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Legal and Humanitarian Implications on The Highway (Case Study of Ambulance Ticketed ETLE)

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Abstract. *This study aims to examine the legal and humanitarian implications of the Electronic Traffic Law Enforcement (ETLE) system when applied to emergency vehicles such as ambulances that violate traffic regulations during life-saving missions. The research employed a normative legal method supported by statutory and conceptual approaches, complemented by limited empirical observations. The method analyzed primary legal materials, including traffic legislation and constitutional provisions, and secondary materials such as journal articles on digital law enforcement and algorithmic decision-making. The novelty of this research lies in its identification of structural weaknesses in Indonesia's automated ticketing system, which fails to differentiate ordinary traffic violations from emergency-based exceptions, resulting in potential conflicts with the constitutional right to life. The findings demonstrate that ETLE operates rigidly because it relies solely on visual camera detection without integration with emergency vehicle databases. This creates legal inconsistency, particularly with Articles 134–135 of the Traffic Law and Article 28A of the Constitution. The research also reveals a technological gap due to the absence of adaptive algorithms, real-time vehicle identification, and human-override mechanisms. Based on these findings, the study concludes that ETLE requires regulatory refinement, technological upgrading, and inter-institutional integration to ensure that automated enforcement remains aligned with principles of justice and humanitarian protection. The study recommends developing an integrated whitelist system, real-time data synchronization with emergency services, and the inclusion of contextual AI-based analysis to prevent the penalization of life-saving actions.*

Keywords: *Algorithm; Emergency; Enforcement; ETLE; Law.*

1. INTRODUCTION

The rapid development of digital technology has reshaped various aspects of public administration, including traffic law enforcement. In Indonesia, the introduction of the Electronic Traffic Law Enforcement (ETLE) system marks a significant milestone in the modernization of traffic regulation. Designed to enhance transparency, accuracy, and efficiency, ETLE utilizes automated surveillance devices such as cameras and sensors to detect violations without direct interaction between law enforcement officers and road users (Utami, 2024). This system aims to reduce opportunities for discretionary abuses and to strengthen public trust in traffic enforcement mechanisms. Furthermore, ETLE represents Indonesia's broader commitment to transitioning toward digital governance,

where data-driven processes are expected to improve institutional performance (Sihotang et al., 2022).

Despite these benefits, ETLE also introduces new challenges, particularly in situations that require contextual and humanitarian judgment. Automated systems inherently operate based on fixed parameters and visual detection, which makes them limited in assessing exceptional circumstances. One of the most controversial cases that surfaced was when an ambulance transporting a critically ill patient was automatically ticketed after being recorded running a red light (Utami, 2024). Although the action was legally permissible under emergency conditions, the system was unable to differentiate between ordinary violations and life-saving missions. This incident triggered public debate on whether ETLE truly reflects the principles of fairness, responsiveness, and proportionality that traffic enforcement should uphold.

Indonesian traffic law explicitly acknowledges ambulances as priority vehicles entitled to special road access during emergency operations. Articles within the Traffic and Road Transport Act affirm that such vehicles may disregard certain traffic rules when necessary to protect human life. However, research indicates that the current ETLE system is not designed to evaluate emergency contexts. As explained by Utami (2024), ETLE cameras only identify visible violations such as red-light infractions or lane breaches, without integrating any mechanism to assess the presence of sirens, emergency indicators, or verified dispatch records. This technological limitation reflects a broader legal gap where statutory rights are not supported by adequate enforcement infrastructure (Hayat, 2015).

Another notable issue concerns the low level of public understanding regarding ETLE procedures, particularly the objection and clarification mechanisms. A study in Sukoharjo revealed that many drivers—including ambulance operators—were unaware that ticket cancellations could be requested by presenting evidence of emergency conditions (Pratama, Prasetiyo, & Setiawan, 2023). This lack of legal literacy demonstrates insufficient government outreach and contributes to perceptions of unfairness toward ETLE. When citizens do not fully comprehend their rights and available legal remedies, automated enforcement may inadvertently create administrative burdens and psychological stress, especially among emergency service providers who rely on rapid mobility.

Similar concerns were found in the jurisdiction of Padang, where an increase in detected violations correlated with infrastructure limitations and vehicle misidentification errors (Roberto & Yandriza, 2023). These findings suggest that ETLE implementation varies in effectiveness across regions due to differences in technological capacity, public readiness, and institutional coordination. Beyond technical issues, scholars emphasize that automated enforcement must still adhere to fundamental principles of substantive justice. According to Asshiddiqie (2012), law must not only provide certainty but also accommodate fairness and proportionality. When a life-saving act is treated the same as an ordinary violation, the spirit of equality before the law—guaranteed under Articles 27 and 28D of the 1945 Constitution—risks being undermined.

Institutionally, the police have acknowledged several weaknesses in the current ETLE framework. Narullita (2024) highlights that the system relies exclusively on visual detection without any integration with emergency vehicle databases, hospital dispatch systems, or health service networks. This structural disconnect creates a significant risk of injustice toward medical personnel and patients who depend on rapid emergency

response. Furthermore, the absence of adaptive algorithms or human-override mechanisms limits ETLE's ability to apply contextual reasoning—a crucial element in humane law enforcement. As Taufiqurrohman (2024) argues, the increasing role of automation and artificial intelligence in legal systems must be accompanied by safeguards to ensure that technology supports, rather than replaces, human judgment.

Considering these issues, this study seeks to analyze the effectiveness and fairness of ETLE in cases involving emergency vehicles, particularly ambulances, within the broader principles of humane and proportionate law enforcement. The research aims to identify structural, technological, and regulatory gaps that hinder the alignment between automated enforcement and humanitarian considerations. Ultimately, this study intends to offer recommendations for refining the ETLE system so that it not only delivers technological sophistication but also upholds fundamental human rights and ensures that the protection of life remains a paramount value in traffic regulation

2. RESEARCH METHODS

This study employed a normative legal research method with a descriptive-analytical orientation to examine the alignment between positive law and the practical implementation of the ETLE system. The research applied a statute approach by reviewing relevant legislation governing traffic enforcement and emergency vehicle priority, as well as a conceptual approach by referring to legal principles, doctrines, and scholarly opinions as analytical bases (Sihotang et al., 2022; Markuat, 2022). The data used in this study consisted entirely of secondary materials, including primary legal sources such as statutes and regulations, and secondary legal materials such as academic journals, scholarly articles, and doctrinal literature relevant to the issues discussed (Labibah, 2022). All collected data were analyzed qualitatively using legal interpretation and deductive reasoning to identify gaps between the normative framework and the operational application of ETLE to emergency vehicles.

3. RESULT AND DISCUSSION

3.1 The Fairness in the Implementation of the Electronic Traffic Law Enforcement (ETLE) System Toward Emergency Vehicles such as Ambulances

In a constitutional state that upholds the supremacy of law, the principle of justice cannot merely be interpreted as the rigid and mechanical execution of regulatory provisions. Law is inherently expected to operate as an instrument that ensures the protection of fundamental human rights, including the right to life, safety, and human dignity. These values represent the philosophical foundation of legal norms and must not be compromised when the state adopts technological automation in law enforcement. With the introduction of the Electronic Traffic Law Enforcement (ETLE) system, the enforcement process increasingly relies on digital devices that function without human discretion or contextual reasoning. Although automation enhances efficiency and minimizes opportunities for corruption, it simultaneously raises concerns about the system's ability to uphold humanitarian considerations in situations requiring urgent response. This concern is particularly significant for emergency vehicles such as ambulances, which are legally granted priority access for the purpose of saving lives but are still subjected to automated penalties despite acting under emergency circumstances. The tension between technological rigidity and humanitarian necessity constitutes the central issue in assessing the fairness of ETLE when applied to emergency vehicles.

The statutory framework governing road traffic in Indonesia, particularly Law No. 22 of 2009 on Road Traffic and Transportation, unequivocally assigns ambulances the status of priority vehicles. Article 134(b) and Article 135(1) stipulate that such vehicles may disregard certain traffic rules in emergency conditions, provided that sirens and warning lights are activated in accordance with legal procedures. These provisions reflect the legislature's recognition that, in life-threatening situations, speed and flexibility are crucial components of public safety. However, despite the clarity of these norms, the operational design of the ETLE system lacks the technological sophistication to differentiate between ordinary traffic violations and emergency-driven actions. The system relies exclusively on visual data captured by cameras, which detect surface-level violations without any capacity to interpret the situational necessity behind them. Consequently, ambulances performing legally justified actions are processed as violators in an indiscriminate manner. This disparity underscores a significant implementation gap between the normative guarantees provided by the law and the technological limitations embedded within the current enforcement mechanism. Such a discrepancy becomes problematic because it reflects a legal apparatus that fails to protect those it is intended to support, especially in contexts involving urgent medical intervention.

The misalignment between legal norms and technological practice introduces a broader concern within the realm of substantive justice. Substantive justice demands that the law not only treat people equally but also consider contextual factors, social realities, and moral imperatives. As emphasized by Hayat (2015), justice is not achieved through uniform treatment when circumstances differ significantly; instead, the law must be sensitive to situational discrepancies that affect the ethical correctness of a decision. Asshiddiqie (2012) further highlights that law in a democratic and civilized nation should serve as a moral compass, reflecting societal values and collective conscience. When technological systems like ETLE disregard the life-saving purpose of an ambulance's actions and impose penalties mechanically, the system violates not only the spirit of the law but also its ethical grounding. The absence of contextual assessment in ETLE's operation demonstrates how digitized enforcement may inadvertently undermine humanitarian principles. This raises an important question: can automated systems truly deliver justice if they cannot evaluate the moral dimensions of a human-centered act such as emergency medical response?

Empirical findings from multiple studies reinforce the argument that ETLE's rigid operational design is ill-equipped to accommodate emergency circumstances. Research by Pardede and Nita (2022) reveals that the current ETLE infrastructure is built on a simplified model of violation detection, which solely relies on camera input without any integration with specialized databases. This means that the system cannot identify whether a vehicle belongs to an emergency service unit, nor can it verify the legitimacy of an emergency operation. Narullita (2024) further notes that institutional integration between law enforcement agencies, hospitals, emergency dispatch units, and health service authorities has not been established. The absence of a unified data-sharing mechanism prevents ETLE from accessing accurate, real-time information about ambulance missions. As a result, any detected violation is automatically criminalized, regardless of its humanitarian purpose. These findings indicate that ETLE is not simply a technological issue but a structural governance issue. Without institutional coordination and inter-agency data integration, automated enforcement cannot properly adapt to exceptional circumstances that frequently occur in emergency medical operations.

Aside from systemic technological shortcomings, public legal literacy contributes significantly to procedural injustice within the ETLE framework. Pratama and Prasetiyo (2023) found that many ambulance drivers and medical personnel lack understanding of the ETLE objection mechanisms, leading them to comply with sanctions even when the violation occurred under lawful emergency conditions. This lack of awareness is compounded by perceptions that the objection process is bureaucratic, time-consuming, and intimidating, especially for individuals whose primary responsibility is saving lives rather than navigating administrative burdens. Research by Roberto and Yandriza (2023) further highlights that even when ambulance operators follow emergency protocol by activating sirens and warning lights, ETLE still registers the action as a violation. This suggests that the ETLE system lacks contextual detection capabilities such as GPS-based emergency verification, RFID-coded vehicle authentication, or integration with dispatch logs. Inadequate public education and insufficient institutional communication create a situation where legal remedies exist on paper but are inaccessible in practice, rendering the system procedurally unfair.

From a legal-ethical standpoint, the reliance on automated enforcement systems without meaningful human oversight raises concerns about the absolutism of technology. Sihotang et al. (2022) argue that when law is executed without ethical consideration or human discretion, it loses its moral legitimacy and becomes a purely coercive instrument. Automated systems may reinforce efficiency, but efficiency alone cannot justify actions that undermine justice, particularly in contexts involving human suffering and life-or-death decisions. Utami (2024) similarly warns that the integration of technology into legal enforcement must be accompanied by affirmative policy safeguards to ensure that vulnerable populations—such as critically ill patients, medical personnel, and emergency operators—are not disadvantaged by rigid digital procedures. Without such safeguards, automation can evolve into a tool of systematic oppression, stripping law of its empathetic and responsive character. The ETLE system, when operating in an absolute and deterministic manner, exemplifies how technological enforcement can inadvertently contradict the ethical and humanitarian values that the law is meant to protect.

Within Indonesia's constitutional framework, the protection of emergency vehicle operations is anchored in fundamental rights. Article 28A of the 1945 Constitution affirms that every individual has the inherent right to life, creating a constitutional obligation for the state to ensure that law enforcement mechanisms do not hinder life-saving efforts. Policies or technological systems that impede emergency medical response may therefore be construed as contravening constitutional protections. Complementary norms, such as Article 106(4) of the Traffic Law and Article 48(1) of Government Regulation No. 80/2012, further emphasize the need for proportional and contextual enforcement, particularly for vehicles with priority status. However, ETLE currently lacks automated differentiation mechanisms, resulting in uniform treatment of emergency and non-emergency violations. This mismatch between legal norms and technological design creates a structural injustice that undermines both constitutional rights and public trust in the legal system. It highlights the urgent need for a more sophisticated enforcement model that integrates legal, technological, and humanitarian considerations.

3.2 The Capability of ETLE Algorithmic Systems in Distinguishing Ordinary Violations from Emergency-Driven Actions

The development of information technology has significantly transformed contemporary law enforcement systems, including in the field of traffic regulation through the implementation of the Electronic Traffic Law Enforcement (ETLE) mechanism. ETLE

operates by capturing visual images of vehicles using static or mobile cameras, which are then processed through Automatic Number Plate Recognition (ANPR) algorithms to identify traffic violations. Technically, the system has proven effective in detecting various infractions such as running red lights, crossing lane markings, neglecting seat belt usage, or operating mobile phones while driving. However, this technical effectiveness is not matched by the system's ability to recognize contextual circumstances behind a detected action. ETLE functions on deterministic algorithmic logic, assessing only the physical position of a vehicle relative to traffic signals without evaluating the situational factors that may justify such an action. Consequently, the system remains incapable of distinguishing between ordinary violations and those arising from emergency conditions, such as ambulances that must disregard traffic signs in order to save lives.

Emergency vehicles, particularly ambulances, routinely perform life-saving missions that require rapid and sometimes unconventional maneuvers, including passing through red lights or exceeding speed limits. In such cases, the act is not a form of negligence but a moral and legal imperative to protect human life. Nonetheless, ETLE's algorithm is not programmed to recognize intention, context, or emergency necessity. As documented by Winarno Sugeng and Reva Nur Ilyas (2023), Indonesia's ETLE system continues to apply deterministic logic, assessing only "what happened" (for example, a red light was crossed) without evaluating "why it happened." This lack of contextual inference means that ambulances performing lawful emergency responses are still categorized as violators. Such limitations demonstrate that ETLE has not yet incorporated contextual reasoning models that are essential for fair and responsive digital law enforcement.

In several technologically advanced countries, traffic management systems have evolved toward integrating artificial intelligence (AI), Global Positioning System (GPS)-based adaptive signaling, and Radio-Frequency Identification (RFID) mechanisms to detect emergency vehicles in real time. These technologies allow traffic lights to automatically provide a clear route for ambulances and prevent wrongful penalization. In Indonesia, similar improvements—such as the installation of RFID on ambulances and integration with ETLE—have been proposed but not yet implemented nationwide. Moreover, Indonesia still lacks a centralized national database of emergency vehicles that can be accessed automatically by the ETLE system. As a result, when an ambulance is recorded by ETLE cameras, the system has no administrative or technological reference to identify its emergency status. This absence of integrated data infrastructure causes ETLE to process all violations uniformly, ignoring legal obligations to treat priority vehicles differently.

The inability of ETLE to differentiate emergency-driven actions produces a new form of algorithmic bias: the system treats every violation as unlawful without examining the underlying cause. Such bias generates structural injustice that disproportionately harms emergency vehicles and the citizens relying on urgent medical assistance. Taufiqurrohman (2024) emphasizes that algorithm-based legal systems must rely on digital ethics and AI accountability frameworks to prevent mechanistic enforcement from overriding moral considerations. Without a human override mechanism or manual corrective pathways, ETLE risks becoming an absolute enforcement tool that lacks moral and legal nuance. When digital systems disregard humanitarian imperatives inherent in emergency medical response, law loses its protective nature and becomes merely a punitive instrument driven by data rather than justice.

To ensure that digital law enforcement remains both efficient and just, ETLE must be enhanced with features capable of recognizing emergency indicators. Such features may include automated detection of active sirens, high-speed patterns consistent with emergency corridors, GPS-verified emergency routes, or contextual time indicators (e.g., late-night critical response hours). Beyond detection, ETLE must incorporate an automatic exemption protocol that delays, suspends, or cancels violation processing when a vehicle identified as an ambulance is operating under emergency conditions. These reforms require the establishment of a regularly updated national whitelisting database for priority vehicles, accessible across all ETLE devices and platforms. Without such innovation, ETLE remains a rigid system unable to uphold fairness in circumstances where human life is at stake.

In addition to technological advancements, institutional reforms are essential. As the primary operator of ETLE, the Indonesian National Police must collaborate with the Ministry of Health, hospitals, emergency medical services, and related agencies to establish integrated data channels for priority vehicle identification. Inter-agency cooperation is crucial to ensuring that digital enforcement mechanisms do not neglect substantive justice principles. ETLE should not be designed solely to maximize operational efficiency; it must embody the state's constitutional duty to safeguard citizens' rights to safety and emergency healthcare. Algorithms can assist law enforcement, but they cannot replace human judgment, adaptive policies, and ethical considerations. Therefore, human oversight and progressive legal values must remain embedded within every stage of ETLE's technological development.

The failure of ETLE to distinguish between ordinary and emergency-driven violations has direct implications for constitutional rights. Article 28A of the 1945 Constitution guarantees the right of every person to life, imposing a positive obligation on the state to ensure that law enforcement does not obstruct life-saving operations. When ambulances receive electronic citations during emergency missions, such enforcement indirectly undermines the patient's right to emergency medical assistance. Furthermore, provisions within the Road Traffic Law (UU LLAJ) and Government Regulation No. 80 of 2012 clearly mandate special treatment for priority vehicles, yet ETLE's technological design fails to operationalize these legal protections. This misalignment illustrates a structural imbalance between legal certainty and substantive justice, underscoring the urgent need for digital law reform aligned with humanitarian principles and human rights protection.

4. CONCLUSION

This study concludes that the current implementation of the Electronic Traffic Law Enforcement (ETLE) system has not yet fulfilled the principles of substantive justice for emergency vehicles such as ambulances, as its deterministic visual-based algorithm is only capable of identifying surface-level violations without considering contextual humanitarian factors, medical urgency, or the priority rights guaranteed under Law No. 22 of 2009 on Road Traffic and Transportation as well as Article 28A of the 1945 Constitution. The system's inability to distinguish between ordinary violations and emergency-driven actions generates algorithmic bias and structural injustice, potentially obstructing the fulfillment of the constitutional right to life when ambulances receive electronic citations during life-saving missions. Moreover, the absence of institutional integration between the police, hospitals, health authorities, and emergency service units reflects a critical gap in cross-agency coordination required for responsive digital law enforcement. Therefore, this research recommends the development of automatic

exemption features for priority vehicles, the establishment of a centralized national database for emergency vehicles accessible to ETLE, the adoption of contextual technologies such as GPS, RFID, and AI-assisted emergency detection, and the reinforcement of human override mechanisms to ensure accountability. These reforms are essential to ensure that ETLE not only provides legal certainty but also upholds fairness, proportionality, and human rights protection, enabling technology-based law enforcement to operate in harmony with humanitarian values and the state's constitutional obligations.

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