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From Prohibition to Formalisation: The Safety and Mobility Implications of Formalizing Motorcycle Taxis

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Abstract

Motorcycle taxi services in Zambia, locally known as *maIhonda*, have expanded rapidly despite their prohibition under Statutory Instrument No. 46 of 2020. This study examined whether formalising motorcycle taxi services could improve road safety and mobility outcomes amid increasing motorcycle-related crashes and fatalities reported by national authorities. The research was motivated by the absence of locally grounded empirical evidence to guide policy decisions on whether motorcycle taxis should remain banned or be integrated into the formal transport system. The study aimed to assess how standardised safety measures, a structured legal framework, and organised operational arrangements could influence safety and passenger mobility. Guided by a pragmatic philosophical approach, the research adopted a mixed-methods design, allowing for concurrent collection of both qualitative and quantitative data, followed by a systematic convergent interpretation. Quantitative data were collected through structured surveys of riders and passengers in Chipata, Petauke, Lusaka, and Solwezi, while qualitative insights were obtained from key informant interviews with regulators, training institutions, and commuter rights organisations. Approximately 420 respondents participated. Data were analysed using descriptive statistics and thematic analysis. The findings indicate that prohibition has not removed the motorcycle taxis from operations, neither has it helped improve the safety and mobility of passengers. In fact, prohibition has potentially pushed their operations underground as evidenced by weak licensing compliance, inconsistent helmet use, limited rider training, and fragmented enforcement patterns. However, respondents strongly supported structured training, registration, and regulatory oversight. The study concludes that phased formalisation could enhance safety compliance, institutional coordination, and passenger mobility, offering a more sustainable alternative to outright prohibition.

Keywords: Motorcycle Taxis; Prohibition; Formalisation; Safety; Mobility; Transport Policy

1. Introduction

The rapid growth of motorcycle taxi services in Zambia, locally known as “mahonda” reflects a wider expansion of an informal transport system across low- and middle-income countries (Kumar, 2011; Porter, 2016). Similar services in East and West Africa, as well as parts of Asia have emerged as adaptive responses to rapid urbanization, limited formal public transport capacity, and rising demand for flexible and affordable mobility options (Howe & Davis, 2002; Olvera et al., 2012). In many developing transport systems, motorcycle taxis provide critical first- and last-mile connectivity, particularly in peri-urban and underserved areas where conventional public transport is insufficient or unreliable (Starkey, 2016). In Zambia, the use of motorcycle taxis has expanded rapidly despite their prohibition under Statutory Instrument No. 46 of 2020, creating a complex policy dilemma. On one hand, these services contribute significantly to mobility, accessibility, and youth employment; on the other hand, regulatory authorities raised concerns regarding road safety risks, hence the ban (Road Transport and Safety Agency [RTSA], 2022; Zambia Police Service, 2025). Similar tensions have been observed elsewhere, like in Ghana, where governments have shifted from prohibition toward structured regulation through registration, training, licensing, and institutional oversight frameworks (Transaid, 2024). In this study, formalization is understood as the process through which informal motorcycle taxi operations are incorporated into a regulated institutional system involving safety standards, legal recognition, and operational control mechanisms (Chen, 2012). However, in Zambia there is limited locally grounded empirical evidence to determine whether formalization can improve safety and mobility outcomes, creating uncertainty for policy makers regarding whether motorcycle taxis should remain banned or be integrated into the formal transport system.

This study therefore examined the safety and mobility implications of formalizing motorcycle taxi services in Zambia, guided by conceptual framework propositions linking standardized safety measures, legal frameworks, and operational structures to improved safety and mobility outcomes. The main objective was to assess whether structured formalization offers a more sustainable regulatory alternative to prohibition. The study addressed the following research questions: how formalization may improve safety, how it may influence passenger mobility, and what alternative regulatory measures can enhance both outcomes without the two-wheeled taxis. Anchored in a pragmatic research paradigm, the study adopted a convergent parallel mixed-methods design combining quantitative surveys of riders and passengers with qualitative interviews with regulators, training institutions, and commuter organizations in selected districts of Zambia. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed thematically, allowing integration of empirical patterns with institutional and policy perspectives. The article progresses by reviewing literature on motorcycle taxi formalization, safety, mobility, and regulatory governance; the methodology explains the research design and analytical approach; with the results section presenting empirical findings; the discussion on the findings in relation to the conceptual framework propositions; and the final section provides conclusions and policy recommendations for the formal regulation of motorcycle taxi services in Zambia.

2. Literature Review

2.1 Purpose and conceptual background

This literature review examines existing scholarship on motorcycle taxi operations, safety, mobility, and regulatory governance in low- and middle-income countries, with the aim of establishing the theoretical and empirical basis for analyzing the formalization of motorcycle taxi services in Zambia. The review adopts a conceptual approach that links transport governance theory, informal sector regulation, and road safety management to the proposition that structured regulatory integration may improve both safety outcomes and mobility accessibility. Recent studies emphasize that informal transport systems often emerge where formal public transport provision is inadequate, particularly in rapidly urbanizing regions characterized by high unemployment and weak institutional enforcement (Olvera et al., 2012; Goodfellow, 2017; ILO, 2023). The World Health Organization (2023) notes that informal transport modes frequently fill accessibility gaps left by formal transport systems, but their operation outside structured regulatory frameworks creates safety and governance challenges.

Motorcycle taxis are widely recognized for improving last-mile connectivity and transport accessibility. Studies across African and Asian cities show that they enable rapid point-to-point travel, navigate congested corridors, and reach areas inaccessible to larger vehicles (Porter et al., 2013; Cervero & Golub, 2021). This flexibility enhances access to employment, markets, healthcare, and education, thereby supporting economic participation among low-income populations (World Bank, 2002). In addition, motorcycle taxi services generate employment opportunities in contexts where formal labor markets remain limited (Olvera et al., 2012; ILO, 2023). However, despite these benefits, motorcycle operations are frequently associated with elevated road safety risks, particularly in countries where enforcement capacity and safety infrastructure are limited (World Health Organization, 2023). Consequently, the regulation of motorcycle taxi services has become a major policy concern, with governments adopting approaches ranging from prohibition to structured formalization.

Recent scholarship increasingly frames formalization as a regulatory strategy for managing informal transport systems. Formalisation refers to the integration of informal services into legal and institutional frameworks through licensing, registration, safety training, and monitoring mechanisms (ILO, 2023). Proponents argue that formalization can improve compliance with safety standards, strengthen institutional coordination, and enhance accountability among operators (Transaid, 2023). Empirical evidence from countries such as Thailand, Vietnam, and Ghana suggests that regulatory systems combining rider training, licensing, and enforcement oversight are associated with improved helmet use and better adherence to traffic rules (Nkurunziza et al., 2012; Porter et al., 2013). However, the effectiveness of formalization depends on governance capacity, regulatory clarity, and institutional coordination, with weak enforcement often limiting policy effectiveness (OECD, 2020; UNDP, 2022; World Bank, 2022). These findings support the conceptual argument that safety, mobility, and governance outcomes should be analyzed within a unified regulatory framework rather than as isolated policy issues.

2.2 Empirical debates, counter-arguments and research gaps

Although formalization is widely promoted as a solution to the safety and governance challenges associated with motorcycle taxis, the literature presents contrasting perspectives regarding its effectiveness. One strand of research argues that structured regulation improves safety outcomes and institutional accountability. Regulatory instruments such as mandatory training, licensing requirements, and helmet enforcement are associated with higher compliance levels and reduced crash exposure, particularly where enforcement is consistent (Nkurunziza et al., 2012; OECD/ITF, 2022; World Bank, 2021). Integrated regulatory systems that combine legal recognition with monitoring and institutional coordination tend to produce more sustainable safety outcomes than fragmented or ad-hoc interventions.

However, other scholars caution that formalization may generate unintended consequences. High licensing fees, insurance costs, and complex administrative procedures may create barriers to entry for low-income operators, encouraging continued informal operation and undermining regulatory objectives (Chipa & Mwanza, 2021; Olvera et al., 2015). Increased compliance costs may also raise passenger fares, reducing affordability for vulnerable users. In addition, governance weaknesses may limit the effectiveness of regulatory reforms. In contexts characterized by low institutional accountability, expanded regulation may create opportunities for corruption, selective enforcement, or rent-seeking behavior (Goodfellow, 2017; Transparency International, 2022). These challenges suggest that successful formalization requires not only regulatory rules but also transparent licensing systems, institutional coordination, and credible enforcement mechanisms (African Development Bank, 2022).

Table 1: Summary of Literature Review

Author (Year)	Subject	Variables	Method	Key findings
Olvera et al. (2012)	Motorcycle taxis in African cities	Informal transport, accessibility, regulation	Comparative transport studies	Motorcycle taxis emerge where formal transport is inadequate and improve accessibility but raise safety concerns
Porter (2016)	Mobility and rural transport in Africa	Accessibility, employment, informal transport	Qualitative mobility research	Motorcycle taxis provide essential last-mile connectivity and support livelihoods
Goodfellow (2017)	Regulation of informal transport	Governance, enforcement, policy	Institutional analysis	Weak enforcement leads to persistence of informal transport despite prohibition
ILO (2023)	Formalisation of informal sector	Regulation, labour conditions, compliance	Policy review	Formalisation improves accountability but requires institutional capacity
Nkurunziza et al. (2012)	Regulation of motorcycle taxis	Regulatory framework, Safety and organisational performance	Qualitative + quantitative, Case study, policy evaluation	Cooperative regulation improved helmet use and rider accountability
WHO (2023)	Road safety in developing countries	Training, helmet use, enforcement	Global safety data analysis	Lack of training and weak enforcement increase crash risk among motorcycle users
OECD (2020)	Transport governance	Regulation, institutions, policy coordination	Governance analysis	Effective regulation requires clear legal framework and institutional coordination
Transaid (2023)	Motorcycle safety programmes	Training, licensing, monitoring	Programme evaluation	Structured training and licensing improve rider behaviour and safety compliance
World Bank (2022)	Informal transport systems	Accessibility, affordability, regulation	Transport policy analysis	Informal transport improves mobility but requires regulation to ensure safety
Mwanza, B. G., Mbohwa, C., Telukdarie, A., & Medohd, C. (Year)	Value addition in informal waste sector	Regulation, value chain integration, informal sector participation, income generation	Mixed methods (case study; interviews and field observations)	Integration of informal waste collectors into formal value chains improves income opportunities and operational efficiency, but requires institutional support and structured system

The literature also questions the effectiveness of prohibitionist approaches. Evidence from several African and Asian cities shows that blanket bans rarely eliminate motorcycle taxi services because demand for flexible and affordable transport persists (Goodfellow, 2017; Behrens et al., 2021). Instead, prohibition often drives operations underground, reducing regulatory visibility and weakening safety oversight. As a result, many scholars advocate alternative regulatory models, including phased formalization, cooperative-based regulation, and technology-supported monitoring systems (ILO, 2023; ITF, 2022). These approaches aim to balance safety regulation with the socio-economic role of motorcycle taxis.

Despite the growing body of international research, several gaps remain. First, most empirical studies focus on East and West Africa and Southeast Asia, with limited context-specific evidence for Zambia and the broader Southern African region. Second, existing studies often examine safety, mobility, and governance separately rather than analyzing their interaction within a single analytical framework. Third, there is limited research on regulatory models suitable for low-capacity institutional environments where enforcement resources are constrained. Finally, the adequacy of existing legal and institutional frameworks for regulating commercial motorcycle taxi services remains under-examined in countries where such services operate under prohibition or legal ambiguity.

Guided by these gaps, the present study adopts conceptual framework propositions linking standardised safety measures, structured legal frameworks, and regulated operational systems to improved safety and mobility outcomes. The study proposes that the introduction of formal training, licensing, and enforcement mechanisms is associated with higher safety compliance, while legal recognition and institutional coordination improve passenger mobility and service reliability. These propositions provide the analytical basis for examining whether formalization offers a more effective regulatory alternative to prohibition in the Zambian context.

3 Research Methodology

3.1 Research design and analytical framework

This study adopted a pragmatic research paradigm to allow the integration of quantitative and qualitative evidence in examining the safety and mobility implications of formalizing motorcycle taxi services in Zambia. A convergent parallel mixed-methods design was employed, in which quantitative and qualitative data were collected during the same phase, analyzed separately, and then integrated during interpretation to strengthen the validity of the findings. This design was considered appropriate because the study examined behavioral, institutional, and regulatory factors that cannot be fully understood using a single method. The analysis was guided by a conceptual framework derived from the literature, linking three independent variables - standardized safety measures, legal framework, and operational structure - to the dependent variables of safety outcomes and passenger mobility, as shown in figure 3.1. The framework informed questionnaire design, interview guides, and interpretation of results.

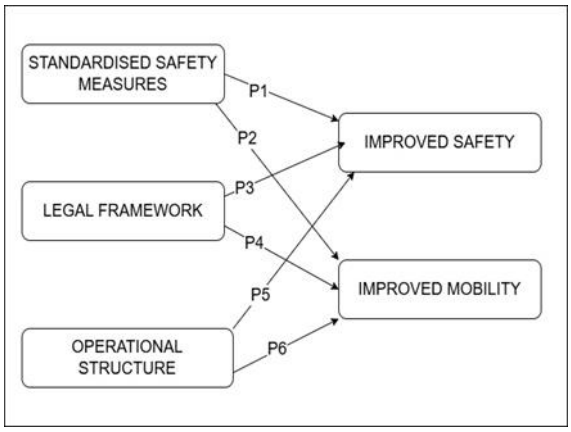

Figure 1: Conceptual Framework (Source: Author)

P1: Standardised safety measures are expected to improve safety.
P2: Standardised safety measures are expected to improve mobility.
P3: A legal framework is expected to improve safety.
P4: A legal framework is expected to improve mobility.
P5: A formal operational structure is expected to improve safety.
P6: A formal operational structure is expected to improve mobility.

3.2 Study area and sampling procedure

The study was conducted in Lusaka, Petauke, Chipata, and Solwezi, selected due to the presence of active motorcycle taxi operations and regulatory institutions. The target population included motorcycle taxi riders, passengers, and sector stakeholders such as regulators, training providers, and commuter representatives. The sample size for the quantitative survey was determined using the Taro Yamane formula with a 5% margin of error, producing a target of approximately 400 respondents. A total of 420 participants were included in the final dataset, consisting of 409 survey respondents (300 passengers and 109 riders) and 11 key informants selected purposively based on their involvement in transport regulation, training, or commuter advocacy.

3.3 Data collection methods

Primary data were collected using structured questionnaires and semi-structured interviews. Questionnaires contained closed-ended items measured using ordinal response scales to allow statistical analysis of safety practices, licensing compliance, training exposure, and mobility reliance. Interviews were conducted with representatives from regulatory agencies, commuter organizations, and training institutions to obtain contextual explanations of regulatory challenges and enforcement practices. Secondary data were obtained from legal documents, policy reports, and published literature on motorcycle taxi regulation and road safety.

3.4 Data analysis

Quantitative data were coded and analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations, to identify patterns in safety behavior, compliance, and transport usage. Qualitative interview data were analyzed using thematic analysis, where responses were coded and grouped into themes related to safety regulation, institutional capacity, enforcement, and mobility access. Integration of results was performed through triangulation, allowing comparison of survey findings, interview insights, and legal-institutional evidence.

3.5 Ethical considerations

Ethical clearance was granted by the University of Zambia University of Zambia Biomedical Research Ethics Committee. Participation by respondents was voluntary and based on informed consent. The study formed part of an academic research project approved by the Graduate School of Business, and the procedures complied with standard ethical guidelines for research involving human participants.

4 Results

4.1 Demographic characteristics of respondents

The study analyzed responses from 420 participants, comprising 409 quantitative respondents (300 passengers and 109 motorcycle taxi riders) and 11 qualitative respondents drawn from regulatory institutions, training organizations, and commuter advocacy groups. The demographic profile provides insight into the socio-economic context within which motorcycle taxi services operate in Zambia.

Most respondents were young and economically active. Among passengers, the largest proportion (32.0%) fell within the 26–35-year age group, followed by 10–25 years (31.2%). Respondents aged 36–45 years accounted for 19.0%, while 11.6% were aged 46–55 years and only 6.2% were above 55 years (see table 4.1). A similar pattern was observed among riders, where 41.4% were aged 26–35 years, followed by 26.2% aged 16–25 years and 23.4% aged 36–45 years, while only 9.0% were above 45 years. These results indicate that motorcycle taxi operations are dominated by young adults and may serve as a source of employment for individuals facing limited opportunities in the formal labor market. The mean riding experience (M = 2.283; SD = 0.872) shows that most riders had operated for between one and three years, suggesting rapid expansion of the sector in recent years.

Gender distribution revealed a strong imbalance. Among passengers, 63.8% were male and 36.2% female. Among riders, 108 out of 109 respondents were male, confirming that motorcycle taxi riding is an overwhelmingly male-dominated activity associated with long working hours and exposure to road safety risks. For locations, most respondents were based in urban areas. Approximately 69.4% of passengers resided in urban locations, while 30.6% were from rural areas. Similarly, 75.2% of riders operated mainly in urban environments. With respect to study locations, the largest proportion of passengers came from Petauke (28.5%), followed by Lusaka (25.8%), Solwezi (19.6%), and Chipata (10.7%), while riders were mainly drawn from Petauke (40.0%), Solwezi (33.8%), and Chipata (26.2%).

Table 2: Demographic characteristics of respondents (Source: Author)

Characteristic	Category	Passengers (%)	Riders (%)
Age group	10–25	31.2	26.2
	26–35	32.0	41.4
	36–45	19.0	23.4
	46–55	11.6	—
	Above 55	6.2	9.0
Gender	Male	63.8	99.1
	Female	36.2	0.9
Residence	Urban	69.4	75.2
	Rural	30.6	24.8
Location	Petauke	28.5	40.0
	Lusaka	25.8	—
	Solwezi	19.6	33.8
	Chipata	10.7	26.2

4.2 Safety implications of formalization

The findings revealed significant gaps in training, licensing, and safety compliance among riders. Approximately 55% reported having no formal motorcycle training, while 49% indicated that they did not possess valid riding licenses. Mean values for training (M = 1.544) and licensing (M = 1.489) confirm that many riders operate without meeting basic regulatory requirements (table 4.3). Interviews with regulators and training providers indicated that many riders learn informally from peers, and that structured training improves hazard awareness, riding discipline, and confidence. These results suggest that mandatory training and licensing could improve safety if integrated into a formal regulatory framework.

Passenger responses showed inconsistent use of protective equipment. Only 26.1% reported always using helmets, while 50.1% used them occasionally and 23.7% never used them. Riders reported that helmets were often unavailable or unaffordable, and some passengers refused to use shared helmets due to hygiene concerns (table 4.3). Interviews confirmed that helmet use is often seen on riders only, leaving passengers exposed to injury risk. Concerns were also raised about traffic rule compliance and overloading. Passenger perceptions indicated that riders frequently violate traffic rules, with a mean response of 3.17 corresponding to “sometimes” or “rarely”. Riders also reported carrying more than one passenger in order to increase income, despite regulations requiring only one passenger per trip (table 4.3). In addition, lack of visible registration numbers made it difficult to identify riders involved in accidents, indicating weak accountability systems. Stakeholders suggested that rider associations could improve monitoring and discipline.

Table 3: Passenger response statistical outcomes

QUESTION OR REQUIREMENT	RESPONSE OPTIONS	MEAN	STANDARD DEVIATION	VARIANCE
Have you ever witnessed or been involvement in a crash?	Yes = 1	1.23	0.43	0.18
	No = 2			
	Always = 1	2.5	1.01	1.03

Do you feel safe to use MTs as a passenger?	Sometimes = 2 Rarely = 3 Never = 4			
Do you use protective gear especially helmets?	Always = 1 Sometimes = 2 Never = 3	1.95	0.73	0.53
In your opinion, do riders adhere to traffic rules?	Always = 1 Often = 2 Sometimes = 3 Rarely = 4 Never = 5	3.17	1.11	1.23
Should MTs be banned by the Government?	Yes = 1 No but regulate = 2 No = 3 Not sure = 4	2.62	0.62	0.38
Should MTs be formalised?	Yes = 1 No = 2 Not sure = 3	1.24	0.56	0.31
Are MTs more affordable than other available motor-transport?	Very affordable =1 Somewhat affordable = 2 Same as car taxi = 3 Expensive = 4	1.33	0.67	0.44
Do MTs access undeserved areas (hard to reach rural areas)?	Yes = 1 No = 2	1.06	0.313	0.09
Are you willing to pay more for well-regulated & safer MTs?	Yes = 1 No = 2 Not sure = 3	1.29	0.62	0.38

4.3 Mobility contributions of motorcycle taxis

Despite safety concerns, motorcycle taxis were widely perceived as essential for mobility. Respondents rated the service as highly affordable (M = 1.33; SD = 0.67), and about 60% reported using motorcycle taxis at least once per week, with 38% using them daily. More than 77% of trips were linked to work, school, or business, showing that the service supports economic activity. Motorcycle taxis were particularly important in underserved areas. About 96.7% of passengers stated that they rely on them to reach places where conventional vehicles cannot operate (see table 4.2). Stakeholders confirmed that motorcycles are often the only viable transport option in areas with poor road infrastructure, narrow streets, or heavy congestion.

Table 4: Rider response statistical outcome

QUESTION OR REQUIREMENT	RESPONSES	MEAN	STANDARD DEVIATION	VARIANCE
Experience duration: how many years have you operated as an MT rider?	<1 year = 1 1 to 3 years = 2 4 to 6 years = 3 >6 years = 4	2.283	0.872	0.759
What motivated you into becoming an MT rider?	Unemployment = 1 Business boom = 2 Additional income = 3	1.4	0.545	0.297
Average working hours per day	<4 hours = 1 4 to 6 hours = 2 7 to 9 hours = 3 >9 hours = 4	3.172	0.869	0.755
What is your preferred number of passengers per load?	1 passenger = 1 2 passengers = 2 3 passengers =3 4 passengers = 4 5 passengers = 5 6 passengers = 6	2.655	0.628	0.394
Are MTs more useful than cars taxis in your area?	Yes = 1 No = 2 Not sure = 3	1.144	0.499	0.249
Do you rely on MTs as sole income?	Yes = 1 No = 2	1.117	0.322	0.104
How do you rate the safety of	Very safe = 1 Safe = 2	1.896	0.743	0.552

MTs?	Neutral = 3 Unsafe = 4 Very unsafe = 5			
Do passengers accept to use helmets?	Yes = 1 No = 2 Helmet not available = 3	2.027	0.857	0.735
Have you ever attended formal training?	Yes = 1 No = 2	1.544	0.499	0.249
Are you licenced to ride motorcycles?	Yes = 1 No = 2	1.489	0.501	0.251
Should the government ban Motorcycle Taxis?	Yes = 1 No = 2 No but regulate = 3 Not sure = 4	2.324	0.587	0.345
Can formalising reduce accidents and improve behaviour?	Yes = 1 No = 2 Not sure = 3	1.455	0.807	0.652
Are you willing to comply with additional safety regulations?	Yes = 1 No = 2 Not sure = 3	1.324138	0.715	0.512

However, safety perceptions remained low. Only 16.6% of passengers reported always feeling safe, while most felt safe only sometimes or rarely (table 4.2). The mean accident exposure score (M = 1.228) indicates that many respondents had witnessed or experienced crashes. This shows a clear tension between mobility benefits and safety risks. Encouragingly, most passengers were willing to support improved safety standards, with 59.6% indicating that they would accept slightly higher fares for safer and better-regulated services. Riders also generally supported formalization, although some feared that increased regulation could lead to corruption or informal payments during enforcement.

4.4 Alternative regulatory measures and framework propositions

Respondents identified several regulatory measures that could improve safety and mobility without a complete ban. Rider associations were viewed as useful for record-keeping, training, and enforcement support. Stakeholders also emphasized the need for a dedicated legal framework, as existing legislation regulates motorcycles mainly as private vehicles rather than commercial transport. Community-based enforcement involving local leaders and civic authorities was suggested as a way to strengthen compliance where government capacity is limited. In addition, technological solutions such as digital registration, GPS tracking, and ride-hailing platforms were considered useful for improving accountability.

Evaluation of the conceptual framework propositions shows that standardized safety measures, legal recognition, and operational structures are currently weak or absent. As a result, neither safety nor mobility outcomes are adequately supported. The absence of a dedicated regulatory unit and clear operational framework limits the effectiveness of existing transport laws, indicating that formalization would require coordinated legal, institutional, and operational reforms.

4.5 Discussion

Interpretation of findings in relation to existing literature

The demographic profile shows that motorcycle taxi riding is dominated by young and economically active individuals, indicating that the sector performs a dual function as both a mobility service and a livelihood strategy in contexts of limited formal employment. Similar patterns have been reported in informal transport systems where youth participation is associated with both economic necessity and increased exposure to operational risks (WHO, 2023). At the same time, younger riders may be more responsive to structured training, digital monitoring, and technology-based regulation, suggesting that demographic characteristics may influence the effectiveness of formalization measures (ITF, 2021). The sector also remains overwhelmingly male-dominated, while passenger composition is more diverse. Previous studies attribute this imbalance to cultural norms, perceived safety risks, and associated capital requirements (Porter et al., 2020). The presence of female passengers reinforces the role of motorcycle taxis as a public transport service rather than a purely informal activity, implying that safety regulation must consider the protection of all user groups.

Spatial patterns indicate that motorcycle taxi services are concentrated in peri-urban and underserved areas, supporting earlier findings that such modes emerge where formal public transport coverage is inadequate (World Bank, 2023). Their distribution reflects broader infrastructure inequality and last-mile connectivity challenges. Although respondents generally agreed on the mobility importance of motorcycle taxis, perceptions of safety varied across locations, suggesting that operational risks may depend on local enforcement conditions, infrastructure quality, and regulatory practices. Similar geographic variation in safety outcomes has been observed in other informal transport systems (UN-Habitat, 2022).

Safety implications of formalization

The findings suggest that safety challenges in the motorcycle taxi sector are linked to gaps in training, licensing, enforcement, and accountability structures. Limited exposure to formal training and inconsistent licensing compliance

indicates uneven regulatory oversight. Previous research identifies competency-based training and certification as important tools for improving rider discipline and rule compliance (ITF, 2020), although training alone may not produce safety improvements where enforcement capacity is weak (WHO, 2022). Inconsistent use of helmets, violations of passenger limits, and irregular compliance with traffic rules correspond with international evidence linking weak enforcement regimes to higher crash risks in informal motorcycle transport systems (OECD/ITF, 2021). However, the literature also cautions that enforcement reforms may create unintended consequences, including corruption, selective penalties, or regulatory capture in contexts of weak institutional governance (Williams & Hirschhorn, 2021). The present findings suggest that some enforcement limitations may result from the absence of a regulatory framework specifically designed for commercial motorcycle taxi operations.

Limited rider traceability and accountability further complicate enforcement. The absence of formal structured registration systems for bike taxis makes it difficult to monitor rider behavior or apply sanctions. Studies of informal transport regulation show that rider associations can facilitate peer monitoring and communication between regulators and operators (Transaid, 2021), although such associations may themselves become ineffective without clear oversight structures (Goodfellow, 2020). These results indicate that safety outcomes are likely to depend on the interaction between training, enforcement capacity, institutional coordination, and governance quality rather than on a single regulatory intervention.

Mobility contributions and regulatory trade-offs

The findings confirm that motorcycle taxis play a significant mobility role, particularly in areas with limited transport alternatives. Respondents widely described the service as affordable and essential for accessing employment, markets, and social services, consistent with studies identifying motorcycle taxis as flexible last-mile transport solutions in environments with weak public transport coverage (Cervero & Golub, 2020). Despite strong reliance on the service, safety concerns remain widespread, indicating that accessibility and safety represent distinct but interconnected dimensions of transport quality. Institutional perspectives suggest that improved regulation may increase passenger confidence and stabilize demand (World Bank, 2022), yet stricter compliance requirements may also increase operating costs and reduce affordability for low-income users (Sietchiping et al., 2021). The results therefore highlight a potential trade-off between safety improvement and cost accessibility.

Opportunities also exist for integrating motorcycle taxis into broader mobility planning frameworks through designated stages, infrastructure improvements, and clearer operational zoning. Previous research shows that integrating informal transport modes into structured planning systems can reduce traffic conflicts and improve service reliability (UN-Habitat, 2021). However, excessive spatial regulation may limit the operational flexibility that makes motorcycle taxis effective in underserved areas.

Alternative regulatory approaches and policy implications

The study identified several regulatory strategies that could improve safety and mobility without resorting to prohibition. One key issue concerns legal and institutional reform. Current legislation regulates motorcycles primarily as private vehicles rather than as commercial passenger services, creating gaps in enforcement responsibility. Institutional theory suggests that regulatory clarity and defined mandates can improve coordination among enforcement agencies (North, 2020), although legal reform alone may not produce behavioral change without adequate resources (World Bank, 2021). Community-based monitoring and rider associations may complement state regulation by supporting registration, training, and peer enforcement, particularly where regulatory capacity is limited (Transaid, 2022). Nevertheless, participatory approaches require oversight mechanisms to prevent internal governance weaknesses or elite capture. Technology-based regulation, including digital registration and rider identification systems, offers additional possibilities for improving traceability and monitoring (ILO, 2021), but implementation must consider affordability and accessibility for low-income operators. The findings also emphasize the importance of policy consistency. Respondents described regulatory approaches that alternated between tolerance and prohibition, creating uncertainty within the sector. Governance research indicates that sustained reform typically requires stable policy direction and coordinated institutional commitment (OECD, 2020).

Contribution to knowledge, limitations, and future research

This study contributes to the limited empirical literature on motorcycle taxi operations in Zambia by providing mixed-methods evidence on the interaction between safety, mobility, and regulatory governance. The results demonstrate that strong mobility benefits coexist with persistent safety vulnerabilities, and that regulatory effectiveness depends on institutional capacity, legal clarity, and operational structuring. Several limitations should be acknowledged. The study relied on self-reported perceptions, which may introduce response bias, and the geographical coverage does not represent all operational contexts within Zambia. In addition, the cross-sectional design captures conditions at a single point in time and cannot assess long-term effects of regulatory reforms. Future research could examine longitudinal changes following policy interventions, compare regulatory models across regions, and evaluate the impact of technology-based monitoring systems on safety outcomes.

5 Conclusions and Recommendations

The study set out to examine whether formalization of motorcycle taxi services could improve safety and mobility outcomes in Zambia without undermining the accessibility benefits that make the mode widely used. The conceptual propositions assumed that standardized safety measures, sector-specific legal frameworks, and stronger institutional oversight would improve both safety and mobility performance. The findings provide partial support for these propositions given that all the three elements were either missing or fragmented under the Zambian situation. No standardized safety measures were found, there were fragmented legal provisions and there were no evident operational structure for motorcycle taxis in the country. Evidence suggests that the absence of sector specific safety measures and a legal framework contributes to unsafe operating practices, while weak operational and institutional coordination limits the effectiveness of existing traffic regulations. The results also indicate that formalization alone would not automatically produce safer outcomes. The effectiveness of regulatory reforms appears to depend on institutional capacity, affordability safeguards, and consistent enforcement, confirming arguments in governance literature that regulatory frameworks are only effective when supported by credible institutions (North, 2020; WHO, 2022).

The study contributes to the limited empirical literature on motorcycle taxi regulation in Sub-Saharan Africa by demonstrating that the sector performs a dual function as both a mobility service and a livelihood strategy. While safety risks were evident in training gaps, helmet use, overloading, and weak traceability, motorcycle taxis were also shown to provide essential last-mile connectivity, particularly in peri-urban and underserved areas where conventional public transport coverage is limited. These findings support previous research describing motorcycle taxis as flexible and affordable transport solutions in contexts of spatial inequality (Cervero & Golub, 2020), but they also extend existing knowledge by showing how safety and mobility outcomes are shaped by institutional and regulatory conditions rather than by the mode itself. Institutional and regulatory constraints have been shown to affect both safety compliance and sector development across emerging service sectors in Zambia, where enforcement capacity, training systems, and operational conditions influence behavioral outcomes (Chipa & Mwanza, 2021; Mwanza et al, 2019). The results therefore challenge prohibition-based policy approaches, which earlier studies have found to be ineffective in informal transport sectors because they tend to displace rather than eliminate operations (Goodfellow & Titeca, 2021).

The study has several limitations. The analysis relied largely on self-reported perceptions from riders and passengers, which may introduce response bias, and the selected study locations do not represent all operational environments in Zambia. In addition, the cross-sectional design limits the ability to assess long-term effects of regulatory change. Future research should therefore examine the impacts of formalization over time, compare regulatory models across regions, and evaluate the role of digital monitoring, rider associations, and institutional reforms in improving safety outcomes.

From a policy perspective, the findings suggest that regulatory integration rather than prohibition offers the most viable approach. Effective reform would require sector-specific legislation, structured rider registration, accredited training systems, and coordinated enforcement supported by reliable institutional capacity. At the same time, policy measures must preserve affordability in order to maintain the mobility benefits that currently support access to employment, education, and markets. A phased and institutionally coordinated formalization strategy may therefore provide a more sustainable pathway for improving both safety and mobility within Zambia's evolving transport system.

Declaration of Competing Interests

The authors declare that they are not aware of any competing financial interests or personal relationships that may have influenced the work described in this document.

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Ethical considerations

The article followed all ethical standards appropriate for this kind of research.

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