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# THE CONTRIBUTION OF THE TRANSPORT INFRASTRUCTURE TO THE ECONOMIC DEVELOPMENT - THE CASE OF THE REPUBLIC OF MOLDOVA

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**Abstract.** The basic objectives of the article were: 1) the elucidation of the concept of road infrastructure and of the role of the road infrastructure in economic development; 2) the reflection on the situation of the road infrastructure development in the Republic of Moldova and of the extent to which the efforts made in this regard contributes to the economic growth needs. In order to achieve the expected objectives, the following research methods were used: synthesis, economic analysis, deduction, generalization.

As a result of the research, it was found that the contribution of the road infrastructure to the economic growth in the Republic of Moldova is insufficient. In this context we deduce that a road strategy is required, based on efficient and rational use of public money and oriented to improving the road quality and to transforming the road infrastructure into a progress and sustainability factor.

**Keywords:** economic growth, gross domestic product, investments, road infrastructure, transport and storage industry.

According to the Guide to Road Infrastructure Planning and Management „the road infrastructure includes physical assets like the roads themselves, as well as everything associated with them, for example bus stops, trucking terminals, signage, drainage, and structures such as bridges or tunnels" [11].

In the Municipal Road Management Plan 2021 of the Warrnambool City Council, the road infrastructure is defined as the structures forming part of the roadway, pathway or shoulder as well as the materials from which a roadway, pathway or shoulder is made. Respectively, bridges, culverts and fords plus materials such as asphalt, bitumen, gravel, line marking, guideposts, signs, traffic lights etc. are mentioned as components of the road infrastructure [12].

It is also considered that the road infrastructure „consists of the installation of fixed assets including surface roads and railways and terminals such as bus stops, trucking terminals, railways stations" [6].

If the conceptualization of the road infrastructure is less addressed by researchers, its role in economic development is widely reflected in scientific works. Thus, Botric et al. investigate the role of road infrastructure in regional development and, in this context, identify 3 related theories: the theory according to which infrastructure depends on regional development, the theory that promotes the idea that infrastructure conditions regional development and the theory of balanced development that places equal emphasis on the role of infrastructure and economic development in the region [5].

In a vast series of works, the development of the road infrastructure itself is associated with the economic growth. Zhang, for example, presented a model of the spatial spillover effects of transport infrastructure on regional economic growth [13].

Ding emphasizes the role of the development of urban roads to rising the gross domestic product (GDP) shares in the cities [8].

Ben, in the context of highlighting the role of road infrastructure in economic sustainability, characterizes two categories of effects on economic development: forward-induced effects and road construction follow-up ripple effects According to the author, the forward-induced effects are represented by the increase in motor-vehicle production, in demand for secondary production sector

production, in employment, in supply, in demand for consumer goods, the final result being the exponential increase in the national income. The road construction follow-up ripple effects on economic growth have been divided into two groups: with direct contribution (lower transport cost, improved affordability, accessibility and safety, door-to-door service) and with indirect contribution (social integration, urbanization process, industrial structure, higher traffic efficiency) [1].

Hg et al. in their turn, stress the crucial role of road infrastructure in „providing mobility for the efficient movements of people and goods, as well as providing accessibility to a wide variety of commercial and social activities" [10].

According to the official website of the European Union [14], the transport industry accounts for about 5% of the GDP. Implicitly, the following benefits to the growth and employment are mentioned:

• Increases the companies' ability to compete in the world economy, taking into account the fact that the share of the transport and storage cost in the finished product is about 10–15%;

• Improves the quality of life: expenses related to transport goods and services constitute approximately 13.2% of every household's budget;

• Increases the employment. Thus, the transport industry directly employs around 10 million people.

Without diminishing the significance of other beneficial effects of the road infrastructure on the economic growth, we will make a reflection on the share of the transport industry in the GDP of the Republic of Moldova. (Table 1).

**Table 1. The share of the transport and storage industry in the GDP of the Republic of Moldova in the period 2015-2020**

| Indicators | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| GDP, thousands lei | 131065513 | 153557776 | 165650077 | 183180638 | 195778725 | 189186518 |
| The contribution of the transport and storage industry in GDP, thousands lei | 4433146 | 6791993 | 8276410 | 7601427 | 8248105 | 7000141 |
| The share of the transport and storage industry in GDP, % | 3.38 | 4.42 | 5.00 | 4.15 | 4.21 | 3.70 |

Source: developed by the author based on [2].

Table 1 data show that the contribution of the transport and storage industry in the GDP in the Republic of Moldova was similar to that in the European space only in 2017. Subsequently a continuous reduction of the indicator is noted.

By analyzing the situation of roads in the Republic of Moldova, we find out that, from the total length of 9471.9 km, 5881.7 km are national roads and 3590.2 km - local roads (Table 2).

**Table 2. The length of the roads by categories in the Republic of Moldova in the period 2012-2021, km**

| Indicators | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | 952.2 | 952.2 | 9360.1 | 9373.1 | 9385.7 | 9377.5 | 9445.9 | 9431.5 | 9464.5 | 9471.9 |
| *inclusive:* | | | | | | | | | | |
| Local | 6016.2 | 6016.2 | 6020.8 | 6033.8 | 6039.5 | 3562.7 | 3623.8 | 3589.5 | 3582.3 | 3590.2 |
| National | 3336.0 | 3336.0 | 3339.3 | 3339.3 | 3346.3 | 5814.8 | 5822.1 | 5842.0 | 5882.2 | 5881.7 |

Source: developed by the author based on [3].

The general quality of roads can be evaluated based on the weight of the roads with rigid clothing, the last being defined as clothing made of cement or cemented macadam [7].

With reference to the quality of roads in the Republic of Moldova (Table 3 and 4) we deduce that if the weight of national roads with rigid clothing is 99.2%, the share of local roads with rigid clothing in their total length is only 92.91%

**Table 3. The length of the national roads on the type of clothing in the Republic of Moldova in the period 2012-2021**

| Indicators | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | 3336.0 | 3336.0 | 3339.3 | 3339.3 | 3346.3 | 5814.8 | 5822.1 | 5842.0 | 5882.2 | 5881.7 |
| Including with rigid clothing, km | 3336.0 | 3336.0 | 3339.3 | 3339.3 | 3346.3 | 5764.6 | 5771.5 | 5797.8 | 5835.3 | 5834.7 |
| The share of national roads with rigid clothing in their total length, % | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 99.14 | 99.13 | 99.24 | 99.20 | 99.20 |

Source: developed by the author based on [3].

**Table 4. The length of the local roads on the type of clothing in the Republic of Moldova in the period 2012-2021**

| Indicators | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | 6016,2 | 6016,2 | 6020,8 | 6033,8 | 6039,5 | 3562,7 | 3623,8 | 3589,5 | 3582,3 | 3590,2 |
| Including with rigid clothing, km | 5499,4 | 5500,5 | 5521,6 | 5539,5 | 5547,4 | 3277,1 | 3307,0 | 3347,8 | 3262,6 | 3335,5 |
| The share of local roads with rigid clothing in their total length, % | 91,41 | 91,43 | 91,71 | 91,81 | 91,85 | 91,98 | 91,26 | 93,27 | 91,08 | 92,91 |

Source: developed by the author based on [3].

Tables 3 and 4 reveal the primary results of the financial efforts made to improve the quality of the road infrastructure in the Republic of Moldova, while the quantification of these efforts is expressed by the related investments. In the absence of more accurate data on investments in road infrastructure, we will analyze the dynamics of investments in engineering constructions which, in turn, include those that refer to roads (Figure 1).

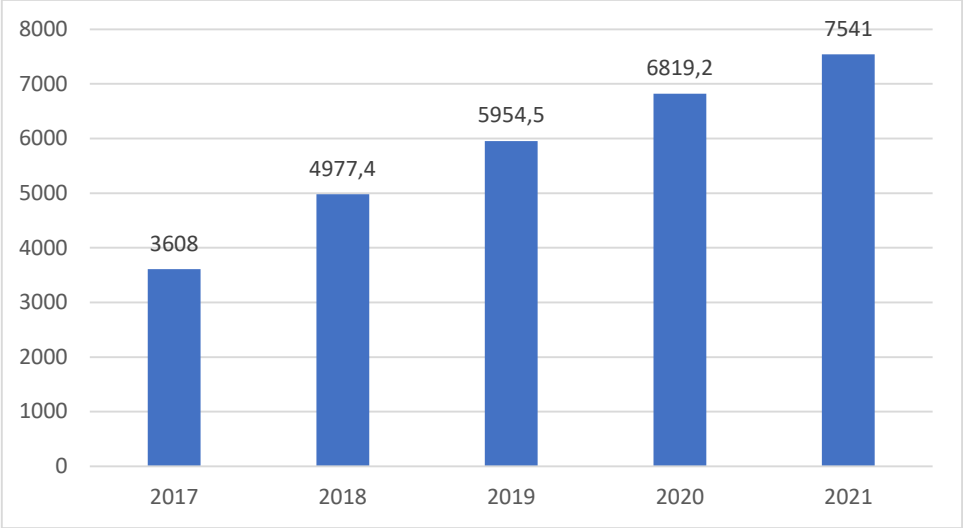



**Figure 1.** The dynamics of investments in engineering constructions in the Republic of Moldova in the period 2017-2021, millions lei

Source: developed by the author based on [4].

According to the data in Figure 1, the investments in engineering constructions had a continuous growth trend during the analyzed period.

The data that reveal the means from the road fund and additional sources used directly for the maintenance and repair of public roads are reflected in Figure 2.

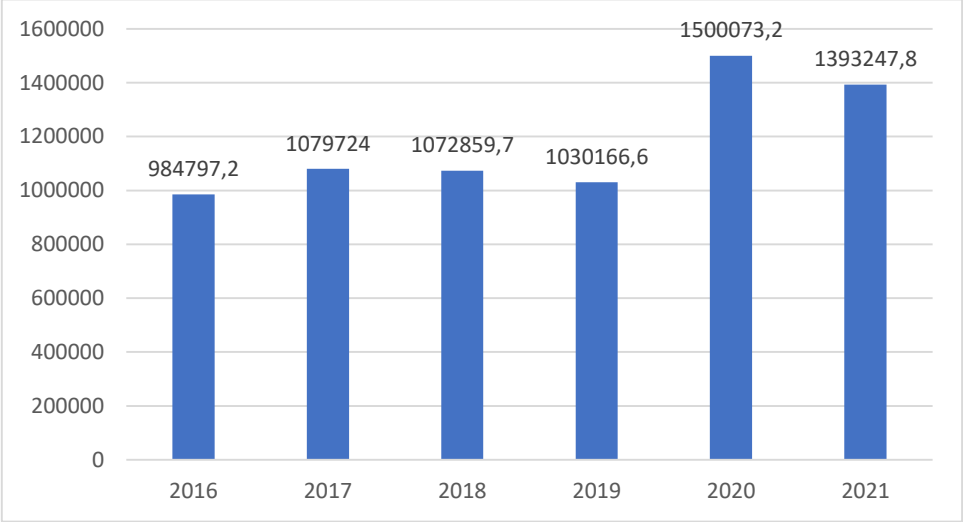



**Figure 2.** The means from the road fund and additional sources used for the maintenance and repair of public roads in the Republic of Moldova in the period 2017-2021, thousands lei

Source: developed by the author based on [9].

Thus, as we find from Figure 2, during the analyzed period, considerable amounts were allocated for the road infrastructure, even if in 2021 there is an insignificant reduction of the volume of means invested compared to 2020.

On the other hand, in an international ranking, according to the data of 2019, the Republic of Moldova held the position 127 according to the quality of the roads, with a quality index of 2.6 out of 7 maximums [15]. The low quality of roads is widely complained by the business representatives and civil community, representing an impediment in economic and social development.

## Conclusions

Despite the problems existing in the Republic of Moldova in the accumulation of budgetary resources, the means allocated to improve the road infrastructure have the tendency to grow, the

statement being argued by the increasing trend of investments in engineering constructions, as well as a higher level of the allocations from the Road Fund in 2020 and 2021 compared to the previous period. At the same time, the contribution of the road infrastructure to the economic growth in the Republic of Moldova is insufficient, reasoning argued by:

a) the reduced contribution of the transport and storage industry in GDP;

b) the low road quality.

Based on the stated above, it is obvious the need for strategic interventions in the problem of roads in the Republic of Moldova. In this context we deduce that a road strategy is required, based on efficient and rational use of public money and oriented to improving the road quality and transforming the road infrastructure into a progress and sustainability factor.

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