ANALYSIS OF POSSIBLE IMPACTS TO ENVIRONMENT OF JELGAVA NORTHERN RING ROAD

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Abstract. The growing welfare of Jelgava has led to circumstances where the increasing number of vehicles cause difficulties for the city to cope with exhaust fumes and noise in the city centre. The city is in lack of bridges across river Lielupe and the ring roads. That is the reason why I chose to search on this problem. As I am an inhabitant of Jelgava, this problem becomes very topical due to the influence on human health and environment pollution. The hypothesis: the importance of environmental impact of perspective Jelgava Northern ring road is not that significant to restrict the construction of the road. I chose to search on the Jelgava ring road to see if it may affect the environmentally sensitive territory Lielupe floodplain meadows nature reserve and how significant can be the influence. In this article there are given also several ways how to decrease the emerged negative influence. The highlighted hypothesis has proved. There will be reduction in the plant and animal species found in Lielupe floodplain meadows nature reserve. However, the territory is wast, but the ring road will affect comparatively insignificant area. The emerged influence of Jelgava Northern ring road to the habitats of Lielupe floodplain meadows can be eliminated by noise muffling walls, animal migration tunnels, asphalt of opened pores, decreased driving speed.

Key words: pollution, noise, ring road, nature reserve.

Introduction

Jelgava as the centre of Planning region of Zemgale has showed considerable rate of development and growth of late years. The economic upturn has created the new work places, thus there has been an increase of living Standard under the favourable conditions. The infrastructure of sports, education, health, engineercommunications and transportation has been improved owing to the projects co-financed by European Union.

Due to the developing living Standard in Jelgava, also the amount of vehicles is increasing considerably fast. According to the latest prognosis that have been done by Jelgava city council

in the Integrated Development Programme for Years 2007 – 2013 of Jelgava, the quantity of automobiles that crosses Jelgava a day may increase for 30 – 35% soon (Jelgavas dome, 2007). The rise in amount of passenger and cargo transport has caused great problems for network of streets of downtown to cope with the increasing amount of vehicles. The current load creates inimic influence to the human health, as well as the surrounding environment. In the mornings and evenings there are traffic jams in the city centre therefore there is large emission of greenhouse gases and noise in the atmosphere that cause the pollution.

The solution for transportation problem of Jelgava, that has been analyzed in this article, is the Northern ring road of Jelgava. The ring road would consist of section of Atmodas street, that join Dobeles motorway and Loka main road and Northern bridge across river Lielupe.

There is not much theoretical and even practical research in this field due to situation when the idea of Northern ring road is quite new and not assessed properly. That is the reason why I am doing this research.

The **aim** of this study was to analyze the possible impacts to environment of Jelgava Northern ring road.

The **main tasks** were:

1) to analyze geographical and natural resources of Jelgava;
2) to analyze the current transportation loads of the city;
3) to acquaint with the significance of Lielupe floodplain meadows nature reserve;
4) to evaluate the possible impacts to environment of Jelgava Northern ring road, considering that the new route has been provided across the sesitive environmental territory of Pils island – Lielupe floodplain meadows nature reserve;
5) to prognosticate the significance of the impact;
6) to provide the suggestions for elimination of environmental impact.

The **hypothesis**: the importance of environmental impact of perspective Jelgava Northern ring road is not that significant to restrict the construction of the road.

Materials and Methods

The research is done based on qualitative methods. The implemented data grouping and analysis methods included following stages:

1) the collection and analysis of relevant laws and literature;
2) the collection and analysis of statistical data of pollutants;
3) the analysis of other countries experience of environment protection from nagative impact to roads.

Results and Discussions

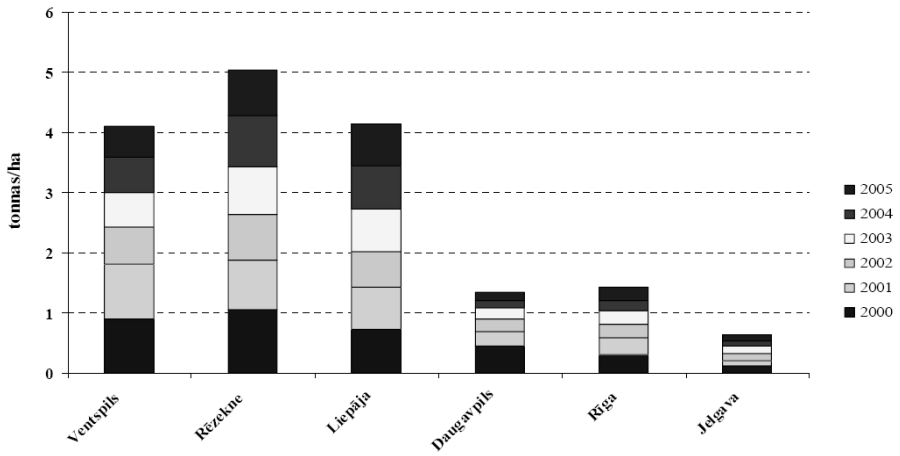
The air pollution in Jelgava

68% of the territory of Jelgava refer to low pollution zone, 29% - to medium pollution zone, but 3% refer to high pollution zone.

Jelgava city can be divided in 3 pollution zones – in the direction from city center to suburb the zones change from polluted to cleaner. The pollution is particulary concentrated along the industrial objects and main transportation routes.

In comparision with other largest cities of Latvia, Jelgava emitates the less amount of hazardous matter (Fig. 1).

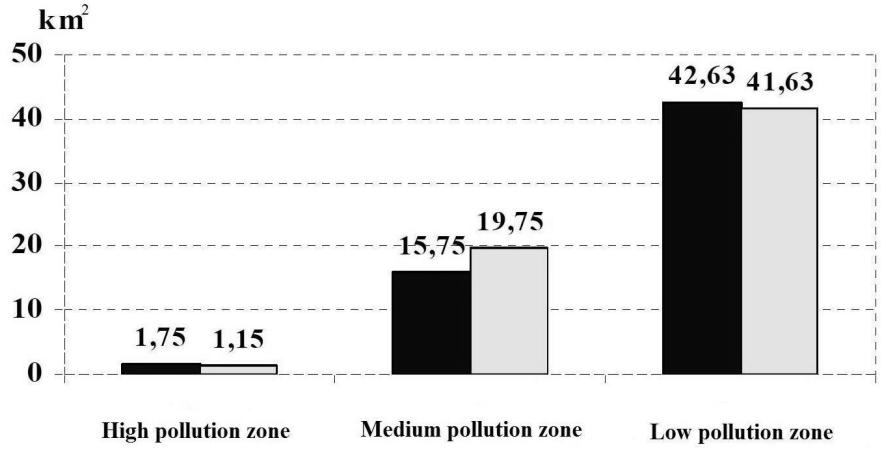
Fig. 1.



The emission of hazardous matter in the atmosphere from stationary sources in largest cities of Latvia in years 2000 to 2005, average on 1 hectare city land/ tonnes.

Compared with the year 1996, there has been the trend to increase the area of medium pollution zone, while decreasing the area of low and high pollution zone (Fig. 2). However, the overall pollution amount in the territory of Jelgava has decreased for 10% (Jelgavas dome, 2007).

Fig. 2.



The zones of air pollution in the area of Jelgava and the comparision of the situation of year 2006 to year 1996:

■ - 1996 □ - 2006.

The main sources of air pollution are three boiler houses that supply with heat and hot water housing, public, minicipal and industrial sector and service industry of Jelgava. According to the results of rearch done in the largest streets of Jelgava, established a fact, that the greatest pollution amount comes from the crossections of biggest transportation trunk-roads in Lielā street, Tērvetes street, near the railway station and in the crossection of Garozas and Rīgas street (Jelgavas dome, 2007).

The transportation

Due to the developing living Standard in Jelgava, also the amount of vehicles is increasing considerably fast. According to the latest prognosis that have been done by Jelgava city council in the Integrated Development Programme for Years 2007 – 2013 of Jelgava, the quantity of automobiles that cross Jelgava a day may increase for 30 – 35% in next 10 years. The rise in amount of passenger and cargo transport has caused great problems for network of streets of downtown to cope with the increasing amount of vehicles. The current load creates inimic influence to the human health, as well as the surrounding environment. In the mornings and evenings there are traffic jams in the city centre, therefore there is a large emission of greenhouse gases and noise in the atmosphere that cause the pollution.

The main problem for traffic organization in the lack of bridges across river Lielupe. Particulary topical the question about the Northern bridge becomes when talking about the former aerodrome and the development of the areas covered by it and the formation of industrial zone as well as the development of direction Liepāja-Ventspils cargo transport (Jelgavas dome, 2007).

The noise

The problem connected with cargo transport is the excessed noise level. The assessement and modelling of noise in the area of Jelgava was done in year 2006. According the obtained results we can conclude that the transport causes significant pollution of noise (Fig. 3). The higher noise values (65-80dB(A)) have been recognized along the trunk-road and railway lines. The values of noise during the day and evening are between 50-70dB(A), however the level at night is 40-55dB(A). In the suburbs of Jelgava, in the direction of North and South, as well as at the West along the border of Jelgava city the level of noise is comparatively low – 35-50dB(A) (Jelgavas dome, 2007).

Fig. 3.

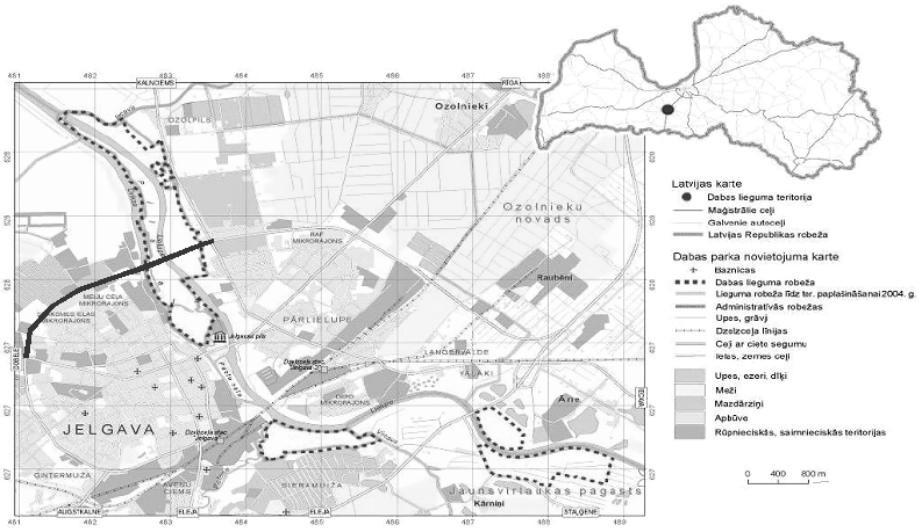
The excess of noise level indices in the territory of Jelgava.

The trace of Jelgava Northern ring road

As concluded previously, there is lack of alteranative roads in Jelgava, particulary for cargo transport and inner city means of communication. These conditions cause traffic jams in the centre of Jelgava in the mornings and in the evenings. With the low speed transportation movements there is created the pollution of atmosphere by the exhaust fumes. Due to increasing traffic intensity, there is a great load of vehicles exactly in the centre of Jelgava city.

Those are the reasons why there has emerged the idea of Jelgava Northern ring road. The Northern ring road of Jelgava would consist of section of Atmodas street, that join Dobeles motorway and Loka main road and Northern bridge across river Lielupe (Fig. 4).

Fig. 4.



The trace of Jelgava Northern ring road:

▬ - the perspective trace.

The city council has left the space in the *Territorial planning of Jelgava for years 2009-2021* for the future Northern ring road (Jelgavas dome, 2009). It would touch the following territories:

1) public and business building territories;
2) nature reserve territories;
3) the territories of engineertechnical objects;
4) the territories of many-storied dwelling-houses.

Lielupe Floodplain Meadows Nature Reserve

The total are of Lielupe floodplain meadows nature reserve is 353 ha, which consists of four territories of floodplain meadows on the both banks of river Lielupe. The first of them (211 ha) is located on the island of Pils and on its surrounded territory on the right bank of river Lielupe. The second one (50 ha) – on the left bank of Lielupe and between its affluents – rivers Vircava and Platone (Latvijas Dabas fonds, 2006).

Since 2004 the reserve has been listed as a *Natura 2000* site, a part of the European specially protected nature area network. The nature reserve is also marked as an Important Bird Area to recognize its importance as a birds nesting site. All of this demonstrantes the importance of the site as birds nesting grounds and a site of rare species.

The nature reserve hosts one of the last natural or minimally altered floodplain meadows with a high biological and ecological value. Three types of habitat listed in Annex I of the

Habitats Directive are found in the nature reserve. So far, 27 specially protected plant and animal species are found in the nature reserve (Latvijas Dabas fonds, 2006a).

The engineertechnical solutions to avoid influences of ring road

The emerged influence of Jelgava Northern ring road to the habitats of Lielupe floodplain meadows can be eliminated by:

1) noise muffling walls;
2) animal migration tunnels;
3) asphalt of opened pores (Kopuzņēmums "SFS Latvian Roads", SEIB Ingenieur-Consult GmbH & Co. KG, FROELICH & SPORBECK GmbH & Co. KG, 2008);
4) decreased driving speed.

Conclusions

1) The highlighted hypothesis has proved.
2) There will be reduction in the plant and animal species found in Lielupe floodplain meadows nature reserve. However, the territory is wast (353 ha), but the ring road will affect comparatively insignificant area.
3) The emerged influence of Jelgava Northern ring road to the habitats of Lielupe floodplain meadows can be eliminated by noise muffling walls, animal migration tunnels, asphalt of opened pores and decreased driving speed.

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