



The Urgency of Reforming Electric Bicycle Regulations in Indonesia in Providing Legal Certainty

Khairunnisa^{1*}, Khairuna Malik Hasibuan², Lesly Saviera³, Faradila Yulistari⁴

^{1,2,3,4} Faculty of Law, Universitas Sumatera Utara, Medan, Indonesia.

: khairunnisa88@usu.ac.id

Corresponding Author*

Abstract

Introduction: The increasing popularity of e-bikes in Indonesia has not been offset by comprehensive regulations, creating safety risks. Law Number 22 of 2009 has not explicitly classified electric bicycles, while Regulation of the Minister of Transportation Number 45 of 2020, although regulating technicalities and areas of use, is still limited to the absence of clear violation sanctions, including for underage users.

Purposes of the Research: Analyze the importance of electric bicycle regulation in Indonesia by examining the existing regulations in Law Number 22 of 2009 and Regulation of the Minister of Transportation Number 45 of 2020, and identifying the urgency of strengthening regulations.

Methods of the Research: Using normative legal research methods with a legislative approach.

Findings of the Research: This study found that the Minister of Transportation Regulation Number 45 of 2020 only covers the definition, requirements for completeness, and areas of use of electric bicycles, but does not regulate the sanctions for violations in detail. This legal vacuum hinders law enforcement and safety assurance. Therefore, strengthening regulations through stricter safety standards and strict sanctions is very urgent to minimize traffic accidents and provide legal certainty.

Keywords: Electric Bicycles; Legal Reform; Legal Certainty; Traffic Safety.

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INTRODUCTION

At first, primitive societies used conventional transportation methods that used physical force to transport goods and cargo. As civilization evolved, people began to think about ways to make their jobs easier. The technique of pikulan that divided the burden among people began to be abandoned. However, the invention of the wheel made great advances in human history. This discovery is a pivotal point in technological advancement. More complex vehicle innovations start with the presence of wheels. Over time, humans have made vehicles more agile such as wheeled carts, delmans, which use animal power. In addition to large vehicles, this innovation also focuses on the human desire to go faster without relying on horses.¹

Baron Karls Drais Von Sauerbronn was a German citizen who first invented and developed the bicycle. In 1818, Karls Drais perfected the bicycle to facilitate the mobility of his work, so he created a two-wheeled transportation.² Over time, bicycles continue to develop into various types with different roles and functions according to the needs of

¹ Sakti Adji Adisasmata, *Perencanaan Infrastruktur Transportasi Wilayah*, (Yogyakarta: Graha Ilmu, 2012), p.15.

² Panuwun Budi, *Ensiklopedia Tokoh Penemu yang Mengubah Dunia Seri II*, (Yogyakarta: Pustaka Referensi, 2023), p. 37.

society. Not only as a means of transportation but also as a means of sports and lifestyle. After the covid virus pandemic broke out in the world a few years ago, many people cycled. Cycling activities in Indonesia are increasing for the reason that it is a sport. In addition to providing good health benefits, bicycles also do not produce pollution. This advantage makes bicycles one of the more environmentally friendly means of transportation. Cycling can be an easy way to reduce motor vehicle exhaust emissions amid air quality problems in major cities and is a major cause of air pollution on the highway because the engine burns the engine that emits dirty air.³ In addition, due to its smaller size, cycling also helps reduce traffic congestion.

Cycling has become a popular lifestyle in Indonesia, not just because it is a cheap means of transportation but is popular with all ages and circles through conveniences such as folding bicycles and encouraging the local economy. A survey in 12 major cities showed that 75% of people said that more people are cycling for sports and walks because they are healthy, environmentally friendly, and save time even though they are less for daily needs (46.4%). Almost all respondents have motorcycles in the room, ah even to the office or school.⁴ Technological developments over time have an impact on the bicycle sector which is progressing. Previously, people only knew about traditional bicycles that were operated by pedaling, but now there is a renewal of operation with the help of electric power. Electric bicycles are an attractive choice because they do not consume excessive power. Electric bicycles are another option compared to ordinary bicycles. The difference lies in the use of electrical power (from the battery) that can be recharged to run it. Electric bikes do not make noise and because they use electrical energy, they do not produce smoke emissions.⁵ The motor vehicle emission reduction program is one of the people's preferences in choosing environmentally friendly transportation.

The existence of electric bicycles is now increasingly popular and its use is widespread in various places, ranging from tourist areas, residential neighborhoods, to urban centers. This increase cannot be separated from the public's need for an affordable alternative mode of transportation because battery charging is much more economical than buying fuel. In addition, electric bicycles are considered more practical and in line with modern lifestyles. The presence of the electric vehicle era in Indonesia, at least three main expectations. First, affordability for the community. Second, the efficiency of energy operational costs compared to motorized vehicles. Third, reducing urban air pollution due to vehicle gas emissions.⁶

The increase in the use of electric bicycles occurs not only among adults, but also among children and adolescents, even without adequate supervision. This situation causes various problems in the flow of traffic. Many electric bicycle riders still do not know traffic rules, do not wear helmets as protective equipment, and often use electric bicycles on public roads uncontrollably.⁷ Based on Law Number 22 of 2009 concerning Road Traffic and Transportation in Article 77, every person who drives a motor vehicle on the road is

³ Sonya Sidjabat, "Sepeda sebagai Alat Transportasi Ramah Lingkungan", *Jurnal Manajemen Bisnis Transportasi dan Logistik* 3, no. 1 (2016), https://stmt-trisakti.ac.id/library-sub/jurnal/index_php/JMBTL/article/view/88/

⁴ Antonius Purwanto, "Bersepeda, Olahraga yang menjadi gaya hidup", *Kompas.com*, 5 Agustus 2011, <https://lifestyle.kompas.com/read/2011/08/05/0442575/bersepeda.olahraga.yang.menjadi.gaya.hidup?page=all>.

⁵ M. Rheza Taufani, *Teknologi Ramah Lingkungan*, (Bandung: Nuansa Cendekia, 2021), p. 50

⁶ Wihana Kirana Jaya, *Ekonomi Kelembagaan: Studi Kasus Sektor Transportasi dan Sektor Ekonomi Lainnya*, (Jakarta: Elex Media Komputindo, 2021), p. 159.

⁷ Gisela Anugrah Safitri, Hisbul Luthfi Ashsyarofi, and Pinastika Prajna Paramit. "Regulasi Penggunaan Sepeda Listrik di Indonesia, *Dinamika Jurnal Ilmiah Ilmu Hukum*, 3, no 2, (2025): <https://jim.unisma.ac.id/index.php/jdh/article/view/28552/21661>

required to have a Driver's License that is in accordance with the type of vehicle. This provision ensures that the rider has sufficient mental, physical, and knowledge readiness to share the road with other users safely. According to its function, electric bicycles are intended for short-distance trips only which are actually in accordance with the travel patterns of the Indonesian people, such as trips to schools, markets, or places of worship that do not require large vehicles. This progress has not been followed by adequate legal arrangements. The regulations that apply in Indonesia have not been able to overcome existing legal problems related to the use of electric bicycles, driving safety standards, user protection, and legal clarity in society. This legal vacuum has an impact on the limitations in the legal regulation regarding electric bicycles. The formulation of the problem in this study is: *First*, how to regulate electric bicycles according to the Law on Traffic and Road Transportation and Regulation of the Minister of Transportation Number 45 of 2020 in the transportation system in Indonesia. *Second*, what is the role of electric bicycle regulations in providing legal certainty for the use of electric bicycles in Indonesia.

The problem of electric bicycle regulation is directly related to the constitutional rights of citizens to safety and self-protection. Article 28D paragraph (1) of the 1945 Constitution of the Republic of Indonesia guarantees everyone the recognition, guarantee, protection, and certainty of fair law. If the state does not make adequate regulations in the midst of the increasing risk of traffic accidents due to the uncontrolled use of electric bicycles, then the state can be considered negligent in fulfilling its constitutional obligation to protect all citizens. Therefore, the study of the regulation of electric bicycles in Indonesia is not only relevant, but urgent.

METHODS OF THE RESEARCH

The method used in this study is normative juridical research by examining the synchronization of laws and regulations, doctrines and legal theories to answer problems related to the existence of electric bicycles in Indonesia. In line with Bagir Manan's view, normative research is a study of existing legal methods and principles by emphasizing research on literature data or so-called secondary data⁸. This approach was chosen because the problems studied are normative, namely the existence of legal gaps and disharmony between laws and regulations that regulate electric bicycles in Indonesia. This research uses a statute *approach*, namely by examining all laws and regulations related to the object of research, including Law Number 22 of 2009 concerning Road Traffic and Transportation and Regulation of the Minister of Transportation Number 45 of 2020 concerning Certain Vehicles Using Electric Motor Drives. The data source used in this study is secondary data, namely data obtained from laws and regulations, journals and legal literature. Qualitative data analysis techniques are related to laws and regulations as well as policies and legal principles to produce conclusions that are able to answer the issue of legal void and the role of regulation in ensuring public safety.

RESULTS AND DISCUSSION

A. Electric Bicycle Regulation in the Framework of National Transportation Law

Advances in transportation technology have introduced electric bicycles as a more environmentally friendly transportation option. As an environmentally friendly means of

⁸ Soerjono Soekanto dan Sri Mamudji, *Penelitian Hukum Normatif Suatu Tinjauan Singkat* (Jakarta: Raja Grafindo Persada, 2001), p. 23.

transportation, electric bicycles have a strategic place in transportation regulations in Indonesia. Its presence not only provides benefits in terms of efficiency and ease of use, but also requires clear arrangements to ensure legal certainty, traffic safety, and protection for the community. Therefore, it is very important to discuss the position of electric bicycles in national transportation regulations.

Electric bicycles act as a low-emission vehicle of choice, supporting the government's efforts to achieve the net zero emission target by 2060. Transportation legal system, electric bicycles are not only considered as an alternative to travel, but are also recognized as an environmental policy tool related to energy law, environmental law, as well as transportation law.

Regulations related to the implementation of traffic in Indonesia are regulated in the Road Traffic and Transportation Law. The Road Traffic and Transportation Law is the legal basis for the government in regulating the road transportation system in order to create safe, orderly, smooth traffic and also ensure the safety of road users. Law Number 6 of 2023 concerning Job Creation then makes adjustments to several provisions in the Road Traffic and Transportation Law.

The scope of vehicles in Article 47 of the Road Traffic and Transportation Law consists of motor vehicles and non-motorized vehicles. The definition of a motor vehicle in Article 1 number 8 mentions every vehicle that uses machine equipment as its drive, except for vehicles that operate on rails. Meanwhile, a non-motorized vehicle is any vehicle that uses human or animal labor as its drive. Based on these provisions, the difference is based on the source of the driving force. The distinction of driving force is not only grouping but is the main basis in determining safety rules and providing infrastructure facilities on the highway. Non-motorized vehicles such as bicycles have lower speed characteristics than motor vehicles so special protection from the government is needed. The government is obliged to prioritize the safety of non-motorized vehicle users by providing special lanes. This aims to reduce the risk of accidents due to mixing traffic flow with high-speed motor vehicles.

Based on Article 47 paragraph (2) of the Road Traffic and Transportation Law, the groups included in motor vehicles are motorcycles, passenger cars, buses, goods cars and special vehicles. Special vehicles themselves are vehicles designed for certain functions and designs such as Indonesian National Army motorized vehicles or Indonesian National Police vehicles, heavy equipment and also special vehicles for people with disabilities. Although the rules regarding motor vehicles are set out in detail in this paragraph, challenges arise when new technologies begin to enter the public sphere which requires to review the classification of non-motor vehicles in the next paragraph. In Article 47 paragraph (4) of the Road Traffic and Transportation Law, it is clear that the definition of non-motorized vehicles is divided into two categories. First, vehicles that are not driven by human power. For example, bicycles, pedicabs, or carts. Second, vehicles driven by animal power, for example delman or horse-drawn carriages. This is where the problem arises. Considering that paragraph (4) only mentions "human power" and "animal power", so that electric bicycles are not included in the category of "non-motorized vehicles" in the Law because they are included in electric motorcycles. The limitations of this rule create legal uncertainty regarding the position of electric bicycles in the national transportation system. Technically, electric bicycles are in an unclear position. Electric bikes have human-driven pedals but are

also equipped with an electric motor as additional propulsion. The use of the terms "people's power" and "animal power" specifically in the Road Traffic and Transportation Act closes the space for battery-powered vehicles. So electric bicycles are often difficult to classify as non-motorized vehicles, but they are also too simple to be equated with motor vehicles (motorcycles). This ambiguity has an impact on law enforcement in the field. If it is not expressly categorized as a non-motorized vehicle, the right of electric bicycle users to use the special lanes guaranteed by law can be uncertain.

The law does not specifically mention electric bicycles, which are two-wheeled vehicles driven by electric motors with batteries as their drive. This is suspected to have happened because at the time the Road Traffic and Transportation Law was enacted, electric bicycles were not yet popular even though their existence existed, so special provisions regarding electric bicycles were not listed. This condition raises ambiguity regarding the position of electric bicycles in vehicle classification, considering that along with technological developments, some electric bike designs are no longer equipped with pedals so that in shape and drive system they are more similar to electric motorcycles

Roscoe Pound, a leader of *the sociological jurisprudence* school, stated that *law as a tool of social engineering* is seen as a means to carry out social renewal or engineering in society. This thinking remains relevant because it emphasizes that the formation and application of law is expected to be able to keep up with the times to answer problems that arise in society.⁹ In other words, the law should be dynamic and also in harmony with the development of society. Furthermore, it is also mentioned that the process of forming laws also needs to pay attention to the values that live and develop in society so that the rules produced can be accepted, obeyed, and able to effectively protect the interests of the community.¹⁰

Filling the legal void in Law Number 22 of 2009, the Government through the Ministry of Transportation issued Regulation of the Minister of Transportation Number 45 of 2020 concerning Certain Vehicles Using Electric Motor Drives. This regulation regulates the use of electric motor-based vehicles such as electric scooters, *hoverboards*, one-wheeled bicycles, motorcycles, and electric bicycles. This Regulation of the Minister of Transportation includes provisions regarding safety standards, minimum age of drivers, maximum speed and the type of road lane allowed for electric motor-based vehicles.

This regulation provides official recognition of the position of electric bicycles in the modern transportation system. Legally, this regulation not only provides definitions, but also sets technical limits for the sake of public safety. The definition of an electric bicycle in Article 1 number 7 of the Regulation of the Minister of Transportation Number 45 of 2020 is a certain vehicle that has 2 (two) wheels equipped with mechanical equipment in the form of an electric motor. Furthermore, in article 2, it must have a battery and a drive motor that are firmly integrated at the time of operation. However, the definition of electric bicycles in the Permenhub has not been explained in detail in terms of its technical elements. In principle, the bike actually has two pedals that function as the main drive. The existence of these pedals should be the main differentiator between an electric bike and an electric motorcycle. As a result, vehicles that are more similar in design and drive system to electric motorcycles are still categorized as electric bicycles.

⁹ Adji Prakoso, <https://marineews.mahkamahagung.go.id/berita/pelanggaran-penggunaan-sepeda-listrik-belum-dapat-dipidana-02>

¹⁰ <https://marineews.mahkamahagung.go.id/berita/pelanggaran-penggunaan-sepeda-listrik-belum-dapat-dipidana-02>

The safety requirements that must be met by an electric bicycle are regulated in Article 3 paragraph (2), among others, they must have a properly functioning headlight, equipped with a *reflector* or light on the back, have a properly functioning braking system, and have a *reflector* on the left and right sides of the bicycle, also equipped with sound signaling devices such as horns or bells, and is only allowed to be driven with a maximum speed limit of 25km/h (twenty-five kilometers per hour). Changing the power of the motor so that it can increase the speed is not allowed. The equipment and the required maximum speed limit aim to improve the safety of electricity users and minimize the risk of accidents.

In addition to the requirements for vehicle equipment that must be complied with, the use of helmets and the age limit for electric bicycle users are also important things that cannot be ignored. The head is a part of the body that must be protected by using a helmet that meets national standards so that it can function to avoid the risk of injury in the event of an accident. The provision of the age limit for electric bicycle users is important to ensure that riders have sufficient ability to control electric bicycles. Article 4 of Permenhub Number 45 of 2020, states that the minimum age limit allowed is 12 years old, and for drivers aged 12-15 years must be accompanied by an adult. It is allowed to transport passengers if the electric bicycle is equipped with a passenger seat.

Certain vehicles that use electric motor drive, especially electric bicycles, can be operated in special lanes or certain areas. This is in accordance with the provisions of Article 5 paragraph (1), which is further clarified in paragraph (2) and paragraph (3) of the Regulation of the Minister of Transportation Number 45 of 2020. The special lane includes bicycle lanes or special lanes that have been provided. Meanwhile, certain areas in question are residential areas, roads that have been designated free from motor vehicles (*car free day*), tourist areas, areas around integrated mass public transportation facilities, office areas and also areas that do not include public road bodies. If a special lane is not available, then electric bicycles can operate on the sidewalk with adequate capacity and also pay attention to pedestrian safety. The designation of areas in these restricted areas aims to make motorists safer, reduce disruption to major traffic and pedestrians so that this regulatory effort aims to balance mobility and safety.

The presence of Regulation of the Minister of Transportation Number 45 of 2020 shows that legal adjustments to the advancement of transportation technology. Despite its position under the Law, this regulation is the most relevant regulation to provide legal certainty for electric bicycle users. This regulation is also the basis for law enforcement to conduct supervision in the field. Supervision in the field by law enforcement officials is very important in the implementation of the Minister of Transportation Regulation Number 45 of 2020. This activity is in the form of monitoring the use of helmets, ensuring that special lanes remain free of motorized vehicles, and regulating the operational area of electric bicycles. The goal is to prevent electric bicycles from interacting with potentially dangerous traffic flows.

B. The Role of Regulation in Providing Legal Certainty for Electric Bicycle Users

The use of electric bicycles is used for various purposes. Based on the news coverage⁶ which cited the results of Popolix's research, an *online survey platform*, most users use it to shop for daily necessities with a percentage of 79%. Furthermore, the use of pick-up and drop off friends or family is at 62%, followed by activities to visit friends or family at 58%. In addition, electric bicycles are also used for the purpose of shipping goods by 23%, and

for work by 13%, to meet this mobility the ideal electric bicycle mileage is 12.32 km. It was further stated that the majority of electric bicycle users as much as 43% use their bicycles every day. Based on mileage, 45% of electric bicycle users travel a distance of 5-10 km, and 44% use it at a distance of 1-5 km.¹¹ Based on this data, the use of electric bicycles is generally used for short-distance daily activities such as shopping, or shuttles, which are mostly used every day with an estimated distance of 1-10 km. This confirms the role of electric bicycles as a practical means of transportation for local mobility.

The reality that happens is that electric bicycles are still often used without paying attention to the provisions that have been set, especially for the use of special lanes or certain areas of electric bicycle use. In fact, the rules regarding this special lane have been affirmed in Article 5 paragraph (1), paragraph (2) and paragraph (3) of the Regulation of the Minister of Transportation Number 45 of 2020 which states that the use of electric bicycles is limited to special lanes and certain areas. This is also influenced by the lack of specific rules that completely regulate the use of electric bicycles and sanctions for violating them. As a result, e-bikes often cross public roads or pedestrian areas and are sometimes used by minors without adult supervision, which can increase the risk of accidents and disturb other road users.

The use of electric bicycles with inadequate regulations results in disorderly traffic management so that it can cause a high number of accidents on the highway. The Traffic Corps of the Republic of Indonesia conveyed data on traffic accidents, including electric bicycles, in the January-June 2024 period, as many as 647 accidents. This means that traffic accidents occur as many as 100 events per month.¹² The high number of accidents shows that the use of electric bicycles still faces significant risks, especially related to compliance with safety rules and also the operation of vehicles on the proper lanes or areas.

Other data quoted from CNN Indonesia, based on data from the Ministry of Transportation, throughout 2024 there have been 435 cases of traffic accidents involving electric vehicles, and most of them are as many as 333 cases of accidents involving electric bicycles.¹³ These data indicate that the lack of adequate regulation can cause legal uncertainty for electric bicycle users, due to the lack of public understanding and also the absence of sanctions if violations occur so that electric bicycle users can commit violations without legal consequences, increasing the potential for traffic disorder and even risking self-harm to electric bicycle users and other road users.

Electric bicycle users have the same rights and obligations as other vehicle users, namely being obliged to comply with the provisions of the Road Traffic and Transportation Law and Regulation of the Minister of Transportation Number 45 of 2020. However, the implementation of this rule still faces challenges in the lives of the Indonesian people and needs further improvement. Some of the things that need to be improved include the regulation of electric bicycles on the highway and the age limit of users, which should be adjusted to the provisions of motor vehicles. This is important because there are still many people who cannot afford to ride motorcycles, so they rely on electric bicycles for mobility on the highway. This condition can cause congestion, considering that the speed of electric

¹¹ Liputan6.com, <https://www.liputan6.com/otomotif/read/5614800/pengguna-sepeda-dan-motor-listrik-di-indonesia-mayoritas-emak-emak?page=2>.

¹² Marinews, <https://marinews.mahkamahagung.go.id/berita/pelanggaran-penggunaan-sepeda-listrik-belum-dapat-dipidana-02>

¹³ CNN Indonesia, <https://www.cnnindonesia.com/otomotif/20250522122329-603-1231980/dalam-setahun-ada-333-lakalantas-libatkan-sepeda-listrik>.

bicycles is not comparable to other motor vehicles.¹⁴ The use of electric bicycles on the highway is clearly not in accordance with the provisions of the Regulation of the Minister of Transportation Number 45 of 2020 so that it can be counted as a violation.

Transportation observer Budiitano stated that violations committed by electric bicycle users on the highway cannot be ticketed by the police, because electric bicycles are not included in the category of motor or non-motorized vehicles in accordance with Law Number 22 of 2009 concerning Road Traffic and Transportation.¹⁵ According to Andi Ramadhni Adi Saputra, a Magetan District Court Judge, seen from the perspective of criminal law, Andi Ramadhni Adi Saputra's views have a strong doctrinal footing. He emphasized two things contained in the principle of legality: first, a criminal act must be formulated in laws and regulations; and second, the regulation must exist before the crime occurs. This is strengthened by the National Criminal Code (Law Number 1 of 2023) which explicitly states that no single act can be subject to criminal sanctions and/or actions, except for the strength of criminal regulations in the laws and regulations that existed before the act was committed, and the laws and regulations in this provision are regional laws and regulations.¹⁶

The establishment of specific areas and special lanes is designed to provide the right of safe lanes for electric bicycles, but the effectiveness of these rules depends on the user's knowledge and compliance with existing regulations. This is an important concern for the government and the community, because even though electric bicycles are environmentally friendly and economical modes of transportation, they must be accompanied by an understanding or knowledge of the correct conditions for using electric bicycles, one of which is related to the use of helmets, age limits and lanes or areas that can be passed by electric bicycles.

Regulation of the Minister of Transportation Number 45 of 2020 which regulates certain vehicles, including electric bicycles, has not yet included sanctions for violations of the use of electric bicycles. Meanwhile, in the Road Traffic and Transportation Law, electric bicycles are not included in the scope of motor vehicles. This condition creates a legal vacuum (*rechtsvacuum*) related to violations of the use of electric bicycles in Indonesia, because there are no sanctions provisions in the Regulation of the Minister of Transportation Number 45 of 2020 and cannot be subject to criminal articles based on the Law on Traffic and Road Transportation.

According to the principles of criminal law, laws that are valid or have a higher status that may impose criminal sanctions. The principle of legality requires that the application of criminal sanctions must have a clear and valid legal basis which is usually regulated in laws rather than implementing regulations such as Ministerial Regulations. Ministerial regulations may stipulate administrative sanctions such as revocation of permits, or other administrative actions of a non-criminal nature. Meanwhile, as we know, electric bicycles do not have driving documents, unlike electric motorcycles, which must have complete papers. Therefore, regulatory enforcement, safety socialization, compliance of electric

¹⁴ Mutiara Hermawati, dkk, "Penegakan Hukum Bagi Pengguna Sepeda Listrik di Jalan Raya Dalam Perspektif Hukum Positif Indonesia (Undang-Undang Lalu Lintas)", *Jurnal Media Hukum Indonesia* 2, no. 2 (2024): 66-73

¹⁵ Amanda Cahaya Pratama, Aurelia Hermawan dan Pitria Ramadhania, "Analisis Pertumbuhan Sepeda Listrik dan Upaya Pencegahan Kecelakaan Lalu Lintas di Indonesia", *Jurnal Cemerlang* 5, no. 1 (2025): 65-70. <https://doi.org/10.55606/cemerlang.v5i1.3431>

¹⁶ Andi Ramadhni Adi Saputra, <https://marineews.mahkamahagung.go.id/artikel/seri-kuhp-nasional-mengapa-harus-asas-legalitas-0do>.

bicycle users, as well as supervision are important aspects to minimize the risk of accidents and improve rider safety.

The importance of creating an inclusive and specific regulation aims to provide legal certainty for electric bicycle users. The rule-forming process must be able to answer problems related to electric bicycles while paying attention to the values that live in the community, so that the public can accept and understand that the rules are formed in order to provide rights and obligations for electric bicycle users. In addition, supervision of the use of electric bicycles is a crucial aspect to ensure that regulations are implemented effectively. Operational supervision on the highway by the authorities to ensure that electric bicycles do not cross prohibited lanes. Parental or guardian supervision is also important to ensure that child users comply with the age limit and ensure that safety standards are met. Education and socialization are needed so that the public can understand the rights and obligations as well as the risks that can occur so that regulations can be implemented effectively and legal certainty for users can be realized.

Regulation of the Minister of Transportation Number 45 of 2020 is not just a complement to the Road Traffic and Transportation Law, but an important rule that provides a legal basis in the transportation sector. Clarity regarding technical requirements, age limits, and place of use, these regulations reduce the different interpretations in the field. This creates a balance between technological innovation and law and order. Although the Regulation of the Minister of Transportation Number 45 of 2020 has regulated the requirements for riding an electric bicycle, this regulation has no legal sanctions at all for violators. The rule without sanctions (*lex imperfecta*) in legal theory is just a moral exhortation that loses coercion in the field. In accordance with Hans Kelsen's view, the law is a regulation that imposes sanctions on human behavior and norms impose sanctions for violators.¹⁷ The absence of this sanction makes the police on the highway have no legal basis to fine violators. As a result, there is an *impunity gap* where electric bicycle users are free to violate without fear of being exposed to any legal risks. Therefore, the government must immediately revise the Road Traffic and Transportation Law and strengthen the Permenhub with strict sanctions for public safety.

CONCLUSION

The current rules for electric bicycles in Indonesia are not ready to face the rapid pace of technology. The Law on Road Traffic and Transportation Number 22 of 2009 does not include electric bicycles in the type of vehicle, while the Regulation of the Minister of Transportation Number 45 of 2020 only regulates technical matters without any sanctions for violators. This weakness triggers a legal vacuum (*rechtsvacuum*) that makes the user's position unprotected and also unenforceable. This problem cannot be solved by simply changing the ministerial rules. The main solution is to revise Article 47 paragraph (4) of the Road Traffic and Transport Law to include a new category, namely "low-speed electric vehicles". If it has been regulated in the law, then legal sanctions will become valid, and local governments can participate in making derivative rules related to special lanes and operational areas officially. In the end, legal certainty and safety on new roads will be realized if regulations, law enforcement, and public education run together. Revising the Road Traffic and Transportation Law is not just a technical matter, but a form of state responsibility in fulfilling the legal protection rights for every citizen according to the

¹⁷ Muhammad Ridwan Lubis and Cut Nurita, *Textbook of Legal Sociology*, (Solok-SUMBAR: Mafy Media Literasi Indonesia, 2023), p. 31.

mandate of the constitution, to overcome the problem of electric bicycle regulation, the most important first step is to urge the House of Representatives of the Republic and the Central Government to immediately revise the Road Traffic and Transportation Law Number 22 of 2009 to include a new category, namely "low-speed electric vehicles" and formulate sanctions. Furthermore, the Ministry of Transportation needs to update the Regulation of the Minister of Transportation Number 45 of 2020 so that it can accommodate various new electric bicycle designs, as well as adding mandatory registration and feasibility test rules. At the regional level, the Regional Government is expected to move quickly to issue a Mayor or Regent Regulation to map special routes and safe operational areas according to the spatial layout of their respective regions. During the transition period pending the revision of the law, law enforcement officials such as the Police and the Transportation Service were asked to tighten administrative supervision in the field through uniform Standard Operating Procedures. Finally, full compliance must be supported by the community and the community through massive driving safety education, including strengthening the important role of parents in supervising minors when using electric bicycles. Future transportation challenges cannot be solved only with ministerial-level regulations, so a commitment is needed to revise the Road Traffic and Transportation Law so that electrical technology innovations can be properly regulated.

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