



Greener Urban Mobility in India

The potential for behaviour change and walking

March, 2024

Acknowledgements:

This publication was authored by: Dr. Vikrom Mathur, Ashali Bhandari, Pooja Haldea, and Ronika Postaria.

Special thanks to the John D. and Catherine T. MacArthur Foundation for their generous support. We would like to extend our gratitude to Dr. Pavan Mamidi and Dr. Sharon Barnhardt for their invaluable intellectual contributions, guiding the analysis of research findings and facilitating the ideation that have shaped the interventions highlighted in this publication. Finally, thanks to the entire Centre for Social and Behaviour Change team for their contributions. We would like to extend our appreciation to Ms. Rimli Boorah for their assistance in copy editing this publication.

© 2024 The Centre for Social and Behaviour Change. All rights reserved.

All information, ideas, views, opinions, estimates, advice, suggestions, and recommendations (hereinafter 'content') in this publication should neither be understood as professional advice in any manner nor interpreted as policies, objectives, opinions or suggestions of the Centre for Social and Behaviour Change (CSBC), Ashoka University. Readers are advised to use their discretion and seek professional advice before taking any action or decision, based on the contents of this publication. The content in this publication has been obtained or derived from sources believed by CSBC to be reliable but CSBC does not represent this information to be accurate or complete. CSBC does not assume any responsibility and disclaims any liability for any loss or damages caused due to any reason whatsoever, towards any person (natural or legal) who uses this publication.

Table of Contents

Executive Summary	3
Section 01: The Project	4
Walking – The Indian Context	4
Choice and Public Transport Usage	6
Project Methodology	7
Section 02: Insights from Fieldwork	8
Demand-Side Barriers	8
Supply-Side Barriers	9
Demand-Side Facilitators	10
Section 03: Recommendations and Interventions	11
Enable	11
Encourage	11
Exemplify	13
Engage	13
Walking Towards Greener Urban Mobility	13
References	15

Executive Summary

Urban India's burgeoning population and increasingly heavy road traffic make the implementation of low carbon transit options an imperative. In recent years, the Indian government has been promoting walking and cycling to curb emissions from the transportation sector. Walking is being advocated as an affordable and convenient mode for shorter distances through various policies and projects. However, the use of walking as a mode of transportation depends on socio-economic status. The 2011 Census suggested that 30% of households in urban areas walk as the primary mode, but research shows this is essentially a segment of society without access to private modes of mechanised transportation. Those who do have this access seldom consider the option of walking even when short distances are involved. This represents a missed opportunity in terms of climate action, as walking has the potential for significant emissions reduction. It is increasingly clear that behavioural biases limit the uptake of low carbon mobility solutions like walking in Indian cities.

This study on walking culture in Panaji, Goa, found that individual barriers such as perceptions of lack of safety, walking as a low-income mode, and walking as recreation prevent households from adopting walking as a mode of commute. Further, supply-side limitations such as the lack of adequate infrastructure and unsafe road conditions hinder walking for commuting. This brief summarises the key structural and behavioural barriers and enablers in walking as a mode of commute, and suggests behavioural interventions and policy measures.

Section 01: The Project

A recent report suggests that Non-Motorised Transportation (NMT) can reduce emissions from urban transport by 2 to 10%, depending on the context (IPCC, 2023). NMT involves 'active' travel modes like walking and cycling and using non-motorised conveyances such as manual wheelchairs, skateboards, carts, etc. As the climate crisis deepens, urban mobility initiatives in cities are increasingly seeking to integrate walking and cycling into the city transportation network since they are zero-emission modes and have a high potential for reducing air pollution. There is great potential for walking to serve as a key mode for first- and last-mile connectivity for those using public transportation networks.

The Low Carbon Lifestyles Project seeks to initiate behaviour change towards sustainable lifestyle choices, including low carbon transportation, in Indian cities. It aims to design interventions to redirect household choices towards sustainable behaviours and technologies. The primary goal is to ensure that policy incorporates an understanding of the context of consumer choices and of local barriers to the uptake of low carbon consumption, essential to devise levers for higher adoption.

In the domain of urban mobility, the project promotes the uptake of low carbon modes, including NMT, electric vehicles, and public transportation. This brief focuses on walking, examining the barriers and facilitators in its adoption in Indian cities. The project uses the city of Panaji, in the state of Goa, as a hyperlocal case study to understand why people are choosing private vehicles over walking for different kinds of short-distance journeys.

Project Objective:

A key objective of the Low Carbon Lifestyles Project is to advocate the adoption of non-motorised mobility modes, like walking. It promotes a switch to walking from private vehicles as the primary mode of transportation for local short trips, running errands, or last-mile connectivity.

- Target Behaviour: Switching to walking as a primary mode of transportation for local or work trips up to 4 km and for short trips (Bassett et al., 2010), including last-mile connectivity up to 800 m (MoUD, 2017)
- Target Population: Commuters who use motorised private vehicles for daily transportation

Walking – The Indian Context

In India, walking and cycling have been integral modes of commuting; however, with the increased popularity of motorised vehicles, the usage of active modes has

declined, especially in urban areas. Further, walking infrastructure in Indian cities is highly inadequate: it is usually limited to certain pockets/neighbourhoods, and lacks prioritisation and financial resource allocation. According to the Climate Smart Cities Assessment Framework 2.0, out of the 126 participant cities, only 22 cities have NMT infrastructure in over 25% of the road network as stipulated by the Ministry of Housing and Urban Affairs' (MoHUA) street design guidelines (MoHUA & NIUA, 2021).

The 2006 National Urban Transport Policy (NUTP) was the first time the Indian government talked about moving people rather than vehicles (MoUD, 2006). The updated NUTP of 2014 acts as a comprehensive guideline for promoting sustainable transportation practices in India, including NMT infrastructure such as footpaths, pedestrian crossings, and street lighting, to improve pedestrian safety and accessibility (MoUD, 2014). The policy also emphasises integration of walking with other modes of transportation to improve connectivity and enable more people to walk while travelling longer distances. Following that, the revised Toolkit for Comprehensive Mobility Plan (CMP) 2014 focused on land use-transport integration such that the urban infrastructure encourages NMT (Institute of Urban Transport (India), 2014). It also emphasised incorporating walking as a last-mile connectivity option for public transportation.

Additionally, the Smart Cities Mission (2015), Atal Mission for Rejuvenation and Urban Transformation (AMRUT) (2015), and Green Urban Transport Scheme (GUTS) (2016) promote sustainable transportation, endorsing a switch from private motorised vehicles to public transportation and walking and cycling; these schemes have allocated funds to develop pedestrian-friendly public spaces in several Indian cities (India Brand Equity Foundation, 2015; MoHUA, 2021). Similarly, the 2017 National Transit-Oriented Development (TOD) Policy has built on the potential of walking as a commute mode in order to reduce the reliance on private vehicles (MoUD, 2017). The central government's Fit India Movement, where people are encouraged to track their fitness core, number of steps, calories burned, etc., to make fitness an integral part of daily life through behavioural changes, also promotes walking (MoYAS, 2019).

Several cities, such as Chennai, Pune, Ahmedabad, Mumbai, Bengaluru, etc., have created walkability plans and guidelines for pedestrian infrastructure under their city master plans. Non-governmental organisations (NGOs) also play a role in promoting walking. The i2u Social Foundation, which assists companies in fulfilling their Corporate Social Responsibility initiatives, conducts employee engagement drives and crowd-funding campaigns such as Ride/Walk/Run-For-a-Cause campaigns to raise funds to support NGOs focused on specific causes (i2u Social Foundation, n.d.).

There is a need to deepen investment in pedestrian-friendly infrastructure and safe and accessible walking networks, including but not limited to designing and maintaining wide, continuous footpaths and pedestrian crossings, enforcing traffic

laws to ensure pedestrian safety, and integrating walking with public transportation. In addition to the supply-side gaps, the uptake of NMT is affected by behavioural challenges, including lifestyle choices.

Choice and Public Transport Usage

Globally, literature highlights that several key behavioural and structural barriers influence individual decisions about adopting walking as a mode of transportation. First, personal factors such as lack of interest, self-discipline, and fear of exposure to large crowds, especially at certain times of the day, can prevent people from walking (Physiopedia contributors, 2022). Second, because walking generally takes longer than a motorised option, people are less likely to walk to a destination farther than 2.5 km (The Netherlands Organisation for Applied Scientific Research, n.d.). Third – and this is allied to the second factor – there is the perception of a much longer duration of a trip when walking, compared to motorised commutes, for caregivers and trip-chainers (whose daily commute includes various stops, such as errands, picking up children from school, etc.), irrespective of the distance, direction, terrain, road conditions, time spent in traffic, and need to find a parking spot at each location (Park et al., 2013; Watson et al., 2021). Fourth, the perception of lack of safety, especially while crossing dead or inactive spaces, with the likelihood of crime or attacks by stray animals, can discourage people, especially women and girls, from walking to commute or for shorter trips (Mason et al., 2013). Finally, supply-side barriers also limit the uptake of walking. For example, the absence of safe walking paths, with adequate street lights and crossings, constitutes a barrier (Usman, 2023). Unpleasant walking routes due to multiple busy intersections, heavy traffic, and pollution and litter also deter people from walking (The Netherlands Organisation for Applied Scientific Research, n.d.). Further, weather (e.g. exposure to the intense sun) limits a person's choice to walk (Dong et al., 2022).

Literature also points to some factors that facilitate walking. Information on total journey distance, time taken to reach the destination on foot, and stops along the way helps users choose a journey based on their needs. Such walking route information is of particular help for trip-chainers, enabling them to take the shortest route with minimal additional effort in the course of making multiple stops (Harries et al., 2013). Awareness of the environmental benefits of walking is a facilitator; awareness campaigns around the issue, such as the Healthy Environments Partnership (HEP) (Detroit Community-Academic Urban Research Center, n.d.), CHAMPS (Community Healthy Activities Model Program for Seniors) (University of California, 2023), and Oregon Walks (Oregon Walks, 2023), can be very effective. The knowledge of health benefits is another facilitator; leveraging health and active lifestyles to promote walking has worked on platforms such as Healthify and Sweatcoin (Sweatco Ltd, 2022). Finally, workplace initiatives to promote walking by establishing social/walking clubs, organising walking meetings, and providing

physical infrastructure such as shower facilities (Transport for Greater Manchester, n.d.) have proven effective.

Project Methodology

Behavioural research on the adoption of walking in Indian cities is sparse, a situation this project seeks to remedy. The study aims to identify the barriers and facilitators that are specific to the Indian context and have an impact on how individuals choose to walk for different trips. The project team designed a robust methodology to investigate the barriers and facilitators in relation to walking, and to design interventions to promote adoption.

- First, a detailed literature review was conducted to identify programmes, policies and guidelines to assess supply-side incentives and disincentives by examining the different planning authorities' (central, state, and cities) ambitions in promoting walking in Indian cities.
- This was supplemented by stakeholder mapping to understand the diverse actors involved in the implementation.
- The next step was diagnostic fieldwork. This was conducted in Panaji, Goa, a city selected for its favourable conditions for walking, such as its small area, dense road network, mixed land use, and fewer infrastructure limitations affecting connectivity, safety, and access to amenities. The team designed and conducted fieldwork with 18 respondents, consisting of two categories:
 - 8 current commuters who walk in the city of Panaji as their primary mode of transportation all year round, to understand the factors that motivate them to walk for commuting daily
 - 10 recreational walkers who use a personal vehicle for commuting, to understand the barriers to more frequent use of walking.

The team ensured gender and age diversity within the sample.

- Finally, we consolidated and analysed the insights from fieldwork to identify behavioural and structural barriers to and facilitators for walking.
- This was followed by ideation workshops to identify interventions to improve uptake.

Section 02: Insights from Fieldwork

Whether or not an individual consumer adopts a given sustainable behaviour depends on two sets of factors: (1) Demand side factors -- The preferences, needs, and beliefs of the individual can make her/him more likely to adopt that behaviour (such factors are demand-side facilitators of sustainable behaviour), or less likely to adopt the behaviour (demand-side barriers) and (2). Supply-side factors: The availability and accessibility of infrastructure and/or services at the systemic level make an individual more likely (supply-side facilitators) or less likely (supply-side barriers) to adopt the behaviour.

Our diagnostic fieldwork revealed seven distinct barriers and facilitators that influence the uptake of walking among individuals and households in Panaji.

Demand-Side Barriers

1. *Perceived lack of safety for women:* Our study revealed that perceived lack of safety is a key barrier to walking as a mode of transportation for girls and women. Familiarity with the route, area (e.g. vendors, shopkeepers, neighbours), and street activity significantly affect how safe women feel while walking. We found that women are hesitant to walk to unfamiliar destinations due to the perceived likelihood of a crime. In particular, female students residing in hostels were more concerned about safety than the permanent residents of Panaji, possibly due to their unfamiliarity with the city. Further, women who do walk prefer shorter distances and usually active areas: places with continuous activities and the presence of a small crowd, such as the university campus, Panaji market, and nearby shops. Interestingly, none of the female respondents mentioned any personal negative incidents, yet they still cited avoidance of unknown routes and opting for group walks for safety reasons as a part of life.
2. *Seen only as a recreational activity, not a mode of commute:* Our research found that upper-middle-class households are primarily motivated to walk for health and recreation purposes. For them, there is no association of walking with travel or commuting. People over 30 years old tend to view walking as an activity to be done in parks or on tracks rather than as a means of transportation. They rely on personal motorised vehicles for routine activities, such as going grocery shopping or visiting nearby places. Further, the lack of pedestrian-friendly infrastructure limits the possibility of walking as a commute mode since people are likely to compare walking for last-mile or short trips to their experience of exercising on well-designed walking paths.

Similarly, for the younger generations, while the reliance on private vehicles is

much less than for the 30-plus age groups, the primary motive for walking is still the same: to stay fit and burn calories. However, this younger age group was found to choose streets for their regular morning or evening walks, taking different routes, rather than dedicated recreational locations.

3. *Perception of walking as poor people's commute mode*: Our research disclosed that people (above 30 years) in middle- and higher-income households are uncomfortable even considering walking to destinations as they believe people move on foot only when they do not have access to a motorised vehicle or want to save money. Due to this mindset, they choose to use a personal vehicle for all 'non-recreational' purposes. We also found that the lower-income groups do not see walking as an aspirational mode of commute. They walk out of necessity and would not choose to walk if they had a personal vehicle.

Supply-Side Barriers

4. *Limited infrastructure and road safety issues*: Our primary research found that people are not likely to walk to destinations taking longer than 5–10 minutes due to poor road conditions and limited infrastructure, such as narrow footpaths, poor lighting, absence of zebra crossings, lack of shade on the walking path, etc. In the absence of proper footpaths, pedestrians are forced to walk on the road alongside moving cars, making walking a highly unsafe mode of commute. The risk factor is compounded by poorly lit streets, making both men and women reluctant to walk at night for fear of accidents. We also found that it is inconvenient for pedestrians, especially the elderly, children, and mothers with strollers and babies, to move across crossroads since the traffic signal cycles do not allot enough time for pedestrians. All these factors combined to make walking uncomfortable and unattractive, especially for those who are not in the habit of walking for their regular trips.
5. *Extreme weather (heat, rain)*: We discovered that individuals are hesitant to walk in extreme weather conditions, such as when it is too hot or rainy. Exposure to intense sunlight can decrease energy levels, while indirect factors like sweating can cause discomfort even during short walks, as people may have to remain in sweaty clothes for an extended period, depending on the purpose of the journey. To walk in extreme weather, people must plan their trips in detail, carrying additional items like water bottles, umbrellas, or raincoats. Further, people are afraid of slipping and falling and getting injured while walking on slippery roads in the rain, making walking seem like a mode of transportation that requires individuals to leave their comfort zones.

Demand-Side Facilitators

6. *Health consciousness*: Our research has shown that pedestrians of all ages recognise the health benefits of walking and, therefore, incorporate walking into their daily routine either as the primary mode of transportation or for recreation. The motivation for walking among all age groups is to stay fit, maintain a healthy body weight, reduce stress, and promote physical and mental well-being.

7. *Environmental values, especially of students*: The study indicates that students in colleges and universities are well aware of the environmental benefits of walking and are committed to reducing their carbon footprint. Of the students interviewed, 75% expressed concern for the environment and the desire to reduce their contribution to traffic pollution. As a result, they prefer to walk or take a bus instead of using a private vehicle. We also found that these students do not always walk out of necessity. In fact, they have access to a private mode of transport in their household or a friend's, but still choose to walk for shorter distances.

Section 03: Recommendations and Interventions

This study has uncovered key behavioural and structural barriers that limit the adoption of walking in the Indian context. Utilisation of these insights is for policy, enabling governments and other stakeholders to employ a powerful set of levers to facilitate the adoption of walking as a mode of transportation.

To activate the behavioural bridge to policy, this study employs the 4Es Model of the UK government's Department for Environment, Food and Rural Affairs (DEFRA), which aspires to enable, encourage, exemplify, and engage in moving individuals towards sustainable practices (Institute for Government, 2015). This model offers an approach to addressing behavioural and structural gaps in policy:

1. Enable focuses on providing the necessary infrastructure to make sustainable choices accessible and attractive.
2. Encourage delves into the realm of information dissemination and public awareness to motivate individuals.
3. Exemplify emphasises the importance of leading by example.
4. Engage encourages active participation and collaboration amongst stakeholders to influence policy.

Through a series of ideation workshops, this project identified nine interventions that address the behavioural barriers to walking, organised below in the 4Es framework.

Enable

Policy- and decision-makers must recognise the physical environment has a direct impact on people's mobility decisions. To address the contextual and structural barriers to enable people to walk, the project suggests the following intervention:

1. Improving walking infrastructure: City authorities must build dedicated space for pedestrians in all areas. Further, fundamental necessities for pedestrians, such as proper width of footpaths, unhindered walking paths, streetlights, shelter and seating at short intervals, etc., must be ensured. Establishing a strong pedestrian network can assist transportation planners in effectively incorporating walking as the first- and last-mile mode choice around public transportation routes.

Encourage

Incorporating insights from behavioural research around walking in traditional policy tools such as information provision, regulations, incentives and communication campaigns will sharpen the efficacy of these tools, enabling them to directly cater to

the concerns of people who do not walk for commuting. The project suggests the following behaviour change campaigns:

2. *Publicise tools for pre-planning trips*: Tips and tools for pre-planning trips can make walking a more comfortable experience. Simple actions like bringing fresh clothes to work, identifying regular commute times and routes, and engaging in mental mapping and creative visualisations to document the walking experience can help people feel more in control.
3. *Highlight the benefits of walking*: Walking as a mode of commute can be encouraged by emphasising its positive aspects, such as protecting the environment, promoting a sustainable lifestyle, and improving physical and mental health. Campaigns to promote walking can involve various strategies, such as creating engaging content, partnering with relevant organisations, and leveraging social media platforms to reach a wider audience. Using attractive visuals and tailoring the language to the target audience can help establish walking as a habit that is both enjoyable and valuable.
4. *Introduce the concept of 'walking back home'*: While adopting walking as the mode of office commute may not work both ways, walking back home from work can be practicable for many. This addresses concerns about reaching the destination on time or sweaty. If feeling fatigued or overheated, a quick break to relax in nature can be easily incorporated into the walk home.
5. *Quantify and highlight the multi-tasking possibilities of walking*: It is possible to measure the advantages of walking in relation to both health and the environment. Walking to work or home can help individuals achieve their daily step goals and improve their fitness while also significantly reducing their carbon emissions and carbon footprint. When presented with quantifiable advantages, people are more likely to choose walking as a commute mode. Combining other activities, such as daily fitness goals, listening to podcasts or news, doing light stretches, making phone calls, picking up groceries, etc., while walking can save extra hours to spend with family. By highlighting these benefits, campaigns can make walking more appealing to people who might otherwise prefer to drive a car or two-wheeler.
6. *Digitise the experience of walking*: People's interest in walking for health reasons can be capitalised on by digitising the walking experience to promote walking as a primary mode of transportation for short distances. This way it can be made into a fun activity with visible and countable rewards at different stages, thus converting physical and mental fitness into a desirable habit. Our research suggests this approach can be effective for different target groups if fine-tuned to leverage individual goals such as daily steps, calorie burn, social

Exemplify

The actions of high-profile figures in society send implicit messages about desirable behaviours. The project suggests using such figures to exemplify the benefits of walking:

7. Campaign with aspirational figures to promote walking: To improve the status perception of walking and establish it as a 'woke' or 'cool' thing to do, use celebrities, influencers, and other admired figures, who walk to their workplace or to perform errands, in campaigns. Their endorsement can generate media coverage, enhancing the campaign's credibility, visibility, and impact.

Engage

Promoting walking as a mode of commute requires cooperation from diverse actors, not just the government and citizens. The following interventions are multi-stakeholder recommendations for the private sector that can incentivise walking for commuting:

8. *Provide workplace incentives*: To encourage a culture of walking to work, businesses and institutions can introduce several incentives. For instance, they can organise a lottery for the person with the highest step count in a week, offer coupons or rewards for those who commute by walking during non-peak hours, and encourage walking meetings or lunchtime walks, to create a culture of walking.
9. *Make it social*: Walking can be framed as a social activity to make it more appealing. To encourage more people to walk on the streets and address safety concerns, a walking culture can be established through community-led walking groups involving friends, family, and neighbours, social support groups, exercise buddy systems, and physical activity plans with clear goals and contracts. Community centres, placemaking institutions, and research collaboratives in the city often implement such interventions, and they have proven to increase physical activity among older adults

Walking Towards Greener Urban Mobility

This diagnostic brief highlights the importance of incorporating behavioural insights in transportation policy and city planning, specifically focusing on promotion of walking as a sustainable mode of commuting. It presents a deep dive into key behavioural barriers to the uptake of walking in India's one of the most walkable cities. While some of these barriers may be context-specific, the majority are applicable across many Indian cities. Alongside, this novel research provides a series of recommendations and interventions that can improve the uptake of walking. With many cities in India now implementing NMT policies, there is great potential to improve the walking infrastructure and increase the adoption of this mode, paving the way for a greener urban future.



FIGURE 1: WALKING ON THE STREET (Photo by Annie Spratt on Unsplash)

References

Bassett, D. R. J., Wyatt, H. R., Thompson, H., Peters, J. C., & Hill, J. O. (2010). Pedometer-Measured Physical Activity and Health Behaviors in U.S. Adults. *Medicine & Science in Sports & Exercise*, 42(10), 1819–1825. <https://pubmed.ncbi.nlm.nih.gov/20305579/>

Detroit Community-Academic Urban Research Center. (n.d.). *Healthy Environments Partnership (HEP)*. University of Michigan. <https://www.detroiturc.org/research-partnerships/hep>

Dong, F., Li, X., Xie, Q., Ye, R., & Cao, S. (2022). The influence of weather and temperature on pedestrian walking characteristics on the zigzag bridge. *International Journal of Biometeorology*, 66(12), 2541–2552. <https://pubmed.ncbi.nlm.nih.gov/36255527/>

Harries, T., Eslambolchilar, P., Stride, C., Rettie, R., & Walton, S. (2013). Walking in the wild: Using an always-on smartphone application to increase physical activity. In P. Kotzé, G. Marsden, G. Lindgaard, J. Wesson, & M. Winckler (Eds.), *Human-Computer Interaction – INTERACT 2013* (Vol. 8120, pp. 19–36). Springer. https://doi.org/10.1007/978-3-642-40498-6_2

i2u Social Foundation. (n.d.). *Ride Walk Run*. <https://www.indiaisus.com/ride-walk-run.html>

India Brand Equity Foundation. (2015). *Smart Cities Mission*. <https://www.ibef.org/government-schemes/smart-cities-mission>

Institute for Government. (2015). *MindSpace: Influencing behaviour through public policy*. <https://www.bi.team/wp-content/uploads/2015/07/MINDSPACE.pdf>

Institute of Urban Transport (India) (2014). *Toolkit for Comprehensive Mobility Plan (CMP), Revised (2014)*. <https://mohua.gov.in/upload/uploadfiles/files/CMP%20Report%20Revised.pdf>

Intergovernmental Panel on Climate Change (IPCC). (2023). *Synthesis report of the IPCC Sixth Assessment Report (AR6)*. https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf

Mason, P., Kearns, A., & Livingston, M. (2013). 'Safe Going': The influence of crime rates and perceived crime and safety on walking in deprived neighbourhoods. *Social Science & Medicine*, 91, 15–24. <https://doi.org/10.1016/j.socscimed.2013.04.011>

Ministry of Housing and Urban Affairs (MoHUA). (2021). *Annual Report 2020–21*. Government of India. [https://mohua.gov.in/upload/uploadfiles/files/Annual_Report_2020_21_MoHUA_EnglishVersion%20\(Final\).pdf](https://mohua.gov.in/upload/uploadfiles/files/Annual_Report_2020_21_MoHUA_EnglishVersion%20(Final).pdf)

Ministry of Housing and Urban Affairs (MoHUA) & National Institute of Urban Affairs (NIUA). (2021). *Climate Smart Cities Assessment Framework 2.0: Cities Readiness Report*. <https://niua.in/csc/assets/pdf/key-documents/Cities-Readiness-Report.pdf>

Ministry of Urban Development (MoUD). (2006). *National Urban Transport Policy*.

Government of India. <https://mohua.gov.in/upload/uploadfiles/files/TransportPolicy.pdf>

Ministry of Urban Development (MoUD). (2014). *National Urban Transport Policy, 2014*.

Government of India. https://www.changing-transport.org/wp-content/uploads/E_K_NUMP_India_2014_EN.pdf

Ministry of Urban Development (MoUD). (2017). *National Transit Oriented Development (TOD) Policy*. Government of India.

https://mohua.gov.in/upload/whatsnew/59a4070e85256Transit_Oriented_Development_Policy.pdf

Ministry of Youth Affairs and Sports (MoYAS). (2019). *Fit India Movement*. Government of India. <https://fitindia.gov.in/>

Oregon Walks. (2023). *Oregon Walks: Protecting Your Right to Roam*.

<https://oregonwalks.org/>

Park, H., Noland, R. B., & Lachapelle, U. (2013). Active school trips: Associations with caregiver walking frequency. *World Conference on Transport Research Society (WCTRS)*, 29, 23–28. <https://www.sciencedirect.com/science/article/abs/pii/S0967070X13000528>

Physiopedia contributors. (2022). *Barriers to physical activity*. Physiopedia.

https://www.physio-pedia.com/Barriers_to_Physical_Activity

Sweatco Ltd. (2022). *Sweatcoin: It pays to walk*. <https://sweatco.in/>

The Netherlands Organisation for Applied Scientific Research. (n.d.). *Promotion of non-motorised transport*. <https://www.ctc-n.org/technologies/promotion-non-motorised-transport>

Transport for Greater Manchester. (n.d.). *Walking Workplaces Toolkit*.

<https://assets.ctfassets.net/nv7y93idf4jq/4TrmhSr8JGEyEquWI8eakU/00aeb128e1fce188064a01fe2f9bf65a/TfGM-Walking-workplaces-Toolkit.pdf>

University of California. (2023). *CHAMPS (Community Healthy Activities Model Program for Seniors)*. CHAMPS. <https://champs.ucsf.edu/home>

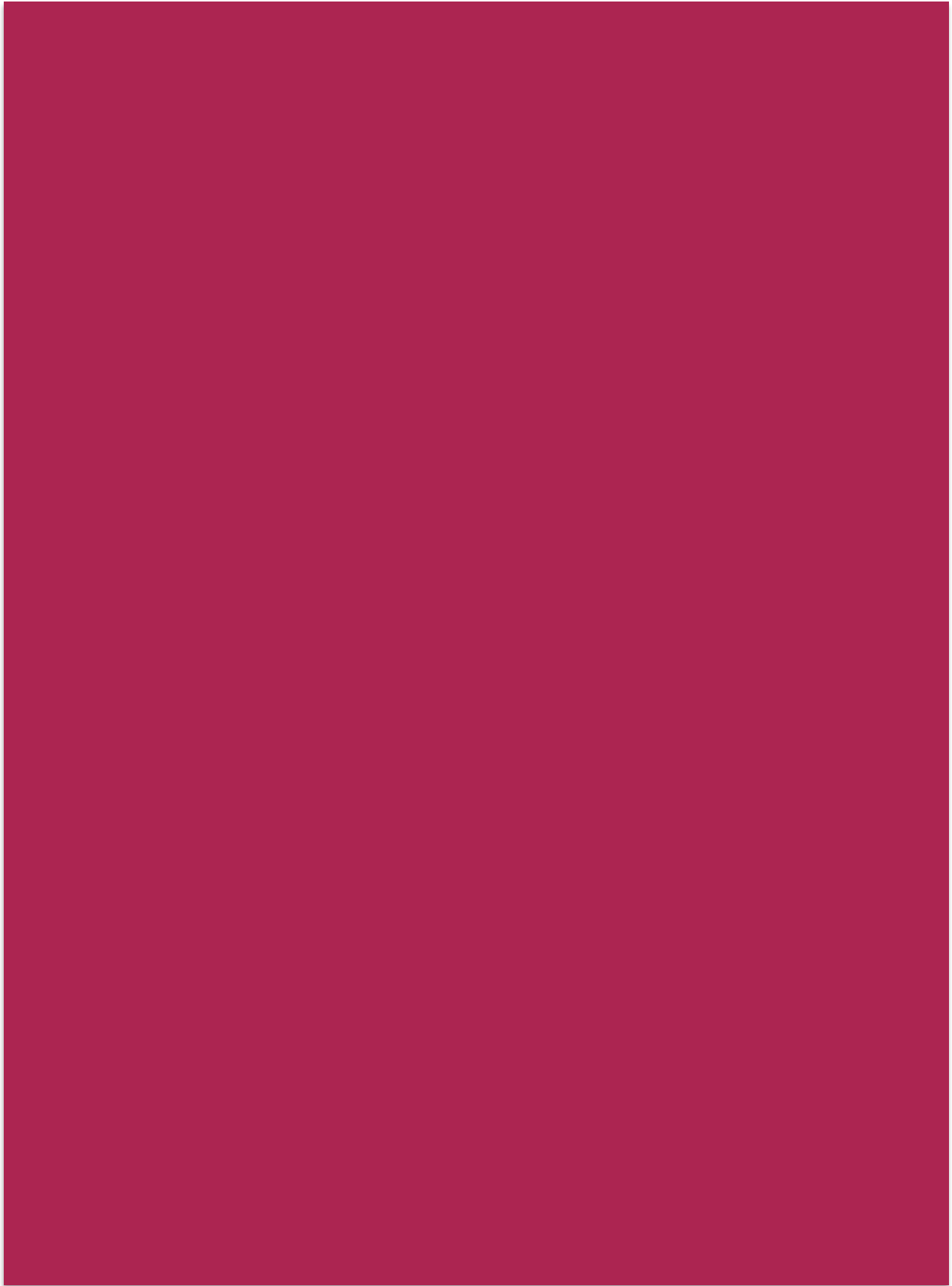
Usman, R. (2023). *Types of hazards to pedestrians and control measures*.

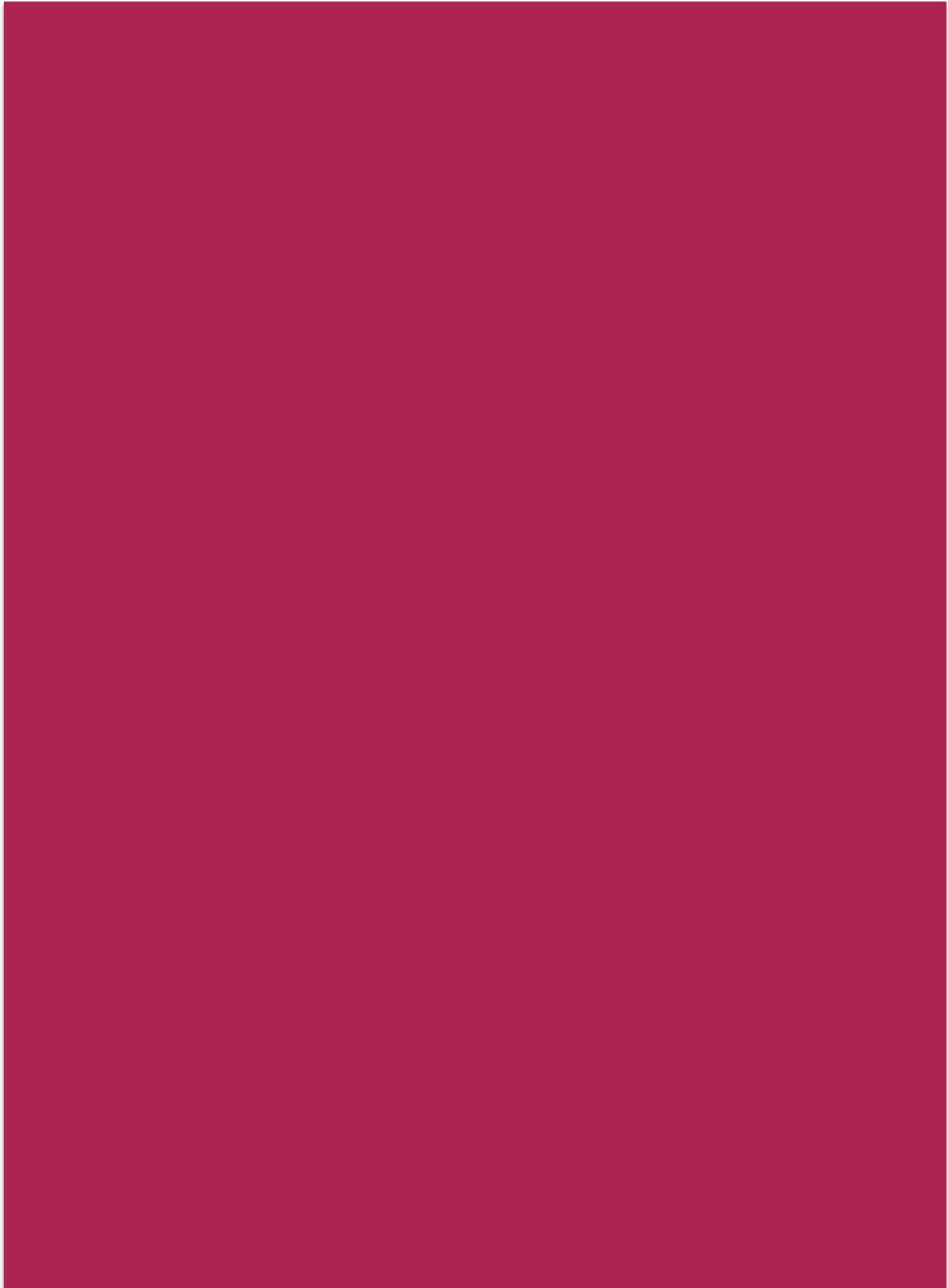
<https://www.hseblog.com/hazards-to-pedestrians/>

Watson, K. B., Whitfield, G. P., Bricka, S., & Carlson, S. A. (2021). Purpose-based walking trips by duration, distance, and select characteristics, 2017 National Household Travel Survey.

Journal of Physical Activity and Health, 18(S1), S86–S93. doi:

<https://doi.org/10.1123%2Fjpah.2021-0096>





Contact us

W: www.csbc.org.in

E: csbc@ashoka.edu.in



@Centre for Social and Behaviour Change



@CSBC_AshokaUniv