PLANNING STRATEGIES FOR INCORPORATING ACCESSIBILITY FOR DIFFERENTLY ABLED IN THIRUVANANTHAPURAM CITY

THESIS REPORT

Submitted by

Allen J Jose (TKM20MUP002)

MUP (2020 - 2022) BATCH

to

the APJ Abdul Kalam Technological University in partial fulfillment

of the requirements for the award of the

Post Graduate Degree of M. Planning in

Urban Planning

URBAN PLANNING

DEPARTMENT OF ARCHITECTURE

THANGAL KUNJU MUSALIAR COLLEGE OF ENGINEERING

Karicode, Quilon 691005

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DEPARTMENT OF ARCHITECTURE

THANGAL KUNJU MUSALIAR COLLEGE OF ENGINEERING

CERTIFICATE

Certified that the Project entitled **"Planning Strategies for Incorporating Accessibility for Differently abled in Thiruvananthapuram city"** submitted by **Allen J Jose(TKM20MUP002)** of MUP (2020-22) BATCH, in partial fulfillment of the requirements for the award of Post-Graduate Degree in Urban Planning, under the APJ Abdul Kalam Technological University is a bonafide work carried out by them under our guidance and supervision.

THESIS GUIDE

Asst. Prof Ann Maria Joseph
Associate Professor
Department of Architecture
TKMCE

HEAD OF THE DEPARTMENT

Dr Annie John
Department of Architecture
TKMCE

INTERNAL EXAMINER

EXTERNAL EXAMIN

DECLARATION

I hereby declare that the project entitled **"Planning Strategies for Incorporating Accessibility for Differently abled in Thiruvananthapuram city"** is a bona fide record of the study done as part of Thesis work of under the supervision of Dr. Annie John during the **Fourth Semester M. Plan (2022)** Post Graduate Degree Course in the Department of Architecture, Thangal Kunju Musaliar College Of Engineering, Kollam. I declare that, to the best of my knowledge, the work reported herein does not form part of any other project report or thesis on the basis of which a degree or award was conferred on an earlier occasion to any other candidate.

Place: Kollam

Date: 14/09/2022

Allen J Jose

(TKM20MUP002)

MUP (2020 - 2022) Batch

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Allen J Jose

(TKM20MUP002)

MUP (2020 - 2022) Batch

ABSTRACT

India is rapidly urbanizing and growing in population. Even though India has a population of over 1.36 billion people, approximately 2.2 percent of the population suffers from a serious mental or physical handicap. Targeted measures for the health and well-being of individuals with disabilities are becoming increasingly important in today's progressive society when integration and inclusion of all people are highlighted as the key to sustainable development.

The Smart City Initiative aims to enable local area development and harness technology, particularly technology that leads to Smart results, to boost economic growth and improve people's quality of life. This initiative provides for the implementation of smart solutions to aid in incorporating disability access in planning. Targeted strategies for the inclusion of disability access in Smart city Mission in required.

This thesis identifies the parameters of disability accessibility and focuses on the recommendation of strategies to incorporate this accessibility in the Smart City Mission. The study includes an assessment of government initiatives and campaigns, strategies of Smart City Mission, Guidelines of Accessible India Campaign, and the best practices followed in incorporating disability accessibility in Urban Planning. The city of Thiruvananthapuram is delineated as the study area owing to the largest population of disabled people as per the census data. Furthermore, the implementation of Smart City Mission projects presents the best opportunity to include accessibility for differently abled people in the development process. The study area is analyzed based on the identified parameters and Key hot spots which require focused initiatives are identified. Both administrative recommendations and spatial planning proposals are proposed to increase the overall accessibility of Thiruvananthapuram city, which enables the differently abled people to access the rich cultural, heritage, administrative and recreational amenities and facilities of the study area.

Keywords: Accessibility, Smart city Mission, Differently abled, Accessible India Campaign

TABLE OF CONTENT

LIST OF FIGURES

Chapter 1. Introduction

This chapter states the overview and the need of the project. The aim and objectives are identified and stated here. The methodology, limitation and scope of this particular study are also explained here.

1.1 Overview

A person with a health condition and a specific environmental situation combine to produce a disability. When a product, service, or facility is designed or adjusted to be used by individuals of all abilities, the requirements of persons with disabilities are carefully taken into account.

One billion individuals, or 15% of the population, have some sort of disability, with developing nations having a higher prevalence of the condition. Information at hand shows a pervasive lack of accessibility for diverse people, many of whom reside in urban areas, in the built environment, from roads and houses to public buildings and spaces. People with disabilities also lack access to fundamental urban services like water and sanitation, health, education, transportation, emergency and disaster response, resilience building, and access to information and communications.

The existing lack of environmental accessibility encountered by individuals with disabilities, in particular in many cities around the world, offers a significant problem even if urbanisation has the potential to be an engineer for attaining sustainable and inclusive development for all. Since the 1980s, certain developed nations have been aware of the needs of those with disabilities who are returning from war. After that India has not yet successfully implemented urban development taking differently abled people's needs into account, despite the fact that many industrialised countries have made including differently abled persons a major element of the planning process.

Other nations have put in place a number of technology-based initiatives to make sure that individuals with disabilities are included and included in work and social life. Location-based solutions are widely used in urban areas to help the disabled in real time.

In India, 2.68 billion people, or 2.21% of the 121 billion people, are classified as "disabled" according to the 2011 Census. Similar numbers of persons experience accidents or medical conditions that leave them incapacitated. This number will also include the 90 million senior citizens of the nation. There are also 7,61843 persons with disabilities in Kerala, according to the 2011 Census. In order to meet the accessibility requirements of the expanding population, the nation and state must adopt effective and sustainable practises, laws, technology, and awareness-raising initiatives.

Focused measures for the welfare of individuals with disabilities are crucial in a time when "inclusive development" is being emphasised as the best road to sustainable development. Disabled people's exclusion from the planning process has led to a number of challenges, including the equitable provision of public services, inadequate and insufficient infrastructure, inefficiently designed public structures and housing, and restricted access to accessible and affordable public transportation.

Differently abled people are excluded and marginalised in urban environments due to barriers to information and communication, including relevant technologies, as well as cultural attitudes, such as negative stereotyping and stigma. Lack of accessibility considerably worsens the precarious and vulnerable situations that individuals with disabilities already face, leading to disproportionately high rates of suffering, marginalisation, and poverty.

Additionally, it is evident from the study and data that include disability access in the planning process adds only 1% to the overall cost. Rebuilding, restoring, or redesigning out dated, inaccessible infrastructure or facilities to make them more accessible and inclusive is typically more expensive. When big groups, like people with disabilities, are excluded, economies stand to lose a lot more when taking into account the loss of human capital and opportunity cost incurred as a result of inaccessibility.

It is clear that there is a push to build an inclusive smart city when one considers the number of projects that are just getting off the ground that offer technological solutions for persons with disabilities. However, the practical solutions put forth either lack a viable

economic model or are based on technology that continues to ignore the actual demands and uses of persons with disabilities.

The Smart Cities Mission, which combines the provisions of the Digital India and the Accessible India Campaign to create an inclusive environment that leaves no one behind, presents the greatest opportunity to ensure inclusion and participation of people with disabilities in all new developments that will now take place in India. The Accessibility India Campaign, however, is absent from the mission objectives when looking at the key campaigns of the smart city mission. Therefore, the study can aid in developing suggestions and plans for the Smart City programme to make cities more accessible for individuals with disabilities.

1.2 Aim

To implement planning strategies to incorporate Accessibility for differently abled people in Thiruvananthapuram city.

1.3 Objectives

- To conduct a study on current conditions, limitations, standards and parameters regarding accessibility for differently abled in Smart city development in India.
- To delineate the study area and study the exisiting conditions of accessibility for differently abled in the study area.
- To conduct an study with the parameters and identify issues and potentials of the study area.
- To study best practices in Accessibility for differently abled through case studies.
- To implement Smart solutions, Built strategies and planning regulations in the Urban development of the study area under the Smart city mission.

1.4 Methodology

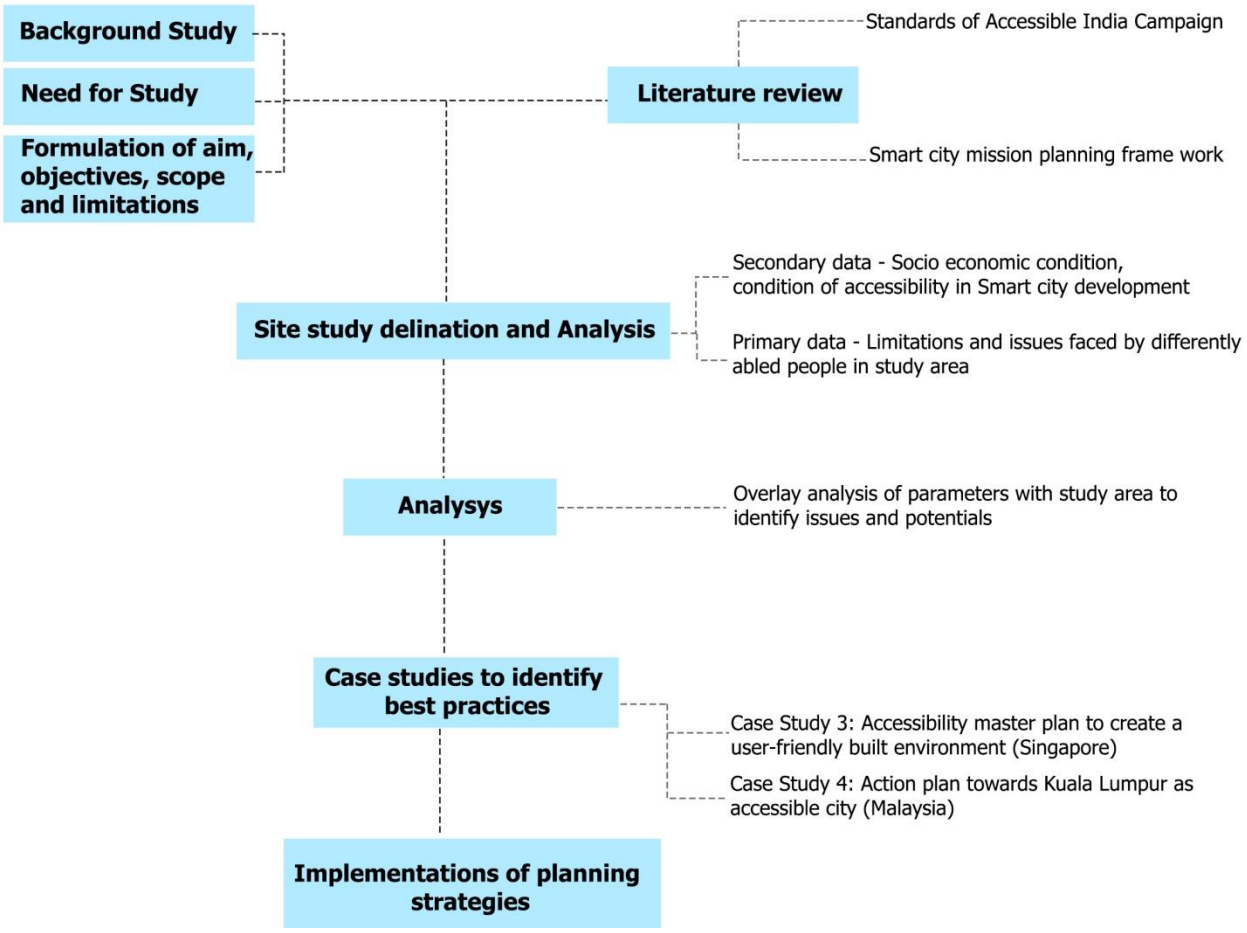


Figure 1 Methodology of Project

1.5 Scope of Study

Since cities of tomorrow cannot be truly sustainable unless it includes all its citizens in its urban development, planning for people with disabilities is a necessity**.** By enabling access to urban centres and transit for people with disabilities, cities would only increase economic productivity and prosperity**.** Hence integrating disability access and mobility in urban planning will always be essential as long as sustainable urban development remains relevant.

1.6 Limitations

According to 2011 census disability in vision (19%) and movement (20%) constitute the largest group in the disabled population. Only these major disabilities are considered for the purpose of this study.

CHAPTER 2. Literature Review

This elucidates the major terminologies and components related to accessibility for differently abled. The guidelines and requirements of Smart city mission and Accessible India Campaign are explained here. The indicators needed for the study are also identified

2.1 Universal Design

Universal Design essentially introduced in 1985 by Ronald Mace, a disabled architect, who defines UD as “a design of products and environments usable by all people to the greatest extent possible, without the need for adaptation design' where it applies to all ages, personal abilities and sizes, with an inclusive capability that goes beyond barrier-free and accessible design”

This is not a special requirement, for the benefit of only a minority of the population. It is a fundamental condition of good design. If an environment is accessible, usable, convenient and a pleasure to use, everyone benefits. By considering the diverse needs and abilities of all throughout the design process, universal design creates products, services and environments that meet peoples' needs.

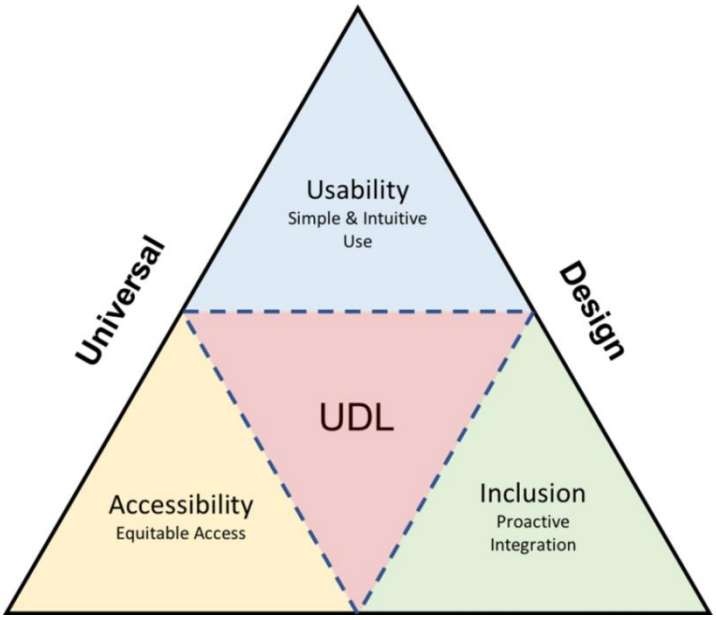


Figure 2 Principles of Universal Design

2.2 Accessibility

Defining accessibility is that the quality of a built environment can be accessed by people with physical disabilities or the elderly. Accessibility is the concept of whether a product or service can be used by everyone—however they encounter it.

2.3 Barrier Free Design

In parallel but contrasting, the term barrier-free design is a design concept to make a built environment accessible to people with physical disabilities or older people by removing the architectural barriers present in existing buildings

2.4 Inference

From the definitions of the terms Universal design, and Barrier free design, it is evident that the terms are not inter-changeable.

Hence factors like existing site condition, administrative structure, peoples participation and best practices is accessibility needs to be thoroughly analysed, in order to find the most suitable method or a combination of both.

2.5 Smart City Mission

India's major economy has had the world's fastest growth, averaging over 7% annual growth during the past ten years. India's growth story is being told in every city, from large metropolitan areas to small communities. To take advantage of the opportunities and successfully address the issues of growing urbanisation, the Government of India launched one of the world's largest suites of urban rejuvenation programmes in 2015, under the leadership of the Prime Minister.

A smart city's primary goal is to revitalise cities by improving their competitiveness and service delivery. The major objective is to use technological breakthroughs to resist the pressure of urbanisation so that its residents can receive better services and a higher standard of living.

2.5.1 Components of Area-Based Development In The Smart Cities Mission

1. City improvement (retrofitting)
2. City renewal (redevelopment) and
3. City extension (green field development)

goal.

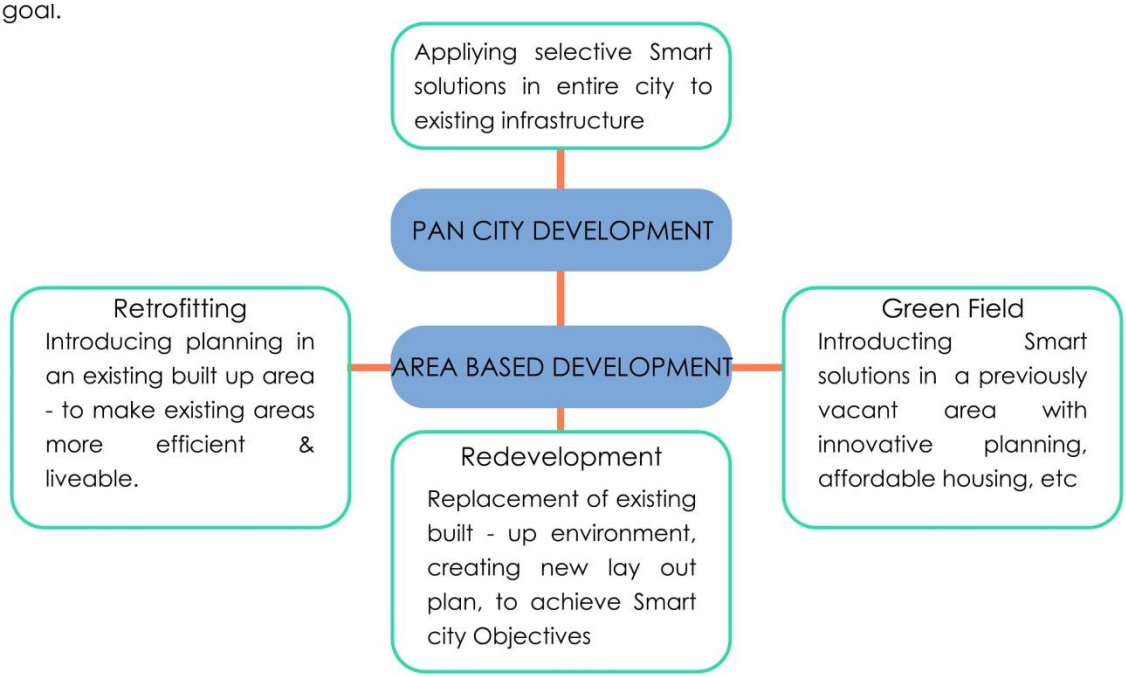


Figure 3 Smart city Mission strategies

Source - *https://www.india.gov.in/spotlight/smart-cities-mission-step-towards-smart-india*

2.5.2 Objectives of the Smart Cities Mission

As is evident from the figure, Accessibility India campaign is missing from the mission objectives of Smart city mission Initiative. In the case of Phase 1 smart city initiatives like Surat etc development initiatives dedicated for Accessibility for differently abled are implemented. But in the case of Thiruvananthapuram city, focused initiatives for differently abled people are yet to be implemented. The goal, with its emphasis on

inclusivity and convergence, falls short of including disability as a major concern in its plan for smart cities. Accessibility for people with impairments is not one of the key infrastructural components in a smart city.

Figure 4 Objectives of Smart city Mission

Source - Structural framework for Accessible Urban Infrastructure in Smart Cities, NCPEDP

2.5.3 Challenges of Smart City Mission

- Absence of Benchmarks for Accessibility features as in the case of other services.
- Absence of a specific regulatory authority to ensure accessibility features in each and every project under the mission.
- Lack of awareness regarding need for improved accessibility for persons with disabilities by the stakeholders (SPVS's, project management consultants etc)
- Poor coordination between government agencies (lack of participation of nodal officer for accessibility India campaign in planning process)
- Poor understanding of laws and policies making accessibility mandatory in Smart city planning and their poor implementation.

- Lack of public participation in the planning process.

Hence the project aims to overcome these challenges by developing a planning strategies (from the planning process to the implementation and management stage) for Thiruvananthapuram Smart city Mission.

2.6 Accessible India Campaign

On December 3rd, 2015, the Government of India launched the Accessible India Campaign, a flagship initiative to promote a barrier-free environment for people with disabilities. The campaign aims to create real physical and virtual infrastructure that is inclusive of people with disabilities and fully accessible to them as well as to make public spaces, the transportation system, and information and communication technologies widely accessible.

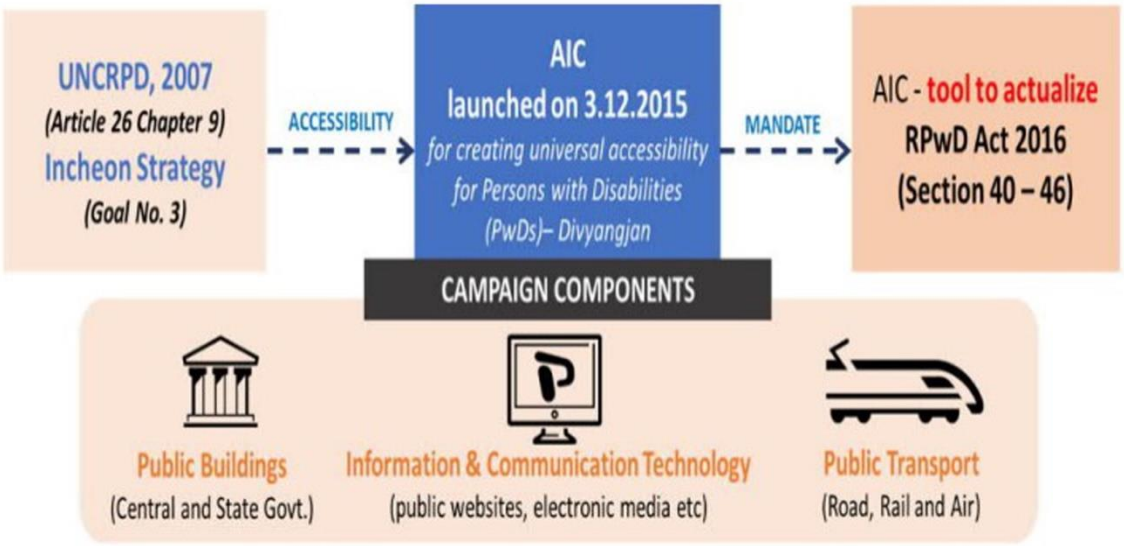


Figure 5 Components of Accessible India Campaign

Source - *https://niepid.nic.in/Accessible_India_Campaign.pdf*

To provide full legislative cover to the Campaign and right to accessibility, the government enacted the Rights for Persons with Disabilities (RPwD) Act, 2016 which came into force from April 2017. Accessibility became a Right for the Divyangjan unlike previously, when it was being seen merely as a welfare measure. Non-compliance of the

provisions of the Act or Rules thereunder has been made punishable by fines and imprisonment.

Figure 6 Features of RPD Act

Source - *https://niepid.nic.in/Accessible_India_Campaign.pdf*

2.6.1 Achievements of Accessible India Campaign

Public Buildings –

1524 buildings already made accessible by providing accessibility features such as ramps, lifts, toilets, parking, etc. These include – 1030 Central Government buildings and 494 buildings in States/UTs. Access audits of 1662 State/UT Government buildings have also been completed (funded by the Central Government)

Transportation Sector -

Airports – All 35 international and 55 out of 69 domestic airports have been provided with features of accessibility.

Railways – 1391 stations provided with features of accessibility, including 603 railways stations also provided with accessible inter platform transfer and markings on edges of platforms.

Public Transport – State Transport Undertakings - 42,169 (28.61%) buses made partially accessible and 10,175 (6.90%) made fully accessible.

2.7 Guidelines for Disability Accessibility

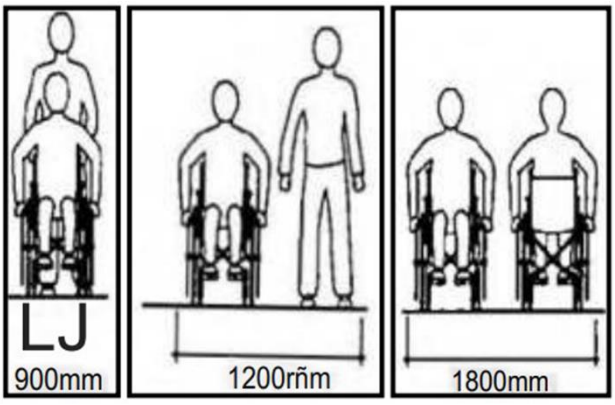
2.7.1 Public Buildings

Accessible Route/Pathway	900-1800 mm, anti skid surface, tacyile pathway, signage (directional and informational), well lit and unpbscured pathway
Accessible Parking	5000 x 3000 mm, with 30 m of entrance, transfer bay, connected to accessible route, vertical and on floor signage.
Accessible Entrance to Buildings	900-1800 mm width, ramp with 1: 12 gradient and double height handrail with proper grips rounded at edges, anti skid floorings, color contrast, main door to be provided with minimum width of 1000 mm, signage prominantly displayed.

Figure 7 Requirements for Outside features

Source - Author generated with reference to Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

2.7.2 Pedestrian Pathway



The pathway should be at least 1800mm wide. The surface of the walkway should be different from the rest of the space and should be made of non-slip material. Vehicle traffic ought to cross the walkway. There should be warning blocks placed 300mm before and after the pathway is finished.

Figure 8 Requirements for pedestrian pathway

Source - Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

2.7.3 Access Ramps

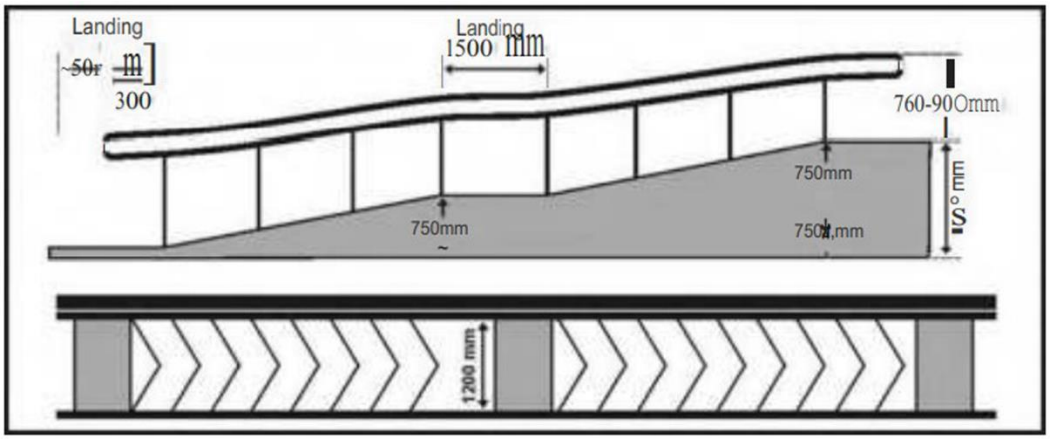


Figure 9 Requirements for access Ramps

Source - Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

At intersections of circulation routes and important locations like doorways, reception points, facilities like telephones, drinking water facilities, restrooms, and areas where hearing enhancement devices are installed, information and direction signs should be supplied. Directional signs should clearly show return routes to specified exits and should quickly identify and provide a logical sequence from a starting point to a point of goal. The signing system should use the same destination names throughout. At both ends of a route, it should be made clear whether there are any steps or ramps present.

2.7.4 Kerb Ramps

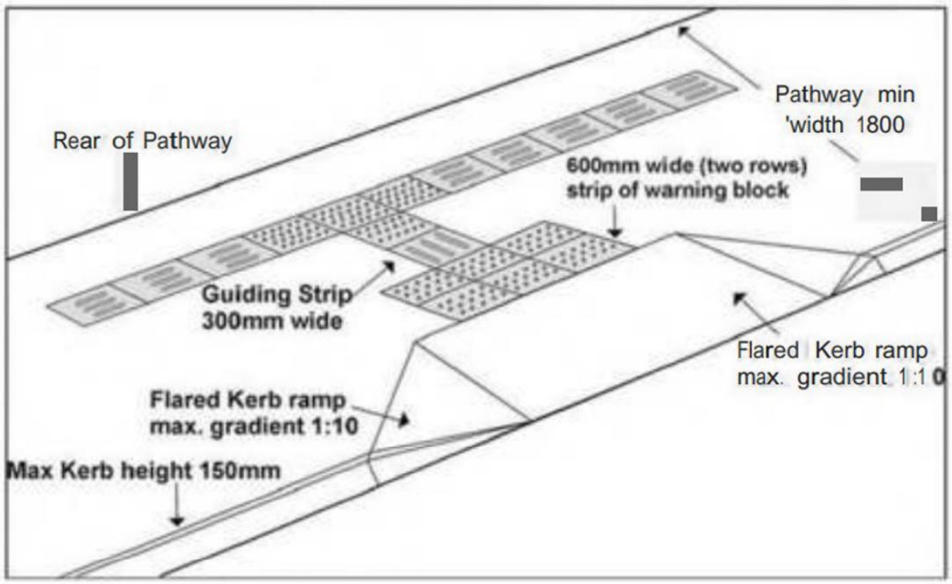


Figure 10 Requirements for Kerb ramps

Source - Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

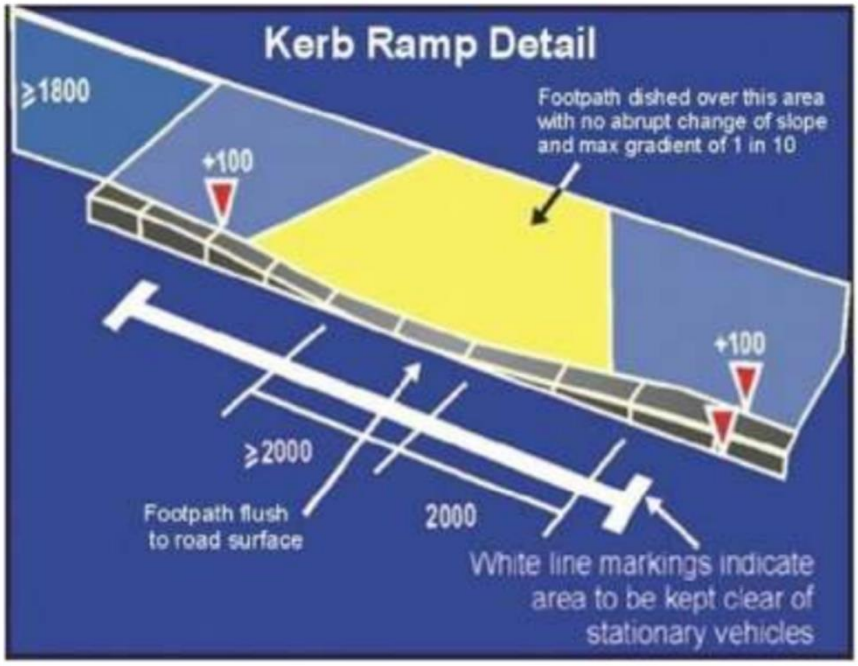


Figure 11 Requirements for kerb ramps

Source - Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

Where the vertical elevation is less than 150 mm, kerb ramps are offered. It should have a non-slip surface and be constructed such that water cannot collect on the walking surface. The ramp shouldn't protrude onto the road's surface, and it should be placed or protected to prevent blockage by parked cars. Signposts, traffic signals, and other obstructions should not be present either.

2.7.5 Subways and Foot Over Bridges

People with impairments should be able to use the subway and footbridges. This can be done by putting up signs in key locations, and wheelchair accessibility is made possible by the use of slope ramps or lifts at both ends. Maintaining the walkway free from any impediments and projections; ensuring that the walkway is at least 1500 mm wide; installing tactile guiding and warning blocks along the walkway's length; and putting seats at regular spaces along the route and at landings for people with ambulatory limitations

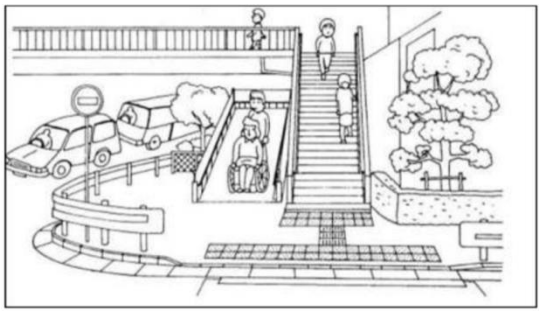


Figure 12 Requirements for Foot Over bridges

Source - Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

2.7.6 Busses and Bus Stops

The following attributes should be included on accessible buses: Bus doors must be at least 1200 mm wide, have a low floor, a railing, and a footlight, among other requirements. Install a device, such as a hydraulic lift or a pull-out, folding ramp, in the doorway to accommodate people using mobility aids or strollers. Wheelchair accessibility should be accommodated in a suitable location without impeding other passengers' ability to board and disembark. Wheelchair safety straps and wheel stoppers ought to be available.

Figure 13 Requirements for Busses

Source - Harmonized guidelines and space standards for barrier free built environment for persons with disability and elderly persons, 2016

Ramps Bus stops that are not level with walkways or pathways should have two separate ramps for passengers to board and exit. There should be a kerb ramp installed when there are curbs between the access aisle and the vehicle pickup area.

2.8 Indicators of Disability Inclusion and Accessibility

The accessibility for differently abled people can be measured based on three parameters – Transportation, Public facilities and ICT services.

2.8.1 Transportation

It encompasses legislation on air, rail, road, and water transportation that includes essential accessibility requirements. The quantity and percentage of accessible transportation service units, broken down by mode of transportation (e.g., bus, train, tram, metro, taxi, etc.) and service type (e.g., public service/private IV service) are considered for this parameter. It also includes taking steps to guarantee that people with disabilities have access to alternate, accessible transportation services. As a result, it can be summed up as the percentage of the population, broken down by sex, age, and people with disabilities, who have easy access to public transportation.

2.8.2 Public Amenities

Mandatory accessibility criteria for the built environment and public services are incorporated into legislation on building and planning, including procedures to provide authorization. The quantity and percentage of existing public and governmental structures and facilities that adhere to accessibility criteria are also included. The percentage of people with disabilities reporting access to public buildings in urban and rural locations, including governmental structures in national and regional capitals, can be used to summarise it.

2.8.3 ICT Services

It is the legal framework providing requirements for information and communication accessibility for both public and private actors, including mass media and the internet, that provide information and services to the general public. The percentage of content offered by "on-demand" or non-linear services (such video on-demand services) that offers sign language interpretation, audio description, captioning, and other accessibility-related features and means. The percentage of people with disabilities who are satisfied with their capacity to use the internet and emergency services through ICT, broken down by sex, age, and disability, can therefore be used to summarise it.

OTHER INDICATORS - implementation of accessibility audits on government programmes, services, and facilities that call for participation from organisations that represent people with disabilities, especially in emergency protocols, procedures, services, and facilities. adoption of procurement guidelines for the government that outline accessibility and universal design standards and mandate that goods and services have these features. The promotion of universal design and accessibility standards among relevant experts, manufacturers, and service providers as well as the education of people on their legal and ethical obligations with regard to accessibility are all goals of awareness-raising campaigns and activities. Processes used to guarantee the active participation of people with disabilities, including through their representative organisations, in the design, implementation

2.8.4 Inference

For the purpose of this study, the indicators related accessibility of physical services are considered. Hence the parameters to be considered when implementing accessibility for differently abled are – Transportation network and Provision of Public amenities.

Chapter 3. Introduction to Study Area

This chapter discusses the study area context and the present conditions of accessible services and amenities. The hotspot areas where accessible issues arises are identified and analysed based on level of Accessibility.

3.1 Thiruvananthapuram City

Thiruvananthapuram is the capital of Kerala, an Indian state. The municipal corporation covers 214.86 km2 and has nine hundred wards with a population of 9,57,730 people. As of 2016, it is Kerala's biggest information technology centre, accounting for 55 per cent of the state's software exports.

For the purpose of the study, the ABD area is delineated for the purpose of action interventions.

43 projects were proposed to the Indian government with the goal of improving the city's basic infrastructure and utilising IT-based solutions to make it smarter.

The projects are broken down into two groups: area-based development (ABD) projects that are retrofitted for nine wards in the City Centre and pan city solutions (IT-based solutions) for the entire corporation.

3.1.1 Why Thiruvananthapuram Smart City?

As per the disability census of 2014-2015 Thiruvananthapuram has a total of 80822 differently abled people out of the total of 761843 differently abled people in the state which is the highest among all districts. In this 11757 are visually impaired , 11012 are hearing impaired, and 19095 people have physical disabilities.

Smart Cities Mission presents the greatest opportunity to ensure inclusion and participation of differently abled in all new developments that will now take place in India, combining together the provisions of the Digital India and the Accessible India Campaign to create an inclusive landscape that leaves no one behind.

Furthermore the exclusion of Accessibility India campaign from the main objectives of smart city mission provides opportunities for proper implementation of disability access into the smart city frame work.

Figure 14 Key map – Study area

Source – Author generated with reference to Smart city Mission

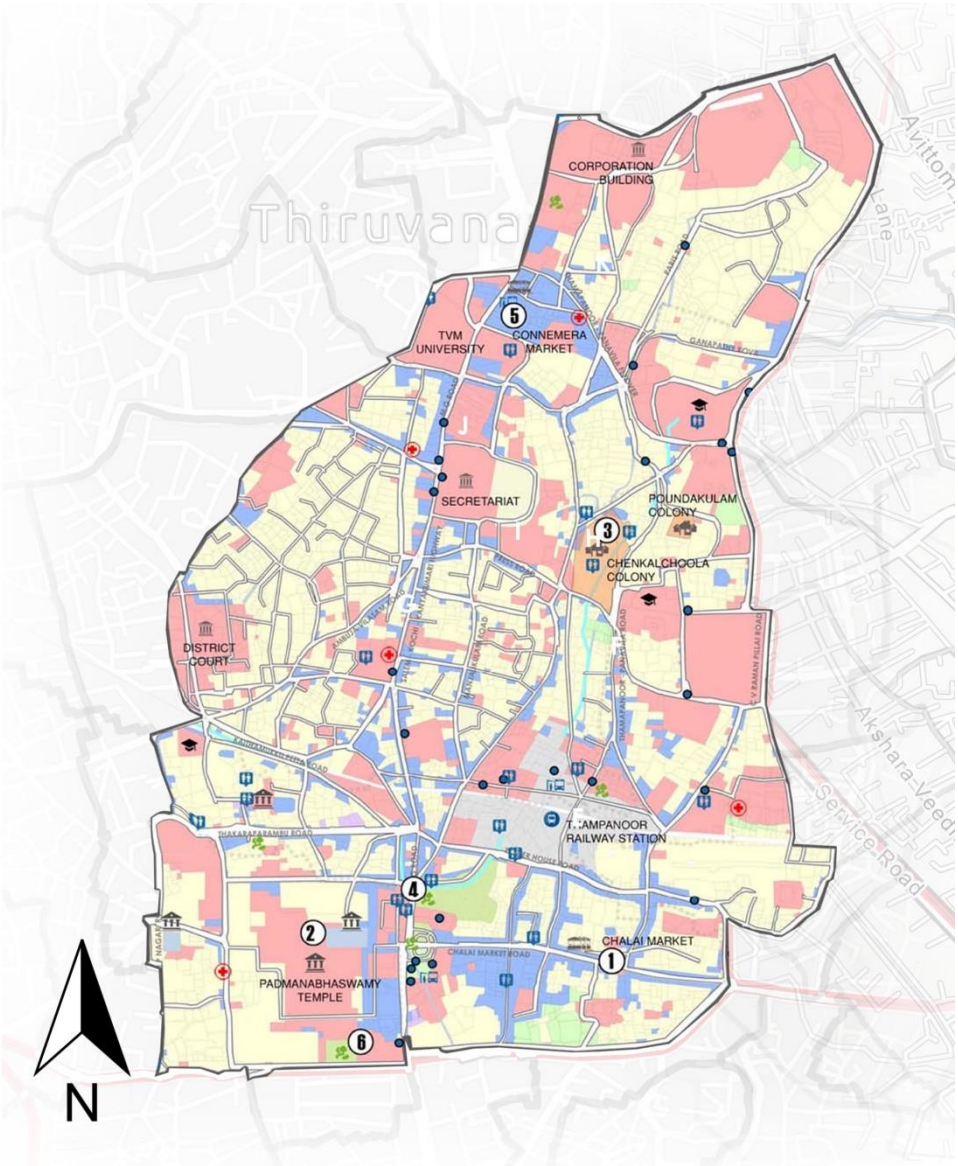
The ABD has high density Mixed use Development which includes -Administrative buildings, Buildings with cultural and heritage importance, Institutional and religious buildings, Traditional housing settlements as well as slums.

The selected 9 wards also has High heritage buildings

3.1.2 Importance of Study Area

As per the disability census of 2014-2015 Thiruvananthapuram has a total of 80822 differently abled people out of the total of 761843 differently abled people in the state which is the highest among all districts. In this 11757 are visually impaired , 11012 are hearing impaired, and 19095 people have physical disabilities. Furthermore in the user rated app Wheel map, in which differently abled people can rate the accessibility of public spaces and buildings, the ABD area shows high number of accessible issues, especially along the railway station/bus station area.

3.2 Land Use



Landuse	Area	
Residential	640.48	45.60%
Public & Semipublic	389.65	27.80%
Commercial	162.15	11.60%
Transportation /Roadways/Railways	159.89	11.40%
Parks/Open Spaces	23.46	1.70%
Agricultural land	18.13	1.30%
Water Bodies	7.72	0.60%
Industries	1.85	0.10%

Figure 15 Land use Map

Source – Author generated with reference Smart city Thiruvananthapuram LTD

The Land use map shows a High concentration of residential, Public/Semi public and Commercial spaces in the ABD area. This along with the cultural importance of the wards results in an influx of daily commuters for Administrative, Institutional, Educational and healthcare purposes. The MG road forms the main spine of the ABD area with primarily cultural, commercial and administrative importance. The Vanchiyoor ward , housing the district court also in an important place especially for differently abled people. But the junction is inadequately set up for the amount of traffic and pedestrian volume it carries. Furthermore the user rated disability app – Wheel map for the ABD area also indicates high accessibility issues. The barriers in accessibility in the study area, especially transportation accessibility results in the differently abled people being unable to properly access these services.

3.3 Accessibility Study

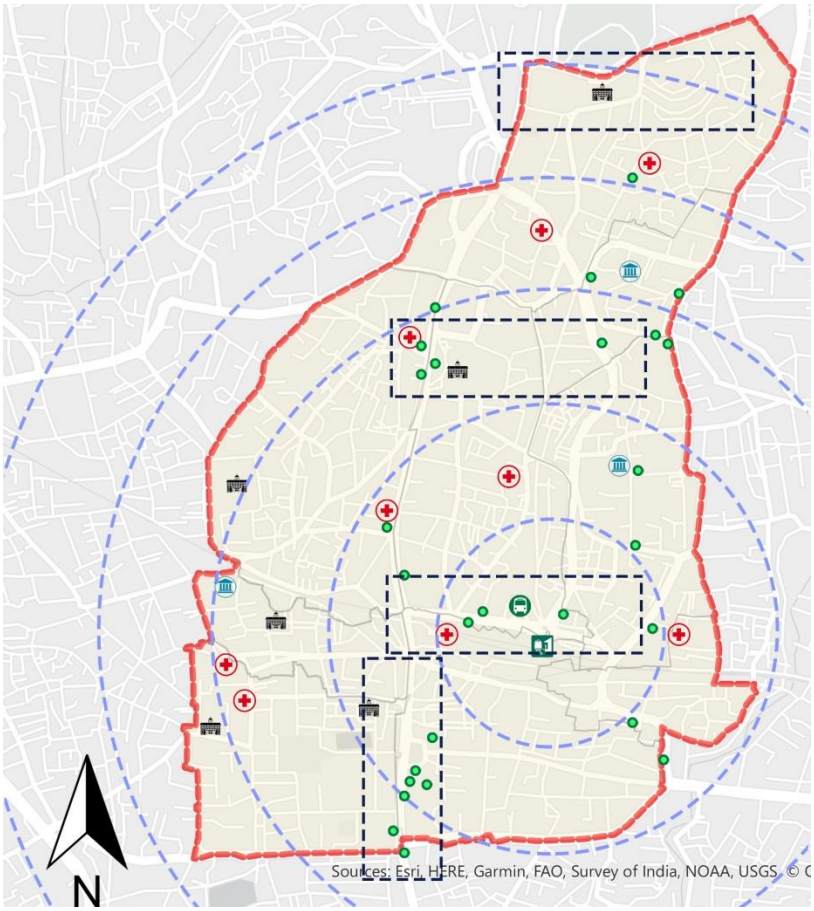


Figure 16 Hotspots/problem areas

Source – Author generated with reference Smart city Thiruvananthapuram LTD

For the accessibility study specific hotspots have been identified based on accessibility issues raised in 'Wheelmap.org', a user rated app highlighting issues in accessibility. For the purpose of this study areas with high accessibility issues were identified and analysed based on land use and data from primary survey.

1. PALAYAM WARD -

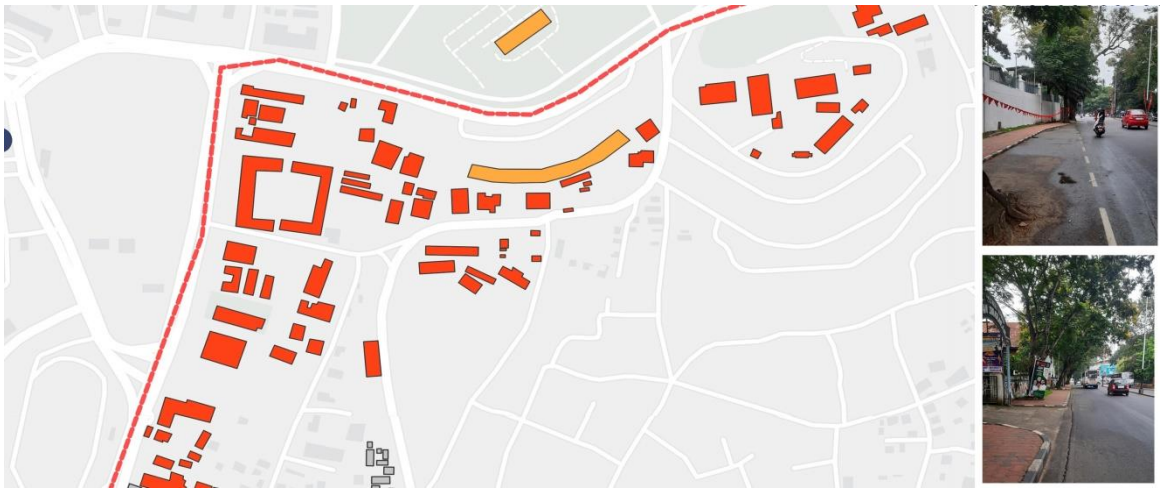


Figure 17 Condition of Accessibility – Palayam ward

Source – Author generated

Discontinuous footpath and lack of ramps for the footpath presents accessibility issues for visually and physically impaired people. Most of the secondary and tertiary roads are lacking proper pedestrian pathways, especially in important shortcuts(Museum -Palayam road) etc. There is a distinct lack of safe differently abled crossings along the major junctions. Overhead footbridges are necessary to ensure this.

2. VANCHIYOOR WARD -

Figure 18 Condition of Accessibility – Vanchiyoor ward

Source – Author generated

Bus stops having a level difference from the footboards in busses creates inaccessibility even in case of specially designed low floor busses. Traditional information boards in busses and bus stops create barrier for visually and hearing impaired people. Kerb ramps are not provided to access the footpaths from the roads. Although sufficient footpaths are present along the main MG road corridor and the secondary roads, it has inadequate width to accommodate wheelchair users.

3. THAMPANOOR WARD -

Figure 19 Condition of Accessibility – Thampanoor ward

Source – Author generated

Accessible ramps and tactile facilities are provided in Important public buildings like KSRTC Bus station and the railway station. This is upgraded under the Accessibility India campaign Services provided includes tactile paths for visually impaired throughout ther interior of the Thampanoor Bus stand as well as the railway station and ramps for physically challenges people. However a discontinuity of services for differently abled can be seen in the case of the immediate surroundings.

1. EAST FORT WARD -

In the case of East fort ward where there is a concentration of commercial, transportation and recreational facilities, the pedestrian pathway is to narrow by normal standards - hence focused initiatives for accessibility for differently abled people is needed. Landuse

map shows high concentration of heritage buildings in the area which are inaccessible for both visually and physically impaired people

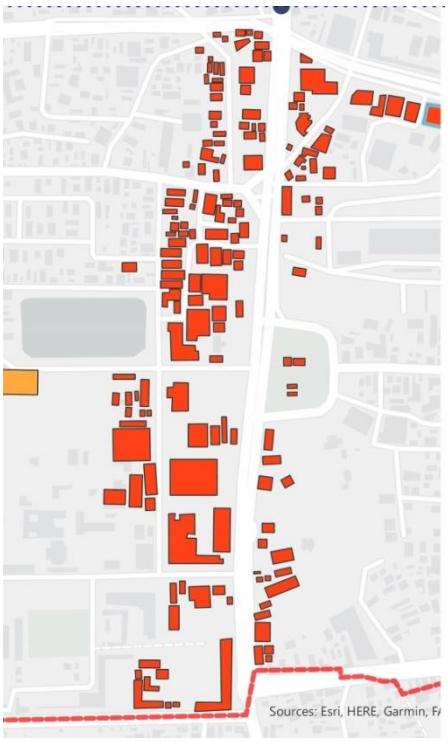
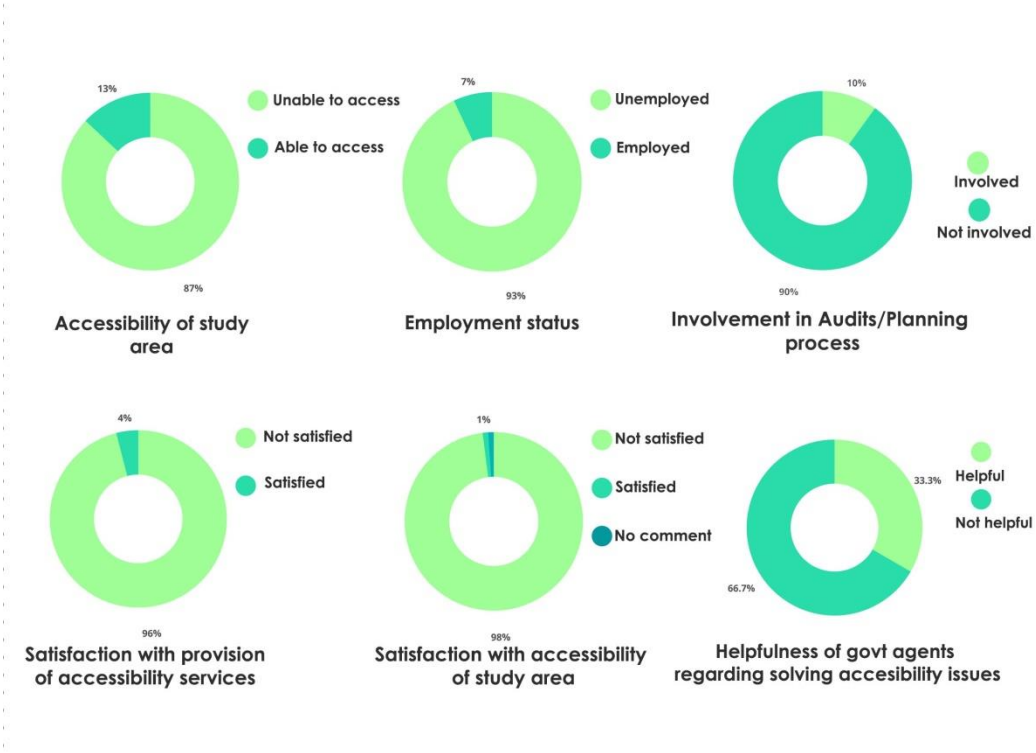


Figure 20 Condition of Accessibility – East fort ward

Source – Author generated

3.4 Primary Survey Details



Sourc

e – Author generated from Primary survey data

A Sample survey was conducted (online and direct) on 6/7/2022 to 8/7/2022 from 65 differently abled individuals who were residing both inside and outside the study area. 87% of the participants expressed the need to access the ABD area for various purpose (Administrative/Recreational/Commercial) but were unable to do so. The rest of the 13% are compelled to access study area, mainly for Employment/Administrative services. Furthermore out of the total samples only 7% were employed with the rest expressing the difficulty in getting employed, especially permanent employment. The discontinuity of disability accessibility services(footpaths/ramps) were raised as an issue in the case of railway station and Bus stops along the MG road.

Chapter 4. Best Practices

This chapter discusses case studies/best practices from Singapore, Hong kong and India which are analysed based on the identified parameters for disability accessibility

4.1 Singapore

4.1.1 Introduction

Singapore is an island city-state with a high-rise and high-density urban form. The city covers a total area of 719 sq. km, with a population of 5.6 million. Singapore has been implementing improvements to increase accessibility throughout the entire nation and to increase the accessibility of individuals with disabilities. At the early stages of the development of the nation, providing accessibility services was secondary to maximizing land resources for the growing population's economic and housing demands. The problem of accessibility was debated in the 1980s, leading to legislation requiring barrier-free accessibility in buildings under the Building Control Regulations Act, 1989.

Singapore's population, like that of many other countries, is rapidly ageing. It is predicted that by 2030, 20% of the resident population would be 65 or older. With a fast ageing population, it was critical to prepare for a user-friendly built environment.

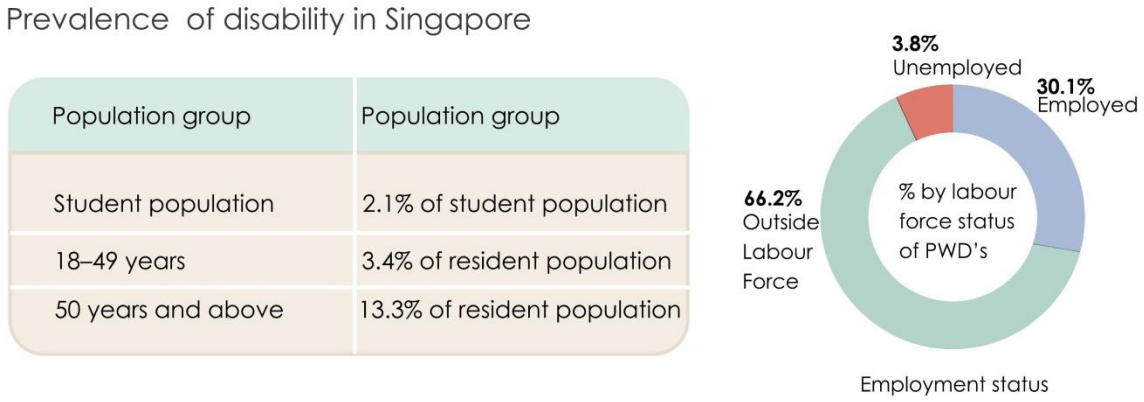


Figure 21 Disability statistics - Singapore

Source – Author generated with reference to https://disabilityin.org/country/singapore/

Therefore an Accessibility Master plan was developed by the Building and Construction Authority to create an inclusive built environment.

4.1.2 Challenges in Built Environment

- Most of the buildings before 1990 were not barrier-free as mandatory barrier-free requirements were only imposed after 1990

- Universal design principles were not being followed in the provision of services and facilities for differently abled people.
- Major issues in interconnectivity were present which prevented building connectivity as well as access to other services.

4.1.3 Project Strategies

The project aims in raising the accessibility standards for differently abled and drive the adoption of Universal Design (UD) in the built environment. The Accessibility Master plan deals with the accessibility concerns of the past, present, and future through a multi-pronged approach.

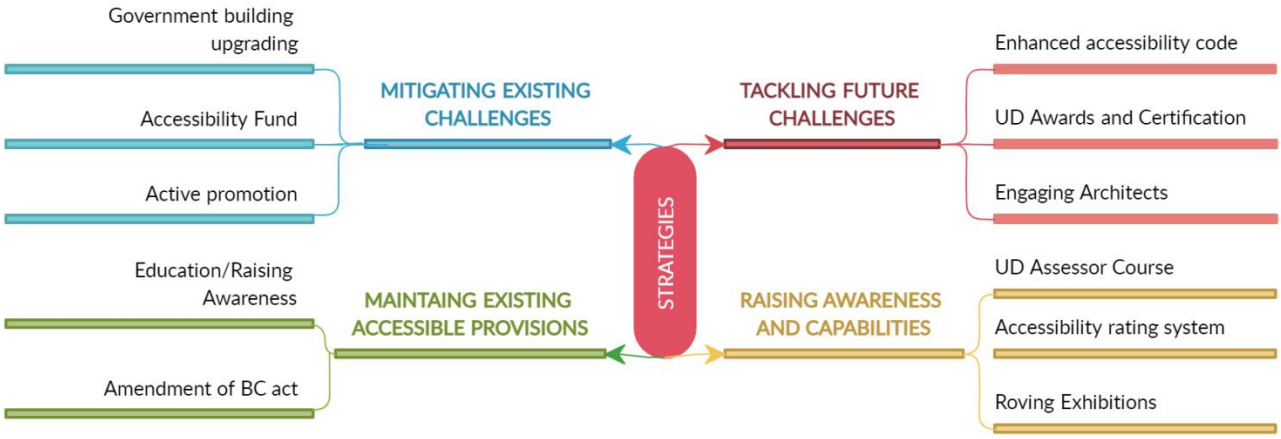


Figure 22 Accessibility master plan strategies

Source – Author generated with reference Good practices of Accessible Urban development, United Nations

MITIGATING EXISTING CHALLENGES – BCA implemented a five-year Accessibility Improving Programme (2006-2011) to help the public and commercial sectors in upgrading major buildings to incorporate accessibility for differently abled. An Accessibility Fund incentive of 40 million Singaporean dollars is also provided to split the cost of development of basic accessibility measures adopted by private sector building owners. Under this strategic thrust, the up gradation of government buildings were carried out to incorporated accessibility for differently abled.

TACKLING FUTURE CHALLENGES – To tackle the future challenges for accessibility, the Accessibility code was improved to incorporate both differently-abled people as well the elderly. The adoption of Universal design principles was promoted in the development of new buildings. Universal design guides were also published to help in this regard. The BCA Universal Design awards were also presented form 2006 – 2011 to acknowledge and promote stakeholders that adopt UD in their development process.

MAINTAINING EXISTING ACCESSIBLE PROVISIONS – To address overuse and removal of accessible elements, the Building Control Act was revised in 2008 to require building owners to maintain accessible features in their structures.

RAISING AWARENESS AND CAPABILITIES – A week-long program consisting of workshops, exhibitions, and conferences to raise public awareness about accessibility for Differently abled and their specific needs is conducted (Singapore Design week). Along with this a training program for building professionals, as well as students, are also conducted. An information portal in the form of friendlybuidings.org is also set up where users can raise issues in connectivity and accessibility.

4.1.4 Changes Achieved

Figure 23 Changes achieved – Accessibility master plan

Source – Author generated with reference Good practices of Accessible Urban development, United Nations

The initiative has resulted in incremental, tangible advances in accessibility as well as a broader use of UD principles in new and old buildings undergoing substantial alterations and expansions. More than 90% of the buildings along Orchard Road now have at least basic accessibility, which is an increase from 41% in 2006. As of 2012, almost 100% of the government and public buildings have been made barrier-free under this initiative. Considering only 50% of the buildings were barrier-free in 2007, the success of the Accessibility master plan in incorporating accessibility for differently-abled is evident. In 2014, the "Zero Project" also acknowledged the BCA UD Mark Certification Scheme as an innovative project for effectively encouraging building owners/developers to voluntarily adopt Universal Design. As a result, Singapore is now the most accessible city in Asia as well as being one of the most accessible cities in the world.

4.1.5 How Change Was Monitored

The monitoring and evaluation of the accessible services are essential in making sure they are being properly maintained and not misused.

In the case of Orchard road project survey forums for building owners are provided to measure accessibility services and their maintenance. Following this, an on-site Audit is conducted by the BCA to ensure the provision and maintenance of services. Furthermore, the online portal (friendlybuildings.org) is used to rate the buildings according to their accessibility. This helps the BCA in identification of areas where barriers to accessibility is present.

CHALLENGES IN IMPLEMENTATIONS – Singapore has a paucity of land. Because of the expensive cost of land, most developers are hesitant to go beyond Code compliance to include UD in their structures. The requirement for higher platform levels to avoid flash floods remains a difficulty in provision of barrier-free interconnection and building entry.

4.1.6 Findings

Provision of Accessibility fund encourages existing owners to adopt Universal Design strategies and maintain them.

Building control act and updating the Accessibility code also ensures the inclusion of accessibility services for differently abled.

Monitoring and evaluation audits are essential to receive feedback from the users and to identify problem areas.

4.2 Kuala Lumpur

4.2.1 Introduction

Kuala Lumpur is Malaysia's capital city and federal territory. It is one of Asia's fastest-growing cities and Malaysia's largest, encompassing an area of 243 km2 (94 sq mi) and with a census population of 1,982,112 as of 2020. Male Malaysians have an average life expectancy of 72.5 years, while females have an average life expectancy of 76.5 years. There is a discernible increase in disability as a result of traffic accidents and natural catastrophes, as well as an increase in being disabled after birth. As of August 2010, the number of PWD registered with the Department of Social Welfare Malaysia was 313,685, accounting for 1.16% of the population. Because registration is optional, and the World Health Organization believes that 5 - 10% is the genuine number, and the most recent unpublished census data verified that 2.7% of the population is disabled.

The Uniform Building By-law of Kuala Lumpur requires that accessibility criteria be followed. These rules apply to public building access, outdoor area access, escape routes, and minimum design criteria for public restrooms.

In 2010, the city developed the Action Plan Towards Kuala Lumpur as Accessible City to address the issue of accessibility. Subsequently, in 2012, access to the physical environment, public transportation, knowledge, information and communication became goal number three of the Incheon Strategy to “Make the Right Real” for Persons with Disabilities in Asia and the Pacific. The Malaysian government committed to achieving a 75% barrier-free environment by 2012 under the Biwako Millennium Framework: Towards an Inclusive, Barrier-free, and Rights-based Society for Persons with Disabilities in Asia and the Pacific in 2002. The government passed the Persons with Disabilities Act in 2008, which includes accessibility regulations as well as a concept of Universal Design. The city created the Action Plan Towards Kuala Lumpur as an Accessible City in 2010. As a result, access to the physical environment, public transit, knowledge, information, and communication became the third aim of the Incheon Strategy to "Make the Right Real" for Persons with Disabilities in Asia and the Pacific in 2012.

4.2.2 Project Strategies

The 2010 Action Plan for Kuala Lumpur as an Accessible City outlines an implementation framework that includes workshops, access audits, and a holistic focus on all three stages of the construction process: design, construction, and post-construction.

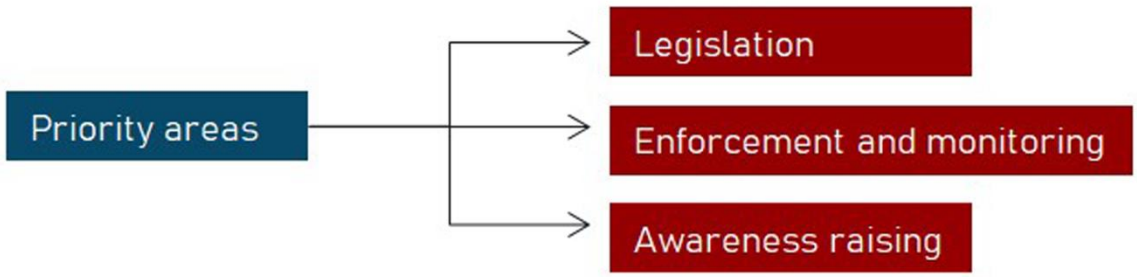


Figure 24 Main priority areas- Action plan

Source – Good practices of Accessible Urban development, United Nations

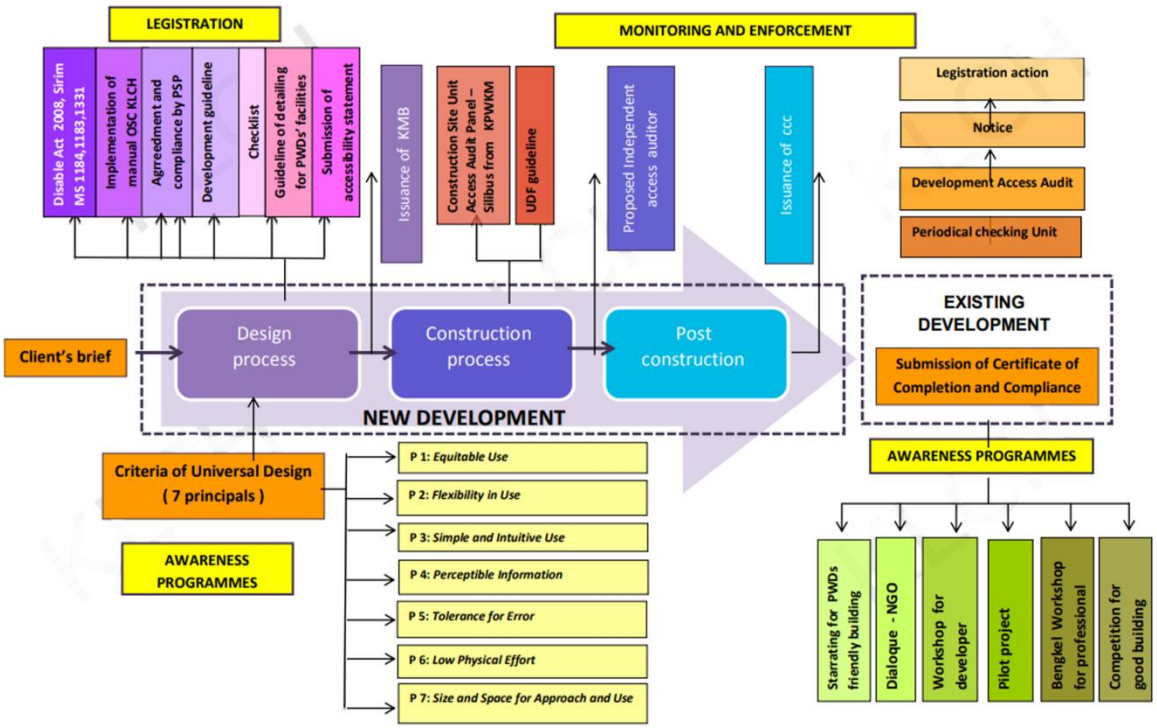


Figure 25 Action plan Framework

Source – Good practices of Accessible Urban development, United Nations

Monitoring - Throughout the building process, access auditors check the work and have the authority to issue a stop-work order. Following construction, follow-up inspections are performed. Enforcement - Access Officers, the Access Advisory Group, Access Inspectors, and Access Auditors are the enforcement mechanisms. To monitor and enforce accessibility requirements, access statements, inspections, and audits are utilised.

Raising awareness and training - Awareness-raising programmes foster a continuous discourse and provide courses for experts as well as experimental projects for benchmarking.

4.2.3 Changes Achieved

A benchmark was created for all local authorities in Malaysia.

BCA was the first local authority implement the Access Statement for Accessibility in public projects

More than 100 access audits were carried out and nine training workshops held (3 times annually).

2,241 persons with disabilities (as of 31 December 2015) staying in Kuala Lumpur City Hall adapted public housing units.

The pedestrian network, which consists of a 48.9 km long pedestrian walkway in the city of Kuala Lumpur, was upgraded in 2011-2014.

More than 1 per cent of Kuala Lumpur City Hall’s employees are persons with disabilities.

This initiative was highlighted in the newsletter of Access Exchange International.

Access audit manual and guidelines were published.

The Mayor’s Award was received for good practices.

Collaborations were established with various agencies and universities in research studies and projects.

4.2.4 Inference

Monitoring and enforcing agency is essential for ensuring Universal Design principles are being followed through each stage of construction.

Awards and incentives for good practices encourages people to adopt and maintain more disability accessibility features.

Awareness programs of Universal design and workshops helps in reducing the social stigma towards PWDS.

4.3 Delhi Metro, India

The Delhi Metro, a mass rapid transit system that carries almost 27 Lakh people each day, has been a part of the city's intricate daily rhythms for the past ten years. The Delhi Metro project was launched in the 1990s with the goal of building Delhi a top-notch metro railway network. There are a variety of amenities available in metro stations and on trains that facilitate travel for people with disabilities.

EXTRA-WIDE AUTOMATIC FLAP GATES FOR WHEELCHAIRS

TACTILE PATHS FOR THE VISUALLY IMPAIRED

PROVISION OF WHEELCHAIRS AT STATIONS AND RESERVED SPACES FOR WHEELCHAIRS IN TRAINS

TOILETS FOR PERSONS WITH DISABILITIES

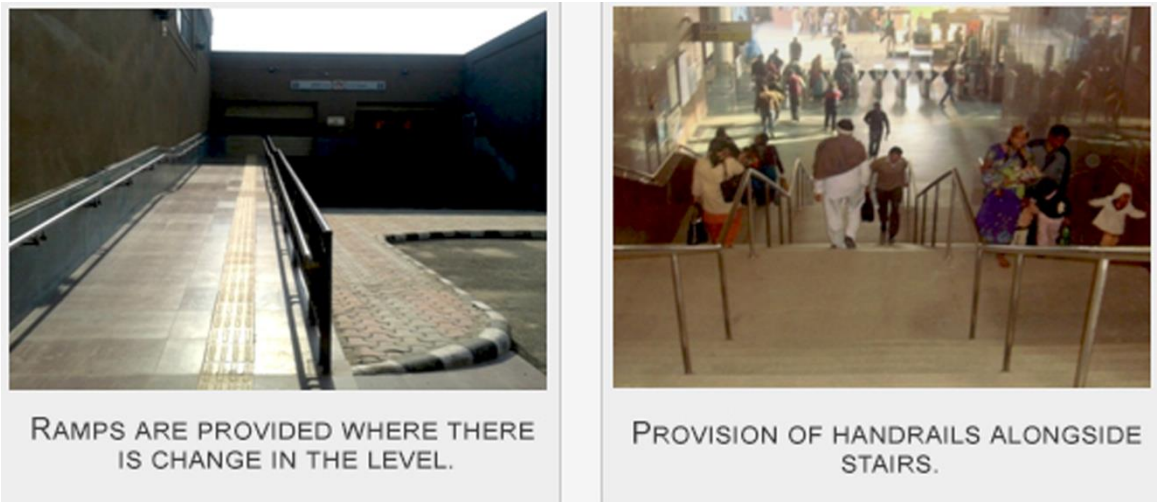


Figure 26 Services for differently abled provided

Source – https://wecapable.com/delhi-metro-accessibility-persons-with-disabilities/

4.3.1 Current Condition

The elderly and differently abled people are the intended users of these lifts. However these elevators are also being used by other individuals. Insensitive drivers occasionally leave their cars parked at the accessible entrance as well. Moreover, in the whole Metro only one entry has been set aside at each station for such travellers. Therefore only at this single entry, provisions have been made to address the unique needs of differently abled people. According to the audit conducted on the Central Secretariat station, all other entrances are inaccessible and require a climb of at least 70 steps to reach the concourse level, with the exception of those on the Rail Bhawan or Parliament side. From the parking lot in front of the Vijay Chowk/South Block entrance, a wheelchair user must go a considerable distance through an extremely small and inaccessible sidewalk before reaching the lift. On the main road, which also serves as an unofficial parking lot for railway authorities, is the ramp that enables access to the lift. Only one area of the station is restricted from using the access features, such as the guide blocks and low set ticket counters. In fact, other areas other than the platform are practically off-limits to anyone using a wheelchair. The gates are always kept shut. At the station, there is no audio announcement of the departure timetable. There are no Braille signs whatsoever in the scripts on information boards. Standards have not been followed in the construction of the pillars. Therefore, in order to create a 100% accessible metro, there should be no segregation of services, and the demands of individuals with disabilities should not be subordinated to those of any other group in society.

4.3.2 Inference

Delhi metro is provided good services regarding accessibility for differently abled is concerned. However the lack of a monitoring agency for the barrier free design features has resulted in misuse of these features. Furthermore the provision of barrier free services at only one entrance is not sufficient to accommodate the number of differently abled people . It is evident that the provision of separate universal design facilities in a public space can lead to misuse. Hence universal design principles need to be adopted to ensure a public space accessible by all.

CHAPTER 5. Analysis

5.1 Swot Analysis

5.1.1 Strength

The well connected transportation network provides opportunities for retrofitting to make them accessible for differently abled. Provisions to make public buildings barrier free are carried out under the Accessible India campaign (Airport, KSRTC Bus stand and Thampanoor Railway station). This opens up potentials to also make pedestrian and transportation facilities barrier free thus creating universal accessibilities.

5.1.2 Weakness

Due to the high density nature of the study area, there is a lack of space for new developmental projects and provision of services. Lack of vehicular parking facilities along the MG road disrupts pedestrian pathways as well as provision accessible pedestrian facilities. Lack of monitoring agency to ensure proper maintenance of Accessible services.

5.1.3 Opportunity

The Smart city Initiative provides the best opportunity for provision of accessibility services for differently abled people. The heritage, Cultural, Commercial and administrative significance of the study area opens up potentials for accessible tourism and transportation services.

5.1.4 Threat

Barriers for accessibility for differently abled - Discontinuous/Level difference of pedestrian pathways. Safety issues are present for pedestrians due to a lack of supportive infrastructure. Namely lack of footpaths along the secondary and tertiary roads (Cantonment station road, SS Kovil road, Manjalikulam road). The Thampanoor ward is prone to flooding due to clogging and poor maintenance of drains.

Chapter 6. Proposals

This chapter discusses the vision, mission and various strategies for incorporating Disability accessibility in the city. This includes both administrative and special planning proposals and recommendations

6.1 Vision

To develop Thiruvananthapuram city as a model city in Accessibility for differently abled through adoption of Universal design principles, recommendations and policies.

6.2 Mission

To adopt Universal design principles and policies in Thiruvananthapuram Smart city Mission to develop a universally accessible city

6.3 Objectives

- To create a framework for the Thiruvananthapuram Smart city mission to ensure the implementation and maintenance of Accessible services and facilities.
- To formulate recommendations and specifications for Future development projects under smart city mission
- To implement active proposals which ensure Universal accessibility and re develop the existing infrastructure and amenities considering the needs of differently abled people.

6.4 Strategies

6.4.1 Administrative Level

- Ensuring standards and guidelines of Accessible India campaign are being followed in the implementations of Smart city projects.
- Recommendations for adjusting the city for the needs of differently abled people.
- Assigning NGO's to monitor and ensure that the facilities for differentlya abled people are being properly maintained.

6.4.2 Spatial Planning Level

- Retrofitting of existing transportation network - Footpaths, Bus stops with audio visual amenities, Universal design recommendations etc.

- Provision of necessary amenities like universal Bio toilets, accessible recreational facilities as well as up-gradation of theses existing services.
- Promoting accessible tourism taking advantage of the study areas rich cultural heritage, administrative and commercial premise.

6.5 Recommendations

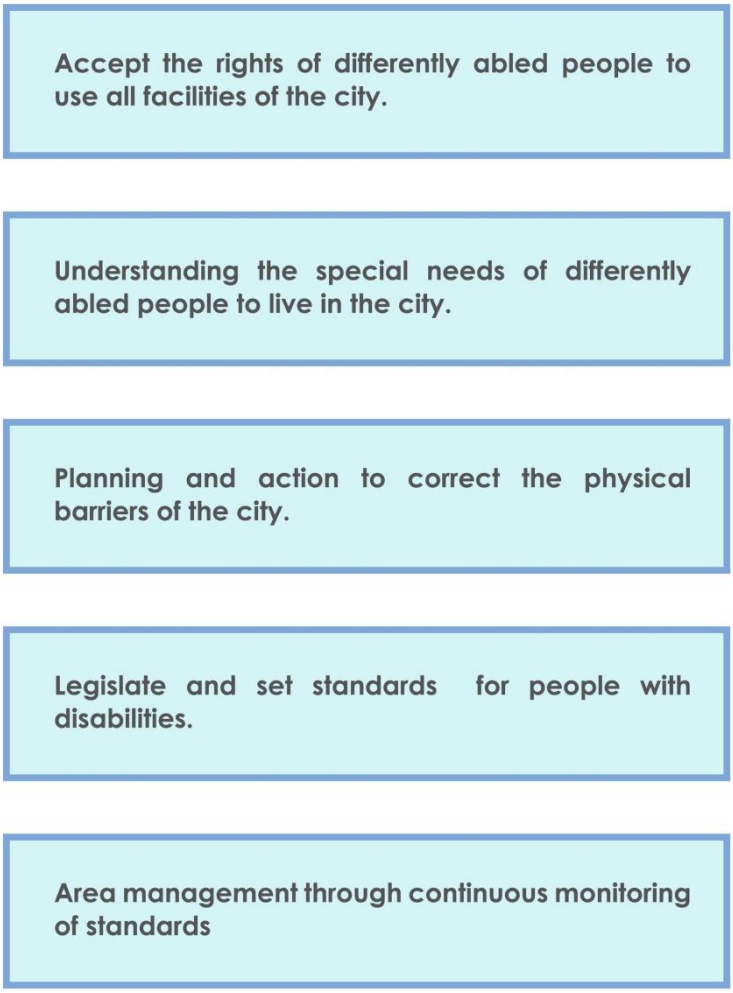


Figure 27 Recommendations for making the city more accessible

6.6 Spatial Planning Proposals

6.6.1 Transportation Network Retrofitting

Retrofitting of existing transportation facilities such as - upgrading pedestrian facilities according to accessibility standards, junction and nodes up gradation, retrofitting of bus stops to make them accessible, proposing accessible routes.

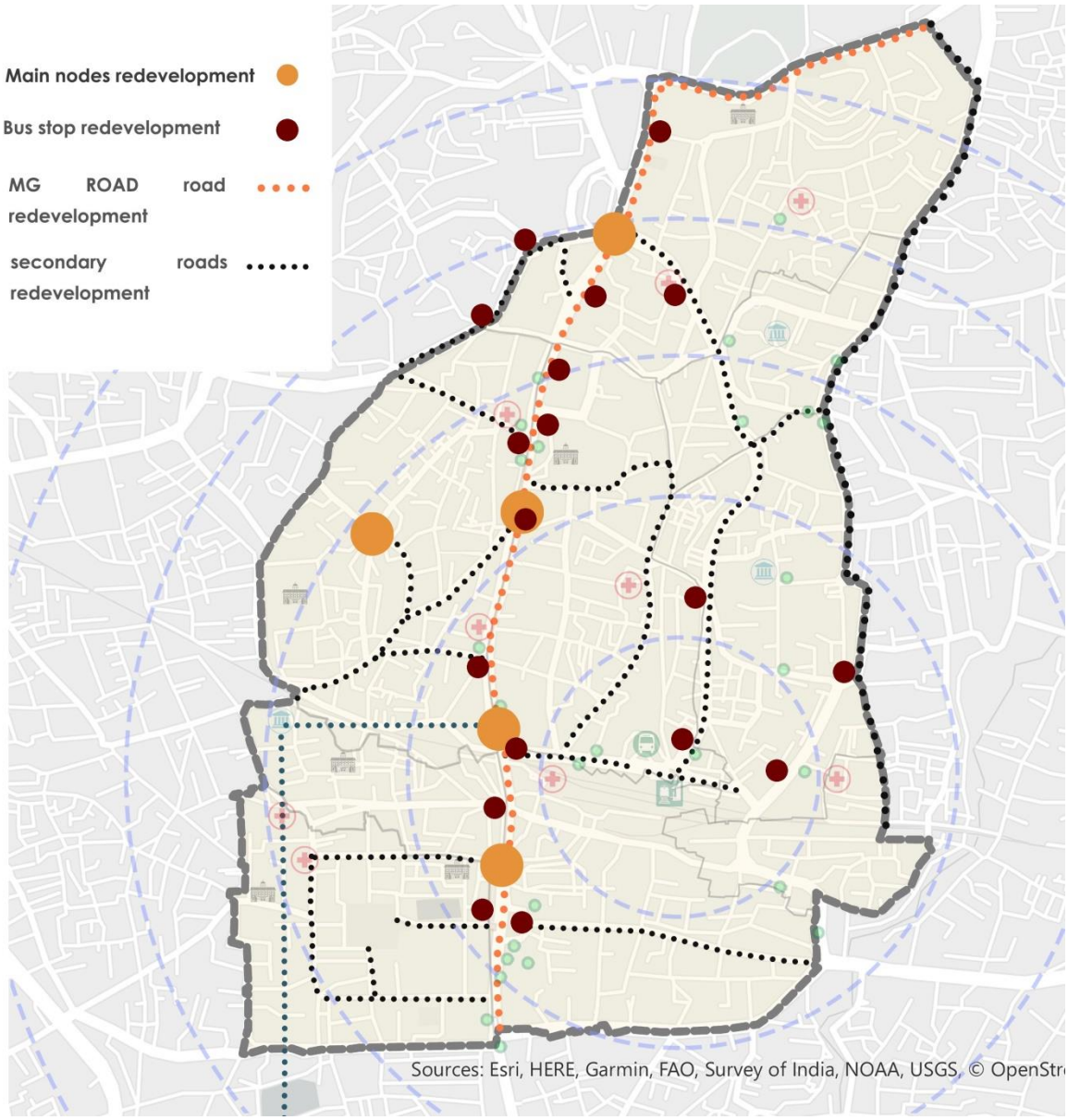


Figure 28 Transportation network Master plan

Source – Author generated

Junction Redevelopment - The major junctions selected for redevelopment are Palayam junction, Pulimoodu junction, Ayurveda college junction, East fort junction and Vanchyoor junction.

Road Redevelopment - The selected roads are to be redeveloped to accommodate accessibility for differently abled people.

Foot paths- 2m wide footpaths are provided according to accessibility guidelines with provisions for wheel chair passage, tactile path and kerb ramps for accessibility.

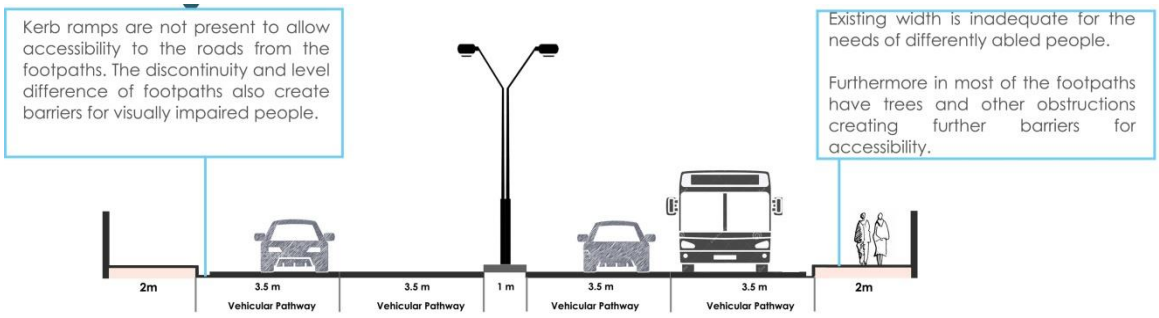


Figure 29 Existing road conditions

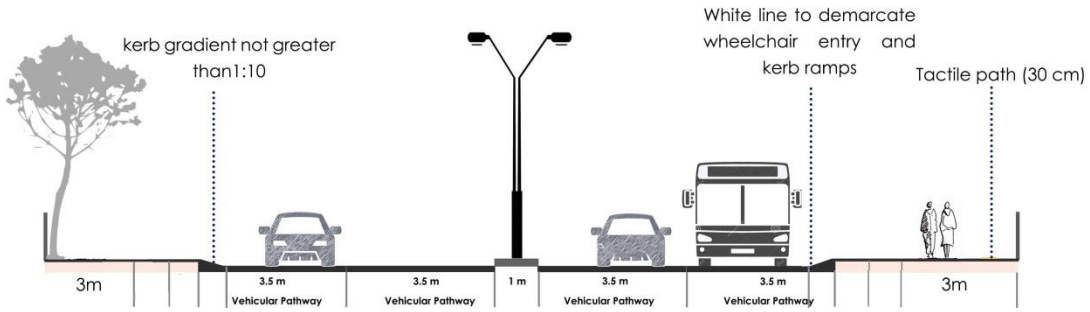


Figure 30 Proposed road section

Source – Author generated

Bus stop redevelopment - Major bus stops are selected along the MG road and the secondary roads are proposed to be retro fitted to provide accessibility for differently

abled people. The bus doors are to be at least 1200 wide and special space for wheel chair provision inside busses are provided. foldable ramps/hydraulic lifts are provided in bus stops to access the bus plat forms.

6.6.2 Promoting Accessible Tourism

Promoting accessible tourism through the provision of supporting facilities for differently abled people such as – up-gradation of existing E toilets, provision of public amenities, parks etc.

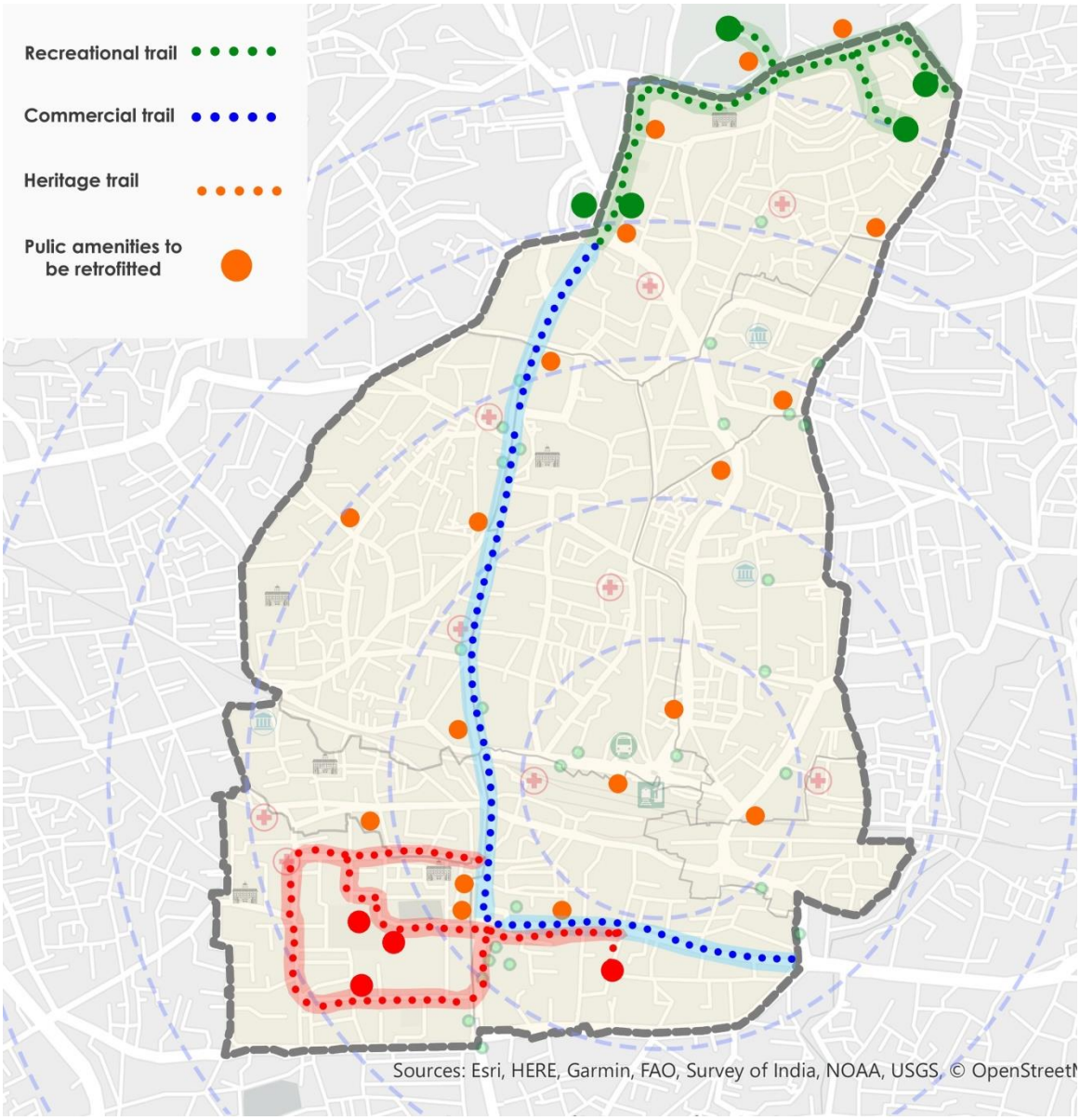


Figure 31 Accessible tourism master plan

Source – Author generated

Accessible tourism is about providing access to tourism for people from all walks of life and all kinds of backgrounds- especially provision for differently abled people.The selected sites are made accessible through the retrofitting of pedestrian pathways to make them accessible for disabled people. Public amenity provisions are provided to the differently abled in the form of retro fitted e toilets. Accessible Tourism is promoted along specific trails, classified according to their usage.

The recreational trails connects Manaveeyam Veedhi, Napier Museum, Kananakakkunnu Palace, Connemera market, St Geroge Cathedral, Kerala Museum of history, Kerala Public Library and CSI Christ church. This ensures that most of the major recreational facilities within the ABD area are accessible to differently abled people. The commercial trail consists of Secretariat, State Legislative Assembly, NABARD and all of the small and medium scale commercial shops and complexes present along the MG road. The heritage trail consists of Sreepadmanabha swamy temple, Kuthiramalika, East fort, Chalai market, Agraharams and Sree padam palace.

The pedestrian pathways for accessibility trails are retro fitted to provide accessibility for differently abled people under the transportation plan. Audio and Braille signage are provided for the people every 500 m along the heritage trails to provide information regarding the accessible trails.

Figure 32 Public toilets retrofitting

Source – Primary Survey

Public toilets present near East fort and the rest of the study area junction does not support provision for differently abled. Provision of accessibility services are to be provided as per accessibility guidelines.

CHAPTER 7. Conclusion

It has been identified that the junctions and nodes along the MG road spine has high concentration of administrative, heritage and commercial built concentration. This results in a daily influx of commuters to the site. Since the amenities and facilities present in the site are inadequate to cater to the needs of differently abled people, focused initiatives is necessary for their inclusion.

The proposals consists of recommendations for the smart city mission to make future projects accessible for differently abled as well as maintain them and also spacial planning projects to retrofit the current amenities and facilities present in the site to mek them accessible for differently abled. This is mainly implemented through transportation retrofitting and promotion of accessible tourism.

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