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Control and electronic surveillance: the use of technology in the traffic in the interior of Bahia

Controle e fiscalização eletrônica: o uso da tecnologia no trânsito no interior da Bahia

Control e inspección electrónica: el uso de tecnología en el tráfico en el interior de Bahía

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Abstract

The process of intensifying urbanization has had many repercussions for life in society and for traffic, such as the popularization of automobiles, which has even increased the number of accidents. Accidents can be caused by numerous factors and their video surveillance has emerged as a measure capable of expanding the scope of inspection. This article intends to analyze the perception of public authorities and citizens of a medium-sized city in the interior of Bahia, regarding the effectiveness of electronic surveillance promoted by the Traffic Monitoring Video Project, implemented by the City Hall. Empirical and descriptive-exploratory, the results indicated that video monitoring is a tool that can help improve traffic fluidity and safety.

Keywords: Control. Electronic Inspection. Traffic.

Resumo

O processo de intensificação da urbanização trouxe muitas repercussões para a vida em sociedade e para o trânsito, como a popularização dos automóveis, que fez crescer, inclusive, o número de

acidentes. Os acidentes podem ser causados por inúmeros fatores e o seu videomonitoramento surgiu como uma medida capaz de ampliar o alcance da fiscalização. Este artigo pretende analisar a percepção do poder público e dos cidadãos de uma cidade de médio porte do interior da Bahia, acerca da efetividade da fiscalização eletrônica promovida pelo Projeto de Videomonitoramento do Trânsito, implantado pela Prefeitura Municipal. De natureza empírica e do tipo descritivo-exploratória, os resultados indicaram que o videomonitoramento é uma ferramenta que pode auxiliar na melhoria da fluidez e segurança do trânsito.

Palavras-chave: Controle. Fiscalização Eletrônica. Trânsito.

Resumen

El proceso de intensificación de la urbanización ha tenido muchas repercusiones para la vida de la sociedad y para el tráfico, como la popularización de los automóviles, que incluso ha aumentado el número de accidentes. Los accidentes pueden ser causados por numerosos factores y su videovigilancia ha surgido como una medida capaz de ampliar el alcance de la inspección. Este artículo pretende analizar la percepción de los poderes públicos y ciudadanos de una ciudad mediana del interior de Bahía, sobre la efectividad de la vigilancia electrónica impulsada por el Proyecto de Video de Monitoreo de Tránsito, implementado por el Ayuntamiento. Empírico y descriptivo-exploratorio, los resultados indicaron que el monitoreo por video es una herramienta que puede ayudar a mejorar la fluidez y seguridad del tránsito.

Palabras clave: Control. Inspección electrónica. Tráfico.

Introdução

Currently, Brazil occupies the fifth place among the countries in the American continent with the highest numbers of fatalities caused by traffic, according to the Health Ministry⁴ (BRASIL, 2015). The majority of causes is related to the lack of organisation of traffic, poor conditions of the vehicles and public roadways, inappropriate behavior of the drivers, or even the weak punishments imposed to the perpetrators.

The Brazilian Traffic Code (CTB – Código de Trânsito Brasileiro) rules over the transit of vehicles and pedestrians on public roadways. It is, therefore, the main normative agent over traffic in Brazil. From the rules imposed by the CTB, the

⁴ Free Translation: Ministério da Saúde

inspection organs take charge on the application of the law of the Code, being it duty of the vehicle drivers and pedestrians to adapt to its rules, such as to allow transit of all with tranquility and safety on the urban highways.

The recente technological advances allow for a wider range of the use of technology as support to the control and surveillance of the traffic, the speed radars, videomonitoring networks and measures which provide the inspection organs with the ability to fine reckless drivers be it real-time or not. The radars are already in use on the stretch of the BR 116 that crosses through Vitória da Conquista, a medium-sized city in the Baiano countryside. However, such system was restricted to the surveillance of the aforementioned federal highway. In 2015, a project for videomonitoring of vehicles was deployed on Vitória da Conquista, which allowed not only the identifying of the most common reckless behaviors of the drivers, but also the intensification of the studies in the area, upon building a database for studies which allow the improvement of urban mobility. The presente study thus aims to analyze the perceptions of the public power and the Conquistense citizens over the deployment of electronic surveillance over the traffic of Vitória da Conquista.

Traffic: appearance, evolution and repercussions

The CTB, in its first article, first paragraph, brings the following description of traffic: "It it considered traffic the usage of ways by people, vehicles and animals, isolated or in groups, driven or not, as means of circulation, stop, parking lot and loading and unloading operations" (BRASIL, 1997). Given the concept, a brief history is traced on the evolution of traffic as a human activity and how such practice helped in the development of the primitive society, until the appearance of modern civilisations. According to Fraz and Seberino (2012), the earliest mean of transportation was walking, for the man already used its own effort to transport its belongings and move from a place to another. Later, the man became aware of the possibility of domesticatitng animals and using their strength to reach further places

and carry a heavier load. Following the invention of the wheel, there was a great revolution of the means of transportation. Thus, to the extent that the wheel was improved, new vehicles were also created to assess the necessities of locomotion and transportation of the man. This way, the ancient pathways were transformed into roads, allowing the easier access between distant towns. According to Hoffman, Cruz and Alchieri (2003) and Vasconcelos (2017), at the end of the nineteenth century, an important landmark was achieved for the development of traffic and humanity, and, as a consequence, unraveled a whole new level of problems with traffic: the invention of the first automobile, patented in January of 1886, by Karls Benz. On the counterpart, when approaching the invention of the automobile, Vasconcellos (2017, p. 6) expatiates that “with the creation of the automobile and the increase in circulation in the cities appear as the first modern issues with traffic and, consequently, a legislation on it”. It is thus highlighted the continuous concern with the subject, for, even before the invention of the automobile, on 1870, London already flaunted the mark of 460 thousand carriages, which left, to that point, somewhere around 3200 wounded and 237 dead, which motivated the authorities to deploy, on the same year, the first traffic light to be reported (VASCONCELOS, 2017, p. 5).

In Brazil, on 1897, with the arrival of the first automobile, Olavo Bilac starred the first traffic accident, which happened, more precisely, in the city of Rio de Janeiro, where the poet hit a tree, after borrowing the car from his abolitionist friend, José do Patrocínio (GAZIR, 1998). From the first half of 1950, with the national growth plan proposed by Juscelino Kubitscheck and the increase in investments directed towards road infrastructure, the popularity of automobiles expanded, contributing to the presence of a higher volume of vehicles in the cities and roads, thus increasing the number of traffic issues, accidents and traffic jam above all, caused by automobiles and motorcycles (FRANZ; SEBERINO, 2012).

A range of problems contribute to giving traffic a disfavorable image before society, such as traffic jams and, as defended by Vasconcelos (2017), those aspects

could be related to the idea of movement, a fundamental condition of traffic. Faced with the conflict between “allowing movement” and “grant access”, the studies of Vasconcelos (2017, p. 17) separate such conflicts in two general categories: the “physical conflict” and the “political conflict”. The first configures the “physical impossibility of accomodating, simultaneously, in the same space, the movements generated by the activities of the people”, while the second handles the “different positioning of people regarding the productive process and its results in society, and the diverse and conflictuous interests that therefrom derive”.

According to data from the UN from 2011, the traffic accidents killed around 1.25 million people, becoming the ninth highest cause of casualties around the world and leaving from 20 to 50 million people wounded every year. Such indicators create concern, because they generate a range of problems to public health, not only for the casualties or the physical and psychological traumas caused by those incidentes, but also for the encumbrance of direct and indirect costs caused to society (BASTOS; ANDRADE; CORDONI, 1999).

Though challenging to calculate the value of a human life, the costs that weight directly on those involved and the costs redirected to society from traffic accidents can be estimated. In a research developed by the Institute of Applied Economical Research (IPEA), it is concluded that “[...] the accidents in roadways cost to the brazilian society around R\$40 billions per year, while the accidents in urban areas, around R\$10 billions, being it that the cost related to the loss of production speaks for the major share of those values, followed by medical expenses” (BRASIL, 2015, p. 13).

As for the reasons that contribute for such a high number of accidents and associated costs, Ferreira and Tebaldi (2004) consider the human being as the greater cause of the accidents. For the researchers, on the other hand, the human fator cannot be isolated for study, in such a way that “The man has its history, personality, interests, needs and aims to fulfill them, creating conflitcs in traffic, for it intreprets

the established rules according to its own vision of the world” (FERREIRA; TEBALDI, 2004, p. 2). Therefore, the education for traffic might help avoid conflicts in traffic, once it's necessary for the individuals the adequate instruction to comprehend the kind of behavior that is to be adopted in the roadways.

This way, upon stimulating the awareness over the good manners in traffic, the citizens start showing, more and more, a positive behavior, especially those introduced by the CTB. It becomes clear that, along with the vigency of the CTB, on 1998, there was a significant drop in cases of traffic accidents in urban roads and highways, when compared to the previous year, due to the creation of more strict laws and higher fines. This decrease, however, was not held for long, possibly “[...] for the lack of an effective surveillance, with severe imposition of the punishments established by the law, and also for the delay in the delivery of the fines, which brought back a feeling of impunity, making so that the drivers and pedestrians turned back to behaving inadequately in traffic” (BASTOS; ANDRADE; CORDONI, 1999, p. 7). Thus, it seems, the act of surveilling and enforcing, if it is the case, takes a major role in the fulfilling of the norms of traffic. Considering what is shown on the article 280, second paragraph, that affirms that each and every infraction must be “[...] verified by the declaration of the authority or the agente of the authority in traffic, by electronic device or audiovisual equipment, chemical reactions or any other technological means available, previously regulated by the CONTRAN” (BRASIL, 1997), the present research intends to study the case of the videomonitoring (VDM) in Vitória da Conquista, which had its project deployed recently. It is then descanted on the electronic surveillance resources adopted by the organs responsible for the enforcement of the laws of traffic, specifically the radars and VDM cameras, as a mean of control, above all, the social control.

Social control

The word *control*, according to the Michaelis (2018) dictionary, etimologically derived from the French word *contrôle*, stands for different meanings, among those: “Act of conducting any activity, surveilling it and directing it in the most convening way” (CONTROLE, 2018). Social Control derives from this subject, it is based on Sociology and is defined as the “process through which a society or group seeks to secure the obedience of its members by means of the current standards of behavior” (CONTROLE, 2018). Or even, “as a series of mechanisms or instruments used by society, or by a social group, with the implicit or explicit objective of controlling the different behaviors (or different manifestations of such) and actions for its system” (HAERTER, 2012, p. 3). Before the exposed, it is possible to sustain that the respect, or lack of it, for the rules imposed by the society are in consonance with the current mechanisms of social control. Merton (1968) identifies how such structures have a direct impact on the behavior of individuals in society, upon affirming that,

[...] an effective balance between the two faces of the social structure is maintained when the satisfaction rises for individuals that are conformed with both, that is, the satisfaction achieved from the objectives and the satisfaction achieved directly from the institutionally channeled means of effort (MERTON, 1968, p. 2).

Such factors might be associated to the term “social deviance”, which, to Harter (2012, p. 23), is configured by the act of behaving out of the standards imposed by society, becoming “a product of the relation individual-culture-society, which, upon spreading its rules, ends up creating its deviances, as well”. In Brazil, it is possible to associate the idea of “social deviance” to the practice of the “Brazilian way”, which is viscerally spread across the Brazilian society and is originated from the period of Brazil-colony (ALCADIPIANI; MOTTA, 1999).

DaMatta (2015) refers to Brazil as a country marked by a highly hierarchized society, surrounded by impersonal relations that always face the top of the pyramid and the outside of the conventional system, what makes it a fertile ground for the development of the “Brazilian way”. For some, the mechanisms of social control do

not apply to that profile, due to the role they play on society (ROSS, 2017). The social control, however, also goes both ways. According to Silva (2002), it was thanks to the managerial reform, established in the public administration in the transition from the twentieth to the twentieth first century, that a possibility of usage of the social control was born, based on the search for the results. "In Portuguese language, the word has a sense of domination and, perhaps for this reason, the control is commonly seen as an inconvenient and uncalled-for procedure" (SILVA, 2002, p. 3).

The social control is little seen as a family subject, for, even with the presence of various mechanisms (Public Prosecution, Court of Auditors, transparency portals, media, among others) contained in Brazilian society, it is verified a lack of prepare by the citizens to use such instruments of control (SILVA, 2002). The study of social control is, this way, carried out through different approaches, according to Haerter (2012): Structuralist, Functionalist, Phenomenological and Interactionist. In the Structuralist approach, the society is seen as an organism segmented into various social groups and organisations that are related to each other and react to the external environment. The Functionalist approach was under tough criticism in its academic trajectory due to not taking into consideration the heterogeneity of the customs present in each social structure, even in those that seem similar. About the Phenomenological approach, it is referred to the meaning given by the members of a certain society to the experiences presented to them daily, that is, "the manner through which the social norms, values, behavior standards, among other aspects of the human conscience are internalized and interpreted by the people in the world they live" (HAERTER, 2012, p. 9). Finally, the center of the Interactionist approach handles the "comprehension of the different ways through which the people react to certain situations" (HAERTER, 2012, p. 11). It is then possible to be said that,

[...] the manifestation of the human behavior is not determined by a "society", nor by a "institution", nor by its "values", but it is influenced by those through feelings, preferences, personal tastes, and lastly, by the different "Me's". In this sense, the social action of

the individuals, as is their different manifestations of their behaviors are a consequence of the mean through which those individuals interpret the realidade and the social context which they take part in (HAERTER, 2012, p. 12).

Thus, as affirmed by Haerter (2012, p. 11), “to the existence itself of rules, it is inferred the possibility of its noncompliance, and, at its turn, a stimulus to defend the society, which takes place through mechanisms of control”. However, the transgression of the rules of traffic cannot always go as planned. This way, the use of electronic mechanisms with the objective of identifying certain acts of transgression to the laws of traffic is very frequente, after all, the “[...] updating of that surveillance through these technical objects contributed to developing a kind of society called [...] the society of control” (BRICALLI; ZANOTETLLI, 2016, p. 134). Following this, the next section brings the adoption of electronic surveillance devices in traffic across the urban VDM systems.

Electronic surveillance devices in traffic

A chaotic scenario in traffic is verifies, in the moajority of times, influenced by failures in the urban planning, precariousness of the public roads and recklessness of the drivers and pedestrians. According to Sousa (2008, p. 6), “a quick growth in the number of private vehicles is observed, due to the need of moving quickly, producing an undesired and unsustainable background regarding the daily movements”. The electronic surveillance appears as a growingly common measure in contemporaneity to try to inhibit and register the cases of transgression of the laws of traffic and keep a minimum level of civility.

The use of electronic surveillance devices is born from the need of increased security and of conditioning the urban mobility, and the reduction of infractions in traffic. To Alves and Ferreira (2014), the urban mobility should be analyzed as much through the political as through the technical optics, for the urban expansion should

keep an eye on the necessities of movement of the individuals. The authors also introduce a study on the sustainability of traffic as a way of improving urban mobility and the quality of life of the population, the electronic surveillance related to a group of existent traffic moderators (traffic calming). Although, the use of traffic moderators is not a recent concern (BARTHÉLEMY et al., 2019; NEMADE, 2016). These originated in Europe, between the decades of 1960 and 1970, when the interventions made were basically the change in the layout and the installation of speed reducers in the roads, to stimulate the conscientization of the drivers. On a brief retrospective on the use of technology on the surveillance of Brazilian traffic, Sousa (2008) affirms that, on August 1992, the first mechanism of this type installed in Brazil was an electronic speed reducer (REV), also known as electronic speed bumps, used to reduce the speed of vehicles in critical spots. Therefore, those devices, which aim to moderate traffic speed on the roads to avoid accidents, keep on being deployed in various Brazilian states.

The third paragraph of the article 24 of the CTB invested the power to the municipalities to “implant, maintain and operate the signaling system, the devices and the equipments of road control” (BRASIL, 1997). It was possible for the municipalities to participate in the management of traffic with higher autonomy, upon becoming responsible for the application of fines and investment of the revenue in measures of education and surveillance. Vitória da Conquista, a medium-sized city, located to the southeast of Bahia, took a while to meet its first instruments of electronic surveillance, being reported, with a permanent character, only after the privatization of the federal highway BR-116, on the year of 2013. That highway crosses the city in its whole North-South extension. According to VIABAHIA, concessionaire responsible for the management of the highway on the state, on the year of 2015, the first fix radars were installed in Vitória da Conquista, close to the stretches where the highway passes by the bypass road that crosses and circles the urban area of the city. Cupolillo (2006) and Lopes and Porto (2007) affirm that the

studies conducted on the highways where there are fix radars reveal that such tools do not reach the intended efficiency, seeing that those actions have a local character, restricted to the surveilled stretch.

Another kind of electronic surveillance present in Vitória da Conquista is the VDM of vehicles. In a recently deployed project, more precisely on July 2018, the traffic surveillance started being carried out through high-definition surveillance cameras, installed on strategic spots of certain roads, with the intent of identifying the centers of traffic problems. As one of the benefits, the traffic agents were free to act on other areas of the city and educate the drivers through efficient surveillance and punishment promoted by the video records of inappropriate behaviors in traffic (PMVC, 2018).

The usage of vigilance mechanisms in the cities has been more common every day, which generates a debate, often controversial, about its use (BARTHÉLEMY et al., 2019). In the majority, its public or private use it's related to a safety matter. According to Castro e Pedro (2013, p. 353), "these devices constitute relations in which daily practices and actions, that so far could've been unnoticed, get visibility". The usage of these mechanisms can, so, help with the alteration of behavior of individuals that start to get conscious about the visibility of their actions. However, there are some who disagree of this usage, and justify that the VDM curtails the individual's freedom.

For Scaringella (2001), the use of technology is a strong ally in the fight against violence and imprudence in traffic. For the author,

Brazilian culture hasn't been generous with preventive measures. In traffic is no different. Besides, when it's said about traffic problems, it's usually reduced to the matter of fluidity, when the biggest challenge is safety, meaning, try to reduce the number and gravity of accidents (SCARINGELLA, 2001, p. 59).

The use of mechanisms of electronic surveillance, therefore, is usually linked to the idea of a more human traffic, giving prevalence to life over fluidity. However, it

must be evaluated the effects achieved by the relation with its population, giving them a voice in this important subject.

Methodological procedures

To reach the intent of analyzing the perception of the Public Power and the citizens of Vitória da Conquista regarding the effectiveness of the electronic surveillance promoted by the Traffic Video Monitoring Project⁵, it was opted a research of the descriptive-exploratory manner, with an empiric nature, because “[...] the meaning of the empiric data depends on the theoretical background, but this data aggregate pertinent impact, mainly by facilitating the practical approach” (DEMO, 1994, p. 37).

As for technique, it was opted the case study, as this presents itself as an appropriate method for the detailing and depth of the phenomenon in study, in a way that intends to “deal with a wide variety of evidences – documents, artefacts, interviews and observations” (YIN, 2001, p. 27).

Considering that the universe of conductors and pedestrians is undefined, the sample of the population was held in a non-probabilistic way. It was applied, then, the criteria of accessibility on a time lapse of 30 days. The sample of employees followed the sample criteria for convenience, to select “the elements that are accessible, this may be, in a way, representative to the universe.” (GIL, 2011, p. 94).

To comprehend the adopted behavior of the people in the monitored and non-monitored stretches, it was held, even, non-participative observation. The choice for the locations followed the random criteria at first, and planned at the second stage. The justification for such choice was due to the ease in the “acquisition of data without producing disputes or suspicion on the community members, groups or institutions that are being studied” (GIL, 2011 p.101). Such data was collected in video footage with about 9 hours of shootings in various locations in the city,

⁵ Free translation: Projeto de Videomonitoramento do Trânsito

distributed in three shifts (morning, afternoon, night), for 15 consecutive days, in February 2019.

To describe the Traffic Monitoring Project, interviews were held with people connected to the Program. Thus, three employees linked to the Urban Mobility Office were interviewed. The choice for this type of data collecting was due to its exploratory character, because, according to Quaresma (2005), it's "[...] used for detailing of matters and more accurate formulations of the related concepts. [...] the interviewed has the liberty to expatiate on the suggested theme. It's a way of exploring extensively a matter." (BONI; QUARESMA, 2005, p. 74).

With the objective of checking the perception of the conductors and pedestrians on traffic, online questionnaires were applied through the platform Google Forms, and transmitted via email and social communication apps. Also used were the secondary data made available by the Urban Mobility Office to check the location of VDM camera's installing distributed through the city's roads until this study date.

The data treatment was of the quantitative-qualitative type. For Demo (1994, p.7), "science prefers the quantitative treatment because it's the most able to the formal improvements: the quantity can be tested, verified, experimented, measured". The qualitative analysis provides, however, a deeper treatment, specially of data from interviews and observations, in the investigating what's behind the less known phenomena, specially the "intricate details" of a phenomena that quantitative methodologies not always offer (ALENCAR, 1999).

Analysis and discussion of the results

The municipal traffic organ is widely known by the citizens as SIMTRANS, even though is officially called Urban Mobility Office⁶ (SEMOB), organ in charge of

⁶ Free Translation: Secretaria da Mobilidade Urbana

the traffic administration in all of the urban space of Vitória da Conquista, and also of the operating of the Traffic Video Monitoring System in the city.

The collected data in field confirm that there's an information's system that gathers and catalog the data of the registered occurrences daily on the streets, because according to the Traffic Agent,

Each process is a little different. There's the infraction notice, that's the administrative act that the traffic agent draws up on the road. In this act, all the data is collected in a tablet electronically, to find the owner of the vehicle, the conductor's information and send it to NAI (Infraction's Notice Notification)⁷ to the residence. When the occurrence record is made, a protocol is generated and after that we make a data collection to feed a spreadsheet that will tell: which are the roads that have more accidents, which are the main vehicles involved in these accidents, what's the gravity of the accident, the conditions of the road, for example. (VERBAL INFORMATION)⁸

The Traffic Coordinator affirms that the information's system kept by the Traffic Coordination was of great value on the moment of the implementation and amplifying of the Video Monitoring Project, however, due to the recent character of the Project, "actually, we're starting to get this data now, right? So first we have to start to understand how to better adjust the monitoring" (COORDINATOR Z). With that, it's evident that, by the time of the interviews, there were no statistic data available capable of comparing the situation before and after the implementation of the Project.

Until the day of the interview, February 25th 2019, there was a total of 18 high resolution cameras installed in the downtown roads. All of them were capable of covering a 360° angle and had high quality zoom that allowed them to focus clearly on the infractions and license plates on a perimeter up to 1km. It's important to note that the equipment doesn't belong to the Public Power.

⁷ Free Translation: Notificação de Auto de Infração

⁸ Interview I (March 2019): interview conducted with Traffic Agent X. Interviewer: Edson Celino Rodrigues Filho.

[...] a bidding process to define which company would make the installation and maintenance of the devices. [...] all this equipment is rented, once the Public Power has no condition to keep this equipment fully operational and still acquire extra parts and not have the personal to repair the equipments. (VERBAL INFORMATION)⁹

However, even if there's contact of other people with the equipment, according to Supervisor Y: "all of the equipment operation is held by SIMTRANS, there's no involvements of third parties. The own (traffic) agent has control of the cameras and moves them". With that, they keep security and privacy of the collected data.

As for the daily routine of the Video Monitoring Project, it was informed that the surveillance occurs in a period of 12 hours a day. Namely, there's a scale of seven agents that work around 6 hours a day. Currently, each agent is responsible for the monitoring of, at most, four monitored stretches. It's settled, however, the limit is at most five monitors per agent. Still according to Supervisor Y: "of the 65 agents we have today, all of them are eventually going there, in a rotation manner, unless one or the other have difficulties with the system and asks to leave, but the vast majority goes through there". On the viability of monitoring to be held 24 hours a day, a spokesperson of the Traffic Coordination informed:

[...] we're still in an embryo phase. So, if today we're at 7 agents in each shift, if there's an upgrade for 24 hours of surveillance this number would have to more than double. However, I believe there's no need for this amplitude in surveillance at the moment, because it doesn't justify the investment to monitor hours in which the incidents of occurrences are low. (VERBAL INFORMATION)¹⁰

On data storage, it was clarified that the video footage is kept in the system for a period up to seven days, due to the technical limitations on data storage. As for the number of people involved in the Video Monitoring Project, there's not a defined number, except for the agents that deal directly with the images captured by the

⁹ Interview II (March 2019): interview conducted with Traffic Supervisor Y. Interviewer: Edson Celino Rodrigues Filho.

¹⁰ Interview II (March 2019): interview held with Traffic Supervisor Y. Interviewer: Edson Celino Rodrigues Filho.

cameras, since all of Traffic Coordination is committed to the tasks that derive from this type of monitoring. According to SEMOB,

[...] with videomonitoring, inevitably the number of infractions will rise, which will be reflected here on the counter. On the counter it will also reflect on the data processing sector, to analyze and store this data. What ends up reflecting in coordinating (of traffic) as a whole, because it's all involved. (VERBAL INFORMATION)¹¹

On the motivations for the implementation of a Project this size, the search for a traffic fluidity was the main motivation for this decision. According to the interviews, one of the biggest problems in the Conquistense traffic is the volume of vehicles that drive through the city. According to Vasconcellos (2017) and Nemade (2016), problems of this nature are due to physical conflicts, that prevent that the needs for traveling, stopping and parking are met at the same time.

Another determinant factor for the implementation of the Project is referred to the text in paragraphs 2, 3 and 5 of the 1st article of CTB: a safe traffic is a common right, and the organs belonging to the National Traffic System (SNT)¹² should adopt the measures to ensure this right; the organs within the SNT are directly responsible by the damages caused to the citizens and composing organs of SNT should give preference to their actions in defense of life, preserving health and the environment. (BRASIL, 1997).

According to Bastos, Andrade e Cordoni (1999), the increase in the violence cases in traffic is directly related to the lack of monitoring. For SIMTRANS, since the beginning of the first step of the Video Monitoring Project, there was a great reduction in the occurrence of traffic infractions in the roads next to the City Hall building (location where the first cameras were implemented), validating even more the premise that it's necessary to have a permanent and incisive surveillance so that the education and safety in traffic increases.

¹¹ SAME

¹² Free translation: Sistema Nacional de Trânsito

To identify the expected disciplinary effect with the implementation of the Traffic Video Monitoring Project, the obtained data was analysed and verified that, for SIMTRANS, the expected disciplinary effect is the inhibition of traffic infraction cases, once the conductors start to control their actions in monitored environments. According to SEMOB,

[...] the right thing is for the conductor to avoid committing any imprudences, not only in the monitored stretches, and not driving with a speed superior to the permitted on the roads, not to run red lights, not to park in forbidden places and expect also that the others won't do the same (VERBAL INFORMATION).¹³

Such reasoning resembles what's treated in the studies of Haerter (2012), as the mechanisms of social control act to try, somehow, to predict and curb cases of "social deviation", looking to significantly reduce the rates of law disrespect, in this case, traffic laws.

The video recordings registered 749 cases of traffic infractions in 555 minutes of recording (Board 1). Meaning, an approximated number of 1.3 infractions by the minute. The number of traffic infractions, however, may have been superior, as this is referred only by the images that could be viewed in the recorded images during the research. That confirms the importance on the use of VDM cameras for the identification of traffic infractions, as its contribution in the sense of curbing the occurrence of actions of infraction (BASTOS; ANDRADE; CORDONI, 1999; VASCONCELLOS, 2017).

Board 1 – Relation of the identified infractions by means of video recording in monitored and not monitored roads by PMVC.

CTB	# of cases	Infraction description
Art. 181	435	Parking the vehicle irregularly.
Art. 182	10	Stopping the vehicle irregularly.
Art. 183	3	Stopping the vehicle on the crosswalk.
Art. 186	22	Driving on the wrong side of the road.
Art. 192	29	Fail to keep lateral and frontal safety distance between vehicles, as

¹³ SAME IBIDEM

		well as in relation to the edge of the track, taking into account the speed, the weather conditions of the traffic location and the vehicle.
Art. 193	9	Driving on sidewalks, walkways, bicycle paths, bicycle lanes, landscaping, central beds and roadway dividers, roadsides, canalization marks, lawns and public gardens.
Art. 196	59	Failing to indicate in advance, with a regulatory arm gesture or direction indicator light, the beginning of the march, the performance of the maneuver to stop the vehicle, the change of direction or lane.
Art. 199	17	Overtaking through the right, except when the vehicle in front is in the appropriate lane and signals to go left.
Art. 206	4	Perform a return operation in a forbidden place or that causes damage to the free circulation or safety even in allowed places.
Art. 208	22	Running a red light or obligated stop.
Art. 214	4	Fail to give preference to pedestrian and non-motorized vehicle.
Art. 215	2	Fail to give preference in passing
Art. 244	8	Driving a motorcycle, scooter or moped: I – without using a safety helmet with visor or protective goggles and clothing according to the regulations and specifications approved by CONTRAN.
Art. 250	2	Fail to leave the soft light on, during the night, when the vehicle is moving.
Art. 252	7	Driving the vehicle with the arm outside the car and only with one hand, except when obligated to make regulating signs, change gears, or to activate equipments or accessories of the vehicle. It will be characterized as a terrible infraction if the conductor is holding or using a mobile phone.
Art. 254	96	It's forbidden for the pedestrian: I – to stay or walk on the roller tracks, except to cross them where it's allowed.
Art. 58	20	In the urban roads and rural with double track, the bike circulation must occur, when there's no cyclist lanes, paths or roadsides, or when it's not possible to use these, on the edges of the roller track, in the same direction of the regulated circulation for that road, with a preference for the motor vehicles.
TOTAL	749	

Source: Research data (2019).

As of the results of the research collected data, it was verified that the incidence of cases of traffic infractions in the monitored stretch is much smaller than the non-monitored stretches, once only 54 of the 749 infraction cases were identified in the lanes that had traffic VDM, representing 7.2% of the presented cases. This data is related to the critiques pointed out by Cupolillo (2006) and Lopes e Porto (2007), when they defended that electronic monitoring has a local character, restricting it to

the surveilled locations, which allows the offenders to practice misconducts where there's no monitoring.

It's demonstrated in Board 2 that about 58% of the observed infractions are referred to the Article 181 of the CTB, about the irregular parking of vehicles. This data is according to the interviews held with the representatives of SEMOB, that revealed that the infraction that's most identified by the surveillance cameras installed around the City Hall, in the first phase of the project, was related to Article 181: "The most committed infractions were those related to the Article 181 of the CTB, right? That's about the matter of parking. Parking next to the central bed, parking in pipeline areas, in a nutshell, parking where it's forbidden." (VERBAL INFORMATION)¹⁴.

The data confirms that the citizens are aware of the prejudices caused by those who insist on committing infractions, mainly for their own benefit. This find relates to the definition of the political conflict, proposed by Vasconcellos (2017), once such conflicts are caused by the different positions occupied by each person in the productive process and their impacts on society. The debate proposed by DaMatta (2015), by treating the Brazilian way¹⁵, present in some social actors, when imposing their will on others, because of their social status, not worrying about the consequences of their actions, may contribute to the understanding of these finds. However, the use of social control mechanisms, on the form of monitoring cameras, acts like it advocates the functionalist approach: as mere repressors to keep the order, before the threats imposed to society, not giving any attention to the real motives that make the offenders to misconduct in traffic.

¹⁴ Interview I (March 2019): interview held with Traffic Agent X. Interviewer: Edson Celino Rodrigues Filho.

¹⁵ Free translation: "jeitinho brasileiro".

Pannel 1 – Infraction to the Article 252, point V, aggravated by the use of mobile phone (left) and pedestrians walking and jogging outside the sidewalk on Olívia Flores Avenue (right).



Source: Research data (2019). Author of the photos: Celino Rodrigues Filho (February de 2019)

As for the elevated number of infractions, it wasn't included the total number of infractions of people that conducted their vehicles using the mobile phone, because the angle in which the responsible camera for these records didn't allow such view with clarity. It was observed, however, the high number of people that conducted their vehicles using their phones, including motorcyclists, as can be observed in the Picture above to the left. Such use, combined with driving, leads to a distraction that may provoke accidents and have victims (SCHICK et al., 2014).

As for pedestrians, responsible for about 12.8% of infraction cases observed in the research, it was verified the lack of common sense in using the sidewalks to travel. Olívia Flores Avenue, one of the most important in the city, it's stage for this infraction, being commonly used by Conquistense pedestrians for the practice of physical activities, such as walking and jogging. However, pedestrians use the exclusive cyclist lane, forcing them to travel with the motorized vehicles. The lanes intended for the traffic of cyclists and motorized vehicles are irregularly used by people practicing walks or jogging (Picture above to the right), even if there's a designated location for these practices in the referred avenue.

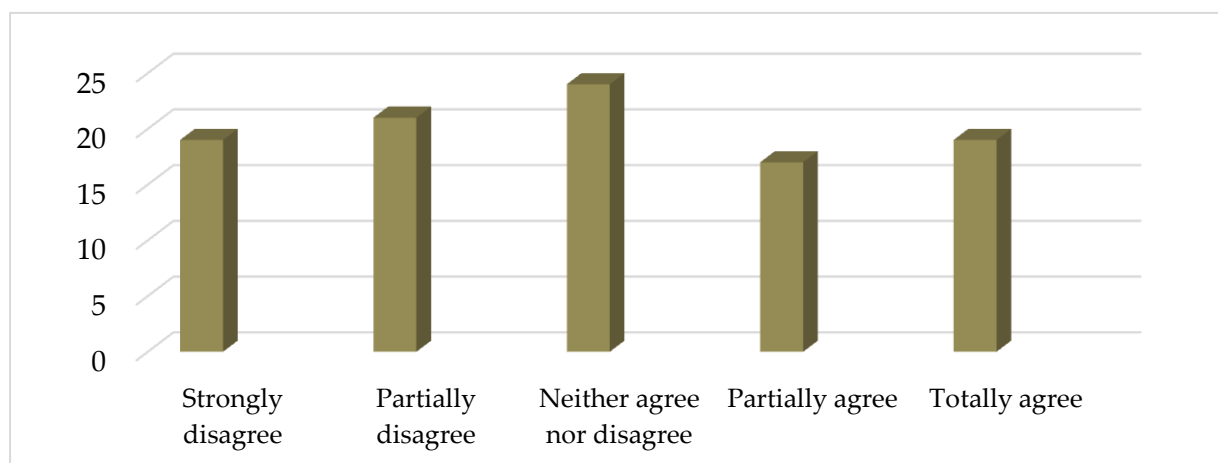
The collected data reveals that the Conquistense traffic is full of misconducts practiced by their many actors. The vast majority of observed infractions, representing 92.4% of the occurrences, were spotted in non-monitored stretches,

which reinforces the idea that the use of such monitoring mechanisms reduces significantly the rates of traffic infractions, achieving its disciplinary effect expected by its usage. (HAERTER, 2012).

On the criteria for the expansion of electronic surveillance projects in the urban area of Vitória da Conquista, the use of speed measuring radars and other equipments in the most critical stretches wasn't discarded by the municipal traffic organ. According to Supervisor Y, "the Project still sees in the future, not only VDM, but also radars, that are being studied in avenues such as Brumado and Luís Eduardo Magalhães". Policies as such demonstrate an interest in the decrease of the numbers of accidents related to speeding in critical roads.

Cupolillo (2006) and Lopes e Porto (2007) defend that the electronic mechanisms of traffic monitoring are tools that promote punishment instead of education. Regarding the assessments, that consequently generate fines for the infractors, the population considers such mechanisms as promoters of an idea of "fines industry". However, Chart 1 reveals that the opinions are diverse.

Chart 1 – Perception on the use of VDM as a promoter of distributing traffic fines



Source: Research data (2019).

For SEMOB, the intent of the electronic monitoring is not to fine and collect, but to promote a safer traffic for all. For the interviewed, the fines are mere consequences of the misconducts of the conductors that don't follow traffic laws.

Some think this Project exists only for collecting fines. However, this collection is not how one would imagine. The average period to get the funding after an assessment is around 18 to 20 months. That's not counting with the fact that from these assessments, 40% aren't paid. And the ones that do get paid, only start the payments after 1 to 2 years. On this amount that's not paid, you have to remember there were costs [...] to get as the City Hall's revenue collecting that's about 50% the amount. Besides, as it's preached on CTB, all the money raised because of traffic, stays on the traffic. To fund road works, infrastructure, traffic education. Relating to the "Fines industry", just don't commit an infraction. Of course, there might be mistakes too, because there are humans behind the machine, that's why there's the possibility of appealing the fine. However, who was fined, the vast majority admits to their mistake, after all there's not much to discuss. (VERBAL INFORMATION)¹⁶

Board 2 presents a global perception of the individuals on the city's traffic and the acting of the monitoring organs. For that, the answers of one of the questions of the questionnaire applied to the population were categorized to evaluate the global opinion of the respondents on some relevant themes to the study.

Board 2 – Perception of the population regarding traffic and SEMOB's actions

Theme	Negative perception (%)	Neutrality (%)	Positive perception (%)
Perception on the conditions and safety of roads and sidewalks	76	10	14
Perception on the conditions of signaling	52,5	21,5	26
Perception on the behavior of users of traffic (conductors, pedestrians, etc.)	58,3	12,7	29
Perception on fiscalization	49,3	22	28,7
Perception on the acting of competent organs for the traffic	41,5	16,4	42,1
Perception on the traffic's VDM	30	17	53

Source: research data (2019)

¹⁶ Interview III ((03.2019): interview held with Traffic Coordinator Z. Interviewer: Entrevistador: Edson Celino Rodrigues Filho

For the population, the impact brought by this new monitoring model are positive, as 53% of the respondents have a positive perception on the employment of these mechanisms in the city's traffic (Board 2). However, in the opinion of the people questioned, the city traffic's biggest problem comes from the dreadful conditions of the roads and the poor signaling. Such conditions, coupled with the individual's misconducts, may rebound in a disorganized, dangerous traffic. (FERREIRA; TEBALDI, 2004). This result may explain the approval rate of the VDM, even though the number of contrary opinions is still expressive (30%), as observed in Board 2. It's important to note that, even if the answers on the acting of the competent organs are shown reasonably balanced, a matter that's expressively critiqued by the population is the lack of funding, by the public power, in the traffic training and education practiced for the citizens, opposing to what Silva (2002) advocates on the importance of education as a main tool for citizen's awareness for a harmonic and safe living in traffic.

In summary, the results indicate a glimpse of hope around the technological innovations used to develop the safety and fluidity of the vehicles and people transit in the city, even tho they still offer resistance.

Concluding Remarks

The countless problems caused by misconducts in traffic stimulate an advance in the technologies that try to control and make traffic a more human, safe environment, and even other locations in the vast national territory may, like Vitória da Conquista, be undergoing such challenges, implementing or even studying the possibility of installing mechanisms to control the traffic. Therefore, the actions of the competent bodies are increasingly aimed at the control through mechanisms of electronic monitoring, which try to reduce the high number of accidents and traffic victims.

The Urban Mobility Office (SEMOB), or SIMTRANS as it's popularly known by Vitória da Conquista's residents, has an information system on traffic capable of storing and treating the data originated by the occurrences that take place daily in urban stretches. However, due to the recent nature of the Traffic Video Monitoring Project in the city, there still aren't comparative statistics on former periods that allow confirmation whether there has been improvement in the traffic per se.

The collected data revealed that the electronic fiscalization project for Vitória da Conquista's traffic, implemented by SEMOB, was mainly motivated by the search for improvement in the traffic's fluidity, especially downtown, marked by the growing need to ensure a good circulation of the large number of vehicles and pedestrians that transit daily in the central region, for the increase in the security and enforcement of the Brazilian Traffic Code laws.

According to SEMOB, it could even be assessed that the incidence of infractions in the monitored stretches maintained extremely low, compared to the non-monitored stretches, achieving the proportion of at least nine to one if contrasted with the infractions rate between the monitored and non-monitored places.

As for the expectations of the population and the municipal public authority regarding the implementation of the electronic fiscalization devices in the Conquistense traffic, it was possible to see that not only the Public Power, but also the population expects that the adoption of these mechanisms provoke significant positive changes in people's behavior in the traffic. However, many opinions express concern with the fact that this instrument can be used merely as a revenue collecting mean. The regulation organs deny such intention and defend that the Project foresees improvements in the fluidity and safety in the city's traffic, promoting beneficial changes to the whole population.

The current research presents itself as the origin of studies on the usage of VDM equipment in the traffic of a medium-sized hinterland city in Bahia and proposes to provoke a debate and investigations on the matter, since it couldn't

provide the exhaustion of the matter in question. In the planning for future work, it's suggested the analysis of the statistic data that might enrichen even more the knowleadges of the applied social sciences and the verification of the achieved contributions with the new control techniques, regardless of the social scope.

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