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Charting the Course Towards a New Legal Framework for Smart Cities

Smart Administrative Punishment: a Slippery Slope of Automated Decision-Making and its Economic Incentives in Public Law

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La crescente automazione delle sanzioni amministrative nelle città intelligenti segna un cambiamento radicale nell'applicazione della legge pubblica. Se da un lato il processo decisionale automatizzato migliora l'efficienza e la coerenza, dall'altro solleva preoccupazioni critiche circa i suoi reali incentivi e l'aderenza ai principi della sanzione amministrativa. Questo articolo esplora i meccanismi e il quadro legislativo che consentono una sanzione amministrativa intelligente, concentrandosi sull'applicazione del codice della strada e sugli incentivi fiscali che ne determinano la politica. Esamina criticamente i rischi di un'applicazione guidata dalle entrate, l'erosione delle tutele legali e la distorsione delle priorità amministrative. Analizzando casi d'uso come l'oggettivazione della responsabilità del proprietario del veicolo nella Repubblica Ceca, l'articolo mostra come l'automazione mal regolata possa compromettere principi legali come la proporzionalità, il giusto processo e la deterrenza. L'articolo sostiene che, sebbene l'efficienza sia un obiettivo legittimo, la razionalità economica non dovrebbe mettere in secondo piano la giustizia, richiedendo un approccio equilibrato che integri l'automazione con misure di salvaguardia contro gli abusi.

The increasing automation of administrative punishment within smart cities marks a transformative shift in public law enforcement. While automated decision-making enhances efficiency and consistency, it raises critical concerns about its true incentives and adherence to the principles of administrative punishment. This article explores the mechanisms and legislative frameworks enabling smart administrative punishment, focusing on traffic enforcement and the fiscal incentives that shape policy. It critically examines the risks of revenue-driven enforcement, erosion of legal safeguards, and distortion of administrative priorities. By analyzing cases such as the

objectivization of vehicle owner liability in the Czech Republic, the article shows how poorly regulated automation may compromise legal principles like proportionality, due process, and deterrence. It argues that while efficiency is a legitimate goal, economic rationality should not overshadow justice, calling for a balanced approach that integrates automation with safeguards against misuse.□

Summary: 1. Introduction.- 2. Administrative punishment and smart cities.- 3. Instruments of automation in current legislative framework.- 4. Incentives behind automated decision-making.- 5. Risks of economically incentivized administrative practices.- 6. Quo vadis, smart punishment?- 7. Possible solutions and considerations de lege ferenda.- 8. Conclusions.

1. Introduction

The rapid development of digital technologies has transformed urban governance, making smart cities one of the central testing grounds for innovative regulatory approaches^[1]. Among various other “smart” regulatory tools, automated administrative punishment has gained prominence as a tool for ensuring compliance with public laws and regulations. While automated decision-making systems in the area of administrative offense prosecution and punishment have enabled public authorities to enforce administrative sanctions more efficiently, it also raises significant legal concerns that warrant closer examination.

Just like all fine things in this world, benefits brought by the automation of administrative punishment practices come at a cost. While the reasonableness and proportionality of that cost can be subject to a whole different debate extending well beyond the scope of this article, it is crucial to be conscious about the price being paid for efficiency and convenience, and make related decisions accordingly. Both policymakers and law enforcement should be aware of potential systemic risks and factor them in when introducing and deploying the innovative practices. In this particular case, such risks have to do with the intrinsic features of automated decision-making (or rather the lack thereof) and its rather obvious practical and economical aspects.

This article explores the implications of automated administrative punishment and critically examines the increasing reliance on automated administrative punishment within the framework of smart cities. By examining the existing use-cases of automated decision-making in sanctioning proceedings and investigating the fiscal incentives that partially drive the implementation of smart administrative practices, the author seeks to identify the risks associated with revenue-driven enforcement models and looks for a balanced approach that integrates economic rationality with principles of fairness, proportionality, and due process to ensure that automation serves as a tool for governance rather than a mechanism for financial gain.

By exploiting the doctrinal methodology in the form of a value-centered proportionality analysis and elements of a critical post-RIA assessment, the author puts some of the existing use-cases of automated administrative punishment to the test and assesses their effectiveness both in reaching the designated goals and protecting individual rights while doing so, subsequently identifying the associated risks. In the first part of the article, the author presents the concept of the so-called “smart administrative punishment” and reveals the relevancy of administrative offence investigation and prosecution in the context of smart cities. The author then explores individual tokens of automation in contemporary administrative law, presenting concrete use-cases on the example of Czech legislation. As the next step, the author explores the ways in which fiscal incentives shape the development of automated punishment practices. Last but not least, the article addresses the ultimate research problem regarding the extent to which economic incentives should be allowed to dictate the administrative practices and policymaking and individual risks arising from automation of administrative punishment, also critically assessing the effectiveness of the said systems and anticipating further development.

2. Administrative punishment and smart cities

As increasingly more cities all over the globe integrate digital technologies into urban governance, hence making the concept of smart cities a focal point for innovation in administrative enforcement and decision-making, it is no surprise that the area of administrative punishment (also known in different jurisdictions

as administrative sanctioning or administrative offences) did not remain untouched by this development. In fact, it was one of the first ones to deploy advanced technology and various types of quasi-automated or semi-automated systems to increase the efficiency of law enforcement, predominantly in urban areas, with the first prototypes dating back to 1960s and widespread implementation taking place from 1990s^[2]. With the introduction of surveillance systems, automated monitoring, and AI-driven decision-making processes, it is hard to escape the reality of administrative punishment becoming increasingly automated.

Derived from the etymology of the term “smart cities”, automated administrative sanctioning processes can be collectively (and somewhat ironically) referred to as “smart administrative punishment”^[3]. This relatively general category may include various types of administrative practices depending on a specific jurisdiction, with the more court-centered punishment systems such as the United States using smart punishment features rather for e.g. tax fraud investigation and revenue collection (administrative punishment in the broader sense with sanctions in the form of tax penalties, fines and punitive interest)^[4], and the systems based upon partial delegation of sanctioning to administrative authorities implementing automation into the investigation and prosecution of administrative offences and misdemeanors^[5].

The most notable smart city initiatives have embraced automated enforcement mechanisms with varying degrees of legal and societal acceptance. One prominent example is automated traffic enforcement, where speed cameras, red-light cameras, and congestion charge systems use AI-powered image recognition to detect traffic violations and issue fines to registered vehicle owners^[6]. Another common area of automation is tax compliance and fiscal monitoring. Many jurisdictions have implemented AI-driven tax enforcement mechanisms to detect underreporting and fraudulent activities. By cross-referencing financial transactions, property ownership records, and spending patterns, these smart city components aim to identify tax discrepancies for further investigation^[7]. Environmental monitoring and enforcement have also seen increased automation, with cities deploying sensors and AI-based monitoring systems to regulate environmental compliance, including illegal waste disposal, air pollution violations, and excessive noise disturbances. Some of the more extreme examples

go even further and use automated social order enforcement has emerged in some smart cities through the deployment of facial recognition technology and predictive policing algorithms. AI-driven crowd analytics can detect unauthorized gatherings, while real-time surveillance may issue warnings or fines for minor infractions^[8].

The shift to “smart-ification” of administrative punishment undoubtedly brings numerous advantages, such as enhanced efficiency, consistency of sanctioning, and resource optimization. For instance, studies show that the presence of speed cameras is effective in reducing the speed adopted by drivers, with this effect even partially generalizing to areas without cameras^[9]. It is also reported that speed cameras seem to have an overall positive effect in terms of prevention of both traffic collisions in general^[10] and traffic injuries and deaths^[11]. However, the delegation of enforcement powers to algorithms also presents unique challenges, particularly concerning procedural fairness and its compliance with the constitutional principles governing administrative processes. Unlike traditional administrative processes that involve discretionary human judgment, automated administrative punishment operates within a rigid, pre-defined algorithmic framework, leaving little room for case-by-case consideration, but also creates new and quite unique problems so far unknown to the traditional doctrine of administrative law. While the issue of smart punishment raises many questions, such as cybersecurity of databases used for automated decision-making^[12] or the so-called “black box” phenomenon^[13], one of the less obvious problems has to do with the incentives (either direct or indirect) forming the autonomous decision-making or formed by such practice itself.

It is also necessary to mention the role of discretion in many enforcement systems, which constitutes a fundamental challenge in automating administrative punishment^[14]. Administrative decision-making often involves case-specific evaluations, contextual considerations, and proportionality assessments, which are difficult to encode into rigid automated systems. Current artificial intelligence and machine learning technologies remain limited in their ability to replicate human judgment, particularly in scenarios where nuanced decision-making is required. Hence, the implementation of smart administrative punishment into the current regime tends to lead to either abandonment of discretionary considerations altogether, or to their generalization and

categorization, with both approaches coming with various downsides.

3. Instruments of automation in current legislative framework

The problems created by the current setup of smart administrative punishment are best demonstrated based on the example of an existing regulatory framework. The legislative frameworks governing automated administrative punishment vary across jurisdictions, but they generally incorporate key legal instruments that enable and regulate automation in enforcement. In order to explore and analyze the legislative tools enabling automated prosecution and punishment, it appears apt to narrow the scope of research down to a particular area of automation, with the most obvious choice being traffic enforcement, being one of the most widely recognized and well-documented applications of automated administrative punishment is traffic enforcement regulation.

Automated traffic enforcement mechanisms, such as speed cameras, red-light cameras, and congestion charge systems, have been in use for decades, providing a valuable case study for analyzing the broader implications of automation in administrative sanctions. This regulatory area serves as an ideal example for several reasons. First and foremost, traffic enforcement is inherently data-driven, relying on objective criteria such as vehicle speed, road positioning, and time stamps to determine violations. Unlike other domains of administrative punishment, where subjective factors or discretionary assessments may play a role, traffic enforcement lends itself well to automation due to its reliance on verifiable data points. This characteristic makes it an early adopter of automation, providing a wealth of case law, regulatory precedents, and empirical data to analyze. Secondly, traffic enforcement systems operate at the intersection of efficiency and fairness, embodying both the benefits and risks of automated administrative sanctions, which makes them a great specimen for testing the fragile balance between those conflicting interests. On the one hand, traffic enforcement systems reduce the need for human oversight, enabling authorities to process vast volumes of violations in a timely and cost-effective manner. On the other hand, they raise crucial questions regarding their compliance with the basic principles of fair prosecution, proportionality, and collateral problems

created by their use, which are issues that are central to the broader discussion on smart administrative punishment. Thirdly, traffic enforcement regulation can be considered one of the most globally standardized forms of automated punishment, making it relatively universal and relevant across different jurisdictions. While individual jurisdictions may vary in their approach to speed limits, fine structures, and procedural safeguards, the fundamental principles governing traffic enforcement are relatively consistent. And finally, the study of automated traffic enforcement provides insight into economic incentives driving automation in public law.

When contemplating possible models of traffic enforcement automation, several solutions corresponding to different levels of automation come into consideration, ranging from partial automation and detect-and-notify systems, through hybrid models incorporating human oversight, all the way to fully automated systems. In case of full automation, detection, violation assessment, and fine issuance can occur entirely without human intervention. This is the case with speed and red-light cameras that automatically capture violations and impose fines by means of full-fledged and binding administrative decisions based on pre-set legal thresholds^[15]. Semi-automated and hybrid models incorporate an initial automated detection phase followed by human verification before sanctions are imposed. This model attempts to balance efficiency with fairness by ensuring that detected violations undergo a review process to filter out potential errors or misinterpretations. For example, some jurisdictions may require law enforcement officers to manually confirm that a detected violation, such as running a red light, meets legal standards before a fine is issued^[16].

It is probably needless to emphasize that current regulatory frameworks in most jurisdictions were architected without automation in mind. In practice, that means that upon their initial deployment, smart administrative punishment practices had to play the hand it was dealt and make use of the existing legislation. A rather fascinating and relatively unique token of legal engineering can be found in Czech traffic legislation, which addressed the systematic inefficiency (caused by the combination of relatively strict burden of proof, understaffing of qualified personnel, and in many cases impossibility to identify the offender) by escaping the ordinary procedural regime and introducing a new concept sometimes referred to as “legal indulgences”^[17]. This administrative practice, legalized by Sec.

125h of the Czech Road Traffic Act^[18], allows authorities to forego formal prosecution of a traffic offense in exchange for a monetary payment by the vehicle owner^[19]:

«The administrative authority of the municipality shall, without undue delay after the discovery or notification of the traffic offence, invite the owner of the vehicle with which the offence was committed to pay a specified sum (...). Should the specified sum be paid not later than the due date, the administrative authority of the municipality shall defer the case. Otherwise, the administrative authority shall proceed to investigate and prosecute the offence»^[20].

Unlike standard administrative proceedings, where a formal charge is issued and contested, legal indulgences effectively work as take-it-or-leave-it plea deals. The recipient of such an offer may either choose to pay the specified amount, thereby avoiding potential prosecution and dodging the associated legal costs, or decline the offer and risk facing formal charges while not being protected by the *reformatio in peius* principle^[21]. This mechanism operates outside the procedural framework of administrative proceedings, meaning that the notification issued by the authority does not constitute a formal administrative decision.

Although not designed specifically for the purposes of automated decision-making, this legal instrument can be (and is) exploited for the implementation of smart city ecosystems. Even though this system increases administrative efficiency, reducing caseload burdens on administrative authorities and courts and providing an expedited resolution to minor offenses, it can be argued that such arrangements resemble a legalized means of purchasing immunity from prosecution. As a result, legal indulgences raise questions about the fairness and legitimacy of automated administrative punishment, particularly in cases where financial considerations strongly influence one's decision to settle an alleged offense outside of formal prosecution.

Another legal tool facilitating automation of decision-making is the objectification of vehicle owner's administrative liability, coincidentally also stipulated by the Czech Road Traffic Act^[22]. By introducing the obligation of the vehicle owner to *«ensure that the driver's obligations and the traffic rules are complied with when using the vehicle on the road»* going hand-in-hand with the administrative offence of failing to do so, the Czech legislator effectively emptied the subjective aspect of the administrative offence (*mens rea*), hence defying the

basic principles of criminal law. Even though administrative punishment is generally considered criminal proceedings under Art. 6 of the European Convention on Human Rights^[23], objectivization of administrative liability of vehicle owners surprisingly survived the review by both the Supreme Administrative Court^[24] and the Constitutional Court^[25], meaning that vehicle owners can be liable for administrative offences they did not commit.

4. Incentives behind automated decision-making

While the expansion of automated administrative punishment *prima facie* appears to be a natural response to modern governance challenges, with automated systems being framed as a neutral technological advancement aimed at increasing compliance through higher detection rates and expedited processing of violations, at the same time it is hard to ignore further factors underlying the issue. When rationalizing the introduction of legislative instruments enabling and facilitating the automation of administrative punishments, policymakers emphasize its potential to enhance enforcement efficiency, ensure consistent application of the law, and alleviate the administrative burden of public authorities, a closer examination reveals a more intricate web of incentives driving the adoption of these systems – ones that extend far beyond mere efficiency.

It is rather obvious that economic considerations play a significant (if not dominant) role in the proliferation of automated enforcement mechanisms. The revenue-generating potential of these systems can hardly be overlooked^[26]. Many jurisdictions have faced criticism for using automated traffic fines as a revenue-generating mechanism rather than a purely safety-driven initiative^[27]. The self-financing nature of these systems certainly raises concerns about the potential for over-enforcement and a shift in priorities from public welfare to fiscal efficiency, that is issues that extend beyond traffic regulation and into other areas of automated administrative punishment. The prioritization of financial returns may lead to excessive reliance on automated punishment as a revenue stream, potentially incentivizing over-enforcement or reducing the willingness of authorities to apply discretionary leniency.

It is, of course, not inherently problematic for public administration to adopt economically rational approaches. Like any organization, governmental bodies

must ensure they operate within their financial constraints and allocate resources effectively^[28]. Efficiency in enforcement, reduction of administrative burdens, and cost-conscious decision-making are all legitimate and even necessary objectives for a well-functioning public sector. However, it should be borne in mind that public administration is not a for-profit enterprise, and its primary function is to serve the public interest rather than maximize revenue. While economic principles can inform and improve decision-making, they should not become the sole driving force behind enforcement mechanisms. When efficiency and financial considerations begin to overshadow fairness, proportionality, and fundamental constitutional principles (especially when it comes to quasi-criminal area of administrative punishment), the legitimacy of the administrative process can be called into question. Striking the right balance between economic rationality and the fundamental principles of justice is crucial to ensuring that automation in administrative punishment serves its intended purpose without undermining its legitimacy.

Ultimately, the debate over economic incentives in automated enforcement is not about whether they are inherently good or bad, but rather about how they are structured and applied in individual cases. A well-calibrated system can leverage financial considerations to improve enforcement efficiency while maintaining the legitimacy and ethical foundation of administrative law. Striking the right balance ensures that automation remains a tool for public benefit rather than a mechanism that prioritizes financial gain at the expense of fundamental rights. Achieving this balance requires a nuanced approach to designing and implementing automated enforcement mechanisms. If economic efficiency is pursued without sufficient safeguards, this comes with a risk of public authorities prioritizing revenue generation and expediency over fairness and justice. The key, therefore, is to integrate economic rationality in a way that enhances administrative functionality without compromising the core values that underpin legal systems.

Another major factor influencing the adoption of automated administrative punishment is the struggle of administrative authorities to carry their burden of proof in traditional proceedings. Due to resource constraints, procedural complexities, and the necessity of human oversight, many authorities find it difficult to meet the evidentiary requirements needed for formal prosecution.

Automation provides a convenient workaround, allowing authorities to bypass intricate investigative processes and shift enforcement models toward preemptive compliance rather than adjudication. By reducing the need for human intervention and streamlining evidentiary processes, automated systems enable authorities to impose sanctions with minimal administrative effort, effectively shifting the balance of power away from the accused and toward the enforcing agency. The problematic nature of this motivation is self-explanatory: while the struggle to increase the efficiency of administrative punishment practices per se is legitimate and even support-worthy, such measures should not be implemented in a manner violating the constitutionally guaranteed rights of administrative procedure parties.

5. Risks of economically incentivized administrative practices

Having established that the automation of administrative punishment practices is at least partially incentivized by fiscal and practical reasoning, it is necessary to critically examine the risks associated with such motivations to ensure that administrative punishment serves its intended purpose without compromising fundamental rights. While some risks are specific to certain types of measures (such as public–private partnership projects^[29]), other ones are fairly universal.

In their paper from 2005, Amanda Delaney, Heather Ward and Max Cameron argue that automated law enforcement can be burdened by several problems referred to as “dilemmas”. Specifically, automated decision-making can be associated with the «*credibility dilemma*» (see above), the «*social dilemma*», the «*legitimacy dilemma*» and the «*implementation dilemma*»^[30]. Those areas can be used as a starting point for the analysis of risks brought by the automation of administrative punishment. The credibility dilemma in automated law enforcement arises from the perception that speed camera programs prioritize revenue generation over road safety, especially in their early stages before safety benefits become evident. The authors of the study argue that over time, enforcement programs in places like Victoria and Britain have shown that public perception may shift to recognizing a dual role, *i.e.* both revenue raising and safety enforcement. The social dilemma stems from the common belief that

minor speeding does not significantly increase crash risk and hence should not be prosecuted. The legitimacy dilemma arises from concerns about fairness and due process compared to traditional enforcement. The implementation dilemma arises from concerns that it diverts police resources from addressing more serious criminal offenses. A related issue is that automation reduces manual enforcement, which is essential for detecting other forms of reckless driving that may be more dangerous than speeding.

Following the use-cases of the legal instruments described afore and assessing their impact on human behavior and administrative practices, several risks can be identified and anticipated. The most obvious risks concern the model of profit-driven enforcement which can, in extreme cases, lead to the abuse of power. Obsession with revenue increase have led to several scandals in the past, with the most notorious ones being the cases of public officials being rewarded based on the amount of imposed fines. This was the case with Rio de Janeiro, in 2021, when the City Hall implemented a policy granting bonuses to employees if the city increased its revenues from electronic traffic fines by up to 65.28% over the 2021 budget^[31]. Another infamous example of such practice can be found in Atlanta, Georgia, USA, where the 2022 investigation revealed an incentive system that encouraged police officers to write more tickets^[32].

Another branch of profit-driven corruption risks also lies in outsourcing or privatization of administrative penalization. In 2019, the town of Varnsdorf in the Czech Republic became embroiled in a significant corruption scandal involving automated speed enforcement. Mayor Stanislav Horáček and Deputy Mayor Josef Hambálek were implicated in a scheme where they awarded a contract to the company Water Solar Technology for operating speed cameras. The agreement stipulated that the company would receive approx. 12 euros for each issued fine. Within a year, the company issued nearly 60.000 fines, totaling approximately 720.000 euros, far exceeding the contract's stipulated limit and the rationally expected amount. This arrangement violated public procurement laws, leading to legal action against the town's officials^[33]. The scandal highlighted concerns about the improper financial incentives associated with automated speed enforcement and the potential for corruption when private companies are remunerated based on the number of fines issued.

While the above-mentioned cases are rather extreme, even common practices are

associated with various risks. When looking at the phenomenon of legal indulgences and their use in practice, it can be argued that this tool not only violates the traditionally subjective nature of administrative offences, but also causes quite a lot of collateral damage along the way. Firstly, it is at least questionable whether such practice can at all fulfill the core objectives of administrative punishment.

The fundamental purpose of administrative sanctions is to deter unlawful conduct, ensure compliance with legal standards, and, where necessary, penalize individual offenders. However, legal indulgences deviate from these principles by shifting the burden of punishment from the actual offender to the owner of the vehicle, effectively disconnecting enforcement from the principle of individual accountability. Instead of ensuring that the person responsible for the infraction is held accountable, legal indulgences operate primarily as a financial transaction between the administrative authority and the vehicle owner. This approach to an extent reduces punishment to a revenue-generating mechanism, where the primary concern is securing payment rather than enforcing behavioral change in the actual offender. Since the legal obligation to pay the imposed amount is placed on the vehicle owner (who may not have committed the violation) the deterrent effect on the real offender becomes secondary at best.

This misalignment with the principles of administrative punishment raises several concerns. First, by imposing financial liability on the owner instead of the driver, the system undermines the fairness of the enforcement mechanism. A core tenet of legal punishment is the idea that sanctions should be proportionate to the wrongdoing and directly attributable to the responsible individual. However, legal indulgences create a scenario where a person who has not committed any wrongdoing is penalized, while the actual offender faces no direct consequences. Second, this practice significantly diminishes the preventive function of administrative sanctions. The purpose of punishment is not merely to impose penalties but to shape behavior and discourage future violations. If a driver knows that a traffic offense will not personally affect them, but rather the vehicle owner, they may have little incentive to adjust their conduct. In this way, legal indulgences fail to serve as an effective deterrent. Furthermore, the decision-making processes of parties to administrative proceedings are also influenced and, in a way, corrupted by the automation, as vehicle owners may opt to pay the

specified amount simply to avoid the legal costs and administrative burdens associated with contesting the penalty, even if they believe they are in the right. The prospect of navigating an often complex and time-consuming appeals process can be daunting, leading many to conclude that settling the *de facto* fine is the more pragmatic choice^[34]. This can create an environment where legal challenges are discouraged, undermining the principles of due process and reinforcing a system where financial expediency takes precedence over legal fairness.

The obsession with efficiency can also lead to administrative authorities choosing to follow the most cost-benefit rational path, while leaving some potentially harmful offences uninvestigated. Complex, resource-intensive investigations into serious but harder-to-prove offenses may be deprioritized in favor of automated mechanisms that generate immediate revenue with minimal administrative effort. This may create a perverse incentive structure in which authorities focus disproportionately on minor infractions that are easy to detect and penalize, while more significant but labor-intensive violations go uninvestigated. Consequently, public administration risks shifting from a system of comprehensive regulatory enforcement to one where enforcement priorities are dictated by financial expediency rather than the broader interests of justice and public safety. The take-it-or-leave-it nature of automated decisions and inability of systems used for administrative punishment to effectively exercise discretion also means that imposed sanctions are neither personalized nor tailored based on the specific circumstances of the case.

The harmful nature of this phenomenon can also be increased by the snowball effect leading to more offenders choosing to “fly under the radar” and take advantage of the fact that their behavior goes unpunished. As this pattern continues, it can lead to an erosion of compliance within society. When individuals perceive that certain offenses are effectively ignored by enforcement authorities, they may begin to disregard legal obligations more broadly, assuming that their infractions will also go undetected. This can have serious long-term consequences, as the perception of a weak or selective enforcement system undermines both deterrence and the rule of law. Over time, this lack of consistent enforcement may lead to a decline in general public trust in administrative institutions, as citizens come to view the legal system as one that

prioritizes financial gain over genuine regulatory effectiveness.

6. *Quo vadis*, smart punishment?

The outlooks regarding automated administrative punishment are relatively uncertain, with the future trajectory of depending on complex sociological phenomena and on how policymakers and legal institutions will manage to navigate the tension between efficiency and justice. When it comes to the effectiveness of smart administrative punishment, it is safe to conclude that their effect is generally positive, at least for now. For the purposes of prediction of further development, it is probably better to extract information from the individual parts of the system rather than looking at it from the mountain view. For instance, in terms of deterrence effect, the opinions on whether automated systems are superior to manned traffic enforcement are mixed. The study conducted by Richard Tay suggests that manned enforcement provides greater specific deterrence of high-risk drivers, thus potentially reducing total and serious crashes, while automated enforcement provides a general deterrence effect on a broad spectrum of the driving population, where some effect on the total number of crashes can be observed^[35]. Other studies show that fully automated systems can bring underwhelming results by failing to impact people's driving behavior and increase the road safety^[36]. Conflicting signals like that somewhat change the perception of the generally upward trend and may indicate possible problems in the future.

Interestingly enough, one of such trends can be observed in the phenomenon where some behaviors related to automated decision-making become economically irrational. For example, a significant number of people seem to deny the authority of automatically issued decisions as opposed to decisions issued by a human being. This finding is also supported by the perception of fines issued by the City of Prague, where lower fines issued by robots were less likely to be paid than much higher fines imposed by humans, which can be explained by the general assumption that while automatically-issued fines can be ignored with a low probability of any negative consequences arising in the future, human officials are more likely to prosecute the non-compliance^[37]. This anticipates a sociological phenomenon when the efficiency of automated

decision-making may actually decline over time, once more people realize that they can simply ignore decisions issued by robots since those decisions are not likely to be upheld and enforced by people due to its inefficiency.

While the rise of automated administrative punishment is an undeniable trend, there remains a significant lack of comprehensive data to predict its long-term societal impact and public acceptance accurately. The use of automated enforcement mechanisms is still in a relatively early stage, and while some studies have highlighted concerns over fairness, transparency, and public trust, there has not yet been sufficient longitudinal research to determine how these systems shape public perceptions and behaviors over time. Questions remain as to whether societies will ultimately accept automated enforcement as a fair and impartial means of regulation or whether backlash against perceived overreach will lead to significant pushbacks and demands for reform. The absence of robust data does not, however, change the reality that smart punishment systems are here to stay. The increasing digitization of governance, the growing availability of enforcement technologies, and the financial incentives driving their adoption ensure that automation will likely continue to play an expanding role in administrative punishment, hopefully accompanied by the public debate shifting toward refining the systems, introducing stronger oversight mechanisms, and ensuring that automated decision-making aligns more closely with principles of justice and due process.

7. Possible solutions and considerations *de lege ferenda*

While it is neither the ambition nor the place of this article to formulate comprehensive proposals addressing the aforementioned problems, it is possible to outline the key ideas leading towards the legislative and implementational solutions.

The first critical policy response that naturally comes to mind lies in the principle of revenue neutrality. This concept can and should be adapted to the domain of administrative enforcement as a mechanism to prevent perverse incentives and to reinforce the legitimacy of automated sanctioning systems. Revenue neutrality, in this context, implies that the primary goal of automated enforcement should be behavioral compliance and public welfare, rather than revenue generation.

Under a revenue-neutral framework, any financial proceeds obtained from fines or penalties would be decoupled from the operating budgets of the enforcing authorities. Instead of flowing directly into the coffers of local municipalities, police departments, or private contractors, fine revenues could be redirected into earmarked, independent funds dedicated to road safety education, legal aid, system maintenance, or other public-interest initiatives.

Such a model has two distinct advantages. First and foremost, it undermines the perception (and often the reality) of profit-driven enforcement, thereby restoring public trust. When citizens are aware that automated fines are not being used to finance municipal deficits or to reward officials, the legitimacy of the sanctioning system is significantly enhanced. Second, it dampens the incentive for authorities to over-enforce or manipulate sanctioning thresholds in order to maximize fiscal return. This structural firewall ensures that policy decisions surrounding the deployment of smart punishment systems are made on the basis of safety, fairness, and proportionality rather than short-term budgetary considerations.

To operationalize revenue neutrality, legislatures could impose mandatory budgetary separation rules, which would prohibit fine revenues from being used to fund the same entity responsible for issuing the fines. Additionally, transparency obligations could require periodic publication of enforcement data, revenue flows, and their subsequent uses, enabling public scrutiny and reinforcing democratic control. It is important to emphasize that the adoption of revenue neutrality does not mean that enforcement systems must operate at a loss or forego efficiency. Rather, it insists that financial viability must not come at the expense of justice. Hence, the objective is not to eliminate revenue altogether but to recontextualize it as a by-product of lawful behavior modification, rather than as a primary metric of policy success.

Another systemic solution that can be put in place is the re-personalization of the administrative punishment. One of the most troubling implications of smart administrative punishment, particularly in its traffic enforcement applications, is the increasing detachment between the sanctioned subject and the actual offender. The widespread practice of objectifying liability may simplify enforcement, but it does so at the cost of undermining the core principles of justice, including the presumption of innocence and the requirement of subjective culpability (*mens rea*). To rectify this structural distortion, a shift

toward personal liability tools is needed. These tools seek to reconnect sanctions with the actual conduct of identifiable individuals, thereby restoring the moral and legal foundations of administrative punishment. A straightforward approach is to enhance mechanisms that allow for the identification of the actual offender, which of course might not be always technically possible without a human in the loop.

Further defining features of smart governance should be its capacity to learn, adapt, and self-correct. However, many current models of automated administrative punishment remain static by design, predicated on assumptions of stable compliance behavior, unaffected by long-term sociological and psychological responses. As such, they risk becoming obsolete or even counterproductive over time if they fail to respond to emerging behavioral patterns or declining enforcement efficiency. A striking example of this is the phenomenon where individuals begin to ignore automatically issued fines or administrative notices, under the assumption that automated decisions are either not followed up or are more likely to be unenforced than those issued by human officials. This behavioral loophole, if left unaddressed, can undermine the entire deterrent effect of automated enforcement, transforming it from an efficient tool into an ineffective symbolic gesture. To counter this, administrative authorities must adopt a model of continuous monitoring, empirical assessment, and adaptive intervention. This approach recognizes that enforcement systems operate within dynamic social contexts and must evolve accordingly to remain effective and legitimate.

As a matter of implementation of this approach, authorities could collect and analyze longitudinal data on payment rates, appeals, and behavioral changes associated with automated decisions. Patterns of noncompliance, especially when concentrated around specific types of violations, geographic areas, or technologies, can indicate weak points in the enforcement chain. A noticeable decline in voluntary compliance may signal the erosion of perceived legitimacy or the failure of enforcement follow-through.

Where systemic avoidance of automated decisions is detected, authorities can implement targeted reinforcement strategies to restore the credibility of the system, which could include randomized human follow-up checks, strategic prosecution of ignored fines to signal seriousness, or temporary escalation to

manned enforcement in high-noncompliance zones. Automated enforcement systems should be designed with flexible thresholds, sanctioning schemes, and intervention triggers, allowing parameters to be adjusted based on periodic evaluations. For example, detection algorithms may be fine-tuned based on seasonal or behavioral changes, and penalty amounts could be scaled according to observed deterrence outcomes.

Although we appear to be a long way from the desirable system of automated administrative punishment, with thoughtful design, transparent oversight, and a commitment to aligning technology with fundamental legal principles, it is possible to transform automated enforcement into a just, proportionate, and trusted component of modern smart city governance.

8. Conclusions

The increasing reliance on automation in administrative punishment highlights an inherent tension between efficiency and fairness: the two principles that seem to not always align. On the one hand, economic considerations should not be entirely dismissed when shaping administrative practices, since efficiency is a fundamental objective of administrative governance, ensuring that enforcement mechanisms operate smoothly, cost-effectively, and without undue delays. However, the pursuit of efficiency often comes at the cost of fair process, proportionality and discretion. This tension becomes particularly problematic when financial incentives enter the equation. The drive for efficiency, when coupled with revenue-generation motives, threatens to transform administrative punishment from a tool of regulatory compliance into a mechanism for financial exploitation. When authorities prioritize quick and cost-effective fine collection over nuanced legal adjudication, the enforcement process can become detached from its original purpose of ensuring lawful conduct through just and proportionate penalties.

The concept of “legal indulgences” enshrined by the Czech traffic enforcement legislation serves as the prime example of prioritization of efficiency over basic principles of administrative punishment. At its core, administrative punishment is intended to deter unlawful conduct and impose proportionate sanctions on offenders, while upholding legal certainty and fairness. Legal indulgences,

however, subvert these objectives by shifting the focus from punishing the actual offender to merely resolving the issue in the most administratively expedient manner. Rather than ensuring that those who break the law face appropriate consequences, this model transforms administrative enforcement into a transactional process that prioritizes rapid resolution over genuine accountability, allowing administrative authorities to bypass the burdensome yet essential elements of administrative proceedings.

Prioritization of efficiency has broader implications for the legitimacy of administrative enforcement. When individuals perceive that the system is designed primarily to extract financial penalties rather than to uphold justice, trust in public administration erodes. Legal indulgences, by their very nature, send the message that the goal of enforcement is not to ensure compliance with the law but rather to streamline revenue collection. Over time, this can contribute to public cynicism toward regulatory authorities and diminish respect for legal norms, ultimately undermining the very objectives that administrative punishment is meant to obey. Just as it is fairly easy for a ski descent to turn into an uncontrollable downhill slide from an icy or slippery slope, it is just as easy for the automated administrative practice to go south, should the metaphorical skier-in-the-loop lose their metaphorical grip and fail to carve the curve in a timely manner.

Based on the performed research, the author concludes that some automated decision-making tools in the field of administrative punishment fail to fulfill their primary intended purpose, instead deviating towards secondary objectives such as efficiency or economic rationale. This imposes significant risks on the system as whole, since deviation from basic principles of administrative punishment tends to shift and corrupt the behavior of both administrative authorities and the addressees of legal norms, leading to the state of rational apathy.

Automation will likely remain a defining feature of administrative enforcement in the foreseeable future. Whether it is used to promote justice and compliance or becomes a source of legal controversy will depend largely on the regulatory frameworks and institutional safeguards put in place to manage its risks.

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Framework for Smart Cities» carried out at the Faculty of Law off Charles University. The author would like to thank Jakub Handrlica and Alessia Monica for their kind support and patience throughout the publication process.

2. See e.g. A. Delaney, H. Ward, M. Cameron, *The History and Development of Speed Camera Use*, Report No. 242, Monash University, Victoria, 2005, or European Commission, *Speed Enforcement Report of the Directorate-General for Mobility and Transport*, in https://road-safety.transport.ec.europa.eu/eu-road-safety-policy/priorities/safe-road-use/safe-speed/archive/speeding/speed-limits/speed-enforcement_en, accessed on 18.12.2024.
3. This term is not generally used and is exploited by the author as a wordplay and in alignment with the topic of Smart Cities for the purposes of this article.
4. See e.g. K. Schubel, *U.S. Treasury's AI is Catching Tax Cheats and Saving Billions*, Kiplinger, New York, 2024. See also O. A. Adelekan, et al., *Evolving Tax Compliance in the Digital Era: a Comparative Analysis of AI-Driven Models and Blockchain Technology in U.S. Tax Administration*, in *Computer Science & IT Research Journal*, 5 (2), 2024, pp. 311-335.
5. See e.g. F. Merli, *Automated Decision-Making Systems in Austrian Administrative Law*, in *CERIDAP*, 1, 2023, Milan, 2023.
6. A. Delaney, H. Ward, M. Cameron, *The History and Development of Speed Camera Use*, Report No. 242, Monash University, Victoria, 2005.
7. See e.g. S. Rahman, R. S. Khan, M. Sirazy, R. Das, *An Exploration of Artificial Intelligence Techniques for Optimizing Tax Compliance, Fraud Detection, and Revenue Collection in Modern Tax Administrations*, in *International Journal of Business Intelligence Research*, vol. 7, no. 3, 2024, pp. 56-80.
8. See e.g. Z. Zuo, *Automated Law Enforcement: An assessment of China's Social Credit System (SCS) using interview evidence from Shanghai*, in *Journal of Cross-disciplinary Research in Computational Law*, vol. 2, no. 1, 2024.
9. See C. Corbett, *Road traffic offending and the introduction of speed cameras in England: The first self-report survey*, in *Accident Analysis & Prevention*, vol. 27, no. 3, 1995, pp. 345-354.
10. See e.g. P. Pilkington, S. Kinra, *Effectiveness of speed cameras in preventing road traffic collisions and related casualties: systematic review*, in *BMJ*, vol. 330, 2005, pp. 331-334, or E. De Pauw et al., *An evaluation of the traffic safety effect of fixed speed cameras*, in *Safety Science*, vol. 62, 2014, pp. 168-174.
11. See e.g. C. Wilson, C. Willis, J. K. Hendrikz, R. Le Brocque, N. Bellamy, *Speed cameras for the prevention of road traffic injuries and deaths*, in *Cochrane Database of Systematic Reviews*, no. 10, 2010.
12. Interested readers can be referred e.g. to S. Kaduk et al., *The use of automated information systems in the investigation of criminal offences*, in *Amazonia Investiga*, vol. 12, no. 61, 2023, pp. 307-316.
13. See J. Nešpor, *Automated Administrative Decision-Making: What is the Black Box*

Hiding?, in *Acta Universitatis Carolinae Iuridica*, vol. 70, no. 2, 2024, pp. 69-83.

14. As a matter of example, the entire Czech system of administrative punishments revolves around the so-called material aspect of the offence, meaning that the administrative authority is obligated to exercise discretion and assess whether the given act fulfils the characteristic of social harmfulness. See Sec. 5 of the l. no. 250/2016 coll., on Liability for Administrative Offences and Proceedings Thereon.
15. A real-life example of this model can be found e.g. in Saudi Arabia, where the so-called Saher System is implemented and used. See Ministry of Interior, Kingdom of Saudi Arabia, *The Saher System*, https://www.moi.gov.sa/wps/portal/Home/sectors/publicsecurity/traffic/contents/!ut/p/z/0/04_Sj9CPykssy0xPLMnMz0vMAfIjo8ziDTxNTDwMTYy83V0CTQ0cA71d_T1djI0MXA30g1Pz9L30o_ArApqSmVVYGOWoH5Wcn1eSWlGiH1FSLjiWlpmsagBlKCQWqRrkJmbmqRoUJ2akFukXZLuHAWCkY5qs/, accessed on 23.12.2024.
16. In theory, this is the case of the Czech traffic legislation, at least when it comes to ordinary administrative proceedings (see further).
17. This ironic label refers to the infamous practice of the Catholic Church during the Medieval period when the indulgences (*i.e.* grants reducing or entirely pardoning the punishment for sins) were simply sold and purchased for money, hence enabling the sinners to “bail out” of punishment.
18. L. n. 361/2000 coll., on Road Traffic and Amendments to Certain Acts (Road Traffic Act).
19. Although the Road Traffic Act strictly speaking distinguishes the terms “owner” and “operator”, with the latter referring to the person legally operating (not driving) the vehicle on a long-term basis, the term “operator” seems rather confusing in the English translations and may be easily confused with the term “driver” (also used by the Road Traffic Act and referring to the person physically driving the car). For this reason, the author prefers to use the term “owner”, which in this case has no impact on the meaning of the communicated message.
20. Sec. 125h para. 1 and 5 of the Road Traffic Act (adapted translation of the author).
21. Since legal indulgences are extraprocedural by design and the sum offered by the administrative authority is not considered a penalty, the *reformatio in peius* principle does not apply and hence fines imposed in the following administrative proceedings can be much higher. In practice, the gap between the requested payments and fines was becoming increasingly smaller and as of today, the difference between the two in most cases is not significant. However, administrative authorities issuing decisions in formal proceedings also impose an obligation to pay the costs of the proceedings, which in many cases can be greater than the fine itself. Thus, taking the indulgence still remains somewhat economically rational.
22. See Sec. 10 para. 3 in conjunction with Sec. 125f para. 1 of the Road Traffic Act.
23. See e.g. European Court of Human Rights, *Lauko v. Slovakia*, judgement of 2 September 1998, 26138/95, or European Court of Human Rights, *Engel et al. v. the Netherlands*,

- judgement of 8 June 1976, 5100/71; 5101/71; 5102/71; 5354/72; 5370/72. In the context of the Czech Road Traffic Act see e.g. Supreme Administrative Court of the Czech Republic, Judgment of 16 October 2024, 6 As 237/2023-31.
24. Supreme Administrative Court of the Czech Republic, judgement of 22 October 2015, 8 As 110/2015-46.
 25. Constitutional Court of the Czech Republic, ruling of 16 May 2018, Pl. ÚS 15/16.
 26. C. Sun, *Is Robocop a Cash Cow? Motivations For Automated Traffic Enforcement*, in *Journal of Transportation Law, Logistics, and Policy*, vol. 78, no. 1, 2011, pp. 11-35.
 27. This issue is often referred to as the credibility dilemma, see e.g. A. Delaney, H. Ward, M. Cameron, *The History and Development of Speed Camera Use*, Report No. 242, Monash University, Victoria, 2005, p. 7.
 28. An example of a good economically-conscious practice can be found in de minimis thresholds in certain offences or value limits used in customs administration ensuring that scarce resources are not used on minor activities with no significant impact on the system.
 29. See e.g. M. Gerrard, *Public-private partnerships*, in *Finance and development*, vol. 38, no. 3, 2001, pp. 48-51.
 30. See A. Delaney, H. Ward, M. Cameron, *The History and Development of Speed Camera Use*, Report No. 242, Monash University, Victoria, 2005, p. 9.
 31. The Rio Times, *Rio de Janeiro city government to reward traffic officials for issuing more fines*, in <https://www.riotimesonline.com/brazil-news/rio-de-janeiro/rios-city-hall-to-reward-public-servants-for-issuing-more-fines/>, accessed on 7.1.2025.
 32. The system was structured as a point-based mechanism, where officers accumulated points for various activities, including issuing citations, which could influence evaluations and promotions. See R. Polansky, *Are Atlanta officers incentivized to write more tickets? CBS46 Investigates*, in *Atlanta News First*, 2024.
 33. See e.g. Děčínský deník, *Kauza radarů ve Varnsdorfu*, in <https://decinsky.denik.cz/tema/kauza-radaru-ve-varnsdorfu.html>, accessed on 7.1.2025.
 34. It must be also noted that, in many jurisdictions, the parties are not entitled to any reimbursement of legal costs in administrative proceedings, even if the charges are dropped and the accused offender is found not guilty.
 35. R. Tay, *The Effectiveness of Automated and Manned Traffic Enforcement*, in *International Journal of Sustainable Transportation*, vol. 3, no. 3, 2009, pp. 178-186.
 36. See e.g. H. Al-Shammari, C. Ling, *Investigating the Effectiveness of a Traffic Enforcement Camera-System on the Road Safety in Saudi Arabia*, in *Advances in Human Aspects of Transportation*, 2019, pp. 660-670.
 37. See H. Jois, *Evaluating human response to robot-administered punishment*, Pennsylvania State University, University Park, 2021.