# PERFORMANCE OF NATIONAL ROADS IN THE REPUBLIC OF MOLDOVA

**Ph.D. Student, Aliona OBOROCEANU**
Doctoral School of Economic and Demographic Sciences,
National Institute for Economic Research, Republic of Moldova
E-mail: andriana74@gmail.com

**Abstract:** *The article represents a research on the significant importance in the economic activity of road quality management, based on performance. In this regard, the author made a concrete estimate of some indicators that influence the development and economic growth by ensuring the implementation of quality road management, which was made by identifying the elements of progress in order to review the efficient use of resources. The factor generating economic growth and emancipation for the development of a society is the existence of modern and quality road networks that are able to ensure trade links at national level between various regions, but also internationally, in this way contributing to intensifying relations between states, connecting localities to the national network, thus facilitating the free movement of citizens and increasing mobility. Road quality management establishes and in fact transposes the quality policy through pre-established and systematic activities, so as to prevent non-quality, to ensure the achievement of the required quality of the road infrastructure. Investments in transport networks increase the capital invested compared to that realized in other fields of activity, based on direct and indirect effects, which result from saving costs and time by attracting the necessary resources to build modern road infrastructure. Progressive road management is based on the performance of both the programming and the implementation of maintenance and operational activities, as determined by the defined performance indicators. The scientific methods used are: analysis and synthesis, induction and deduction, critical analysis of materials, etc. The main results obtained from the investigations refer to the assessment of the indicators regarding the efficient management of the road quality by applying the progress performances in view of the users' access to qualitative public roads.*

***Keywords:*** *management, transport networks, public roads, quality, modern infrastructure, performance.*

***JEL Classification:*** *H54, H83.*

## 1. The role and importance of the quality management system in road modernization

Quality assurance management is a major component of the quality system in the construction of public roads and represents a significant aspect within the management system of economic operators in construction. Quality management establishes and in fact implements the quality policy through pre-established and systematic activities, thus still preventing non-quality, ensuring the achievement of the required quality and providing confidence in the capacity of the unit.

Within the new European approaches to the construction / rehabilitation of public roads, economic operators in construction must adopt, implement and maintain an efficient Quality Management System, as a component part of the general management system of the unit, which guides and coordinates the activity of the unit in terms of quality.

Quality is a widely used notion, which makes it extremely difficult to give a definition from a scientific point of view. An older definition states: the set of properties of a product or service that gives it the ability to meet expressed or implied needs. Other informal definitions mention: - prevention is cheaper than repair; - or it is cheaper to do everything right from the start; - quality is the minimum cost that a product imposes on society.

Seen as a concept, the notion of quality includes two aspects:

- an aspect of a *technical characteristic*, compliance with the specifications set out in the documents;

- an *aspect of value*, a value of the product, that ability to be according to needs and to satisfy certain needs.

According to the international standard issued by the International Organization for Standardization, EN ISO 9001: 2015, "quality is the extent to which a set of engineering characteristics meets the requirements". ISO 9001: 2015 provides a better understanding of the organizational process and the efficient functioning of quality management by contributing to the clear definition of responsibilities, creating a framework for continuous improvement and application of the requirements of the standard. The quality management system contributes to the improvement of internal and external communication, efficient use of resources to reduce costs.

Quality within roads' construction is defined and regulated by law no. 721 of 02.02.1996 entitled "Law on quality in construction". The provisions of this law apply to constructions of any category and their related installations, regardless of the type of property or destination, including rehabilitation, major repairs of public roads, hereinafter referred to as constructions, as well as modernization, modification, transformation and consolidation works.

*Construction quality* means a set of properties that must be possessed by an object to be put into operation, which meets the modern requirements for its construction, operation and economy.

*Construction quality* of the installation, of the infrastructure network, depends on the quality of the project, the quality of the construction materials, constructions, semi-finished products, parts and the quality of the construction and installation works.

In the Republic of Moldova, the state quality control in constructions is exercised by the Agency for Technical Supervision, which is the successor of rights and obligations of the Main State Inspectorate for Technical Supervision of Dangerous Industrial Objects, State Inspectorate for Construction, State Inspectorate for Geodetic, Technical and Regime Surveillance.

The Agency for Technical Supervision subordinated to the Ministry of Infrastructure for Regional Development, aims to perform several functions, including those in the field of construction and urban planning:

a) participation in the works of the commissions for the final reception of the constructions and the afferent installations, financed from the state budget or from the local budgets;

b) establishing the degree of damage to the constructions and, in case the constructions present a danger, prohibiting their exploitation;

c) submitting to the Attestation Commission the proposals regarding the cessation of validity or cancellation of the certificates of technical-professional attestation of the technical managers, site managers, designers, project verifiers and other specialists involved in the construction process;

However, major importance in the operation of the entire road infrastructure quality system is designed to achieve *the process of receiving the works performed*. Thus, the procedure for receiving the works starts by forming a reception commission.

Another aspect that is no less important in ensuring the quality of road infrastructure is the *quality of materials used in construction,* rehabilitation, repair of public roads, the tests of which are examined in laboratories of analysis and construction tests, authorized and accredited.

Accreditation of construction analysis and testing laboratories means the official recognition that a construction analysis and testing laboratory is competent to perform analysis and testing in this field.

Most road construction and rehabilitation companies take steps to obtain certificates of conformity for materials in accordance with the requirements of harmonized standards in collaboration with testing laboratories abroad.

Among those 20 laboratories for analysis and testing in construction, authorized and accredited in the Republic of Moldova according to SM EN ISO / IEC 17025: 2006 / SM EN ISO / IEC 17025: 2018 is also the Test Laboratory of the State Enterprise, State Administration of Roads".

The basic field of the Laboratory is the testing of road construction materials for objects managed by the State Enterprise "State Road Administration", as well as providing services to construction product certification centers and requesting third parties. It is aimed at determining the physical-mechanical and physico-chemical indices (organic binders) of the following materials: Organic binders (fluid bitumen, viscous, bituminous emulsion); Aggregates (sand, savory, crushed stone, gravel, filler); Mixture of aggregates, soils processed with organic / inorganic binders; Earth; Asphalt concrete made of granular materials; Asphalt concrete (hot, warm, cold); Cement concrete; Non-slip material (sand with salt, salt).

The basic objectives of the laboratory are represented by the following:

- Examining the quality of road construction materials, applied to the repair and maintenance of the public road network;
- Quality control of the execution of the repair and maintenance of the public road network;
- Proposing and implementing new ways of quality control.

The laboratory employs specialists with extensive experience in the field, licensed engineers, competent master students, with a high level of qualification.

However, given the capacity of the available expertise works to be performed by the Test Laboratory of the State Enterprise "State Road Administration", it is revealed that it has the possibility to examine the samples taken only from the concrete surface layers - asphalt, not having the capacity for the expertise of the layers for the foundation which is an integral part, directly of the built road.

The laboratory is currently in the process of transitioning to harmonized European standards, with modern test equipment and high-level measuring instruments that ensure the accuracy, succession and integrity of the tests performed. The laboratory systematically cooperates with the Moldac National Accreditation Center and provides services to construction product certification centers, having collaboration contracts with the CertMatCon Certification Organization, the Technical Center for Industrial Safety and Certification, the Center for Applied Metrology and Certification, the National Institute of Metrology and CVALIMETRITOT Certification Organization.

It is estimated that in order to ensure the transition to EU road standards, about 100 million lei will be needed, which should be allocated by contractors. This change would develop research methods in the use of modern materials for road construction and maintenance, which would ensure the quality of road infrastructure.

During 2021, the opportunity to use the "Road Recorder" application was examined, in order to digitize the way of verifying the quality of the construction, repair and periodic maintenance works, executed on the national roads of the Republic of Moldova. This action is to take a broader perspective in helping technical managers to ensure the quality of the works audited and to eliminate conflicts of interest.

## 2. Implementing performance-based management

Outcome-based or performance-based resource management was actually recommended by the Hoover Commission of the United States in 1949. In the 1950s and 1960s, many countries, including the United States, began evaluating institutions using some performance indicators not on how much they spent, but on what they actually produced. Ultimately, these systems did not deliver the expected results because they were too rigid to account for uncertainty and unpredictability and because they failed to identify the limits of formal systems that influence people's behavior.

As a result, performance measurement declined in popularity in the late 1970s and mid-1980s, but has seen a renaissance during the last 30 years as a result of changing economic environments as well as the ever-increasing demands of citizens for quality infrastructure. Thus, the strongest trend for performance improvement is to use resources through performance-based management and reporting. Australia and New Zealand were the first countries to implement performance indicator performance management in the late 1980s, followed by Canada, Denmark, Finland, France, Sweden, the United Kingdom and the United States in the early 1990s. In the late 1990s - In the early 2000's we find Austria, Germany and Switzerland.

Governments have introduced performance-based management due to four main reasons:

- to improve efficiency;
- to improve decision-making;
- to transparently improve accountability;
- to make savings.

Some countries have focused on only one or two of these goals, while others have embraced all four, with the aim to introduce performance-based financial resource management and the responsibility of the legislature and citizens. Australia, Denmark, the Netherlands, New Zealand, the United Kingdom and the United States are pursuing this approach.

In countries such as the United States, ministries have developed strategic plans that include performance targets. Others have adopted performance contracts, for example, between a ministry and a subordinate institution. The purpose of these contracts or agreements is to facilitate greater understanding and strengthen bargaining power within the public sector.

This approach has the advantage that it tends to clarify the responsibility of each party to the contract or agreement, informally specific on the performance in the allocation of resources as well as the specification of sanctions and rewards.

There have existed different approaches to implementing performance management. Some countries - for example Australia, the Netherlands, New Zealand, and the United Kingdom - have implemented the top-down approach, others, such as Finland, have adopted a bottom-up and ad hoc approach in which institutions are free to develop their own methods based on performance and less mixing of the top management bodies.

The main goal is to move from an input-based system to a results-based system. This can be achieved by clearly defining the objectives and methods to be followed.

Therefore, there are higher demands for results but at the same time more freedom is given to the methods used to obtain them. But the central point is the responsibility, who and how is responsible for the results.

A stronger emphasis on responsibility allows for the limitation, even exclusion, of day-to-day inspections of the higher management bodies. It is therefore important to develop appropriate means of measurement that fully ensure accountability, with the aim of both promoting greater operational freedom and effective strategic control.

In the Republic of Moldova, the management of resources in the field of road management focuses on the results to be obtained from the activities planned / carried out by the authorities / institutions, by establishing performance indicators in program budgeting.

Program performance is a method of presenting and substantiating budgets, based on programs with goals, objectives and indicators to evaluate their performance at all stages of management. High-performance program management is also an effective road management tool, which ensures that priorities are set and decisions are made on the allocation of resources needed for road rehabilitation and modernization. It is also based on the allocation of resources in programs according to planning and prioritization, highlighting the connections between the allocated budgetary resources and the results to be achieved, through the activities funded by these resources. It is a tool to strengthen the increased responsibility of public authorities / institutions in the process of spending the resources allocated to the maintenance and rehabilitation of road infrastructure and the achievement of progressive performance.

For the field of roads, financial means were used for the implementation of the Program "Development of transport and road management", Subprogram "Development of roads". The sub-program included maintenance, repair and rehabilitation of national and local public roads, road condition monitoring, and actions to increase road safety. The objectives of the sub-program were implemented by the State Enterprise "State Road Administration", the total length of national roads being 3336 km, and local roads - 5475 km.

## 3. Conclusions

It is concluded that in the Republic of Moldova the challenge is to review the performance of requirements and indicators set by developed countries around the world. In addition, performance-based road maintenance and rehabilitation management is closely linked to the selection of appropriate performance indicators with successful progress, as it is the most modern approach to obtaining sustainable financing for the maintenance and operation of road infrastructure.

In order to ensure the quality of the road infrastructure, the level of performance of the management of their administration must be high enough. Road degradation causes discomfort, additional costs and waste of time. The correlation of the efficiency criteria with the criteria of capitalization of the economic resources requires a differentiated treatment of the roads and an efficient distribution of the resources.

The road quality management system of the roadway is the most important part of the road maintenance and modernization management. The fundamental goal of a road management system is to obtain the best possible solution for the available funds and to provide quality roads to users with a high degree of comfortable and economical satisfaction. This can be achieved by comparing investment alternatives, coordinating design, construction, maintenance and evaluation activities, and making effective use of existing field practices and knowledge.

The road infrastructure quality management system must carry out comparative cost estimates and economic evaluations for different options for maintenance, rehabilitation, for a specific project, a group of road sectors or for the whole network. Improving the road infrastructure management system and safety conditions by efficiently amplifying the implementation of complex reform programs and large-scale investment promotion campaigns intensifies the development of transport networks by providing users with quality roads.

**References:**

1. Aberdeen Group, 2006. *The Transportation Management Benchmark Report - The New Spotlight on Transportation Management and How Best in Class Companies Are Responding.* Aberdeen Group.
2. Dărăbanț, S., Ștefănescu, P. and Crișan, R., 2012. Economic Benefits Of Developing Intermodal Transport In The European Union. *Annals of the University of Oradea*, Economic Science Series.
3. Douglas, L. and Stock, J., 1992. *Strategic Logistics Management*, 3th ed. Homewood: Boston.
4. Dumitraşcu, D., Fleischer, W. and Moser, T., 2014. Analysis of the external general environment of the logistic market in Romania. *Proceedings of the 4th Review of Management and Economic Engineering Management Conference (RMEE)*, 18 – 20 September 2014. Todesco Publising House.
5. Dumitraşcu, D. and Pascu, R., 2005. *Managementul proiectului*. Sibiu: University „Lucian Blaga" Publishing House.