

BUILDING HEALTHY CITIES



CITIZEN SPOTLIGHT:

ROAD SAFETY IN INDORE

PEDESTRIAN SURVEY

The USAID-funded Building Healthy Cities (BHC) project is a 5-year (2017-2022) learning project that aims to refocus city policies, planning, and services with a health equity lens while improving data-driven decision making for Smart Cities in four countries: Indore in India, Makassar in Indonesia, Da Nang in Vietnam, and Kathmandu in Nepal.

Planning for a Smart City is intrinsically linked to health: transportation, environment, sanitation, education, recreation, technology, and the built environment all influence the health of an urban population. Partnering closely with Indore Smart City Development Limited (ISCDL), BHC has engaged with sectors that contribute, directly or indirectly, to citizens' health and quality of life. This multi-sector engagement aims to provide all municipal sectors a common understanding of how they contribute to health. In Indore these sectors include health, urban planning and development, information and communications, education, waste management, pollution, food safety and hygiene, women and child development, traffic, and road safety. The project is also committed to helping ISCDL in its efforts to create more bicycle- and pedestrian-friendly infrastructure in Indore.

The number of pedestrian deaths in Indian cities has steadily increased in recent years. According to the Union Transport Ministry, the number of pedestrians killed on roads nationwide rose by 84 percent between 2014 and 2018, with average daily fatalities nearly doubling from 34 to 62 in the same time period.¹ Equity in access to safe roads and walkways is a big issue for those who walk. Those of lower income or education may have to walk even if it is unsafe due to lack of access to

¹ Dipak K. Dash, "62 Pedestrians Die Daily in India, up 84% in 4 Years," *The Times of India*, November 18, 2019, <https://timesofindia.indiatimes.com/india/62-pedestrians-die-daily-in-india-up-84-in-4-years/articleshow/72101003.cms>.

other transport, or if they choose to walk their neighborhoods may be less likely to have safe pedestrian access. One study found that 81 percent of pedestrian road traffic deaths were associated with less education and living in poorer neighborhoods, signaling some of these access issues.² Pedestrian safety is affected by a wide variety of factors; therefore, the challenge of defining and implementing effective changes to improve the safety of all road users requires coordination across all sectors and government agencies.³

Citizen feedback is valuable when it comes to planning, especially in urban areas. To support this, BHC conducted a series of rapid feedback surveys in Indore to understand citizens' experiences and feedback towards existing infrastructure for cycling and walking within the context of road traffic management by the city Traffic Department, Indore Municipal Corporation (IMC) and ISCDL. The first survey was conducted online in February—March 2021 and targeted current and future cyclists, to better understand motivations, barriers, and opportunities regarding cycling in Indore. The results are summarized in the brief [Citizen Spotlight: Road Safety in Indore](#). The second survey was conducted in-person in August—September 2021 and targeted pedestrians. This brief summarizes those findings.

Methods

The pedestrian survey questionnaire was designed to collect information regarding existing city infrastructure and traffic behavior towards pedestrians, and recommended a set of corrective interventions for the city government to take. The final questionnaire included 35 questions. Data were collected in-person by BHC staff who interviewed pedestrians walking in parks and gardens in the city center, where middle- and high-income families reside. The team also interviewed pedestrians near four “labour chawks” where laborers assemble in search of daily wage tasks. A total of 203 adult (age 18 and older) pedestrians responded to the survey; each respondent was selected because they walked for their work or for attending healthcare facilities. Verbal consent was taken before the beginning of the interview and only those who gave their consent were interviewed.

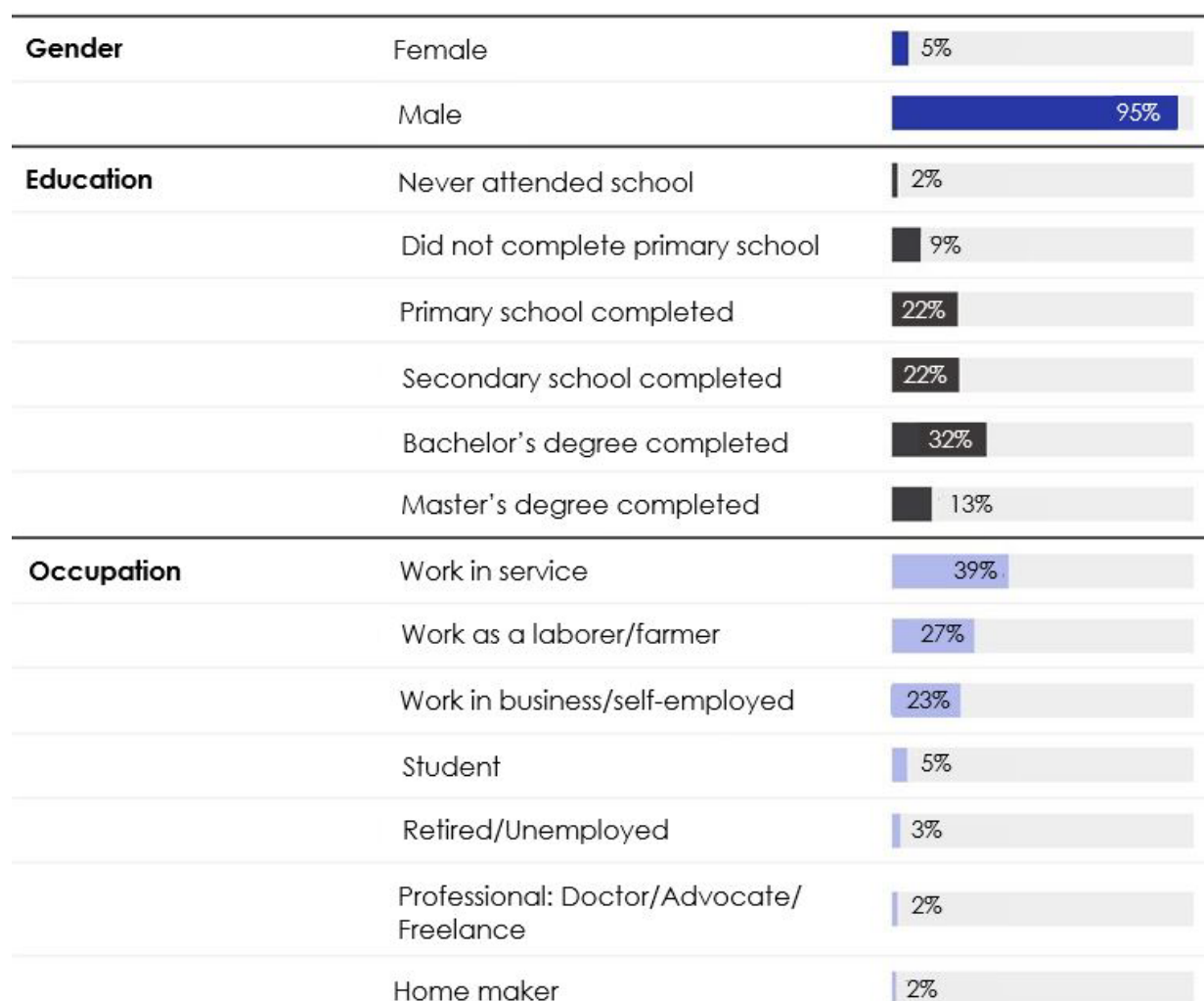
² Marvin Hsiao et al., “Road Traffic Injury Mortality and Its Mechanisms in India: Nationally Representative Mortality Survey of 1.1 Million Homes,” *BMJ Open* 3, no. 8 (August 17, 2013), <https://doi.org/10.1136/bmjopen-2013-002621>.

³ Kuru Dindi et al., “Road Traffic Injuries: Epidemiology, Challenges and Initiatives in India,” *The National Medical Journal of India* 32, no. 2 (April 2019): 113–17, <https://nmji.in/road-traffic-injuries-epidemiology-challenges-and-initiatives-in-india/>.



Results

General Information (n=203)

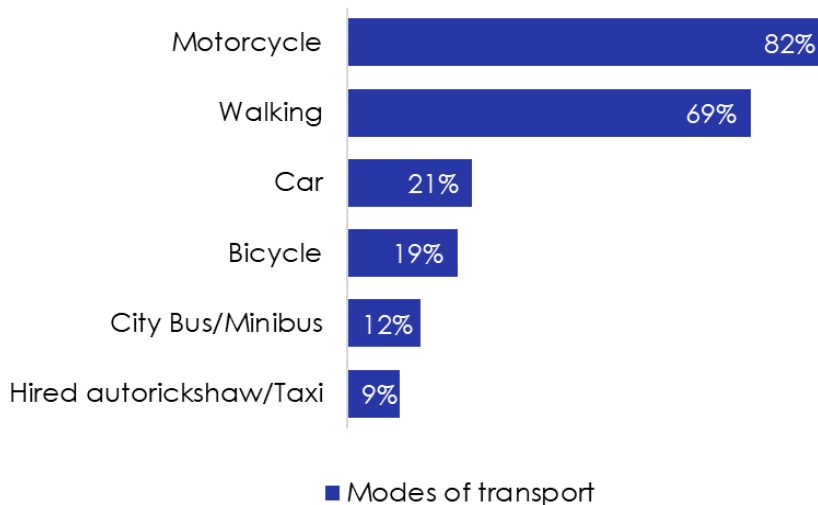


The majority (95%) of the respondents were male and resided in non-slum areas (70%). Nearly 30% of respondents lived in slum areas, which aligns with the city's demographic distribution. A small number of respondents (11%) either never attended school or did not complete a primary education. Nearly 44% completed primary or secondary education and 45% had completed bachelor's or master's degree courses. Most of the respondents were engaged in service (39%), business (23%) or worked as laborers (27%). Aside from slum designation, BHC acknowledges that this convenience sample under-represents women, and over represents higher education groups and white collar workers. In addition, most of the laborers who were present at labour chawks were male, as was the case with people walking for recreation and exercise.

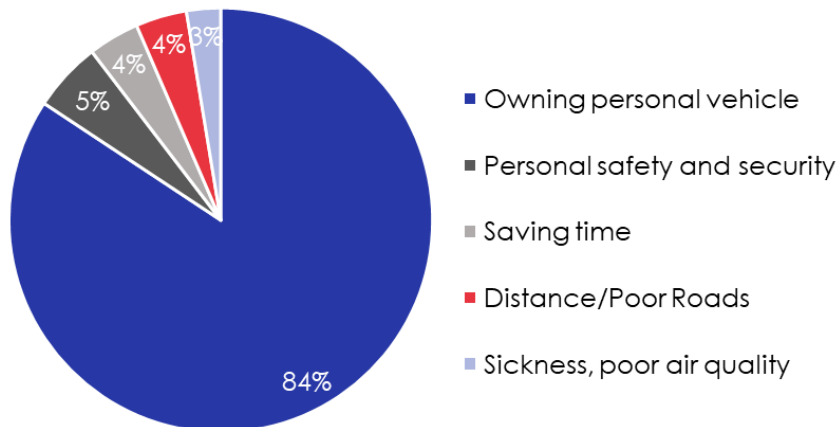


Commuting Preferences and Practices

More than two-thirds (69%) of respondents mentioned walking as a mode of transport. The most commonly used mode of transport was motorcycles (82%).



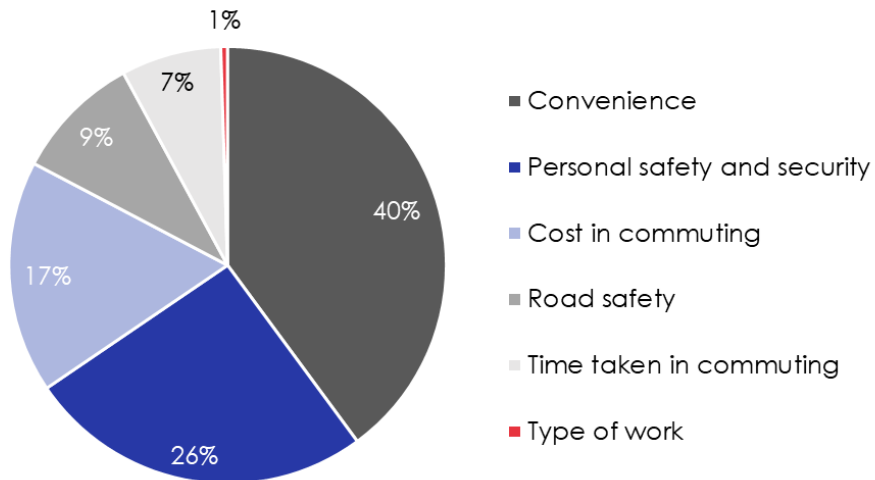
The availability of a personal vehicle (84%) was the main reason why respondents did not walk to their workplace. Some respondents (5%) also mentioned personal safety as a reason for preferring not to walk.



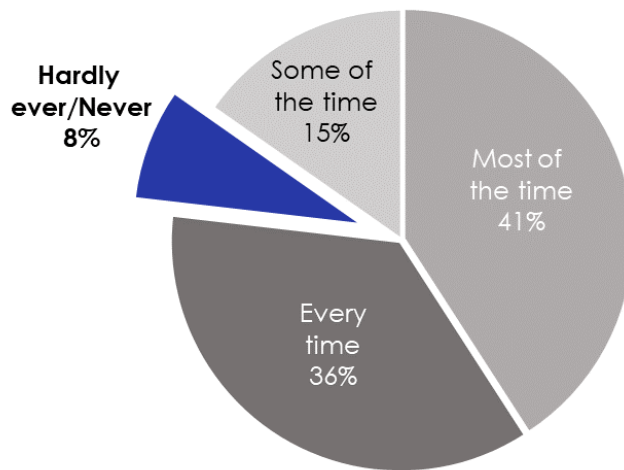
When asked about the number of days they walked in the last week for work or recreation, one-third (35%) of respondents had not walked at all. The remaining respondents were evenly split across categories: walked 1-2 days, 3-4 days, and 5-7 days.



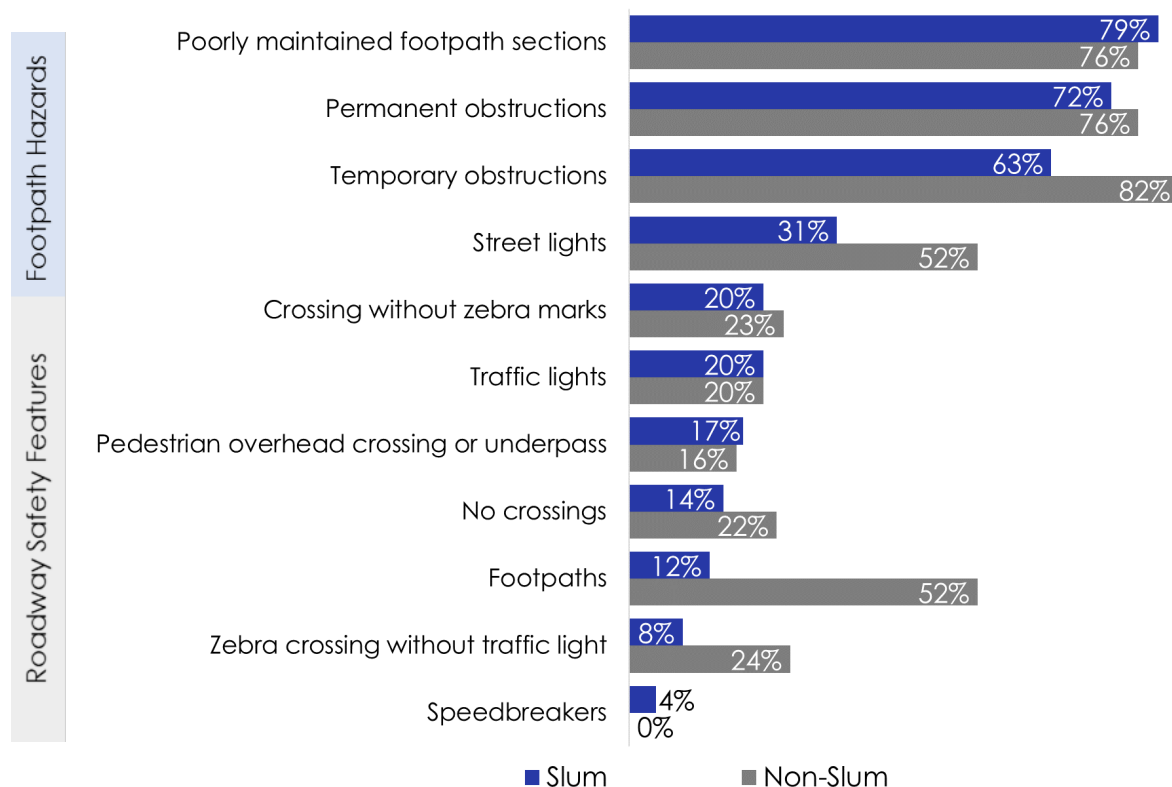
The most common **key factors that influenced choice of mode of transport** were convenience of commuting (40%) and personal safety and security (26%). Type of work (1%) and time taken in commuting (7%) were the least common factors. This may be influenced by the fact that the majority of our sample was male.



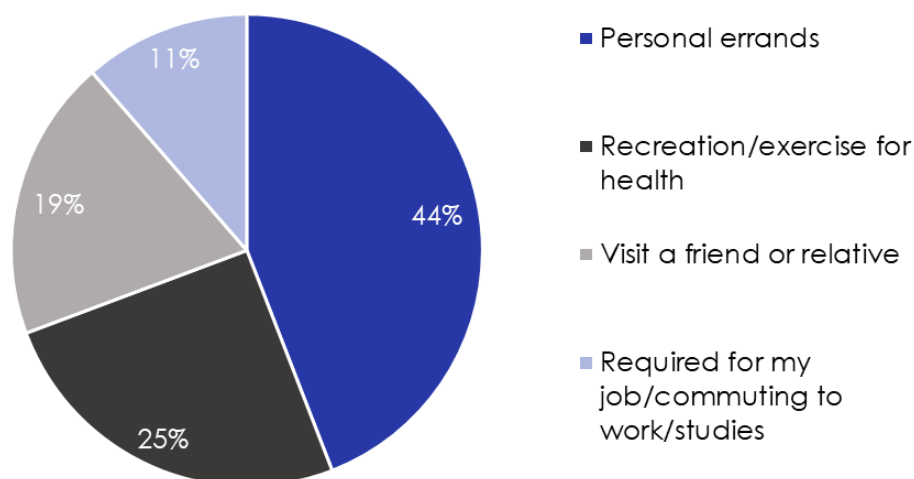
Almost 40% of respondents said that their walking habits had not changed compared to the previous year, while 33% had increased their walking. The vast majority (77%) of respondents walked on sidewalks or paved paths most of the time or every time, while only 8% hardly ever or never walked on these paths. **The main reason given by those who did not walk on paths was such paths did not exist or were in poor condition.**



Indeed, when we compare these answers to findings from BHC's 2018 Noncommunicable Disease Risk Factor and Environment Survey,⁴ many hazards were observed on footpaths throughout the city, and especially in slum neighborhoods. **There are also few safety features available on roads.**



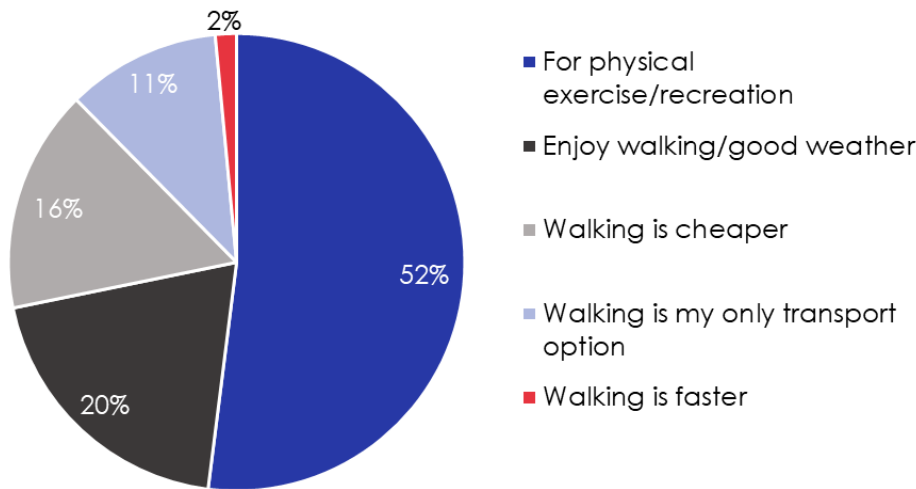
When asked about the main purpose of walking at the time of the survey, the primary reason was personal errands (44%). Only 11% were currently walking for their jobs or studies.



⁴ Goheer et al., "Does Neighborhood Status Affect Access to a Healthy Built Environment?," *Research Square*, August 12, 2021, <https://doi.org/10.21203/rs.3.rs-783491/v1>.



In response to the question of **why respondents preferred walking to other modes of transport, the majority answered physical exercise or recreation (52%)**. Very few responded that walking was their only transport option (11%) or was faster than other options (2%).

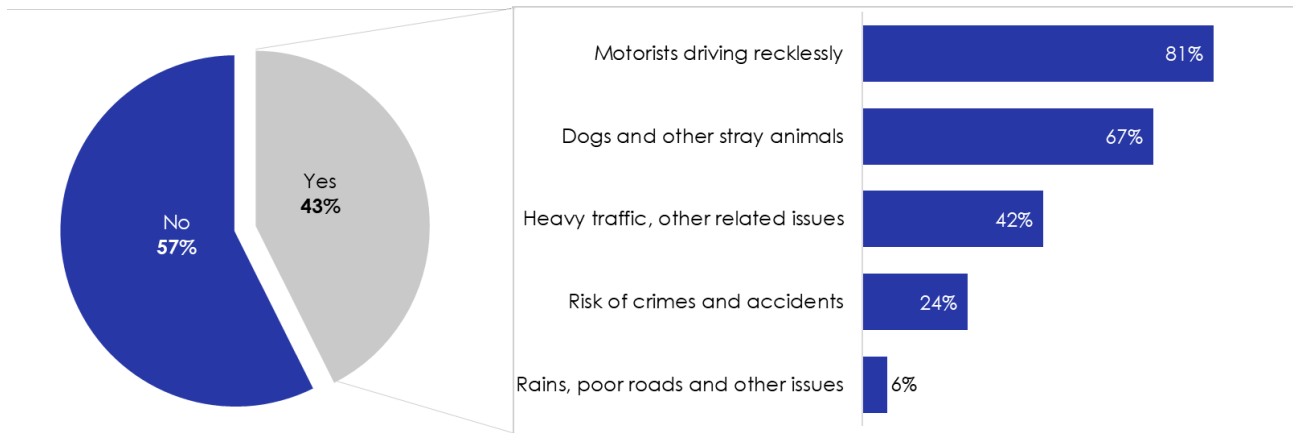


Road Safety

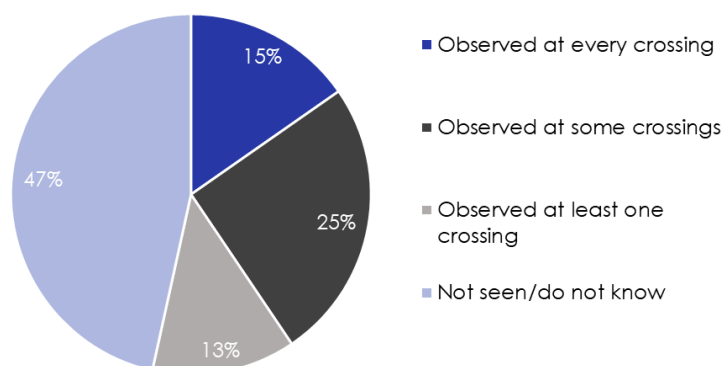
Nearly 43% of respondents felt their personal safety was threatened when walking, even among this sample of primarily men. The main reasons given by those who felt threatened walking were reckless driving by motorists (81%), and presence of stray animals (67%).

Do you feel your personal safety is threatened while walking?
(n=202)

If yes, why do you feel your personal safety is threatened while walking?
(n=86)



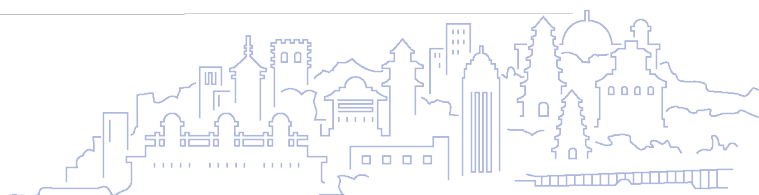
Nearly half (47%) of respondents did not see or did not know of the presence of safety measures such as traffic lights, zebra crossings, or other pedestrian-friendly aids to cross streets safely.



The table below summarizes **responses to questions assessing knowledge of road and traffic rules.**

Question	Answers	%
Zebra lines are meant for what?	Pedestrians crossing	82%
	Stopping/giving preference to vehicles	18%
Is boarding in and alighting from a vehicle in motion permitted?	Prohibited in all vehicles	94%
	Permitted in bus/autorickshaw	6%
What is the meaning of continuous yellow lines marked on the road?	Not touch or cross the yellow line	60%
	Allow to overtake only through the right side of yellow line	22%
	Cross the line only when overtaking a vehicle in front	18%
What is the meaning of broken white lines marked on the road?	Change track, if required	51%
	Shall not change track	25%
	Shall stop the vehicle	24%
On a road without footpath, where should the pedestrian walk?	Walk on the right side of the road	20%
	Walk on the left side of the road	27%
	Walk on either side of the road	53%
What is the priority action when a vehicle is involved in an accidental injury?	Take all reasonable steps to secure medical attention	90%
	Stop the vehicle & report to police station	9%
	Take the vehicle to the nearest police station and report the accident	1%

■ Correct answer
■ Incorrect answer



Most respondents knew the correct answers for **zebra crossings** (82%; they are meant for pedestrians crossing the road) and **boarding and alighting from a vehicle in motion** (94%; it is prohibited), and could list the rules to follow when **in a road accident that has caused injury to a person** (90%).

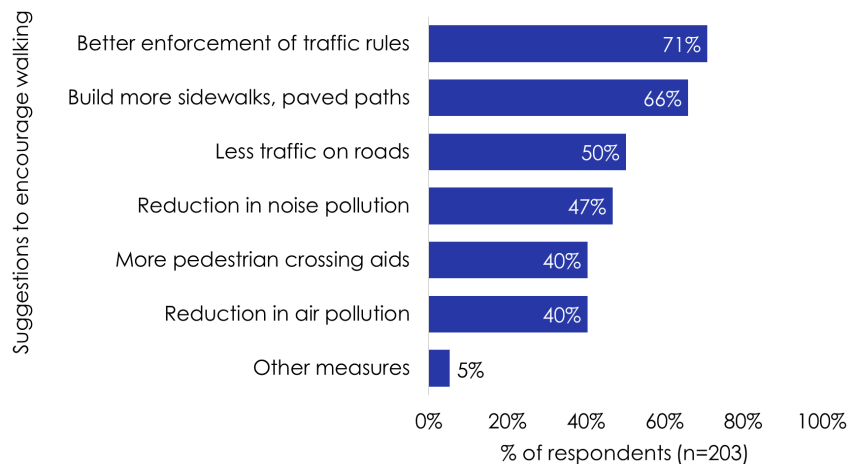
On the other hand, only 20% of people knew that they should **walk on the right side of a road without a footpath**. Half of the respondents (51%) knew the rule behind the **broken white lines** (the cyclist/motorcyclist/driver cannot change track). Only 60 percent gave the correct response that the **vehicle should not touch or cross a yellow line**.

Despite the issues noted, **half (50%) of the respondents were very satisfied with the community design for making walking safe**, while one in three (35%) felt somewhat satisfied.

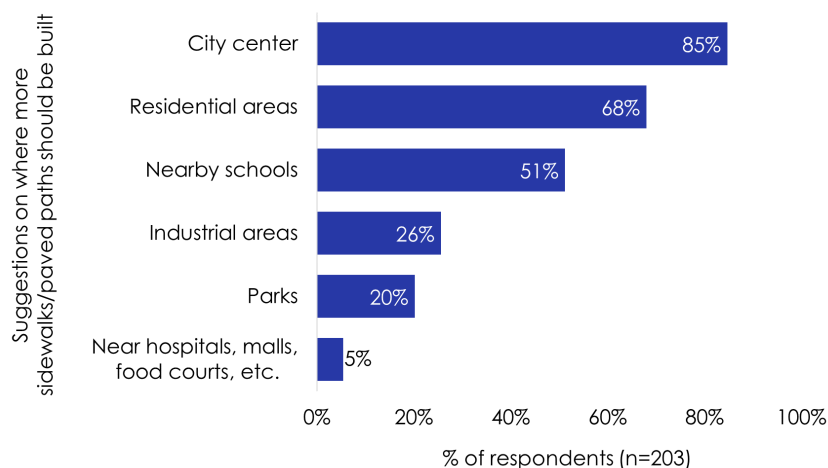


Suggestions for Improving Walking and Pedestrian Safety

The top suggestion for encouraging more walking in Indore was to improve traffic law enforcement (71%). Other popular suggestions included more sidewalks/paved paths (66%), and reduction in traffic (50%).



Sites recommended for more sidewalks and paved paths include the city center, residential areas, nearby schools, industrial areas, and parks.



Discussion

Given their impact on human health and wellbeing, road safety, better transport infrastructure, and improved awareness of traffic norms are important development priorities for India. BHC's survey was designed to understand experiences of pedestrians and gather feedback towards existing infrastructure for walking within the context of road safety and traffic management. Acknowledging the limitation of this sample which underrepresents women, this survey has identified the need for safe and improved pedestrian infrastructure in Indore, more awareness regarding road and traffic rules, and decreased noise and air pollution levels.

The survey findings suggest that though walking was an available mode of transport for 69% of respondents, owning a personal vehicle (84%) decreased their likelihood of walking. Nearly 43% of respondents felt that their personal safety was threatened when walking, even among this sample of primarily men. This number could have been higher if more women were a part of this survey. The top reason given by those who felt threatened walking was reckless driving by motorists (81%), which corresponds to the top suggestion given for improving walkability, which was to improve traffic law enforcement. This is backed by secondary data, which suggest that Indore has recorded the highest number of deaths due to road accidents in Madhya Pradesh every year since 2011.⁵ Moreover, a report by The Times of India found that road deaths increased by 72% during the COVID-19 lockdown between April-July 2020.⁶

On a positive note, the results suggest that one third of the respondents had increased their walking as compared to the previous year, mostly to improve their health. The majority of the respondents chose to walk for running personal errands (44%), and for recreation/health (25%); only 11% of the respondents walked to work. This finding contradicts the census report which

⁵ Anuraag Singh, "Indore Roads Biggest Killer, Most Injuries Reported from Bhopal," *Hindustan Times*, June 6, 2016, <https://www.hindustantimes.com/bhopal/indore-roads-biggest-killer-most-injuries-reported-from-bhopal/story-DOBRDKrV915rjgTPdRII3H.html>.

⁶ Kumar, "Road Deaths Shot up 72% in Indore in Lockdown," *The Times of India*, September 3, 2020, <https://timesofindia.indiatimes.com/city/indore/road-deaths-shot-up-72-in-indore-in-lockdown/articleshow/77902361.cms>.



suggests that around one fifth of Indian nonagricultural workers walk to work.⁷ This may be because the majority of the respondents fell into the middle- and high-income group and owned a personal vehicle, which reduces commuting time.

There was a lack of awareness among citizens regarding basic safety signs. Nearly half of the respondents (47%) did not notice the presence of any traffic lights, zebra crossings, or other pedestrian-friendly aids to cross streets safely. Surprisingly, only 20% of the respondents knew of the correct way of walking on the right side of the road.

The majority (90%) of survey respondents answered correctly that in the event of a road accident a person should take all steps to secure medical attention. In the past, concerns about legal and financial repercussions (such as being called as a witness in legal cases, or receiving bills from hospitals for the injured person's care) prevented citizens from providing assistance to injured strangers or calling an ambulance to provide emergency care. To address this issue, the Government of India enacted a 'Good Samaritan Law' in 2016 to encourage immediate care and transport of people experiencing medical emergencies, especially those injured in road accidents.⁸ Evidence suggests that care provided within the first hour of injury can avert many accident-related deaths.⁹

Despite the issues noted, half (50%) of the respondents were very satisfied with the community design for making walking safe, while one in three (35%) felt somewhat satisfied. A report by EMBARQ, The World Resources Institute Center for Sustainable Transport, also suggests that Indore has a better footpath infrastructure as compared to other cities; however, it also highlighted a need to expand safe pedestrian signals at crossings and remove obstructions of pathways.¹⁰ Recent news reports have also highlighted the serious issue of illegal parking and street food vendors encroaching on footpaths in Indore.¹¹ If commuters do not comply with traffic and footpath rules, and traffic authorities do not strictly enforce these rules, pedestrian safety will suffer.

To improve the safety of pedestrians, the former Additional Commissioner of Police in Indore recommended a multisector '5E' approach. BHC developed the table below, adapted from the US State of Vermont's 5E approach to road safety around schools,¹² to illustrate the concept and apply it to Indore.

⁷ Rukmini S, "India Walks to Work: Census," *The Hindu*, November 14, 2015, sec. Data,

<https://www.thehindu.com/data/india-walks-to-work-census/article7874521.ece>.

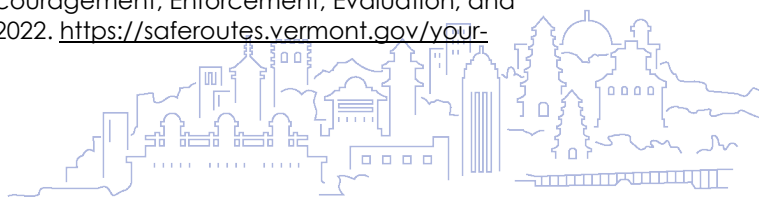
⁸ Ministry of Road Transport & Highways, Government of India. 2022. "Good Samaritan." Ministry of Road Transport & Highways. 2022. <https://morth.nic.in/good-samaritan>.

⁹ TNN. 2016. "Right Response in Golden Hour Can Save 90% Lives." *The Times of India*, December 11, 2016. <https://timesofindia.indiatimes.com/city/bhopal/right-response-in-golden-hour-can-save-90-lives/articleshow/55918574.cms>.

¹⁰ Prajna Rao and Matthew Bomberg, "Building a Pedestrian City: Indore A Place For People" (EMBARQ, The World Resources Institute Center for Sustainable Transport, 2010), <https://smarnet.niua.org/sites/default/files/resources/Indore%20A%20Place%20For%20People%20%28EMBARQ%20India%29.pdf>.

¹¹ *Nai Dunia*. 2018. "Indore: Encroachment and parking on 50% of the 250 km of footpath," December 4, 2018. <https://www.naidunia.com/madhya-pradesh/indore-encroachment-and-parking-on-250-km-footpaths-50-percent-in-indore-city-2695913>.

¹² Vermont Government. 2022. "The 5 E's - Education, Encouragement, Enforcement, Evaluation, and Engineering." State of Vermont, Safe Routes to School. 2022. <https://saferoutes.vermont.gov/your-school/5es>.



5 E's	Action	Stakeholders
Engineering	Maintain roads.	IMC, ISCDL
	Develop pedestrian and cycling pathways	
	Develop dedicated multi-level parking spaces.	
Education	Improve public awareness of traffic rules.	Department of Health, Traffic Police, Media
	Improve public awareness of first aid care to the injured.	
	Improve public awareness of Good Samaritan laws.	
Enforcement	Ensure compliance with traffic rules by all commuters, including pedestrians.	Traffic Police, IMC
	Provide legalized hawking spaces to street food vendors.	
	Remove encroachments on pathways.	
Emergency care	Train traffic police, ambulance staff, and volunteers on pre-hospital care for people injured in road accidents	Department of Health, Traffic Police, hospitals, and ambulance service providers
	Connect smart ambulance services with emergency facilities.	
	Use zone-wise mapping of hospitals for managing injuries.	
Evaluation	Monitor compliance with traffic rules.	Department of Health, Traffic Police, City Crime Bureau, Integrated Command and Control Centre
	Track trends and patterns of injuries and deaths post implementation of this strategy.	
	Track number of new pathways, parking spaces, and hawking spaces created or made functional.	

BHC is supporting Indore's efforts to become a safer city for pedestrians. In 2021 and 2022, BHC is working with ISCDL and IMC to improve pedestrian and cycle paths in eight neighborhoods, and is launching a Healthy City Action Plan that aims, among other things, to expand safe, equitable, and green transport options across the city. Citizen feedback is vital to this effort in order to place these resources where they are most needed.

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