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Implementation of the Policy for Handling Unregistered Level Crossings for the Safety of Railways and the Public in West Sumatra

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Abstract

This study analyzes the implementation of policies for handling unregistered level crossings to improve railway and public safety in West Sumatra. The issue is significant because unregistered level crossings remain dominant, with 189 of 310 active crossings, and accident data from 2021–2025 show continuing safety risks involving road users, fatalities, serious injuries, and minor injuries. This research employed a descriptive qualitative approach using grounded theory analysis. Data were collected through in-depth interviews, field observations, and documentation involving 37 informants from railway regulators, operators, local governments, law enforcement agencies, field officers, and road users. Data analysis was conducted through open coding, axial coding, and selective coding. The findings indicate that policy implementation is influenced by institutional authority, cross-sector coordination, resource limitations, technical risks at crossings, public access needs, road user behavior, and community acceptance. The study found that handling unregistered level crossings cannot rely solely on physical closure, as many crossings function as daily access routes for communities. Therefore, effective policy implementation requires risk-based data collection, clarification of authority, inter-agency coordination, improvement of safety facilities, continuous public education, law enforcement, and provision of alternative access routes. The core finding shows that the handling of unregistered level crossings must be based on institutional synergy, safety considerations, and community acceptance. This study contributes to public administration and transport safety governance by emphasizing a collaborative, data-driven, and socially responsive model for managing unregistered level crossings.

Keywords: *policy implementation; unregistered level crossings; railway safety; public safety; West Sumatra.*

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Introduction

Railways play a crucial role in supporting public mobility, regional connectivity, and regional economic growth, primarily because this mode is considered efficient, has a large capacity, and supports sustainable transportation (Onuchukwu, 2023; Soretire et al., 2024; Susanti et al., 2024). In West Sumatra, the role of railways is increasingly important in supporting community activities, tourism, and logistics distribution. However, the development of railway services still

faces safety issues, particularly at level crossings. Level crossings are vulnerable points because they connect railway lines with highways in a single area. Trains have fixed tracks and cannot stop suddenly, while road vehicles are heavily influenced by user behavior. This makes level crossings high-risk accident locations (Lie et al., 2023; Marsa et al., 2023; Kamila et al., 2023). This risk is even greater at unregistered level crossings because they generally do not have adequate administrative legality and safety facilities (Wicaksono et al., 2022; Arisikam, 2024; Wahyudani et al., 2024).

Table 1 At-Grade Crossings on Active Railway Lines in West Sumatra

No.	Crossing Category	Number	Percentage (%)
1	Registered crossings	121	39.03
2	Unregistered crossings	189	60.97
Total		310	100.00

Source: Class II Railway Engineering Center of Padang (2026).

Table 1 shows that of the 310 active level crossings in West Sumatra, 189, or 60.97 percent, are unregistered. This figure is higher than the 121 registered crossings, or 39.03 percent. This situation indicates that the legality and safety of these crossings remain major challenges.

Table 2 Number of accidents in West Sumatra

Total accidents	2021	2022	2023	2024	2025
120	31	14	30	23	22

Source: Class II Railway Engineering Center of Padang (2026).

Table 2 shows that during the 2021–2025 period, there were 120 accidents in West Sumatra. The number of accidents fluctuates, with the highest number in 2021 (31 incidents) and 2023 (30 incidents). This data demonstrates the need for consistent strengthening of railway safety efforts.

Table 3 Types of vehicles involved in collisions

Type of vehicle	Total	2021	2022	2023	2024	2025
Car	73	19	8	13	19	14
Motorcycle	25	8	2	8	1	6
Pedestrian	21	3	4	9	3	2
Animal	1	1	0	0	0	0
Total	201	31	14	30	23	22

Source: Class II Railway Engineering Center of Padang (2026).

Based on Table 3, the most frequently involved vehicles were cars (73 incidents), followed by motorcycles (25 incidents), and pedestrians (21 incidents). This indicates that the interaction between trains and road users is a significant factor in level crossing accidents. Therefore, improving road user discipline and promoting safety awareness is necessary (Aghastya et al., 2021; Nelansari & Tjahjawati, 2022; Widodo & Hastasari, 2022).

Table 4 Number of accident victims

No.	Type of victim	Total	2021	2022	2023	2024	2025
1	Fatalities	31	4	11	8	3	5
2	Serious injuries	35	5	2	11	6	11
3	Minor injuries	50	8	5	13	6	18
	Total victims	116	17	18	32	15	34

Source: Class II Railway Engineering Center of Padang (2026).

Table 4 shows that the number of accident victims reached 116, consisting of 31 fatalities, 35 serious injuries, and 50 minor injuries. This number of victims demonstrates that accidents at level crossings not only impact train operations but also pose a public safety issue.

Table 5 Accident factors in West Sumatra

No.	Accident factor	Total	2021	2022	2023	2024	2025
1	Train-to-train collision	0	0	0	0	0	0
2	Derailment	0	0	0	0	0	0
3	Overturning	0	0	0	0	0	0
4	Collision with external objects/persons	120	31	14	30	23	22
5	Flood/landslide	0	0	0	0	0	0
6	External factors	0	0	0	0	0	0
	Total accidents	120	31	14	30	23	22

Source: Class II Railway Engineering Center of Padang (2026).

Level crossings are vulnerable points because they connect railway lines with highways in a single area. Trains have fixed tracks and cannot stop suddenly, while road vehicles are heavily influenced by user behavior. This makes level crossings high-risk accident locations (Lie et al., 2023; Marsa et al., 2023; Kamila et al., 2023). This risk is even greater at unregistered level crossings because they generally do not have adequate administrative legality and safety facilities (Wicaksono et al., 2022; Arisikam, 2024; Wahyudani et al., 2024). Table 5 shows that the dominant accident factor was tempestuous, with 120 incidents. There were no accidents caused by trains, derailments, overturns, floods/landslides, or other external factors. This confirms that the primary railway safety issue in West Sumatra lies at level crossings, primarily due to interactions between trains and road users (Se et al., 2023; Ismail, 2021; Astuti et al., 2024).

Regulatory aspects of level crossing management are outlined in Law Number 23 of 2007, Government Regulation Number 72 of 2009, Government Regulation Number 6 of 2017, and Ministerial Regulation Number 94 of 2018. However, the large number of unregistered level crossings indicates that policy implementation has not been optimal. Implementation barriers can be related to inter-agency coordination, limited resources, weak oversight, and the need for public access around railway lines (Bedasari et al., 2022; Ristianti et al., 2022). Given these conditions, this research is crucial to analyze the implementation of policies for handling unregistered level crossings for the safety of railways and the public in West Sumatra. The study focuses on policy implementation, coordination between actors, implementation barriers, and strategies for handling unregistered level crossings to improve railway and public safety.

Literature Review and Research Focus

Level crossings are intersections between railway lines and road networks that create a direct meeting point between two transportation systems with different operational characteristics. Railways operate on fixed tracks, have limited maneuverability, and require long braking distances, while road vehicles are more flexible but are strongly influenced by driver behavior, traffic density, and compliance with safety rules (Lie et al., 2023). This condition makes level crossings highly vulnerable to accidents, especially when safety facilities, supervision, and public compliance are inadequate. Therefore, level crossing management cannot be understood only as a technical transportation issue, but also as a matter of public safety governance that requires regulation, infrastructure support, institutional coordination, and consistent compliance from road users (Marsa et al., 2023; Kamila et al., 2023).

From the perspective of transportation and accessibility, railways play an important role in supporting the movement of people and goods, regional connectivity, tourism, logistics distribution, and economic activity (Onuchukwu, 2023). Good transportation accessibility can strengthen community mobility and expand economic opportunities, particularly in areas where railway corridors intersect with residential, educational, commercial, and agricultural activities. However, restricted access without adequate alternatives may disrupt daily mobility and create social and economic burdens for local communities. In this regard, level crossing management often produces a policy dilemma between the need to ensure railway safety and the need to

maintain community economic mobility (Soretire et al., 2024). This dilemma becomes more complex when unregistered level crossings have long been used by the community as daily access routes.

Railway safety theory emphasizes that safety is not determined solely by the physical condition of railway infrastructure, but also by the interaction between infrastructure, users, technology, supervision, and institutional control. In the context of level crossings, accident risks are shaped by several factors, including road user behavior, the availability of crossing gates, signs, warning lights, visibility conditions, traffic volume, and the effectiveness of monitoring by responsible agencies (Arisikam, 2024). Previous studies on railway crossing accidents show that the level of risk and severity of accidents are influenced by infrastructure conditions, environmental factors, and road user characteristics (Se et al., 2023). Therefore, the handling of unregistered level crossings should be based on risk assessment, not merely on administrative closure. A risk-based approach allows policymakers to determine whether a crossing should be closed, guarded, upgraded with safety facilities, or redirected through alternative access.

Public infrastructure policy also needs to be viewed through the principles of sustainability and social justice. Infrastructure decisions should not only focus on efficiency and safety, but also consider their social impacts on affected communities. Policies that prioritize safety without considering community access may produce resistance, especially when the crossing serves as the shortest route to workplaces, schools, markets, or residential areas. Public infrastructure policies must therefore avoid unequal access and ensure that safety interventions do not create new forms of social exclusion (Desalegn & Negussie, 2022). In the management of level crossings, this means that safety protection, legal compliance, and equity in public mobility must be balanced. Thus, level crossing policy should not be limited to closing illegal crossings, but should also consider alternative routes, public consultation, and the distribution of access impacts on local communities (Hu, 2021; Beck et al., 2025). In public administration, policy implementation refers to the process of translating policy decisions into concrete actions through institutions, resources, procedures, and coordination among actors. The success of policy implementation is strongly influenced by the clarity of policy objectives, the adequacy of resources, the commitment of implementing agencies, institutional communication, and support from target groups (Bedasari et al., 2022). In the case of unregistered level crossings, implementation does not depend only on the existence of transportation regulations, but also on how those regulations are operationalized by central government agencies, local governments, railway operators, law enforcement institutions, field officers, and communities. This shows that level crossing management is a multi-actor policy issue that requires clear division of authority, shared responsibility, and continuous coordination.

Level crossing management in Indonesia still faces several administrative and institutional challenges, particularly in compliance, oversight, resource allocation, and the division of authority among agencies. Unregistered level crossings often emerge because of community access needs, weak supervision, unclear responsibility based on road status, and limited coordination between railway and local government institutions (Wicaksono et al., 2022). These conditions indicate that the problem of unregistered level crossings is not only caused by technical deficiencies, but also by fragmented governance. Therefore, handling unregistered level crossings requires collaborative governance involving the Railway Engineering Center, local governments, PT KAI (Indonesian Railway Company), the police, field officers, and the community (Wahyudani et al., 2024). Collaboration is important because each actor has different authority, resources, and practical knowledge in managing safety and public access. In addition to institutional coordination, public awareness and technology utilization are important elements in strengthening level crossing governance. Safety awareness is necessary because many accidents at level crossings are related to road user behavior, such as ignoring signs, crossing when trains are approaching, and underestimating the braking distance of trains. Safety campaigns can improve road user discipline and increase public understanding of the risks associated with unregistered or unguarded crossings (Aghastya et al., 2021). At the same time, technological tools such as geographic information systems, digital mapping, and violation detection systems can assist government agencies in identifying vulnerable crossings, mapping accident-prone areas, and monitoring violations more effectively (Ismail, 2021; Susilawati et al.,

2025). Therefore, level crossing governance requires an integrated approach that combines administrative, technical, social, and technological strategies.

Based on the literature reviewed, previous studies have extensively discussed level crossings from the perspectives of technical safety, accident risk, infrastructure conditions, road user behavior, and safety facilities. However, studies that specifically examine the administrative process for establishing registered level crossings, the factors contributing to the emergence of unregistered level crossings, the conflict between transportation safety and community economic mobility, and the development of a level crossing management model from a public administration perspective remain limited, particularly in West Sumatra. This indicates a research gap in understanding unregistered level crossings as a governance issue that involves legality, institutional authority, public safety, local access needs, and community acceptance.

Therefore, the focus of this research is the implementation of policies for managing unregistered level crossings to support railway safety and public safety in West Sumatra. This research aims to examine the administrative process for establishing registered level crossings, the factors causing the emergence of unregistered level crossings, the forms of conflict of interest between transportation safety and economic mobility, and the ideal level crossing management model from a public administration perspective. The novelty of this research lies in the integration of transportation accessibility theory, railway safety, public infrastructure sustainability, social justice, collaborative governance, and public policy implementation in the management of unregistered level crossings. Through this integrated perspective, the study positions unregistered level crossings not merely as technical safety problems, but as public administration issues that require institutional synergy, risk-based decision-making, and socially responsive policy implementation.

Method

This study used a descriptive qualitative approach with grounded theory analysis to examine the implementation of policies for handling unregistered level crossings to support railway safety and public safety in West Sumatra (Ahmed, 2024). This approach was considered appropriate because the research focuses on policy processes, actor roles, inter-agency coordination, implementation constraints, safety risks, and social dynamics in the management of unregistered level crossings. The study was conducted in West Sumatra Province, specifically in the railway crossing areas of Padang City, Pariaman City, and Padang Pariaman Regency. Research informants were selected using purposive sampling, namely by choosing informants based on their authority, experience, knowledge, and direct involvement in level crossing management policies and practices (Ahmad & Wilkins, 2025). The total number of informants was 37, consisting of one central-level railway safety regulator, eleven officials from the Class II Railway Engineering Office of Padang, two railway operators from PT KAI Regional Division 2 West Sumatra, one representative from the West Sumatra Provincial Transportation Agency, one representative from the Traffic Directorate of the West Sumatra Regional Police, one representative from the Padang City Transportation Agency, two representatives from the Pariaman City Transportation Agency, one representative from the Padang Pariaman Regency Transportation Agency, ten field officers, and seven road users or community members.

The research data consisted of primary and secondary data (Cheong et al., 2023). Primary data were obtained through in-depth interviews and field observations, while secondary data were obtained from regulations, policy documents, crossing data, accident reports, agency archives, crossing maps, and scientific literature. Data collection techniques included interviews, observations, and documentation to obtain a comprehensive understanding of crossing conditions, safety facilities, institutional coordination, and public responses to policy implementation (Chand, 2025). The main instruments used in this study were interview guidelines, observation notes, documentation sheets, and supporting field records. Data analysis was conducted through three stages of grounded theory, namely open coding, axial coding, and selective coding (Akkaya, 2023). In the open coding stage, interview and field data were broken down into initial codes, such as regulatory roles, division of authority, cross-sector coordination, budget constraints, crossing risks, public access needs, road user behavior, and safety outreach. In the axial coding stage, these codes were grouped into broader categories, including institutional authority, cross-sector coordination, resource constraints, technical risks, safety

strategies, social approaches, access needs, road user behavior, and risk-based policy. In the selective coding stage, these categories were integrated into a core theme, namely the implementation of unregistered level crossing policies based on institutional synergy, safety, and public acceptance. Data validity was ensured through source triangulation, technical triangulation, and member checking by comparing information from different informant groups, checking interview results against observations and documentation, and confirming interview summaries or initial findings with informants (Ahmed, 2024; Lloyd et al., 2024).

Result and Discussion

The results of this study were obtained through grounded theory analysis of informant interview data. The research data came from 37 informants consisting of railway safety regulators, the Class II Railway Engineering Office of Padang, PT KAI Regional Division 2 West Sumatra, provincial and local transportation agencies, the Traffic Directorate of the West Sumatra Regional Police, field officers, and road users or community members. These informants were selected because they had authority, technical knowledge, field experience, or direct involvement in the management and use of level crossings in West Sumatra. The diversity of informants enabled this study to capture the issue of unregistered level crossings from institutional, operational, law enforcement, field implementation, and community perspectives. The analysis process was conducted through three stages of grounded theory, namely *open coding*, *axial coding*, and *selective coding*. In the *open coding* stage, interview data were broken down into initial codes based on the main meanings found in the informants' statements. The initial codes included safety policy, accident risk reduction, division of authority, policy supervision, road status, regulatory basis, cross-sector coordination, local government commitment, field monitoring, technical evaluation, safety improvement, public socialization, informal access, community mobility, safety facilities, road user discipline, and policy transparency. These codes show that the problem of unregistered level crossings is not only related to technical infrastructure, but also to institutional authority, actor coordination, safety facilities, public behavior, and community access needs. This analytical process is consistent with grounded theory procedures that develop categories and core themes from qualitative data through *open coding*, *axial coding*, and *selective coding* (Akkaya, 2023).

The *open coding* findings reveal that the main issues in the implementation of policies for handling unregistered level crossings include the role of regulators, the division of authority based on road status, cross-sector coordination, budget constraints, technical risks at crossings, community access needs, road user behavior, and safety socialization. Level crossings are vulnerable points because they bring together two transportation systems with different characteristics: trains operate on fixed tracks and have long braking distances, while road vehicles are strongly influenced by user behavior and traffic discipline (Lie et al., 2023; Marsa et al., 2023; Kamila et al., 2023). In West Sumatra, this issue is particularly important because unregistered level crossings remain widely used by the community, even though many of them lack adequate signs, crossing gates, warning lights, guards, and other safety facilities. In the *axial coding* stage, the initial codes were grouped into broader categories that explain the relationship between conditions, strategies, inhibiting factors, and expected consequences in policy implementation. The main categories identified were institutional and policy authority, cross-sector coordination, implementation resource constraints, technical risks of unregistered level crossings, safety handling strategies, social approach and community participation, access needs and community mobility, road user behavior and awareness, and risk data-based policy. These categories indicate that the handling of unregistered level crossings requires not only regulatory enforcement but also institutional cooperation, adequate resources, technical safety improvement, public communication, and data-based prioritization. This finding is consistent with public policy implementation studies emphasizing that clear objectives, institutional capacity, resources, coordination, and support from target groups are important determinants of policy success (Bedasari et al., 2022; Wicaksono et al., 2022; Wahyudani et al., 2024).

From an institutional perspective, the findings show that policy implementation is strongly influenced by the division of authority among the central government, local governments, the Railway Engineering Office, PT KAI, the police, field officers, and the community. The division of authority is necessary to clarify institutional responsibility; however, it may also produce fragmentation when coordination is weak. Level crossing management in Indonesia still faces challenges related to compliance, supervision, and the distribution of authority among institutions (Wicaksono et al., 2022; Wahyudani et al., 2024). Therefore, cross-sector coordination becomes an essential requirement in handling unregistered level crossings, especially in data collection, site surveys, alternative route mapping, risk classification, public outreach, and the implementation of closure or safety improvement policies. The *axial coding* findings also show that resource constraints are a major obstacle in policy implementation. Budget limitations, low prioritization of safety at the regional level, limited facilities, and uneven availability of crossing gates, warning signs, warning lights, sirens, and crossing guards hinder the strengthening of level crossing safety. These limitations increase the vulnerability of unregistered level crossings because many crossings do not yet meet technical safety standards and are often used as informal community access routes. This condition is consistent with studies showing that accident risks at level crossings are influenced by infrastructure conditions, environmental factors, and road user characteristics (Arisikam, 2024; Se et al., 2023).

In terms of safety, the findings indicate that accidents in West Sumatra are closely related to direct interaction between trains and road users. Level crossings are not merely an issue of railway operations, but also a matter of public safety. Road user behavior is one of the important risk factors, particularly indiscipline, crossing violations, ignoring signs, being in a hurry, and limited understanding of the long braking distance of trains. Therefore, the improvement of physical facilities must be accompanied by continuous safety education, socialization, and public awareness campaigns. This aligns with previous studies emphasizing the importance of socialization and safety campaigns to improve road user discipline and awareness at level crossings (Aghastya et al., 2021; Nelansari & Tjahjawati, 2022; Widodo & Hastasari, 2022). However, physical closure cannot be treated as the only solution. The findings show that many community members use unregistered level crossings because they are considered the fastest and most practical access routes to workplaces, schools, residential areas, markets, and other economic activities. This creates a dilemma between transportation safety and community accessibility needs. Transportation plays an important role in supporting mobility and economic development; therefore, closing access without providing alternative routes may generate social resistance (Onuchukwu, 2023; Soretire et al., 2024). From a social justice perspective, infrastructure policies must also consider the distribution of access and their impacts on affected communities (Desalegn & Negussie, 2022; Hu, 2021; Beck et al., 2025).

In the *selective coding* stage, all main categories were integrated into one core theme: policy implementation for unregistered level crossings based on institutional synergy, safety, and community acceptance. This core theme indicates that the success of policy implementation is determined not only by regulations, but also by inter-institutional coordination, resource support, safety facility improvement, road user compliance, and community acceptance. Unregistered level crossings represent a complex policy issue because they stand between the need for railway operational safety and the community's need for daily access. Therefore, policies for closing, guarding, upgrading, or redirecting level crossings need to be implemented through risk-based data collection, cross-sector coordination, public socialization, deliberation, transparent explanation of safety reasons, and the provision of alternative access routes. Based on the grounded theory analysis, this study formulates a substantive theory called the Adaptive Synergy Theory of Safety and Accessibility at Unregistered Level Crossings. This theory explains that the implementation of policies for handling unregistered level crossings will be effective when it is

built upon institutional synergy, risk-based safety management, and community acceptance of transport access policies. The theory emerged from field findings showing that unregistered level crossings are not merely technical railway problems, but also policy arenas where three main interests interact: railway operational safety, road user safety, and community accessibility needs. Therefore, the closure of unregistered level crossings cannot be implemented only through regulatory and technical approaches, but must also consider social dimensions, local mobility patterns, and the daily access needs of affected communities.

The Adaptive Synergy Theory emphasizes that policy effectiveness is strongly influenced by the ability of institutional actors, including local governments, the Railway Engineering Office, PT KAI, the police, field officers, and the community, to build cross-sector coordination, clarify the division of authority, provide safety facilities, conduct public education, and offer alternative access routes that are acceptable to the community. The stronger the cross-sector coordination, the clearer the institutional authority, the more adequate the resource support, and the higher the level of safety education and community acceptance, the more effective the implementation of safety policies at unregistered level crossings. Conversely, weak coordination, limited safety facilities, low road user awareness, and the absence of alternative routes may increase social resistance and accident risks. Furthermore, this theory explains that the management of unregistered level crossings should be carried out through a collaborative model based on risk and community needs, rather than relying solely on physical closure. A risk-based approach requires the strengthening of data related to crossing vulnerability, traffic volume, accident history, safety facility conditions, road status, and community access needs as the basis for policy decision-making. Thus, this theory positions transport safety and community accessibility as two dimensions that must be managed in a balanced manner through institutional synergy, community participation, cross-sector coordination, and risk data-based policy.

Based on this substantive theory, several theoretical propositions can be formulated. First, the stronger the institutional synergy among cross-sector actors, the more effective the implementation of safety policies for unregistered level crossings. Second, policy effectiveness is influenced by the balance between regulatory enforcement and community accessibility needs. Third, community acceptance of crossing closure policies increases when alternative routes and adequate safety socialization are provided. Fourth, risk data-based policy implementation can improve safety prioritization and reduce the potential for accidents at unregistered level crossings. This study also emphasizes the importance of risk data-based decision-making. Data on the number of crossings, road status, traffic volume, accident history, facility conditions, and level of vulnerability are needed to determine whether a crossing should be closed, guarded, upgraded with safety facilities, or redirected through alternative routes. This approach is consistent with the use of geographic information systems and violation detection technologies to support mitigation, mapping, and safety supervision at railway level crossings (Ismail, 2021; Susilawati et al., 2025). Accordingly, unregistered level crossings in West Sumatra should be understood as a policy arena that brings together three main interests: railway operational safety, road user safety, and community access needs.

Thus, the relevant handling model is not limited to physical closure. It should involve risk-based management through the strengthening of data, clarification of authority, cross-sector coordination, improvement of safety facilities, public education, law enforcement, community participation, and the provision of alternative routes. These findings contribute to public administration studies by emphasizing that the implementation of transport safety policy must be collaborative, data-driven, and sensitive to the social needs of the community. In practical terms, the study suggests that the handling of unregistered level crossings in West Sumatra should be directed toward institutional synergy, risk-based safety planning, and socially responsive accessibility management.

Conclusion

This research shows that the implementation of policies for handling unregistered level crossings in West Sumatra is suboptimal due to institutional complexity, division of authority, cross-sectoral coordination, limited resources, technical conditions of crossings, road user behavior, and public access needs. The results of the grounded theory analysis, conducted through open coding, axial coding, and selective coding, yielded the core theme that handling unregistered level crossings requires institutional synergy, safety, and public acceptance. The research findings confirm that unregistered level crossings are not only a technical transportation issue but also a matter of public policy governance. Handling them requires more than just physical closures; they must be supported by risk-based data collection, clarity of authority, inter-agency coordination, improved safety facilities, ongoing outreach, law enforcement, and the provision of alternative routes for affected communities. Therefore, policies for handling unregistered level crossings will be more effective if implemented collaboratively, based on data, and considering the balance between train safety, road user safety, and public mobility needs.

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