

THE IMPACT OF ROAD INFRASTRUCTURE ON TRAFFIC SAFETY AND THE ECONOMIC DEVELOPMENT OF THE STATE – CASE OF THE REPUBLIC OF NORTH MACEDONIA

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Abstract

Starting from the popular saying that road infrastructure is the bloodstream of a state's economy as well as its impact on traffic safety. Road infrastructure that includes highways, regional roads as well as roads of a local character of the state. Looking at the facts, it follows that road infrastructure is of great importance to a state. Special attention should be paid to the expansion and modernization of road infrastructure, and the development of America on the developed European countries as well as other countries in the world.

Analyzing the situation, it emerges that road infrastructure has an impact on economic development as well as on traffic safety.

Hence, this paper will analyze the following factors that have an impact on the economy and security of the country, namely:

- Analysis of European corridors 8 and 10 that pass through the RNM,
- Analysis of the entire existing road infrastructure,
- Analysis of good and efficient measures for the further development of the road infrastructure.

Of course, the subject of analysis will be a good and efficient analysis of the significance and influence of the country's road infrastructure.

So good and efficient analyses will propose in the conclusion the most efficient measures that have an impact on the development and efficiency of the road infrastructure that has an impact on the economic development and traffic safety of the country.

Keywords: Road infrastructure, safety, economic development, analysis of corridors 8 and 10.

Introduction

In order for a country to develop, it needs to have a good, modern and high-quality road infrastructure, which has a direct or indirect impact on economic development, traffic safety, as well as on all areas that are necessary for the normal functioning of the country. Taking into account the aforementioned, it is quite certain that special attention should be paid to the modernization and development of road infrastructure.

This applies equally to developed, but even more so to underdeveloped countries, as well as to developing countries.

The relationship between road infrastructure and the economic development of the country should be well analyzed, as well as from the aspect of traffic safety, from the aspect of the existing situation, and in order to plan the further construction of new modern roads.

Gradual resolution of problems creates prerequisites for intensification of economic development as well as traffic safety throughout the entire road infrastructure in the Republic of North Macedonia.

Road Infrastructure of the Republic of North Macedonia

The Republic of North Macedonia can be distinguished by a well-developed road network with a length of 14,182 km, including highways, regional, national and local roads. The main axes of the state road network are the two Pan-European corridors, such as Corridor 8 (east-west) and Corridor 10 (north-south).

Regional roads provide access to the main road corridors and the national road network, and together with local roads are of great importance for the development of the local economy, small businesses, agricultural activities, which are of great importance to the country, as well as attracting new investments from abroad and from our emigrants who are temporarily employed in European countries, America and other continents.

In accordance with the applicable legal regulations in the Republic of North Macedonia, the Public Enterprise for State Roads is the body responsible for the management, construction, reconstruction, maintenance and protection of state roads throughout the country.

Currently, the country has a total road network length of 14,182 km, of which 242 km are classified as highways, 911 km are national roads, 3,771 km are regional roads and 9,258 km are local roads.

This entire road network of the Republic of North Macedonia has the largest share in the total transport of goods and passengers, which is also the case with other countries in the region and further afield.

It can be mentioned that, in the structure of the transport of goods transported throughout the country, national transport dominates over international and transit transport. Also, road transport dominates over rail transport.

If analyzed in more detail, the existing road construction is solid and of good quality.



Figure 1. Road network of RNM

Analysis of Corridors 8 and 10 Passing Through the Republic of North Macedonia

Analyzing the existing road infrastructure and the current condition of the roads in the Republic of North Macedonia, the Government of the Republic of North Macedonia on 07.03.2023 approved the contract for the construction of Corridors 8 and 10-e. Nine proposals for amending laws were submitted by some parliamentary groups, which, according to the explanation, were necessary for the implementation of the project. Among others, amendments

to the Law on Forests were proposed. The proposed amendments to the laws stipulate that the procedure for permanent conversion of forest land will not be carried out when it comes to buildings of strategic interest determined by law.

On 08.05.2023, the Government, using the so-called abbreviated procedure with a European flag, submitted proposals for five of the laws for which proposals had already been submitted by the MPs.

Several laws have been adopted to regulate the legal procedures for the construction and completion of the road infrastructure in the Republic of North Macedonia.

The immediate reason for the need for these documents was the announced project for the construction of the highways on Corridors 8 and 10-e, which in some parts should also pass through forests. The document contains a legal analysis of the implications of the proposed changes in the legal framework for environmental protection.

Thus, the Government of the Republic of North Macedonia in 2025 made a decision to invest in several significant projects, but the emphasis was on the construction of Corridors 8 and 10 as the main strategic corridors.

In the area of railway infrastructure, in 2025 projects were announced for the construction of a high-speed railway on Corridor 10, as well as an international railway tunnel for connection with the railway of Skopje and Sofia.

With the modernization of corridors 8 and 10 as the main strategic corridors, emphasis was placed on the expressway Kriva Palanka - Dlabochica, Grasko - Drenovo, the regional road Ohrid - St. Naum, the Kichevo - Ohrid highway, which is under construction and part of which has been put into use. The Bukojcani - Kichevo section is also under construction.



Figure 2. Corridors 8 and 10 passing through RNM

The Impact of Road Infrastructure on Traffic Safety in the Country

The impact of road infrastructure on traffic safety is a key factor in reducing the number of traffic accidents, injuries, victims, as well as material damage to vehicles and road infrastructure facilities.

Infrastructure, as the third element in the traffic system "man-vehicle-road", is often a direct cause or significant contributor to accidents when it is not properly designed, maintained or marked.

We can mention several key aspects of this impact such as:

- The quality and condition of the road surface, damaged road surface with holes, unevenness or reduced skid resistance (asphalt wear) directly increases the risk of loss of control over the vehicle,
- The geometric characteristics of the road, poorly designed curves (inappropriate gradient), steep gradients, insufficient visibility when overtaking or merging into traffic are common causes of collisions,
- Traffic signaling and equipment, lack of visible horizontal signaling (lines), damaged vertical signaling (signs) or absence of protective fences in dangerous places significantly increase the danger,
- Design of intersections, intersections are critical points. Inadequate design, lack of roundabouts or unclear right of way lead to frequent side collisions,
- Lighting of certain traffic areas that are part of the road infrastructure, insufficiently lit roads in populated areas or dangerous sections outside populated areas drastically reduce visibility at night and in bad weather conditions,
- Infrastructure for vulnerable participants, lack of sidewalks, cycle paths and safe pedestrian crossings that expose pedestrians and cyclists to high risks.

The concept of modernity in road safety, as well as in the entire road infrastructure, should be designed so that if a driver makes a mistake, the infrastructure will minimize the consequences (for example, soft zones along the road without trees or poles, elastic fences and forced parking zones).

The Influence of Road Infrastructure on the Economic Development of the State

Road infrastructure has a key impact on economic development, exports, employment and regional connectivity.

The road is not only part of the largest human institutions, just because it is the foundation of the survival of society, but it also has a stake in every segment of the state. The road determines the size, development and function of many cities and other settlements such as industrial zones. The road controls the development of strategy and the place of our battle. The road provides a framework for overall economic development. The road controls all trade and, importantly, all ideas. With its modest function, it is an indispensable guide without which progress from place to place would be an uninterrupted experiment, it is a means without which an organized society would not be possible. The road supports and controls all history.

From an economic perspective, transport infrastructure is the bloodstream that serves the economic organism, enabling its functioning and development. The famous economist Hirschman defines infrastructure as public or social capital that provides basic services without which primary, secondary and tertiary activities could not function. In other words, production activities cannot produce and place goods on the market if they do not have appropriate input such as transport services. Transport infrastructure is a function for exploiting the economic space, participating in the division of labor and the achieved level of economic and technological development.

For these reasons, **“The Transport System of the Republic of North Macedonia and European Economic Flows”** represents an opportunity for a better understanding of the relationship between the meaning and role of transport infrastructure and transport traffic in the overall socio-economic development and organization of space in the country.

Conclusion

The road infrastructure of a country is of great importance, because on the one hand, the development of the country begins with the construction of a developed, modern and contemporary infrastructure. The question also arises whether roads came first in the development of man or vice versa. However, all scientists agree on one thing: if the wheel is the most important invention of man, then the road is right after it.

The transport of passengers and goods can be realized with several types of traffic, namely: Road traffic, rail traffic, air traffic, maritime traffic, river traffic.

The benefits of investing in the construction of road infrastructure are great, because on the one hand, it opens up work for many construction companies, and on the other hand, good infrastructure is important for both domestic and foreign investors.

Modern and high-quality road infrastructure as well as good transport policy can serve and influence:

[7] The development of the economy and the overall development of the country,

[8] The impact on traffic safety as a key factor in reducing the number of traffic accidents, injuries, victims, as well as the occurrence of material damage.

The Republic of North Macedonia needs to be included in the European road network. For this purpose, modern transport technologies, technical-technological and other achievements are necessary, as well as a modern traffic system and a road network of new quality, safety and speed of services.

A modern and developed country always gives priority to the construction of road infrastructure both in populated, urban and rural areas, and outside populated areas, such as connecting populated areas with each other and connecting them with industrial zones, tourist areas, shopping centers and others.

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