parallel with electric cars shortly we will have fully autonomous road vehicles. Again, we don`t know how to build the roads to be suitable for that kind of vehicle. We even don`t examine the

impact of autonomous vehicles on the roads and the people, to have a base point from which to plan the new roads and reconstruct the old ones.

Maybe the most examined future problem is the one of climate change and its impact on the roads, so this paper will not focus on it (Popova, Katsarov, Antov, 2019).

3. THE CHANGES IN THE STRATEGIC INFRASTRUCTURE

The strategic infrastructure is the backbone of the transport network. It includes the roads, railways, airports, ports, and the connections between them. All other infrastructure is built by the plans for strategic infrastructure. But is the planning of strategic infrastructure flexible enough to cover the needs? The simple answer is no, because of the costly procedures and often the differences between countries it must cross. Let`s examine one transport corridor. The corridor N8 Durres – Skopie – Sofia – Plovdiv – Bourgas – Varna was originally developed to connect three main ports in Europe – Durres, Bourgas, and Varna and of course Albania, North Macedonia, and Bulgaria as a country with bad connections between them (Katsarov, 2019). This corridor, before COVID and the war in Ukraine, was part of the plans of the EU and Albania, North Macedonia, and Bulgaria, but never actually anything was done for it to be built. Now when we started to talk about the reconstruction of Ukraine after the war and how we will do it the main part was with the missing infrastructure and of course, the connection with the ports is essential. So to the corridor was “attached” the port in Brindisi and the connection from Varna to Ukraine (Tsonkov, Petrov, Berberova-Vulcheva, 2021; Tsonkov, 2023).

Figure 4. Corridor №8 – Source Bulgarian Ministry of Transport and Communications

In less than a year the Bulgarian government started the following procedures:

1. Technical design of the missing highway section between the Macedonian border and the Struma Highway

2. Road safety assessment for the Rila highway, which continues the highway from the Macedonian border to the Struma highway, to the Trakia highway (Second Macedonian Road Congress 2022)
3. Road safety assessment for building additional lanes for Trakia highway in the section from Sofia to Maritsa Highway (after Plovdiv)
4. Technical design for Cherno more highway, connecting Bourgas and Varna
5. Technical design and road safety assessment for two sections for reconstruction of the road from Varna to Romania (Ukraine)
6. The Three Seas Initiative investment fund bought a major part of the port of Bourgas.

So the war in Ukraine was the trigger to start all of those, but what would happen if we already had it? Maybe we would be in a position to help Ukraine faster and better, maybe we would have the possibility to transport the Ukrainian grain via this corridor, and so on.

Pretty much the same is the situation with the connection North-South in the eastern part of Europe, A connection between Bulgaria (and Greece) with the Baltic countries was needed connections but work done on it, not before 2021 when the Three Seas Initiative summit and business forum held in Sofia it was made a main topic (Tsonkov, 2022). Later it was unofficially added a connection to Ukraine.

In the term "Corridor" we added digitalization. This is a huge step towards changing our minds and our understanding of the infrastructure. The step is huge but it is not enough we need to understand that we must change our regulations and standards to have the infrastructure the society needs.

CONCLUSION

Now facing all that and understanding that we must plan our transportation infrastructure considering all the possibilities we need to establish a new way of understanding transport. From now further, when we talk about transport we must consider everything – the road, the connections, the intermodality, the digitalization, all the possible scenarios even the least likely. For that to happen we need to:

1. Reconsider our vision and understanding
2. Rewrite our strategies
3. Change our standards
4. Building the infrastructure in a way that guarantees that all the goods and people will have the possibility to travel on a different transport mode at the same cost

This must be agreed between all the countries, assuring that traveling between borders will not face different rules and different kinds of infrastructure.

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