

Inclusive Public Toilets: A Universal Design Enquiry for Indian Context

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Abstract. Public toilets fulfil an essential need for all human beings. In the context of India, the diversity of population implies a diverse set of complex barriers in the public toilet experience. Inclusion and the contextual translation of universal design becomes crucial, considering the distinct socio-cultural dimensions. This study intends to enquire the above-mentioned perspective and contribute towards an understanding of inclusion and universal design in public toilets. The methodology is a three-part process including literature review, experiential case reflections and ethnographic field perspectives. The gathered data is mapped thematically and assessed qualitatively, based on the existing principles of universal design. The insights from the assessment highlight the need for contextualization of existing universal design principles, bringing out a multi-dimensional complexity of inclusion across human needs, behaviour, physical, planning and service aspects. This study paves a way forward for evolving design directions by raising further questions through fresh perspectives on inclusion & accessibility in public toilets. The raised questions contribute to a dilemma of standardisation versus contextual customisation around the understanding of inclusion and universal design, focusing on the scenario of Indian public toilets.

Keywords. Public Toilets, Inclusion, Universal Design, India

1. Research Background

Public toilets are a fundamental part of the urban realm, fulfilling an essential need for diverse populations. The global Sustainable Development Goals (SDGs) emphasise this through their Goal 6 stating ‘clean water and sanitation for all’ (United Nations, 2023). India in 21st century has initiated a sanitation revolution. The Government of India had constructed nearly 7 million toilets in cities, as of 2021 (Press Trust of India, 2021). However, inclusive toilet experiences remain challenging for diverse groups, intersecting across age, gender, ability/disability and socio-economic background (Purkayastha & Raheja, 2022).

As per World Bank, 15% of the Indian population does not have access to a toilet (Delfolie et al., 2022). The diversity of Indian population implies a diverse set of complex

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barriers, ranging across attitudinal barriers, environmental barriers and institutional barriers (Dawn, 2016). As per a survey conducted in the national capital of Delhi for 229 public toilets, 76% of toilets lacked provision of a ramp, making access difficult for persons with mobility difficulties, and two out of three public toilets did not have separate provisions for women (ActionAid India, 2018). Contextual translations of accessibility and inclusive design of public toilets, therefore, remain a subject of enquiry with distinct socio-cultural dimensions. The intent of this study is to work towards an understanding of inclusion and universal design in public toilets, situated in the Indian context.

2. Methodology

The methodology of the study involves three components – a) preliminary literature review around understanding existing interpretations of ‘inclusion’ and ‘universal design’ in public toilets, b) case reflections of the Indian context from the authors’ field experiences, and c) ethnographic insights from specific locations of three different cities of Dehradun, Roorkee and Delhi.

The first component of the study was a preliminary narrative or traditional literature review involving a broad search in the databases of Google Scholar, Scopus and Web of Science using multiple keyword combinations of ‘inclusion’, ‘universal design’ and ‘public toilets’. The insights were qualitatively categorized based on themes.

The second component identified primary case reflections of public toilets from the authors’ perspectives, highlighting key accessibility concerns for public toilets. This component elaborates on existing interpretations of inclusion and universal design in public toilets, from an Indian lens. The insights are thematically assessed and refine the existing themes identified in the literature review.

The third component involved interpreting ethnographic insights / reflections from exploratory observations and informal conversations in the researcher’s experience across the cities of Dehradun, Roorkee and Delhi National Capital Region (NCR). The locations were identified based on the site context with the following criteria: near a street market, near a notable public place and / or near a mobility / transit point like railway stations, bus terminals, etc. The studies were of an exploratory nature to build familiarity with the ground reality, spanning between multiple instances at different times. They were short-term, with an average time spent at each location being approximately 3 hours. The informal conversations were conducted with a total of 50 participants. These included on-site as well as off-site conversations, with representation of persons with physical disabilities, visual impairment, elderly and persons with illnesses like urinary incontinence. The conversations were unstructured and initiated with asking about their understanding and thoughts on contemporary Indian public toilets and accessibility / inclusion in the context of toilets. The questions were asked in both English and Hindi, the local language, based on respective participant’s comfort and ease of understanding. The conversation was unstructured with some key questions including ‘What comes to your mind while thinking of Indian public toilets?’ and ‘What are your thoughts on inclusion in Indian public toilets?’. Due verbal consent was taken from all the participants before carrying out the conversations, after explaining the intent of the study.

The gathered data from all three components was thematically mapped and assessed qualitatively based on the existing seven principles of universal design and the five universal design India principles or UDIP (Khare et al., 2011; Steinfeld & Maisel, 2012).

3. Results

The results have been elaborated in three parts – the insights from the literature review, the experiential case reflections and the ethnographic insights from Chandni Chowk, Delhi.

3.1. Literature Insights

The literature review revealed multiple interpretations around the meaning of inclusion in public toilets. Three scales of interpretations were observed – the ‘urban’ scale, the ‘surrounding context’ scale and the public toilet ‘experience’ scale.

3.1.1. Inclusion in Public Toilets at ‘Urban Scale’

The first scale of an inclusive public toilet design is situated in how the public toilet fits into the larger urban realm. Based on the review, the location and availability of toilets emerge to be two crucial dimensions. Fu et al. (2022) highlight the importance of spatial equity in toilet provision at the urban scale, considering aspects of availability based on the population demand. Greed (2006) and Nega et al. (2021), amongst other authors, have highlighted the importance of locating toilets appropriately with respect to other urban elements, for example in marketplaces, connected to street / road junctions, and near transport points like bus stations.

Beyond location, information about the location of the toilet with its relevant details has been highlighted to be of importance (Bichard & Ramster, 2013). This is considering with disabilities or other diverse human conditions require to know the nearest accessible public toilet, especially tourists or new residents of the city.

3.1.2. Inclusion in Public Toilets at ‘Surrounding Context Scale’

As we zoom in from the urban scale to the surrounding context scale, more aspects of public toilet design become relevant for being inclusive and universally accessible. Identification of the public toilet amidst other built forms and surrounding elements is essential, implying the importance of employing the principles of aesthetics and ease of visibility (Afacan & Gürel, 2015; Greed, 2006). Information about where to find the toilet (e.g., appropriate wayfinding signage) in the surrounding context is discussed to be of importance, which is often missing causing difficulties (Nielsen, 2023).

3.1.3. Inclusion in Public Toilets at ‘Toilet Experience Scale’

The public toilet experience comprises of many different stages – from entering the toilet, moving around, using the WCs and other fixtures and elements, and finally exiting the toilet. For diverse user groups, the experience in using the toilet greatly varies with numerous barriers and challenges (Afacan & Gürel, 2015). Studies focusing on maneuverability, spatial considerations and usage experiences of fixtures inside the toilet environments were identified (Mamee & Sahachaisaeree, 2010; Mullick et al., 2012; Morales et al., 2017). However, empirical studies about public toilet experience from the ‘human rights’ lens are limited (Moreira et al., 2022). From a contextual lens, use of traditional types of fixtures, for example the Asian squat toilet, is a critical point for cultural inclusivity (Afacan & Gürel, 2015). Representation of gender and cultural

sensitivity in toilet information, for example through pictograms, is another crucial dimension that plays a role in an inclusive toilet experience.

3.2. Experiential Case Reflections

The diverse perspectives around inclusion are noted from case reflections across three cities of India – Ahmedabad, Dehradun and Noida. Each case reflects upon a perspective in a narrative manner.

3.2.1. Technology-enablement in Public Toilets

The first case highlights the advent of technology and its role in designing inclusive public toilets. During May 2022, the authors documented a Smart Toilet in the city of Ahmedabad. The toilet was hands-free, ‘self-cleaning’ and it had incorporated sensor-based fixtures, enabling inclusion for diverse user groups. There were no on-site maintenance personnel. It was a paid toilet, which required any user to insert cash, and the toilet would unlock automatically. The authors observed that a female user in her 20s who wanted to use the toilet inserted a coin without unlocking the toilet. The user attempted banging the door and employed other similar measures, eventually leaving the site.

This case highlights that technology, apart from being an enabler for inclusion, requires it to be supported by other aspects, especially appropriate services for it to be completely functional and incorporate tolerance for error. Technology, therefore, becomes a critical component to enhance inclusion at the ‘toilet experience’ scale.

3.2.2. Distribution of Public Toilets in the City

As part of a collaborative study with the National Institute of Urban Affairs (NIUA) in India, the authors documented public toilets in the city of Dehradun. A reflection during the study was the distribution of public toilet locations. There were toilets more frequently present in the city centre with lesser toilets present in the outskirts, with toilets often being sited near street junctions. This finding was in alignment with insights from the literature discussing location and availability of toilets as a crucial aspect. However, the toilets were often difficult to locate owing to challenges in visibility and built form aesthetics.

3.2.3. Inaccessible Approach and Entrance of Public Toilets

As part of an independent study, the toilets in the industrial city of Noida were documented. During this study, the status of accessibility of toilets was mapped. It was reflected that a primary challenge to having an inaccessible toilet is an inaccessible approach and entrance to the toilet (as shown in Fig. 1). Similar observations were recorded across multiple instances throughout the toilets of the city.



Figure 1. Infrastructural Accessibility Challenges at a Public Toilet entrance in Noida, Uttar Pradesh.
Source: Authors

3.3. Ethnographic Insights

The following insights have emerged from field observations and informal conversations at a total of 12 toilet locations across Dehradun, Delhi NCR and Roorkee. The informal conversations were additionally conducted off-site, primarily to capture perspectives of people with physical disabilities, visual impairments and chronic illnesses. This was because there were limited instances of encountering persons with disabilities on-site during the field studies.

The observations and informal conversations led to emergence of numerous themes around the ethnographic understanding of inclusive public toilets of people. The first theme was that of people's understanding of inclusion. The term, known as 'samaveshi' (in Hindi), was not familiar with multiple respondents. It was 'never heard before'. It was observed that inclusion is discussed with respect to interpersonal behaviour. For example, one of the respondents shared that 'if everyone is allowed to use a public toilet so it is inclusive', implying that inclusion from his / her perspective is owing to whether he / she is allowed to use the toilet or not without any social barrier. Another commonality involved describing inclusion with respect to 'gender inclusion' – whether both males and females can use a public toilet – exemplified by a response which mentioned 'having separate provisions for both'.

The second broad theme was of typical barriers / challenges faced by diverse user population groups. Concerns of locating toilets were identified by persons with visual impairment along with challenges of identifying fixtures inside the toilets. Persons with disabilities highlighted how, despite locating toilets, they are often poor in terms of accessibility (with challenges like level differences, broken grab bars, etc.). Women highlighted safety and privacy concerns due to broken doors. Excessive crowding was observed outside female sections of toilets in multiple instances. Behavioural challenges like vandalism and conflicts between cleaners and users were also observed.

4. Discussion

4.1. Complexity of Inclusive Public Toilets

Based on the gathered insights, the complexity of an inclusive public toilet is evident. spread across scales, disciplines and for diverse human conditions, classified into six broad themes (as shown in Fig. 2).

Urban planning captures perspectives around location, availability and toileting demand at an urban scale. Information as a theme transcends across various scales - where the toilet is located, and accessibility status becomes crucial for any person with disability or diverse needs while using any nearby public place. The physical signage and wayfinding elements are a part of this theme. Infrastructure as a theme intersects with engineering, architecture and product / industrial design perspectives – capturing built-form accessibility, elements of lighting & ventilation and fixture ergonomics. Knitting all the categories together are the service and technology theme – operations & maintenance and safety & security being the prime components. The last theme is human needs & behaviour – one of the most essential components. The complexity of human behaviour has various dimensions including interpersonal behaviour between the diverse stakeholders, behaviour in the context of using toilets and sense of privacy and dignity.



Figure 2. Complexity Mapping of Inclusive Public Toilets. Source: Authors.

4.2. Reflecting the Principles of Universal Design

Taking forward the thematic complexity map of inclusive public toilets, the insights from the study are reflected in the existing seven principles of universal design and five

universal design India principles (UDIP) of equitable, usable, cultural, affordable and aesthetics (Khare et al., 2011). For each theme, the relevant principles are highlighted with the respective source of observations.

Table 1. Reflecting Universal Design Principles in the Identified Themes. Source: Authors

Theme	Sub-themes	Relevant Universal Design Principles	Observation Source
Urban Planning	Location	Equitable, Flexibility in Use, Tolerance for Error, Low Physical Effort, Size and Space for Approach and Use	Ethnographic Insights, Experiential Case Studies, Literature Review
	Availability		
Location & Wayfinding			
Information	Amenities	Simple & Intuitive Use, Perceptible Information, Cultural (UDIP), Aesthetics (UDIP)	Experiential Case Studies, Literature Review
	Representation		
	Instruction		
	Cautionary		
Infrastructure	Architecture	Equitable, Flexibility in Use, Simple & Intuitive Use, Perceptible Information, Tolerance for Error, Low Physical Effort, Size and Space for Approach and Use, Cultural (UDIP), Economy (UDIP)	Ethnographic Insights, Experiential Case Studies, Literature Review
	Engineering Systems		
	Fixture Design		
Services	Operations & Maintenance (Cleanliness)	Equitable, Tolerance for Error, Cultural (UDIP), Aesthetics (UDIP)	Ethnographic Insights, Experiential Case Studies
	Safety & Security (Comfort)		
Interpersonal Behaviour			
Human Needs & Behaviour	Usage Behaviour	Flexibility in Use, Tolerance for Error, Cultural (UDIP)	Ethnographic Insights, Experiential Case Studies, Literature Review
	Cultural Practices		
Technology	Service-enabling	Flexibility in Use, Tolerance for Error, Cultural (UDIP), Aesthetics (UDIP)	Experiential Case Studies, Literature Review
	User-enabling (assistive)		

Based on the above discussion, it is evident that the universal design India principles of ‘cultural’ and ‘aesthetics’ are the most relevant to the identified themes. The principles of ‘tolerance for error’ and ‘flexibility in use’ are also quite relevant for 4 out of 6 themes. As the relevance mapping is subjective, the following questions are raised for taking this discourse ahead:

- Is the current interpretation of existing universal design principles appropriate and sufficient for examining the various aspects of inclusion in public toilets in India?
- Can the existing universal design principles be contextualized as opposed to standardized interpretations for the subject of public toilets and Indian complexity of inclusion?

5. Conclusion

Even though the study is limited in terms of capturing ethnographic insights from diverse user groups, it paves a way forward for evolving design directions by raising further questions through fresh perspectives on inclusion & accessibility in public toilets. It discusses an emerging complexity of inclusion in public toilets in Indian cities, though based on a subjective perspective, thus the generalizability needs to be validated in further studies. There is scope to carry out further investigations to establish interrelationships and evolve the complexity map around inclusion in public toilets, which can eventually contribute to the evolution of design frameworks for inclusive and accessible public toilets that are contextually relevant and significant. The raised questions contribute to a dilemma between standardized interpretations and contextual customisation around inclusion and universal design, focusing on the scenario of Indian public toilets.

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