

Dragan OBRADOVIĆ, PhD*
Judge, Higher court in Valjevo
Research Fellow

Biljana TEŠIĆ, PhD**
Associate professor
Faculty of health and business studies
Singidunum University

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EFFECTS OF THE APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TRAFFIC IN THE WORK OF THE MISDEMEANOR COURT (VALJEVO CASE STUDY)

The judicial system in Serbia in the 21st century is increasingly following the achievements in the field of science and technology. In various areas of social life, a wide range of technologies is applied to support the judicial system and the work of the police, including integrated information systems for the management of court cases as well as video surveillance systems in traffic. The development of technologies, their adoption and application directly affects the work of the police, as well as the efficiency and quality of functioning of all parts of the judicial system. The subject of this paper is the analysis of the application of modern information and communication technologies in the field of road traffic safety with the aim of improving the functioning of that system or its individual parts. The aim of this paper is to point out the importance of the application of modern technologies in the field of supervision of traffic participants as well as their influence on proving

* E-mail: dr.gaga.obrad@gmail.com

** E-mail: btesic@singidunum.ac.rs

traffic violations in the work of misdemeanor courts through the example of the Misdemeanor Court in Valjevo. The paper also deals with the positive financial effects of the collection of fines for convictions on the example of the city of Valjevo.

Keywords: information and communication technologies, traffic, violations, fines

1. Introduction

Traffic accidents are one of the leading causes of death – over 1.25 million people die each year, (WHO, 2016) and material losses in the world (in underdeveloped and middle developed countries about 5% of gross national income (hereinafter: GDP), and in developed countries up to 2% GDP. At the same time, between 20-50 million people suffer minor and severe injuries (Veselinović et al, 2013). Injuries in traffic accidents are the leading cause of death among young people aged 15-29¹. According to the data (WHO, 2013), the number of deaths in traffic accidents in the world tends to increase further, so it is estimated that deaths in traffic in 2030 would become the fifth leading cause of death in the world.

Traffic accidents around the world have been recognized as a global problem by the United Nations as well. In order to extend the best practice of developed countries in terms of increasing road safety to the rest of the world, especially to underdeveloped and developing countries, the UN General Assembly in 2010 adopted the *Global Plan for the Safety of Road Safety 2011-2020 and the Decade of Action for Traffic Safety (A 68/368)* (Pešić, Rosić, 2014).

The Republic of Serbia, in accordance with the best experiences in improving traffic safety, took over this activity and in the mentioned period took active measures in order to increase traffic safety on the roads.

In August 2020, the UN General Assembly adopted Resolution 74/299 “Improving Global Road Safety”, declaring a new Decade of Action for Road Safety 2021-2030, with the ambitious goal of preventing at least 50% of road deaths and injuries in traffic until 2030. The action plan of the new Decade is in line with the Stockholm Declaration, adopted in February 2020 at the Third Global Ministerial Conference on Road Safety, which calls for continuous improvements in road and vehicle design; improving and enforcing laws on risky behaviors – such as

¹ <https://www.abs.gov.rs/%D1%81%D1%80/o-nama/medjunarodna-saradnja-i-eu-integracije/erasmus-trafsaf>, Accessed 13.5.2022

speeding; and providing timely and adequate assistance to the injured². The Republic of Serbia has accepted the stated goals and taken over this global activity, considering that the results in terms of improving traffic safety on the roads in the previous decade did not meet the set goals.

In addition, in order to prevent the suffering of traffic participants on roads around the world, even in Serbia, the police is constantly improving systems and work techniques by introducing newer information systems for video surveillance and information and communication technologies (hereinafter: ICT). The introduction of ICT, in addition to the effect on traffic safety and in general on increasing the general safety of all citizens, has another, positive effect on every country, including Serbia – on public finances. Violations of traffic regulations, which were noticed and registered by members of the police, according to their characteristics represent different offenses and are subject, depending on the severity of the offense, to different sanctions. These are, first of all, financial sanctions in various ways: by submitting a misdemeanor order on the spot for minor misdemeanors, by submitting a request to initiate misdemeanor proceedings for more serious misdemeanors and convictions passed before the competent court. Police officers have a unique role in enforcing the law on behalf of society and represent an institution that has the authority to use force against citizens. The police have significant power since no other government agency has the legal ability to detain citizens, search their personal belongings, physically assault them, or deny them other rights and freedoms (Paraušić, 2020). Given that traffic offenses are the most common of all offenses committed by individuals, it is clear how sanctioning them affects public finances – filling the budget, national and at the level of each local government³.

In this regard, the main goal of introducing modern management systems in the public finance system is to improve the process of planning, monitoring, control and management of the budget system, through the creation of documents, information and procedures supporting operational and strategic plans and regular and meaningful reporting (Tešić, 2011). The information requirements of users of different levels of management in the budget process, which is an essential part of public finances (both central and local), differ in content, quality and form and thus the ability of identified functions and processes of the system to provide

2 <https://www.zdravlje.org.rs › index.php › aktuelne-vesti: Početak nove Dekade akcije za bezbednost na putevima>. Accessed 30.4.2022.

3 Article 18 of the Law on Road Traffic Safety prescribes that the funds from the collected fines for misdemeanors and economic offenses in the amount of 70% belong to the budget of the Republic of Serbia, and in the amount of 30% belong to the budget of the local government where the violation was committed.

information. Strategic planning is based on the interaction and mutual support of the strategy, mission, values and goals of financial management, but also the strategy of developing the information system as a source of information resources (Viscusi, 2010). The role of strategic management is to, with adequate information support, ensure the implementation of decisions and implementation of planning and control activities related to management, control and decision-making on financial resources of local governments – revenues, expenditures, assets and liabilities (Bouwman et al., 2002).

In a limited volume, the authors presented the latest official data related to road traffic safety in the Republic of Serbia, as well as the most important regulations related to the use of information systems for video surveillance in road traffic in Serbia. They also analyzed certain violations in the field of traffic safety on the territory of Valjevo through the practice of the Misdemeanor Court in Valjevo, effects from the aspect of justice and police, but also economic effects of collecting fines for traffic violations committed in Valjevo over a period of 10 years, which is a relevant period for assessing the importance of the use of ICT in everyday life and the impact on strengthening public finances at the level of local self-government.

2. Video surveillance information system

The most recognizable device for citizens, who participate in traffic as drivers of one of the vehicles, as a rule, is a radar. Vehicle speed control and measurement radars previously had to meet the appropriate requirements prescribed in certain bylaws. Having in mind the period 2010-2019, to which the research conducted in this paper refers to, there are two rulebooks: the *Rulebook on metrological requirements for measuring the speed of vehicles in traffic*,⁴ or the *Rulebook on vehicle speed meters in traffic*.⁵ It was only in the second decade of the 21st century that we began to get used to the use of other ICT tools such as automatic control cameras (hereinafter: cameras), which are increasingly in use and whose use by police is increasingly important. The first camera location of the video surveillance system for automatic recognition of license plates in Belgrade was set up at the end of 2009, and from that moment the testing of possibilities and adjustment of the system began (Nikolić, Đikanović, 2015: 146). Over time, the number of these cameras in Belgrade increased, as did the technical

4 Off. Gazette of the RS no. 40/09

5 Off. Gazette of the RS, nos.119/2014, 111/2015, 117/17 i 50/19

possibilities. The example of Belgrade was followed by almost all cities in Serbia. Apart from cities, cameras are also installed on new roads, where the traffic is most frequent – on the part of the E 10 highway through Serbia, on the section Belgrade – Nis (to Aleksinac). In addition, today the cameras measuring the average speed of movement also cover other most important roads in Serbia, namely highways: Belgrade – Zagreb (to Batrovac), Belgrade – Subotica and “Milos the Great” (Obrenovac – Preljina)⁶. Also, in recent years, mobile automatic cameras have been increasingly used in Serbia, mainly by official vehicles, so-called interceptors, which are used in traffic safety control and detection of violations not only outside cities but also in individual cities.

Cameras in cities and on the open road control traffic safety and record – register certain, most common traffic violations by drivers of individual vehicles: passing a red light, controlling the current speed and controlling the average speed on a certain section of road, bypassing vehicles on a full line, wrong rearrangement of vehicles, endangerment of pedestrian. In addition to detecting offenses, cameras are becoming increasingly important and are used as evidence to detect perpetrators of various crimes, not just those related to road safety. Some authors point out that for frauds that have emerged with the development of modern information and communication technologies and the progressive informatization of society, new, specific, fraudulent techniques have emerged aimed at deceiving users of these technologies (Milošević, Putnik, 2019: 69).

3. Traffic safety on roads in Serbia and criminal offenses

Traffic accidents on the roads with injured persons, i.e. material damage, which according to their characteristics are criminal acts, are a reality in Serbia, in the area of Kolubara district and the City of Valjevo, as the seat of the mentioned district, through which important roads pass. However, on the roads across Serbia, out of all criminal offenses in the field of road traffic safety (criminal offenses, economic offenses, misdemeanors), various traffic offenses are committed by drivers of all ages, all categories of vehicles with driver’s license and without driver’s license. The ultimate consequence of all traffic accidents, after various court proceedings, is the payment of damages by certain insurance companies, above all. The cost of accidents is measured in billions of US \$.

According to the data of the Traffic Safety Agency (hereinafter: TSA), in the period from 2016 to 2020, 2.760 people were killed in traffic accidents (here-

6 „Sat Plus“, broj 517, godXXI od 30.12.2021., Kako da ne platite kaznu zbog proseka, Ž.Regoda, 18-23

inafter: TA) in the Republic of Serbia, 16.489 people were seriously injured, while 84.030 people sustained minor injuries. This is even better seen in Table 1.

Table 1. Data from the Traffic Safety Agency: Basic indicators of the state of traffic safety in the Republic of Serbia, period 2016-2020

Year	TA	TA	TA	TA	In total	Died	SBI	MBI	Injured	In total
	Died	Injured	Suffered	MD	TA					
2016	551	13864	14415	21557	35972	607	3362	17308	20670	21277
2017	525	14286	14811	21664	36475	579	3514	17849	21363	21942
2018	491	13744	14235	21583	35818	548	3338	17508	20846	21394
2019	494	13735	14229	21541	35770	534	3322	17068	20390	20924
2020	459	11849	12308	18410	30718	492	2953	14297	17250	17742
In total	2520	67478	69998	104755	174753	2760	16489	84030	100519	103279

Source: Traffic Safety Agency

TA-traffic accident; SBI-severe bodily injury; MBI-minor bodily injury

Having in mind the subject of this paper, we focused on the current Law on Misdemeanors (hereinafter: ML)⁷ and in this regard on certain violations of the Law on Road Traffic Safety (hereinafter: LRTS)⁸, which in the previous ten years most often certain categories of drivers – participants in traffic on the territory of the city of Valjevo. These are serious misdemeanors for which, according to the provisions of the Law on Misdemeanors, a misdemeanor order cannot be issued (Jeličić, 2018). Our goal was to see the importance of the use of ICT in traffic, in the everyday life of the city of Valjevo. We analyzed various aspects of ICT implementation from the aspect of police, judiciary, but also economic – financial effects, from the aspect of planning budget funds at the City level, which are available to the City Traffic Safety Council.

The data become important when we take into account the effects of the recent traffic control on roads, which was conducted in March 2022 as part of the international action ROADPOL (European Traffic Police Network) in which members of the Republic of Serbia Ministry of Interior – traffic police participated. Namely, members of the Traffic Police Administration, in the action of intensified traffic control conducted from March 21 to 27, discovered 29.857 violations on the roads in Serbia, of which as many as 22.403 were speeding. Of that number, 16.471 drivers who exceeded the speed limit were stopped in the settlement,

7 Off. Gazette of the RS, nos.65/13, 13/16, 98/16, 91/19

8 Off. Gazette of the Republic of Serbia nos. 41/09, 53/10, 101/11, 32/13, 55/14, 96/15, 9/16, 24/18, 41/18, 87/18, 23/19, 128/20.

of which 2.382 drivers in the zone of pedestrian crossings, while 5.932 drivers exceeded the speed limit outside the settlement. During the action, the traffic police controlled a total of 34.149 vehicles and sanctioned 666 drivers who drove under the influence of alcohol, and 6.737 other traffic violations were discovered.⁹ The existence of problems in the field of road safety is shown by the data that in the first two months of this year, 61 traffic accidents occurred on the roads in Serbia, and in almost half of these accidents as one of the influencing factors was unadjusted speed and traffic conditions. Also, during this period, the traffic police sanctioned about 65.000 drivers for speeding offenses, which is twice as many as in the first two months of 2021.¹⁰

4. Certain violations in the area of Valjevo and data from the research

TSA data show that in the area of the city of Valjevo from 2001 to 2013, 10.686 TA occurred, of which 117 TA with dead persons, and 2.973 TA with injured persons. In the TA team, 127 people died in Valjevo, while 4,087 people were seriously and lightly injured. The latest officially published TSA data for the city of Valjevo – “Report on basic indicators of traffic safety in the period from 2016 to 2020 – the City of Valjevo” states the most important facts about the state of traffic safety in the city of Valjevo. In that period, a total of 2101 TA occurred, of which 917 TA with casualties, 43 people were killed in the TA, 1225 people were seriously and lightly injured. A declining trend in the number of dead has been established, while the number of injured has been increasing over the years.

During the second decade of the 21st century, the use of automatic cameras began in Valjevo, which were placed in several places in the city. Also, members of the traffic police of the Valjevo Police Department received new, modern devices – speed measurement radars that can measure speed through day and night.

Based on the research conducted after obtaining data from the Misdemeanor Court in Valjevo on the basis of requests for access to information of public importance and the requested data for the period from 2010 to 2019, the author’s goal was to show the impact of stationary and mobile cameras on the state of traffic safety on the roads in the area of the city of Valjevo, whether the number

9 <https://rs.n1info.com/auto/mup-od-21-do-27-marta-otkriveno-29-857-saobracajnih-prekrasaja/>, Autor: N1 Beograd 28. mar. 2022 14:33, Accessed 1.5.2022

10 <https://www.telegraf.rs/vesti/srbija/3476201-porazavajuca-statistika-za-pet-dana-policija-kontrolisala-20000-vozaca-prekrasaj-napravilo-17700-njih>. Accessed 1.5.2022

of registered violations has increased and how this is reflected in the court proceedings conducted in connection with the committed violations and the results of those proceedings. The ultimate goal was to see the economic effects in terms of the amount of fines collected on the basis of traffic violations in the city of Valjevo in the period before and after the installation of cameras in the city of Valjevo and how it affects the income of Valjevo. Historically, misdemeanor courts did not even exist until January 1, 2010, when they were introduced as part of the judicial system in Serbia. Until then, authorities for misdemeanors existed as “sui generis” authorities, which were essentially something between courts and administrative authorities (Marinović, 2018).

The request referred to the most common offenses committed by drivers as participants in traffic prescribed by the LRTS for two offenses committed in the settlement that are detected by stationary cameras: Speeding in the settlement from article 332, para. 1, point 8 of the LRTS¹¹ and Passing through the red light from article 331, para. 1, point 39 of the LRTS¹². Also, the request referred to two offenses detected by members of the police with the use of mobile cameras – radar from vehicles in the area belonging to Valjevo, namely: Speeding outside the settlement from article 331, para. 1, point 8 of the LRTS¹³ – and Crossing the full line from article 331, para. 1, point 10 of the LRTS¹⁴. The subject of analysis was the following data:

1. Number of submitted requests for initiating misdemeanor proceedings,
2. Types and number of decisions made (number of convictions, acquittals, suspensions...),
3. Types of sanctions and protective measures in convictions.

5. Research results

5.1. Analysis of speeding offenses in the settlement

The misdemeanor referred to in article 332, para. 1, point 8 of the LRTS¹⁵ prescribes a penalty for exceeding the permitted speed within the settlement by more than 30 km / h to 50 km / h, for which the misdemeanor is punishable by a

11 Connection: article 43, para 1 of the LRTS (part: speed)

12 Connection: article 142, para 2 of the LRTS (part: traffic signalization – traffic lights)

13 Connection: article 45, para 1 point 4 of the LRTS (part: speed)

14 Connection: article 55, para 3 point 14 of the LRTS (part : overtaking)

15 Connection: article 43, para 1 of the LRTS (part: speed)

fine in the amount of 10,000- 20,000 dinars. For this misdemeanor, a cumulative imposition of 4 penalty points is executed (article 335, para. 1, point 9 of the LRTS), as well as the obligatory imposition of a protective measure prohibiting the driving of a motor vehicle of that category which the driver drove on that occasion for at least 30 days (article 338, para. 1, point 5 of the LRTS). The number of submitted requests for initiating misdemeanor proceedings can be seen in Table 2.

Table 2. Number of submitted requests for initiating misdemeanor proceedings by years for speeding in the settlement

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of submitted requests	1975	2001	2136	2746	1533	2267	3226	4406	3154	3374

In the period from 2010 to 2014 (period before the installation of cameras) the average number of submitted requests was **2078**, and in the period from 2015 to 2019 (period after the installation of cameras) the average number of submitted requests was **3285**. It can be concluded that in the period after the installation of cameras, a higher number of these violations was registered in Valjevo by an average of **1207** violations (**58%**) per year than in the period before the installation of cameras.

Every year, the Misdemeanor Court in Valjevo made a large number of different decisions on the submitted requests for initiating misdemeanor proceedings due to the mentioned misdemeanor.

Table 3. Types of decisions made by year for speeding offenses in the settlement

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Convictions	1760	1806	1862	2540	1291	2073	3000	4239	2908	3064
Acquittals	94	81	31	118	99	175	222	161	234	301
Suspensions	121	114	243	88	143	19	4	6	12	9

From 2010 to 2014, the average number of convictions was **1851**, acquittals **84** and suspensions **141**. In the period from 2015 to 2019, the average number of convictions was **3056 (+ 65%)**, acquittals were **218 (+155%)** and the number of suspended proceedings was **10 (-93%)** (Table 3). Also, certain specifics can be noticed in the period before and after the installation of cameras when it comes to imposing sanctions concerning convictions.

Table 4. *Types of imposed sanctions by years for speeding offenses in the settlement*

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fine (money penalty)	1743	1778	1851	2495	1276	2050	2988	4221	2897	3045
Prison sentence	0	0	0	0	0	0	0	0	0	0
Warning	17	28	11	45	15	23	12	18	11	19
Protective measures	1743	1778	1851	2495	1276	2050	2988	4221	2897	3045

In the observed period, the Misdemeanor Court in Valjevo imposed only two penalties prescribed by the provisions of the ML, namely: fines and warnings, while in the same period, none of them was sentenced to imprisonment for the said misdemeanor. Considering that the cameras were installed at the end of 2014, an increase in the number of fines imposed can be seen in the period 2015-2019. Therefore, there is an increase in the number of protective measures imposed by the ban on driving motor vehicles of a certain category, as a consequence of the increased number of fines imposed. The second sanction imposed – a warning, has a stable number on average in both periods, but this is especially evident in the period before the installation of cameras (Table 4).

5.2. Analysis of violations of the red light

Passing through a red light from article 331, para. 1, point 39 of the LRTS¹⁶ is one of the most serious traffic offenses for which a fine in the amount of 20,000-40,000 dinars or imprisonment for up to 30 days is envisaged. For this offense, a cumulative imposition of 6 penalty points (article 335, para. 1, point 62 of the LRTS) is implemented, as well as mandatory imposition of a protective measure prohibiting the use of a motor vehicle of the category driven by the driver on that occasion for at least 3 months (article 338, para. 1, point 37 of the LRTS). The number of submitted requests for initiating misdemeanor proceedings can be seen in Table 5.

Table 5. The number of submitted requests for initiating misdemeanor proceedings

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of submitted requests	202	197	146	136	101	124	871	598	876	911

16 Connection: article 142, para 2 of the LRTS (part: traffic signalization – traffic lights)

In the period from 2010 to 2014 (period before the installation of cameras) the average number of submitted requests was **156**, and in the period from 2015 to 2019 (period after the installation of cameras) the average number of submitted requests was **676**. It can be concluded that in the period after the installation of cameras, the registered number of these violations in Valjevo increased by an average of **520** violations (**435%**) per year than in the period before the installation of cameras.

Every year, the Misdemeanor Court in Valjevo made a large number of different decisions on the submitted requests for initiating misdemeanor proceedings due to the mentioned misdemeanor.

Table 6. Types of decisions made by year for red light violations

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Convictions	166	153	111	100	77	98	795	564	823	856
Acquittals	9	8	11	22	11	15	62	27	45	49
Suspensions	27	36	24	14	13	11	14	7	8	6

From 2010 to 2014, the average number of convictions was **121**, there were **12** acquittals and **22** were suspended. In the period from 2015 to 2019, the average number of convictions was **627 (+ 417%)**, and **39** were acquitted (**+225%**), and the number of suspended proceedings was **9 (-59%)** (Table 6).

Also, certain specifics can be noticed in the period before and after the installation of cameras when it comes to imposing sanctions on convictions.

Table 7. Types of sanctions imposed by year for red light violations

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fine (money penalty)	155	139	101	91	67	90	785	554	807	843
Prison sentence	0	0	1	2	4	4	5	7	9	9
Warning	11	14	9	7	6	4	5	3	7	4
Protective measures	155	139	102	93	71	94	790	561	816	852

In the observed period, the Misdemeanor Court in Valjevo occasionally imposed imprisonment for the mentioned misdemeanor in almost the entire observed period (Table 7), but in individual cases it was imposed continuously 2012-2019, with gradual increase in the number of these sentences noticeable in the period 2016-2019. In the period 2016-2019, there is a drastic increase in the number of fines imposed, as well as an increase in the number of protective measures imposed, banning the driving of motor vehicles of a certain category. The

warning is on average stable, with a decrease in the number of fines imposed in the period after the installation of the cameras compared to the period before the installation of the cameras.

5.3. Analysis of speeding offenses outside the settlement

In the Republic of Serbia, the speed of vehicles within the settlement is limited to 50 km / h. Very often, drivers grossly violate the regulations in the settlement, as well as outside the settlement, they drastically exceed the speed limit by a traffic sign by more than 50 km / h. The subject of analysis in this case were not all offenses related to speeding outside the settlement, but only those offenses related to speeding outside the settlement from article 335, para. 1, point 8 of the LRTS¹⁷ when certain participant in traffic was moving at a speed higher than the allowed speed of movement by more than 50 km / h to 70 km / h. A fine in the amount of 20,000-40,000 dinars or imprisonment for up to 30 days is envisaged for the mentioned violation. It is also envisaged to cumulatively impose 7 penalty points (article 335, para. 1, point 13 of the LRTS), as well as to impose a mandatory protective measure prohibiting the use of a motor vehicle of the category driven by the driver for at least 4 months (article 338, para. 1, point 9 of the LRTS).

The number of submitted requests for initiating misdemeanor proceedings can be seen from the following table.

Table 8. Number of submitted requests by year for speeding offenses outside the settlement for the period from 2010 to 2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of submitted requests	202	237	199	274	272	375	509	611	489	437

In the period from 2010 to 2014 (period before the installation of cameras) the average number of submitted requests was **236**, and in the period from 2015 to 2019 (period after the installation of cameras) the average number of submitted requests was **484**. It can be concluded that In the period after the installation of cameras, the registered number of these violations in Valjevo is higher by an average of **247** violations (**104%**) per year than in the period before the installation of cameras (Table 8).

17 Connection: article 45, para 1 point 4 of the LRTS (part: speed)

Table 9. Types of decisions made by year for offenses of speeding outside the settlement for the period from 2010 to 2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Convictions	174	214	173	211	227	323	506	605	486	430
Acquittals	17	14	9	33	23	27	2	5	1	3
Suspensions	11	9	17	30	22	25	1	1	2	4

In the period from 2010 to 2014, the average number of convictions was **200**. In the period from 2015 to 2019, the average number of convictions was **470 (+135%)**. In the period from 2010 to 2014, the average number of acquittals was **19**. In the period from 2015 to 2019, the average number of acquittals was **7 (-63%)**. In the period from 2010 to 2014, the average number of suspended proceedings was **18**. In the period from 2015 to 2019, the average number of suspended proceedings was **6 (-67%)** (Table 9).

Table 10. Types of imposed sanctions by years for offenses of speeding outside the settlement

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fine (money penalty)	156	192	156	173	199	279	476	555	428	376
Prison sentence	0	0	0	0	13	17	19	21	27	36
Warning	18	22	17	38	15	17	11	29	31	18
Protective measures	156	192	156	173	212	296	495	576	455	412

In the observed period, the Misdemeanor Court in Valjevo did not impose prison sentences for the mentioned misdemeanor in the first four years of the conducted investigation, and only in 2014 did it continuously start imposing a prison sentence for this misdemeanor. In the period from 2015 to 2019, the number of imprisonment sentences increased slightly every year in continuity (Table 10). In the period 2015-2019, there is a significant increase in the number of fines imposed, as well as a significant increase in the number of protective measures imposed by the ban on driving motor vehicles of a certain category. The number of warnings issued is on average stable, a small number in both observed periods, before and after the installation of cameras, with an occasional increase in some years of both periods

5.4. Analysis of offenses related to crossing the full line

Crossing the full line from article 331, para. 1, point. 10 of the LRTS¹⁸ is one of the more serious offenses for which a fine in the amount of 20,000-40,000 dinars or imprisonment for up to 30 days is envisaged. Cumulatively, the imposition of 6 penalty points (article 335, para. 1, point 20 of the LRTS) and the mandatory imposition of a protective measure prohibiting driving a motor vehicle of the category that the driver drove for at least 3 months are envisaged (article 338, para. 1, point 13 of the LRTS). The number of submitted requests for initiating misdemeanor proceedings can be seen in Table 11.

Table 11. Number of submitted requests for initiating misdemeanor proceedings by years for crossing the full line

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of submitted requests	254	199	278	324	469	578	696	788	596	611

In the period from 2010 to 2014 (period before the installation of cameras) the average number of submitted requests for violation crossing the full line was **304**, and in the period from 2015 to 2019 (period after the installation of cameras) the average number of submitted requests was **653**. It can be concluded that in the period after the installation of cameras the registered number of these offenses in Valjevo is higher by an average of **349** offenses (**114%**) per year than in the period before the installation of cameras. Every year, the Misdemeanor Court in Valjevo made a large number of different decisions on the submitted requests for initiating misdemeanor proceedings due to the mentioned misdemeanor.

Table 12. Types of decisions made by year for offenses crossing the full line

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Convictions	189	143	205	242	415	518	636	718	529	550
Acquittals	22	19	26	23	18	41	45	52	48	39
Suspensions	43	37	47	59	36	19	15	18	19	22

From 2010 to 2014, the average number of convictions was **238**, acquittals **21** and suspensions **44**. In the period from 2015 to 2019, the average number of convictions was **590 (+ 147%)**, acquittals were **45 (+109%)** and the number of suspended proceedings was **18 (-144%)** (Table 12). Also, certain specifics can be

18 Connection: article 55, para 3 point 14 of the LRTS (part : overtaking)

noticed in the period before and after the installation of cameras when it comes to imposing sanctions concerning convictions.

Table 13. Types of imposed sanctions by years for offenses crossing the full line

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fine (money penalty)	184	137	200	234	406	509	630	713	523	545
Prison sentence	1	0	0	1	4	2	3	2	1	4
Warning	4	6	5	7	5	7	3	3	5	1
Protective measures	185	1137	200	235	410	511	633	715	524	549

In the observed period, the Misdemeanor Court in Valjevo imposed only fines (money penalty) for the said violation, while warning and imprisonment occurred in absolutely small numbers, approximately identical before and after the installation of cameras. Considering that the cameras were installed at the end of 2014, a significant increase in the number of fines imposed can be seen in the period 2015-2019. Therefore, there is a significant increase in the number of protective measures imposed by the ban on driving motor vehicles of a certain category, as a consequence of the increased number of fines imposed (Table 13).

5.5. Summary results of the analysis

The data for all 4 analyzed violations in this paper show that primarily by introducing images from stationary cameras starting in 2015 as evidence in misdemeanor proceedings increases the number of detected serious traffic violations in the city – in absolute numbers and percentage, and that increased use of mobile cameras – radars in traffic control outside the city since 2015 also increases the number of detected individual serious violations that were discussed in this paper – in absolute numbers and in percentage.

In addition, the above data show that the introduction of stationary cameras and more frequent use of mobile cameras – radars in traffic control allows a fair trial and easier determination of the facts in the Misdemeanor Court in Valjevo, which increases the number of convictions for each of the analyzed offenses. The number of persons acquitted has also increased, because on the basis of the recording, among other evidence in the procedure, it can be clearly determined whether a certain person committed the said violation and whether he is responsible or not. This was not the case before the cameras were put into operation, because the responsibility of an individual person as the perpetrator of the violation was based on the statement of the witness, ie. police officers. In all analyzed offenses, the number of suspensions has decreased since 2015, because it was much easier to

unambiguously determine whether a certain person committed one of these offenses and pass a conviction, or if the camera footage showed that an individual participant did not commit a traffic offense in traffic due to the fact that a misdemeanor procedure was initiated against him in order to acquit him in such a case.

6. Economic effects of misdemeanor fines on public finances

Economic effects and efficiency in the implementation of the collection of misdemeanor fines have been analyzed through the implementation of integrated information systems in misdemeanor courts and in the field of public finance.

At the end of 2015. Software System for the Misdemeanor Courts (hereinafter: SIPRES) was introduced in misdemeanor courts in Serbia, and its full implementation began on January 1. 2016. SIPRES is the first system in the Serbian judiciary that is connected with other bodies within the network of judicial bodies and the network of the Administration for Joint Affairs of Republic Bodies (hereinafter: AFJARB) and they are, for now, the Treasury Administration, the Traffic Police Administration of the Ministry of Interior of Serbia (hereinafter: TPA MI) and the Central Register of Compulsory Social Insurance. By connecting with the MI, the electronic delivery of tens of thousands of misdemeanor warrants to the courts has been enabled. Since the beginning of the implementation of this system, only TPA MI has issued over one million misdemeanor orders, and voluntary payment of fines has reached a record level of 74% – more than double compared to 30% of the percentage of voluntary payment of mandatory fines under previous law. SIPRES is an active system that includes various functions, in which every procedural action in the court is implemented.

When it comes to public finances, over the last 15 years, there has been the introduction of the Integrated Financial Management Systems (hereinafter: IFMS) as part of comprehensive financial management reforms aimed at improving efficiency, effectiveness, accountability and transparency, data management security and comprehensive financial reporting. The scope and functionality of an IFMS varies from country to country and represents a complex, strategic reform process (Chêne, 2009).

In Serbia, as in many developed economies, the initial reforms of Public Financial Management (PFM)¹⁹ were focused on establishing a functional Treasury – Financial Management Information System (hereinafter: FMIS) and a Treasury

19 Report on the implementation of the Public Financial Management Reform Program 2016–2020 for the period from December 2015 to December 2017, <https://www.mfin.gov.rs/UserFiles/File/strategije/2018/Izvestaj%20o%20spvodjenju%20Programa%20reform%20upravljanja%20javnim%20finansijama%20dec%202015%20-%20dec%202017.pdf>

Single Account (hereinafter: TSA) in order to solve operational / technical problems. FMIS, which was established in phases in Serbia, is a set of activities and procedures aimed at establishing financial unity in recording revenues, expenditures and execution of expenditures and expenditures of budget users. This ensures the integrity of the budget system and budget goals of the Republic of Serbia.

In terms of terminology, the FMIS, a platform specifically designed for the public sector, usually refers to the computerization of public expenditure management processes, including budget formulation and execution, cash flow management, control, reporting and accounting, with a fully integrated financial management system for ministries and other budget users. The application of these systems provides reliable information for decision makers, ensures integration and communication with all relevant information systems from the internal and external environment and enables effective state responsibility in terms of supporting efficient decision-making related to national and local budgets.

In order to achieve interoperability between national and local Treasuries, as well as integration with the FMIS platform, in 2020 the Treasury Administration implemented an information system for budget execution of autonomous provinces and local governments, whose implementation began on January 01 2021, which is a part of the public financial management system in which revenues and incomes are recorded and expenditures of autonomous provinces (hereinafter: AP) and local self-government units (hereinafter: LSGU) determined by the budget decision, i.e. the act on temporary funding. The system provides insight into the decisions on the budget of AP and LSGU, insight into the available funds according to the determined appropriations as well as control of execution up to the amount of available appropriations. In that way, the monitoring, control and reporting on the executed expenditures and expenses and the realized revenues and incomes according to all elements of the budget classification in accordance with the instructions for the preparation of the program budget for LSGU has been improved.

The main sources of public revenues are: taxes, customs duties, fees, charges, contributions and other public revenues. In addition to these public revenues, there are also local revenues, which belong to territorial autonomy (provinces), i.e. local self-government (cities and municipalities). Each of the forms of public revenues represents a whole, i.e. a system that is regulated by normative acts (laws and bylaws), the regulation of which is prescribed, starting from determination, collection, to control. Likewise, local revenues have their own norms and are controlled either at the state level or at the level of local government.

In accordance with the Rulebook on conditions and manner of keeping accounts for payment of public revenues and distribution of funds from those ac-

counts (hereinafter the Rulebook)²⁰, public revenues and receipts are allocated to the budget of the Republic, i.e. local government budget, organizations for compulsory social insurance and other users who are included in the consolidated treasury account system. Accounts for the payment of public revenues are kept according to the Chart of Accounts for the payment of public revenues, within the consolidated treasury account.

Payment of public revenues and incomes is made by levels, as follows: at the municipal level (code 1), at the city level (code 1 / g), at the city level (code 2, special code of the city treasury that differs from the codes of city municipalities), at the level of the AP (code 3) and at the level of the Republic (code 4). When it comes to the distribution of revenues, paid public revenues and incomes are distributed to users in accordance with the law, i.e. according to the affiliation and prescribed participation rates of individual users in the distribution of those revenues and incomes. It is important for this research to state the following affiliations: revenues and incomes belonging to the city (code 2) and revenues and incomes belonging to the Republic (code 4). The structure of the call for the approval number of the account for the payment of public revenues is defined by the Rulebook and is in accordance with the level of payment.

Payment account for Revenues from fines for misdemeanors and economic offenses envisaged by the regulations on road safety (account number 840-743324843-18) belongs to the group “Revenues from fines for misdemeanors”. The level of payment for this account is 1, 1 / g and 2, while the distribution, more precisely the level of affiliation, is 1, 2 and 4. Therefore, payments for misdemeanor fines can be paid at the municipal and city level, and the inflow is distributed to municipalities or cities and the Republic. The City of Valjevo has a payment status of 1 / g, so that the revenues from this payment account are distributed as a percentage between the city and the Republic in the ratio of 30% (city of Valjevo) to 70% (Republic).

Table 14. *Revenues from fines for violations of traffic safety regulations – the city of Valjevo*

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Revenues from fines the city of Valjevo	11.886.735,00	11.865.732,70	15.072.838,21	19.238.377,51	21.203.053,16	17.047.677,00	26.576.720,99	28.239.513,02	34.979.696,37	42.672.457,81

Source: Ministry of Finance-Treasury Administration Valjevo

20 Rulebook on conditions and manner of keeping accounts for payment of public revenues and distribution of funds from those accounts, Off. Gazette of the RS nos.16/16, 49/16, 107/16, 46/17, 114/17, 36/18, 44/18 – dr. zakon, 104/18, 14/19, 33/19, 68/19, 151/20, 19/21, 10/22

In accordance with the objectives of the work, in Table 14, for the analyzed period, and according to the above distribution, the inflow of funds to account 840-1070743324843-03 is shown, which according to the defined structure refers to revenues from fines for traffic violations at the level of Valjevo.

Based on the presented data, it can be concluded that after 2015. there has been a certain increase in the inflow of funds related to the collection of fines for traffic violations, which in recent years of both observed periods (before and after the introduction of cameras in the city) is particularly visible, given that in 2019 the revenue from fines was twice than in 2014. It is interesting to note that during 2015. revenue was significantly lower than the previous year, which can be interpreted in several ways. One is that that year was a test period of adaptation to the newly implemented information system and that the planned and later efficiently established synchronization with other institutions, primarily with the Ministry of the Interior, was missing. The role of the Ministry of the Interior is very important in the entire process of case processing, decision-making, sentencing and collection of fines. On the other hand, the introduction of video cameras that year, which was much talked about and written about in the media, may have affected the self-discipline and prudence of drivers, which was later lacking.

7. Conclusion

Traffic cameras are an important segment in raising general security in urban areas. As an integral part of the integrated protection system, traffic video surveillance cameras have the primary purpose of reducing the number of traffic violations.

The research included an analysis of the impact of information technology in the field of road safety, the efficiency of processing cases related to traffic violations and the effectiveness of the collection of fines for certain types of offenses. The authors examined the extent to which the use of information technology affects or may affect the change in the structure of misdemeanor liability of traffic participants and improve the efficiency of misdemeanor courts in terms of the ability to use evidence obtained with the help of information technology to make a lawful decision.

The results of the research show the positive effects of traffic control on the roads after the installation of video cameras, in terms of requests for misdemeanor proceedings by the Valjevo police, as well as in terms of decisions and sanctions imposed by the Valjevo Misdemeanor Court for analyzed types of traffic offenses.

es on the territory of the city of Valjevo – in the city itself and on roads outside the city.

Also important is the role of the implemented integrated information system for case management in misdemeanor courts, which provided efficient business processes and rational use of resources available to the misdemeanor court, as well as the establishment of electronic data exchange between courts and other relevant institutions.

We believe that the results of this research can be important for improving traffic safety on the roads with the application of information and communication technologies in other local communities in Serbia.

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