



Analysis of the quality of the distribution of goods, case study

¹ I. Cvetanovski, ² V. Atanasova, ³ N. Krstanoski*, ⁴ M. Stojanoska

¹ Doctor, Faculty of Technical Sciences, University "St. Kliment Ohridski", Bitola, Macedonia

² Doctor, Faculty of Technical Sciences, University "St. Kliment Ohridski", Bitola, Macedonia

³ Doctor, Faculty of Technical Sciences, University "St. Kliment Ohridski", Bitola, Macedonia

⁴ Ph.D candidate, Faculty of Technical Sciences, University "St. Kliment Ohridski", Bitola, Macedonia

Email:¹ile.cvetanovski@uklo.edu.mk,²vaska.atanasova@uklo.edu.mk,³nikola.krstanoski@uklo.edu.mk

⁴*Corresponding author: marija.stojanoska2@uklo.edu.mk

Abstract: *Transport guarantees our mobility and provides access to goods and services. Furthermore, the transport sector helps maintain and develop social and economic systems, but at the same time transport is one of the main sources of pressures on the environment, such as the unsustainable use of natural resources, the release of pollutants into the air, greenhouse gases and noise emissions. Transport is a major contributor to environmental pollution, and is particularly detrimental to urban environments. Efficient freight transport provides a range of economic benefits that enrich living standards through multiple effects, such as better access to markets, employment and additional investments. In such conditions, quality transport, especially road freight transport, has imposed itself as an indispensable part of modern living. And the main prerequisite for developed freight transport is road infrastructure, which is often compared to the bloodstream of a modern society. The subject of the analysis of this work will be the quality of distribution of goods in the territory of the city of Bitola.*

Key Words: Road, goods, distribution, quality, Bitola.

1. INTRODUCTION:

Road freight transport has many advantages over other modes of transport. It can be much faster than the others because the goods can leave the final destination immediately or very quickly. It's more convenient for short-distance transportation and it's easy to track where the goods are at the moment. There are provisions for continuous communication with the driver. And it's best suited for transporting goods in rural areas. Freight transport across Europe is expected to increase by 80% by 2050, and freight transport to ports by four times compared to a few years ago. These figures indicate that there will be an increasing demand for quality, reliable, and above all, experienced haulage companies.

According to the Ministry of Environment and Spatial Planning, the total demand for passenger transport in the period under review increased by 100.36%. The share of road transport in the total passenger transport is 99.8% in 2023, representing an increase of 110.98% compared to 1990, while rail transport is 0.2% in 2023, representing a decrease of 11 times compared to 1990. The total demand for freight transport shows a variable trend of decreasing and increasing over the period considered. In 2023, compared to 1990, the total demand for freight transport increased by 4.1 times as a result of an increase in road freight transport by 5.5 times, while rail freight transport has a decrease of 81%, which has no favorable impact on the environment. Bitola is a city through which a large number of traffic flows transit daily, primarily due to its good road connection with the cities of Ohrid, Kichevo, via Prilep with Skopje, but most importantly with neighboring Greece. Bitola is the largest urban center in the fertile and largest Macedonian basin of Pelagonia and the second largest city in the Republic of Macedonia.

2. AIM:

Given that the database of freight transport on the territory of the city of Bitola is very small, the purpose of this research was to ask truck drivers about their opinion about the quality of goods distribution in Bitola using a survey.

3. METHODOLOGY:

The methodology that was used in this study is as follows:

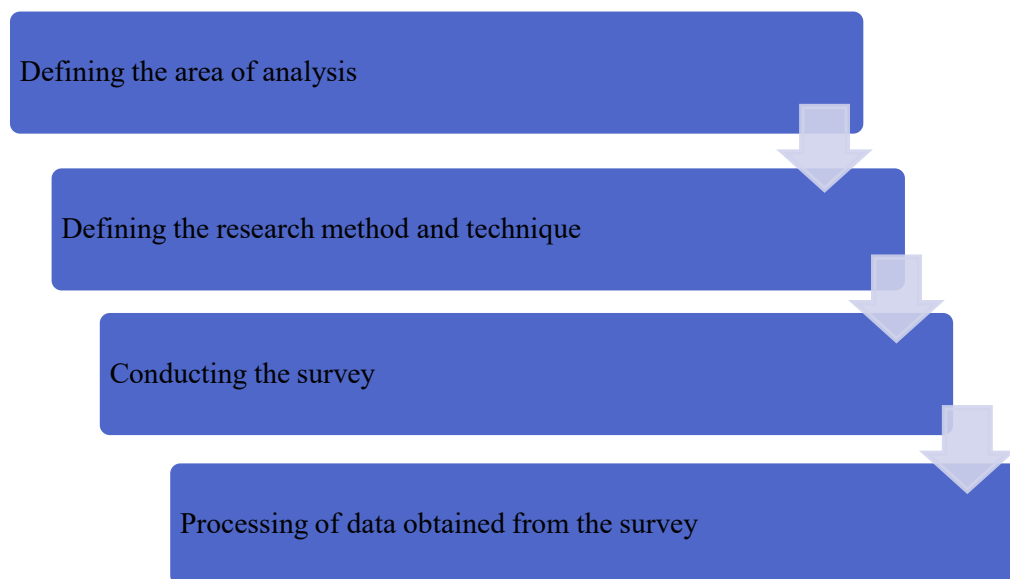


Diagram 1: Methodology

Most cities in Macedonia are chronically burdened with temporal and spatial traffic jams, noise, pollution, conflicts with pedestrians, cyclists and other motor vehicles. Such a city is Bitola, which does not lag behind other cities in the growth of the degree of motorization, spatial expansion of the city, increasing concentration of activities, informal network of roads, increased flow of trucks through narrow and inherited infrastructure areas, all this leads to the degradation of the urban space, endangering the safety of traffic participants, etc.

Freight vehicles in the territory of the city of Bitola, usually move along:

- Highway A3, Prilep - Bitola - R. Greece,
- The E 65 from Bitola to Ohrid, at the Lucoil gas station,
- The roundabout on the street of Vasko Karangelevski- Partizanska –Krusevska Republic.

Data collection was done at various locations where the trucks were involved in loading/unloading, resting, refueling, etc. Industrial facilities, terminals and transportation enterprises were covered.

The method used in this study is a survey. It's the best way to get face-to-face answers to a given problem. The survey was conducted over a period of one month, on a selected group of people, namely truck drivers who were encountered on the territory of the city of Bitola. The questionnaire consisted of 15 main and 7 sub-questions.

Some of the questions on the questionnaire are as follows:

- Are you satisfied with your distribution of goods in the territory of the city of Bitola?
- If you are not satisfied, what is the cause of your discontent?
- What's the quality of the road network in Bitola on those sections that you drive on?

4. RESULTS AND DISCUSSION:

The results of the survey conducted are given below.

- How satisfied the carriers are with the distribution of goods on the territory of the city of Bitola.
Of the respondents (48%) are partially satisfied with the distribution of goods on the territory of the city of Bitola, (37%) are not satisfied, while only (15%) are satisfied with their distribution of goods.

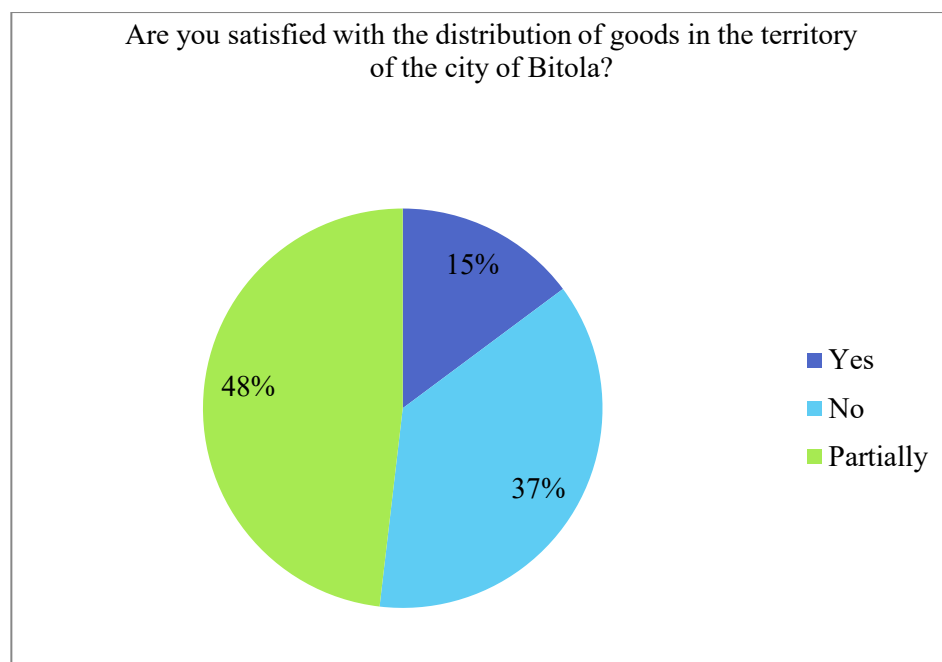


Diagram 2: How satisfied are the carriers with the distribution of goods in the territory of the city of Bitola

- What are the reasons why you are not satisfied with the distribution of goods in the territory of the city of Bitola? The reasons are numerous, but most commonly due to poor and legacy infrastructure (54%), limited movement (23%), too much noise (17%).

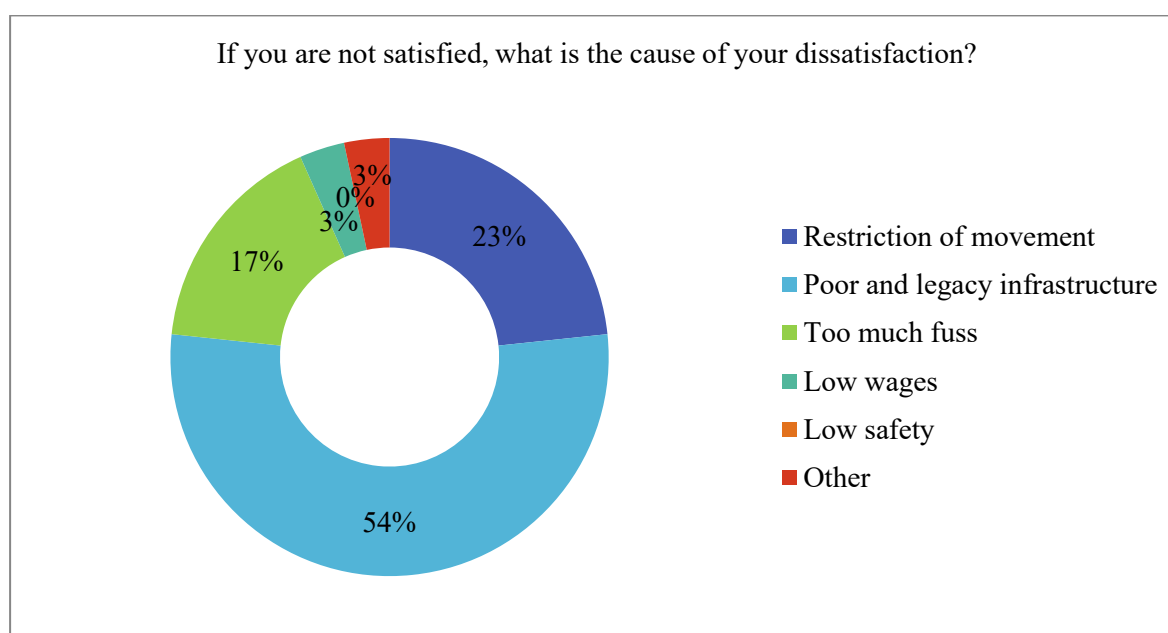


Diagram 3: If you are not satisfied, what is the cause of your dissatisfaction?

- The quality of the road network on which the carriers operate? Drivers rated their schedules as bad (41%), very bad (35%) and, to a lesser extent, good (24%).

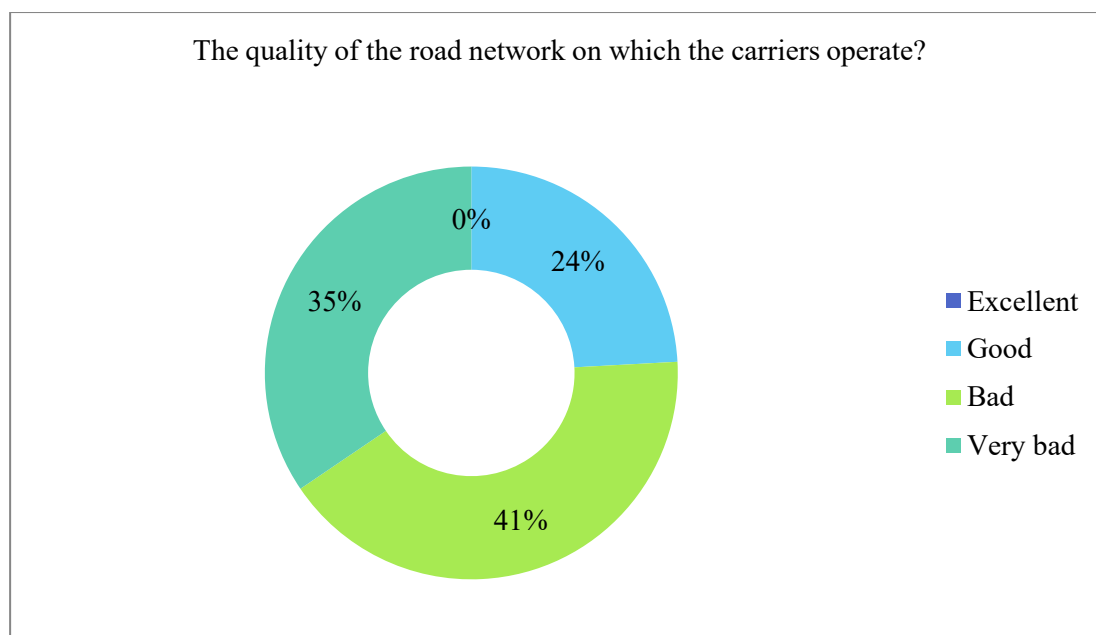


Diagram 4: The quality of the road network on which the carriers operate?

Partially satisfied with the distribution of goods in the territory of the city of Bitola, the most common dissatisfaction is the poor infrastructure and that is 54%.

There are a number of problems that they face as well: congestion, limited movement, lack of parking spaces, poor infrastructure, a narrow and legacy network.

Freight vehicles coming from Prilep and their final destination is Greece, they pass along the A3 Highway, Prilep - Bitola - R.Greece. They move along the street "4th of November", which is characterized by a narrow arc of the turning radius, narrow traffic lanes, which make it difficult for heavy trucks to move.



Figure 1: Troubled road for heavy trucks in Bitola

5. CONCLUSION:

An efficient transportation infrastructure system facilitates individual mobility and movement of goods, providing equal and safe access to employment and services such as health, education and promotion of economic activity.

The delivery of goods in Bitola is mostly done by heavy goods vehicles, trucks, trailers, which represent an important part of the local economy. However, urban structure and narrow street corridors create significant limitations in efficiency and safe delivery of goods. Poor and legacy infrastructure makes it difficult for trucks to move. Restricted movement, bans delay direct delivery of goods, increase waiting times and reduce efficiency.



The quality of the infrastructure on which the heavy trucks move is poor, on certain sections there are damages, depressions and cracks, due to the large volume of traffic. There are places with incomplete lighting, sharp curves, reduced and insufficient visibility and risk in night driving. In order to have a quality distribution of goods on the territory of the city of Bitola, comprehensive measures should be taken, both short-term and medium-term, rehabilitation of the infrastructure and construction of a new ring road. The existing ring road around Bitola, is a key traffic route for heavy goods vehicles, in order to reduce the load on the city centre. It serves as the main transit corridor for the distribution of goods from industrial zones to other settlements and vice versa. Due to the large congestion that occurs during peak hours and during periods of heavy truck traffic, it causes delayed delivery of goods, increased transportation costs, higher fuel consumption. Inherited infrastructure, narrow streets, and underperforming parking are just some of the reasons for the riot. While the restriction of the movement of trucks required for various reasons, additionally affects the quality of the delivery of goods.

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