LOGISTICS AND TRANSPORT TECHNOLOGY

Zebra Crossing Infrastructure and Driver Yielding Behaviour in Ikeja Local Government Area, Lagos, Nigeria

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Published November 2026

Abstract

Zebra crossings remain the most widely available pedestrian crossing facility in Nigerian cities, yet their protective value depends on both the physical condition of the crossing and the willingness of motorists to yield right-of-way to waiting pedestrians. In Ikeja Local Government Area (LGA), Lagos State's principal administrative and commercial hub, evidence on these two dimensions has been limited, as earlier Nigerian studies have concentrated on pedestrian use and behaviour rather than on the joint assessment of crossing infrastructure and driver compliance. This study assessed the number and physical condition of zebra crossings in Ikeja LGA, determined the yield rate of drivers at these crossings, and tested the hypothesis that driver yieldedness does not differ significantly across times of day. A cross-sectional observational design was adopted. A physical census of thirty-five road corridors identified 148 zebra crossings, each assessed for visibility, approach signage, obstruction and traffic-calming provision. Driver yielding behaviour was subsequently observed at the three busiest of these thirty-five corridors across morning, afternoon and evening peak periods, yielding 1,490 recorded vehicle approaches. A chi-square test of independence ($\alpha = 0.05$) was used to test the hypothesis. Results showed that 61.5% of crossings were in poor visual condition and only 5.4% had approach signage. The overall driver yield rate was 9.4% (140 of 1,490 vehicles), varying from 6.9% in the morning to 12.3% in the afternoon and 9.8% in the evening. The test confirmed a statistically significant association between driver yieldedness and time of day, $\chi^2(2, N = 1{,}490) = 7.442$, $p = 0.024$, although the effect size was small (Cramer's $V = 0.07$). The study concludes that zebra crossings in Ikeja LGA are physically present but poorly maintained, inadequately signed, and rarely yielded by drivers, with compliance further constrained during high-volume morning traffic. Remarking and signage upgrades, together with enforcement concentrated in the morning peak period, are recommended to improve pedestrian safety.

Keywords: Zebra crossing; driver yielding behaviour; yield rate; pedestrian safety; road infrastructure condition; time of day; Lagos; Nigeria

1 Introduction

Safe and accessible pedestrian infrastructure is essential to the transition towards sustainable urban mobility, supporting the United Nations Sustainable Development Goals on reduced inequalities (SDG 10), sustainable cities and communities (SDG 11), and climate action (SDG 13) (WHO, 2018; Litman, 2017). In developing countries such as Nigeria, the zebra crossing is the most commonly available form of dedicated pedestrian crossing infrastructure (Ojekunle et al., 2017), largely because it is among the lowest-cost interventions available for mitigating pedestrian accidents (Asaju et al., 2020). A zebra crossing functions as intended only when two conditions are jointly met: the facility must be sufficiently visible and well maintained to alert an approaching driver, and the driver must be willing

and able to slow down or stop to give way to a waiting pedestrian, a behaviour referred to as driver yieldedness (Sogbe, 2024).

In Europe, Guéguen et al. (2015) found that one in four pedestrian fatalities in road traffic crashes occurred at marked zebra crossings, attributable to drivers' failure to yield. Pedestrians in the African region continue to bear a disproportionately high share of global traffic fatalities (WHO, 2019), and within Nigeria the bulk of researches on zebra crossings has examined pedestrian use and crossing behaviour (Olawole & Olayiwola, 2018; Ojekunle et al., 2017) rather than the physical adequacy of the crossings themselves or the extent to which drivers actually yield. Femi and Tolorunloju (2020), assessed road transport infrastructure along a major Lagos expressway corridor, found zebra crossings to be entirely absent, while Asaju et al. (2020) warned that the rapid growth of Lagos's vehicle population and residential density makes the inadequate provision of pedestrian infrastructure, including zebra crossings, an increasingly urgent safety concern.

Within Lagos State, Ikeja LGA is the state capital and its principal administrative, commercial and transportation hub, hosting major arterial corridors such as Obafemi Awolowo Way, Mobolaji Bank-Anthony Way and Kudirat Abiola Way, along which pedestrian and vehicular movement is intense. This combination of high footfall and heavy traffic makes Ikeja a practically significant, though empirically understudied, setting in to examine the effectiveness of zebra crossing infrastructure in relation to driver behaviour. Sogbe (2024) investigated the factors underlying drivers' failure to yield at pedestrian crossings, including gender and vehicle-type differences in compliance, but did not examine the physical adequacy of the crossings themselves or quantify a corridor-level yield rate for a Nigerian setting. More broadly, the available Nigerian literature has not jointly quantified the number and condition of zebra crossings alongside a directly observed, statistically tested measure of driver yielding behaviour. This represents a specific empirical gap that constrains the ability of urban planners and road safety authorities in Lagos State to judge whether existing zebra crossing infrastructure is delivering its intended pedestrian-safety function.

This study addressed that gap by examining zebra crossing infrastructure and driver yielding behaviour in Ikeja LGA, Lagos State, Nigeria. The specific objectives are to: (i) assess the number and current condition of zebra crossings in Ikeja LGA; and (ii) determine the yield rate of drivers at zebra crossings in the study area. In addition, the study tested the null hypothesis (H0) that there is no significant difference in driver yieldedness across different times of the day.

2 Literature review

2.1 Zebra crossing infrastructure and condition

Zebra crossings are unsignalized, road-surface-marked pedestrian crossings at which approaching motorists are expected to slow down or stop to allow pedestrians to cross safely. Elvik et al. (2009, as cited in Seflers et al., 2021) identify road user behaviour, vehicle condition and the quality of road infrastructure as the three fundamental determinants of road safety, a framework that positions crossing condition, alongside driver behaviour, as a direct influence on pedestrian safety outcomes at zebra crossings. When properly marked, maintained and signed, a zebra crossing functions as a visual and functional cue that elicits driver yielding; when markings are faded, signage is absent, or the crossing is obstructed, its capacity to prompt yielding is correspondingly reduced (Anciaes et al., 2020; Baleja et al., 2017). In metropolitan Lagos specifically, Odeleye (2002) observed more than two decades ago that zebra crossing markings routinely peeled without prompt replacement, while Gitel-

man et al. (2017) linked excessive vehicle speed and driver non-yielding directly to the absence or fading of pedestrian crossing markings. Comparable evidence from urban Ghana indicates that the poor condition and inconsistent maintenance of crosswalks, rather than their mere physical presence, is a major contributor to pedestrian risk (Obeng-Atuah et al., 2017).

2.2 Driver yielding behaviour and yield rate

Driver yielding rate is defined as the proportion of instances in which motorists yield to pedestrians relative to the total number of opportunities they had to do so (Sogbe, 2024), and it provides a direct behavioural measure of crossing effectiveness. Reported yield rates vary considerably by context. Bella and Nobili (2020) recorded an 80% yield rate for pedestrians using designated, legal crossings in a European setting, whereas Fu et al. (2018) reported a substantially lower rate of approximately 10% at unprotected, unsignalized crosswalks in Canada. In West Africa, Sogbe (2024) found yield rates ranging from 18.2% among private car drivers to 55.2% among motorcyclists, while William et al. (2021) similarly reported that the majority of drivers in a comparable Ghanaian setting hardly yielded to pedestrians at all. Several studies attribute variation in yielding to situational and traffic-related factors rather than to driver disposition alone: Stapleton et al. (2017) identified traffic volume as among the strongest predictors of yielding compliance at uncontrolled midblock crosswalks, and Sucha et al. (2017) similarly argue that both traffic volume and vehicle speed constrain the time and spatial buffer a driver has available to safely yield. Zhao et al. (2020) further note that yielding behaviour is sensitive to real-time fluctuations in road user density. Within the Theory of Planned Behaviour, such situational constraints correspond to perceived behavioural control, the extent to which a driver feels able to perform a behaviour given prevailing conditions (Ajzen, 1991); a driver who does not perceive a crossing in time, whether because of poor markings, absent signage, or dense traffic, has limited behavioural control over yielding regardless of underlying attitude or social norms, which provides a theoretical basis for expecting both crossing condition and time-of-day traffic conditions to shape observed yielding.

2.3 Evidence from Nigeria and comparable developing-country contexts

Nigerian research on zebra crossings has predominantly examined pedestrian use and crossing behaviour (Ojekunle et al., 2017; Olawole & Olayiwola, 2018) rather than driver compliance or infrastructure condition. Where infrastructure has been assessed, findings point to significant deficits. For instance, Femi and Tolorunloju (2020) found zebra crossings entirely absent along a major Lagos expressway, while Olayinka et al. (2024) reported that pedestrian facilities, including zebra crossings, were largely absent or insufficient across population-density zones of Lagos metropolis. Akple et al. (2020) additionally found that Ghanaian drivers' ability to correctly recognise traffic signs consistently exceeded their comprehension of what those signs required of them, a gap with direct relevance to signage-dependent facilities such as zebra crossings.

2.4 Synthesis and identified gap

Across the reviewed literature, there is reasonable agreement that both physical crossing condition and situational traffic factors, particularly volume and time of day, shape driver yielding behaviour, and that yield rates in African and other developing-country settings tend to be markedly lower than those reported in some European contexts. However, the reviewed studies differ methodologically, ranging from videographic surveys at signalized intersections (Zafri et al., 2022) to direct field observation at unsignalized crossings (Bella & Nobili, 2020), and few studies jointly quantify both the

physical inventory and condition of zebra crossings and a statistically tested measure of driver yield rate within a single Nigerian study area. This represents a contextual and methodological gap that this study addresses by combining a corridor-level infrastructure census with directly observed, time-disaggregated driver yielding data for Ikeja LGA, and by formally testing, rather than merely describing, the association between driver yieldedness and time of day.

3 Materials and methods

3.1 Study area

Ikeja is the capital of Lagos State, located in south-western Nigeria, and serves as the state's principal administrative and commercial hub. The LGA hosts several government institutions, corporate headquarters and commercial centres, and is a key node in the Lagos transportation network, hosting the Murtala Muhammed International Airport, major bus terminals and high traffic generated arterial corridors such as Mobolaji Bank-Anthony Way, Obafemi Awolowo Way and Allen Avenue, along intense pedestrian movement. This combination of administrative significance, commercial density and heavy road user interaction makes Ikeja LGA a relevant setting for examining zebra crossing infrastructure and driver yielding behaviour, with findings potentially generalisable to comparable high-density urban corridors elsewhere in Nigeria.

Figure 1 shows the location of Ikeja LGA and the surveyed road corridors.

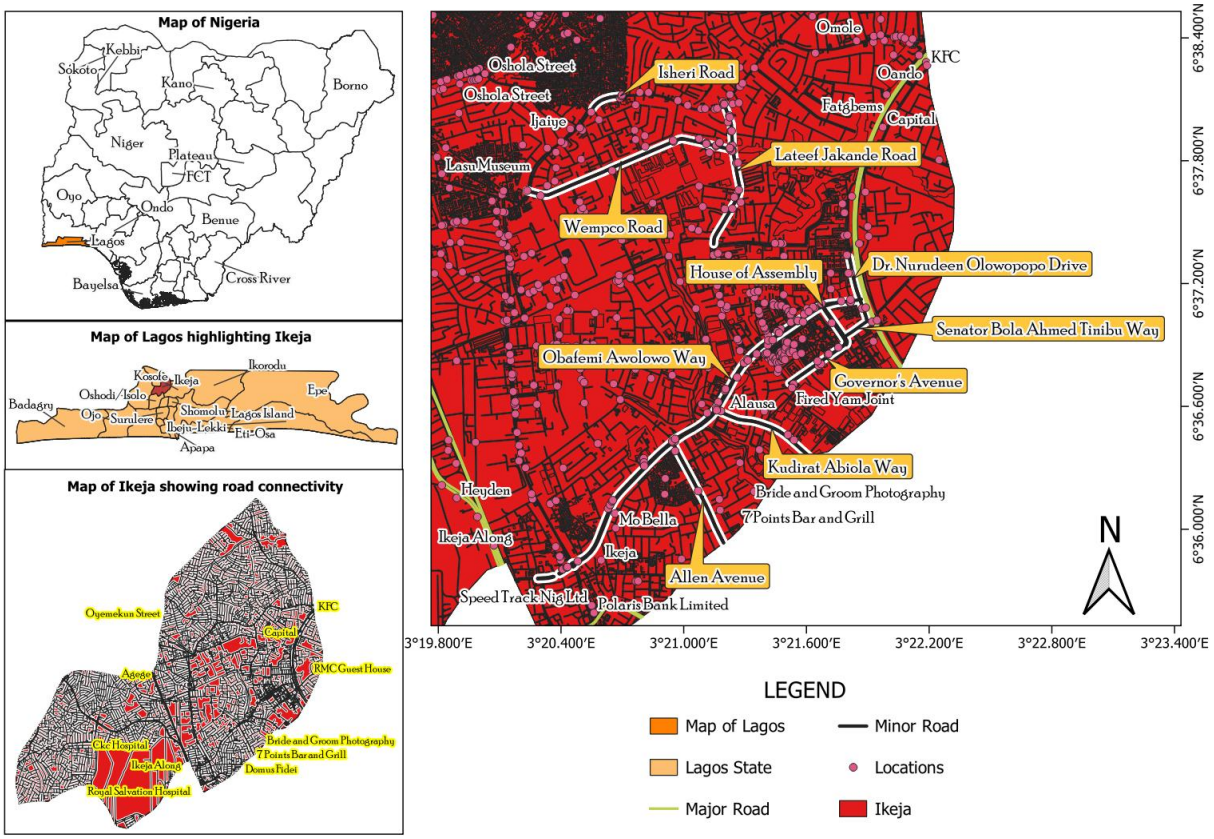


Figure 1. Location of Ikeja LGA within Lagos State and Nigeria, showing surveyed road corridors.

3.2 Research design

The study adopted a quantitative, cross-sectional research design using structured field observation (Asenahabi, 2019; Sullivan & Calderwood, 2017). Field observation was used to generate the data for the number and condition of zebra crossings and the yield rate of drivers at three selected road corridors.

3.3 Population and sampling

The population relevant to this article comprised the zebra crossings located along road corridors in Ikeja LGA and the vehicles approaching those crossings during the observation period. A two-stage purposive approach was used. In the first stage, thirty-five (35) road corridors bearing zebra crossings across Ikeja LGA were purposively identified and subjected to a full physical inventory; all 148 zebra crossings located on these corridors were assessed for condition, constituting a census of the identified population rather than a probability sample. In the second stage, three of these thirty-five corridors, namely Obafemi Awolowo Way, Mobolaji Bank-Anthony Way and Lateef Jakande Road, were purposively selected for detailed observation of driver yielding behaviour, on the basis of their comparatively high generated pedestrian and vehicular traffic volumes. Within these three corridors, every vehicle approaching the crossing during each observation session was counted, giving 1,490 vehicle observations in total, rather than a formula-derived sub-sample. Because driver yielding behaviour was observed at only three of the thirty-five corridors inventoried for condition, the yield-rate findings reported here should be interpreted as characteristic of high-traffic corridors specifically, rather than as directly representative of all 148 crossings assessed under the infrastructure inventory.

3.4 Data collection

Two field-observation procedures were used, corresponding to the two objectives of this article. For the infrastructure inventory, each of the 148 identified zebra crossings was physically inspected and rated against a structured observation checklist covering marking visibility, presence of approach signage, presence of obstruction, and presence of traffic-calming measures. For the driver-yielding observation, the researcher was stationed at each of the three selected corridors and recorded vehicle approaches and driver responses over three ten-minute observation sessions per corridor, representing morning (08:00–08:10), afternoon (13:30–13:40) and evening (17:30–17:40) peak traffic periods, while a pedestrian was present and waiting to cross.

3.5 Measurement of zebra crossing condition

Each zebra crossing was rated on a three-point ordinal visibility scale (Good, Fair, Poor), reflecting the extent to which the painted road markings remained clearly distinguishable from the surrounding road surface in accordance with the Federal Ministry of Works standard for zebra crossing design. In addition, each crossing was assessed for the presence or absence of approach signage warning drivers of the crossing ahead, obstruction of the crossing area (for example by parked vehicles or trading activities), and traffic-calming measures such as speed bumps.

3.6 Measurement of driver yielding

For the purpose of computing yield rate and testing the study hypothesis, driver behaviour at each observed approach was classified in binary terms: a vehicle was recorded as “yielded” where the driver slowed down or stopped to allow a waiting pedestrian to cross, and as “non-yielded” where the

driver maintained speed and did not create a safe opportunity for the pedestrian to cross. Yield rate was computed as:

$$\text{Yield rate } (\%) = \frac{\text{Number of vehicles yielded}}{\text{Total vehicle count}} \times 100 \quad (1)$$

3.7 Data analysis

Descriptive statistics (frequencies and percentages) were used to address both objectives: the number and condition of zebra crossings, and the yield rate of drivers by location and time of day. Hypothesis One was tested using the chi-square (χ^2) test of independence, appropriate for assessing whether an association exists between two categorical variables within a single sample (Franke et al., 2012). The dependent (response) variable was driver yieldedness, categorised as yielded or non-yielded; the independent (grouping) variable was time of day, categorised as morning, afternoon or evening. The significance level was set at $\alpha = 0.05$. The test statistic was computed as:

$$\chi^2 = \sum \frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}} \quad (2)$$

where O_{ij} is the observed frequency and E_{ij} the expected frequency in cell i, j, with i denoting the categories of driver yieldedness and j the categories of time of day. The decision rule was to reject H0 if the computed p-value was less than 0.05, or equivalently if the computed χ^2 statistic exceeded the critical value at the corresponding degrees of freedom.

4 Results

4.1 Number and current condition of zebra crossings

The physical inventory across the thirty-five surveyed road corridors identified a total of 148 zebra crossings in Ikeja LGA. Crossing density varied considerably by corridor, ranging from a single crossing on several minor roads to eighteen crossings on Obafemi Awolowo Way, the busiest corridor surveyed. Table 1 presents the number of zebra crossings identified in Ikeja LGA.

Table 1. Zebra crossings recorded in Ikeja LGA.

S/N	Location (Road Corridor)	Number of Zebra Crossings
1	Kudirat Abiola Way	14
2	Governors' Avenue	6
3	Governor's Road	2
4	House of Assembly Road	4
5	Senator Bola Ahmed Tinubu Way	1
6	Lateef Jakande Road	11
7	Kafi Street	2
8	Oyeleke Street	2
9	Allen	3
10	Toyin Street	1
11	Opebi Road	1

S/N	Location (Road Corridor)	Number of Zebra Crossings
12	Opebi Link Road	2
13	Obafemi Awolowo Way	18
14	M.K.O Abiola Gardens Road	2
15	Mobolaji Bank-Anthony	4
16	Isaac John & Sobo Arobiodu Streets Junction	4
17	Aina Street	2
18	Harold Sodipo Crescent	2
19	Joel Ogunnaike Street	2
20	Oba Akinjobi Street	1
21	Simbiat Abiola Way	5
22	Kodesoh Street	1
23	Adegbola Street	1
24	Lateef Jinadu Dosunmu Street	1
25	Dr. Nurudeen Olowopopo Drive	10
26	Otunba Jobi Fele Way	8
27	Assbifi Road	5
28	Alhaja Ashabi Cole Street	4
29	Adeniyi Jones Avenue	8
30	Aromire Street	2
31	Wahum Bus-stop	1
32	Surulere Industrial Road	5
33	Wemco Road	9
34	Metalbox Road	2
35	Ladipo Oluwole Street	2
	Total	148

Source: Author's field analysis (2026).

Each of the 148 crossings was subsequently rated for visibility and assessed for the presence of approach signage, obstruction, and traffic-calming measures. As shown in Table 2, only 27.7% of crossings were rated in Good visual condition, 10.8% were rated Fair, and the majority 61.5% were rated Poor, with markings significantly faded, worn or barely distinguishable from the road surface.

Table 2. Physical condition (visibility) of zebra crossings in Ikeja LGA.

Condition Rating	Frequency	Percentage (%)
Good	41	27.7
Fair	16	10.8
Poor	91	61.5

Condition Rating	Frequency	Percentage (%)
Total	148	100.0

Source: Author's field analysis (2026).

Table 3 shows that approach signage, present at only 5.4% of the 148 crossings, was the most significant infrastructure gap identified; signage was absent at 94.6% of crossings including on major corridors such as Lateef Jakande Road, Obafemi Awolowo Way, Kudirat Abiola Way and House of Assembly Road. Obstruction from parked vehicles or trading activity was recorded at 14.2% of crossings while traffic-calming measures such as speed bumps were present at 55.4% of crossings, leaving 44.6% of crossings without such measures.

Table 3. Presence of approach signage, obstruction and traffic-calming measures at zebra crossings.

Feature	Present (n)	Absent (n)	Present (%)	Absent (%)
Approach signage	8	140	5.4	94.6
Obstruction (parking/trading)	21	127	14.2	85.8
Traffic-calming measure	82	66	55.4	44.6

Note: Absent (%) values computed as the complement of Present (%). *Source:* Author's field analysis (2026).

4.2 Yield rate of drivers at zebra crossings

At the three selected corridors, 1,490 vehicle approaches were observed across the morning, afternoon and evening sessions, of which 140 vehicles yielded to waiting pedestrians, giving an overall driver yield rate of 9.4%. Table 4 shows that yield rate was low, across the three corridors: Mobolaji Bank-Anthony Way recorded the lowest rate at 8.0%, followed by Lateef Jakande Road at 10.3% and Obafemi Awolowo Way at 10.4%.

Table 4. Vehicle count, number yielded, and yield rate by corridor.

Corridor	Vehicle Count	No. Yielded	Yield Rate (%)
Obafemi Awolowo Way	415	43	10.4
Mobolaji Bank-Anthony Way	590	47	8.0
Lateef Jakande Road	485	50	10.3
Combined	1,490	140	9.4

Source: Author's field analysis (2026).

Disaggregated by time of day (Table 5), yield rate was lowest in the morning peak (6.9%), rose to its highest point in the afternoon (12.3%), and settled at an intermediate level in the evening (9.8%).

Table 5. Driver yield rate by time of day (all corridors combined).

Time of Day	Vehicle Count	No. Yielded	Yield Rate (%)
Morning (08:00–08:10)	533	37	6.9
Afternoon (13:30–13:40)	367	45	12.3
Evening (17:30–17:40)	590	58	9.8

Time of Day	Vehicle Count	No. Yielded	Yield Rate (%)
Sum	1,490	140	9.4

Source: Author's field analysis (2026).

4.3 Driver yieldedness across times of the day

In this section, the study investigated the hypothesis (H0) which states that there is no significant difference in driver yieldedness across different times of the day. The observed vehicle counts from Objective Two were collapsed into a 2 × 3 contingency table of driver behaviour (yielded, non-yielded) by time of day (morning, afternoon, evening), shown in Table 6. As shown, fewer vehicles yielded in the morning (37 observed against 50.1 expected) than would be expected under independence, more yielded in the afternoon (45 observed against 34.5 expected) than expected, while the evening (58 observed against 55.4 expected) was close to the expected value.

Table 6. Observed and expected frequencies of driver yielding by time of day.

Driver Behaviour	Morning	Afternoon	Evening	Row Total
Yielded (Observed)	37	45	58	140
Yielded (Expected value)	50.1	34.5	55.4	140
Non-Yielded (Observed)	496	322	532	1,350
Non-Yielded (Expected value)	482.9	332.5	534.6	1,350
Total	533	367	590	1,490

Source: Author's field analysis (2026).

Table 7 presents the chi-square test summary for the null hypothesis.

Table 7. Chi-square test summary for the null hypothesis.

Statistic	Value
Chi-square (χ^2) value	7.442
Degrees of freedom (df)	2
Critical value ($\alpha = 0.05$)	5.991
p-value	0.024
Cramer's V (effect size)	0.07
Sample size (N)	1,490

Source: Author's field analysis (2026).

Since the p-value was 0.024, which was less than the 0.05 significance level, and the computed χ^2 value of 7.442 exceeded the critical value of 5.991 at 2 degrees of freedom, the null hypothesis (H0), that there is no significant difference in driver yieldedness across different times of the day, was rejected. Driver yieldedness therefore differs significantly by time of day within the study corridors. The associated effect size (Cramer's V = 0.07) is small, indicating that although the association is statistically significant given the large sample size, time of day accounts for only a modest share of the overall variation in driver yielding behaviour, implying that other unmeasured factors likely contributed substantially to the low yield rate observed.

5 Discussion

The infrastructure inventory shows that zebra crossings are not scarce in Ikeja LGA: 148 crossings were recorded across thirty-five corridors. However, the condition assessment does not equate to functional adequacy. That 61.5% of crossings were rated in poor visual condition, and that approach signage was present at only 5.4% of crossings, echoes Odeleye's (2002) much earlier observation that zebra crossing markings in metropolitan Lagos peel without prompt replacement, this maintenance gap has persisted for more than two decades. The pattern parallels findings from urban Ghana, where poor condition and inconsistent maintenance, rather than the absence of crossings, was identified as the principal barrier to pedestrian safety (Obeng-Atuah et al., 2017). This is consistent with the theoretical expectation that infrastructure condition constrains a driver's behavioural yielding (Ajzen, 1991): a crossing that cannot be clearly seen in advance offers a driver little opportunity to slow down or stop in time, irrespective of that driver's underlying attitude towards pedestrian right-of-way.

The overall driver yield rate of 9.4% recorded in this study is markedly low in absolute terms and, comparatively, sits close to the approximately 10% yield rate reported by Fu et al. (2018) at unsignalized crosswalks in Canada, but is substantially below both the 18.2% to 55.2% range reported by Sogbe (2024) across vehicle types in Ghana and the 80% legal-crossing yield rate reported by Bella and Nobili (2020) in a European setting. This comparison suggests that while low driver compliance at zebra crossings is not unique to Nigeria, the magnitude of the compliance gap in Ikeja LGA relative to better-performing jurisdictions is considerable, and is broadly consistent with the poor signage and visibility documented under Objective One: a crossing that is poorly marked and unsigned is unlikely to prompt yielding regardless of jurisdiction.

The statistically significant variation in yield rate by time of day, lowest in the morning (6.9%) and highest in the afternoon (12.3%), is consistent with evidence that traffic volume and vehicle speed constrain driver yielding capacity (Stapleton et al., 2017; Sucha et al., 2017; Zhao et al., 2020). The morning period corresponded with the highest combined vehicle volumes recorded at two of the three corridors, plausibly reflecting peak-hour commuter congestion under which drivers may feel less able, or less willing, to slow down for pedestrians. However, the small effect size (Cramer's V = 0.07) indicates that time of day alone explains only a modest portion of the variation in yielding, and that the uniformly low yield rate observed across all three time periods, and across all three corridors, points to a more pervasive underlying constraint, most plausibly the infrastructure deficits documented under Objective One, rather than time of day being the dominant cause of non-compliance.

This interpretation warrants an important caveat because condition was assessed across all 148 crossings on thirty-five corridors while yield rate was observed at only three of those corridors, this study cannot establish a direct, corridor-level statistical link between crossing condition and yield rate; the association drawn here between poor infrastructure and low yielding is inferential rather than a tested relationship within the same dataset. Furthermore, as an observational and associative study, these findings established that driver yieldedness differs by time of day and appears low across corridors of varying infrastructure condition, but do not, and are not intended to, establish a causal mechanism linking specific infrastructure deficits to specific yielding outcomes.

6 Conclusion

This study assessed the number and current condition of zebra crossings in Ikeja LGA, Lagos State, Nigeria, and determined the yield rate of drivers at some crossings. A total of 148 zebra crossings were recorded across thirty-five road corridors, but the majority (61.5%) were in poor visual condition and approach signage was present at only 5.4% of crossings. Driver compliance was correspondingly poor: the overall yield rate across three selected busiest corridors was 9.4%, meaning fewer than one in ten vehicles yielded to a waiting pedestrian. The chi-square test of independence confirmed that driver yieldedness varies significantly by time of day, being lowest during the morning peak period, though the modest effect size indicates that time of day is only one of several likely contributors to the low overall compliance observed. Collectively, these findings indicate that zebra crossings in Ikeja LGA are present in substantial number but function more as a symbolic than as an effective pedestrian safety measure, with direct implications for the achievement of Sustainable Development Goal 11 on safe, inclusive and sustainable cities within the study area.

7 Practical and policy implications

The findings suggested several evidence-based priorities for road safety and transport stakeholders in Lagos State. First, the Lagos State Ministry of Transportation and relevant road maintenance agencies should prioritise the repainting and remarking of the 61.5% of crossings identified being in poor visual condition, alongside the installation of approach signage on both lanes, particularly along Lateef Jakande Road, Obafemi Awolowo Way, Kudirat Abiola Way where signage was found to be absent. Secondly, given that the yield rate was found to be significantly lower during the morning peak period, road safety agencies such as the Lagos State Traffic Management Authority (LASTMA), Lagos Neighbourhood Corps and the Federal Road Safety Corps (FRSC) should concentrate visible enforcement resources, whether through officer presence or camera-based monitoring, during morning hours specifically, and distribute enforcement uniformly across other time of the day. Thirdly, traffic-calming measures should be extended to the 44.6% of crossings currently without them, since reduced approach speed gives drivers more time and space to yield safely, and this measure is directly derived from the infrastructure gap identified under Objective One rather than being a generic recommendation.

8 Limitations of the study

This study is subject to limitations that should be considered when interpreting its findings. Driver yielding observation was restricted to three road corridors, purposively selected as the busiest in the study area, and to short ten-minute observation sessions within three broad time periods; the resulting yield-rate estimates may not generalise fully to the remaining thirty-two corridors in Ikeja LGA, particularly residential streets, nor capture variation across weekdays, weekends or differing weather conditions. In addition to these explicitly stated limitations, this article identifies a further methodological constraint arising from its narrower two-objective focus: because the condition inventory covered all 148 crossings across thirty-five corridors while the yield-rate observation covered only three of those corridors, the relationship drawn in this article's discussion between poor crossing condition and low driver yielding is an inference across two partially overlapping datasets rather than a statistically tested corridor-level association, and should be treated accordingly.

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