

Building Accessible, Safe and Inclusive Indian Cities

Framework for 100 Smart Cities

Nanda Kishore Alegala Nagabhushanam

National Institute of Urban Affairs
1st & 2nd Floor, Core 4B, India Habitat Center
New Delhi, India
e-mail: akishore@niuua.org

Kanika Bansal

National Institute of Urban Affairs
1st & 2nd Floor, Core 4B, India Habitat Center
New Delhi, India
e-mail: kbansal@niuua.org

Abstract— The action research project on Building Accessible, Safe and Inclusive Indian Cities (BASIIIC) intends to showcase the implementation frameworks on how to strengthen and build institutional capacities at national, state and local levels on inclusion, accessibility and safety of vulnerable, marginalized and excluded groups with special focus on persons with disability. The paper highlights the existing status of the disabled population and the concerns addressed in the latest government schemes in India, the BASIIIC project genesis, goals and objectives, as well as its detailed approach and methodology. The project envisaged its learnings to be useful in developing guidelines and policy recommendations at the national level and implementation of pilot projects through convergence with the Smart City Mission.

Keywords- Accessibility; Safety; Inclusive cities; Persons with Disability.

I. INTRODUCTION

Rapid urbanization has become a trend across the world, especially in the developing countries. Such a trend created its own challenges to urban life, along with the benefits. While the focus has always been on equitable distribution of resources and opportunities, the needs of marginalized population, including the differently abled, have been compromised. It is estimated that nearly one billion people (15% of the global population) experience some form of disability. Out of that number, about 30 million are residing in India, according to the 2011 Census [3].

Urban living in itself can be challenging and it is particularly true for those with disabilities. A lack of universal design can be commonly observed in public buildings like schools, banks, offices and, most of all, recreational spaces. Restricted mobility, dependence on others, lack of sensitivity among fellow citizens, create a sense of insecurity and isolation among people with disabilities, impacting their physical as well as mental health. The lack of accessibility to digital platforms, unfamiliarity with the technology and unaffordability of assistive devices has impacted the intellectual growth and empowerment of the disabled population. It has become imperative to include and place emphasis on the “accessible and inclusive component” on the path for achieving sustainable development.

A. Status of the Disabled Population in India

According to the 2011 Census [3], India has around 3 crore of the disabled population, which constitutes about 2.21% of the total population. The disabled population constitutes about 2.17% [1] of the urban population, half of which is concentrated in just five states. Table I gives the details of the top five states and of the urban agglomeration with the highest percentage of disabled population. With the increase in the number of categories from 7 to 21 in the Rights of Persons with disability Act in 2016 [10], these statistics are likely to vary. There is no available data on the qualitative aspects of demographics of the people with disabilities. There is a need for enhancement and strengthening of the data available on the state of the disabled population.

TABLE I. CONCENTRATION OF DISABLED POPULATION. TOP FIVE STATES/UNION TERRITORIES AND URBAN AGGLOMERATIONS (UAs)/CITIES (MILLION PLUS)

States/Union Territories (UT)		
States/UTs	Numbers (Thousands)	Share (%) of Total
Tamil Nadu	558.2	6.8
West Bengal	648.5	7.9
Andhra Pradesh	753.6	9.2
Uttar Pradesh	990.9	12.1
Maharashtra	1297.3	15.9
India	8178.6	100.0
UAs/Cities (Million Plus)		
Delhi UA	228.4	6.0
Bruhat Bangalore UA	251.6	6.6
Hyderabad UA	294.1	7.7
Kolkata UA	342.3	8.9
Greater Mumbai UA	484.7	12.6
UAs/Cities (Million Plus)	3832.8	2.4

Source: Census 2011 [3]

B. Existing Policies and Frameworks

The disability Act of 1995 [5] mandates the provisions for accessibility for persons with disabilities. The national policy for persons with disabilities [14] places emphasis on provisions for equal opportunities and protection of the rights of the disabled population. India is a signatory of the

“Declaration on full participation and equality of persons with disabilities in Asia Pacific Region”, Biwako Millennium Framework, Biwako plus Five and the UN Convention on the Rights of Persons with disabilities [14].

The government of India has given a new direction to urban development which now has a much larger coverage and huge investments, in addition to including newer areas of the latest government schemes such as Swachh Bharat Abhiyan [6], Smart City Mission [1], etc. The new missions of the government are complementing each other by enabling access to the resources available under different missions. The concerns of inclusivity and accessibility of Persons with Disability (PwD) have been highlighted in the flagship program Accessible India Campaign or Sugamya Bharat Abhiyan [15] launched by the Hon’ble Prime Minister of India (under the Ministry of Social Justice and Empowerment) in 2015 and later supported by the enactment of the Rights of Persons with Disability Act in 2016 [10]. Schemes such as Smart City Mission [1], Swachh Bharat Mission [6], AMRUT [8], Pradhan Mantri Awas Yojana – Urban [9], and HRIDAY [7] (under the Ministry of Housing and Urban Affairs), Digital India Campaign (under the Ministry of Electronics and Information Technology) [16] have the crosscutting agenda to guarantee accessibility and inclusivity components, briefly described below in Table II.

TABLE II. STATUS OF DISABILITY IN VARIOUS PROGRAMS UNDER THE GOVERNMENT OF INDIA (GOI)

Program/ Mission/ Schemes	Year of Launch	Accessibility and Inclusivity Components
Swachh Bharat Abhiyan [6]	2014	Targets elimination of open defecation, conversion of unsanitary toilets to pour flush toilets, eradication of manual scavenging, municipal solid waste management and bringing about a behavioural change in people regarding healthy sanitation practices. Handbook on Accessible Household Sanitation for Persons with Disabilities was published under the mission.
Atal Mission for rejuvenation and urban transformation (AMRUT) [8]	2015	It aims at providing basic services (e.g. water supply, sewerage, urban transport) to households and build amenities in cities which will improve the quality of life for all, especially the poor and the disadvantaged, as a national priority. The components of Urban Transport include footpaths/ walkways, sidewalks, foot over-bridges and facilities for non-motorised transport (e.g. bicycles) and ensure the safety of citizens. The component of development of green spaces and parks ensures inclusion of a special provision for children, senior citizens and PwD.
Smart City Mission [1]	2015	The objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and encourage the application of 'Smart' Solutions. It focuses on inclusive

		development and caters to the infrastructural elements most significant to BAsIIC interventions including mobility and public transport, affordable housing, Information Technology (IT) connectivity, governance, safety and security of citizens.
Digital India Mission [16]	2015	It aims at transforming India into a digitally empowered society and knowledge economy. The vision areas include: digital infrastructure as a core utility to every citizen, governance and services on demand as well as digital empowerment of citizens. The mission has been designed inclusive of the needs of PwD with the creation of apps like Accessible India App and Sugamaya Pustakalya.
Pradhan Mantri Awas Yojana- Urban (PMAY-U) [9]	2015	The scheme aims at providing affordable housing to all in the urban areas. Inclusivity components are visible in the suggestions for allotment preferences and credit linked subsidy schemes for the weaker and vulnerable sections of society, including PwD.
National Heritage city development and augmentation Yojana (HRIDAY) [7]	2015	It aims at preserving and revitalising the soul of the heritage city to reflect the city’s unique character by encouraging an aesthetically appealing, accessible, informative & secured environment. The scheme’s objective includes: "Increase accessibility i.e. physical access (roads as well as universal design) and intellectual access (i.e. digital heritage and GIS mapping of historical locations/ tourist maps and routes)" ensuring accessibility, safety and inclusion of PwDs.
Accessible India Campaign [15]	2016	It aims at achieving universal accessibility for Persons with Disabilities (PwDs), by enhancing the proportion of accessible government buildings (targeted to be extended to at least 50%); enhancing the transport system accessibility by adding accessibility to airports, railway stations and public transport, and strengthening the Information and communication eco-system accessibility by enhancing the proportion of accessible and usable public documents, websites, as well as the pool of sign language interpreters, accessible for public television news, programmes, etc.

II. GENESIS OF THE PROJECT

To reflect on the needs and way forward in facilitating Indian cities towards ensuring universal access and inclusive planning, the Ministry of Housing and Urban Affairs (MoHUA), in collaboration with the National Institute of Urban Affairs (NIUA), called upon the key stakeholders in the domain of accessibility and inclusivity. A consultation was organized on September 11, 2018 to seek expert insights on framing the person with disability

friendly measures and policy recommendations that can be implemented through the Smart Cities Mission [1]. The key recommendations that emerged from the consultation can be broadly put into six areas of intervention, as detailed below:

1) *Legislative Framework and Guidelines* – Duplicity and discrepancies in guidelines pertaining to universal design and accessibility need to be addressed, such that uniform standards can be established and followed across Indian cities.

2) *Inclusive Design and Planning* – Planning and design of projects under the Smart Cities Mission with principles of accessibility and inclusivity.

3) *Institutional Arrangement and Capacity Building* – Improving existing institutional mechanisms and capacity building of authorities and practitioners to carry out works pertaining to universal design.

4) *Awareness Generation* – Generation of awareness amongst all stakeholders and the public towards disabilities, universal design and inclusive cities.

5) *Information and Communication Technology (ICT)*– Incorporation of accessibility components in ICT the infrastructure of Smart Cities.

6) *Monitoring and Review* - Regular monitoring and evaluation of universal design applications in Smart Cities projects.

To facilitate the above, there is a need for focused technical assistance at all levels of governance, for the accurate and successful adoption of PwD friendly measures in Indian cities. It is in this context that NIUA, with support from the Department for International Development (DFID) of the UK Government, is implementing a project “Building Accessible, Safe and Inclusive Indian Cities” (BASIIC). The project has formalized a Technical Assistance Support Unit (TASU), which will ensure that tenets of universal access, inclusivity, and safety, are practiced through sensitive and responsive planning. The project endeavors to promulgate the above in the ethos of urban planning and design through policy level interventions, capacity building, pilot demonstrations of contemporary solutions, and implementation of robust monitoring systems.

I. PROJECT GOALS AND OBJECTIVES

The principal goal of BASIIC is to build the capacities of Indian cities to be sensitive and responsive to the needs of the PwDs. The project aims to homogenize the definitions and concepts associated with PwDs in India and to holistically build the capacity of practitioners to plan and implement with the tenets of universal access and inclusiveness. The project shall also actively work to gather the key stakeholders working on disabilities on a common platform and demonstrate innovative solutions – technologies, programs, and service delivery models in the realm of universal access.

The key objectives of the project are:

a) *Consolidation of definitions, concepts, policies, provisions, and practice with respect to PwDs in India.*

b) *Mapping the major areas of opportunity in implementation of policies and provisions at city level and replicable solutions for making cities more accessible and inclusive for PwDs.*

c) *Develop a monitoring and evaluation framework for pilot cities to assess and improve their standards of universal access and inclusivity. The framework developed will be replicable for other Indian cities to implement.*

II. APPROACH AND METHODOLOGY

A. Project Initiation

The project has been initiated with understanding the target population through detailed study of the available data and stakeholder meetings to gain the sensitivity and empathy required for the project. The interaction with stakeholders, including persons with disabilities, non-profit organizations and relevant institutions working in the field, helped in understanding the needs and aspirations of PwDs along with the challenges faced by them in life every day.

B. Defining the Project Geography

Identification of pilot cities/towns is critical with any project for creating a measurable impact. Criteria were formulated for identification of partner cities in order to achieve the project objective to implement innovative pilot solutions focused on accessible/ inclusive/ safety design and planning principles in selected partner cities. The selection framework included the following influencing factors for city selection under the BASIIC project:

1) *Ongoing Policies and Programs* - like Accessible India Campaign [15], Smart Cities Mission [1], etc. to establish convergence between the projects/schemes.

2) *Data Relevance* - in terms of City Classification and Disabled Population to identify the cities in need of immediate interventions.

3) *City Intent* – the cities promising intent in the form of proposed or ongoing projects related to the concept of accessibility, inclusivity and safety. Association with these cities will assist in getting support in terms of leveraging partnerships, availability of funds for implementation, awareness/sensitization of the stakeholders, etc.

An intensive city selection process has been adopted comparing around 39 cities overlapping between Smart City Mission [1] and Accessible India Campaign [15]. These cities were further scrutinized to 22 cities based on the percentage of disabled population and class of city, which was further narrowed down to 14 taking into account the proposed or ongoing initiatives. The level of intent through initial accessibility audit has resulted in shortlisting of 9 cities, namely: Kanpur, Chennai, Chandigarh, Jaipur, Varanasi, Vishakhapatnam, Bhubaneswar, Delhi and Dehradun. Out of these, two cities will be selected as

partner cities for demonstration of the pilot projects. Based on experiential learning models, seven (7) cities shall shadow the partner cities throughout the pilot interventions to learn and replicate.

C. Baseline Study

1) *Qualitative and Quantitative Data on the Disabled Population:* BASIIC has undertaken a secondary baseline study to evaluate the current status of disability in India, both in terms of qualitative and quantitative aspects of the concerned population set. This will help in understanding the sectors of urban development which need immediate attention. It is observed, from the details in Table III, that people with hearing, visual or speech disability constitute more than half of the disabled population.

TABLE III. DISABLED POPULATION BY TYPES OF DISABILITY IN MILLION PLUS UA'S/CITIES IN INDIA, 2011

Type of Disability	Share (%)
Vision	21.4
Hearing	22.3
Speech	9.0
Movement	13.1
Mental Retardation	5.3
Mental Illness	2.6
Any Other	21.1
Multiple Disabilities	5.3
Total	100.0

Source: Census 2011 [3]

2) *Status of Accessible and Inclusive Environment:* An assessment of secondary data has been undertaken to understand the existing status of accessibility and inclusivity in projects in the realm of urban planning and built environment. The assessment resulted in preparation of identifying prospective sectors of intervention.

3) *Status of Existing Policies and Frameworks:* The status of accessibility and inclusivity of the PwD in the existing policies and guidelines was done to list the existing focus areas, existing gaps and possible areas of intervention. It was found that there is duplicity and discrepancies in existing guidelines/codes.

D. Auditing

1) *Accessibility Audits:* Evaluation and grading of the smart city projects will be done in terms of inclusivity, accessibility, scope and impact. This evaluation will help in identification of pilot projects.

2) *Review of Existing Policies and Frameworks:* A comparative analysis of the existing policies, acts, standards/guidelines and building codes helped in mapping the gaps and scope of revision in existing guidelines. Table IV gives the details of the relevant guidelines/codes.

TABLE IV. DETAILS OF RELEVANT GUIDELINES AND CODES

S.No.	Guidelines	Owner Agency	Nature
1.	National Building Code,2016 [17]	Bureau of Indian Standards, GoI	Inputs from the Disable People Organisation has been incorporated in latest version
2.	Harmonised Guidelines [18]	Ministry of Housing and Urban Affairs (MoHUA), GoI	Comprehensive document recognised in the RPwD act
3.	Model Building Bye-laws	Town and Country Planning Organisation, MoHUA, GoI	Guidelines for formation of all state/city specific byelaws. Barrier free-environment is one of the fourteen new features of the latest version
4.	Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines	Town and Country Planning Organisation, MoHUA, GoI	Comprehensive Guidelines for preparation of all development plans. Gives Infrastructural provisions for Barrier free urban development.

The review highlighted the need for a structured, comprehensive, yet harmonized, approach addressing the needs of PwDs in accordance with the existing statutory framework, to ensure appropriate implementation at all levels and to act as a reference for formulation of upcoming guidelines/ policy interventions.

3) *Assessing the Existing Knowledge Base:* A comprehensive repository of contextual challenges, possible solutions and expert opinions will be developed and assessed.

E. Implementation

1) *City Level Demonstration and Pilot Project Implementation:* Demonstration of replicable solutions/examples that augments accessible, inclusive and sensitive planning and implementation will be done with urban local bodies in the selected cities. These chosen projects will act as model projects for other cities. Table V gives the details of potential solutions for seven identified sectors for pilot project implementation.

2) *Policy Level Intervention:* Based on the observations of the review of the existing guidelines and statutory framework, it is suggested to do necessary enhancement and revision of guidelines/ standards leading to statutory documents i.e. the developmental plans and the building bylaws. Also, the Harmonised Guidelines [18], as prepared by the Ministry of Housing and Urban Affairs, is suggested to be revised and enhanced in a comprehensive manner to address accessibility, safety and inclusivity of PwD in built environment and be integrated in all existing and upcoming

guidelines/standards. Table VI gives the details of the considerations for a structured, comprehensive and harmonised approach and relevant guidelines for intervention.

TABLE V. LIST OF POTENTIAL SOLUTIONS IN THE IDENTIFIED SECTORS

Sector	Potential Solutions
City Level Policy and Statutory Framework	Occupancy and completion certificate Developmental Plan City Bylaws Detailed Project Report for Smart city Projects
Governance	Representation in City Level Advisory Forum, Municipal Ward Committees etc.
Built Environment	Universal design of all buildings including: Housing complexes, Educational Institutions, Healthcare centers, Office complexes & Workplace Commercial establishments
Infrastructure provisions	Inclusion in Educational institutions Accessibility to art, heritage and culture Accessibility to religious sites Digitally inclusive Public engagement platforms Accessible WASH facilities
Mobility	Accessible Public Transport from buying ticket to travelling Universal Design and safe pedestrian pathways Accessible Subways and overhead bridges
Tourism	Inclusive tourism schemes Barrier Free access to religious and heritage sites Availability of wheelchairs, audio guides within the sites Inclusive and accessible museums, art galleries, and theatres
Incorporation of ICT (Cross cutting in each sector)	Access to real time online applications and websites IT-enabled government services Access to mobile based applications Online portals for empowering PwDs IT- enabled business process

TABLE VI. CONSIDERATIONS FOR STRUCTURED, COMPREHENSIVE AND HARMONISED APPROACH OF POLICY INTERVENTION

Consideration	Application in
Understanding the statutory status and mandate of the guidelines	Developmental Plans/ Landuse Plans: Master Plan, Local Area Plans Building Bylaws and Occupancy and Completion Certification
Identification of Model Documents prepared by Central Town and Country Planning Organisation to be modified/ adopted by the State/ City Governments	Model Building Bye-Laws Urban and Regional Developmental Plan Formulation and Implementation (URDPFI) Guidelines
Comprehensiveness with respect to Disable friendly attributes in Built Environment	Harmonised Guidelines [18] National Building Code, 2016 [17]
Scope of Inter-referencing	Harmonised Guidelines [18] comprise details of general universal design elements, easy to refer in other statutory documents.

3) *Knowledge Management and Training*: Training programs and modules will be arranged to ease the understanding of policies and provisions for PwDs for relevant stakeholder/ practitioners at national and city level. This will help in capacity building of the civil bodies/ municipal authorities and creating a toolkit containing aspects addressing inclusive and accessible components, aiming at increased awareness among the stakeholders. Also, a knowledge network of sector experts, practitioners and stakeholder will be formulated for ease co-learning opportunities.

F. Monitoring

Monitoring and evaluation will be an integral part of this project and have been integrated into the proposed objectives for setting up a framework for sectoral monitoring of the city level efforts. In addition, to monitor the progress of the sector and partner cities, the project will also track its own progress in delivering the indicated results.

G. Intended Outcomes

The project will work towards achieving the following outcomes and assist the national, state and city level governments in achieving aligned goals:

- a) *Easing the understanding of policies and provisions for PwDs for relevant stakeholders/practitioners at different levels through simplification and revision of existing guidelines.*
- b) *Developing a comprehensive repository of contextual challenges, possible solutions, toolkits and experts in matters pertaining to PwD in urban India.*
- c) *Developing collaborative engagement and operating models with key stakeholders (such as municipalities), which can help sustain the above solutions by undertaking pilot projects in the partner cities.*
- d) *Capacity building and dissemination of knowledge with respect to PwD among key stakeholders. This will be achieved through knowledge management and training.*

III. CONCLUSION

The efforts under BASIIC will support the Government of India programs in the pilot cities and will try to propagate the results. It is envisaged that the learnings of the project will be useful in developing programs and policy recommendations at the national level. In convergence with the Smart Cities Mission program and Accessible India Campaign, the project will allow Indian cities to secure benefits through their institutional capacity building, design challenge and pilot demonstration efforts.

ACKNOWLEDGMENT

The authors would like to thank the BASIIC program team and director at NIUA for feedback and inputs. Special

thanks to Smart Cities Mission team at MoHUA and in the 100 Smart Cities for operational support on a continuous basis. This paper would not have been possible without the funding support by Department for International Development of UK Government through an Accountable Grant to NIUA.

REFERENCES

- [1] GoI, "Smart City Mission," MoHUA, 2015. [Online]. Available: <http://smartcities.gov.in/content/>. [Accessed February 2020].
- [2] PIB, MoHUA, 2018. [Online]. Available: <https://pib.gov.in/newsite/PrintRelease.aspx?relid=183389>. [Accessed February 2020].
- [3] Office of the Registrar General and Census Commissioner, India, MoHA, GoI, [Online]. Available: http://censusindia.gov.in/2011census/population_enumeration.html. [Accessed February 2020].
- [4] GoI, [Online]. Available: https://dghs.gov.in/WriteReadData/Orders/201807110205070537024SKM_554e18071113560.pdf. [Accessed February 2020].
- [5] NIEPMD, [Online]. Available: <http://niepmd.tn.nic.in/documents/PWD%20ACT.pdf>. [Accessed February 2020].
- [6] GoI, "SwachBharat," MoHUA, [Online]. Available: <http://swachhbharaturban.gov.in>. [Accessed February 2020].
- [7] GoI, "HRIDAY," MoHUA, [Online]. Available: <https://www.hridayindia.in>. [Accessed February 2020].
- [8] GoI, "AMRUT," MoHUA, [Online]. Available: <http://amrut.gov.in/content/>. [Accessed February 2020].
- [9] GoI, "PMAYU," MoHUA, [Online]. Available: <https://pmaymis.gov.in>. [Accessed February 2020].
- [10] "Rights of Persons with Disabilities Act," [Online]. Available: <http://www.iitg.ac.in/eo/sites/default/files/RPwDAct2016.pdf>. [Accessed February 2020].
- [11] BASIIC, NIUA, December 2019. [Online]. Available: To be available on NIUA website.
- [12] MoSJE, PIB, [Online]. Available: <https://pib.gov.in/newsite/erecontent.aspx?relid=67565>. [Accessed February 2020].
- [13] World Bank, [Online]. Available: <http://siteresources.worldbank.org/INDIAEXTN/Resources/295583-1171456325808/Chapter07.pdf>. [Accessed February 2020].
- [14] "Disable Persons in India- A statistical profile,2016," Ministry of Statistics and programme Implementation, GoI, Delhi, 2016.
- [15] GoI, "Accessible India Campaign," DEPwD, MoSJE, GoI, [Online]. Available: <http://accessibleindia.gov.in/content/>. [Accessed February 2020].
- [16] MoE&IT, GoI, [Online]. Available: <https://www.digitalindia.gov.in/infrastructure>. [Accessed February 2020].
- [17] Bureau of India Standards, *National Building Code*, Delhi: GoI, 2016.
- [18] MoHUA, *Harmonised Guidelines*, Delhi: GoI, 2016.