

## PLANNED ACTIVITIES TO INCREASE ROAD SAFETY IN THE MUNICIPALITY OF KURSUMLIJA

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**Abstract:** Awareness of traffic safety improvement is not just a topic of large urban areas, but also smaller municipalities with modest financial means. Such is the case with municipalities of Kursumlija that the surface of the majors in Toplica district whose residents are exposed to daily problems in the normal functioning of all road users. Initiative of the city authorities in 2013, it began the improvement of road safety in the places where it was necessary. By this meant resolving the long-standing parking problems in the city, setting retarders in school zones, improving the existing traffic signals, etc.

**Keywords:** school zone, parking, traffic safety

### 1. INTRODUCTION

Before the Road Traffic Safety Act came into force in 2009, local governments were not under obligation to monitor and increase the degree of safety on their own levels. Therefore, the role of a local community boiled down to efforts made by individuals who were interested in this problem and aware of the possible consequences of neglecting the aforementioned problem. For the first time, the law clearly defines the responsibilities of state institutions as well as of a community as a whole. Furthermore, there is a great understanding of the need for determining the responsibility of all subjects that are part of the big system concerned with the safety of people and preservation of material goods.

In order to fulfill the community's expectations, the representatives of a local selfgovernment must establish a sustainable model of road traffic safety. According to the analysis of the current road safety situation, normative regulation, authorizations and responsibilities, it seems that it is acceptable to clearly define the distribution of authorizations concerning road safety (state and local), to determine the organs and functions of the institutional organizations, real financial resources and possible funds, goals, sustainable forms of work, expected results that can be measured, as well as individual and collective responsibility. In the current situation, directing activities towards certain interventions in local traffic is not enough for creating an efficient road safety system (Kovačević et al, 2011:74).

The first part deals with the description of the location, that is, with the analysis of the current road safety situation in Kursumlija. Then, the existing modes of the traffic are described in more details. The second part deals with the solution of the parking problem, implementation of street furniture and marking of the parking spaces. Next, there is a description of the organization of traffic in school zones and a primary school was taken to serve as an example. Finally, there is a description of the measures taken to ensure safety for road users when taking sharp curves, such as the installation of guardrails.

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## 2. THE ANALYSIS OF THE CURRENT ROAD NETWORK

A part of the magistral road Niš - Priština runs through Kuršumlja. The length of the magistral roads that are not completely paved with asphalt is 105.7 km, the directions being those that run from the border with the municipality of Leposavić in the northwest, from Prepolac on the border with Kosovo and Metohija, as well as the road running from the direction of Kruševac, through Kuršumlja and then, through Prolom Banja. The total local road length is 284 km, out of which only 27 km are paved with asphalt. The total length of uncategorized roads is 188 km, while the length of the rest of uncategorized roads is 285 km.

The general characteristics of the regional roads are the following: they are mostly built for light and medium heavy vehicles, the road structure is weak without the surface course and the current traffic load by far exceeds that for which the roads were designed.

The general characteristics of the local asphalt roads are the following: they are not 5 metres wide and thus do not comply with the standard, there is no surface course and they cannot sustain the current traffic load. In average, these roads are 30 years old.

## 3. THE ANALYSIS OF THE TRAFFIC MODES IN KURŠUMLIJA

Road safety is one of the most complex problems in human society and is influenced by a lot of diverse factors such as the degree of motorization, mobility, education of people, traffic regulations, etc. However, it can be argued that dedication and work in the field of road safety represents the basic and the most important parameter of changes in the road safety situation (Jovanović D. et al, 2009:19).

In order to get the real picture of the road safety, it is essential that we analyze the number of drivers according to categories on the territory of the municipality of Kuršumlja, as shown in the table 1:

*Table 1. Review of the number of vehicles by category*

Category	A	B	C	D	E	PSP	Tractor drivers
Total number	1224	2540	1035	292	118	903	385

The total number of registered vehicles in the municipality of Kuršumlja in 2012. is presented in table 2:

*Table 2. Review of the number of registered vehicles in the municipality*

Category of vehicles	Total number
Motorcycles	51
Combined Vehicles	64
Passenger cars	5430
Buses	28
Commercial vehicles	312
Towing vehicles	289
Tractors	117

The analysis of the number of the vehicles registered in 2012 on the territory of the municipality of Kuršumlja showed that most registered vehicles are actually passenger cars, which is understandable. They are followed by a much smaller number of freight vehicles, whereas motorcycles and buses make up the smallest percentage of the registered vehicles.

Cycling is not very prominent in Kuršumlja. It takes place on the same areas as motor traffic, which is one of the reasons it is less prominent. In order for bicycle traffic to develop, the conditions for its safe functioning should be provided and there should be areas designated for cycling, which is not the case in Kuršumlja so cyclists often have to use pedestrian zones.

Pedestrian traffic represents the greatest part of the whole traffic in the town. Also, one of the reasons for such a great share of pedestrian traffic in the total traffic is the fact that the incomes of the inhabitants of the municipality have dropped.

In order to increase the degree of pedestrian traffic, the appropriate infrastructure must be provided. It is necessary to free the areas designated for pedestrians from parked cars, kiosks, vending stands. It is necessary to build new areas in the streets without pavements, to reconstruct the existing ones and to adjust them to meet everybody's needs (parents with children, people with disabilities). There is a suggestion to turn Vuk Karadžić Street into a pedestrian zone, in which case motor traffic would be allowed only for delivery vehicles from 04:00 to 06:00. The greatest part of pedestrian traffic takes place within the downtown, as a consequence of the location of all major city activities: administration, education, health care, trade.

Outside the downtown, the conditions under which pedestrian traffic functions are far worse. In a lot of streets, outside the downtown, there are no pedestrian zones, so pedestrians have no choice but to use the areas designated for motor traffic, which impinges on their safety. If there are pavements in some streets, they are in such a bad condition due to the poor maintenance that there are a lot of bumps that make it difficult for people with disabilities to use the pavements, so they have no choice but to use areas designated for motor traffic.

The biggest problem of road traffic is a poor traffic infrastructure:

- poor maintenance of the existing roads and highways (a huge number of holes in all roads and highways), sparse places to pull over and park,
- damaged berms covered in grass on most local and a great number of regional roads,
- lack of pavements and pedestrian lanes along the streets and roads in rural communities.

In Kuršumljija, as well as in other towns, there is a great problem with the maintenance and construction of new roads, that is with the lack of finances for investing in road traffic. For this reason, problems with unmarked parking spaces, pedestrian crossings, dividing lines and other forms of signalization are often encountered.

Making of strategic documents is a sure path to success. Well placed strategic documents with quality conducted survey of the current situation, a clear definition of the future state, as well as ways to translate the existing system of the future state, is a systematic approach to solving the observed problems, which usually results in success (Jovanov and Vukovic, 2011:85).

#### 4. THE PARKING SITUATION

As far as the characteristics of parking in Kuršumljija are concerned, two different zones can be singled out. The first zone is the downtown zone where a significant number of the administrative, trade and cultural functions, which Kuršumljija as the centre of the municipal administration possesses, are concentrated. In the downtown zone, there are the most significant and the most visited town buildings, among which are the Kuršumljija Town Hall, the court, the post office, shopping malls and shops, catering and accommodation businesses. All these facilities are located on a relatively small space, which represents a significant problem for visitors of this zone who use motor vehicles as a means of transport. Also, within the downtown zone there is a number of inhabitants who park their vehicles here if they cannot park within their parking space. In this zone, legal parking and illegal parking are intertwined, which occasionally leads to short traffic jams (up to several seconds) when a vehicle is entering or exiting a parking space, and which disrupts the pedestrian traffic, and sometimes even disrupts traffic flow in general. Illegal parking is present on pavements, in front of garden entrances, on grass areas. There is also illegal parking in the streets in which road signs and traffic regulations state that it is forbidden to pull over and park. Mostly, those are the streets where it is impossible to park vehicles because of insufficient width.

The second, considerably bigger zone in Kuršumljija comprises the rest of the town where it is mostly residents who park their vehicles. In this zone, parking takes place on surfaces that represent a minimal obstacle for traffic flow and on those segments of roads that are not under much traffic load. A few years ago, in the downtown zone a new time - limited (paid) parking regime came into effect and in less than two months of the introduction of this new parking regime, parking charges were abolished. On that occasion, the town zones were defined. Parking charges had been introduced despite the fact that there had not been a single condition to charge for parking. Kuršumljija does not have a study that would define all the important parameters related to parking. The cost of the parking was 40 dinars in the first zone, and 20 dinars in the second zone. Due to the lack of the police control and control of other town organs, time limits are not in effect. Currently, a study that would result in a complete solution for the parking problem in the town is being worked on. In Kuršumljija there is no Parking Service, so the Kuršumljija Land Development Public Agency is in charge of everything parking related.



*Figure 1. Example of preventing irregular parking by installing street furniture*

Technical regulation of parking spaces by means of horizontal signalization is in a very bad condition. In most streets that are within the first and the second zones, horizontal signalization is not visible, which means that horizontal signalization should be maintained on a regular basis. Vertical signalization is in a much better condition and in most streets it complies with traffic regulations. In some streets, there is a problem with “no stopping/parking” signs that are hardly visible or faded, which is one of the reasons of illegal parking.

#### 4.1. Installation of street furniture

In order to reduce the number of illegally parked vehicles, except for a better control and sanctioning system, it is also necessary to introduce, i.e. to construct and install certain technical means that would prevent illegal parking in Kuršumlja. Street furniture that can be installed comprises bollard balls and posts, planters. Bollard balls and posts would considerably reduce the number of illegally parked vehicles on pavements where parking is forbidden for the benefit of the pedestrian traffic. Drivers would not be able to park their vehicles on the pavement, where it is forbidden to park, which would both improve the quality of the service and increase the safety of pedestrians (Figure 1).

#### 4.2. Parking lot marking

Horizontal traffic signalization in the parking system is in a very poor condition. A considerable number of drivers park their vehicles with the help of vertical signalization which shows how to park and which is in a very good condition, or thanks to the fact that they have parked their vehicles in the same place for years, so they know how to park. The horizontal signalization should be maintained on a regular basis, since the materials used for marking are not very durable as they are actually very thin layers of paint which last 3 to 4 months.

In the street parking lots in the downtown zone in Kuršumlja, it is necessary to synchronize vertical signalization with the adopted parking organization, i.e. it is necessary to place adequate traffic signs that belong to the category of informative signs and are produced in standard size 600x900 mm, with corresponding additional boards. This goes for all the parking lots in Kuršumlja. This is a III-32 sign with all its additional boards.

### 5. IMPROVEMENT OF ROAD SAFETY IN SCHOOL ZONES

In Kuršumlja, apart from the problem of parking, there is also the issue of increasing the safety of pedestrians (children) in school zones. In the period from 2012 to 2013 there were two projects that were carried out and that significantly increased the degree of road safety. Apart from the usual vertical and horizontal signalization in school zones, this year, for the first time, vertical guardrails with retroreflective sheeting were installed; moreover, catadioptric systems and some other elements that contribute to the improved road safety were also installed.

Figure 2 shows a part of the project of the installation of traffic signalization, both vertical and horizontal, in the zone of "Drinka Pavlović" elementary school in Kuršumlja, as well as the installation of metal guardrails, works on the pavement and the installation of bollards for the purpose of preventing parking.

Because of the vicinity of the school, 4 speed bumps were installed, two in 7th July Street, one in Vuk Karadzic Street and one in Rade Drainac Street. They are placed 15 metres away from pedestrian crossings at the nearby crossroad. Five metres away from the speed bumps, from both directions in relation to the speed bumps, there are III-79 signs (traffic calming device).

Along the premises of the school, on the pavement, protective guardrails are being installed in order to prevent children from running into the street. Guardrails are also being installed across the elementary school in order to prevent parking on the pavement.



*Figure 2. Example of designing traffic signals in school zone*

## 6. INSTALLATION OF GUARDRAILS

Based on the frequent descents vehicles off the road and requires residents of the inhabitants Kastrat, a village in the municipality of Kuršumljija, on February 5, 2013, a part of Ivan Kosančić Street in Kastrat was inspected. After the inspection of the part of the street that runs from house 52 to 54, the following conclusions were made:

- On the left side of the street, the elastic guardrail is damaged - it is pulled out and needs to be repaired. It is not possible to make the road wider because of the supporting stone wall and the residential building (house number 52) on the right side of the road towards the so-called Kastrat interchange.
- In the zone of dangerous turn, in front of house 54, it is necessary to install 45 metre long elastic guardrail in order to protect the buildings on the left side of the road.



*Figure 3. Appearance of the sharp bend which will be set up guardrails*

After the analysis of all the facts and the real situation, a meeting was held and the decision was made to calculate the expenses and begin the installation of the 45-metre guardrail as soon as possible (Figure 3). Thus, one of the inhabitants' problems was solved, and the traffic users' safety was raised to a higher level, because in this way prevents the descent vehicles off the road. Setting guardrails at this location was conducted in accordance with international practice on the principles for setting up guardrails.

## 7. CONCLUSION

Delays in designing strategic documents and in starting with planned activities when it comes to road safety result in unnecessary and irreparable losses of human lives, in unnecessary expenses and damage. The local selfgovernment units have sufficient funds necessary for starting with vital activities for establishing a road traffic system and for the first tangible activities which should result in drafting strategic documents and starting with coordinated activities in the field of road safety. The process of designing, adjusting and adopting the strategy is time consuming and therefore should be undertaken as soon as possible. The first step of this process is an analysis of the current situation based on which it would be possible to, on one hand, identify the problems and provide a foundation for making sound decisions, and on the other hand, to monitor the realization of the activities. This would create a possibility to compare various local communities and obtain additional information on the results of certain measures. It is important to mention that local communities should not be left to themselves; instead, the Road Traffic Safety Agency, as it is its basic role and responsibility, should organize the drafting of methodological instructions for carrying out standardized research that would be applicable in all local communities in the country.

Due to the delays in drafting such strategic documents and implementing the designed activities, unnecessary and irreparable losses of human lives occur in the field of road traffic safety. Local selfgovernments should have sufficient funds that are necessary for starting with the activities for establishing a complete road safety system as well as for starting with tangible activities. The process of designing and adopting a strategy is a process that should start as soon as possible. First, the current situation should be analyzed in order to identify the problems and establish a basis for making the right decisions.

In 2013, the municipality of Kuršumljija came up with numerous initiatives, which, up to then, had been just a matter of discussions at City Council meetings. These changes are best visible in the town itself, as the projects that had begun earlier were finally fully realized. The long expected solution to the problem of parking finally got its epilogue, and during this year it will be monitored for slight shortcomings so that they are dealt with in no time. The access roads in school zones will finally get appropriate traffic signalization, which will greatly affect the behaviour of both drivers and students. Of course, not all of the problems were analyzed in a proper way, and some of the problems that began to be dealt with were not fully resolved. That is why it is up to the municipal organs to make the best of this year and provide their inhabitants, their families, and themselves, with a safe local community as far as road traffic is concerned.

This paper presents a common solution to the problems that have been recorded as a priority in the field of traffic safety in the area of Kuršumljija. However, it is important to note that all of the usual solutions give satisfactory results, and because of lack of financial resources, it is not possible to implement case of successful practices that are applied in the world.

In order to establish a uniform system monitoring of traffic safety, has recently been in the Republic of Serbia, implemented the project "Methods of monitoring indicators traffic safety in Serbia and their importance for strategic management of traffic safety". Monitoring of indicators of traffic safety, among other things, identify the problems in traffic safety in the area and provide guidance for successful operation in order to increase traffic safety. Representatives of Kuršumlja will certainly, in cooperation with relevant institutions in the near future consistently implement guidelines for measuring indicators of traffic safety in their area, all in order to act preventive to the future sources of danger in traffic.

## 8. LITERATURE

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