



Behavioral Dynamics in Urban Traffic: Insights from Islamabad's Road Users

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Abstract:

The traffic pattern in Islamabad represents well cultural practices, the enforcement agents and institutional designs. For instance, where culture disposes individuals to engage in certain ways or behavior patterns, this may encourage aggressive driving where there are perceived gains in terms of productivity or status and insofar as enforcement mechanisms do not properly punish aggressive driving, namely, speeding or overtaking. This research uses Theory of Planned Behavior and Risk Homeostasis Theory to understand how these factors affect driving, pedestrian, and cyclist behavior in relation to road traffic. This study used both close-ended semi-structured interviews combined with quantitative measures of traffic, accident rate, and PM2.5 pollution data. Critical conclusions show that rates of risky actions such as speeding and lane offenses demonstrate strong and unique cultural and psychological predictors. On the psychological level, the feeling that wide roads are safer to drive gives riders a phenomenon of very subjective safety, with a consequent increase in dangerous behavior, such as speeding and aggressive movements. It also exogenous factors that could negatively affect the environment implying noise pollution levels of more than 85dB and PM2.5 of not less than 120 $\mu\text{g}/\text{m}^3$, which magnify cognitive and safety issues.

Keywords: Islamabad, urban traffic behavior, theory of planned behavior, risk homeostasis theory, mixed research, safety measures

INTRODUCTION

Islamabad is the capital city of Pakistan and is experiencing massive urbanization, and many roads are being expand with the intent of enhancing the connectivity between them. The population density has been growing at an estimated annual rate of 2.5% for the last decade, coupled to a current record of a 35% augmented rate in vehicular traffic (Ali et al., 2023). These trends have remained instrumental in calling for improvements in road infrastructure where numerous and

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broad avenues like Srinagar Highway and Islamabad Expressway have been expanded. Nevertheless, this rapid urbanization has come with unprecedented traffic congestion, high accident rates, as well as pollution of the environment, this call for the right balance to be struck in mobility planning. It has created increased traffic accidents, unsafe road user behavior and exercises environmental impacts because of infrastructural development. Structures like Islamabad Expressway and Srinagar Highway have been constructed with the increase in roadway density where the automobile is privileged over the pedestrian and cyclists. The present paper attempts to understand the behavioral pattern of Road Transport Users in Islamabad with reference to cultural factors and enforcement and design influences on safety and accessibility.

The TPB gives understandings of how attitudes, norms, and perceived control contribute to traffic behavior, and the RHT gives account of the compensatory behavior that comes with the perception of safety. In Islamabad, there is present TPB as drivers tend to believe that speeding is efficient because society expects one to be efficient in today's world. For instance, while community pressure promotes reckless overtaking and neglect of traffic laws there is pressure to perform or succeed. Likewise, RHT is seen on extended axis roads such as the Srinagar Highway, with enhanced Franco traffics giving a perceived enhanced security characteristic and an upsurge in average superior speeds and overtaking. These theories have emphasized the requirement of intervention like to engender change in people's awareness about the traditional practices which are hazardous, and the existence of punitive measures to curb compensatory risk-taking behaviors. This study intends to use frameworks to establish factors, which may result in unsafe road practices and recommend possible interventions to enhance safe traffic practices in urban areas.

The behavior of traffic in Islamabad seems to be a very complex phenomenon and any attempt to solve the problems of safety or mobility in Islamabad needs to consider this complexity. Due to the growth of the population and the status of a capital, Islamabad is an important area in which it is necessary to analyze the situation regarding infrastructure, culture, and legislation.

This study has the following objectives: To decompose the daily moving traffic in Islamabad into culture, policing and engineering behaviors. To assess the extent to which TPB and RHT might be used to account for the observed traffic behaviors. To examine the environmental and psychological factors that affect road safety and mobility. To recommend operational recommendations for improving safety and reducing prejudice in traffic environments of big cities.

THEORETICAL FRAMEWORK

Theory of Planned Behavior (TPB)

TPB, developed by Ajzen, posits that human actions are guided by three constructs:

- Attitudes: Processed evaluations of behavior (for example, speeding is perceived as efficiency).
- Subjective Norms: Stimuli arising from the social environment (e.g., social discouragement of the compliance with traffic rules).
- Perceived Behavioral Control: Belief in the capability to perform a behavior (e.g., driving in traffic).

Again, in Islamabad social cultural aspects such as self-centered driving behavior provoking others to engage in reckless overtaking as well as low value placed on pedestrian lives perpetuate the practice. TPB is an effective way of conceptualizing and changing these behaviors through intervention.

Risk Homeostasis Theory (RHT)

According to Wilde, RHT holds that people would have a threshold level of risk beyond which they are willing to modify their behaviors in reaction to safety promotion. For instance, the increased use of broader roads can lead to increased distortion of speed limits on the same roads, a negative impact, which was not anticipated. This framework is relevant to explain why some roads in Islamabad more accidents have even when they have longer access to the road network.

LITERATURE REVIEW

Urbanization and Road User Behavior

There has been a progressive transformation in traffic patterns in developing countries and particularly in the cities and in this concern, Islamabad has not been left behind. For example, the annual population growth rate of Islamabad was estimated to be 2.5 percent over the last decade that has translated into 35 percent increase in traffic volume (Ali et al., 2023). Other capital cities in South Asia pose different sets of issues, not least because Islamabad was built, and is still in the process of developing as a planned urban city and a center for a rapidly suburbanizing country. Such factors contribute to road traffic jams and further increase safety problems for non-motorized traffic with equitable and sustainable urban planning being a necessity in the city. Research done shows that road widening schemes mostly favor the use of automobiles, and in the process ignore other forms of road users like the pedestrians and cyclist (UN-Habitat, 2013). Such prioritization poses long-term effects on spatial equity in urban areas because it contributes to the exclusion of vulnerable groups in society such as the poor, the elderly and the children from access to sound and environmentally friendly means of transport. In this regard, such projects perpetuate the socio-economic exclusion of non-motorized road and reinforce the car culture dominance of the roads over other precedence such as equity and access. Such effects clearly point out the fact that the cities to be well planned which in turn lead to improved lives of the people in society and that this should be done by including the pedestrians and cyclists in the planning of the roads. This emphasis on cars and other vehicular traffic gives rise to these planning distortions thus worsening safety disparities, and poor access. Such biases in the urban planning process have been positively associated with high rates of traffic violations and accidents, particularly within growing urban center cities (Rafique & Malik, 2020). For example, Downs' (2004) induced demand thesis postulates on the fallacious notion that extending surface transport's capacity triggers more utilization, and usually not in the constructive manner that the infrastructure expansion sought. In support of this, Ali et al. (2023) notecase that the improvements of roads in Islamabad including Srinagar Highway also revealed an increased traffic congestion which has led to increased noise pollution level and incidence of accidents. In addition, inadequate governance structures, poor law enforcement, and poor, or complete absence, of pedestrian infrastructure escalate the safety risks for non-motorized road users (Adeel et al., 2018).

Risk Factors Associated with Road Expansion

Wilde 1994's study forms the basis of the idea that uncompensated gains in the infrastructure cause risky compensatory behavior such as speeding on wide roads. For instance, the Srinagar Highway in Islamabad was widened for the ease of traffic and now that has led to that region having increased rates of traffic accidents that are due to high speeding and risky overtaking by motorists as noted by Ali et al., (2023). The improvements in road work and the expansion of the carriageway to a wider part of the road make drivers feel safer driving recklessly. Likewise, observation surveys conducted along the Islamabad Expressway showed that cars often travel at a higher speed than the posted speed limits establishing Wilde's hypothesis true. Such behaviors demonstrate an urgent necessity to adopt additional traffic calming devices like speed humps and enforcement tools as part of the road network design to counter the negative effects of infrastructure improvement (Rafique & Malik, 2020). This is in line with Risk Homeostasis that has been widely practiced on the expanded corridors of Islamabad especially on Srinagar Highway where smooth and wide roads lead to intense behaviors like overspending and violation of lanes. Most of these behaviors contradict the value of enhanced safe infrastructure, resulting in higher accident rates (Ali et al., 2023).

In addition, according to Stokols (1972), noise and air quality, worsened unsafe practices and deteriorated cognitive abilities of road users. The major highways' noise levels experience rates often rise to higher than 85 dB which enhances stress and aggression hence reducing attentiveness and decision-making prowess. Consequently, high concentrations of particulate matter greater than 120 $\mu\text{g}/\text{m}^3$ cause physical fatigue and mental strain in addition to the challenges arising from management of urban traffic (Rafique & Malik, 2020; Adeel et al., 2018). These dynamics between enhanced infrastructure availability, strains of the natural environment, and behavior modifications require an interdisciplinary approach to governance of our cities and road uses.

Psychological and Social Dimensions of Traffic Behavior

The Theory of Planned Behavior (Ajzen, 1991) has been widely used to analyze traffic behaviors that are determined by attitudes, subjective norms, and perceived behavioral control. According to Islamabad, the community support for speeding and the violation of other rules show the generic culture of the community. This cultural influence is often backed up by lack of compliance and enforcement of traffic laws thus escalating a custom of disrespect to ordinances. Research has found that behavioral expectation, including those from friends and acquaintances and a general social contempt for pedestrian lives, contribute to continence of these malpractices (Adeel et al., 2018). Also, cultural values in the context of urban Pakistan does not advocate significant compliance with strictly road safety rules and regulations which makes people riskier in nature. For instance, inadequate provisions for pedestrian corridors and cycling lanes push non-motorized transport to the fringes and epitomize the foregoing societal non-recognition of the rights of such marginalized transport stakeholders. It concerns these ingrained behaviors, which needs an intervention enforcement, awareness raising, and redesign of infrastructure, information, and communication technology (UN-Habitat, 2013; Rafique and Malik, 2020).

Environmental Impacts of Urban Traffic

Pollution of the environment is one of the major impacts of the expansion of roads in urban areas. For instance, traffic noise levels in Islamabad's Srinagar Highway have risen by 25% after

expansion with noise level above 85 dB during rush hours (Ali et al., 2023). Consequently, the levels of particulate matter (PM_{2.5}) also remain high, regularly crossing 120 µg/m³ on the Islamabad Expressway; far from the WHO's guidelines. These factors complicate respiratory diseases and increase stress levels in urban population (Stokols, 1972; Rafique & Malik, 2020). High levels of noise disturbances, above 85 dB, prevail with pollution levels of PM 2.5 exceeding 120 µg/m³ as pointed out by Ali et al. (2023); the specific areas identified are the main highways around the city of Islamabad including Islamabad Expressway and Srinagar Highway. These conditions are focal hindrances to health; worsen respiratory functions and have negative impacts on healthful stress of urban dwellers. Further, the ever-persistent noises from traffic and other environmental pollution lower the perception of safety among pedestrians and cyclists to discourage active mobility.

To minimize such environmental effects, several measures have been suggested such as conventional implementation of noise barriers, establishment of green walls and better standards of vehicle exhaust emissions. These measures are informed by similar successful models in other countries, for instance, Copenhagen which adopted establishment of green corridors parallel to the urban highways and more to do with similar sentiments as Amsterdam that instated low emission zones. Furthermore, to control emissions from vehicles and traffic congestion, electric vehicle policies be adopted together with public transport. Coordination with stakeholders in urban planning, policy and the public is therefore necessary firstly if these strategies are to be successfully applied in Islamabad and secondly to make sure their application has long term effects.

Global Best Practices and Local Adaptation

International experiences are effective in developing lessons that may be applied to the improvement of traffic safety in cities through the method of "complete streets" particularly as exemplified by Amsterdam city. This approach combines several kinds of solutions for the development of urban mobility such as pedestrian priority zones, dedicated cycling tracks, and high-quality public transport. When applied to Islamabad, they need to be adjusted towards dealing with cultural questions about the car dominance, lack of dedicated sidewalks, and infrequent, mainly symbolic cycling. It may include provisions of exclusive rights-of-way for pedestrians in the business areas like blue area, extending a BRT network to less served neighborhoods, and provision of road features consist of speed humps, crosswalks etc. Besides, enforcement and public relations using flyers and billboards would help in the change of attitude in adhering to co-sharers' road etiquette and recognizing non-motorized road users. When such measures were integrated with enforcement agencies at the regional level as well as the afforestation programs, there are likely to be boosters to safety of the transport systems and the disabled individuals in Islamabad. This model coordinates the provision of infrastructure and space for operation with the Pedestrians, Cyclists and motorists to form a safe and integrated environment for all users (UN-Habitat, 2013). Although the general focus of this paper is on the successes of Amsterdam, it is crucial to understand that these successes are the results of a long-term strategy that entails numerous elements like bike-only paths, pedestrian precincts, and developed PT systems. Such measures have reduced road accidents dramatically and improved active mobility in the transport system.

If applied to the context of Islamabad, those principles would require some diversion in the hierarchy of priorities within urban agendas. Specific tactics include identifying areas where pedestrian dominating facilities are required like blue area and implementing measures like speed

breakages, raised crosswalks on major roadways. Also, increasing the improvement in Bus Rapid Transit (BRT) can play a role that substitutes the use of private cars to some extent and minimize traffic jams as well as emissions. When combined with compliance with local enforcement tools and promotion of civil sociologists' initiatives and awareness, these measures would regulate the stipulations of Islamabad, analyzing the complexities of this urban context more thoroughly and providing a more adequate protection to every class of road users.

Challenges in Governance and Enforcement

Inadequate government authority and poor long arm have been as main constraints to traffic safety in Islamabad. Some of the general governance issues are as follows: Ineffective inter-sectoral cooperation between urban planning departments and traffic control organizations, which lead to scattered policies and resource distribution (Rafique & Malik, 2020). Examples of enforcement failures include the failure to enforce traffic laws, for example, no penalty is incurred on cases of overspending on major roads including Srinagar Highway. Moreover, these problems worsen due to the lack of other technologies as Speed cameras, and Artificial intelligence traffic control, which make such violations undocumented (Ali et al., 2023). These gaps underscore the importance of holistically addressing traffic safety with well-framed governance, technological solutions and participative communities. Rafique & Malik (2020) identified that urban planners, traffic authorities, and law enforcement agencies are working in silos, lack coordination, and have fragmented traffic management policies, inadequate funding, and no strategic plan execution. This disconnection often results in those very important safety components being understaffed or implemented insufficiently, adding to the difficulties in roads usage.

To counter these problems, the organization of institutions is the key solution that adequate academic research needs to provide. Promoting harmonized centralization of advisors and coordinators who work closely with urban planning and traffic authorities and state governments can go a long way towards improving the traffic problems in our urban centers. The application of advanced technologies that are unique to smart traffic management, that include the AI traffic control systems can help in live traffic analysis, traffic flow, calibration of risky zones for traffic congestion, and accident-prone areas. Besides, there is the potential of developing partnership between the public and private sectors to ensure the search for sustainable funding, as well as generate innovations for traffic safety projects. Supporting measures such as carrying out capacity-building programs for enforcement agencies, and program reviews to assess policy effectiveness could also increase a safer and more efficient urban traffic flow in Islamabad.

METHODOLOGY

Research Design

A mixed-methods approach was employed to capture the complexities of urban traffic behavior:

- **Quantitative Data:** Obtained by traffic counters, speed guns and environmental measuring instruments to estimate traffic intensity, the rate of accidents and pollution.
- **Qualitative Data:** From the current study, semi structured interviews and based on themes identified gave us a way of understanding the experiences and perception of the road users.

Sampling

Highways and avenues were categorized into expanded, under construction and standard with 1000 subjects in the survey end Users of the roads include vehicle, pedestrian and bike. Specific areas were the Islamabad expressway, Srinagar highway and blue area.

Data Collection Tools

- **Traffic counters and speed monitors** recorded vehicular density and speeds.
- **Noise and pollution sensors** assessed environmental impacts.
- **GIS mapping** visualized accident hotspots and infrastructure gaps.

RESULTS

Quantitative and qualitative analyses of the findings are presented to present a comprehensive understanding of urban traffic behaviors in Islamabad.

Quantitative Findings

Following this, the quantitative analysis provides measures such as the speed, the quantimeter contents, the environmental impacts. It shows distinct patterns in how the data collected from the major road types – expanded, under construction, established, and school zones – relates to traffic dynamics, noise pollution, and air quality.

Traffic Volume and Speeds

Automated counters and speed monitors were used to assess the traffic volumes and speeds, on roads like the Islamabad Expressway and Srinagar Highway. Peak hour average speeds and volumes are highest in expanded roads, which presents a great safety concern. However, localized regulation results in slower traffic and lower volume in school zones, as can be seen. This section makes the point that road infrastructure and user behavior are intimately intertwined — and that there will be tradeoffs in balancing efficiency and safety over time.

Table 1: Summarizes traffic data from key roads

Road Type	Average Speed (km/h)	Peak-Hour Volume (vehicles/hour)
Expanded Roads	70	4,500
Under-Construction	50	2,800
Established Roads	40	2,500
School Zones	20	1,200

The studies present show that traffic speeds and traffic volumes on the expanded road are also higher and therefore have increased accident probability. This connection shows the universality in road expansion initiatives where any efforts to enhance capacity prompt undesired speed and density levels. In Islamabad, the example could be Islamabad Express way and Srinagar Highway where enhancement of infrastructural structure has enhanced accident frequency rates. By doing so, these findings support the call for road safety interventions including speed humps and vigorous observation of speed bumps alongside improvement and expansion of road networks.

Environmental Impacts

Table 2: Highlights noise and pollution metrics

Road Type	Noise Levels (dB)	PM2.5 ($\mu\text{g}/\text{m}^3$)
Expanded Roads	85	130
Commercial Zones	85	125
School Zones	65	70

This can be further substantiated with reference to actual data of Islamabad where details of variation of environmental conditions of different roads have been highlighted in the table below. The analysis of noise levels and PM2.5 pollution in expanded and commercial roads showed that they are the noisiest roads with noise levels above 85 dB and increased PM2.5 pollution of over 130 $\mu\text{g}/\text{m}^3$. These conditions not only increase other risks concerning the physical health of the road users such as respiratory diseases and hypertension but also decrease the resultant mental fatigue especially in higher cognitive load situations. However, school zones retain low noise and pollution standards to show how regulations intended to minimize automotive encroachment in vulnerable areas can work. Such a gap indicates the likelihood of suffering adverse health effects from the mentioned sources near main roads; hence, audible barriers and more conservative emission standards should be implemented.

Commercial and expanded roads have the worst noise and pollution impacts increasing stress among road users. These heightened stress levels are reflected in higher frequency of aggressive driving behaviors including speeding and tailgating simply because the drivers are overwhelmed by the auditory and cognitive demands. Furthermore, people who use spaces for walking feel more stress and delay than when walking in other areas, especially when crossing routes or sharing pavements with fast-moving cars. On a larger level, such stressors result in developing physical diseases such as high blood pressure and respiratory disorders and mental health disorders such as irritability and poor concentration (Ali et al., 2023; Stokols, 1972).

QUALITATIVE FINDINGS

Driver Behaviors

Two interviews show that wider roads lead to increased speeding, as drivers believe that those roads are safer. It is in this culture that practices are upheld, such as arriving early for a function, rather than spending the wee hours of the night guarding against an occurrence that might have been avoided were you not so insistent on being punctual.

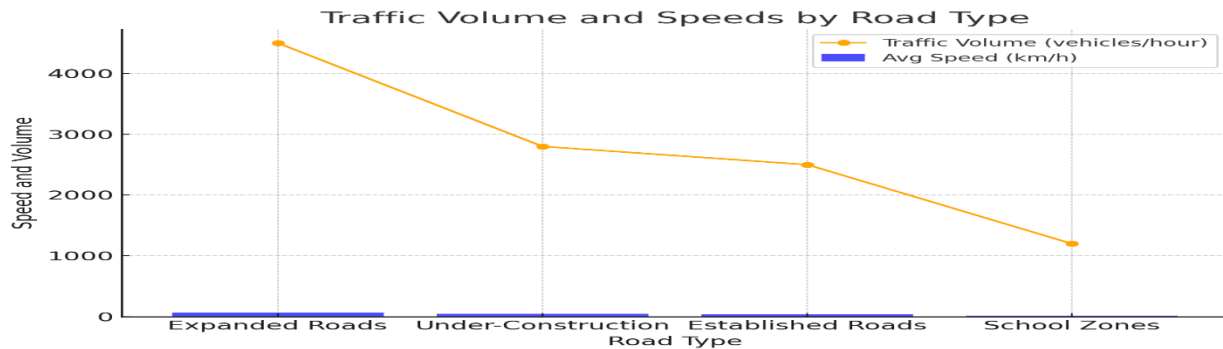
Table 3: Summarizes key behavioral observations from drivers

Observation	Frequency Reported (%)	Key Contributing Factors
Speeding on wider roads	70%	Perceived safety, reduced enforcement
Aggressive overtaking	55%	Cultural norms, impatience
Non-adherence to lane rules	60%	Lack of visible markings, minimal penalties

The table which focuses on different Behavioral observation of drivers in Islamabad Table 3 boldly demonstrates how wider roads and lack of enforcement lead to unsafe behavior. For instance, speeding identified by seventy percent of participants is commonly associated with perceived

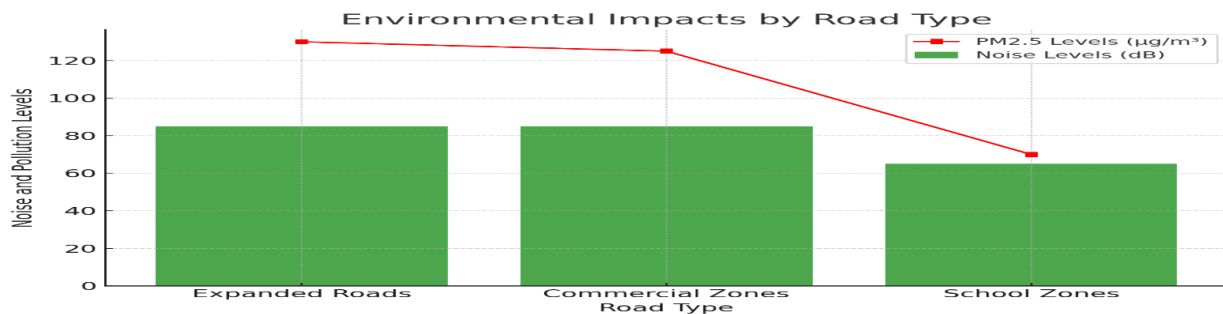
safety on broad roads such as the Srinagar Highway. Likewise, aggressive overtaking as illustrated in the head in 55 % of cases is a practice that is supported by cultural beliefs of time latitude than safety latitude. Indeed, only 60% of respondents mentioned non-adherence to lane rules is explained by the absence of easily visible markings and applying insufficient penalties. Hence, there is encouraging call for developmental programs like improving the enforcement measures, the marking of the lane barriers, and the public enlightenment measures to improve drivers' behavioral patterns on roads.

Figure 1: Traffic Volume and Speeds by Road Type



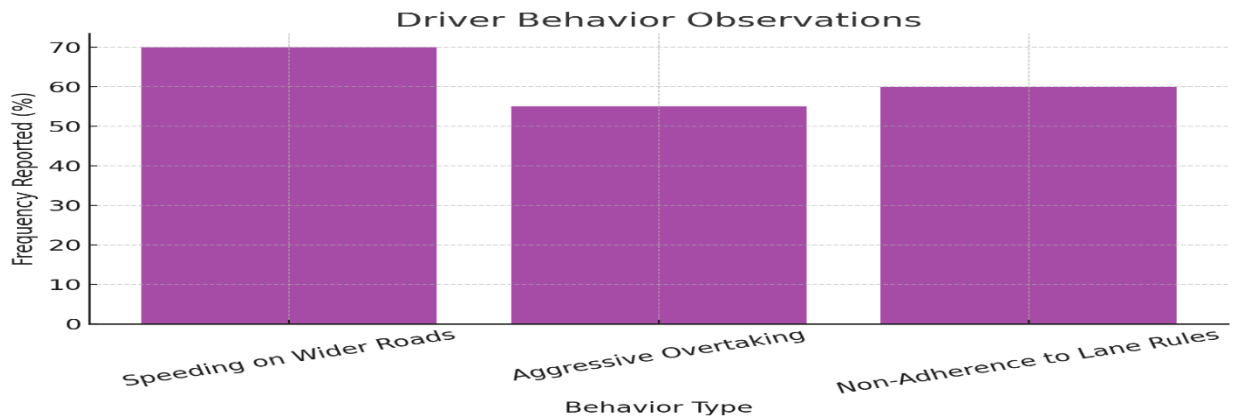
This graph also shows road class and the time dependence of traffic environment in Islamabad. Additional roads have the highest traffic intensity and mean speeds, which testifies to a greater load-carrying capacity of automobiles and the growth of accident danger. On the other hand, speeds and traffic volumes are the lowest in school zones, which suggests that tight control of traffic within this type of area is possible.

Figure 2: Environmental Impacts by Road Type



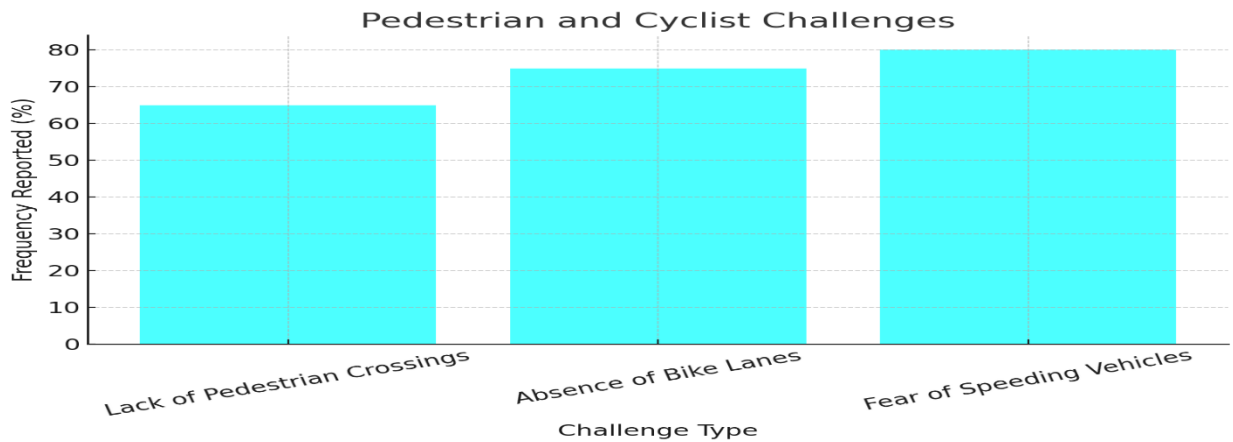
This graph shows average noise and pollution in various roads including arterial, collector and local. Constructed and commercial roads record the highest PM2.5 pollution levels and noise levels above $120\mu\text{gm}^{-3}$ and 85 Db. These environmental stressors present considerable danger to the health of motorists and other users of the roads. However, school zones primarily seem to have relatively lesser amounts of polluted and noisy environment, which gives policies to control environmental degradation in certain areas.

Figure 3: Driver Behavior Observations



The following bar graph shows the general distribution of unsafe driving behaviors. Having wider roads for driving; 70 % of the respondents have experience of being a speed risk, 55 % for aggressive overtaking; and 60 % for non-adherence to the lane rules. Such behaviors include increased speed on extended roads, cultural expectations of fast-moving vehicles and weak compliance with traffic laws.

Figure 4: Pedestrian and Cyclist Challenges



The graph below shows certain barriers of using non-motorized roads in Islamabad. Averagely, 65% of the respondents reported no pedestrian crossing and 75% reported no bike lanes, which affects mobility, and 80% reported being afraid of speeding vehicles and – active transport. These findings will also emphasize the importance of providing access for the so-called vulnerable groups which include the elderly, disabled and children through construction of inclusive infrastructure.

Pedestrian and Cyclist Experiences

Having surveyed, pedestrians confirmed that they experience high hesitation times when crossing expanded roads since such roads are characterized with high speeds, and poor crossing facilities. In the case of cyclists, they point to the absence of safe cycling lanes as the major impediment to safe cycling.

Table 4: Overview of pedestrian and cyclist challenges

Challenge	Frequency Reported (%)	Implications
Lack of pedestrian crossings	65%	Increased hesitation, jaywalking
Absence of bike lanes	75%	Reduced cycling activity, safety risks
Fear of speeding vehicles	80%	Limited road usage by vulnerable groups

The table clearly shows concern jeopardy that pedestrians and cyclers- both are vulnerable road users are facing in Islamabad. For instance, the lack of pedestrian crossings, noted by 65% of respondents, contributes to hesitation and risky behavior, including pedestrians crossing the streets when and where they want to. Likewise, 75% noted that there were no bike lanes for cyclists which poses risk and hinders active transport. Additionally, 80% stated that their major concern was speeding vehicles due to analysis of motorized transport and lack of protective structures for the vulnerable users. From the current study, it re-emphasizes the need for provisions in form of footbridges and signals, bicycle lanes, etc., to reduce these risks and to also make the country safer for non-motorized users.

CONCLUSION

This paper reveals that in most road expansion projects across Islamabad, attempts to enhance access have unanticipated adverse consequences affecting safety and the accessibility of roads to other users such as pedestrians. Lately, the spatial transformation of Islamabad has prioritized the ability of wheeled modes of transport at the detriment of pedestrians and cyclists despite the latter experiencing increased vulnerability on newly elongated roads like Islamabad Expressway and Srinagar Highway. It also doubles up the argument that, based on the Theory of Planned Behavior (Ajzen, 1991) and Risk Homeostasis Theory (Wilde, 1994), improvements in infrastructure cannot guarantee safety simply by changing the physical environment of risk-takers. For example, the tendency of increasing the speed limit and frequent overtaking on wider roads is also a big concern that requires strong enforcement measures as well as the increase in awareness.

Environmental aspects are crucial to grasp the general context for evaluating expansions of several roads. The approximation of noise and high levels of particles, particularly PM2.5 leads to negative impact on the health condition and cognitive capabilities of the urban populations, which imposes additional constraints to safe mobility (Hien et al., 2023; Stokols, 1972). The implementation of green buffers, noise barriers and low emission zones into planning systems will help reduce these stressors making the environment more conducive for any road user. Thus, Inclusive Urban Designs such as 'Complete Street' or designs that accommodate only pedestrians and cyclist would certainly help in improving the chances of mobility and decreasing the chances of accidents.

Further studies should also investigate cross-sectional surveys with assessment of the effects of road widening projects in the long run on traffic flow, safe roadways and the general environment. There are several specific methodologies: One of them is carrying out the GIS-based spatial analysis to within-urban areas that have higher risks; the other one is using econometric models to quantify traffic injuries' socio-economic impact; the last methodology should be community engagement and participation for the purpose of inclusiveness in the within-city planning. Moreover, the areas of focus should include comparative studies of the case countries and cases scanned, for instance, the

experiences of implementing the 'complete streets' in Amsterdam to implement in Islamabad city. Extensions involving predictive analytics of traffic flows, and air pollution check using AI could also help increase certainty and generalization of analyses. Inclusive urban planned architecture case studies of successful models of global influential cities such as Amsterdam and Copenhagen could be adopted to main city of Pakistan, Islamabad. Nonetheless, if policymakers and urban planners try to tackle these poly-dimensional challenges orally, interactively, they would define guidelines to develop safer, fairer, and ecologically friendly traffic systems in large cities.

Behavioral Dynamics

Implications derived from this research lend support to TPB and RHT for various unsafe behaviors evidenced among Islamabad Road users. Such values and perceptions that promote car domination severely exclude pedestrians and cyclists from the built environment. This preference for vehicles work holds culture that regards cars as status symbols and the absence of safe provisions for those who would otherwise prefer walking or cycling (Rafique & Malik, 2020). Besides, motorists feel safe on extended roads and in this context feel free to overspeed and overtake their counterparts, which RHT hypothesis that individuals only alter their perception of risk level to a certain limit (Wilde, 1994). For example, when broader and smoother roads are designed, drivers may consider road risk as has decreased hence they are more inclined to travel at higher speeds besides displaying meaner road demeanor. The following changes negate the efficiency gains for safer roads outlay, as exemplified by increased accident trends along such roads as Srinagar Highway (Ali et al., 2023).

The TPB also emphasizes the influences of the subjective norms and cultural perceived regarding these behaviors. Two of the factors in Islamabad's perceived factors include perceived norms where people accept speeding by their friends which is evidenced by the research done and others consider honking as a way of passing information. For instance, the reason given for engaging in aggressive overtaking includes its assertion as socially acceptable. Likewise, jaywalking is evident and common because people disregard the crosswalks; the latter are scarce in the Chinese city. These examples clearly illustrate how norms that sanction risky behaviors continue to prevail and the need to target an undesirable change to these normative processes. Another factor, which significantly contributes to the failure in pedestrian rights implementation, is social culture since in Islamabad, it is common for people to overtake, honk excessively and disregard zebra crossing protocols. These behaviors are escalated by poor compliance with the traffic norms; this makes the drivers accept the belief that such conducts are okay in society and will not attract penalties (Adeel et al., 2018). Besides, there is pressure from peers and no stigma associated with non-compliance with the law comes from the process. The absence of proper pedestrian crossings, cycle tracks and other provisions make consequences to discourage non-motorized transport hence the provision of adequate and proper infrastructure to support car use (UN-Habitat, 2013).

Environmental and Psychological Stressors

Interference and other forms of pollution are important environmental stressors that affect the capabilities of an individual's mental capacity and increase risky behaviors in conformity with Environmental Stress Theory by Stokols (1972). Existing Noise pollution: Range above fifty dB was observed on Islamabad's expanded road such as Srinagar Highway and Islamabad expressway during the daytime mainly due to traffic noise and this is likely to cause stress and aggression

among the drivers and the pedestrians. Research has established that this type of noise weakens concentration levels, impairs logical thinking, and raises impulsiveness levels among road users, thus raising their accident risk (Ali et al., 2023). Environmental noise pollutes physical and psychological health and turns the urban environment unsafe.

Furthermore, PM_{2.5} daily average concentrations on high traffic roads which intermittently exceeded 120 µg/m³ have negative impacts on physical health as more people in urban areas have respiratory illnesses. Tricorder: reduces alertness further from DM68, Mental fatigue due to stay in the polluted environment thus leading to poor concentration while on the road decreases road safety; Poor air quality also affects the drivers' ability to focus hence increasing the danger of accidents in, 2021; Rafique & Malik, 2020; Stokols, 1972). These environmental difficulties are most profound at rush hours when traffic density increases thus increasing noise and air pollution.

Other than environmental stresses, psychological factors acting as a variable add to the of vulnerability among non-motorized road users. These crossroads are mostly at junctions or along high-speed carriage paths and there always express hesitance and fear due to poor pedestrian crossings and facilities. This characteristic is well illustrated along the Srinagar Highway where the location of built-up environment clearly presents dangers to non-motorized road users (UN-Habitat, 2013). The same problem exists with cyclist who share road space with motors; this puts them in a very vulnerable position in the eye of larger motors resulting to high collision risks as highlighted by Adeel et al., (2018).

In addition, since culture informs attitudes towards psychological burdens presented in the book by road users, it is essential to use public awareness to promote a cultural shift. Raising awareness and encouraging motorists on general knowledge on usage of roads by both pedestrians and motorists, or even demanding our rights is a way of promoting a change within society. Other supportive urban measures embrace designs for access for all, for instance, pedestrian bridges, bike lanes, and structural components for safe roads, for instance, speed humps among others. It is relevant here to argue that multi-sectoral strategies working in cooperation with policymakers, urban planners, and communities will be instrumental in the success of these interventions, consequently changing the urban face of Islamabad and the road environment to safer for all stakeholders Adeel et al., (2018); Stokols, (1972).

Recommendations

Short-Term Interventions

- Traffic Calming Measures: Divide roads with islands, humps, crossroads, and round a bout to prevent cases of speeding.
- Enhanced Enforcement: Deploy speed cameras and dynamic speed limit signs.

Long-Term Strategies

- Inclusive Infrastructure: Develop complete streets with dedicated lanes for cyclists and pedestrians.
- Sustainable Urban Planning: Introduce green corridors and mixed-use zoning to reduce reliance on private vehicles.
- Public Transport Integration: Expand Bus Rapid Transit (BRT) systems to underserved areas.
- Smart Technologies: Use AI-driven traffic management for real-time congestion control.

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