

LOGISTIC STRATEGY FOR SOLVING TRAFFIC PROBLEMS IN THE CITIES –URBAN (CITY) LOGISTICS

Abstract: The subject of research on this paper is the logistics strategy for solving traffic problems in cities that we define as urban logistics. The theoretical characteristics of logistics and logistic systems themselves are numerous, each of which has its own specific characteristics with different implications and missions. As part of this research will be elaborated in detail on two studies within the European Union, which emphasis has been placed in the last few years, and the projects of these two studies are funded by the EU, and the solutions of those projects should and must be accepted and used by all countries. These projects refer to:

- 1) Transport and environment - regional aspect
- 2) Study of goods transport in cities - urban logistics

The first study explores and specifies measures in terms of transport and environment, and the other rationalization of city commodity distribution centers with a proposal for the formation of city (city) logistics centers and commodity-distribution centers as the main carriers of intermodalism.

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Introduction

Within a country's economy, activity traffic and transport is a consequence that has a greater impact on the environment. Such a causal link enables traffic to be found in the narrowest circle of production, social, and scientific interest. Scientific knowledge in this field today is characterized by a high social status, and thus, to a large extent, it attains the status of fundamental sciences.

In an attempt to achieve a vital economy, governments around the world face an increasing problem with the impact that air pollutants resulting from emissions from motor vehicles have on human health.

Reducing environmental pollution can be achieved by reducing the number of cars, increased use of public transport, parking restrictions, etc., is an additional way of controlling emissions. This can be achieved by introducing various transport strategies, such as:

- Strategies for encouraging more efficient transport methods
- Strategies for increasing the performance of engines to the existing number of vehicles
- Strategies to reduce the need for travel

City logistics has a strategy that involves the solution of the problem of freight traffic in cities, taking into account the environmental factor, the economy and the safety at the same time. It also implies all coordinated dispositions and operational actions that address the supply of the city with needed goods, as well as the supply of specialized landfills with materials and secondary raw materials.

City Logistic Centers, as part of the City Logistics strategy, are located on the tour of overcrowded cities and tend to integrate, concentrate and coordinate the flow of goods in both directions of the narrow, city trade zones.

With the integration of markets in Europe, economic growth and increased livelihood, the transport sector in the countries of Central and Eastern Europe is growing and this growing trend is expected to continue.

The development of an efficient transport system in such conditions is of great importance for the further development of these countries, and this specifically applies to:

1. Improve mobility for all people and products, thus helping prosperous economic development, and
2. Reducing the differences in the development of some regions.

In conditions where transport sector development has more negative environmental effects, one of the most important challenges for the countries of Eastern and Central Europe is finding acceptable environmental solutions. To date, only limited results have been achieved in this field, so the actualization of the problem of the environment and transport has become more significant.

1. Transport and environment-regional aspect

Many urban areas in the world today have a high concentration of sources of air pollution resulting from everyday activities of man; sources such as motor vehicles; the production of energy; residential heating and industry. Air pollution in urban areas is not just a threat to human health and the urban environment, but it can also lead to serious regional and global problems. Air pollution is experienced in almost all urban areas and is therefore a global and global problem. It is estimated by the World Health Organization that every year about 500,000 people die prematurely as a consequence of exposure to surrounding pollution from particles floating in the air. It is estimated that an increase in respiratory diseases due to air pollution occurs in about 40 million people; several million babies die every year of acute respiratory infections caused by air pollutants. The noticeable increase in urban populations occurring in many cities, along with industrialization, will lead to an increase in the discharge of pollutants, as well as an increase in the exposure of these pollutants. By 2010, approximately 6 billion people will live in this world, and it is expected that 45 percent of them will live in urban areas. [1]

Type of transport	Category	Main objectives
ROAD	A	1:Application of cleaner, environmentally friendly and more sustainable vehicles 2:Applying cleaner fuels 3:Limiting the increase in urban car traffic 4:Reduction of noise in the basic traffic network 5:Support of bus transport (railway, metro, tram, etc.)
RAILWAY	A	6:Promotion of sustainable development of internal and external water transport
WATER	B	7:Tend to self-sustaining air traffic development
AIR	A	8:Improve city traffic by applying city logistics and environmental measures
URBAN (CITY) TRAFFIC	C	9: To improve the ecological characteristics of the existing and the new infrastructure 10:Optimize the combined intermodal transport and distribution 11:Improve safety when transporting dangerous goods
A–targets for emission reduction; B–targets for reducing the demand for transport and for influencing modal distribution C–targets for improving the environmental properties of the infrastructure		

Table1. Basic objectives of sustainable development in relation to types of transport in line with the requirements of the EU transport policy

Source: European union common transport policy ISSN 0469-6255

The FARE research project is based on a regional approach that involves cooperation and participation in multiple countries. It is a common framework for achieving environmental protection objectives in the region with defined concrete actions for each participating country. The need for a regional approach stems from the fact that many environmental problems in traffic affect a wider region that includes more countries.

Activities must be carried out internationally in order to avoid disturbing the functioning of the markets.

Legislation must be harmonized internationally (EU and international agreements) including emission standards, fuel, transport of dangerous goods, and so on.

Therefore, the regional approach implies:

- 1) Regional cooperation between countries (technical, technological, economic, environmental, etc.);
- 2) Development of a strategic framework that will form the basis of the national strategies of each country.

The basis of the regional approach consists of 11 key objectives that describe at strategic level how transport should be developed (Table 1).

2. EU emission standards for emissions (Legal regulations for environmental protection)

The rapid development of the industry entails a gradual increase in the pollution of our planet's atmosphere. Distribution of pollution is not uniform throughout the planet's surface, so the pollutant pollution is 93% of the total pollution of the atmosphere compared to the southern hemisphere. This is due to the uneven development of the industry, because the developed industrial countries are located on the northern hemisphere. In addition, about 90% of those pollutants pollute 10% of the surface of the terrestrial part of the planet (parts of Europe, S. America and Japan) or 3% of the total area of the planet.

Alarming emission and concentration figures are striving to reduce, using all possible means. Therefore, limits have been introduced in the world for the amount of waste emitted by the maximum

permissible concentration (MPC), or in some countries through maximum permitted emission (MDE) or through the maximum allowable specific emission. The values of these boundaries are in constant decrease, and will continue to decrease. [2] The legal obligation to monitor air pollution arises from the Law on Air Protection and the recommendations given by the European Community Directive (80 / 779 / EEC), which has several bylaws that more precisely regulate the organization of this activity.[3]

Directive 70/220 / EEC contains several amendments and recommendations of which the most important are the Euro 1/2 standards, given by Directive 93/59 / EC (EC93) and 96/69 / EC (EC96) and the most recent Euro 3/4 limits given in the Directive 98/69 / EC. The 2000-2005 standards is a recommendation for the introduction of higher fuel quality with a maximum sulfur content of gasoline to be 150 ppm in 2000 and 50 ppm in 2005.[4] Euro 2 - 4 standards are different for petrol and diesel engines. Diesel engines have lower CO standards, however higher NOx standards. Petrol engines are excluded from the emission standards. The standards for light freight vehicles are given in Table 2, while the standards for new cars are given in Table 3.

Table 2. EU emission standards for light commercial vehicles category N1) g / km

<i>Petrol engines</i>							
		Year	CO	HC	HC + NOx	NOx	PM
Class I <1305 kg	Euro 1	1994	2.72	-	0.97	-	-
	Euro 2	1998	2.20	-	0.50	-	-
	Euro 3	2000	2.30	0.20	-	0.15	-
	Euro 4	2005	1.00	0.10	-	0.08	-
Class II 1305 kg – 1760 kg	Euro 1	1994	5.17	-	1.40	-	-
	Euro 2	1998	4.0	-	0.65	-	-
	Euro 3	2000	4.17	0.25	-	0.18	-
	Euro 4	2005	1.81	0.13	-	0.10	-
Class III >1760 kg	Euro 1	1994	6.90	-	1.70	-	-
	Euro 2	1998	5.0	-	0.80	-	-
	Euro 3	2000	5.22	0.29	-	0.21	-
	Euro 4	2005	2.27	0.16	-	0.11	-

source: Emission standards for light commercial vehicles category, www.dieselnet.com

Table 3. EU emission standards for passenger cars (category M) g / km

<i>Petrol engines</i>						
	Year	CO	HC	HC + NOx	NOx	PM
Euro 1	1992.07	2.72(3.16)	-	0.97(1.13)	-	-
Euro 2	1996.01	2.20	-	0.5	-	-
Euro 3	2000.01	2.30	0.20	-	0.15	-
Euro 4	2005.01	1.00	0.10	-	0.08	-

source: Emission Standards for passenger cars, www.dieselnet.com

3. Need for a logistic approach to solving modern traffic and transport problems

Numerous authors and numerous literature deal with the content and definition of the term logistics. However, the definition defines the most completely and completely expressive of the notion of logistics, and states: logistics as a discipline encompasses a set of interdisciplinary and multidisciplinary sciences that study and apply laws of numerous and complex activities (eg. function, process, measure, works, rules, operations ...) that function and effectively integrate all the delicate processes of overcoming the spatial and temporal transformations of material, semi finished products, raw materials, capital, knowledge, people, information in order to minimally invested resources (production, financial, human, etc.), in order to ensure that the information is delivered from the point of delivery to the point of receipt, maximally meet the market demands (buyers of goods, service users, consumers ...) [5]

4. New logistics solutions of city freight transport and connection with the national transport

The problems of urban transport in the last decade have covered numerous research topics in Europe, as well as in the United States and Japan. Fieldwork studies have shown that trucks account for only 10% of all transport operations in cities, especially in the larger ones, and that about 40% are responsible for pollution and noise generation. The fact that freight road traffic is the biggest environmental pollutant is that it is irreplaceable in the transport of goods in cities. Technological changes in transport are seen primarily in the integration inside and between the types of traffic, then in the merging of industrial and public transport (wherever possible), not only within the country's economic system, but also in the wider context. For commodity flows to master the space and time in the optimal way, it is necessary to present the function of the goal with the total distribution costs: costs for procurement, storage, packaging, transshipment, transportation, insurance, interest on tied capital, with a higher quality of services and minimal total costs.[6]

5. Innovative components of solutions for CITY - LOGISTICS

The complex strategy of regulating urban freight transport requires certain organizational forms, in order to define an intermediate principle for determining the regulatory routes. The basis for this kind of claims could be the logistics alliance within the boundaries of a particular area.[7]

A logistics alliance could be established immediately in the exit area at a certain place, without having to have a single center for the transfer of goods, whose action in the environment is in any way questioned. Already the existing terminals, which refer to different areas, and logistics centers of trade could integrate without any problems.

The achievement of the tasks of supplying and recycling of goods within a certain area is carried out on the basis of a meaningful alliance, which commits the regional co-operatives for the joint fulfillment of those tasks. These alliances could form state-level cooperatives, trade-legal autonomous enterprises, whose capital is in the hands of the state (state capital) or in individuals but in cooperation or agreement with the highest state power. In this way there is a possibility of organizing a federation.

6. Contemporary development programs at the EU level with the goal of further development of logistics and CITY logistics

The implementation of road freight transport in Europe has defined many different conventions and standards as well as (national) and local (city) laws, rulebooks and regulations.

In addition to the international binding regulations for all countries, there are numerous local regulations that differ in some ways from the international ones.

The differences are most often in the following:

- Tax on trucks,
- Fuel price,
- Permissible dimension and weight of motor vehicles,
- Regulations on the time of work and the number of hours how much the driver can sit behind the wheel,
- Safety Regulations,
- The legal provisions for pollution of the surroundings and the inconvenience of the noise,
- Traffic laws (for example, the allowed speeds inside and outside the populated areas),
- The policy of using the country,
- Regulations for parking space and different terminals.

In any case, the measures undertaken with one another must be in a firm and rational manner. Interventions that too favor one or the other should be avoided at all costs.

In Europe, the city authorities are stimulating the development of logistic systems in a new way, and therefore, broader research and development programs at EU level have been raised, which relate to:

- 1) Analysis of basic data on goods transport,
- 2) Developing logistics systems,

3) Development of new technologies (such as urban vehicles for transporting goods, low-cost trucks, new load systems), and new forms of cooperation, for example: intermodal (combined) transport, single servicing of multiple users and regions,

4) Development of new infrastructure (eg. railway - road terminals, logistics centers),

5) Development and application of unified and standardized informatics.

Conclusion

Problems related to pollution and noise caused by motor vehicles increase with the increase in traffic in motor vehicles, both in developed and developing countries. The conclusions and recommendations given here are intended to give guidance on formulating and implementing effective strategies to prevent the emergence or aggravation of serious problems related to air and environmental pollution in all countries at all stages of economic development.

The transition period in the Republic of Macedonia has created differences in the socio-economic development of cities, especially visible through the use of land. Transition economies are characterized by the combined rapid growth of motorization of the population and by rapidly decreasing the fiscal capacity to support public transport systems and improving transport infrastructure. The most serious problem related to pollution is caused by motor vehicles in the metropolises. Metropolis in the world is populated by about 50 percent of the country's population and these places either already have or will have, problems with the dense traffic of motor vehicles that will lead to high concentrations of certain pollutants. Although aerosol problems associated with air pollution can be caused locally through industrial emissions or through the combustion of coal or oil, the impact of emissions from a growing number of vehicles becomes more and more predominant.

The basic trends related to transportation and the environment are characterized by:

1) The demand for transport is steadily increasing and approaching the one in the EU countries. The growth is recorded in both passenger transport and transport of products, especially in road and air transport, and what is very important is that the share of road transport in the transport sector is growing very rapidly.

2) The growth of mobility in urban areas and the degree of motorization is expected to continue to increase rapidly in the next decade in line with the rise in the economy and the standard of living. However, infrastructure development does not follow this trend. This situation leads to deterioration of the quality of the environment especially in urban areas where problems such as heavy traffic, smog and noise are very actual.

3) The fleet remains relatively old. This is particularly true for passenger vehicles that are the largest emitter of harmful emissions in the transport sector. The number of vehicles with a catalytic converter is very small and it all results in high emissions and high noise.

4) The quality of fuel in a number of countries is not at the right level, leading to a higher emission level, and the use of leaded gasoline leads to increased engine consumption.

5) Intensified construction of the infrastructure in the long term is expected as a consequence of the increase in the use of motor vehicles. Infrastructure construction affects the environment due to land seizure and destruction of ecosystems.

Just - in - time philosophy leads to more trust and transparency of traffic. If JIT traffic is introduced into new purchasing and distribution logistics strategies that cover the entire enterprise, reaching the effect of a concentration that will first lead to the erosion of vehicle suffocation, but also to their amplification. On the occasion of JIT, due to strict quality controls, they deliver only correct parts, and there is also a tendency to settle JIT suppliers near the manufacturer, which entails positive factors for reducing the transport services behind. From the point of view of the City Logistics Environmental Protection, freight vehicles of electric power - "environmentally friendly vehicles" are becoming more interesting. Their main characteristic is that they are quiet and do not pollute the environment with harmful gases.

The results and evaluations of these studies conclude that:

1) The city authorities can and must have a major influence on keeping up to date the development of goods transport in cities. It is important that the developed policy is supported by all parties involved

in the transport sector, including citizens of the cities. This means that the local transport policy must be designed to carry out commodity transport where it is necessary to act promptly and act in a proper manner when it comes to protecting residents from the harmful effects of traffic.

Many European cities have been working on this task for a long time. In our country, more precisely in Skopje, as the largest city and the largest logistics center, new innovative solutions are needed to reduce traffic jams and increase the productivity of vehicles supplying the metropolitan area.

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