AT2030
Case Study: Full Report

Inclusive Design and Accessibility of the Built Environment in Varanasi, India

Prepared by
GDI Hub

Cluster 4 Capacity & Participation
Inclusive Infrastructure

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India

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KIRAN
A ray of hope into lives

भारतीय प्रौद्योगिकी संस्थान रुड़की
Indian Institute of Technology Roorkee

AT2030

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Summary: Becoming a more inclusive city

“An inclusive Varanasi (Sugamya Kashi) is somewhere that can be experienced by everybody in a fair and equal way. By creating safe and accessible environments for all members of the community the city can allow everyone to access and participate in the opportunities they would like.”

Varanasi is famous for the Ghats that lead to the river Ganges. A centre of social and cultural life in the city, they are inaccessible for persons with disabilities.

Varanasi is a vibrant cultural city, with a rich heritage and complex, organic urban form. The city sits on the banks of the river Ganges and is famous for its Ghats, stepped landmarks that line the river Ganges and form an important part of rituals and daily life. The city has a population of just over 1.3 million, but is also populated by huge numbers of pilgrims and tourists throughout the year. In Varanasi, inclusive city design must integrate the considerable and vital heritage sites woven throughout its fabric. As one of the cities in India’s Smart City Mission, Varanasi is becoming a hub for innovation and has shown resilience and adaptability in the COVID-19 pandemic, developing digital tools to support its citizens. Now, with the support of the National Institute of Urban Affairs (NIUA) and the Global Disability Innovation Hub (GDI Hub), the Varanasi Municipality is championing disability inclusion through supporting research, developing interventions and driving policy changes.

An inclusive design strategy for Varanasi must embrace the living, breathing, nature of the city. Varanasi city stakeholders are encouraged to produce a comprehensive inclusive design vision and strategy for the city that engages with policy-making and awareness; industry and practice; and local communities. An overarching vison can help determine a mindset and approach that stakeholders can champion while a strategy provides a roadmap for how to sustainably make progress towards becoming a more inclusive city.

An inclusive Varanasi should be co-designed with persons with disabilities.

These steps would allow the city's design and development to accommodate and celebrate diversity improving the lives of everybody, including persons with disabilities. Inclusive design should be understood as a mindset and methodology above technical standards, to allow responsive and adaptive design in a rapidly changing city and world. This adaptive mindset in design has the potential to engage more effectively with the city's rich heritage and culture, consider the different ways people want to live in the city and respond to sustainable development challenges including climate related stresses and recovery from COVID-19.

Adherence to good practice and action towards inclusion is the responsibility of all stakeholders. At a policy level, national laws must be accompanied by local guidance and standards. National accessibility standards must also be localised to Varanasi, and having best practice examples that could be highlighted would help. At the industry scale, good design practice, design reviews and inspections must take place and construction professionals must also be aware of and champion inclusive design and take responsibility to ensure quality implementation.

Communities should convey their needs through participation in design and consultation processes, conducting accessibility audits and advocacy work where

they can. However, there should be government and industry support to fund this work, people should be acknowledged and compensated for their work. Persons with disabilities should also be participating in design and decision-making processes through being provided opportunities to access employment in policy and industry professions.

Key barriers to an inclusive city

- Access to essential infrastructure and services, including water and sanitation to support health and wellbeing
- A lack of access to transport and inclusive mobility infrastructure limits people's ability to access opportunities, recreation and green spaces
- Education and employment opportunities are limited by inaccessibility of environments, services and information
- Culture and heritage sites are largely inaccessible but a central part of life in the city
- Access to assistive technology due to its distribution system and need for maintenance
- Stigma, attitudes and awareness of the public

Existing building stock must be made accessible.

Recommended actions

- Taking an inclusive city approach – an inclusive design strategy that works across sectors, coordinates infrastructure and considers how the city is connected and how people use it day to day is needed. This could begin with developing an accessibility map of the city. That map could be interactive and be able to collect data.

- An inclusive design approach should not just follow accessibility standards but think about user experiences and journeys. How inclusive is someone's experience in the city from start to finish?
- Embed inclusive design in the implementation of all essential infrastructure and services including; water and sanitation, education, health and related public services, to ensure they are inclusive for all.
- Targeted support is necessary for equitable access to opportunities and education for persons with disabilities. Ensuring persons with disabilities can learn and work must be a high priority and requires targeted programmes and interventions.
- Infrastructure must factor in assistive technology users, for example, tricycle users experiencing obstacles in the narrow streets and alleys.
- Focus on creating a more inclusive heritage experience rather than simply gaining physical access to heritage sites. There will always be challenges and compromises in making heritage accessible, so stakeholders must work together to create the most inclusive and enjoyable heritage experience for people with disabilities, in turn benefiting all visitors
- Awareness of the issues and capacity to deliver solutions are both necessary for good implementation of inclusive design and infrastructure. Building capacity at the local level is important.
- Work incrementally, start somewhere and gradually build inclusive infrastructure. Prioritise and phase plans to achieve the short, medium and long term visions of inclusive development and an inclusive Varanasi. Make the journey inclusive as much as the destination.
- Develop local best practice examples, show people how great they are and create incentives to replicate them. Can small business and individuals be incentivised by local government to support inclusive design targets?
- Update local bye-laws to reflect progress on inclusive environments, to ensure local standards reflect best practice and create compliance protocols.
- Develop a fairer assistive technology distribution system that accounts for needs and aspirations and not just severity of disability.

Creating an enabling environment

An enabling environment for persons with disabilities should integrate: a supportive legislative environment, an inclusive culture and mindset, participation in planning, design and decision-making, positive cultural change, an accessible and inclusive built environment and access to good quality and affordable assistive technology.

So what might an inclusive Varanasi look like?

- **Updated city bye-laws**: mandatory accessibility standards and accountability processes within city policy
- **An inclusive riverfront**: accessible and welcoming public spaces and services that people can experience equally – that offer people choices.
- **Accessible transport options**: a vision and strategy for inclusive mobility
- **Inclusive and accessible Ghats**: Inclusive heritage experiences for all
- **Assistive technology people want and need**: access to good quality, affordable, assistive technology
- **Awareness, understanding and joy**: a culture of genuine inclusion
- **A city everyone can enjoy**: equity of access to opportunities and information for all

What's next?

This report outlines the key findings from a four-month research case study on the city of Varanasi. As the second of six case studies on inclusive design and the built environment in lower-and-middle-income countries, this report will go on to inform global actions on inclusive design.

The findings of this report will be shared with both international and local audiences through a range of dissemination activities and GDI Hub will continue to support NIUA's activities in Varanasi and across India through the UK Aid funded Building Accessible, Safe, Inclusive, Indian Cities (BASIIC) programme.

The data collection that informed this case study took place prior to the second wave of COVID-19 in India. We recognise the impact the pandemic has had on partners and communities, and hope this research on inclusive environments can support strategies for an inclusive recovery.

Acknowledgements

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We have collaborated with the National Institute of Urban Affairs in India (NIUA) for this case study with our findings also contributing towards NIUA's UK Aid funded programme, 'Building Accessible, Safe and Inclusive Indian Cities' (BASIIC).

We'd like to thank all the team at the Varanasi City Municipality and Varanasi Smart City Mission for their support and engagement throughout the work.

We'd like to thank all of the participants in the research for their enthusiasm and honesty. It is our goal to amplify the voices of persons with disabilities in our research and we hope this report reflects your vision for a more inclusive and accessible Varanasi.

We'd also like to thank the GDI Hub team who have supported the work, including; Vicki Austin, Katherine Perry, Naomi Thompson, Prof. Cathy Holloway, and Louise Gebbett and finally, the members of our research advisory group who are; Luis Artieda, Prof. Richard Bibb, Rama Gheerawo, Chapal Khasnabis, Dr. Maria Kett, Sophie Morley and Julian Walker for their continued guidance and support.

This research has ethical approval from University College London (UCL) and permission from the Municipal Government of Varanasi.

Global Disability Innovation Hub

www.disabilityinnovation.com

GDI Hub is a research and practice centre driving disability innovation for a fairer world. Our vision is of a world without barriers to participation and equitable opportunity for all. We believe disability innovation is part of a bigger movement for disability inclusion and social justice. GDI Hub works across 5 domains, research, innovation, programmes, teaching, and advocacy. We are solutions-focused experts in; Assistive & Accessible Technology; Inclusive Design; Inclusive Education Technology; Climate & Crisis Resilience and Cultural Participation. Based in East London and a legacy of London 2012 Paralympic Games, we deliver world-class research, ideas and inventions, creating new knowledge, solutions and products, and shaping policy through co-creation, participation and collaboration. An Academic Research Centre (ARC) and a not-for-profit Community Interest Company (CIC) we are guided by an Advisory Board of disabled people. We are operational in over 35 countries and have reached 12 million people since our launch in 2016.

National Institute of Urban Affairs

www.niua.org

Established in 1976, **the National Institute of Urban Affairs (NIUA)**, is a premier Institute of Ministry of Housing and Urban Affairs, Government of India for research and capacity building for the urban sector in India. The Institution has been actively working on bringing forth key areas of concern for urban India to build the urban discourse, at various urban scales and is committed towards aligning its efforts towards achieving the Sustainable Development Goals (SDGs) through all its initiatives and programs. It has utilized its competencies in research, knowledge management, policy advocacy and capacity building to address urban challenges and continuously strives to develop sustainable, inclusive, and productive urban ecosystems in the country. It has emerged as a thought leader and knowledge hub for urban development in India and is sought out by both Indian and International organizations for collaborations and partnerships in India’s urban transformation journey.

BASIIC programme

The Building Accessible, Safe & Inclusive Indian Cities (BASIIC) programme is being implemented by NIUA in collaboration with Ministry of Housing and Urban Affairs (MoHUA) with support from the Foreign Commonwealth and Development Office (FCDO) of the UK Government. The programme is supporting two partner cities (Varanasi and Pune) through a Technical Assistance Support Unit (TASU) established at NIUA. It endeavours to promulgate the tenets of accessibility, safety and inclusivity in the ethos of urban planning and design. This will be achieved through focused policy-level interventions, pilot demonstration of innovative solutions, capacity building and sustaining the above through application of robust monitoring and evaluation mechanisms.

Kiran Society

www.kiranvillage.org

Kiran Society is a non-profit, non-political organisation working in an inclusive way for the holistic development of children and persons with and without disabilities, and from marginalised sections of society. Founded in 1990 by a small group of people from various social, cultural, and religious backgrounds, Kiran Society has a 'bottom-up' philosophy at its heart. Kiran Society support their service users through individualised rehabilitation plans, small education classrooms, family involvement, and by providing opportunities for service users/students to expand their independence. Based on the outskirts of Varanasi city, the word "KIRAN" means "ray of light" and Kiran Society strives to be just that in the lives of the service users they support.

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Foreword

स्मार्ट सिटी वाराणसी
अलौकिक · आध्यात्मिक · आधुनिक

Ministry of Housing and Urban Affairs Government of India · Smart City

Foreword by CEO,VSCL

India is urbanising and by 2050, 68% of India's population will live in cities. This mirrors global trends and highlights the importance of cities in achieving sustainable and inclusive development. Additionally, 15% of the global population is differently abled, highlighting the importance of including persons with disabilities in global, national, regional and local development.

India's progress on disability inclusion has been substantial in recent years, from the Accessible India campaign launched in 2015 to the updated Rights of Persons with Disabilities Act in 2016. Through these policies and programmes, we continue to create an enabling environment for Persons with Disabilities, but there is always more to be done.

India's Smart City Mission aims to enhance economic growth and improve quality of life in 100 cities across India. Varanasi city joined the Smart City Mission in 2016, offering a unique opportunity to transform the city for all citizens. A smart city must also be an inclusive city, and in Varanasi there are ambitious plans to create smart and inclusive infrastructure to support all citizens.

To achieve inclusive Indian cities, the support and collaboration of institutions conducting research and delivering programmes on disability inclusion such as Global Disability Innovation Hub and the National Institute of Urban Affairs in India is vital. Funded by the UK Foreign Commonwealth and Development Office (FCDO), GDI Hub's AT2030 programme and NIUA's BASIIC programme are delivering evidence and action to drive disability-inclusive Indian cities. Through this collaboration, these institutions have delivered research and evidence, influenced policy, increased capacity and provided technical assistance to projects in Varanasi.

This case study on 'Inclusive Design and Accessibility in Varanasi, India' provides important information on the experiences of Persons with Disabilities living in Varanasi, highlighting the importance of involving persons with disabilities in urban development. By collaborating with non-government organisations such as Kiran Society and Disabled Persons Organisations, the case study sets a precedent for disability-inclusive research. The case study also engages city stakeholders to include all stakeholders who have a role in urban development, design and planning. The recommendations it makes will help inform our current programmes and future actions towards inclusive cities in India.

We are grateful to all who took the time to participate in this research collaboration and feel optimistic about the future of inclusive, smart cities in India.

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India's development challenges are complex, and inequality has only become more apparent due to the onset of the COVID-19 pandemic. It is more important than ever that we work together, develop partnerships and co-design solutions for our cities with the people that are most disadvantaged – such as persons with disabilities. According to the 2011 census, 2.1% of India's population is disabled, but the reality is most likely higher, and all of us experience changing abilities and needs throughout our lives. We need to design our cities inclusively to support that. Now is the time to make these changes, as we advance through the final decade of the 2030 Agenda, especially to achieve SDG 11: Sustainable, Inclusive Cities. India also has great opportunity through the Smart Cities Mission to foster innovation in inclusive ways and build cities where everyone can participate.

This case study on inclusive design in the city of Varanasi is an important partnership for furthering our goals on inclusive cities. The collaboration opportunity presented through the two UK Aid funded programme: 'AT2030' and 'BASIIC' between GDI Hub and NIUA will advance inclusive design knowledge and practice in India. Bringing together the Global Disability Innovation Hub, NIUA and Kiran Society represents a partnership that blends world leading inclusive design expertise, India's leading urban research and policy think tank and an NGO that excels in advancing disability inclusion on the ground in Varanasi by collaborating with NGOs such as Kiran Society and Disabled Persons Organisations, the case study sets a precedent for disability-inclusive research in India. The case study has also been supported by the Varanasi Nagar Nigam and Varanasi Smart City Ltd who have generously given their time to participate in the research activities.

This case study will have both global and national relevance. As part of the UK Aid funded AT2030 programme, it will be one of six global case studies on inclusive design, providing valuable insights and actions for other cities and form part of a Global Action plan on inclusive design led by GDI Hub. Nationally, the case study also forms part of NIUA's Building Accessible, Safe and Inclusive Indian Cities (BASIIC) programme where its learning will be shared with other cities and support the technical assistance unit in implementing inclusive design. The work of these two programmes is delivering research and evidence, influencing policy, increasing capacity and provided technical assistance to projects in Varanasi and beyond.

The research reveals the day-to-day experiences of persons with disabilities in Varanasi. It highlights the importance of making transport options more accessible and inclusive, ensuring people have access to services, work and education and creating inclusive heritage experiences where everyone can experience cultural life in Varanasi. The case study also reveals that the current city administration has knowledge and appetite to build a more inclusive city, so hopefully the support delivers through NIUA and GDI Hub's work can help achieve the vision of 'Sugamya Kashi'.

We'd like to thank everyone who took the time to participate in this research collaboration and feel optimistic about the future of inclusive, smart cities in India.

Mr. Hitesh Vaidya
Director, NIUA

Glossary of Key Terms

Inclusive Design - can help all human beings experience the world around them in a fair and equal way by creating safe and accessible environments for all members of the community. Inclusive design is a mindset, a methodology that embraces diversity to create a world that is more intuitive, elegant and usable for all of us.

Infrastructure - is the physical and organisational structures, services and facilities that support society. Good infrastructure should contribute to inclusive prosperity, including health and wellbeing. The term often refers to; transport, water and waste-water systems, energy and telecommunications industries, and social welfare structures such as health, education and social support systems[1]. For the purpose of this report all structures (whether physical, institutional or digital) that contribute to the participation of people with disabilities in daily life and society fall under the remit of infrastructure.

Inclusive and Accessible Infrastructure and Environments - promote access, opportunity, participation and equity in society. Inclusive and accessible infrastructures and environments take into account the principles of inclusive design, embracing diversity and acknowledging that designing for people who experience the least equity in the built environment, such as persons with disabilities, has the potential to benefit all of us.

Persons with Disabilities – throughout this report the term ‘persons with disabilities’ is used as it is more commonly used internationally including in the UNCRPD. However, we acknowledge that in the UK the term ‘disabled people’ is preferred and at GDI Hub we prefer to use ‘disabled people’. We also recognise that national policy in India uses the term ‘Divyang’ and other terminology such as ‘differently abled’ is also in use.

[1] Anjlee Agarwal and Andre Steele, ‘Disability Considerations for Infrastructure Programmes’ (Evidence on Demand, 8 March 2016), https://doi.org/10.12774/eod_hd.march2016.agarwaletal.

Acronyms and Abbreviations

ADB: Asian Development Bank
AT: Assistive and Accessible Technology
AT2030: UK Aid-funded programme, 'Testing what works to enable access to life-changing assistive technology for all'
DPO: Disabled Persons' Organisation
FCDO: UK Government's Foreign, Commonwealth and Development Office *(incorporating what was formally known as DFID)*
GDI Hub: Global Disability Innovation Hub
ILC: Independent Living Centre
LMICs: Lower-and-Middle-Income Countries
NIUA: National Institute of Urban Affairs India
NUA: New Urban Agenda
PwD: Persons with Disabilities
SDGs: the UN's Sustainable Development Goals
WASH: Water, Sanitation and Hygiene
WHO: World Health Organisation
UN: United Nations
UNCRPD: United Nations Convention on the Rights of Persons with Disabilities
VCSL: Varanasi Smart City Ltd

AT2030 and Inclusive Infrastructure Programme Background

About AT2030

This case study is part of the FCDO UK Aid-funded 'AT2030: Life-changing assistive technology for all' programme. The AT2030 programme aims to explore 'what works' to increase access to life changing assistive technology (AT) for all. The World Health Organisation (WHO) estimates that there are currently 1 billion people around the world who need assistive technologies, but 90% of them do not have access, and this figure is project to rise to 2 billion by 2050. The programme has reached 21 million people so far through activities that cut across the domains of data and evidence, innovation, country implementation and capacity and participation. The programme is currently operational in over 35 countries and works with more than 70 delivery partners[2].

About Inclusive Infrastructure

The Inclusive Infrastructure sub-programme of AT2030 responds to the idea that successfully reaching people that need assistive technology is also dependent on supporting accessible and inclusive environments and infrastructure.

GDI Hub believe that 'Inclusive Design' has an important role in facilitating enabling environments for persons with disabilities[3]. Research on the current state of accessibility in different cities around the world and the capacity and appetite for inclusive design in policy and industry in those places is needed both to enable better access to assistive technology and contribute to the inclusion and participation of all assistive technology users in society.

Current knowledge around disability inclusion and inclusive design is largely limited to high income settings[4]. This research aims to counter that by building local and specific knowledge of what constitutes an inclusive environment in diverse, lower-and-middle-income countries (LMICs) by engaging directly with communities,

[2] For further information on the AT2030 programme please visit http://www.at2030.org

[3] For more information on GDI Hub's approach to inclusive design please visit: http://www.disabilityinnovation.com/inclusive-design

[4] Infrastructure and Cities for Economic Development (ICED), 'Delivering Disability Inclusive Infrastructure in Low Income Countries', Inception Report: Summary, 2019, http://icedfacility.org/resource/delivering-disability-inclusive-infrastructure-low-income-countries/.

industry and policy makers. This will build knowledge and generate actions around inclusive design that is adaptive to these diverse contexts. Research will take place in three main areas:

1. People - the community experience of disability and the built environment;
2. Practice - industry focused research on the awareness and application of inclusive design in practice; and
3. Policy - focused research on the governance, guidelines and protocols of accessibility and inclusive design at local, regional and national levels of government.

Through qualitative and participatory research, the project will engage diverse stakeholders interested in and influencing the built environment such as; decision-makers, urban planners, architects and persons with disabilities. It will generate new insights on the challenges and opportunities for an inclusive built environment and build a picture of what good inclusive designs looks like in different settings and cultures.

Inclusive Infrastructure summary:

- Three-year research programme
- 6 cities in 6 different countries, in low-and-middle-income settings
- Engaging local partners and diverse stakeholders
- Conducting research and engagement across the domains of policy, practice and people

Why does ‘inclusive infrastructure’ matter?

‘Access’, in its various forms, is a primary factor in the connection between disability and poverty. Where there is a lack of access, such as access to employment, access to essential infrastructure such as water or electricity, or access to safe spaces for women, inequality and social exclusion will increase. This can be both a cause or effect of either disability or poverty and is described as a ‘vicious cycle’[5], reinforcing the relationship between disability and poverty[6]. For example, in Mongolia, (where

[5] Department for International Development, UK Government, ‘Disability, Poverty and Development’ (Department for International Development, 2000).

[6] Christoffel J. Venter, Thomas E. Rickert, and David A. C. Maunder, ‘From Basic Rights to Full Access: Elements of Current Accessibility Practice in Developing Countries’, *Transportation Research Record:*

we undertook our first case study) households with at least one person with a disability have double the poverty incidence of other households[7]. Research on the multi-dimensional nature of poverty has also shown higher incidences of poverty in households with disabilities in middle-income settings compared to low-income settings, indicating a 'disability development gap'[8] and making clear the importance of disability inclusive development programmes.

People have a right to access the spaces, services and activities they would like. It is a basic human right as set out in the UNCRPD[9]. Access can be either enabled or disabled by the built environment and infrastructure and this is understood best by those who experience inaccessibility in the built environment most profoundly, persons with disabilities[10]. To break cycles of disability and inequality, it is necessary to design accessible and inclusive environments. To do that there must be consensus on what barriers to accessibility exist in the built environment and what the barriers to designing, building, implementing and regulating accessible environments are. Justice-based approaches to disability and the built environment propose that, 'the distribution of space is an important aspect of realising justice for disabled persons'[11] highlighting the importance of designing and building inclusive infrastructure to create more equitable societies.

Infrastructure, transport and the built environment represent one of the largest areas of investment for any country and 'good' infrastructure can be a driving force for positive change and achieving development goals. Infrastructure should be designed to support society. However, if it is inaccessible, it can exclude individuals or groups, diminish quality of life and infringe on human rights.

In lower-resourced settings, where basic infrastructure needs are great, accessibility is often considered as an extra and is rarely integrated as part of mainstream

Journal of the Transportation Research Board 1848, no. 1 (January 2003): 79–85, https://doi.org/10.3141/1848-11.

[7] Asian Development Bank, 'Living with Disability In Mongolia: Progress Toward Inclusion' (Manila, Philippines: Asian Development Bank, December 2019), https://doi.org/10.22617/TCS190596-2.

[8] Monica Pinilla-Roncancio and Sabina Alkire, 'How Poor Are People With Disabilities? Evidence Based on the Global Multidimensional Poverty Index', *Journal of Disability Policy Studies*, 17 May 2020, 104420732091994, https://doi.org/10.1177/1044207320919942.

[9] Disability Inclusive and Accessible Urban Development Network (DIAUD), World Enabled, and CBM, 'The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development. Key Recommendations for an Inclusive Urban Agenda', 2016, 40.

[10] Aimi Hamraie, 'Designing Collective Access: A Feminist Disability Theory of Universal Design', *Disability Studies Quarterly* 33, no. 4 (5 September 2013), https://doi.org/10.18061/dsq.v33i4.3871.

[11] Victor Santiago Pineda, 'Enabling Justice: Spatializing Disability in the Built Environment', n.d., 14.

infrastructure development[12]. Yet inaccessible infrastructure profoundly impacts the freedom, independence and rights of persons with disabilities and their ability to access opportunities. Some of the factors contributing to inaccessible infrastructure include lack of knowledge or understanding among decision-makers around the implications of design choices, lack of user consultation and consideration of diverse needs and 'missed opportunities' to integrate added value through promoting equal access[13].

Previous research led by the iBuild centre at Newcastle University on inclusive infrastructure has emphasised the importance of a more integrated and holistic understanding of infrastructure, including the wider and longer-term benefits to infrastructure spending and multi-scalar systems-based approaches[14].

The World Report on Disability[15] highlights the importance of 'enabling environments' for persons with disabilities and defines these environments as physical, social and attitudinal environments. The implementation of policy, compliance and the suitability of existing standards on accessible environments in relation to low-resource settings, informal settlements and rural areas are all discussed as barriers to enabling environments. The report also suggests that the pace at which technologies to support persons with disabilities are developing is 'out-pacing' the rate at which standards and regulations in the built environment can be developed calling for a more integrated and adaptive approach to regulating the build environment[16].

A comprehensive understanding and application of inclusive design practices to infrastructure programmes would address some of these barriers. As one of the largest areas of investment in any country, infrastructure development has the opportunity to lead the way in terms of creating an enabling environment for persons with disabilities[17].

[12] The World Health Organisation, 'World Report on Disability' (The World Health Organisation, 2011).
[13] Agarwal and Steele, 'Disability Considerations for Infrastructure Programmes'.
[14] Richard Dawson, 'Delivering Effective and Inclusive Infrastructure', ESRC Evidence Briefings (Economic and Social Research Council, March 2018), https://esrc.ukri.org/news-events-and-publications/evidence-briefings/delivering-effective-and-inclusive-infrastructure/.
[15] The World Health Organisation, 'World Report on Disability'.
[16] The World Health Organisation.
[17] Hamraie, 'Designing Collective Access'.

Why focus on cities in low-resource settings?

The world is rapidly becoming more urban and more than half the world's population live in urban settlements[18]. This growth is not always accompanied by equivalent infrastructure development, leading to wide gaps in urban equality or an 'urban divide'[19]. Urbanisation is most widespread in low-and-middle-income settings, leading to the suggestion that 'poverty is urbanising'[20]. By 2050, 66% of the world's population will live in cities; 90% of which will be in low-middle-income settings[21]. UN-Habitat estimates that in 75% of cities people have less access to basic services, quality public spaces, affordable housing and livelihood opportunities than two decades ago and spatial inequality like this exacerbates social exclusion[22]. The capability to connect to urban infrastructure, services and opportunities such as work and education are vital to building social inclusion.

According to the World Bank, urban inclusion is multi-dimensional and expressed through three domains: spatial inclusion, social inclusion and economic inclusion[23]. These three domains are driven by principles of access (such as access to housing, land and essential services), opportunity (such as access to education and employment or access to increasing prosperity in the place they live) and the right to participation (the ability to participate in society). These principles offer a foundation for planning inclusive infrastructure.

Research on, 'what works' for disability inclusive infrastructure has shown the importance of taking city-wide or holistic approaches, to avoid siloed solutions within one type of infrastructure. Additionally, in low-resource settings, large components of infrastructure still need to be built and so there is an opportunity to 'get it right the

[18] Bharat Dahiya and Ashok Das, 'New Urban Agenda in Asia-Pacific: Governance for Sustainable and Inclusive Cities', in *New Urban Agenda in Asia-Pacific*, ed. Bharat Dahiya and Ashok Das, Advances in 21st Century Human Settlements (Singapore: Springer Singapore, 2020), 3–36, https://doi.org/10.1007/978-981-13-6709-0_1.

[19] Dahiya and Das.

[20] The World Bank, 'World Inclusive Cities Approach Paper' (The World Bank, May 2015), https://documents.worldbank.org/en/publication/documents-reports/documentdetail/402451468169453117/world-inclusive-cities-approach-paper.

[21] 'New Urban Agenda' (United Nations, 2017).

[22] UN-Habitat, 'Flagship Programme 1: Inclusive, Vibrant Neighbourhoods and Communities' (UN-Habitat), accessed 19 September 2020, https://unhabitat.org/programme/inclusive-vibrant-neighbourhoods-and-communities.

[23] The World Bank, 'World Inclusive Cities Approach Paper'.

first time' highlighting the relevance of focusing on inclusive infrastructure in lower-and-middle-income cities.[24]

Meeting global goals?

Cities, and particularly cities in low-resource settings, are central to the UN 2030 Agenda and the Sustainable Development Goals, most clearly marked through SDG 11: 'Make cities and human settlements inclusive, safe, resilient and sustainable'. Habitat III and the New Urban Agenda represent a shift in thinking around cities and urbanisation as a cause of poverty and exclusion to thinking about cities as sites of opportunity and marked an important moment of centring inclusion in development processes through participatory approaches to sustainable development. These global agendas have generated a vast amount of discussion on the topic of 'inclusive cities' [25] [26] [27]. However, inclusive cities are often discussed in its broadest meaning and explicit attention to *disability-inclusive cities* and the design and construction of accessible and inclusive environments and infrastructure in high level policy agendas remains limited.

The UN2030 Agenda recognises that disability inclusion must be at the heart of poverty eradication[28] and the UNCRPD Article 9 and Target 3 of the Incheon Strategy to 'Make the Right Real for People with Disabilities in Asia' in 2012 explicitly connects access to the physical environment and an inclusive society: "*Access to the physical environment, public transportation, knowledge, information and communication is a precondition for persons with disabilities to fulfil their rights in an inclusive society*." The Global Disability Summit in 2018 was a pivotal event in which inclusive infrastructure was highlighted as one of six spotlight issues where commitments to embedding disability inclusion in the infrastructure sector were made[29]. To realise these policies, knowledge and guidance on disability inclusive design for cities in low-resource settings is necessary and so our research and these six case studies will help support making these policy goals a reality.

[24] Infrastructure and Cities for Economic Development (ICED), 'Delivering Disability Inclusive Infrastructure in Low Income Countries'.
[25] Asian Development Bank, 'Enabling Inclusive Cities: Tool Kit for Inclusive Urban Development' (Manila, Philippines: Asian Development Bank, 1 December 2016), https://doi.org/10.22617/TIM157428.
[26] The World Bank, 'World Inclusive Cities Approach Paper'.
[27] Diana Mitlin and David Satterthwaite, 'On the Engagement of Excluded Groups in Inclusive Cities: Highlighting Good Practices and Key Challenges in the Global South', Urban Development Series Knowledge Papers (The World Bank, 2016).
[28] The World Health Organisation, 'World Report on Disability'.
[29] Infrastructure and Cities for Economic Development (ICED), 'Delivering Disability Inclusive Infrastructure in Low Income Countries'.

Why inclusive design?

"Inclusive Design can help all human beings experience the world around them in a fair and equal way by creating safe and accessible environments for all members of the community." [30]

Inclusive design was highlighted by the former UK Department for International Development (now FCDO) as one of six key opportunity areas for 'delivering disability inclusive infrastructure'[31].

An accessible environment is often considered to be one that offers step-free level access whereas an inclusive environment goes further, looking at equality of experience in the built environment and infrastructure. Inclusive environments embrace diversity and flexibility, understanding that everyone has different needs and those needs are constantly changing[32].

Inclusive design is about genuine engagement and innovation, listening and making space for people. It is a practice that embeds participation and embraces diversity in solving design problems. It differs from universal design in how it embraces difference and recognises that 'one size fits one person' and 'universal solutions' are not always feasible or optimal to promote inclusion for everyone[33]. Inclusive design can help to minimise social exclusion[34] and the inclusive design of the built environment has the potential to embed the principles of access, opportunity, participation and equity in the lived experience of cities, contributing to spatial, economic and social inclusion for persons with disabilities.

In a world where 1 billion people need access to assistive technology, a world that is ageing and experiencing worsening inequality, designing and building a world that limits access or is unnecessarily challenging for persons with disabilities is not an option. Inclusion benefits everyone.

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[30] Global Disability Innovation Hub, Queen Elizabeth Olympic Park, and London Legacy Development Corporation, 'Inclusive Design Standards', May 2019.

[31] Infrastructure and Cities for Economic Development (ICED), 'Delivering Disability Inclusive Infrastructure in Low Income Countries'.

[32] Global Disability Innovation Hub, Queen Elizabeth Olympic Park, and London Legacy Development Corporation, 'Inclusive Design Standards'.

[33] World Economic Forum: Strategic Intelligence, 'Global Issue: Inclusive Design. Curated by the Smithsonian Institution', World Economic Forum: Strategic Intelligence, accessed 12 September 2020, https://intelligence.weforum.org/topics/a1G0X0000057IniUAE?tab=publications.

[34] Dr Ellie Cosgrave, 'The Role of the Engineer in Creating Inclusive Cities', n.d., 16.

The application of inclusive design principles, methods and practices to the holistic design of urban development and inclusion - be that policies, a city masterplan, road infrastructure, a building or a service – is an area that is under-investigated and requires research and engagement to understand what inclusive design looks like in resource-constrained contexts.

The holistic approach and practice of inclusive design can be applied to more than physically accessible designs. It can be used to build cohesion across sectors by placing disabled voices at the heart of problem solving. Inclusive design can also contribute to achieving the World Health Organisation's Disability Action Plan by offering methods to develop 'culturally appropriate person-centred approaches'[35].

Evidence shows that isolated interventions for urban development have limited success. To improve quality of life in cities, interventions and urban programmes need to be holistic and sustained over long periods of time[36]. This calls for a deep understanding of context-based planning and design, where inclusive design can help, by bringing together the people with the most intimate knowledge of the challenges to be solved. The opportunity for inclusive design in disability inclusive infrastructure does not just lie in technical design solutions but in how its practice could mediate multi-sectoral and cross-thematic approaches to pressing urban development challenges for persons with disabilities.

What do we want to find out?

The over-arching research question for this sub-programme is, 'What is the current state of inclusive and accessible environments and infrastructure in LMICs and what is the role of inclusive design in creating an enabling environment for disabled people?'.

1. What legislation, policy, regulation and guidance currently exists to protect the rights of disabled people in the built environment in each case study city?

[35] F Khan et al., 'World Health Organization Global Disability Action Plan: The Mongolian Perspective', *Journal of Rehabilitation Medicine* 50, no. 4 (2018): 388–366, https://doi.org/10.2340/16501977-2207.
[36] Dahiya and Das, 'New Urban Agenda in Asia-Pacific'. Pg.23

2. What is the current awareness, understanding, acceptance and application of inclusive design in built environment policy, planning, design and construction among key stakeholders in each case study city?

3. What are the current barriers to and opportunities for inclusion in the built environment for people living with disabilities in each case study city?

4. How can inclusive design contribute to creating enabling environments for AT and AT users?

Introduction to the Case Study in India

This purpose of this case study is to explore the state of inclusive and accessible environments for persons with disabilities in Varanasi, India, through engagement with policy, industry and community stakeholders (policy, practice and people). Through this engagement, the case study is developing evidence on the challenges and opportunities for implementing inclusive and accessible design in Varanasi and makes recommendations on local actions towards becoming a more inclusive city.

This is the second of six case studies analysing the state of accessibility and inclusive design in low-resource contexts around the world. The six independent case studies will then be analysed to develop a comparison report and finally a global action report that will offer evidence and recommendations that support making infrastructure, the built environment and urban development in low-resource settings more accessible and inclusive.

An example of a streetscape in Varanasi

Across the Asia-Pacific region, urban economic growth has not been equal and the urban poor carry this burden. This region already houses over half the world's urban population and its urbanisation is only increasing[37]. Major inequalities in access to housing, infrastructure and services, and affordable transportation[38] are found across cities in Asia and the Pacific. These inequalities in urban development, disproportionately affect persons with disabilities and these case studies will contextualise the lives of persons with disabilities across Asia and Africa through research on inclusion and accessibility in the built environment.

According to UNESCAP there are 650 million persons with disabilities in the Asia Pacific region[39]. At a regional level, the Incheon Strategy 'to make it real for Persons

[37] Dahiya and Das.

[38] Judy L. Baker and Gauri U. Gadgil, eds., *East Asia and Pacific Cities: Expanding Opportunities for the Urban Poor* (The World Bank, 2017), https://doi.org/10.1596/978-1-4648-1093-0. Pp. XVIII

[39] 'Incheon Strategy to "Make the Right Real" for Persons with Disabilities in Asia and the Pacific' (UNESCAP, 2012).

with Disabilities' (2012) is an agreed set of disability-inclusive development goals for the Asia-Pacific region, the first of its kind, offering opportunities for the region to be exemplar in disability inclusive development. India has made progress on its commitments to the Incheon Strategy through improving legislation, both anti-discrimination laws and accessibility policies and through national campaigns (the Accessible India Campaign). However, implementation challenges are an issue, such as a lack of an accountability mechanism for budget allocations[40]. India has had legislation on disability inclusion since 1995 and the current legislation (Rights of Persons with Disabilities Act) was introduced in 2016. This law, and supporting policies protect the rights, opportunities, access and participation of persons with disabilities. The Union Minister of Social Justice & Empowerment announced during a review meeting organized by UNESCAP in November 2017 that India is committed to the principle of unity in diversity and the goal of inclusive development encompassing all segments of society including persons with disabilities.

India's population is growing rapidly and becoming more urban. In 2011 there were 7933 towns and cities in India with 31% of the country's population and two thirds of its economic output in urban areas[41]. Rapid urbanisation has created wide disparities across the country, which will likely increase as according to NIUA currently only a few states are undertaking urban-rural transformation. Cities are a major focus of the Indian government for improving quality of life through the 'Smart City Mission' which aims to create 100 smart cities across India, including Varanasi. Varanasi is classified as a Tier II city in India, smaller than cities such as Delhi or Mumbai, but it is the 30th most populous city in India according to the 2011 census[42]. However, it has huge historical and cultural significance. The city is also surrounded by a large peri-urban area with villages that rely on Varanasi to access services. It is described as a complex city that blends 'old and new, stability and change, industry and agriculture, and business and spirituality'[43]. The city is also a popular destination for pilgrims and tourists to visit, creating a fluctuating population.

[40] 'Disability at a Glance 2019: Investing in Accessibility in Asia and the Pacific — Strategic Approaches to Achieving Disability-Inclusive Sustainable Development', n.d., 143.
[41] NIUA, 'Urban Scenario of India', 22 January 2020, https://www.niua.org/urban-scenario-of-india.
[42] 'List of Most Populated Cities of India', accessed 14 September 2021, https://www.census2011.co.in/city.php.
[43] Rana P. B. Singh, 'Varanasi, Making of India's Heritage City', in *Society and Development: Human Geographic Perspectives: In Honour of Professor H.N. Sharma*, ed. H. N. Sharma, Bimal K. Kar, and Abani K. Bhagabati (Guwahati: EBH Publishers (India), 2017), 233–61.

This case study will build a picture of the current state of inclusion and accessibility in the built environment and infrastructure in Varanasi through engaging local stakeholders and communities and exploring the understanding of and potential for inclusive design to address some of the current barriers to inclusion.

The case study will first describe the background research and contextual factors that influence questions of access and inclusion in the built environment in Varanasi. It will then describe the activities that took place before discussing insights, lessons learned, and actions towards inclusion for the city of Varanasi.

Background and Contextual Factors

This section provides some background information that supports and contextualises the primary data collection undertaken in this case study on Varanasi. India is a vast and diverse country, and findings from the city of Varanasi may not fully represent the national context. However, it is important to understand the national initiatives around disability inclusion and accessibility and how they are being implemented at local levels. To that end, Varanasi's role as a city within India is important as there is an opportunity to build evidence in Varanasi that can apply to other cities with similar urban, geographical, economic, heritage and cultural contexts – when currently most high-profile initiatives and policy dialogues take place in larger metropolitan cities such as Delhi. Varanasi can be described as a low-resource context, where aspirations for accessibility compete with essential infrastructure and quality of life improvements. Varanasi also has great cultural and religious importance in India, creating a unique context to study accessibility.

Statistics on Disability in India			
Population of India	1.21 billion		
Population of Uttar Pradesh	204.2 million		
Population of Varanasi	1.23 million (estimated to be much higher)		
Population of Persons with Disabilities in India	26.8 million	15 million male	11.8 million female
Population of Persons with Disabilities in Uttar Pradesh	4.16 million	2.36 million male	1.79 million female
Population of Persons with Disabilities in Varanasi[44]	96,924	54,297 male	42,627 female

Varanasi's population is growing, expected to reach 4 million by 2030 and the country is rapidly urbanising. The statistics above give an indication of the population

[44] 'District Wise Population of Disabilities | Official Website of Empowerment of Persons with Disabilities Department, Government of Uttar Pradesh, India.', accessed 13 April 2021, http://uphwd.gov.in/page/en/district-wise-population-of-disabilities.

demographics and prevalence of disability. The statistics show that rates of disability are slightly higher among men, and in rural populations.

Disability and Accessibility in India

The statistics above state that around 2.1% of India's population is registered as disabled. These figures are taken from the 2011 census, since which the country's population has continued to increase and legislative reform has changed how disability is defined. In 2011, disability in India was defined through seven categories. Today, The Rights of Persons with Disabilities Act 2016, provides 21 categories of disability. Considering the lack of recent data, experts question whether these figures are sufficiently accurate[45]. The World Health Organisation (WHO) estimates that that 15% of the world's population is disabled, with 2-4% experiencing severe impairment. These figures would suggest the disability prevalence in India is actually much higher[46]. Another report suggests there are 60-70 million persons with disabilities in India, of which around half have visual impairments[47], while a report by the World Bank suggests the figure is between 55-90 million[48]. Varanasi is in the state of Uttar Pradesh which has been described as, 'the most populous state in the world' with some of the poorest health indicators[49]. Disability rates are higher among males and among those who are illiterate. Disability rates are also higher in urban areas. However, the total population of people with disabilities is greater in rural areas[50]. Uttar Pradesh state is home to 15% of India's disabled population, suggesting that research on accessibility and inclusive environments could have great impact here, and the state has an opportunity to lead by example for the rest of the country. Furthermore, Varanasi city is the constituency of Prime Minister Modi, which could mean there is political will and capital to make Varanasi a leading example of an inclusive, smart, Indian city.

The enabling legislative environment in India has made progress since the first law on Persons with Disabilities (Equal Opportunities, Protection of Rights and Full

[45] Rakhi Dandona et al., 'India's Disability Estimates: Limitations and Way Forward', ed. Stefano Federici, *PLOS ONE* 14, no. 9 (6 September 2019): e0222159, https://doi.org/10.1371/journal.pone.0222159.
[46] The World Health Organisation, 'World Report on Disability'.
[47] Raijve Raturi in Infrastructure and Cities for Economic Development (ICED), 'Delivering Disability Inclusive Infrastructure in Low Income Countries'.
[48] 'Disability at a Glance 2019: Investing in Accessibility in Asia and the Pacific — Strategic Approaches to Achieving Disability-Inclusive Sustainable Development'.
[49] Vaishali K Shrote and Kishor P Brahmapurkar, 'Distribution of Disabled Persons in World's Most Populous State' 9, no. 11 (2018): 6.
[50] ibid.

Participation) in1995, which was replaced with the new Rights of Persons with Disabilities Act in 2016. However, scholars and practitioners in the disability field question how much these policies have led to change, 'on the ground' and cite challenges associated with implementation, funding, and local adaptation.

Both the medical model and charity model of disability are still very prevalent in India and it is important to understand disability scholarship developed from within an Indian context - that reflects the ground reality of persons with disabilities living in India[51]. The medical model of disability defines disability by a person's impairments and focuses on the individual, unlike the social model which places responsibility on society and the environments we live in for creating barriers and disabling people. The charity model places emphasis on persons with disabilities requiring support to participate in society. Disability studies in India have attempted to critically assess how the discourse has evolved over the last 10-20 years with changing policy and legislation[52]. Nilika Mehrotra also questions how relevant research and theory on disability from the Global North has relevance to the 'lived realities of India', calling for an intersectional and decolonial approach to disability[53]. Many persons with disabilities in India are also living in poverty and are unable to access vital opportunities including education and employment, reinforcing cycles of poverty.

National accessibility standards exist, called the "Harmonised Guidelines and Space Standards for Barrier Free Built Environment for Persons with Disability and Elderly Persons"[54]. Published by the Ministry of Housing and Urban Development. They were last updated in 2016, compiling three previous sets of standards into one document and include the following categories:

- Universal design elements in buildings
- Access to toilet facilities
- Level changes
- Signage
- Fire evacuation
- Alighting and boarding areas
- Transport and road planning
- Adapted housing
- An access audit checklist

[51] Dr. Dilip Kumar Upadhayay, 'Models for Person with Disability in India', Madhav University, accessed 14 September 2021, https://madhavuniversity.edu.in/models-for-person-with-disability.html.
[52] Nilika Mehrotra, *Disability Studies in India: Interdisciplinary Perspectives* (Springer Nature, 2020).
[53] Mehrotra.
[54] 'CABE Foundation: Resources', CABE Foundation, 2020, https://www.cabefoundation.com/p/resources.html.

The guidelines are currently under review as part of the 'Building Accessible Safe Inclusive Indian Cities (BASIIC) Programme', funded by FCDO, UK Government and supported by Ministry of Housing and Urban Affairs. The programme is led by NIUA and the review is being delivered with the Indian Institute of Technology (IIT) Roorkee – who are also supporting this case study - as partner. A participatory approach is involving and engaging key stakeholders including persons with disabilities living all over India[55]. The revised aim is to bring a more holistic approach to accessibility by shifting from a barrier free approach to a universal design mandate. The guidelines will also widen the scope of interpreting inclusion from disability to human diversity considering needs of older people, children, women and other disadvantaged population groups. The new guidelines are proposed to be titled as "Harmonised Guidelines & Standards for Universal Accessibility in India – 2021"[56].

In addition to the guidelines, since 2016 the National Building Code also includes requirements for accessibility for people with disabilities and older people. Each state and city have their own by-laws. However, in most cases these follow the nationally developed 'Model Building Bye-Law', also published in 2016. The National Building code sets standards and the bye-laws are designed to support implementation. More recently, the Central Public Works Department published a manual on accessible built environments. However, versions of the manual available online are not digitally accessible[57]. Various other specific regulations exist, such as the Urban Bus Specifications (UBS) I and II and the UTTIPEC Street Design Guidelines[58]. One of the challenges with implementing good inclusive design in India is that there are many different documents to refer to which makes adherence quite complex. There is a need for a unified approach that covers planning, design and development compliance to ensure inclusive design is applied consistently. Local and regional bye-laws and planning processes have an important role to play in ensuring the successful implementation of inclusive design guidelines.

[55] BASIIC Programme, National Institute of Urban Affairs, 'Internal Document: Concept Note: Revisiting Existing Policies and Guidelines to Create "Cities for All"', 2020.
[56] NIUA, IIT Roorkee, and Ministry of Housing and Urban Affairs, Government of India, 'Public Consultation on Guidelines & Standards for Universal Accessibility in India: Key Findings' (NIUA, April 2021), https://niua.org/intranet/sites/default/files/1305.pdf.
[57] 'CABE Foundation: Resources'.
[58] Agarwal and Steele, 'Disability Considerations for Infrastructure Programmes'.

One of the major government-led initiatives in recent years is the Accessible India Campaign 'Sugamya Bharat Abhiyan', launched in December 2015. The campaign signifies an important moment in the country's approach to access and inclusion and was designed to meet Incheon Strategy commitments. The campaign focuses on three domains: built environment, public transportation and Information and Communications Technologies (ICTs). The Accessible India Campaign states that all public buildings should conform to the international standard ISO 21542:2011, 'building construction – accessibility and usability of the built environment', which was updated in June 2021. During the campaign a number of access audits were conducted to assess accessibility. However, in most cases there has been little progress on making the recommended changes and people have campaigned for greater transparency on how budget allocations for accessibility (5%) are spent[59]. An accessibility audit checklist was developed under the campaign to be used as a tool for undertaking access audit of public/government buildings. The checklist includes various assessment parameters to audit the physical accessibility of external and internal built environments, digital accessibility and access to related services. The checklist is designed in alignment with the 'Handbook on Barrier Free and Accessibility', developed by Central Public Works Department, India in 2014.

Previous studies have illustrated the need for universal/inclusive design to achieve the goals of the Accessible India Campaign[60] with universal/inclusive design experts and the training of government officials as needed. The challenge of implementing standards is also an issue for the many heritage buildings and projects that exist across India. A focus on cosmetic fixes is also a common problem[61].

In certain areas, India has been making great efforts to create barrier-free environments. Multiple cities in India have adopted accessible bus rapid transport systems (BRT) as an accessible transport method, where a low-floor transit vehicle is used. The BRT has been implemented in Surat, Ahmedabad, New Delhi, Pune, Indore, and Jaipur but not in Varanasi[62] but the accessibility of these infrastructures

[59] 'Disability at a Glance 2019: Investing in Accessibility in Asia and the Pacific — Strategic Approaches to Achieving Disability-Inclusive Sustainable Development'.

[60] Sandeep Sankat and Anne Britt Torkildsby, 'Achieving Success of "Accessible India Campaign" Through Universal Design Education in India', *Transforming Our World Through Design, Diversity and Education*, 2018, 40–55, https://doi.org/10.3233/978-1-61499-923-2-40.

[61] Shyju P.J. et al., 'Local Stakeholders' Perspectives on Religious Heritage and Tourism Development in Varanasi', *International Journal of Tourism Cities* 6, no. 3 (27 June 2020): 529–44, https://doi.org/10.1108/IJTC-10-2019-0194.

[62] Agarwal and Steele, 'Disability Considerations for Infrastructure Programmes'.

is contested. An example that is often shared as best practice in an Indian context is the Delhi Metro Rail System which has been designed in consultation with persons with disabilities through conducting access audits and monitoring[63]. The issue is that a holistic inclusive design and planning approach has not been implemented, so while the metro itself is accessible, the surrounding routes and connections to other modes of public transport, including the metro feeder buses, are not. The result is that many persons with disabilities cannot gain access to the new accessible metro system in the first place. Similar issues are encountered in the train system where accessible seating and toilets have been provided. However, there is no level boarding access to the trains and first and last mile connectivity remains a challenge.

Culture, Heritage and the development of Varanasi

Varanasi is one of the oldest cities in the world, the city is described as 'living history itself' and a 'mosaic of India'[64]. It was well developed by the 8th century BCE [Before Common Era] but major transformation of the city took place between the 8th and 12th Century when the city, previously centred on the northern side of the river Ganges, also expanded to the Southern side of the river. The 11th and 12th Century are described as the 'golden period' of Varanasi and it was during this time that many of the Ghats, for which the city is famous, were built.

Over history the city has gone through cycles of destruction and reconstruction with changing rule. It was not until the Mughal Emperor Akbar, who ruled from 1556 to 1605, granted more religious freedom that this cycle ended. During this time many Ghats were repaired and the Vishwanath temple was rebuilt for a third time. There is no major Hindu religious sanctuary that predates the 17th century due to these cycles of destruction. The British then took control of its administration in 1857. Banaras Hindu University was founded, firstly as the Central Hindu College, in 1898. In total there are 3,600 Hindu temples and shrines and 1,388 mosques and Muslim shrines in Varanasi. It is also described as a city of learning with many schools, colleges and universities[65]. Scholars describe how the city is one that can be difficult to

[63] Ibid.
[64] Rana P B Singh and Pravin S Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development', 2017, 19.
[65] Singh and Rana.

comprehend for those outside of Hindu culture, and therefore be one of the most challenging cities in India for visitors.

Ghats of Varanasi. There are 84 of these stepped riverfront heritages sites in the city.

In terms of city administration, a Municipal Board for the city was set up in 1867[66]. The independence of India in 1947 brought about change to the city as Varanasi's district grew and became part of the state of Uttar Pradesh. In the second half of the 20th Century the city experienced an increasing influx of foreign tourists, prompting the construction of several 'star' hotels and the construction of four road bridges, built in 1999[67].

Varanasi has a strong cultural and economic base and is an important river port and textile manufacturing hub. The first masterplan of Varanasi was created in 1951. The Varanasi Development Authority (VDA) was created in 1974. A more comprehensive

[66] Singh, 'Varanasi, Making of India's Heritage City'.
[67] Ibid.

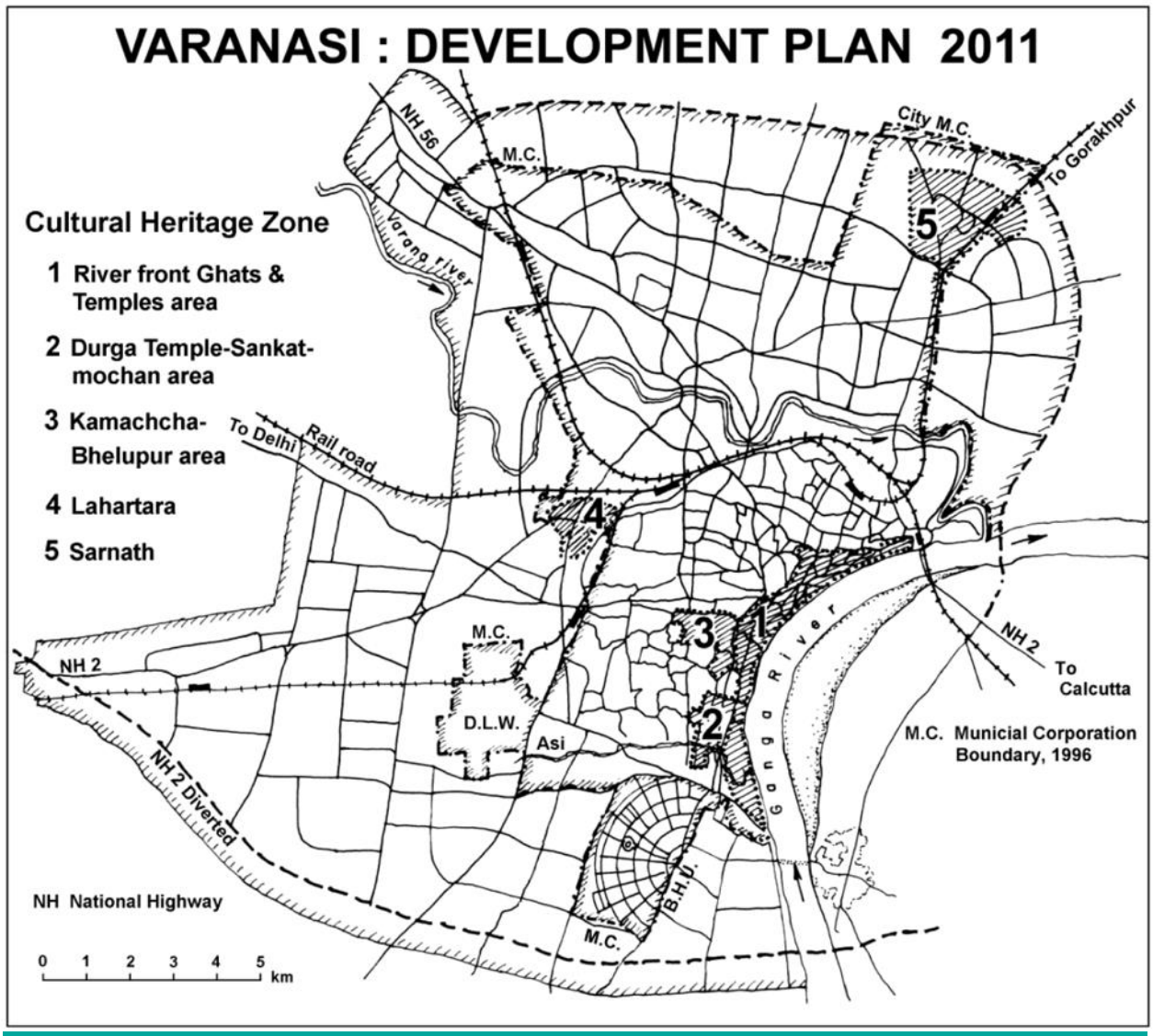
master plan for 1991-2011 was prepared by the VDA, with the support of the Town & County Planning Organisation (TCPO) of the Government of India. This expanded the area of Greater Varanasi to 179.27km^2 increasing the planning area by 55.5%. This has seen both rapid growth and change in land use, with parks and available open spaces decreasing by 60% since 1999. Agriculture and fallow land have also decreased by 40%. Around 40,000 commuters enter the city daily, increasing to 60,000 in the festive seasons[68].

The 2001 city masterplan, identified 5 cultural zones that are to be protected, where just over 2% of the land is protected as urban heritage. This development plan was intended to preserve culture and heritage and support developing infrastructure. The five heritage zones are:

- The Riverfront Ghats (there are 84 in total)
- Durgakund-Sankatmochan Area
- Kamachcha-Bhelupura Area
- Kabir Math (Lahartara) Area
- Sarnath[69]

[68] Ibid.

[69] Singh, 'Varanasi, Making of India's Heritage City'.



Varanasi Development plan indicating cultural heritage zones.

Image credit: Rana P.B. Singh (2017)

Alongside the 'Accessible India Campaign' and 'Smart City Mission', the Indian government has launched two initiatives to support preserving culture and heritage in Indian cities. The HRIDAY programme (Heritage City Development and Augmentation Yojana) and PRASAD (Pilgrimage Rejuvenation and Spiritual Augmentation Drive) seek to promote, 'integrated, inclusive and sustainable development of heritage sites'[70] (of which Varanasi city is one). Varanasi was one of the three priority sites selected within the HRIDAY and PRASAD and in 2017 was designated one of five heritage cities.

[70] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.

The plan for a sustainable heritage city system includes the consideration of inclusive heritage development from the beginning, 'setting the vision'[71]. Previous case studies have shown that setting a vision is also an important step in implementing inclusive city design[72], so there are opportunities here for holistic and inclusive development practices to be developed. There is a need to balance religious and cultural heritage, housing and community development and economic factors such as tourism. Community participation will be key to this process and inclusive design can support this.

It is important to note that these national campaigns have immense potential due to the funding and political will behind them, including up to $15 million of funding specifically allocated to Varanasi in 2015, followed by a further $48 million in 2017[73]. However, the question remains, to what extent are these campaigns having tangible impact, 'on the ground' and creating inclusive heritage for persons with disabilities.

Heritage efforts in India also place importance on intangible and living cultural heritage, with UNESCO stating that it has an important role in preserving cultural diversity in a rapidly changing world[74]. Intangible cultural heritage is described as, 'the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage.'[75] Intangible cultural heritage is important because it celebrates inclusion and diversity and is driven by communities laying claim to what they consider to be their heritage. An example of this is the Ganga Aarti, which takes place daily at Dashashwamedh Ghat in Varanasi, an important ritual and celebration in the city[76].

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[71] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.
[72] Mikaela Patrick, Iain McKinnon, and Victoria Austin, *AT2030 Inclusive Infrastructure Case Study 1: Inclusive Design and Accessibility in Ulaanbaatar, Mongolia*, 2020, https://doi.org/10.13140/RG.2.2.26922.44485/1.
[73] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.
[74] Ibid.
[75] 'UNESCO - Text of the Convention for the Safeguarding of the Intangible Cultural Heritage', accessed 15 April 2021, https://ich.unesco.org/en/convention.
[76] Resham Sengar, 'A Visual Treat – Ganga Aarti of Varanasi', Times of India Travel, accessed 14 September 2021, https://timesofindia.indiatimes.com/travel/things-to-do/a-visual-treat-ganga-aarti-of-varanasi/as65532479.cms.

Maintenance of the Ghats that line the Ganges river has historically been organised through social relations, where parts of the Ghats are linked to certain temples and families maintain them. This creates an inconsistency where some areas are well-maintained and others are not, particularly where maintenance is the responsibility of the government who lack capacity and funds. In the past, public spaces and assets were cared for by the people who lived near them, but these caring practices have been lost over time[77].

There is a tension between pilgrimage, religious tourism and tourism in general. International visitors are most likely to be visiting for recreational tourism. However, sacred sites are becoming congested as the commercial ventures aimed at capitalising on recreational tourism grow. In fact, Varanasi can become so congested with tourists that many people (including local people and religious tourists) can no longer easily gain access to the Ghats[78]. In a study on stakeholder perspectives around tourism and religious pilgrimage, it was viewed by some that the growth of the tourism industry is diminishing the genuine sacred experience of the city.

Varanasi and the Smart City Mission

Smart cities are cities where digital solutions and technology are leveraged to improve quality of life[79]. The Smart Cities Mission in India aims to create 100 smart cities across India with a vision to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to 'Smart' outcomes[80]. Varanasi is one of the cities forming part of India's Smart City Mission, joining the programme in September 2016 during the second phase of the selection process. Under the Smart City Mission Varanasi recently won an award for its city leadership and innovation during COVID-19.

[77] Geeta Mehta, 'Restoring Agency to Urban Stakeholders through Social Captial', in *Water Urbanism in Varanasi* (Columbia GSAPP), accessed 7 April 2021, https://www.arch.columbia.edu/books/reader/331-water-urbanism-varanasi#reader-anchor-1.

[78] Singh, 'Varanasi, Making of India's Heritage City'.

[79] 'Smart Cities', Text, European Commission - European Commission, accessed 21 September 2021, https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en.

[80] www.smartcities.gov.in

The six pillars of envisioning ‘Smart-Kashi’ [Varanasi is also known as Kashi or Banaras] are:

- Suramya: picturesque, through religious and cultural heritage
- Nirmal: pure/clean, through greening spaces and ecological restoration including reviving the Ganges river
- Surakshit: safe, through better transport. Pathways and motorised transport
- Smmunat: improved, through citizenship, civility and viable employment
- Ekatrit: integrated, through interfacing and coordination among various cells for maintaining SDGs
- Sanyojit: planned, through balance in tradition and modernity[81]

In addition to this, heritage conservation and tourism management is given high priority. Varanasi’s smart city plan closely involves the national heritage programmes HRIDAY and PRASAD which will be discussed in more detail in the next section on heritage. The city’s goals will also be extended to align with the UN’s Sustainable Development Goals and New Urban Agenda, where culture and heritage are valued as important aspects of development[82]. According to Rana P. B. Singh, an eminent scholar on the city of Varanasi, comprehensive planning of the city will be delivered through: liveable communities; heritage conservation and tourism management; roads and city infrastructure; urban planning; governance; environmental planning; and economic development. Inclusive heritage development will be delivered alongside poverty alleviation strategies, with support from the Japanese government.

The three areas of focus for inclusive heritage development in Varanasi are:

- Rejuvenation of historic temples and the Ganges riverfront Ghats
- Providing a worthy platform for visitors to experience Varanasi’s inherently rich culture and heritage
- Capitalise on Varanasi’s status under the UNESCO city of music label and intangible heritage such as Ramlila at Ramnagar fort – an annual play that lasts one month[83].

[81] Singh and Rana, ‘Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development’.
[82] Ibid.
[83] Ibid.

The Varanasi smart city mission proposes to use innovative social and financial inclusion solutions to make Varanasi a great place to live while also showcasing its rich heritage[84].

Local government is invested in ensuring accessibility is part of the city's Smart City Mission with initiatives including the development of an accessible sports stadium, improving access to heritage sites and introducing sensory parks. These projects are supported by the BASIIC Programme at NIUA. NIUA has established a partnership with Varanasi Smart City Ltd (VSCL) to facilitate Technical Assistance for adoption and implementation of inclusive interventions at pilot scale and build the technical capacities of the city stakeholders through knowledge management and shared learning approach across smart cities. The Technical Assistance and Support Unit (TASU) is currently supporting VSCL to integrate the components of barrier free design/universal design elements for their smart cities' initiatives. Some of the related inclusive interventions include:

- Redevelopment of Dr. Sampoornan and Sports Stadium into a Barrier Free Sports Facility
- Planning and designing of an Inclusive Park
- Planning and designing of an Inclusive Street

The Happy Streets project opens up streets to community activities with women, children, older people and persons with disabilities.

Image credit: VCSL Twitter

[84] Ibid.

As a larger goal, the partnership aims to bring reforms at the institutional and policy level mechanism for promoting inclusion and universal access for Persons with Disabilities through a collaborative, participatory and integrated approach.

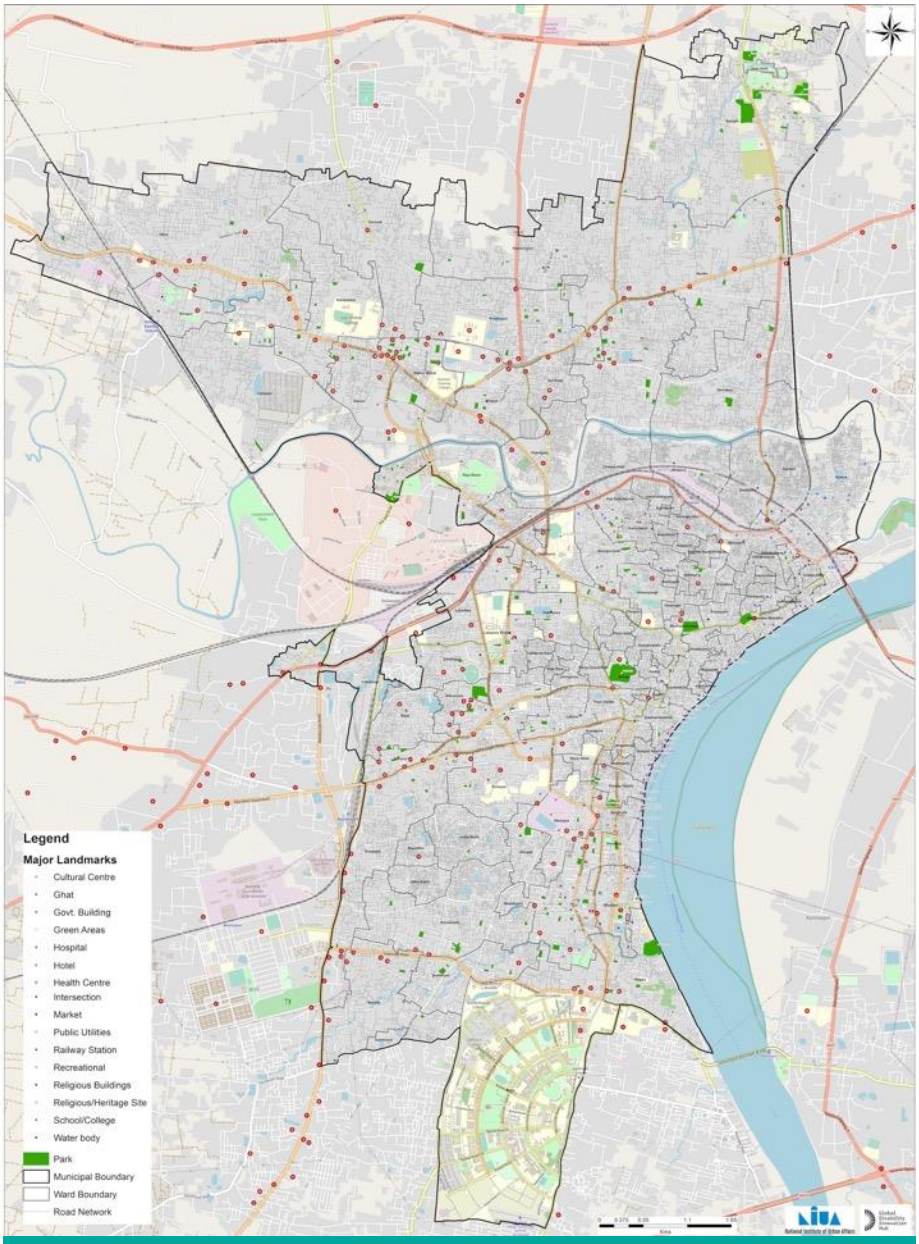
Urban Development, Infrastructure and Living Conditions

Urbanisation is a major theme of the modern development of India, including Varanasi, and research has been undertaken to understand how marginalised groups are being excluded from these processes. Looking more broadly at urban development, a study into the cities of Varanasi, Pune and Ahmedabad found that cities, rather than affording greater opportunities, are increasingly mirroring rural settings where marginalised groups are often the most excluded[85]. The study found that most people living in informal settlements represent marginalised or excluded groups. The location of a neighbourhood also determines its access to municipal services and stronger urban governance is needed to bridge gaps. The study also found that the socio-economic characteristics of a neighbourhood play a role in its level of access to services and that the processes of exclusion in cities are complex, particularly considering migrant populations[86]. However, in recent years cities such as Varanasi and Pune have been making considerable progress on disability inclusion with a number of interventions that illustrate good practice, such as the Happy Streets project.

Reports suggest that the population of Varanasi fluctuates from 1.2 million to 6 million throughout the year with pilgrims, tourists, nomads and migrant traders[87], Varanasi has about 5.5 million tourists visiting every year[88]. Around an additional 35,000 people move through the city daily, on top of an already extremely dense population of 400-500 people per hectare. The average household size in Varanasi is 7.3 people per household[89].

[85] Niranjan Sahoo, 'A Tale of Three Cities: India's Exclusionary Urbanisation', *A Tale of Three Cities*, no. 156 (2016): 8.
[86] Sahoo.
[87] 'Water Urbanism Varanasi', Columbia GSAPP, accessed 29 March 2021, https://www.arch.columbia.edu/books/reader/331-water-urbanism-varanasi#reader-anchor-1.
[88] https://economictimes.indiatimes.com/news/politics-and-nation/varanasi-big-budget-projects-galore-in-pm-narendra-modis-constituency/articleshow/54271330.cms
[89] Pramit Verma et al., 'Green Space Indicators in a Social-Ecological System: A Case Study of Varanasi, India', *Sustainable Cities and Society* 60 (September 2020): 102261, https://doi.org/10.1016/j.scs.2020.102261.

Varanasi is the regional capital of Uttar Pradesh, and a centre for economic development. The city has been growing steadily with neighbouring cities Ramnagar and Mughalsarai expected to become part of Varanasi's metropolitan region by 2031[90]. Currently, surrounding developments and peri-urban settlements are not considered in planning which is problematic[91].



Map of Varanasi, inhabited settlements sprawl beyond the city's municipal boundary.

[90] Singh, 'Varanasi, Making of India's Heritage City'.

[91] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.

As an old city, Varanasi's land use consists of both planned and unplanned parts[92]. Varanasi's urban centre is constituted of three main zones: the riverfront which is the face of the city; the middle city which is the high-density core of the city on the hill above the outer bank of the river; and communities in the surrounding periphery. The inner bank of the river also has a history of being seasonally occupied for grazing and agriculture and where temporary structures of nomadic pastoralists can be found[93]. The floodplains around the city limit the potential of growth in some parts of the city.

The core city constitutes the old city and much of the culture for which Varanasi is famous for can be found in this part of the city, it is characterised by Hindu architecture, narrow streets and is densely populated. The middle zone has developed steadily since the middle of the 20th century, with the areas previously reserved for agriculture and historic water management built over for residential and commercial construction. Its architecture blends Varanasi's history with Hindu, British and Muslim influences and many of the government buildings are in this area. The outer zone has seen the most growth since the 1990s, as land prices and congestion in the inner city have forced people to settle here. The city also saw wealthier residents seeking larger residential spaces and green spaces further out from the city centre[94].

The city is occupied with informal settlements throughout these three zones. According to the 2011 census, informal settlements make up about 34% of the city's residents[95] and about 17% of the land[96]. These settlements have been expanding throughout the 20th and 21st century with 97% having emerged in the last 45 years. Many informal settlements are located close to employment opportunities or close to the holy centre of the city, where people aspire to live. Informal settlements, while representing a third of the population, only occupy 17% of land in the city, creating

[92] Manoj Kumar et al., 'Land Use Patterns and Urbanization in the Holy City of Varanasi, India: A Scenario', *Environmental Monitoring and Assessment* 167, no. 1–4 (August 2010): 417–22, https://doi.org/10.1007/s10661-009-1060-0.

[93] Dilip De Cunha et al., 'From Anandavana to Varanasi', in *Water Urbanism in Varanasi* (Columbia GSAPP), accessed 7 April 2021, https://www.arch.columbia.edu/books/reader/331-water-urbanism-varanasi#reader-anchor-1.

[94] Darshan Kumar Jha, Rahul Harshwardhan, and V K Tripathi, 'Geographical Zones of Varanasi City: Past to Present', *National Geographical Journal of India* 65, no. 1 (2019): 46–55.

[95] Darshan Kumar Jha, Rahul Harshwardhan, and V. K. Tripathi, 'Determining Poverty and Quality of Life in Slums of Varanasi City', *National Geographical Journal of India* 62, no. 4 (31 December 2016): 377–88.

[96] Darshan Jha and V.K. Tripathi, 'Quality of Life in Slums of Varanasi City: A Comparative Study', *Transactions of the Institute of Indian Geographers* 36 (1 December 2014): 171–83.

high levels of density and significant challenges for infrastructure development. Quality of life is also generally low with 44% of this population living below the poverty line and 79% representing marginalised groups, including persons with disabilities[97]. However, there is an urgent need for updated city-wide data as the last census was conducted in 2011.

A quarter of houses in informal settlements in Varanasi do not have an individual toilet, many lack access to sewage and waste disposal and many rely on hand pumps to access water[98]. Additionally, 75% of residents of informal settlements in the city are illiterate and under 35% are able to access government health services[99]. 47% of these settlements are prone to flooding, indicating the need for disaster risk reduction strategies. These figures paint a picture of the need for an inclusive planning process that engages all city residents, and places particular attention on disadvantaged groups, currently marginalised and excluded from accessing essential services. Numerous government programmes have attempted to improve living conditions for the urban poor, but often struggle to have demonstrable positive impact.[100].

Resolving sewage problems, waste disposal and the over-reliance of motorised vehicles that are both congesting and polluting the city are three of the most urgent urban challenges in Varanasi, where dry latrines are still commonly used[101]. Even where sewers do exist, they are often not connected to toilets. Scholars have suggested that a loss of community relations that historically maintained public assets is part of the problem and that the city has become more individualistic and consumer-minded. Rebuilding social capital and empowering citizens to take agency over their city could support positive change[102]. Traditional rainwater management systems, tanks called kunds or talabs, that would collect water in the monsoon season are now in poor states due to increased urbanisation, with a breakdown of

[97] Jha, Harshwardhan, and Tripathi, 'Determining Poverty and Quality of Life in Slums of Varanasi City'.
[98] Jha, Harshwardhan, and Tripathi.
[99] Darshan Jha and V. Tripathi, 'Achieving Millennium Development Goals and India Vision 2020: Evidences from the Slums of Varanasi City', SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 22 April 2015), https://papers.ssrn.com/abstract=2597833.
[100] 'City Houses 227 Slums on 17% of Total Area | Varanasi News - Times of India', The Times of India, accessed 16 April 2021, https://timesofindia.indiatimes.com/city/varanasi/city-houses-227-slums-on-17-of-total-area/articleshow/29981477.cms.
[101] Shradha Chandan and Ashwani Kumar, 'Challenges for Urban Conservation of Core Area in Pilgrim Cities of India', *Journal of Urban Management* 8, no. 3 (1 December 2019): 472–84, https://doi.org/10.1016/j.jum.2019.05.001.
[102] Mehta, 'Restoring Agency to Urban Stakeholders through Social Captial'.

local systems of repair and care[103]. Most sewage flows untreated into the Ganges. The peripheries of the city also suffer from a lack of connectivity to a sewage system[104].

According to urban scholars, barriers to city development include; poor public participation, lack of knowledgeable and engaged stakeholders, poor urban governance, low rates of job opportunities and old traffic systems. These need to be overcome to make Varanasi a liveable and ecologically sustainable city[105].

Singh proposes the following general principles to make Varanasi a more liveable city:

- Be better place to live, for everyone
- Underpin jobs and growth
- Leave a sound legacy for future generations
- Offer better linkages to other major cities and regions
- Integration within and between transport and land use, urban form and new technologies. [106]

He also proposes that to support mobility and an accessible city, the following should be considered:

- Take a systems approach to the whole network
- Limit the need for travel, and if not possible, limit the distance such as providing work opportunities closer to home
- Lessen the reliance on vehicular transport, to focus on public transport
- Separate the flows of freight and passengers moving through the city [107]

More generally, he advocates for better urban planning, more public transportation, better sanitation and rational water use policies, energy conservation, urban farming and waste recycling in the city [108]. Wide support for initiatives is required with actual implementation often an act of complex compromise between stakeholders where corruption can also be an issue.

[103] Mehta.
[104] 'Water Urbanism Varanasi'.
[105] Singh, 'Varanasi, Making of India's Heritage City'.
[106] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.
[107] ibid
[108] ibid

Historically, public participation in masterplans[109] has been lacking and stakeholders are not sufficiently engaged in development plans. Plans need to be implemented to a higher standard, while also not focusing on merely cosmetic fixes[110].

Health, Environment and Climate

An inclusive city must also be a healthy and resilient city and for Varanasi, inclusive environments, public health and climate resilience are closely linked.

Varanasi has a sub-tropical monsoon climate, with three seasons described as: the cold from November to February, the hot from March to Mid-June where temperatures can reach up to 42°C, and the rainy from mid-June to September. October is considered a transitional month[111]. During the monsoon season, silt that washes down the Ganges from the Himalayas can fill the ghats and temples with mud and debris[112]. The climate crisis and rising waters are already impacting the river's ecosystem. During the rainy season, buildings in the city's core can also risk collapse with some infrastructure becoming unusable[113]. The Ganges river is the centre of life in Varanasi, and a vital water source for 400 million people but it also suffers from pollution and there are public health concerns[114]. Poor quality infrastructure creates issues of water logging and flooding, particularly during the rainy season. This is also an issue of poor planning[115] and demonstrates the importance of a coordinated and multi-sectoral approach to city planning and infrastructure.

The banks of the river Ganges have historically been prone to flooding, but in recent years scholars have become more concerned with the potential impacts of climate change on this dense, organically formed city[116]. Studies are ongoing into the

[109] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.ngh
[110] P.J. et al., 'Local Stakeholders' Perspectives on Religious Heritage and Tourism Development in Varanasi'.
[111] Singh and Rana, 'Varanasi: Sustainable Development Goals, Smart City Vision and Inclusive Heritage Development'.
[112] De Cunha et al., 'From Anandavana to Varanasi'.
[113] Chandan and Kumar, 'Challenges for Urban Conservation of Core Area in Pilgrim Cities of India'.
[114] 'Cleaning up a Public Health Threat - the River Ganges', BMC Series blog, 17 July 2017, https://blogs.biomedcentral.com/bmcseriesblog/2017/07/17/cleaning-up-a-public-health-threat-the-river-ganges/.
[115] Sankat and Torkildsby, 'Achieving Success of "Accessible India Campaign" Through Universal Design Education in India'.
[116] Ranit Chatterjee et al., *Climate Disaster Resilience of Varanasi; City, Zone and Ward Profile*, 2015.

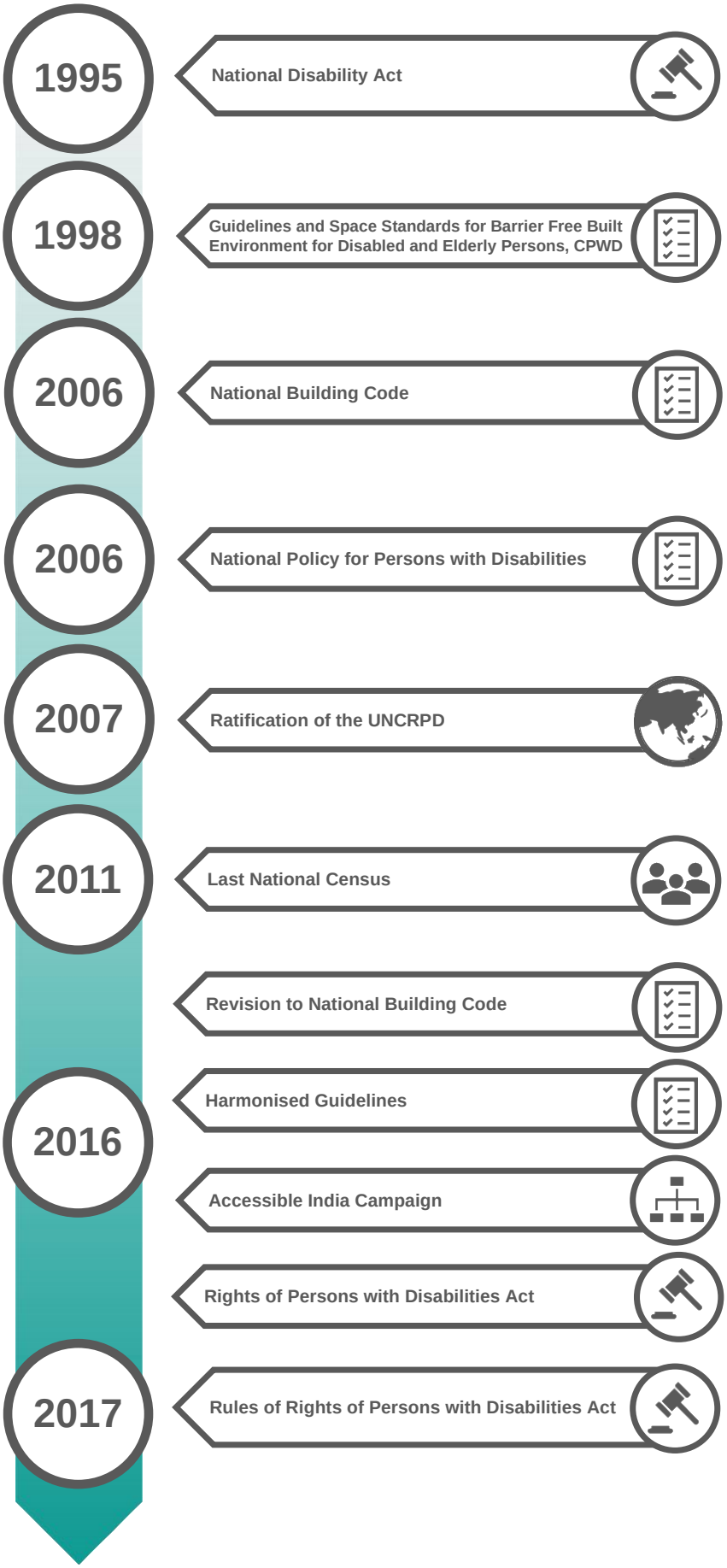
potential health impacts of climate change[117] [118] but evidence is showing that climate change is already impacting water resources in the city[119].

Historically, Varanasi has experienced population decline due to disasters and epidemics. Between 1891 and 1921 the population declined by 11%[120]. However, since then, the population has grown steadily. Pollution is a problem both from motorised transport and untreated solid waste and sewage which can be found in water bodies and on roads. The city is also famous for cremation rituals that take place on the river, another significant cause of pollutants. A study in 2017 on older people living in Varanasi identified that two thirds of older people had at least one impairment[121], indicating the importance of an accessible environment to support older people.

In terms of green spaces in the city, a study found that green spaces or tree cover were more common in planned urban spaces than unplanned ones[122]. Attention to green spaces, reforestation and cultivating the ecosystem in planning is required to prevent land degradation. Another study found that only 16 out of 90 wards in Varanasi had a standard of green space per capita that meets the WHO standards. However, it still has better green space indicators than larger cities like Delhi, Mumbai, Kolkata and Chennai. Green spaces tend to increase towards the peripheries of the city. Another study also found that areas with greater green spaces had higher levels of literacy and employment[123]. However, areas of high employment are not always indicative of better socio-economic conditions. Often, this indicates a higher number of workers in low paid professions, who may still struggle to support their dependents[124]. Stakeholders engaged in the study remarked that the loss of green spaces in the city has not been sufficiently addressed[125].

[117] 'Plotting Climate Change and Diarrhoea in Varanasi', The Wire, accessed 14 September 2021, https://thewire.in/health/nidhi-singh-climate-change-health.
[118] Nidhi Singh et al., 'Attributing Mortality from Temperature Extremes: A Time Series Analysis in Varanasi, India', *Science of The Total Environment* 665 (15 May 2019): 453–64, https://doi.org/10.1016/j.scitotenv.2019.02.074.
[119] Mărgărit-Mircea Nistor et al., 'Climate Change Effect on Water Resources in Varanasi District, India', *Meteorological Applications* 27, no. 1 (2020): e1863, https://doi.org/10.1002/met.1863.
[120] Singh, 'Varanasi, Making of India's Heritage City'.
[121] Priya Keshari and Hari Shankar, 'Self Reported Morbidity and Its Correlates among Urban Geriatric Subjects: A Community Based Study from Varanasi' 48, no. 1 (2017): 10.
[122] Kumar et al., 'Land Use Patterns and Urbanization in the Holy City of Varanasi, India'.
[123] Verma et al., 'Green Space Indicators in a Social-Ecological System'.
[124] Ibid.
[125] P.J. et al., 'Local Stakeholders' Perspectives on Religious Heritage and Tourism Development in Varanasi'.

Pathway to inclusion – where are they?



Summary of activities

Research activities took place from November 2020 – March 2021 in three phases. The research combined virtual and face to face research activities and followed local protocols around the COVID-19 pandemic.

Phase 1 focused on understanding the current state of accessibility in the built environment in Varanasi through desk research, document reviews, working sessions and stakeholder mapping. Interviews took place with key stakeholders including; government officials, architects, urban planners, project managers, academics and entrepreneurs.

Phase 2 focused on capturing the lived experience of persons with disabilities in Varanasi and in particular, their experience of the built environment and infrastructure. Interviews, photo diaries and co-design activities were employed to understand; the challenges and barriers persons with disabilities face in the city, areas where good practice can be found and aspirations for a more inclusive city.

Co-design workshop. Participatory mapping.

Phase 3 focused on synthesising the findings of the previous two phases by holding workshops to discuss and validate the initial findings. The aim of these sessions was to identify, 'actions towards inclusive environments' by identifying shared challenges and opportunities across the diverse stakeholders involved. The workshops employed participatory inclusive design techniques to elicit insights and prioritise areas for action while allowing participants to gain experience of inclusive design methods that could be applied to their own work.

The research engaged three key stakeholder groups;

- **Policy**: government and policy;
- **Practice**: industry professionals such as architects, urban planners;
- **People**: persons with disabilities, community groups, other citizens.

11 stakeholder interviews were undertaken with government and industry professionals operating in the domains of inclusion, accessibility and/or the built environment. All of these stakeholders were male.

15 interviews and 6 photo diaries with interviews were conducted with persons with disabilities. The gender balance among our disabled participants was 15 male to 6 female participants.

Across all the interviews undertaken the gender balance was 26 male to 6 female participants. Age groups ranged from 18-29 to 60+ with the majority of participants with disabilities between the ages of 18-29 (8) and 30-39 (12).

Our disabled participants had a mixture of mobility and visual impairments. Three of our government and industry stakeholder interviewees also identified as disabled. Limitations of the research include the lower representation of female participants and a limited representation of different disabilities, both related to recruitment challenges during the research.

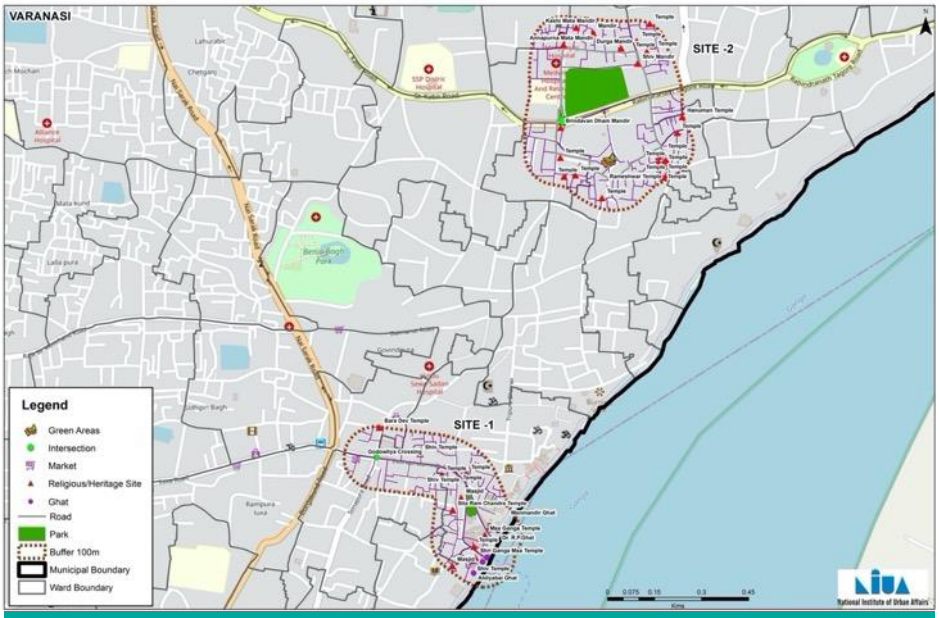
Two workshops, one with disabled participants and one multi-stakeholder workshop took place where exploratory co-design activities were used to discuss the findings from the primary data collected. Activities included journey mapping, participatory mapping and priority setting. An additional workshop took place with the immediate research team to validate the research findings. A further engagement and capacity building event with city stakeholders was held in September after some delays due to COVID-19. This event brought together stakeholders to set a vision for an inclusive Varanasi (Sugamya Kashi).

Multi-Stakeholder Workshop led by NIUA

We also conducted 5 individual expert interviews with leading academics and practitioners to provide a wider context on accessibility and inclusion in India.

BASIIC Programme activities supported through the case study

The case study research was conducted in parallel with activities under NIUA's BASIIC (Building Accessible, Safe and Inclusive Indian Cities) programme, including a city audit on Varanasi, consultation on the national accessibility standards with IIT Roorkee[126] and technical assistance unit that is providing support to the city. Our collaborative approach with the NIUA team ensured the sharing of resources and



Map of selected sites for the City Audit Study led by NIUA

information in a way that benefitted both UK Aid funded programmes and will support both national and global learning from the case study.

The '**City Audit and Assessment Study'** undertaken as part of the BASIIC Programme[127] aimed to measure city's efforts towards disability inclusion. An audit framework was designed to qualitatively assess urban infrastructure and services and measures compliance with national accessibility standards such as the Harmonised Guidelines. The framework assesses diverse urban characteristics -

[126] NIUA, IIT Roorkee, and Ministry of Housing and Urban Affairs, Government of India, 'Public Consultation on Guidelines & Standards for Universal Accessibility in India: Key Findings'.
[127] National Institute of Urban Affairs, 'NIUA: BASIIC Programme', Programme Website, 2021, https://www.niua.org/projectdetails.

physical, social, economic, administrative and governance aspects - and was piloted at two selected sites in Varanasi:

- Site 1 - Godowlia Chowk to Dashashwamedh Ghat
- Site 2 - Area along Maidagin Crossing

To accompany the physical audit, a city-wide survey took place to understand the inclusive policy and project level efforts of city stakeholders. The exercise supported measuring the compliance and adoption of disability-inclusive policies, guidelines and development norms, inclusive design, and planning principles to promote 'Disability-Inclusive and Accessible Urban Development' for Varanasi.

Collaborative participation of stakeholders supported mapping a holistic picture of the state of accessibility, safety and inclusivity in the built environment in Varanasi. The survey findings will shed light on the status of existing funding mechanisms, investment patterns, and procurement policies that enable disability inclusion across urban development in the city. The findings will also assist in mapping the existing city infrastructure and services from the perspective of disability inclusion, while reflecting on the social, economic, and spatial characteristics of the urban environment as well as identifying the key barriers and challenges associated with Persons with Disabilities. The outcomes of the Audit and Assessment study will be used to develop a framework to improve the existing infrastructure/services from the perspective of accessibility, inclusivity, and safety.

The 'Audit and Assessment' study aims to augment the city's ability to implement inclusive policies and create provisions at city level for marginalised groups including persons with disabilities. The study will aggregate local best practices from Varanasi and be replicated in other Indian cities, developing a toolkit that can be scaled.

NIUA team undertaking the city audit

The findings of the study will be published shortly and be available through the BASIIC programme website[128].

[128] National Institute of Urban Affairs, 'NIUA: BASIIC Programme', Programme Website, 2021, https://www.niua.org/projectdetails.

Who has a stake in inclusive design and an accessible built environment in Varanasi, India?

To identify who has a stake in a more inclusive and accessible built environment, the team conducted a virtual mapping session with the Varanasi City Government to identify key stakeholders. The initial insights were synthesised with the findings from the primary data collection to build a picture of all the key stakeholders, including those who benefit most from a more inclusive environment, and those that shape it, resulting in the diagram below.

Insights

Thematic analysis was used to explore the research data which identifies key themes across the three different stakeholder groups; policy, practice and people. In depth insights from the research are described through these themes and relay the different stakeholder perspectives throughout. The themes are:

- Day to day life for persons with disabilities in Varanasi
- Accessing and experiencing the city
- Accessing and experiencing heritage and culture
- Disabling or enabling environments
- Social context, stigma and awareness
- Inclusive living environments
- Inclusive urban life
- Assistive technologies, mobility and opportunities
- Planning, collaboration and coordination of inclusive environments
- Accessibility and implementation challenges
- Inclusive design knowledge and practice
- Barriers to and capacity for implementation
- Maintaining and sustaining the city over time
- Participation and co-creation of inclusive cities

Day to day life for persons with disabilities in Varanasi

Persons with disabilities experience many barriers in day-to-day life in Varanasi. The inaccessibility of the built environment was a barrier to opportunities for many of our participants, including access to education and employment. Most participants lived with their families and many were reliant on family members for support, spaces to socialise with family and neighbours was important, particularly for participants who have restricted mobility. Participants were restricted in their mobility due to poor transport infrastructure including a lack of accessible public transport and poor road conditions that limited smaller and individual transport options such as a three-wheeled scooters or auto-taxis.

Many participants spend a lot of time at home. Outdoor spaces where they can study or interact with neighbours are important.

“These days I don't do many activities, I sit with family members, neighbours, talk with them. Talk with my friends over the phone and roam around in the village.”

Day to day routines for most participants centred around work and errands such as going to the market or cooking. Some participants were able to go about their daily routines independently, but others required support. The state of infrastructure has a great impact on day-to-day accessibility and the independence of persons with disabilities:

“There are open drains on every footpath, if it was covered it might be easy for us to walk as we can't jump over those open sewage is like everyone else. Due to these drains in front of shops we won't be able to get inside the shop so we have to request the shopkeeper to come and deliver to us outside the shop.”

For some participants, gaining access to assistive technology helped address this barrier and it was a source of pride to be able to conduct day to day activities independently without needing support from others. However, it is clear that the balance between accessible and inclusive infrastructure and independence and access to opportunities is complex and varied as the following themes will illustrate.

Co-design workshop in Varanasi. Journey mapping exercise.

Accessing and experiencing the city

Creating inclusive environments in cities with great heritage and cultural significance is complex, but it is fundamental that persons with disabilities living in Varanasi can equally access and experience the city. The city is renowned for being a place of sensory overload, with loud noises associated with traffic and sacred rituals, smells from cooking and heat from the dense, crowded streets. This type of sensory

experience can be overwhelming for many, and participants frequently raised the issues of noise and congestion. However, it is equally a part of experiencing this unique city, something everyone has a right to.

"The city should not be as noisy as it is. If we look for perspective over visually impaired person this sound is a very important part. I have seen many cities and Varanasi is one of the noisiest cities"

The river is a focal point in Varanasi, part of sacred ritual and pilgrimage, and also used for recreation, fishing and transport. Boating is a popular pastime in Varanasi that is not accessible to all and many disabled participants felt excluded from being able to participate in life on the river: "no visit to Varanasi is complete without reaching the river".

"People didn't design these places from an accessibility point of view, which restricts our movement in the city."

In addition to the river, the topography and climate of Varanasi create particular conditions that make accessibility challenging. The main part of the city is on a steep slope leading down to the river, which has ultimately resulted in the creation of the stepped Ghats the city is famous for. The city experiences seasonal monsoons and the heavy rains create challenges for all its residents. The infrastructure is not well built to withstand the rains and waterlogging is a common problem. The city's historical water infrastructure is no longer used and current water drainage solutions are not fit for purpose. Both the open drains and poor road conditions cause more issues when the weather is bad.

The right to access the river is important for citizens of Varanasi.

In photo diaries, participants talked about the inaccessibility of the riverfront and the Ghats, which are a central part of life in Varanasi.

Surrounding the core city, many people live in villages that rely on the city for essential services. However, access between the city and these villages is poor, limiting the opportunities of people living in the villages. People living in the outskirts of the city or in informal settlements are often left out of planning discussions. It is essential that these populations are engaged in planning processes to ensure commonly excluded communities, including persons with disabilities, are not left behind.

"From village to city, uneven roads, heavy traffic, all these things make it difficult to ride safely. That's why I mostly stay inside the village."

Accessing and experiencing heritage and culture

A fundamental part of life in Varanasi is its culture and heritage. Varanasi is a site of pilgrimage and cultural significance for visitors from near and far but for many residents of the city, much of that experience is inaccessible. For some of our participants, temples in their communities offered a place of reflection and relaxation.

“There is a temple inside the village, I spend time there. Whenever I feel sad I go there, spend some time there as it's very peaceful. That place is accessible for me I can go easily inside the premises on my tricycle.”

However, most of our disabled participants were not able to visit the more famous temples and Ghats in the city as they were not accessible. In particular, the large amount of steps to reach the riverfront was a major barrier, and the crowds both at the Ghats and temples created additional barriers. Improving the accessibility of some of these sites would support creating a more equitable city for all and would also support older residents and tourists.

“I have to make some compromises, like I can't get down on the Ghats I just enjoy the view from the road.”

Creating more accessible heritage sites is a government priority, and there is funding and planned design interventions to make some of the Ghats accessible, however these plans have not been realised yet. On January 1st 2020, the Uttar Pradesh government, released budget for works to begin on Assi, Manikarna and Dashashwamedh Ghats, which are the most visited ghats (due to religious and ancient traditions) in Varanasi.[129] The redevelopment work will integrate universal design elements including; ramps, handrails, accessible toilets, braille signage and accessible drinking water facilities.

The interventions also aim to improve the connectivity to the ghats areas by creating scope for levelling roads, pedestrian infrastructure, separate lane for persons with disabilities and dedicated parking zone to reduce the congestion caused by the haphazard traffic conditions. The project will be executed in support from the Accessible India Campaign of Government of India.

The implementation of technological/powered solutions (i.e. external passenger lifts) are not considered to be feasible due to changing water levels and heavy rains and the issue of maintenance and long term sustainability.

“Getting the places worth visiting which you as a citizen would want to visit, want to see for yourself, those places need to be made accessible.”

[129] https://economictimes.indiatimes.com/news/politics-and-nation/in-a-new-years-gift-to-pms-constituency-three-varanasi-ghats-to-be-made-wheelchair-accessible/articleshow/73094003.cms

Some of these temples and Ghats currently provide separate VIP access that allows people to avoid crowds. However, this access is usually not available for persons with disabilities. It is clear therefore that more accessible experiences can be created. It is a question of planning, allocating appropriate resources, such as a budget or trained staff, to ensure persons with disabilities are supported on their visits to these sites.

Crowds and inaccessible entrances are two of the main barriers to accessing heritage sites.

Disabling or enabling environments

In most cases, the experience of participants was that the physical environment is more disabling than enabling. The Varanasi City administration considers accessibility a high priority but improvement is either recent, still in progress or, in most cases, yet to be realised.

Existing building stock must be made accessible.

City stakeholders have started to realise the value of creating an inclusive and enabling environment and are developing exemplar interventions such as the improvement of the Ghats and a new inclusive sports stadium. These high-profile projects are to be complemented by provisions for universal/ barrier free design elements across the city.

Replicating these flagship initiatives across the city will be important for Persons with Disabilities. At present, many of the exemplar interventions will still not be able to be reached by persons with disabilities due to mobility issues across the city. However, if these high-profile initiatives are shown to be successful, then they could become the catalysts for positive change across the urban environment. Applying an end-to-end journey, or holistic approach, to inclusive design can ensure that all citizens can experience the city equally.

It will be fundamental to ensure future initiatives integrate those who are most excluded such as persons with disabilities living below the poverty line, or those who live in the urban-rural fringes where access to services is further restricted.

“In some buildings things are there on paper but not on the ground”.

Stakeholders suggested that buildings are not built to meet accessibility standards and that the implementation or construction is not consistent. There is also a focus on applying accessibility standards to new buildings and infrastructure, such as the new inclusive sports stadium, with less attention given to existing building stock: “they are focusing on new buildings but there are so many homes, buildings here with no lift so people with disabilities can’t rent a room there”. In the old city of Varanasi, there is a necessary compromise between preserving heritage, feasibility and resources, and improving accessibility. Focusing on the creation of inclusive experiences and not just physical building amendments can help ensure that everybody can have an equally positive experience despite inherent, physical accessibility barriers. Improve services at heritage sites where physical accessibility is challenging can support a more inclusive experience. Where physical access cannot be provided, alternative information and services should be offered.

The ramp to this bank is being used by a homeless person. Inclusive interventions must include homeless people and the urban poor.

The Uttar Pradesh Budget 2021-22 has allocated INR 100 crores[130] (for the development of tourism facilities and beautification projects in Varanasi[131]. Under the Pilgrimage Rejuvenation and Spiritual Augmentation Drive (PRASAD), INR 8.96 crore had been sanctioned for the pedestrianisation of a street between Godolia and Dashahwamedh Ghat. The project is near completion and will provide barrier free infrastructure including kerb ramps, space for wheelchair movement, street furniture and multi-level parking facilities to reduce the traffic congestion and ill-maintained parking issues.

"We live in a city where there are no rules, in the middle of the road you may find a barrier, you may find it anywhere."

People describe Varanasi as a dense and congested city. Physical barriers such as frequent 'breakers' (speed bumps) to slow people down are obstacles for persons with disabilities in the urban environment. Here tensions emerge between conflicting priorities. For safety reasons there is a need to manage traffic flow. However, access for persons with disabilities is equally important. This issue is exacerbated as many roads in Varanasi (and indeed across India) do not have pavements. Roads are often too narrow for them, and there has been strong public opposition to the implementation of pavements. Many shopkeepers say pavements would be disruptive for trade as currently people directly access shopfronts to collect goods in their vehicles.

Trade favours motorised transport.

Current infrastructure favours vehicles over pedestrians, and the urban environment can be dangerous for all pedestrians due to a lack of traffic management systems in the city. For assistive technology (AT) users, crossing traffic safely or having space to move are significant constraints to their mobility. Informal occupation of space and a lack of planning in the built environment has a significant role here and these issues are more prevalent in the older and denser parts of the city. Those areas are also more popular with tourists and pilgrims, adding to congestion and demand on

[130] 1 crore is equivalent to 10 million INR

[131] https://timesofindia.indiatimes.com/city/varanasi/infra-tourism-medical-educationget-big-push-in-kashi-east-up-dists/articleshow/81158986.cms

infrastructure. Many participants and stakeholders expressed a desire for separate pathways for persons with disabilities to be able to escape the congestion and safely move through the city. There is a need to upgrade basic and essential infrastructures in the city to support all citizens. It is also clear that public participation is important to negotiate conflicts and identify compromises in order to create a more inclusive urban environment.

“In public places, I can't go inside, just stay outside, but people usually help. During rainy season it gets worse.”

Most public buildings in Varanasi are not accessible. Schools, universities, workplaces, banks and ATMs, government buildings and markets were all described by our participants as being inaccessible. Accessibility was most frequently discussed in basic terms such as the provision of; ramps, lifts, tactile paving, handrails etc. It is also clear there are quality issues in terms of applying the correct specifications, ensuring quality execution and the ongoing maintenance of accessibility features. Where buildings do have provisions like ramps, they are often blocked by parked scooters and other obstacles. Participants also highlighted the need to better consider things like material selection to make sure surfaces don’t become slippery in use and when wet. Many participants mentioned having issues with slippery surfaces and the importance of better awareness about these design features.

Entrances to banks are often inaccessible. Construction work, poor road infrastructure or parked scooters are common obstacles.

An example of tactile paving in Varanasi.

National policy, as mandated in the Accessible India campaign, states that all government buildings and services should be accessible. However, there was mixed feedback on whether that was the case in Varanasi and different interpretations of accessibility is a challenge throughout India. For example, some of our participants said the Disability Empowerment office was accessible, while some said that it wasn't. In this specific example, while the Disability Empowerment office was on the ground floor, offering level access, if a visitor needed to access any other services on the upper levels, then no level access or alternative service was available.

Speaking to stakeholders, access improvements to government buildings in Varanasi are recent, and so may not be known to all participants. However, physical inaccessibility of the built environment is still a significant barrier to inclusion for persons with disabilities. The inaccessibility of banks and government buildings and the lack of alternative accessible services, mean many persons with disabilities are unable to access essential services which impacts greatly on their quality

Due to inaccessibility, one participant said they needed support to access the bank.

of life, independence and financial inclusion. For example, there are government services to provide free drinking water to homes, through the ongoing AMRUT scheme in Varanasi which aims to provide all households with water supply and sewerage connection. These services can be difficult for persons with disabilities to access, one participant explained how he did not meet the criteria to access this service despite being disabled. Other participants explained that water and sanitation facilities that have been designed to be accessible do not always meet the accessibility standards.

"In city where I live at present is just a one room with attached bathroom, it's not accessible but I adjusted comfortably. In village my home wasn't accessible but now I rebuilt it as per my needs it's completely accessible for me now."

Participants shared that persons with disabilities can be resilient and can be resourceful in necessary situations. However, this does not diminish governments' responsibilities to create inclusive environments for persons with disabilities. Stakeholders were aware of the need to adapt and make compromises, but also expressed that a lack of resources should not be seen as justification for not creating inclusive environments: "If they can't afford a lift they should think of an alternative, they shouldn't give up".

"I can do things on my own, I can go anywhere I want if something urgent comes up but these public places are not accessible, we can manage but things need to change."

An inclusive society and progress towards a more inclusive city requires an enabling policy environment. At the national level, policies, standards and campaigns are quite comprehensive, but their implementation and translation to local context could be improved.

An example of a communal waterpoint in the city.

Varanasi city has a unique context. Accessibility standards and the translation of policy to a masterplan should adapt to that context which requires local knowledge as well as inclusive design expertise. A lack of data and resources were both cited as barriers to an enabling environment as local officials lack specific data about disability in their communities. The Disability Empowerment office is very active in Varanasi, but they also have limited staff so there is limited resource to access harder to reach communities. They would be able to do their work more effectively if there were better cooperation mechanisms across government sectors and more robust engagement of local communities, including persons with disabilities.

Social context, stigma and awareness

The social environment can also be enabling or disabling. Social context and social connections were important for participants. Where people experienced stigma, it caused a negative experience of that place or service. The amount of stigma experienced varied among participants: “There is always two kinds of people those

who support us and those who don't". In some cases, participants had been able to change perspectives in their community by showing what they are able to do independently. Participants were proud to be independent and challenge stigmas: "So it all feels very good whenever in the office or with family someone asks me do anything, I feel proud that they think I am able to do it. They don't think of me as a disabled person". Inaccessibility of the built environment limited people's social connections: "I mostly stay at home in my free time. I can't visit my friends or relatives house even if I wanted to as bathroom and other facilities won't be accessible for me."

"Everyone knows me, likes me, here they never show any kind of discrimination towards me, I get to equal participate in all activities like everyone else."

In some cases, participants talked about Varanasi being a very supportive environment where people are eager to help others: "they are very much aware, if they see someone needs help people usually rush there and help". This seems to be connected to Varanasi's status as a pilgrimage site, where helping others forms part of this experience. This type of support and acceptance, while important and valuable, is more representative of a charitable model of disability and does not represent a solution for creating inclusive environments that support greater independence of persons with disabilities.

"Everyone is busy in their own lives, they don't think about others."

Stakeholders also discussed the importance of awareness at different levels depending on responsibilities, such as policy makers have a greater responsibility to be aware as they make key policy decisions. Stakeholders involved in implementation such as designers and planners also need awareness and technical skills to be able to deliver good inclusive design. These are two examples of the need for effective inclusive design capacity.

Inclusive living environments

Living environments were generally not accessible for participants. In many cases, participants had adapted to their home and felt able to manage but did not have access to what they would describe as inclusive accommodation.

Some participants felt the living environment was the most important place to improve accessibility whereas others felt public places were more important as in their homes they could learn to adapt whereas unknown places were more challenging.

"It has a flat surface so it's easy for me to stay here and do my work. I have proper light here and I can also stay in touch with other people so I don't feel alone"

Some participants also lived close to work and where they can access services: "I live here because I work here, it's close to the city, all facilities are available here. You can say that's why I like it, that's why I am here, there's nothing special apart from this." Others were less happy with aspects indirectly affecting their living environments: "there's a lot of smoking and gambling culture in my area, even children are getting addicted to it at a very early age."

"I'd like to visit gardens, parks, but there are no such parks in my locality where I can go."

Many participants spend a lot of time at home with some working or studying from home due to the inaccessibility of their workplace or school, lack of accessible transport options or both. Some had specifically chosen a profession that meant they were able to work from home because of the known accessibility challenges.

Stairs and steps were one of the main issues raised as was access to sanitation, with bathrooms being external or on other levels making them harder to reach. Many participants had found accessible spaces near their homes where they could

interact with people, with one participant even building a bench where they could comfortably sit and interact with neighbours to reduce their isolation.

“I prefer village more than cities. Here in city, life is very fast and busy. In village, people used to spend time together coming we care about each other.”

Some participants lived in more rural settings, in villages on the outskirts of Varanasi. Some aspects of this living environment were more accessible due to being less densely populated and in some cases, villages offering better access to education for persons with disabilities. In other cases, accessing services such as disability pensions was more difficult as they still needed to reach the centre of Varanasi to access these services. Some people found attitudes to disability to be better in rural areas but others thought urban settings were more inclusive.

“We made a bench with bricks where I can sit comfortably with my callipers on.”

For some participants, outdoor spaces, and hybrid spaces, were important for being able to socialise.

“Since I stay in the house mostly these days, I spend time in the courtyard. Here I can sit and talk with other people.”

Inclusive urban life

“People here are always very cooperative towards people with disabilities. In comparison to my village, people here in Varanasi who have more busy lives never ignore us, they always help us.”

Participants’ day to day experiences often centred around employment or education but other aspects of urban life are also valued. Access to public spaces and green spaces, recreation and wellbeing or spirituality were important parts of people’s lives. Many of the places people would like to visit were not accessible to them. As

participants were often restricted in their mobility, spaces around their home such as courtyards and rooftops that could provide social interaction were important.

“In my lifetime only twice I went out for a picnic, first in 2007 I went to Sarnath coming so as you expect when you go on a picnic you can roam around and have fun but when you have to depend on others it's not fun.”

“I like nature so much. I like mountains, rivers, garden, forest, whenever I get free time I go to such places with my family. Challenges are everywhere but with the support of family we can overcome any challenges.”

A built environment that supports good health and wellbeing is also important. Air and noise pollution are problematic in Varanasi so it is important people can access green spaces and spaces for relaxation. One participant talked about gaining weight after becoming more stationary due to having a desk job, and that this means he can’t move as freely as he used to. The inaccessibility of the built environment could also be a contributing factor, as it limits mobility and therefore the ability to exercise: “I never went on the Ghats, stairs make it very difficult for us there and now due to my desk job and all I don't have as much stamina as I used to in college days. I gained weight although now I'm working on it as I don't want to be dependent on anyone for anything”.

“I liked relaxed atmospheres. There's a temple in my village I go and sit there in my free time.”

Recreational spaces must be accessible, such as shopping malls.

Access to green spaces is important. One participant valued the ability to visit their aunt’s house outside the city.

Assistive Technologies, Mobility, and Opportunities

Many of our disabled participants use a three-wheeled scooter to move around in their day to day lives. However, most of these are not motorised, which limits their mobility. All the three-wheeler users said if they could have a motorised or battery-operated one it would improve their lives as with poor road conditions and steep terrain or ramps, they often need someone's help to push them. A motorised three-wheeler would also expand their access to opportunities as currently they can't travel long distances. One participant explained that the motorised ones are only given to people with more severe disabilities, and that people require to score '80% disability' in the government's assessment system in order to be given a motorised three-wheeler. However, in many cases those scooters are given to people who are unable to use them and so they can often end up being sold for parts or used by their family members instead. People expressed a desire for a fairer distribution system that accounted for need and not just severity of disability.

An example of a three-wheeled scooter used by participants.

For some people, accessing assistive technology was also difficult because the government distribution camps were in inaccessible areas or the application process through government services was also inaccessible. Most of our disabled participants used one or more type of assistive technology, with some provided by the government, some purchased privately and some provided by NGOs.

Accessing government provided assistive technology and other services could be difficult. One participant waited 7 years to receive a tricycle and another had applied for the previous 5 years for a UDID card (unique government identification card for persons with disabilities to access various public services) and still not received it, having helped 15 people to apply for and receive theirs in that time. Assistive technology enabled many participants to have greater access to the built

environment but they did experience some stigma associated with AT use, in particular when using public transport and entering banks. Some participants also explained that using crutches, callipers or a white cane could make wild animals, such as the many cows that are ubiquitous around India, become aggressive, creating another barrier and danger in the urban environment.

Wild dogs on the street in Varanasi.

A dense and congested city like Varanasi relies heavily on individual or small scale transportation options. Most participants found buses to be inaccessible and preferred to use cars, 'auto-taxis' or their own assistive technologies for transport. However, with all transportation methods people experienced stigma or a lack of awareness that made the experience of using public transport options more challenging. Varanasi railway station is one area where improvements have been

Varanasi Train Station.

Image credit: The Washington Post

made, but participants still mentioned issues. A lift, escalator and tactile paving has been installed but it is still difficult to gain access onto the trains and the overcrowding in the station is still a problem.

“Buses are inaccessible, many times we don't get seats either. There are reserved seats inside the bus but people occupy those seats too, nobody supports us there.”

Mobility barriers, the inability to get around the city, was the most commonly discussed challenge among all stakeholders and often identified as the greatest priority. To create more inclusive mobility in Varanasi requires improving public transport infrastructure and services (including training staff), improving road infrastructure and proving better access to appropriate assistive technologies.

Poor road conditions and a lack of pedestrian infrastructure.

The current mobility barriers were often cited as the leading cause of people not being able to access opportunities such as education and employment. This has a profound impact on people’s livelihoods as some participants reflected that by not being able to access education, they were then less able to access employment opportunities in the future which in turn impacts their financial independence.

Being able to learn and find work was a high priority for participants. Education and workplace accessibility were also frequently named as key challenges. Many participants attended schools that were not accessible or inclusive. Some managed to adapt and find ways to study. However, many had no choice but to drop out: “School was very far away from my home, there was no proper way for me to go there and no one is there to help me as my father was busy in his work and my brothers were too young so in lack of support and proper resources I dropped out of school”. If teachers were supportive it helped to overcome some of the barriers they experienced. Some participants also explained that many of the schools have improved since the time they were studying, implementing some accessibility features, but they did not provide details.

“School life was a very good experience for me. I am proud of myself that I dared to go outside the house to study. But my school was totally inaccessible, I had to park my tricycle outside the school and go inside crawling to my classes which were on the top floor, everything else like drinking water, the washroom, is on the ground floor so I had to climb up and down the stairs many times in a day.”

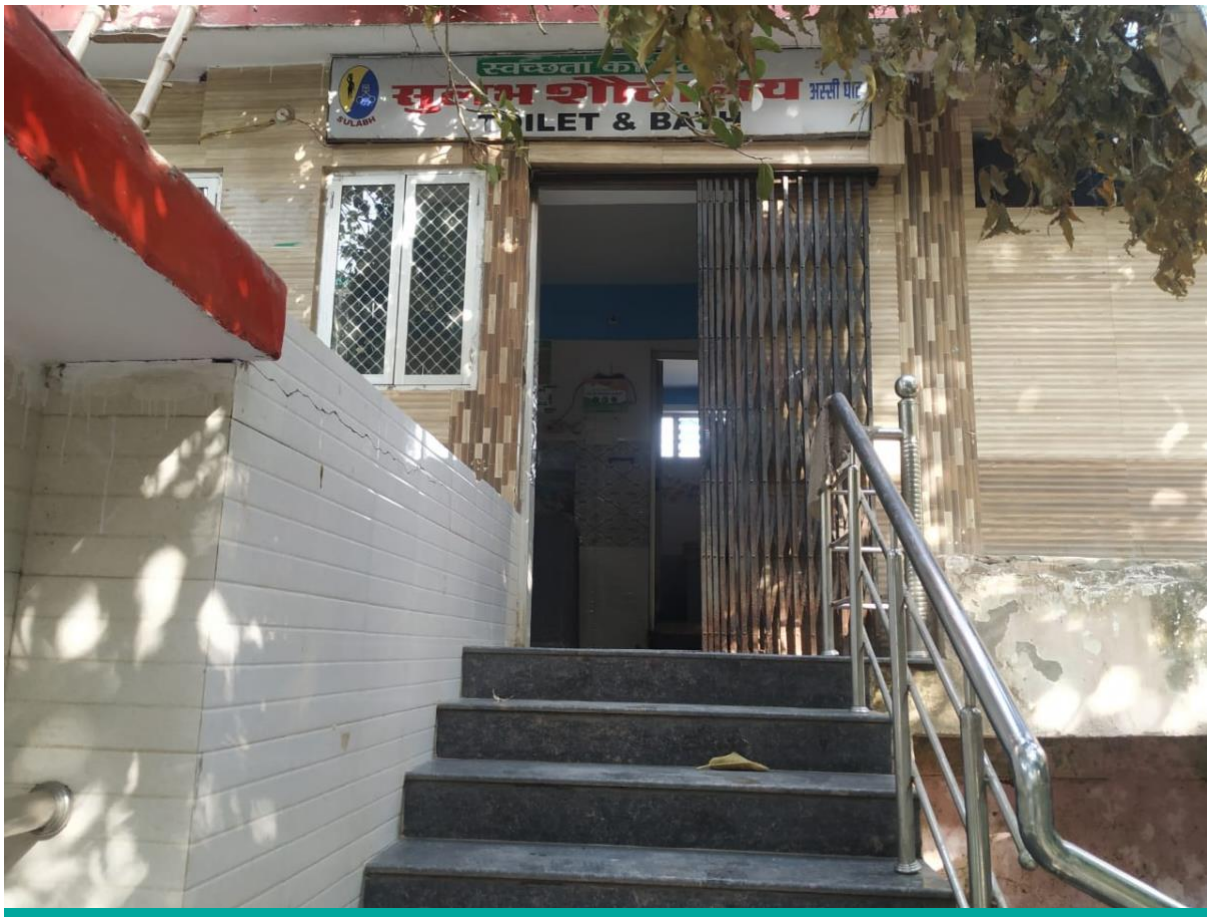
Accessing higher education or skills training was also important for many participants, but again, largely inaccessible: “Government’s skill development schemes are not easily available here for persons with disabilities compared to other cities”. Many participants had compromised with their employment due to the limited options that were available to them. One participant had to quit his job because they refused to make the workplace (a shop) accessible.

Planning, collaboration and coordination of inclusive environments

Government and practice stakeholders discussed the challenges of implementing inclusive design in urban environments due to the challenges of planning and coordination between different government departments.

Varanasi Municipal Corporation and the Varanasi Development Authority are responsible for large parts of the city’s infrastructure but they also need to collaborate with other departments concerned with infrastructure. Additionally, the local Disability Empowerment Office is not very engaged with built environment programmes, focusing more on awareness and education. However, their cooperation will be an important component of ensuring city development plans consider and include persons with disabilities as they can facilitate accountability.

In our workshop sessions, government stakeholders shared how the city has been making great efforts to improve access to essential infrastructure such as waterpoints and washrooms throughout the city. However, in many cases these infrastructures are still not designed to be accessible, leaving persons with disabilities excluded.



An example of an inaccessible public washroom in Varanasi. These public washrooms are an essential service for people who don't have access to running water in their home.

Physical space for accessibility is a major challenge in Varanasi. The narrow streets and dense urban environment is already congested, so urban planning has a crucial role to play in developing solutions that can create the space needed for more inclusive environments. These developments also have to consider the preservation of the city's heritage and require close collaboration with heritage experts.

Streets and alleyways can be narrow and filled with obstacles.

Accessibility and intersecting challenges

“We're just trying to educate and enlighten the administrators and public and political representatives of what is the importance of the basic infrastructure as we haven't even achieved the basic level in terms of infrastructure so these inclusive infrastructures are far away now. And funding agencies also have a big role to play in this some are aware and some are not.”

The right to access the river is important for citizens of Varanasi.

The challenge of implementing good inclusive design in Varanasi intersects with other key challenges such as heritage conservation and urgent infrastructure needs such as water and roads. These intersecting challenges can create conflicts: “we should not mix these two things, people should understand that improving the urban local scenario is not reducing the historic city, there are always heritage experts who take care of these things in the planning so the public should trust these experts and that it's possible to improve accessibility here”. Collaboration with heritage experts and the support of tourism and conservation stakeholders will be crucial to shaping a more inclusive city in Varanasi.

According to stakeholders, there has also been public opposition to initiatives that could improve accessibility and mobility in the city: “for example there was this project where we had to improve the road networks, we introduced walkways ramps and all features, but when these projects came into implementation there were many objections by local people, local stakeholders. They claimed it will reduce the road width.” Trade often takes place between shopfronts and vehicles so there has been strong opposition to improving pedestrian infrastructure and where pavements have been built it is often poorly constructed and then occupied by street vendors. This raises additional challenges because senior officials then consider that the general

public is opposed to improving accessibility when it is necessary to conduct more participatory consultation with a more diverse group of citizens to determine that.

For persons with disabilities, the exclusion they experience in the built environment is connected to their ability to access opportunities and therefore live independently: “The problems I am facing because of poverty are what I dislike most.” These challenges intersect and have been shown to reinforce cycles of poverty. Government stakeholders are aware of the gap but should be proactive in making sure people with disabilities who are also living in poverty have access to services and opportunities.

“Government services are accessible for me because I am educated and working in this field. But there are so many people with disabilities who just stay inside the house, they are unable to avail any benefit from government services.”

Creating successful inclusive infrastructure requires dealing with complexity and thinking about systems. Rarely does an individual intervention function completely independently of other infrastructures or not need a wider network of initiatives to support it. For example, in Varanasi they are developing accessible public washrooms which include things like ramps and handrails. However, they have not accounted for the way in which people need to enter the washroom: “there are these public toilets built in each and every part of the city that have these ramps but how are we going to approach that ramp if they do not have walkways, the spaces where these toilets are built are not that accessible, there are open drains which are all moving along. Even if you have a small stream of water running someone might be able to jump over that and go towards the toilet but if you need to use a ramp or you have limited mobility you do not know whether the road approaching to that ramp to access the toilet is accessible or not.”

Inclusive design knowledge and practice

At a national level, India has good accessibility standards and policies to support more inclusive environments, but the ‘ground reality’ is less positive and there are implementation challenges widely reported. There is good political support to create more inclusive environments and an appreciation and understanding of inclusive or universal design. However, there is a need to contextualise knowledge and adapt

standards to work with local conditions: “our cultural scenario is different from others so here universal design needs to adopt in a different way not the same in other countries.”

“They go after funding and when they get funds built things to existing standards, they don’t even have a rightful understanding, they might be following what’s right for Ahmedabad [not Varanasi] where conditions are completely different to here.”

Government stakeholders had a good appreciation of the need to adapt standards and create local solutions that work: “you have to develop your own standards as per the requirements of that particular site or context first up that is the part where as a planner we lacking.” However, there is a need for greater technical capacity to deliver that work and ensure best practice from other regions is adapted and not copy and pasted. The Indian government is supportive of national programmes to create more accessible, safe and inclusive cities. However, city governments should also consider long term sustainability and the need to develop local capacity/expertise to evolve and sustain change over time. Varanasi will not become a more inclusive city overnight. It requires sustained support. The foundations are there, as the Municipality have an understanding of the importance of creating equal experiences for people, beyond accessibility. The next step is to educate and spread awareness among other government stakeholders and practitioners. Developing local capacity to conduct accessibility audits of existing buildings will also support progress – building on the work begun through the Accessible India campaign and the BASIIC programme.

“We have to design every environment as a barrier free environment, these are the basic responsibility. Because of the lack of awareness about these issues in government and non-government sectors there are constraints in implementing this. However, it is mandatory from the government.”

Policy stakeholders suggested there is a conceptual challenge associated with improving accessibility. They proposed that it should be considered as essential and fundamental as discussing cement or concrete in the construction process, but that it is not there yet. When accessibility and inclusive design does become a fundamental consideration of the construction process then we should begin to see sustained transformation. This evolution of local inclusive design practice will happen gradually. It is important to recognise that inclusive design and accessibility are continually

evolving concepts, and so the engagement and participation of communities to capture the lived experiences of persons with disabilities is fundamental.

"Current laws and policies are effective but there should be some refinement from time to time because there are many types of disability out there. Sometimes we don't find certain things, therefore a timely update is required."

Barriers to and capacity for implementation

"We have laws, we have policies but they don't have teeth to get implemented. What I am trying to say is that nobody is there to make sure it's really done or even to demand it."

As mentioned in the previous section, barriers to implementation of inclusive design are significant. Awareness of the issues and knowledge and capacity to deliver solutions are fundamental to ensuring good implementation of inclusive design and infrastructure. Expert stakeholders suggested having guidelines that bridge current technical standards and rights-based laws, which would support decision-makers in guiding implementation. National guidelines and a National Building Code already exist but more contextualised guidelines would be useful.

"public awareness is one thing but the awareness of the policymaker is very important… there should be guidelines for government and decision makers as they make final decisions on things. we should develop a guideline or protocol which would be adhered to by the policymakers government bodies."

Developing or improving accountability mechanisms will help improve implementation. Accountability can be used as an enabler, building approval processes should include mandatory accessibility criteria. These processes are improving, the Municipality has introduced more rigorous controls on building construction through a completion certification process that tests if the building was built according to the plan that was sanctioned. Until now, building plans could be amended with minimal control over whether sanctioned plans were what was executed. City government stakeholders should take responsibility for ensuring compliance: "but the onus lies with us [the Municipality] to work within that framework to ensure compliance as much as possible".

Responsibility for effective implementation is shared across different stakeholders: “The consultant should be good enough that the drawings are in a very good shape, so the construction team knows that this part has to be executed in this manner. […] The government agency that is responsible for the implementation needs to make sure that it gets implemented in the same manner”. Accountability mechanisms or implementation guidelines should set out how this responsibility is shared to avoid situations where blame is passed between stakeholders: “While planning we think of all these issues [accessibility etc] but how much gets implemented is another thing”. Government stakeholders also have a responsibility to consider implementation of specific projects within a wider vision or city plan to ensure a holistic approach to inclusion. For example, applying best inclusive design practice to new buildings is only effective if the surrounding infrastructure has been audited and retrofitted appropriately to also be accessible.

Maintaining and sustaining the city over time

Inclusive design is a practice that evolves over time. The same is true of the built environment, a city is not a static physical environment, it is constantly changing and growing. Inclusive design strategies must account for this. In the case of Varanasi, there are several temporal factors to consider.

Firstly, the city changes throughout the year. Seasonal weather variations have a great impact on accessibility and mobility and the city experiences a fluctuating population based on pilgrim, tourist and migrant movement.

“During school days I had to stay at home for 2 to 2 1/2 months and after that when I go back to school I have to complete all my syllabus just because the roads are not accessible during rainy season.”

Secondly, maintenance and sustainability are key factors for a successful inclusive design city strategy. Participants described how there is a lack of care for public infrastructure that people perceive as not for them. It is critical to build awareness on how inclusive infrastructure can support everyone throughout our lives to ensure a public accountability for preserving inclusive environments.

An example of an accessible toilet that has not been well maintained.

Maintenance is an issue for preserving infrastructure and inclusive design solutions are no exception: “whether there is lift or not, a ramp should always be there in case the lift doesn’t work”. Inclusive design experts also shared how important it is to consider the longer term sustainability and resource requirements of interventions and how adapting solutions to low-resource settings will ensure longer term resilience of inclusive infrastructure.

Technological fixes may not work in places with an unreliable electricity supply or where the ground may flood. Another important aspect of sustainability is considering where retrofitting may be more appropriate than new construction: “one thing I notice here is that they are frequently making new buildings inside the campus, so much raw material comes here daily, but they never use that to fix the existing problems, they just keep creating new infrastructure.”

This photograph of tactile paving in Delhi illustrates the importance of good maintenance of inclusive environments.

Thirdly, the city is famous as a site of festivals and celebrations, bringing many visitors and pilgrims to the city each year to celebrate festivals such as Diwali. When these festivals take place, the city temporarily transforms to bring to life these celebrations. Can a city-wide inclusive design strategy account for these milestone events in the city's yearly calendar and support all residents and visitors to have an inclusive experience of these celebrations?

Festivals and celebrations on the Ganges river are a part of life in Varanasi. The changing water levels at the river are also visible here.

Lastly, the city will continue to evolve and change. Demographic changes such as ageing or urbanising populations will require a responsive inclusive design strategy that continues to actively include people over time. The impact of COVID-19 will leave a mark on the history of both the city and country, and people will require support for an inclusive recovery and opportunity to build back fairer.

Participation and co-creation of inclusive cities

"This is an important point decision makers think about, they have to consult them, they cannot design for person without consulting them so stop this is the main reason why Accessibility features here are only limited to ramps and railings, Accessibility is not limited to these things, it is much more than that."

Current public consultation on city development is limited. Current open public consultations typically undertaken on city plans are not sufficient to allow the co-creation of more inclusive and accessible cities. These consultations do not actively engage persons with disabilities whose participation is fundamental to ensure the city creates inclusive environments.

City stakeholders had some awareness of the importance of participation, but implementation still needs to take place at ground level. Developing tools to capture

people's lived experiences will help integrate the voices of persons with disabilities in city design and decision-making.

Summary of insights

The most common themes discussed by people with disabilities during interviews were:

- Transport: including private and public transport and the quality of transport infrastructure such as roads and pavements
- Education: accessing inclusive and accessible education, including inclusive physical learning environments and staff's disability awareness and understanding from primary through to higher education and training opportunities
- Accessing opportunities and financial independence: most participants experienced barriers related to employment and as a result, were less financially independent. There is a strong link back to education here.
- Participants had limited use of technology, some people were using computers and smartphones but not all, therefore digital solutions are not creating access for all
- The quality of assistive technology and infrastructure matters
- People need to be able to easily access services and information
- Accessing the city's heritage and culture was very important to residents of Varanasi
- Awareness and stigma: negative attitudes to disability were a major influence on people's experiences
- Social environments matter, accessing public and communal spaces helped address feelings of isolation where other barriers were limiting people's mobility

Building on these findings, during co-design activities, participants identified the following categories of barriers to an inclusive city:

- Access to public transport
- Access to basic utilities and services
- Access to public and private buildings
- Access to heritage sites
- Access to the riverfront and ghat areas
- Issues related to city governance

And during the co-design workshops the following priorities and actions were suggested by persons with disabilities:

- Availability of support/assistance for Persons with disabilities to access the major heritage sites.
- Making the ghat area accessible through installing lifts/ramps or creating an interconnected platform. It may include creating provisions for Persons with Disabilities to attend events such as the Ganga Aarti (a ritual ceremony performed at the banks of river Ganga).
- Running an awareness campaign through social media platforms or news channels would play a crucial role in understanding the diverse needs and challenges associated with disability.
- Steps to reduce the social stigma and related barriers associated with disability amongst citizens and city stakeholders.
- Provision for displaying digital and audio messages across city intersections, public places and conducting awareness drives or training about disability with city service providers.
- Creating provision for accessible para-transit mode in pedestrianised and crowded streets/road networks.
- Access for Wheelchair users and provision for personal assistance to be provided in popular temples like Kashi Vishwanath, and Kal Bhairav Temple.
- Provision of accessible boarding platform to access the boating area, an inter-connected platform for all ghats, and ramps or chair lifts along the ghat staircases.
- Provision for lifts for elderly and persons with disabilities in government buildings, and hospitals.
- Telecast of recordings from similar workshops, stakeholders consultations, or special interviews with persons with disability across popular news channels or social media platforms can be made to build sensitivity among the stakeholders.
- Creating a “Divyang Complaint Centre” (a complaint centre for persons with disabilities) and appointing disability inclusion champions across various parts of the city would play an important role for establishing efficient accountability mechanisms for Persons with disabilities[132].

The exploration of the data above indicates a complex system of accessibility barriers in Varanasi and a series of aspirations for a more inclusive city where people can fulfil their aspirations. It is also clear that inclusion is a priority among

[132] GDI Hub and NIUA, ‘Creating an Inclusive and Accessible Varanasi City: Co-Design Workshop with Persons with Disabilities’, 2021.

government stakeholders, there is knowledge and awareness of inclusive design and a great opportunity for transformation through the smart city projects. A major challenge facing the city is to develop practical tools, policies and protocols that can help overcome implementation challenges. The follow sections will build on the findings to look at what works and what lessons have been learned through the case study engagement.

What works now?

"So in Varanasi we may not have that much space, and have constraints, but then there is always a way to do things. The degree of access may not be as much as in new areas but at least we can improve"

Many of the insights discussed focus on barriers not opportunities. It is as important to identify examples of good practice that can be replicated across the city and used to spread awareness on why inclusive cities are a good thing.

Understanding what works and who is driving inclusion can unlock opportunities for good inclusive design. The who is important because champions can advocate for inclusive design and tell the stories of what works. Identifying what matters through participation and co-creation with persons with disabilities and stakeholders can support an incremental approach that addresses people's priorities first.

City government is motivated and wants to work with experts. It is important to recognise that the current city government of Varanasi is very engaged with the topic of accessibility and has begun a series of initiatives including: the development of; an inclusive sports stadium, accessible public washrooms and sensory parks and accessibility improvements to the railway station and several of the Ghats. It will be important to monitor the progress of these initiatives to ensure ambitions are met and evaluate them to understand their successes and failures. In 2019, Varanasi district won a national award for the best district in the field of disability empowerment so it is clear some of the efforts have been recognised[133].

"Interventions should be needs based, priority oriented and resource supportive"

There are also innovative examples from the non-profit sector. Kiran Society is an NGO that supports people and children with disabilities in Varanasi. They run a range of training programmes including bakery courses and have a bakery in the city that is run by persons with disabilities. This combination of training and employment opportunity supports persons with disabilities in an inclusive way.

[133] 'Varanasi Awarded for Being Most Disabled-Friendly | Lucknow News - Times of India', The Times of India, accessed 14 September 2021, https://timesofindia.indiatimes.com/city/lucknow/varanasi-awarded-for-being-most-disabled-friendly/articleshow/72357893.cms.

People have shown they are willing to adapt and support: “For example when I go to repair my scooter, they always make space for me where I can sit but once I sat down the engage with other workers they forget I came there for some service so I have to poke them.” This example shows how shopkeepers are willing to support persons with disabilities where they can. There could be ways to further incentivise small business to create more inclusive environments through government and private sector initiatives. For example, the supermarket brand Big Bazar have provided availability of manual assistance for customers, ramps and lifts, tactile paving, voice over facilities for people to independently access their stores.

A step-by-step approach might work: “Varanasi is a very congested city, we can’t simply make roads and streets accessible here but what we can do is make change wherever it is possible”. A gradual approach ensures the city starts somewhere, can allow it to develop more positive examples and build a movement towards a more inclusive city. The initiative to pedestrianise the area from Godolia to Dashashwamedh Ghat could serve as a good example for the city.

COVID-19 has accelerated innovation in service delivery: “during lockdown I stayed in my room for three months, never went out once, if they didn’t deliver food at home I could have died there”. Fast acting solutions to support people who need to isolate have shown that reasonable accommodations can and should be made to support people. In the post pandemic recovery period there should be learnings from the interventions developed during this time. Work should be done to evaluate how inclusive these innovations were and the user experience: “Digital services are accessible, since it is online they don't have to go anywhere, if they are aware of how to use it then obviously they can. During lockdown we [the Varanasi Smart City Mission] developed an application to provide services called Safe Kashi.

Safe Kashi is an android based app launched by VSCL in March 2020 to arm its citizens to fight the pandemic. The app provides citizens information on up-to-date Covid-19 Cases Tracker, dos and don’ts and incident reporting. The case tracker provides daily updates regarding total number of people quarantined, isolated, recovered and succumbed in Varanasi District. Additionally, the app provided information to citizens to; access Tele-Medicine, consult doctors stationed at the Integrated Command Control Centre, information related to groceries, e-pass sites, government orders and voluntary contribution facilities.

Digital services are making progress: “I can now make transactions from anywhere, I don't have to go to the bank that often now.” This has the potential to improve access for people.

However, it is important to remember that digital does not equal accessible. Digital services may not reach or be accessible to everyone and so built environment accessibility will always be important.

Government understands the need to support implementation. Recent government infrastructure projects such as the development of rainwater harvesting facilities on public buildings has shown how the government can mandate change. Government departments have the capacity to support persons with disabilities through improved implementation processes: “we [the Municipality] are hand holding those departments for that. We had some discussion with professionals in these fields, we got them onboard and we sent them to these Department where it needs to be done”.

Government stakeholders understand that inclusive design should apply to all projects: “whether it be a new project, whether it be an existing project, if it needs retrofitting or whether it be provision of urban services, we ensure that the facet of disability inclusion is being addressed.” Government stakeholders have a good understanding of what standards should be applied to projects, now there is an opportunity to develop robust implementation practices that can set an example for other cities.

Lessons learned

The biggest learning opportunities in the case study were in developing a deeper understanding of the lived experience of disability in Varanasi, building a picture of the whole 'system' of accessibility and inclusion needs in the city and starting conversations between diverse stakeholders.

The city should have its own framework for accessibility and inclusive design that recognises its unique challenges and opportunities. City by-laws incorporate accessibility but there is a real opportunity for the city's smart city mission to develop a framework for integrating inclusive design within infrastructure. More evidence is needed on how national policies, such as budget allocations for disability provisions, are being deployed in the city.

The city's framework or inclusive design strategy should address the different co-existing components of the city: the city has existing buildings, new buildings and both heritage (monuments and buildings with historical significance) and living heritage. Key infrastructures could also be categorised as:

- mobility infrastructure (transport options within the city, between the city and its peri-urban surroundings, within peri-urban and informal settlements and along the river)
- basic services and infrastructure: banks, schools, markets, healthcare services, water and waste disposal, water and public sanitation
- tourist infrastructure – hotels, accommodation, visitor centres, tourist and heritage site access
- living and social infrastructure: housing, community and public spaces

A more sustainable inclusive infrastructure supports retrofitting. Local policies and guidelines for inclusive environments must also embrace retrofitting and making existing infrastructure more inclusive too – this will support a more sustainable approach to inclusion.

There is a need for technical capacity to deliver this. Where accessibility is being delivered it is not always designed to the correct standards. Accountability and technical expertise assistance is needed not just to ensure compliance with standards but also to provide guidance when standards compliance is *not* possible. At present, the city government does not have a resident inclusive design expert and

this is something that needs addressed. The appointment of a resident expert would give accountability, help ensure interventions are delivered within specific timeframes and raise awareness to ensure decision-makers are aware of the legislation that protects persons with disabilities. Capacity building among other staff engaged in infrastructure projects should be done to support the inclusive design expert.

Examples of inclusive design interventions that are not fit for purpose and do not meet standards.

The city needs space for accessibility. Varanasi is dense and congested and many inclusive design solutions require space. City masterplans and building regulations must account for future growth and the need for inclusive infrastructure.

City stakeholders should develop tools for inclusive design or co-design. The Municipal Government has access to policies and guidelines that set a reasonable standard for accessibility. However, they need design processes that can integrate those standards within site constraints and tools that can help support a collaborative process with persons with disabilities. Stakeholders also suggested that inclusive design toolkits would be a useful resource.

The most excluded groups must be included in city planning. People living in the outskirts of the city or in informal settlements, including persons with disabilities living in these places, are often left out of planning discussions. It is essential these populations are engaged in planning processes to ensure excluded communities are not left behind.

A culture of inclusion, not charity, should be encouraged. Adopting an approach to disability inclusion that embraces the human rights model can support disability justice in the city. Currently the medical or charity model and social model of disability co-exist in the city. As Varanasi is a city of pilgrimage, many come to the

city to serve and help others which creates a prevalence of the charity model of disability. While this approach may be deeply rooted, Varanasi must still do more to support genuine disability inclusion in a way that can bring independence to persons with disabilities as much as possible. Current awareness and advocacy initiatives are also often one-off events. To create a culture of inclusion requires continuous and sustained efforts.

Inconsistencies in views on what is accessible speaks to lack of awareness and need for greater consultation. Accessibility audits led by persons with disabilities are a great way to pick up on diverse accessibility requirements. Inclusive environments must support the widest possible range of end users and recognise that often one size does not fit all.

Essential infrastructure must be inclusive. Resources are constrained and there are many pressing urban development challenges in Varanasi, but that does not mean inclusion can be left behind. On the contrary, inclusion and specifically inclusive design practice, must be a core aspect of proposed solutions to these challenges. The case of public washrooms illustrates this well. There is an urgent need to provide this public infrastructure to support citizen's health and wellbeing and to improve the condition of public spaces. However, not making these washrooms inclusive and accessible automatically excludes persons with disabilities, older people and many people who are excluded for other factors such as gender. Embedding inclusive design helps ensure the solution provided, in this case public washrooms, can be used by more citizens and therefore be more impactful and deliver better and more sustainable end results for the city.

Changing places are a welcome addition to the city's infrastructure, but they must be accessible - this one is not.

An inclusive design strategy should be multi-sectoral and engage politicians. The Municipality does not have oversight on all infrastructure in the city as there are a number of different government departments, all with a degree of responsibility on

infrastructure development. Strategic co-ordination and cooperation mechanisms are therefore incredibly important and different city government departments must work towards a united strategy on disability inclusion. Election cycles are also hugely influential in city development further emphasising the need for a consistent strategy for this area of work.

Awareness campaigns work, but must be accompanied by genuine transformation and accountability in the built environment. The Accessible India Campaign has been successful in raising awareness. Under the Accessible India Campaign, Varanasi city has made efforts to address the issues of an inaccessible urban environment. The Department of Empowerment of Persons with Disabilities in Varanasi is actively involved in creating awareness about the diverse needs associated with different types of disabilities and are implementing projects to make the government and public buildings and Ghat areas more accessible. Varanasi Smart City Ltd and Varanasi Nagar Nigam are also implementing inclusive interventions to help create a more accessible and inclusive city.
It is important that these campaigns, initiatives and interventions do go on to deliver appropriate and sustainable results. They must also be developed with, and provide positive change for, persons with disabilities.

Access is not just about the physical environment. Creating access is about facilitating a positive and inclusive experience, creating cities where people can live, work and play without discrimination. Access is also about participation in sacred experiences such as religious festivals and rituals which are an important part of daily life in Varanasi. As one of the cities participating in India's Smart City Mission, Varanasi must consider not only how it can create physical access across the city, but how it can supplement with digital and service-based solutions.

Technology can help, but digital solutions should complement inclusive environments. Access to and the accessibility of ICT solutions must be developed in the same way as buildings, by consulting persons with disabilities and applying an inclusive design approach. Technological solutions may not always be appropriate when electricity supplies can be unreliable or in areas where flooding is common. Also, many people will not have access to these technological and digital solutions as they do not own a computer or smartphone or may not have access to the internet.

To create inclusive public spaces requires participatory planning that mediates different stakeholders' interests. Current public consultation is not sufficient to create inclusive public spaces, conflicts with the general public and private sector stakeholders such as shopkeepers must be resolved through inclusive dialogue.

People need to know what is accessible to them. The city should provide information on the accessibility of its public services and infrastructure and consider creating an accessibility map of the city. This would support persons with disabilities by giving them the information they need to make informed decisions about where they can and cannot go in the city and help identify priority areas for improvement.

Improving accessibility can benefit everyone. Accessibility is not just the domain of persons with disabilities and Disabled Persons' Organisations. Everyone is affected by inaccessibility in the built environment as illustrated by participants feelings on the state of transport and road infrastructure, with issues such as congestion negatively impacting mobility for all citizens. The congestion of streets and public spaces, without separation of pedestrian and vehicular circulation, was repeatedly cited as problematic. Barriers are also socially constructed and creating an inclusive city is a collective process. Messaging around accessibility and inclusion must make it clear that the benefits support everyone and not solely persons with disabilities or older people. This can help improve engagement and widespread support for change.

Improving mobility is a pressing issue, and a complex challenge. The city relies on small scale and informal transport options such as bicycles, scooters, three-wheelers, autos or rickshaws which also create challenges in terms of congestion and create dangerous conditions for pedestrians. A systemic approach is required to develop a holistic and inclusive functional transport system for Varanasi, considering innovations such as paratransit access (smaller scale and customisable transport options). Learnings here could have huge benefit for other small, compressed cities across India where metro or bus-rapid-transit systems are not an option. Mobility along the river, including access points, land to boat transfer and accessible boats/vessels should also be addressed as this has the potential to unlock some of the current issues around congestion and access to the riverfront and Ghats.

Assistive technology provision should account for people's needs and aspirations. Participants expressed a desire for a fairer distribution system that accounted for how assistive technologies enable access to opportunities, such as people with less severe disabilities being able to access motorised three-wheelers.

Varanasi's popularity as a tourist destination could be used as a way to develop inclusive innovation and inclusive tourism. Tourism infrastructure, such as hotel chains, can be harnessed as examples of international best practice on accessibility. Local designers and architects can leverage this to create examples of best practice for Varanasi.

The city has to confront big challenges. COVID-19, climate change, urbanisation are all impacting Varanasi and exacerbating existing problems. Inclusive city planning also needs to factor in health, wellbeing and disaster risk reduction planning to ensure Varanasi becomes an inclusive *and resilient* city.

The city can lead by example. As a major city in Uttar Pradesh, the city of Prime Minister Modi's constituency and as the core city or nexus for surrounding smaller settlements, Varanasi is in a unique position to influence and disperse good inclusive design practice well beyond the city limits.

Financial resources can be a barrier to implementing inclusive design. Stakeholders should know how budgets allocated to disability inclusion are spent. All infrastructure investments should have budget ringfenced for disability inclusion and accessibility, according to stakeholders currently the amount allocated to disability inclusion in the infrastructure plan is not sufficient. Stakeholders should also be educated on the wider value of inclusion rather than the financial cost of implementation. Tourist infrastructure may be a key area to convince stakeholders of the economic benefits of more inclusive infrastructure.

Leverage community stakeholders. Neighbourhood and village leaders can be hugely influential. Informal or indigenous access solutions can be developed in communities and city stakeholders should learn about these. People are resilient and will often find ways to thrive. It is therefore important for Varanasi city government to learn from its disabled and older citizens to inform contextual inclusive design solutions. Religious and community leaders have influence in different parts of

Varanasi and they must also be consulted and engaged in city planning and developments to ensure they are inclusive and progressive.

Varanasi's heritage is not static. Creating accessibility on heritage sites requires a specific approach that requires more than a simple access audit. When assessing the accessibility of the many heritage sites across Varanasi, consideration must be given to a wide range of factors including, what can change, what cannot, how alternative access can be provided, what innovations (digital or otherwise) can support, what can the service offer do to maintain a positive visitor experience and also understand the likely impacts of the annual calendar of religious and cultural activities.

Maintaining and sustaining inclusion is a continuous and collective effort. Public awareness around disability inclusion and inclusive design should also address the importance of the ongoing maintenance and care of inclusive infrastructures. People should also be made aware of the importance of their own actions in creating an inclusive environment, for example, by not blocking routes, creating obstacles and being respectful of the needs of others. Communal maintenance systems have historically existed in Varanasi to maintain and clean the ghats along the river, these collective efforts could be reinvigorated and leveraged to support more inclusive environments.

What have we learned about assistive technology, infrastructure and the built environment?

The insights shared in the case study illustrate the intimate connection between enabling access and use of assistive technology and an accessible and inclusive built environment. An accessible built environment must support assistive technology use in a seamless way. As described by case study participants, an inaccessible built environment can limit assistive technology use and even cause damage. Participants view assistive technology as empowering and an enabler to participation which should be supported and celebrated within an inclusive city.

Assistive technology is an important enabler with many of our participants requiring more than one type of assistive technology to overcome the inaccessibility of the physical environment in Varanasi. For example, people who used wheelchairs in

their day-to-day activities had to make use of crutches inside buildings that were not wheelchair accessible. Assistive technology access and quality varied between participants with most expressing a desire for access to better quality, more useful assistive technologies. Participants also expressed the need for a fairer distributions systems for AT, as currently need and aspiration are not factored into distribution and in general people cannot easily access the AT they need. Even when AT is provided through charitable support, the lack of maintenance support is a major barrier to using AT and accessing the city.

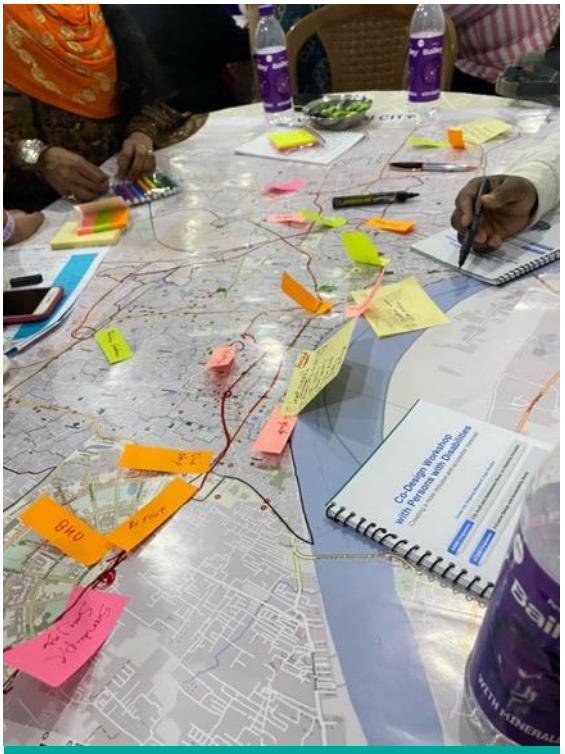
Better quality assistive technology does not diminish the need for or impact of an inclusive and accessible built environment. Poor quality of roads, heavy rain, narrow doorways, a lack of ramps or lifts all impact how effectively persons with disabilities can use assistive technology, such as wheelchairs.

Assistive technology use could also be a source of stigma with examples given of taxi drivers in the city not stopping as they do not want to pick up a wheelchair user. Some participants even talked about how wild animals could be dangerous for assistive technology users, with cows and buffalo, commonly found on the streets across India and in Varanasi becoming aggressive towards people using crutches, canes, sticks and callipers.

Using participatory approaches to set priorities and identify actions

Setting priorities is a way to identify tangible actions that can start to build towards Varanasi becoming a more inclusive city. There are many barriers to inclusion in the city and limited resources with which to take action, so it is important to identify priorities and strategic opportunities to gradually create positive change.

Inclusive design workshops can be used to co-design ideas for an inclusive city with city residents and key stakeholders. During this case study research, workshops were used



Example participatory map.

to build on the initial insights gathered from stakeholder interviews and photo diaries, validating the insights and co-creating recommendations.

Participatory mapping is a tool that facilitates discussion around priorities and can help identify geographic areas to target interventions. These exercises can transform city stakeholder's engagement with citizens from public consultation to participation and co-creation, which is an essential component of inclusive city development.

Similar workshops can be conducted to identify tangible actions to address those areas and allocate responsibilities and tasks between stakeholders. This can support addressing implementation barriers through establishing priorities, roles, responsibilities and inclusive design champions.

Workshop set up to facilitate virtual and face to face activities.

Limitations and areas for further exploration

The following limitations were identified during this study:

- The research team had to adapt to the ongoing COVID-19 pandemic, which meant adapting and limiting some fieldwork activities. Overall, the team was able to establish an effective working relationship while working remotely. While online collaboration was effective, it is important to remain mindful of the limitations it can have regarding engaging participants and building consensus among a team.
- Reliable internet and electricity connections could be a challenge when connecting remotely, and particularly during workshops could present challenges
- Accessing and engaging city government stakeholders and people with disabilities was challenging at times. City government stakeholders in particular were very busy and as such could be non-responsive to communications or cancel appointments at the last minute. Reaching persons with disabilities was also more difficult if they had limited access to technology, particularly due to restriction in pace as a result of the pandemic.

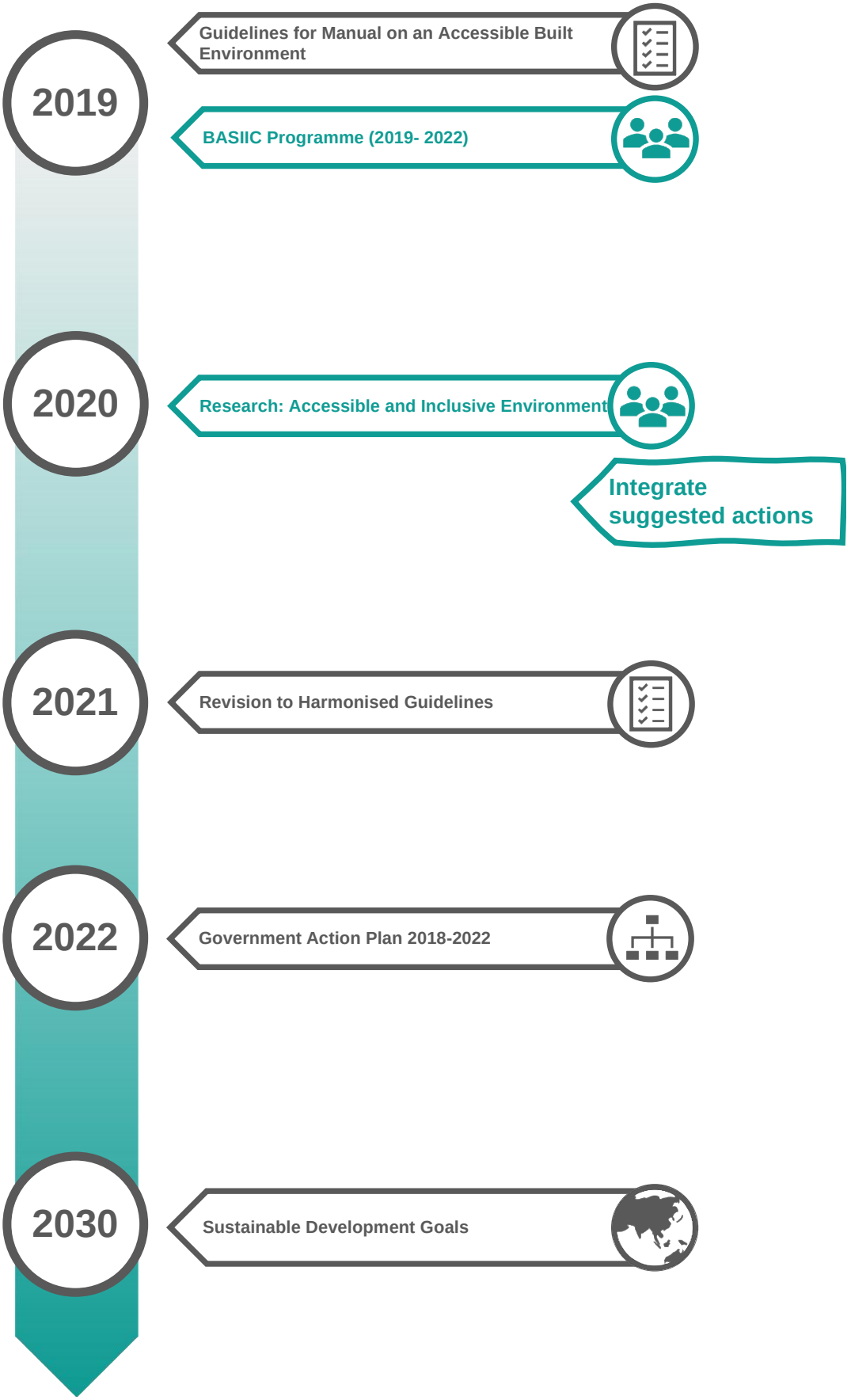
- Capturing a genuine account of participants' perspective was sometimes a challenge, some stakeholders were hesitant to share negative experiences with language and cultural differences also a factor
- Most of our participants identified as having either a mobility or visual impairment, so further research that captures a more diverse group of persons with disabilities would be valuable, such as neurodiverse people, people with hearing impairment and people with multiple disabilities
- The gender balance of participants was not equal, it was much more difficult to reach female participants to interview which may indicate that women with disabilities are excluded to a greater extent. Among city government stakeholders there were also very few female participants, indicating that among key stakeholder groups there is a need for better gender diversity
- The research team was unable to conduct site visits and some collaborative live projects were delayed due to the coronavirus pandemic, limiting the amount of live project work featured in this report
- The research deliberately focused on accessibility and inclusion from a disability perspective. It is important to note that inclusive design also considers groups that may be excluded from participation for other reasons such as race, class, age, religion, gender, or socio-economic status

Areas for further research, which would assist some of the actions suggested throughout this report include:

- Quantitative research mapping accessibility in the city
- Monitor and evaluation of inclusion projects that are being implemented would be useful, including measuring impact
- Research on socio-cultural factors associated with disability inclusion or research on socio-cultural factors in inclusive design approaches
- To drive policy agendas, it would be useful to develop more robust data on how different aspects of exclusion intersect, such as gender and disability, class and disability and race and disability.
- Research on accessibility and inclusion of the built environment in peri-urban/rural areas, as statistics show more persons with disabilities are living in rural areas and may be harder to reach.
- Further research on inclusive design with persons with disabilities of all genders
- Research on the role of inclusive design in sustainable development priorities such as the relationship between climate adaptation measures and inclusive design and accessibility would be useful.

- Research on humanitarian contexts or inclusive design and disaster risk reduction is also needed as city design must be resilient to disasters and crises, as seen through the COVID-19 pandemic and previous flooding.
- Pandemic resilient urban plans which are inclusive, sustainable and resilient for all.
- Research on key urban sectors such as inclusive and green public spaces, pedestrian mobility, and accessible public transport system.
- There is an urgent need for national data on disability, as the last census was in 2011.

Pathway to inclusion – where are they going?



Conclusion: Actions toward inclusion

“An inclusive Varanasi (Sugamya Kashi) is somewhere that can be experienced by everybody in a fair and equal way. By creating safe and accessible environments for all members of the community the city can allow everyone to access and participate in the opportunities they would like.”

An inclusive design strategy for Varanasi should embrace the living, breathing, nature of the city. Varanasi city stakeholders should develop a comprehensive inclusive design vision and strategy for the city that engages with policy-making and awareness; industry and practice; and communities. An overarching vison can help determine a mindset and approach that stakeholders can champion and a strategy can create a roadmap for how to sustainably make progress towards becoming a more inclusive city.

A cow talks down the streets of Varanasi.
Image credit: India Times

These steps would allow the city’s design and development to accommodate and celebrate diversity improving the lives of everybody, including persons with disabilities. Inclusive design should be understood as a mindset and methodology above technical standards, to allow responsive and adaptive design in a rapidly changing city and world. This adaptive mindset in design has the potential to engage more effectively with the city’s rich heritage and culture, consider the different ways people want to live in the city and respond to sustainable development challenges including climate related stresses and recovery from COVID-19.

Adherence to good practice and action towards inclusion is the responsibility of all stakeholders. At a policy level, national laws must be accompanied by local guidance and standards. National accessibility standards must also be localised to Varanasi, and having best practice examples that could be highlighted would help. At the industry scale, good design practice, design reviews and inspections must take place

and construction professionals must also be aware of and champion inclusive design and take responsibility to ensure quality implementation.

Communities should convey their needs through participation in design and consultation processes, conducting accessibility audits and advocacy work where they can. However, there should be government and industry support to fund this work, people should be acknowledged and compensated for their work. Persons with disabilities should also be participating in design and decision-making processes through being provided opportunities to access employment in policy and industry professions.

Priority Recommendations:

- Taking an inclusive city approach – an inclusive design strategy that works across sectors, coordinates infrastructure and considers how the city is connected and how people use it day to day is needed. This could begin with developing an accessibility map of the city. That map could be interactive and be able to collect data.
- An inclusive design approach should not just follow accessibility standards but think about user experiences and journeys. How inclusive is someone's experience in the city from start to finish?
- Embed inclusive design in the implementation of all essential infrastructure and services including; water and sanitation, education, health and related public services, to ensure they are inclusive for all.
- Targeted support is necessary for equitable access to opportunities and education for persons with disabilities. Ensuring persons with disabilities can learn and work must be a high priority and requires targeted programmes and interventions.
- Infrastructure must factor in assistive technology users, for example, tricycle users experiencing obstacles in the narrow streets and alleys.
- Focus on creating a more inclusive heritage experience rather than simply gaining physical access to heritage sites. There will always be challenges and compromises in making heritage accessible, so stakeholders must work together to create the most inclusive and enjoyable heritage experience for people with disabilities, in turn benefiting all visitors
- Awareness of the issues and capacity to deliver solutions are both necessary for good implementation of inclusive design and infrastructure. Building capacity at the local level is important.
- Work incrementally, start somewhere and gradually build inclusive infrastructure. Prioritise and phase plans to achieve the short, medium and long term visions of

inclusive development and an inclusive Varanasi. Make the journey inclusive as much as the destination.
- Develop local best practice examples, show people how great they are and create incentives to replicate them. Can small business and individuals be incentivised by local government to support inclusive design targets?
- Update local bye-laws to reflect progress on inclusive environments, to ensure local standards reflect best practice and create compliance protocols.
- Develop a fairer assistive technology distribution system that accounts for needs and aspirations and not just severity of disability.

Additional areas to consider action are documented through the lessons learned.

Recommendations for policy and decision-makers:

Policy-makers should have a plan for inclusive design, act on it and be accountable for its implementation.

- Develop a city-wide framework to implement inclusive design and infrastructure, develop an inclusive design strategy that supports this
- Integrate service provision and programme delivery to this framework – support persons with disabilities in a holistic way.
- Employ inclusive design experts who champion making Varanasi an inclusive city. Give them the funding and authority to do their job well. Even better if these people are persons with disabilities themselves. Build capacity on inclusive design among all staff.
- Allocate budget to implementing inclusive design.
- Build accountability mechanisms in building and infrastructure construction
- Enhance accountability through participation, engage persons with disabilities in your work, listen to them and work with them to co-design solutions
- Make information about projects in development, such as the accessible Ghats, publicly available to encourage accountability
- Celebrate a culture of inclusion, continue to spread awareness and embed disability inclusion in day-to-day life in Varanasi
- Engage community stakeholders and consistently reflect on who might be excluded by the city and how the city's design can change to include them
- Partner with communities, private sector and persons with disabilities to achieve goals on inclusion. This can be done by forming an accessibility monitoring committee where the voices of all citizens and stakeholders can be heard.

Recommendations for industry (Practice):

Practitioners should understand that inclusive design will deliver better results, should be motivated to design and deliver good inclusive design, and work collaboratively.

- Support government initiatives by delivering best practice design, developing tools and methods that can support implementing inclusive infrastructure.
- Ensure industry professionals have disability awareness and inclusive design training.
- Inclusive design must be delivered across planning, design and construction processes to be successful and also into public building operation, management and maintenance.
- Design for people, work with persons with disabilities, employ persons with disabilities and co-design creative solutions and inclusive environments
- Follow the standards, but do better if you can, advocate for people who are excluded by the built environment
- Consider the local context, be adaptive and don't be afraid to innovate, testing what works with end users
- Recognise inclusion is a right of person with disabilities and therefore has to be provided.

Recommendations for the community (People):

People should feel empowered, be advocates, be involved and affect demonstrable change.

- Identify champions or visionaries within communities
- Audit and evaluate the built environment (ideally in a formal and recognised way with local government and agencies)
- Spread awareness on the value of inclusive environments through cultural activities and advocacy
- Participate in decision-making, design processes and evaluations, and ask to participate if it is not offered

Creating enabling environments

An enabling environment for persons with disabilities should integrate: a supportive legislative environment, participation in planning, design and decision-making,

positive cultural change, an accessible and inclusive built environment and access to good quality and affordable assistive technology. An inclusive culture and mindset is an important aspect for creating this environment.

So what might an inclusive Varanasi look like?

- **Updated city bye-laws**: mandatory accessibility standards and accountability processes within city policy
- **An inclusive riverfront**: accessible and welcoming public spaces and services that people can experience equally – that offer people choices.
- **Accessible transport options**: a vision and strategy for inclusive mobility
- **Inclusive and accessible Ghats**: Inclusive heritage experiences for all
- **Assistive technology people want and need**: access to good quality, affordable, assistive technology
- **Awareness, understanding and joy**: a culture of genuine inclusion
- **A city everyone can enjoy**: equity of access to opportunities and information for all

What's next?

This report outlines the key findings from a four-month case study on the city of Varanasi. As the second of six case studies on inclusive design and the built environment in lower-and-middle-income countries, it will go on to inform global actions on inclusive design.

The findings of this report will be shared with both international and local audiences through a range of activities including directly engaging stakeholders with the research. GDI Hub will continue to support NIUA's activities in Varanasi and in India through the BASIIC programme. Some of the next steps include

- Dissemination of the key learnings from Varanasi to other Indian Cities
- Documentation of best practices, case studies and disseminate with 100 smart cities for larger outreach of the vision.
- Replication of city audit exercise at pilot or project scale.
- Dissemination of audit toolkit with 100 smart cities.
- Advocacy for adoption of the revised national accessibility guidelines at city level.

The data collection that informed this case study took place just prior to the second wave of COVID-19 in India, we recognise the impact it has had on partners and communities, and hope this research on inclusive environments can support strategies for a more inclusive recovery.

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