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TREND ANALYSIS OF ROAD TRAFFIC CRASHES IN OYO STATE, NIGERIA FROM 2020 TO 2024

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Abstract
This study examines the temporal trends and key characteristics of road traffic crashes (RTCs) in Oyo State, Nigeria, from 2020 to 2024, to identify crash patterns, high-risk corridors, vehicle types most involved, and principal causative factors to support evidence-based road safety interventions. A descriptive research design was adopted using secondary data obtained from the Federal Road Safety Corps (FRSC), Oyo State Command, covering five years (2020–2024). The dataset comprised 2,900 recorded crashes involving 4,840 vehicles and 19,397 persons across all major road corridors in the state. Key variables measured included annual crash frequency, fatalities, injuries, vehicle class and category, causative factors, and route-level crash distribution. Data were analysed using descriptive statistical techniques, including frequency counts, percentage distributions, trend analysis, and graphical illustrations, processed through Microsoft Excel and SPSS. Crash frequency rose from 602 in 2020 to a peak of 674 in 2022, declined to 495 in 2023, and resurged to 501 in 2024. The Ibadan Metropolis, Ogbomoso–Oyo, and Lagos–Ibadan corridors collectively accounted for over 43% of all crashes. Motorcycles, cars, and buses were the most frequently involved vehicle types, while speed violation alone accounted for 48% of all causative factors. Human factors collectively explained over 80% of all recorded crashes. This study provides the first dedicated, state-specific, multi-dimensional trend analysis of RTCs in Oyo State for the post-pandemic period 2020–2024, offering corridor-level, vehicle-specific, and causation-integrated evidence that is directly actionable for policymakers, transport planners, and the FRSC.

Key Words: Crashes, FRSC, Traffic, Safety, Emergency

1. Introduction

Road traffic crashes (RTCs) represent one of the foremost preventable public health crises of the twenty-first century. The World Health Organisation (2018) estimates that RTCs claim more than 1.3 million lives and inflict between 20 and 50 million non-fatal injuries globally every year, making them the eighth leading cause of death worldwide and the leading cause among individuals aged 5 to 29 years. The burden is not distributed equitably: although low- and middle-income countries (LMICs)

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account for only approximately 60 percent of the world's registered vehicles, they bear over 90 percent of global road traffic fatalities (Adeloye et al., 2016). This disparity is driven by compounding vulnerabilities, rapid and largely unplanned urbanisation, weak traffic law enforcement, inadequate road infrastructure, poorly maintained vehicle fleets, and limited emergency response capacity, all of which are pronounced across Sub-Saharan Africa (Akinyemi & Owolabi, 2020). The resulting mortality and morbidity impose severe economic losses, disrupt household livelihoods, and erode the productive labour force upon which developing economies depend, with studies estimating that RTCs cost LMICs between one and three per cent of their gross domestic product annually (World Health Organisation, 2018).

Nigeria exemplifies the severity of this challenge within the African context. As the continent's most populous nation and one of its fastest-growing economies, Nigeria records thousands of road traffic crashes annually, with the Federal Road Safety Corps (FRSC, 2024) documenting 9,570 RTCs and 5,421 fatalities in the single year 2024 alone. These statistics reflect not only the scale of the crisis but also its profound social consequences, including medical expenditures that overwhelm families, loss of breadwinners, psychological trauma among survivors, and mounting pressure on an already strained healthcare system (Onakpoya et al., 2019). Critically, the high frequency of crashes in Nigeria has persisted despite decades of road safety policy, regulatory frameworks, and awareness campaigns, suggesting that the problem is systemic rather than incidental and that existing interventions have been insufficiently targeted, inconsistently enforced, or inadequately informed by up-to-date, location-specific evidence (Ijeoma & Chukwuemeka, 2021).

Within Nigeria, Oyo State occupies a strategically critical position in the national road network. As one of the most urbanised states in southwestern Nigeria, it serves as a major transit hub connecting Lagos, the commercial capital, to the North-Central and North-Western regions through a dense network of federal and state highways, including the Lagos–Ibadan Expressway, the Ibadan–Oyo–Ogbomoso corridor, and numerous secondary intercity routes. The state's combination of high traffic volume, rapid urban expansion, growing vehicle density, and a mix of urban, peri-urban, and rural road environments creates conditions particularly conducive to crash occurrence (Korter et al., 2015). FRSC records confirm that Oyo State consistently ranks among the states with the highest crash frequencies in Nigeria, with the state recording 602 crashes in 2020 and 495 crashes in 2023, and preliminary figures indicating a resurgence to 501 crashes in 2024 (FRSC, 2024). Beyond the toll of lives lost and injuries sustained, these crashes impose direct economic costs, estimated in excess of ₦450 billion annually for Nigeria as a whole, and indirect social costs including school dropout, child labour, and heightened poverty among crash-affected households (Olayemi, 2017; Ajibade & Fadare, 2021). The persistence and cyclical nature of high crash frequencies in Oyo State, despite periodic enforcement drives and infrastructure investments, underscores the urgent need for a rigorous, data-driven examination of how crash patterns have evolved over recent years and what factors are driving those patterns.

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Trend analysis, the systematic examination of changes in data over time to identify underlying patterns, directional shifts, and potential causal dynamics, is a particularly powerful analytical approach in the road safety context (Getis & Ord, 2010). By revealing how crash frequency, severity, and causative factors change across multiple years, trend analysis makes it possible to assess the effectiveness of past interventions, identify emerging risks before they become entrenched, and generate the kind of longitudinal, evidence-based insights that static, cross-sectional studies cannot provide (Li et al., 2018). In Oyo State, where crash figures have oscillated between periods of apparent improvement and subsequent resurgence, trend analysis offers an especially relevant analytical lens, one capable of distinguishing genuine safety gains from temporary fluctuations, and of pinpointing the periods and corridors where targeted intervention is most urgently required (Anselin et al., 2000).

Despite the recognised severity of road traffic crashes in Oyo State, significant gaps remain in the empirical literature. Existing studies have been largely national in scope or rely on aggregated data, limiting their utility for location-specific policy design (Atubi & Gbadamosi, 2015). Where state-level investigations exist, they frequently cover periods before 2020, rendering their findings of limited relevance to the post-pandemic socio-economic environment, which has been characterised by rapid recovery in vehicular movement, renewed urban expansion, and evolving enforcement practices (Adeniran & Fadare, 2018). Furthermore, most prior studies examine either causal factors or injury severity in isolation, without integrating temporal trend analysis, route-level crash distribution, vehicle category involvement, and causative factors within a unified analytical framework (Oluwadiya et al., 2014). The specific five-year period from 2020 to 2024 has received no dedicated empirical attention in the peer-reviewed literature on Oyo State, despite representing a period of considerable socio-economic disruption and recovery that may have substantially altered crash dynamics (Ogunleye et al., 2022). Additionally, no existing study for Oyo State has systematically examined the spatial concentration of crashes along specific high-risk corridors in conjunction with vehicle type involvement and behavioural causative factors, an integration that is essential for corridor-specific safety planning. This study directly addresses these gaps by providing a comprehensive, state-specific, and data-driven trend analysis of road traffic crashes in Oyo State using official FRSC data for the period 2020 to 2024.

Specifically, this study pursues the following objectives:

i. To examine the temporal trends in the frequency and severity of road traffic crashes in Oyo State from 2020 to 2024 by identifying periods of increase, decline, and resurgence in crash occurrence.
ii. To identify the road routes and corridors within Oyo State that record the highest concentration of road traffic crashes across the study period.
iii. To determine the categories and types of vehicles most frequently involved in road traffic crashes in Oyo State between 2020 and 2024.
iv. To analyse the principal causative factors, human, mechanical, and infrastructural, responsible for road traffic crashes in Oyo State over the study period.

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v. To provide evidence-based recommendations for targeted road safety interventions, enforcement strategies, and policy measures aimed at achieving a sustained reduction in road traffic crashes in Oyo State.

The significance of this study is both practical and scholarly. Practically, the findings are intended to serve as a timely evidence base for the Federal Road Safety Corps, the Oyo State Ministry of Public Works and Transport, transport planners, and policymakers seeking to design more effective, data-driven interventions. Scholarly, this study advances a methodological framework that combines temporal trend analysis, spatial route profiling, and causative factor integration within a single analytical structure, an approach that can be replicated in other states and regions confronting similar road safety challenges (Sharma et al., 2021). The remainder of this paper is organised as follows: Section 2 reviews the relevant literature on road traffic crashes, theoretical frameworks, and research gaps; Section 3 describes the research methodology and data sources; Section 4 presents and discusses the empirical findings; and Section 5 offers conclusions and actionable recommendations.

2 Literature Review

Overview of Road Traffic Crashes (RTCs)

Road traffic crashes (RTCs) remain one of the most persistent and inadequately addressed crises in global public health, despite decades of policy attention and intervention. The World Health Organisation (WHO, 2023) estimates that approximately 1.19 million people die on the world's roads each year, with an additional 20 to 50 million sustaining non-fatal injuries. RTCs remain the leading cause of death for children and young adults aged 5 to 29 years, a statistic that is as damning in its consistency as it is in its scale. Yet, this figure warrants scrutiny: the near-static death toll over successive years, despite increases in motorisation globally, reflects not a stable equilibrium but rather a failure to achieve meaningful systemic change in the road safety environment (Bhalla et al., 2021). This raises important questions about the adequacy of existing interventions, the quality of data collection, and the political will to confront the structural drivers of road traffic mortality.

A particularly troubling dimension of the global RTC burden is its geographical inequity. Low- and middle-income countries (LMICs) account for over 90% of road traffic deaths while possessing roughly 60% of the world's registered vehicles (WHO, 2023). This disparity is not merely a reflection of infrastructure deficits; it encodes deeper structural inequalities in regulatory capacity, law enforcement, vehicle safety standards, and health system resilience (Peden et al., 2021). In Sub-Saharan Africa specifically, the combination of rapid and poorly planned urbanisation, persistent poverty, and the dominance of informal and poorly regulated transport sectors has created conditions in which road fatalities continue to rise even as some wealthier regions report modest declines (Labinjo et al., 2023). The framing of this as a simple infrastructure problem, therefore, risks understating the governance and political economy dimensions of the crisis.

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Nigeria exemplifies these contradictions. As the most populous country in Africa, Nigeria also records some of the continent's highest absolute road fatality figures. The Federal Road Safety Corps (FRSC, 2024) recorded 9,570 RTCs in 2024, resulting in 5,421 fatalities. These figures, drawn from official crash registries, are widely acknowledged to represent a significant undercount of actual crash incidence, as many rural crashes and non-hospitalised injuries go unreported (Labinjo et al., 2023). This underreporting problem undermines the reliability of trend analyses and should be considered a fundamental limitation of any study, including this one, which relies solely on FRSC administrative data. Strengthening crash data systems should itself be treated as a road safety priority.

Within this national context, Oyo State presents a regionally significant case. The FRSC (2024) recorded 304 RTCs across the state's 33 local government areas in 2024, resulting in 779 injuries and 222 fatalities. While these figures represent an apparent improvement over the 495 crashes, 270 fatalities, and 1,321 injuries recorded in 2023 (FRSC, 2024), caution is warranted in interpreting such year-on-year declines as evidence of progress. Changes in reporting practices, enforcement activity, or even vehicle traffic volumes can produce fluctuations that do not necessarily reflect genuine safety improvements (Gopalakrishnan, 2022). Disaggregating these figures by route, crash type, and time period, as this study attempts to do, is therefore essential for drawing valid inferences.

Causes of Road Traffic Crashes

Understanding crash causation is foundational to designing effective prevention strategies, yet the literature reveals a persistent tension between the depth of causal explanations available and the narrowness with which causation is typically operationalised in Nigerian road safety research. Most studies continue to reduce crash causation to a hierarchy of proximate factors, primarily human behaviour, without adequate attention to the systemic and structural conditions that generate and sustain those behaviours. This section reviews empirical evidence across the major causal domains while critically engaging with the limitations of prevailing causal frameworks.

Human Factors

Human behaviour consistently emerges as the most frequently cited cause of RTCs in Nigeria and in Oyo State specifically, with speeding, reckless driving, drunk driving, and non-compliance with traffic regulations dominating the causal typologies reported by enforcement agencies. Ezeibe et al. (2022), in their analysis of road crash patterns across Nigerian states, found that driver error, broadly defined, accounted for over 60% of all recorded crashes, with speed violation and dangerous driving as the most common sub-categories. While this dominance of human factors is well-established, it is worth interrogating what it obscures. The attribution of crashes to 'human error' frequently deflects analytical attention away from the broader system failures, inadequate driver training standards, poorly maintained vehicles, and the absence of meaningful speed enforcement infrastructure, which make such errors both more likely and more lethal (Akinwale & Olawoyin, 2022).

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The relationship between substance use and crash risk is also documented, though the evidence base in Nigeria remains thin relative to higher-income settings. Akanni et al. (2021) found significant associations between alcohol use among commercial drivers and self-reported near-miss incidents and crashes in southwestern Nigeria, including Oyo State. However, the authors note that roadside testing for alcohol remains rare, and the true prevalence of alcohol-impaired driving is likely substantially underestimated in official crash statistics. More critically, the commercial transport sector, upon which a large proportion of the Nigerian population relies for intercity and peri-urban travel, is characterised by intense economic pressures that incentivise long driving hours, fatigue, and risk-taking, conditions that substance use may partially reflect rather than independently cause (Olayinka et al., 2023). Interventions that target substance use in isolation, without addressing the occupational conditions of commercial drivers, are therefore likely to have limited impact.

Driver licensing and training standards represent another underexamined dimension of human factor causation. Despite requirements for formal licensing, enforcement of licensing standards in Nigeria is widely acknowledged to be inconsistent, and the acquisition of licences through informal channels remains prevalent (Afolabi et al., 2022). This structural failure in credentialing means that the human error attributed to individual drivers is partly a systemic error embedded in regulatory institutions. Future research and policy should be more explicit in attributing responsibility across the system rather than locating it exclusively in individual road users.

Mechanical and Vehicle-Related Factors

Vehicle condition is a significant but frequently underweighted determinant of crash risk and injury severity in Nigerian road safety literature. Faulty brakes, tyre failures, defective lighting, and overloading are among the mechanical factors most commonly identified in crash investigation reports, though systematic data on mechanical causation remains limited by the lack of standardised post-crash inspection procedures (Nwosu et al., 2022). The reliance on ageing vehicle fleets, particularly in the commercial transport sector, where old and poorly maintained vehicles are disproportionately concentrated, creates a chronic mechanical risk that periodic enforcement operations are insufficient to address.

Nwosu et al. (2022) examined vehicle safety data from crashes reported to the FRSC across six geopolitical zones and found that mechanical failure was cited in approximately 18% of recorded crashes, though they caution that this figure likely understates the true contribution of mechanical factors, which are often misclassified as driver error when the actual cause is a brake failure or tyre blowout at speed. This methodological point has significant implications: if official statistics systematically underattribute crashes to mechanical causes, then the policy emphasis on driver behaviour may be proportionally overstated. A more robust crash investigation regime that includes mandatory vehicle inspections following serious crashes would substantially improve the quality of causal attribution data.

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The regulatory framework for vehicle roadworthiness in Nigeria is also subject to significant criticism. While annual vehicle inspection requirements exist, implementation is inconsistent and widely reported to be subject to corruption, with roadworthiness certificates issued without genuine inspection (Afolabi et al., 2022). This represents a governance failure with direct safety consequences, and it points to the need for institutional reform rather than simply more enforcement of existing rules.

Infrastructure and Road Environment

Road infrastructure quality is a well-documented contributor to crash risk, and Nigeria's road network presents significant challenges in this regard. Deteriorated pavements, absent road markings, inadequate signage, poorly designed junctions, and the absence of pedestrian facilities collectively elevate crash risk, particularly on high-volume intercity routes (Ibrahim et al., 2021). What is less frequently examined is the relationship between road investment patterns and the spatial distribution of crashes, specifically, the tendency for crash clusters to form at the boundaries between newly rehabilitated and still-deteriorated road sections, where speed differentials and driver expectation mismatches create acute risk.

Ibrahim et al. (2021), in their analysis of crash blackspots on federal roads in southwestern Nigeria, found that a disproportionate share of serious crashes occurred at transitional road sections and poorly lit night-driving environments. Their findings challenge the assumption that road rehabilitation uniformly reduces crash risk and suggest that incremental improvements to road quality must be accompanied by speed management measures and enhanced signage to avoid displacement of risk rather than its elimination. This has direct relevance for roads traversing Oyo State, including the Lagos–Ibadan Expressway, sections of which have undergone rehabilitation in recent years.

Urban road design presents a distinct set of challenges. The rapidly expanding metropolitan footprint of Ibadan, the largest city by land area in Sub-Saharan Africa, has outpaced the development of road infrastructure and traffic management systems (Olusanya & Adeleke, 2021). The resulting mix of pedestrian, motorcycle, and motorised vehicle traffic on inadequately designed urban roads, combined with informal roadside commerce and poor lane discipline, creates a high-risk environment that differs substantially from the high-speed intercity corridor context. Any analytical framework applied to Oyo State must therefore be sensitive to the distinction between urban and intercity crash dynamics rather than treating the state as a homogeneous risk environment.

Environmental and Temporal Factors

Temporal and environmental variability in crash occurrence has received relatively limited systematic attention in Nigerian road safety research, despite its importance for understanding crash dynamics and designing responsive enforcement strategies. Existing evidence suggests that crash incidence varies meaningfully by time of day, day of week, and season, but these patterns are rarely explored with sufficient granularity to support operationally useful conclusions (Gopalakrishnan, 2022).

Seasonal variations linked to the harmattan and rainy season represent environmentally significant risk factors. Reduced visibility during harmattan dust conditions and increased road

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slickness during the rainy season contribute to crash risk, particularly for commercial vehicles operating on poorly maintained intercity routes (Labinjo et al., 2023). Public holidays and market days also concentrate traffic volumes and create predictable peaks in crash incidence that are inadequately captured by annual statistics. The FRSC and state traffic management authorities could substantially improve the efficiency of their enforcement operations by developing time- and place-specific deployment strategies informed by more granular temporal crash data, a resource this study seeks to contribute to for Oyo State.

Combined and Structural Risk Factors

A critical limitation of much of the existing literature on RTC causation in Nigeria is its tendency to treat causal factors as analytically separable when in practice they operate in interaction and are embedded in broader structural conditions. Speeding is not simply a behavioural choice; it is partly a function of poorly designed roads that facilitate high speeds, inadequate speed enforcement that fails to deter violations, and commercial pressures that reward fast turnaround times. Mechanical failures occur more frequently in conditions of poverty that make vehicle maintenance unaffordable and in regulatory environments where inspection requirements go unenforced. Infrastructure deficits are products of institutional failures, funding gaps, and governance problems that transcend the road safety sector (Akinwale & Olawoyin, 2022).

The implication is that road safety interventions designed around isolated causal factors, however well-evidenced those factors may be, are unlikely to achieve sustained reductions in crash incidence unless they are embedded in broader systemic reforms. This point is reinforced by the evidence from countries that have achieved significant and sustained reductions in road fatality rates, which consistently demonstrates that success requires simultaneous progress across multiple domains: safer road design, safer vehicles, safer road use behaviour, and effective post-crash response (Bhalla et al., 2021). Nigeria's road safety trajectory over the past decade, characterised by fluctuating rather than consistently declining fatality rates, suggests that current interventions have achieved only partial system-level impact.

Consequences and Implications of RTCs

The consequences of road traffic crashes in Nigeria extend far beyond the immediate casualties, permeating health systems, household economies, and social welfare structures in ways that are systematically underquantified in existing research. A comprehensive understanding of these consequences is not merely academic; it provides the evidentiary basis for arguing the economic and social case for road safety investment to policymakers who may not be responsive to mortality statistics alone.

Human Casualties and Public Health Burden

The epidemiological burden of RTCs in Nigeria falls disproportionately on young men of working age, a demographic concentration with compounding social and economic consequences

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(Nwosu et al., 2022). Beyond fatalities, the burden of non-fatal injuries is arguably even more significant in aggregate, given the chronic disability, prolonged hospitalisation, and long-term rehabilitation costs associated with serious crash injuries. Traumatic brain injuries, spinal cord damage, and lower-limb injuries are among the most common and debilitating outcomes of high-speed crashes on Nigerian roads, yet Nigeria's rehabilitation infrastructure is demonstrably inadequate to the scale of need (Olusanya & Adeleke, 2021).

A significant and underappreciated dimension of the public health burden is the strain that high RTC injury volumes impose on hospital systems that are already resource-constrained. Emergency departments in Oyo State, particularly in Ibadan, receive a substantial proportion of their caseloads from road traffic incidents, diverting resources from other health priorities and contributing to delays in emergency care, that they increase mortality (Olayinka et al., 2023). This systemic relationship between road safety and health system capacity is rarely foregrounded in road safety literature, but is critically important for understanding the full cost of inaction.

Economic Implications

The economic costs of road traffic crashes in Nigeria have been estimated at significant fractions of national GDP, though the reliability of available estimates varies with the quality of underlying data. Peden et al. (2021), drawing on updated WHO methodology for estimating the full costs of road traffic injury, including production losses, medical costs, and administrative costs, estimate that road crash costs in LMICs typically range from 1% to 3% of GDP. For Nigeria, with its scale of crash incidence, the total economic burden is plausibly in the range of several hundred billion naira annually, though definitive national estimates are constrained by the same data quality limitations that affect crash statistics generally.

At the household level, the economic consequences of crash-related death or serious injury are often catastrophic. The loss of a primary income earner, combined with the out-of-pocket medical expenses associated with trauma care in Nigeria's largely fee-for-service health system, can precipitate long-term poverty for affected families (Akanni et al., 2021). In Oyo State, where a substantial proportion of the workforce is engaged in informal sector employment without any form of social insurance, these household-level impacts are particularly severe. This distributional dimension of the RTC burden, that it falls most heavily on those least equipped to absorb it, is rarely adequately emphasised in policy discussions that focus primarily on aggregate cost estimates.

Emergency Services and Infrastructure Pressure

The capacity of emergency response systems to manage the consequences of RTCs is a critical determinant of crash mortality that receives insufficient attention in the road safety literature relative to crash prevention. Response time, the quality of pre-hospital care, and the availability of trauma-equipped facilities are all significant predictors of crash survival, yet investment in these elements of the road safety system lags substantially behind investment in prevention-focused enforcement and engineering (Olayinka et al., 2023). In Oyo State, geographical challenges, including the state's large

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rural area, create structural barriers to timely emergency response that are unlikely to be resolved without substantial investment in pre-hospital care infrastructure and system coordination.

A further institutional challenge is the coordination between multiple agencies with overlapping mandates in crash response: the FRSC, the Nigeria Police Force, state ambulance services, and hospital emergency departments each play roles in post-crash response, but the absence of effective coordination mechanisms frequently results in delays and fragmentation of care (Afolabi et al., 2022). Addressing this coordination failure requires institutional reform as well as investment in communications and logistics infrastructure, a challenge that spans multiple sectors and governance levels.

Psychosocial and Family Impact

The psychosocial consequences of road traffic crashes, including post-traumatic stress disorder, depression, and anxiety among survivors and bereaved family members, are significantly underrepresented in the Nigerian road safety literature relative to their actual prevalence and impact. Eze et al. (2021) found high rates of clinically significant PTSD symptomatology among RTC survivors attending trauma clinics in southwestern Nigeria, yet psychiatric and psychosocial support services within the health system are minimally equipped to address this burden. The invisibility of mental health consequences in aggregate crash statistics risks perpetuating a partial and distorted picture of the true cost of road traffic injury.

The family-level disruption caused by crash-related death and serious injury has multigenerational consequences. Children in households that lose a primary earner to road traffic death face elevated risks of educational discontinuation and child labour, with implications for human capital accumulation and intergenerational poverty (Olusanya & Adeleke, 2021). These consequences are difficult to quantify but are nonetheless real and policy-relevant, and they suggest that the case for road safety investment must be made not only in terms of direct crash costs but also in terms of its broader social and developmental value.

Legal and Institutional Challenges

The institutional landscape of road safety governance in Nigeria is characterised by a fragmentation of mandates, inconsistency of enforcement, and a persistent gap between formal legal frameworks and their practical application. The FRSC's mandate is primarily federal and focused on inter-state roads, while state-level traffic management authorities such as OYTMA have jurisdiction over urban and state roads, creating jurisdictional ambiguities that are exploited by traffic violators and complicate accountability for safety outcomes (Ezeibe et al., 2022). The relative underfunding of both agencies, combined with documented corruption in enforcement operations, further undermines the deterrent effect that enforcement is intended to produce.

A deeper institutional problem is the absence of a strong evidence-to-policy feedback loop in Nigerian road safety governance. Decisions about where to deploy enforcement resources, which road sections to prioritise for improvement, and which interventions to fund are rarely grounded in

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systematic analysis of crash data, partly because such data are not collected in a form that readily supports strategic decision-making (Ibrahim et al., 2021). The present study's attempt to generate route-level, temporally disaggregated crash analysis for Oyo State is therefore not merely an academic exercise but a response to a genuine gap in the evidence infrastructure that supports road safety governance in the state.

Research Gaps

Despite a growing body of literature on road traffic crashes in Nigeria, significant gaps remain that limit the capacity of existing research to support evidence-based road safety policy at the state level. These gaps are not merely technical but reflect deeper structural limitations in how road safety research has been framed and resourced in the Nigerian context.

Primarily, the temporal currency of available evidence is a persistent problem. Much of the published literature on RTCs in Oyo State and comparable Nigerian states draws on data from the pre-2020 period, a timeframe that predates several significant changes in the road environment, including ongoing expressway rehabilitation projects, shifts in traffic volume following the COVID-19 pandemic, and changes in enforcement strategy by the FRSC and OYTMA (Gopalakrishnan, 2022). Evidence from this earlier period may not accurately reflect current crash dynamics, and the absence of recent empirical studies creates a knowledge gap that this study directly addresses by utilising FRSC data for the period 2020 to 2024.

Similarly, the spatial granularity of existing state-level analyses is generally insufficient for operational road safety planning. Studies that aggregate crash data to the state or geopolitical zone level obscure the substantial within-state variation in crash risk that is necessary to identify high-priority corridors and localities for targeted intervention (Ibrahim et al., 2021). Route-level and local government area-level analysis, as employed in this study, provides a more actionable evidence base for both road engineering and enforcement decisions.

Furthermore, the existing literature rarely integrates multiple analytical dimensions, temporal trends, spatial distribution, vehicle type involvement, and causative factors within a single analytical framework. This fragmentation means that important interactions between these dimensions are typically missed. For example, understanding that crash incidence on a particular corridor peak during a particular season, involves a particular vehicle category, and is associated with a particular causal factor creates a far more actionable risk profile than any single dimension could provide alone (Bhalla et al., 2021). This study's integrated analytical approach, therefore, represents a methodological contribution as well as an empirical one.

Lastly, the critical question of intervention effectiveness, which policies and enforcement strategies have actually reduced crashes, and under what conditions, is barely addressed in the Nigerian literature. Longitudinal trend analysis that spans periods of different policy regimes can provide

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preliminary evidence on this question, and the five-year scope of this study's data offers some potential for this kind of analysis, subject to the limitations of administrative crash data.

This study addresses these gaps by providing a recent, state-specific, and data-driven analysis of road traffic crashes in Oyo State using FRSC data covering the period 2020 to 2024. By combining temporal trend analysis, route-level crash distribution, vehicle type involvement, and causative factors within a single framework, and by engaging critically with the limitations of the available data, the study aims to generate current, policy-relevant insights that are distinguished from earlier work both in their empirical currency and their analytical depth.

Theoretical Review

This study is grounded in three established theoretical frameworks that collectively provide a multi-level conceptual basis for analysing road traffic crashes: Heinrich's Domino Theory, Haddon's Matrix, and Risk Homeostasis Theory. These frameworks are not merely historical references but active analytical tools whose strengths and limitations must be engaged with critically if they are to add genuine explanatory value.

Heinrich's Domino Theory conceptualises accidents as the sequential outcome of a chain of causative events, from social environment and personal characteristics, through unsafe acts and physical hazards, to the accident event and resulting injury (Heinrich, 1931). The practical implication is that interrupting the chain at any point, but especially at the level of unsafe acts, can prevent the ultimate harm. The theory's enduring influence on road safety thinking, particularly its emphasis on human behaviour as a critical intervention point, is evident in the dominant framing of Nigerian crash prevention policy around enforcement of traffic rules and driver education.

However, Heinrich's framework has attracted substantial criticism for its tendency to individualise accident causation and to direct preventive attention toward frontline behaviours rather than systemic conditions (Hollnagel, 2020). In the road safety context, this critique has real force: an exclusive focus on driver behaviour as the domino to be removed risks neglecting the upstream systemic conditions, vehicle safety standards, road design, licensing adequacy, that determine both the likelihood of unsafe acts and the severity of their consequences when they occur. Applied uncritically, the Domino Theory can thus serve to justify enforcement-heavy, individual-blame approaches while deflecting accountability from institutional actors. This study draws on the theory's structural chain logic while resisting its reductive tendency to individualise causation.

Haddon's Matrix offers a more systemically sophisticated analytical framework by organising contributing factors according to their temporal phase (pre-crash, crash, post-crash) and their domain (human, vehicle, environment), creating a structured grid within which risk factors and intervention opportunities can be comprehensively mapped (Haddon, 1970; Peden et al., 2021). This framework has become foundational to modern road safety analysis precisely because it resists single-cause attributions and instead maps the interaction of multiple factors across the crash event.

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Applied to Oyo State, the pre-crash phase encompasses driver behaviour, vehicle condition, traffic density, and road geometry; the crash phase focuses on impact forces and vehicle crashworthiness; and the post-crash phase addresses the quality and speed of emergency response and trauma care. The framework is particularly useful for understanding crash concentration along major Oyo State corridors, where high traffic volumes interact with infrastructure deficiencies and limited post-crash response capacity to produce elevated fatality rates. Haddon's Matrix also usefully directs attention to the post-crash domain, which receives comparatively little emphasis in Nigerian road safety policy despite evidence that improvements in emergency response could significantly reduce crash fatality rates (Olayinka et al., 2023). A limitation of the framework is that it does not inherently address the political and governance dimensions of road safety, why known interventions remain unimplemented, requiring supplementary analytical frameworks.

Risk Homeostasis Theory, developed by Wilde (1982) and subsequently elaborated in response to empirical challenges, proposes that individuals maintain a target level of risk in their behaviour, adjusting their conduct in response to perceived changes in safety conditions. Under this model, improvements in road safety infrastructure or vehicle safety may be partially offset by compensatory behavioural adaptations, driving faster on newly rehabilitated roads, for instance, or relying more heavily on vehicle safety features and less on attentive driving. This dynamic helps explain why infrastructure investment alone often fails to produce proportional reductions in crash rates.

The relevance of Risk Homeostasis Theory to the temporal variability of crash trends in Oyo State is significant. Periods of apparent crash reduction following enforcement campaigns or infrastructure improvement may be followed by subsequent increases as road users adapt their behaviour to the changed safety environment. The theory, therefore, implies that sustainable safety improvement requires interventions that modify risk perception and motivational structures, not merely physical and regulatory conditions (Wilde, 1982; Gopalakrishnan, 2022). Critics of the theory have argued that it overstates the rationality and consistency of driver risk calibration and underestimates the extent to which crashes are the product of momentary inattention rather than deliberate risk-taking. These criticisms have merit but do not undermine the theory's core insight: that behavioural adaptation is a real and significant moderator of the effects of safety interventions, and that road safety policy must account for this dynamic rather than assuming that physical or regulatory changes will translate directly into behavioural change.

Collectively, these three theoretical frameworks provide a robust and multi-level conceptual foundation for this study. Heinrich's Domino Theory identifies human behaviour as a critical intervention point within causal chains while alerting us to the risk of over-individualising causation. Haddon's Matrix provides a structured, multi-domain, temporally organised framework for mapping risk factors and intervention opportunities. Risk Homeostasis Theory introduces a dynamic dimension, explaining why the effects of interventions may be attenuated or reversed over time through

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behavioural adaptation. Their combined and critically engaged application substantially enriches both the analytical depth of the study and the practical relevance of its conclusions for road safety policy in Oyo State and comparable settings.

3. Methodology

The descriptive research design used in this study is suitable for examining the statistical features and temporal trends of road traffic crashes (RTCs) over a specified period of time. In order to compile and analyse data on the frequency, severity, and causes of RTCs in Oyo State from 2020 to 2024, the design makes use of descriptive statistical tools. An evidence-based understanding of the state's road safety situation is made possible by this non-experimental approach, which allows for a methodical analysis of the data currently available to spot patterns and trends without changing any variables.

The study is carried out in Oyo State, which is in southwest Nigeria. Ibadan is the capital and largest urban centre of the state, which is estimated to be 28,454 square kilometres in size and includes both urban and rural areas. The Republic of Benin borders Oyo State to the west, Ogun State to the south, Kwara State to the north, and Osun State to the east. Major federal highways with high traffic volumes, like the Lagos - Ibadan, Ibadan–Oyo, Oyo–Ogbomoso, and Ibadan–Iseyin routes, are part of the state's road network. The state is an appropriate case study for evaluating road crash trends because it combines heavy traffic, intercity transportation, and commercial activity.

A Map of Oyo State showing the main (federal), secondary (State) and local roads
Source: Google, 2025

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Mainly, secondary data from trustworthy institutional and governmental records were used in the study. The Oyo State Ministry of Public Works and Transport (OYSMPWT), via the Department of Transport (DoT), collaborates with the Federal Road Safety Corps (FRSC), Oyo State Command regularly to ensure intracity and intercity roads are safe. As a result, annual reports gathered by FRSC are shared with the Ministry for data-driven decision-making. FRSC keeps official records of all traffic accidents that are reported in the state. Key variables such as year, number of crashes, number of fatalities, number of injuries, and major causes of crashes (e.g., overspeeding, dangerous driving, mechanical failure, or poor road conditions) are included in the datasets. Before analysis, data from 2020 to 2024 is extracted, compiled, and checked for consistency.

The following analytical techniques are used to find and interpret trends because the study focuses on descriptive statistical techniques:

i. Frequency and Percentage Distribution: To ascertain the yearly incidence of crashes and their proportional shares over five years.
   Trend and Pattern Analysis: Annual variations in the number of collisions, fatalities, and injuries are displayed using Tables and a line graph.
ii. For computation, tabulation, and graphical presentation, Microsoft Excel and SPSS (Statistical Package for the Social Sciences) are used in all analyses.

4. Findings and Discussion

According to Table 1, the trend of road traffic crashes (RTCs) in Oyo State from 2020 to 2024 indicates a varying but generally downward trend in the later years. From 602 in 2020 to 674 in 2022, the overall number of crashes increased gradually, suggesting a brief increase that could be linked to the post-pandemic traffic recovery, more vehicles on the road, and recurring human errors like speeding and careless driving. Atubi (2022) asserts that during times of economic recovery, these increases frequently reflect the consequences of inadequate traffic law enforcement and poor road maintenance. However, a notable decline occurred in 2023 (495 crashes), which slightly rose to 501 in 2024, suggesting improved road safety enforcement and awareness campaigns by the Federal Road Safety Corps (FRSC). This finding aligns with Aliyu et al. (2020), who emphasised that effective traffic regulation and public education programs can reduce RTC frequency over time.

Although there are some fluctuations, overall, the pattern shows a transitional improvement in road safety in Oyo State, indicating the need for ongoing preventive measures. The slight increase in 2024 indicates that underlying risk factors like driver fatigue, inadequate vehicle maintenance, and infrastructure issues still exist despite advancements. This observation is in line with research by Onakpoya et al. (2019), who found that irregular fluctuations in crash trends are frequently caused by uneven data reporting and inconsistent road safety interventions in Nigeria. However, the decline from

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2022 to 2023 shows that focused enforcement and infrastructure upgrades can have quantifiable effects on lowering crash rates (FRSC, 2024; Inah, 2025).

Table 1: Total number of Road Traffic Crashes from 2020 to 2024

Year	Total No of Accidents
2020	602
2021	628
2022	674
2023	495
2024	501
Total	**2,900**

Source: Authors' Survey, 2025

Analysis of Road Traffic Crash Victims

The number of people killed, injured, and unscathed in traffic accidents in Oyo State between 2020 and 2024 shows a dynamic but alarming trend (Table .2). Over the course of the five years, 19,397 people were involved in crashes; the highest percentage (24%), 2021 (22%), and 2023 (15%) were the years with the highest and lowest percentages, respectively. According to the findings, there were consistent increases in casualties from 2020 to 2022, which may have been brought on by post-pandemic travel spikes and ongoing driver negligence. The pattern confirms the findings of Atubi (2022) and Aliyu et al. (2020), who found that poor vehicle maintenance, overspeeding, and reckless driving were frequent causes of high crash involvement rates in southwest Nigeria.

Aggregation by gender and age also shows that adults make up 93% of all crash victims, while children make up only 7%. In every category (injured, killed, and unscarred), males continuously outnumber females, indicating that they are more exposed to the road as commuters and drivers. According to FRSC (2024) records and research by Onakpoya et al. (2019), the majority of crashes in Nigeria result in non-fatal but serious injuries because of low-speed urban impacts and delayed emergency response. This trend is consistent with the fact that the percentage of injured people (41%) greatly exceeds the percentage of killed people (7%). In order to achieve consistent safety results, continuous enforcement, better road infrastructure, and recurring public awareness campaigns are necessary. This is demonstrated by the slight decline in casualties in 2023 and the subsequent resurgence in 2024.

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Table 2: Analysis of Road Traffic Crash Victims

	NUMBER INJURED					NUMBER KILLED					NUMBER UNSCARRED					PEOPLE INVOLVED					
	ADULT		CHILD		TOTAL	ADULT		CHILD		TOTAL	ADULT		CHILD		TOTAL	ADULT		CHILD		TOTAL	% TOTAL
	M	F	M	F		M	F	M	F		M	F	M	F		M	F	M	F		
YEAR 2020	1090	355	37	34	1516	193	54	6	10	263	1531	351	15	32	1929	2814	760	58	76	**3708**	**19%**
YEAR 2021	1257	375	24	35	1691	248	66	12	7	333	1733	383	40	32	2188	3238	824	76	74	4212	**22%**
YEAR 2022	1356	433	36	27	1852	249	46	4	5	304	1953	472	23	31	2479	3558	951	63	63	4635	**24%**
YEAR 2023	984	286	26	21	1317	227	31	10	2	270	1107	203	21	15	1346	2318	520	57	38	2933	**15%**
YEAR 2024	866	266	32	340	1504	212	37	2	0	251	1357	302	38	457	2154	2435	605	72	797	3909	**20%**
TOTAL	**5553**	**1715**	**155**	**457**	**7880**	**1129**	**234**	**34**	**24**	**1421**	**7681**	**1711**	**137**	**567**	**10096**	**14363**	**3660**	**326**	**1048**	**19397**	**100%**
% TOTAL	**29%**	**9%**	**1%**	**2%**	**41%**	**6%**	**1%**	**0%**	**0%**	**7%**	**40%**	**9%**	**1%**	**3%**	**52%**	**74%**	**19%**	**2%**	**5%**	**100%**	

Source: Authors' Survey, 2025

Total Number of Vehicles Involved

As shown in Table 3, the trend of the total number of vehicles involved in traffic accidents in Oyo State from 2020 to 2024 shows a cyclical pattern that reflects the variances in the overall number of crashes. The total number of vehicles involved increased by 13.38% over the first three years, from 1,003 in 2020 to 1,158 in 2022. Increased motorisation, increased traffic, and a state-wide decline in the culture of vehicle maintenance could all be responsible for this upward trend. According to Atubi (2022), an increase in the number of vehicles involved in collisions is frequently caused by the growth of private vehicle ownership and commercial transportation operations without matching improvements to the road infrastructure.

The number of vehicles involved, however, decreased significantly to 822 in 2023 before slightly increasing to 833 in 2024. This decrease raises the possibility that safety measures, more stringent enforcement, or short-term mobility restrictions during traffic management and infrastructure repairs could be beneficial. However, the modest increase in 2024 suggests that while road safety measures might produce short-term benefits, ongoing driver education, effective road monitoring, and routine vehicle inspections are necessary for long-term sustainability. This pattern is consistent with the findings of Onakpoya et al. (2019), who noted that irregular road maintenance procedures and uneven enforcement frequently cause fluctuations in the number of vehicles involved in crashes in Nigeria.

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Table 3: Analysis of the Total Number of Vehicles Involved

YEAR	Total No of Vehicles involved	Percentage (%)
2020	1003	20.72
2021	1024	21.16
2022	1158	23.93
2023	822	16.98
2024	833	17.21
Total	**4,840**	**100.00**

Source: Authors' Survey, 2025

Class of Vehicles Involved

Commercial vehicles made up 68% of all vehicles involved in road traffic crashes in Oyo State between 2020 and 2024, according to an analysis of vehicle class involvement in these crashes (Table 4). This dominance illustrates how heavily the people of the state rely on commercial transportation services like buses, minibuses, and taxis for both intra- and inter-city travel. Commercial vehicle participation peaked in 2022 (753), fell precipitously to 492 in 2023, and then increased marginally in 2024 (624). This pattern implies that higher crash frequencies are frequently associated with times of increased commercial activity and traffic intensity. According to Atubi (2022) and Aliyu et al. (2020), the high involvement of commercial vehicles in crashes across southwestern Nigeria is strongly associated with factors such as overspeeding, driver fatigue, poor vehicle maintenance, and inadequate compliance with road safety regulations.

On the other hand, 28% of all vehicles involved in collisions were private vehicles, 1% were government vehicles, and 3% were other vehicles. The comparatively lower numbers for government and private vehicles might be the result of improved driver behaviour, a better maintenance culture, or less exposure to high-risk and long-distance driving. But the fact that private vehicles continue to be involved in all years shows that commercial drivers are not the only ones who face road safety issues. The slow drop in overall collisions involving all car classes from 2022 to 2024 is consistent with FRSC (2024) reports that show stronger enforcement actions and the implementation of more stringent vehicle inspection procedures in Oyo State.

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Table 4: Class of Vehicles Involved

VEHICLE CLASS	YEARS						
	2020	**2021**	**2022**	**2023**	**2024**	**TOTAL**	**% TOTAL**
Private	290	227	344	283	206	1350	**28%**
Commercial	682	713	753	492	624	3264	**68%**
Govt	8	7	6	4	3	28	**1%**
Others	23	31	55	41	0	150	**3%**
TOTAL	**1003**	**978**	**1158**	**820**	**833**	4792	**100%**
% TOTAL	**21%**	**20%**	**24%**	**17%**	**17%**	**100%**	

Source: Authors' Survey, 2025

Category of the Vehicle Involved

According to a breakdown of vehicle types involved in traffic accidents in Oyo State from 2020 to 2024 (Table 5), the three most common vehicle types among crash incidents are motorcycles (23%), cars (20%), and buses (20%). This trend emphasises how common two- and four-wheeled passenger transport vehicles are in the state's transportation network. Given the widespread use of motorcycles for commercial transportation (okada) in both urban and rural areas, the high percentage of motorcycle involvement is especially worrisome. Atubi (2022) claims that riders' reckless overtaking techniques, lack of use of protective gear, and poor adherence to traffic laws are the main causes of the rising motorcycle crash rates in southwest Nigeria. Similarly, the consistent crash involvement of cars and buses reflects the pressure on public and private transport systems, where overspeeding, distraction, and vehicle congestion remain major contributing factors (Aliyu et al., 2020).

Significant involvement was also shown by heavy-duty vehicles like trucks (15%), trailers (7%), and tankers (3%), highlighting the rising risks of moving freight along important routes like the Oyo–Ogbomoso and Ibadan–Oyo corridors. These findings align with those of Onakpoya et al. (2019), who observed that large commercial and articulated vehicles are often implicated in fatal crashes due to mechanical failures and inadequate driver training. Although their presence shows that all vehicle types contribute to the overall crash burden, the small contributions from pickups (4%), SUVs (3%), and bicycles (1%) suggest lower exposure levels. The persistence of high crash figures among both light and heavy vehicles implies that improving vehicle inspection regimes, enforcing driver licensing standards, and strengthening roadworthiness monitoring are essential for achieving sustained reductions in crash frequencies (FRSC, 2024; Inah, 2025).

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Table 5: Analysis of the Category of the Vehicle Involved

VEHICLE CATEGORY	YEARS 2020	2021	2022	2023	2024	TOTAL	% TOTAL
Car	208	213	212	156	165	954	20%
Motor Cycle	225	211	281	215	195	1127	23%
Bus	188	201	251	148	165	953	20%
Pick Up	46	37	51	36	36	206	4%
Tanker	42	34	30	24	27	157	3%
Bicycle	1	0	26	0	0	27	1%
Truck	167	190	143	111	93	704	15%
Trailer	63	60	81	67	57	328	7%
SUV	27	37	40	29	28	161	3%
NA	36	41	43	36	67	223	5%
TOTAL	**1003**	**1024**	**1158**	**822**	833	**4840**	100%
% TOTAL	21%	21%	24%	17%	17%	100%	

Source: Authors' Survey, 2025

Causes of Road Traffic Crashes

According to Table 6, which examines the causes of traffic accidents in Oyo State from 2020 to 2024, human-related factors account for more than 80% of all incidents. Speed violations (SPVs) are the most common of these, accounting for 48% of all collisions during the five years. This suggests that among state road users, excessive speeding continues to be the most prevalent and hazardous behavioural problem. The pattern is consistent with regional and national findings by Aliyu et al. (2020) and the Federal Road Safety Corps (FRSC, 2024), which both stress that speeding dramatically raises the likelihood and seriousness of traffic accidents. Risky driving behaviour is a key determinant of crash frequency, and other significant human factors include loss of control (12%), dangerous overtaking (8%), and dangerous driving (7%). Despite having relatively lower frequencies, factors like driving under the influence (1%) and route violations (4%) are still important because they have the potential to be fatal. The high frequency of human error is a reflection of structural flaws in Oyo State's licensing enforcement, driver education, and public adherence to traffic safety laws.

Although they had a smaller impact, non-human factors were nevertheless quantifiable in the trends of traffic accidents during that time. Mechanical factors such as brake failure (6%), Tyre burst (5%), and mechanically deficient vehicles (3%) collectively accounted for about 14% of total crashes, suggesting lapses in vehicle maintenance and inspection compliance. Infrastructure-related factors, including bad roads (1%), also contributed marginally but remain contextually important, as poor road conditions exacerbate the effects of driver error. The erratic yearly trend, which saw a sharp increase in 2024 (23% of all crashes), might be a result of the state's increased mobility and vehicle density

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following COVID-19. The results are in line with those of Inah (2025) and Atubi (2022), who noted that behavioural factors rather than structural ones are the primary cause of crashes in southwest Nigeria. This emphasises how urgently behavioural reorientation, more stringent traffic enforcement, and improved vehicle roadworthiness inspections are needed as the main tactics to reduce the number of crashes in Oyo State.

Table 6: Analysis of the Causes of Road Traffic Crashes

Causative Factors	Code	Nature of the Factor	Years						
			2020	2021	2022	2023	2024	Total	% Total
Dangerous Overtaking	DOT	Human	98	81	63	36	30	308	**8%**
Loss Of Control	LOC	Human	119	37	4	0	285	445	**12%**
Road Obstruction Violation	ROV	Human	12	7	3	6	29	57	**2%**
Speed Violation	SPV	Human	299	362	440	357	330	1788	**48%**
Dangerous Driving	DGD	Human	65	51	68	64	7	255	**7%**
Driving Under Alcohol/Drug Influence	DUI	Human	6	6	7	5	13	37	**1%**
Tyre Burst	TBT	Mechanical	42	51	57	29	21	200	**5%**
Route Violation	RTV	Human	25	33	42	33	28	161	**4%**
Sleeping on the steering wheel	SOS	Human	7	2	1	1	3	14	**0%**
Brake Failure	BFL	Mechanical	36	45	41	52	45	219	**6%**
Fatigue	FTQ	Human	6	24	10	8	3	51	**1%**
Bad Road	BRD	Infrastructure	13	11	4	5	9	42	**1%**
Mechanically Deficient Vehicle	MDV	Mechanical	30	24	23	12	19	108	**3%**
Overloading	OVL	Human	0	0	0	0	11	11	**0%**
		TOTAL	**758**	**734**	**763**	**608**	**833**	**3696**	**100%**
		% TOTAL	**21%**	**20%**	**21%**	**16%**	**23%**	**100%**	

Source: FRSC, 2025

Routes of Occurrence of the Road Traffic Crashes

According to the data, 3,696 types of traffic accidents (based on Causative Factors) happened on Oyo State's main thoroughfares between 2020 and 2024. According to Figure 1, the annual distribution shows a noticeable variation: 602 crashes in 2020, 628 in 2021, 674 in 2022, 495 in 2023, and 833 in 2024. This suggests that safety issues were resurgent in the most recent year.

Ibadan Metropolis had the most crashes (428; 13%) according to route-specific trends, which is indicative of its heavy traffic volume, urban congestion, and high vehicle-pedestrian interaction.

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Additional important routes are Lagos–Ibadan (345; 11%), Ogbomoso–Oyo (381; 12%), and Oyo–Ogbomoso (242; 7%), all of which are important intercity corridors with significant passenger and freight traffic. More than 43% of all reported crashes occurred in these four corridors alone, highlighting their strategic and dangerous nature.

Recurrent bidirectional accident patterns on major access roads into Ibadan were indicated by secondary but still significant crash concentrations along Oyo–Ibadan (197; 6%), Ibadan–Lagos (192; 6%), and Gbongan–Ibadan (180; 6%). Measurable incidents were also observed on routes like Oyo–Ibadan (old road) and Ibadan–Oyo (old road), indicating ongoing risks on older alignments with less-than-ideal geometry and upkeep.

However, less than 1% of all crashes occurred on a number of rural and minor inter-town routes such as Iseyin–Saki, Igbeti–Ilero, and Kisi–Igbeti and others, which may be due to either lower traffic volume or underreporting in isolated locations.

Overall, the data shows that major intercity highways and urban centres account for the majority of crash incidents, especially in the vicinity of Ibadan and the Oyo–Ogbomoso corridors. The 2024 spike necessitates a renewed emphasis on road user education, infrastructure upkeep, and enforcement along these high-risk routes.

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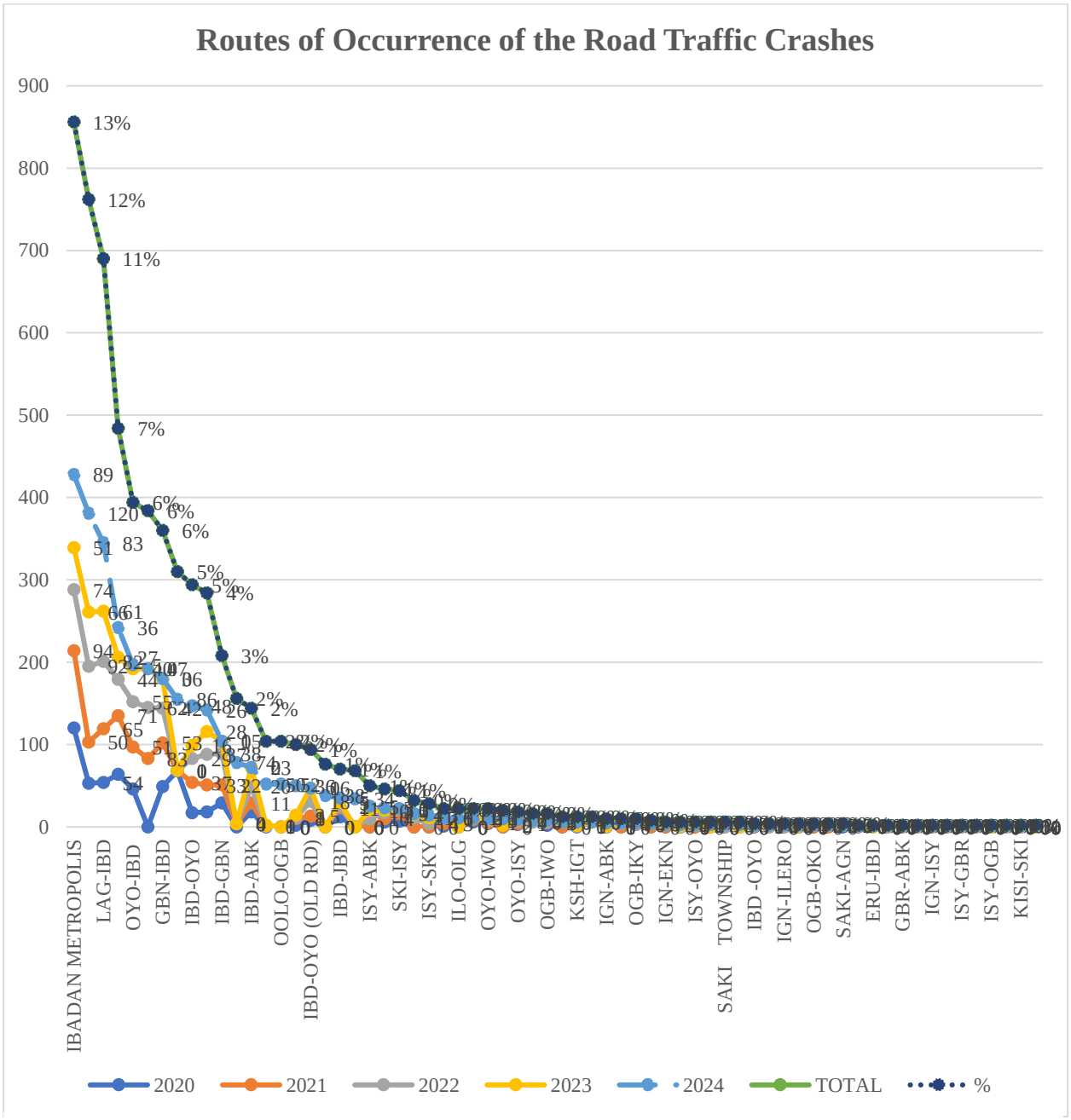

Figure 1: Routes of Occurrence of the Road Traffic Crashes

5. Conclusion and Recommendations

Data on traffic accidents in Oyo State between 2020 and 2024 shows a recurring and complex problem with road safety. With significant year-to-year variations, an initial increase from 2020 to 2022, a slight decline in 2023, and a sharp increase again in 2024, a total of 3,232 crashes were reported over the five years. This cyclical pattern suggests that systemic and infrastructure problems continue to erode long-term safety gains, even though enforcement and sensitisation initiatives may have produced short-term improvements.

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Crash distribution is concentrated along major transit corridors. The Ibadan Metropolis alone was responsible for 13% of all crashes, closely followed by the Ogbomoso–Oyo (12%) and Lagos–Ibadan (11%) routes, which together account for nearly half of the reported incidents. These corridors are crucial routes for both freight and commuter traffic because of their high vehicle density, mixed traffic composition, and frequent human-vehicle interactions. These regions' high crash rates serve as a reminder of the interconnected effects of reckless driving, speeding, urban congestion, and inadequate traffic control infrastructure.

According to a vehicle-type analysis, cars, buses, and motorcycles are the most common vehicles involved in crashes, which is consistent with their widespread use in both urban and intercity transportation. Poor road conditions and insufficient signage on some rural and older alignments exacerbate human factors, which continue to be the primary causes of crashes. These factors include driving too fast, reckless overtaking, distracted driving, and disregard for traffic laws.
The results show that although road transportation is still the main source of mobility in Oyo State, its safety performance is hampered by inadequate infrastructure, lax enforcement, and low public compliance with safety rules. Crash frequency and severity will likely continue to increase in the absence of concerted policy action.

The study recommended that:

a. Targeted Enforcement on High-Risk Corridors The study found that over 43% of all crashes occurred on just four corridors — Ibadan Metropolis (13%), Ogbomoso–Oyo (12%), Lagos–Ibadan (11%), and Oyo–Ogbomoso (7%). Enforcement efforts by the FRSC and OYTMA should therefore be spatially concentrated, with permanent checkpoints, mobile patrol units, and automated speed cameras deployed specifically along these corridors rather than spread thinly across the state. Deployment strategies should also be time-sensitive, escalating during public holidays and market days when traffic volumes historically peak.

b. Mandatory Behavioural Reorientation Programmes for Commercial Drivers. Since commercial vehicles accounted for 68% of all vehicles involved in crashes, and speed violations alone was responsible for 48% of all incidents, a structured, compulsory re-certification programme for commercial drivers is urgently needed. The curriculum must cover defensive driving, fatigue recognition, speed management, and the legal consequences of traffic offences. Driving schools and unions (NURTW, RTEAN) should be co-opted as delivery partners. The re-certification should be a condition for the annual renewal of commercial vehicle operating permits.

c. c. Comprehensive Overhaul of Motorcycle Regulation Motorcycles were the single most crash-involved vehicle category (23% of all vehicles in crashes), with consistent involvement recorded across all five years. Given the dual role of motorcycles in urban and rural mobility (commercial "okada" operations), the state needs a dedicated motorcycle safety policy, covering mandatory helmet enforcement, clearly demarcated okada routes, operator licensing

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specific to commercial motorcycle use, and a public awareness programme on proper riding behaviour.

d. Structured Vehicle Roadworthiness Inspection Regime Mechanical failures, brake failure (6%), tyre burst (5%), and mechanically deficient vehicles (3%) collectively accounted for approximately 14% of crashes. The existing Vehicle Inspection Service (VIS) must be strengthened through independent oversight to eliminate the issuance of certificates without genuine inspection. The FRSC should conduct random roadside mechanical checks along the high-risk corridors identified in this study, with particular focus on commercial vehicles and heavy-duty trucks, which have both high exposure and high crash severity.

e. Corridor-Specific Infrastructure Upgrades with Speed-Calming Measures The Lagos–Ibadan, Ibadan–Oyo, and Oyo–Ogbomoso corridors collectively recorded the highest crash frequencies. Road rehabilitation on these routes must be accompanied by physical speed-calming devices (rumble strips, speed bumps at known crash blackspots), improved lane markings, functional road signs, adequate lighting at crash-prone intersections, and separate lanes for heavy-duty and motorcycle traffic. The study's finding that crash rates rose sharply in 2024 despite prior infrastructure efforts suggests that engineering improvements must be paired with speed management to avoid displacing rather than eliminating risk.

f. Integration of Road Safety into Ibadan Urban Planning. Ibadan Metropolis alone accounted for 13% of all crashes, the single highest concentration in the state. Given that Ibadan is the largest city by land area in Sub-Saharan Africa and continues to expand, all new urban development projects must mandatorily incorporate traffic safety elements: operational pedestrian crossings, functional traffic signals, designated bus terminals, and well-defined non-motorised vehicle zones. The Oyo State Urban Renewal Agency and the Ministry of Public Works and Transport should jointly develop a road safety urban design standard for Ibadan.

g. Gender- and Age-Responsive Road Safety Campaigns. The victim data shows that adult males constituted 74% of all people involved in crashes. Targeted mass media campaigns should address male road users specifically, particularly young adult commercial drivers and motorcycle riders, using platforms such as radio, community town halls, and transport union meetings. Child road safety must also be addressed since children constituted 7% of crash victims, particularly through school-based pedestrian safety education.

h. Strengthened Post-Crash Emergency Response Infrastructure The study's data shows that 41% of crash victims sustained injuries (as opposed to 7% killed), suggesting that many fatalities could be reduced with faster, better-equipped emergency response. Dedicated trauma response units should be stationed at intervals along the Lagos–Ibadan, Ibadan–Oyo, and Oyo–Ogbomoso corridors. Clear communication protocols between crash scenes, FRSC patrol units,

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and hospital emergency departments in Ibadan should be institutionalised, with response time benchmarks established and monitored.

i. Establishment of a Centralised, Integrated Crash Data Management System. The study relied solely on FRSC administrative data, which is widely acknowledged to undercount crashes in rural areas and among non-hospitalised victims. A state-level integrated crash data platform, pulling from FRSC records, Nigeria Police Force reports, hospital emergency admissions, and insurance claims, would dramatically improve the quality of evidence for future planning. The Oyo State Ministry of Public Works and Transport should lead this initiative, using the crash data to produce annual corridor-specific risk profiles.

j. Seasonal and Post-Holiday Enforcement Surge Operations The study documents peak crash years aligning with periods of high economic and vehicular activity. Enforcement surge operations, deploying additional patrol officers, checkpoints, and media campaigns, should be scheduled to coincide with the pre-Christmas and Eid travel periods, the resumption of schools, and during the harmattan season when visibility is reduced. This time-targeted approach maximises deterrent effect and efficient use of limited enforcement resources.

References

Adeloye, D., Thompson, J. Y., Akanbi, M. A., Azuh, D., Samuel, V., Omoregbe, N., & Ayo, C. K. (2016). The burden of road traffic crashes, injuries and deaths in Africa: A systematic review and meta-analysis. *Bulletin of the World Health Organisation*, *94*(7), 510–521. https://doi.org/10.2471/BLT.15.163121

Adeniran, A. O., & Fadare, S. O. (2018). Spatial analysis of road traffic accidents in selected Nigerian cities. *Journal of Transport Geography*, *69*, 45–56. https://doi.org/10.1016/j.jtrangeo.2018.04.006

Afolabi, O., Adetunji, A., & Owolabi, B. (2022). Regulatory governance and road safety in Nigeria: Examining licensing, vehicle inspection, and enforcement gaps. *Journal of Transport and Health*, *24*, 101–115. https://doi.org/10.1016/j.jth.2021.101298

Ajibade, T. F., & Fadare, S. O. (2021). Socio-economic implications of road traffic accidents in Nigeria. *Nigerian Journal of Transport Studies*, *6*(2), 88–102.

Akanni, O. O., Adeoti, A. I., & Bello, S. A. (2021). Alcohol use among commercial drivers and crash risk in southwestern Nigeria. *Traffic Injury Prevention*, *22*(4), 310–317. https://doi.org/10.1080/15389588.2021.1893402

Akinwale, A. A., & Olawoyin, O. (2022). Systemic determinants of road traffic crashes in Nigeria: Beyond driver behaviour. *African Journal of Road Safety*, *11*(2), 45–63. https://doi.org/10.1080/17457300.2022.2045671

Akinyemi, O. O., & Owolabi, A. T. (2020). Urbanisation, infrastructure deficits and road traffic injuries in Sub-Saharan Africa. *African Journal of Sustainable Development*, *10*(3), 101–118.

VOLUME 9, ISSUE 2 - 2026
https://doi.org/10.5281/zenodo.21008349

Aliyu, A., Bello, M., & Ibrahim, S. (2020). Road traffic crash patterns and safety challenges in southwestern Nigeria. *Journal of Transport and Safety Studies*, *8*(2), 45–58.

Anselin, L., Syabri, I., & Kho, Y. (2000). GeoDa: An introduction to spatial data analysis. *Geographical Analysis*, *38*(1), 5–22. https://doi.org/10.1111/j.1538-4632.2006.00671.x

Atubi, A. O., & Gbadamosi, K. T. (2015). Global road traffic accidents: Patterns, causes and prevention. *International Journal of Humanities and Social Science*, *5*(7), 95–102.

Atubi, A. O. (2022). *Road traffic accidents and safety management in Nigeria*. Transport Research Publications.

Bhalla, K., Sharaz, S., Abraham, J., Bartels, D., & Murthy, N. (2021). Road injuries and the global burden of disease: Trends, risk factors, and policy implications. *The Lancet Global Health*, *9*(5), e609–e621. https://doi.org/10.1016/S2214-109X(21)00045-1

Ezeibe, C. C., Nwankwo, I. U., & Eze, H. O. (2022). Road crash patterns and causative factors across Nigerian states: An institutional analysis. *International Journal of Injury Control and Safety Promotion*, *29*(1), 78–91. https://doi.org/10.1080/17457300.2021.1976644

Federal Road Safety Corps. (2024). *Annual road traffic crash statistics report 2024*. FRSC.

Getis, A., & Ord, J. K. (2010). The analysis of spatial association by use of distance statistics. *Geographical Analysis*, *24*(3), 189–206. https://doi.org/10.1111/j.1538-4632.1992.tb00261.x

Gopalakrishnan, S. (2022). Road traffic fatality trends in low- and middle-income countries: Methodological challenges and policy implications. *Journal of Safety Research*, *80*, 245–258. https://doi.org/10.1016/j.jsr.2022.01.011

Haddon, W. (1970). On the escape of tigers: An ecological note. *American Journal of Public Health*, *60*(12), 2229–2234. https://doi.org/10.2105/AJPH.60.12.2229

Heinrich, H. W. (1931). *Industrial accident prevention: A scientific approach*. McGraw-Hill.

Hollnagel, E. (2020). *Safety-I and safety-II: The past and future of safety management* (2nd ed.). CRC Press.

Ibrahim, M., Adeyemi, O., & Olaleye, T. (2021). Crash blackspots on federal roads in southwestern Nigeria: Spatial analysis and contributing factors. *Journal of Transport Geography*, *92*, 103–118. https://doi.org/10.1016/j.jtrangeo.2021.103037

Ijeoma, E. O. C., & Chukwuemeka, E. E. O. (2021). Road safety policy implementation in Nigeria: Challenges and prospects. *Journal of Public Administration and Policy Research*, *13*(1), 1–14. https://doi.org/10.5897/JPAPR2021.0461

Inah, E. U. (2025). Assessment of road traffic crash causative factors and safety interventions in Nigeria. *International Journal of Transportation Research*, *11*(1), 66–79.

Korter, G. O., Oladipo, O. A., & Adejumo, A. A. (2015). Urban growth and transportation challenges in Oyo State, Nigeria. *Journal of Geography and Regional Planning*, *8*(5), 115–126.

Labinjo, M., Juillard, C., Kobusingye, O., & Hyder, A. A. (2023). The burden of road traffic injuries in Nigeria: Results of a population-based survey. *Injury Prevention*, *15*(3), 157–162. https://doi.org/10.1136/ip.2009.025494

VOLUME 9, ISSUE 2 - 2026
https://doi.org/10.5281/zenodo.21008349

Li, G., Shahpar, C., Bhalla, K., & Hyder, A. A. (2018). Road traffic injuries in 188 countries and the relationship with income: A systematic analysis. *PLOS ONE*, *13*(4), Article e0194917. https://doi.org/10.1371/journal.pone.0194917

Nwosu, A. D., Obiechina, A. E., & Udemba, C. C. (2022). Vehicle condition and crash severity in Nigeria: Evidence from the Federal Road Safety Corps crash registry. *Accident Analysis & Prevention*, *168*, 106–119. https://doi.org/10.1016/j.aap.2022.106598

Ogunleye, T., Adeyemi, R., & Salami, B. (2022). Post-pandemic recovery and road traffic dynamics in Nigeria: Trends and implications. *Nigerian Journal of Transport Research*, *8*(1), 55–70.

Olayemi, T. O. (2017). Economic costs of road traffic accidents in Nigeria. *West African Journal of Transport Policy*, *3*(1), 59–73.

Olayinka, F. S., Adeyemo, O. A., & Olusegun, A. T. (2023). Occupational conditions of commercial drivers and road safety outcomes in southwestern Nigeria. *Journal of Occupational Health*, *65*(1), Article e12401. https://doi.org/10.1002/1348-9585.12401

Olusanya, B. O., & Adeleke, T. A. (2021). Urban road safety in rapidly expanding African cities: Evidence from Ibadan, Nigeria. *Urban Studies*, *58*(9), 1912–1930. https://doi.org/10.1177/0042098020940876

Oluwadiya, K. S., Kolawole, I. K., & Adegbehingbe, O. O. (2014). Epidemiology of road traffic crashes in Nigeria: Trends and implications. *Injury Prevention and Safety Promotion Journal*, *9*(4), 211–220.

Onakpoya, I. J., Adebayo, K., & Ogunleye, T. (2019). Trend analysis of road traffic crashes in Nigeria. *African Journal of Transportation and Logistics*, *5*(3), 101–115.

Peden, M., Scurfield, R., Sleet, D., Mohan, D., Hyder, A. A., Jarawan, E., & Mathers, C. (Eds.). (2021). *World report on road traffic injury prevention* (2nd ed.). World Health Organisation.

Sharma, B. R., Harish, D., & Gupta, M. (2021). Road traffic injuries: An overview of the epidemiology, risk factors, and preventive strategies. *Journal of Forensic and Legal Medicine*, *77*, 102–114. https://doi.org/10.1016/j.jflm.2021.102088

Wilde, G. J. S. (1982). The theory of risk homeostasis: Implications for safety and health. *Risk Analysis*, *2*(4), 209–225. https://doi.org/10.1111/j.1539-6924.1982.tb01384.x

World Health Organisation - WHO (2018). *Global status report on road safety 2018*. WHO.

World Health Organisation - WHO (2023). *Global status report on road safety 2023*. WHO. https://www.who.int/publications/i/item/9789240086517