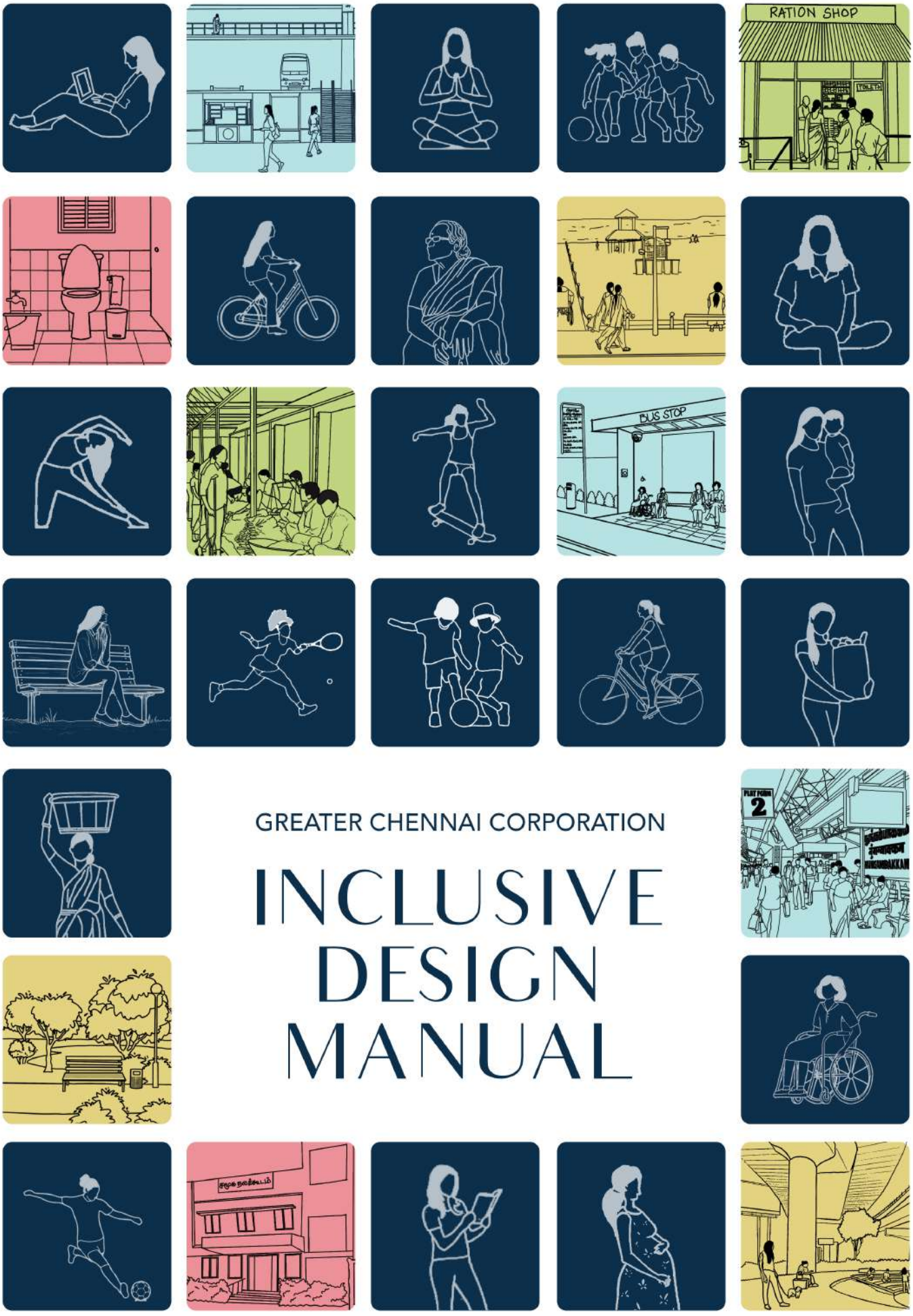

GREATER CHENNAI CORPORATION

INCLUSIVE DESIGN MANUAL

GENDER & POLICY LAB
GREATER CHENNAI CORPORATION

GREATER CHENNAI CORPORATION
INCLUSIVE DESIGN MANUAL

Manual with gender inclusive guidelines for urban infrastructure design to enable women's safety and access to public spaces.

May, 2025

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Developed and Published by
Gender and Policy Lab & Greater Chennai Corporation (GCC)

Development of the Manual is supported by Nirbhaya funds

Disclaimer: This manual presents a comprehensive set of inclusive design recommendations developed through research and stakeholder consultation. However, not all guidelines may be universally applicable. The intent is to serve as a reference framework—to be adapted based on the local context, site conditions, and community needs. Users are encouraged to interpret and apply these recommendations with sensitivity to specific geographies, infrastructure types, and governance realities.

Acknowledgements

This manual is the result of a collaborative and collective effort involving individuals and organisations committed to advancing equity, safety, and dignity in public infrastructure design. We would like to extend our deepest gratitude to Sameeran IAS, Joint Commissioner (Works), and Sharanya Ari IAS, Deputy Commissioner (Education), Greater Chennai Corporation, B.V Babu, Superintending Engineer, Special Projects for their leadership, encouragement, and support during the initial phases of this project.

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We would like to thank the World Bank Chennai City Partnership Team for their constant support for the Gender and Policy Lab and for supporting this important work.

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- Kanika Bansal, Lead – Universal Design and Inclusion, Inclusive Cities Centre, NIUA
- Aishwarya Bali, Associate, NIUA

Their inputs have been instrumental in refining the scope, clarity, and relevance of this manual for a diverse set of users and stakeholders.

To the many women and gender-diverse individuals across Chennai who shared their experiences, aspirations, and critiques during the research process—this manual exists because of your voices. Thank you for showing us what the city could and should be.

From the Mayor

Tmt. R Priya
Hon. Mayor of the Greater Chennai Corporation (GCC),
Government of Tamil Nadu

As Mayor of Chennai, my foremost responsibility has been to ensure that the city works for everyone, especially women, children, elderly people, and persons with disabilities. My focus has been on creating equal opportunities and improving access, safeguarding the commitment of Honorable Chief Minister, M.K Stalin and Government of Tamil Nadu's 'Ellarukum Ellam' (everything for everyone). I am delighted to present this manual as an extension of my work towards inclusivity.

Our parks, playgrounds, streets, bus stops, homeless shelters, and e-Sevai Maiyams are not just facilities — they are essential public services and lifelines. These spaces must serve everyone equally, irrespective of gender, age, ability, or economic background.My vision for Chennai is one where young women and girls can freely walk, express themselves, and feel safe in public spaces. That's why I launched EmpowHer, an initiative to establish women-only gyms and why we are continually creating and rejuvenating parks and playgrounds across the city.

I am heartened that this manual reflects these values. It is not a top-down document, but one shaped by consultations with people on real urban concerns. It stands as a testament to the diligent work done by Gender and Policy Lab (GPL) over the past three years to improve GCC-infrastructure and mobility in the city. In covering 12 GCC infrastructures that include parks, playgrounds, streets, bus stops, homeless shelters, and e-sevvai mayyams among others, it seeks to empower residents who have expressed what they need to live comfortably and with pride in their areas.

Chennai's infrastructure should be designed such that people from the margins, cutting across gender, age, abilities and socio-economic backgrounds have the same access and opportunities as all others. They are all part of the city and it is essential to focus on their needs in the planning of infrastructure. I urge all professionals involved in shaping our city's future to embrace the guidelines presented in this manual.

Together, let's make Chennai an example of what it means to be truly inclusive — a city that embraces its diversity and leads with compassion and innovation.

Photo Credit: Flikr

From the Deputy Mayor

Thiru. M. Mahesh Kumar
Hon. Deputy Mayor of the Greater Chennai Corporation (GCC),
Government of Tamil Nadu

As the Deputy Mayor of Chennai, it is my vision to build public infrastructure that truly serves everyone—especially the elderly, persons with disabilities, women, children.

I am glad to see that vision reflected so strongly in this Gender Inclusive Design Manual. This is not just a technical document, it is a vision reflecting in the design.

This manual was built from the ground up—through field audits, research, and honest conversations with communities across Chennai. What makes it powerful is its practicality. It doesn't offer abstract ideals; it gives us real, scalable solutions rooted in everyday realities.

I commend that Greater Chennai Corporation is moving towards more inclusivity with Gender and Policy Lab leading this effort. This Manual reminded us that inclusion isn't a bonus—it's a necessity. It's how we build a Chennai that is not only functional, but equitable, affordable and for everyone.

Let this manual be our guide as we build a Chennai that truly belongs to everyone and a city which reflects the ethos of Government of Tamil Nadu, 'Ellarukkum Ellam'

From the Commissioner

Thiru. J. Kumaragurubaran, IAS
Commissioner of the Greater Chennai Corporation (GCC), Government of Tamil Nadu

Chennai has emerged as a forerunner among Indian cities in inclusivity and safety, thanks to the decades of political will, progressive government reforms and institutions echoing principles of social justice. The Government of Tamil Nadu and the city of Chennai have been moving towards inclusivity by adapting Tamil Nadu State Policy for Women state and incorporating policies for women with disabilities in various aspects.

As a department within GCC, the Gender and Policy Lab (GPL) works to support this agenda by focusing on gender mainstreaming governance and improving the safety and accessibility of urban spaces. GPL has been helping GCC's services be more accessible and safe for women through audits of public spaces, ensuring bus shelters follow universal design guidelines, sensitising zonal engineers on inclusivity, and establishing gender clubs in schools.

As an extension of this work, GCC in collaboration with GPL has developed this inclusive urban design manual. It aims to standardise inclusive features within public spaces, enabling the city to foster equitable access to infrastructure, services, and opportunities for individuals across the gender spectrum, ages, and abilities. Structural gaps that inhibit inclusivity in 12 commonly used GCC-infrastructures were identified through a research-intensive and collaborative process. In response, a set of design guidelines and a practical checklist have been provided to translate these findings into actionable interventions.

To build a truly inclusive Chennai, equity must be embedded into the very foundation of urban design. Addressing the unique challenges of age, gender, ability, and socio-economic diversity requires sustained, targeted planning. The city's infrastructure must be reflective of the people who live in it—enabling all to participate fully in public life.

This manual is a call to action: to centre marginalised voices in planning and move beyond symbolic inclusion. I urge government officials, engineers and urban planners to apply these guidelines from the ground up. Let us build a Chennai where equity is not just a principle on paper, but a lived reality in every space we build and use.

Photo Credit: The Hindu

From the Deputy Commissioner

Thiru. Sivakrishnamurthy V, IAS
Deputy Commissioner (Works) of the Greater Chennai Corporation (GCC),
Government of Tamil Nadu

To build a truly inclusive Chennai, equity must be embedded into the very foundation of urban design. Addressing the unique challenges of age, gender, ability, and socio-economic diversity requires sustained, targeted planning. The city's infrastructure must be reflective of the people who live in it—enabling all to participate fully in public life.

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GENDER & POLICY LAB
GREATER CHENNAI CORPORATION

The Gender and Policy Lab (GPL), housed within the Greater Chennai Corporation,was established in April 2022 under the Nirbhaya Fund as part of Chennai city Partnership project between the Govt. of Tamil Nadu and World Bank. It is the first such initiative to be embedded within an Urban Local Body in India. Since its inception, the Lab has sought to address women's safety and mobility through research, awareness-building, and integrated infrastructure development.

Over the past three years, GPL has been exploring the question, 'How do we make the city work for everyone?" What do young women and girls want from the city?'

To better understand their needs, The Gender and Policy Lab works across four core pillars: Research and assessments, Policy support, capacity building, strengthening operations and infrastructure development.

Message from the team

Chennai — India's fourth-largest metropolitan city — has earned recognition as one of the safest cities for women and has pioneered several inclusive urban initiatives, such as India's first beach access path for persons with disabilities at Marina Beach, free bus services for women, and state-sponsored working women's hostels. As the city continues to grow, it is vital that its infrastructure evolves to meet the needs of its diverse residents.

Public spaces are more than just infrastructure—they are where the city comes alive. They offer room to breathe, connect, and just be. For many, they are places of possibility. For women, they must be places of comfort and safety—where they can walk freely without looking back, rest without worry, and express themselves without fear. Public spaces should not be places to avoid, but places where women feel they truly belong.

Encouragingly, recent Gender Lab surveys show that 80% of women in Chennai feel the city is safe, and over 70% report that government public facilities are accessible. These women have also expressed the need for more responsive and well-designed public parks, continuous footpaths, clear signage, and other improvements that enhance comfort, safety, and mobility.

At the Gender and Policy Lab, supported by the Nirbhaya Fund—a fund dedicated to improving women's access to public infrastructure—we've been working to understand how men and women use public spaces differently across Chennai. From parks and footpaths to toilets and bus stops, we study everyday patterns to help make the city more inclusive. We ask questions about how the Chennai context is different: What does feeling safe mean? Can small, incremental changes—like adding a hook at the back of a bathroom door—change someone's experience of public toilets? When 24.5% of women choose a public route based on safety, what kinds of changes are needed in first-mile and last-mile infrastructure?

Over the last three years, we have conducted over 725 audits across bus shelters, parks, foot overbridges, toilets, and footpaths. These insights have been included in this manual, and our research shows that there are different gendered usage patterns of public infrastructure. Women often use parks in the evening and prefer spaces with good lighting and seating near children's play areas—allowing them to supervise children and relax. These insights show that these patterns can be addressed through design. That's why we believe gender-inclusive design is not abstract; it is immediate, tangible, and deeply local.

Yet, turning these insights into action is where the real challenge lies. In our early work with Greater Chennai Corporation engineers, we noticed a pattern—design changes were being made in response to specific feedback, like fixing a toilet in a few neighbourhoods or improving lighting at a particular transit station. While these were important wins, they were also highly localized. That's when we recognised the need for a more standardised, scalable approach to inclusive design.

During consultations with GCC zonal engineers and civic staff, 61.2% of them stated that the "lack of standard designs/models" was one of the main challenges they faced while executing projects. The other recurring concern was: "We understand the need for gender-sensitive infrastructure, but *ena pananum-nu sollunga* (Tell us, what exactly do we have to do)?"

At the same time, other government bodies—like the Tamil Nadu Highways Department and the Tamil Nadu Housing Board—began reaching out, expressing interest in incorporating gender-inclusive designs into their own projects. It became clear that the learnings from Chennai could inform a broader shift. That's how this manual was envisioned.

This manual was created to bridge that gap. Grounded in eight focus group discussions, twelve audits of public spaces, and expert roundtables with users, community members, planners, sociologists, and engineers, it brings together practical tools and lived insights. It translates the city's commitment into context-sensitive design interventions.

Executive summary

The Gender Inclusive Design Manual developed by the Greater Chennai Corporation's Gender and Policy Lab marks a significant shift in how public infrastructure is approached. It focuses not on abstract ideals or policy frameworks but on the lived experiences of women and gender-diverse people navigating the city. It recognises that public infrastructure, though intended for all, often excludes, alienates, or endangers many by design. Through a design lens, this manual challenges the assumption that infrastructure is neutral and demonstrates how spaces can—and must—be more inclusive, accessible, and comfortable for everyone.

Across Chennai, sustained community engagement and increasing public awareness have highlighted the need for everyday infrastructure to better serve all residents—particularly women, the elderly, persons with disabilities, queer and trans individuals, and those from socially and economically marginalised communities. These ongoing conversations have led to a growing recognition that inclusive design is not only a matter of equity, but also a key driver of a vibrant and resilient city. When streets, parks, transit systems, and public spaces are accessible and welcoming to all, participation in education, employment, civic life, and cultural activities increases. Infrastructure is utilised more effectively, service delivery improves, and social cohesion is strengthened.

Recognising the need for inclusion-focused design standards, the Gender and Policy Lab, under the leadership of the Greater Chennai Corporation, initiated the development of this Gender Inclusive Design Manual in August 2023. This manual is both practical and reflective, created to support engineers, architects, contractors, and civic actors in designing public spaces that are not only functional but affirming diverse user needs.

The manual was developed through a rigorous research process that began in March 2024. It builds on earlier studies by the Gender Lab, incorporates insights from local fieldwork, and is informed by global best practices—bringing together diverse perspectives to ensure the guidelines are relevant, grounded, and ready for application across Chennai's urban fabric. Twelve types of public infrastructure were identified for the study, ranging from parks, beaches, markets to toilets, bus stops, and shelters for the urban homeless.

The study design integrated field-based inquiry with user-centred insights. A detailed mapping and audit of 25 infrastructure sites was undertaken across North, Central, and South Chennai to capture diversity in social context and physical form. This included observational studies, physical assessments, and spatial audits. This was followed by in-depth qualitative research through focus group discussions with over 80 participants including young women, trans and non-binary individuals, sanitation workers, women with disabilities, migrant workers, and others. These conversations explored how people move through the city, what they avoid or gravitate toward, what makes them feel safe, and how design affects their ability to participate fully in public life. Their insights were concrete, design-specific, and directly rooted in daily experience—forming the core of this manual's recommendations.

Each chapter in the manual focuses on a specific infrastructure type and is structured through eight key lenses. It begins with an overview of existing conditions, using Chennai-specific data to identify high-impact improvements. It then examines how the infrastructure interacts with surrounding land use, followed by an assessment of how people access the site—on foot, by transit, or by private vehicle—and move within it. The manual also addresses spatial planning, amenities that enhance comfort, and safety through both physical and perception-based elements.

A key component of the manual is a checklist-based assessment tool included in each chapter that allows both professionals and members of the public to evaluate infrastructure projects through a gender inclusion lens. Alongside, a scoring framework enables project teams to prioritise interventions and guide retrofit strategies where needed. These tools aim to bridge the gap between policy intent and on-ground implementation by offering clear, actionable recommendations rooted in everyday realities.

Beyond the infrastructure chapters, the manual includes sections on materials and specifications, operations and maintenance, and the role of social change. It emphasises that inclusive design must be supported by durable choices, consistent upkeep, and efforts to shift behaviours and perceptions for lasting impact.

The manual is grounded in five design principles—access, visibility, experience, comfort, and safety—which run through every chapter and recommendation. Together, these offer a vision of gender-inclusive design that is not aspirational but actionable. Inclusion here is not treated as an optional feature or add-on; it is the very measure of good design.
Ultimately, this manual is a call to reimagine the everyday city. It demonstrates that inclusive design is not only possible but essential to building fair, functional, and responsive urban infrastructure. It urges Chennai—and cities everywhere—to build with care, to listen more closely, and to design for everyone.

Contents

Photo Credit: ITDP

INTRODUCTION

Photo Credit: New Indian Express

WHAT IS GENDER INCLUSIVE DESIGN?

Gender Inclusive Design is a strategic and evidence-based approach to building infrastructure that acknowledges the diverse identities, roles, and experiences of individuals across the gender spectrum. Gender is not a binary concept, but a spectrum of identities that shape the way individuals navigate, experience, and engage with public space. It goes beyond conventional notions of gender, recognizing that public spaces are experienced differently by women, girls, transgender, and non-binary individuals due to intersecting factors such as safety, accessibility, mobility patterns, caregiving responsibilities, and social norms. In doing so, it reimagines public spaces not just as neutral backdrops, but as active agents that can either reinforce or challenge existing social inequalities.

Public spaces are where people connect with their city — walking, waiting, working, resting, selling, protesting, or playing. These spaces, however, are not always designed to accommodate the complex social realities of gender. Design can either create barriers or open up possibilities. Thoughtfully designed streets, parks, transit stops, and community spaces can make daily life more secure, more dignified, and more equitable.

WHY DO WE NEED GENDER INCLUSIVE DESIGN?

Design shapes experience.

Poor design and inadequate infrastructure can affect everyone, but their impacts are uneven. For example, a dimly lit street may feel unsafe or unwelcoming to all, but due to existing social norms and safety concerns, it disproportionately restricts women's mobility, often preventing them from accessing that space altogether. Similarly, a high-floor bus may inconvenience many passengers, but for persons with disabilities, it can be a major barrier that limits their independence and participation. Uneven or broken footpaths create difficulties for everyone, yet 94.4% of women report regularly walking with two bags, making such obstacles particularly challenging and discouraging for them.

These everyday examples illustrate how intersectionality compounds the effects of poor design — where gender, disability, and other social factors overlap, the consequences become even more severe. When infrastructure fails to consider these diverse experiences, it not only limits individual lives but also limits the city's social, economic, and cultural vitality.When design does not account for gendered realities, it creates barriers — to comfort, to safety, to access, and to participation.

In Chennai, these challenges are not new. The demand for more responsive public environments have created a strong foundation for institutionalising more inclusive practices. There is great potential to improve design by moving beyond one-size-fits-all approaches and fostering better coordination between departments—prioritizing empathy alongside efficiency to create truly inclusive spaces.

- For individuals, inclusive public spaces improve daily life—enhancing comfort, safety, and access for all users.
- For communities, they support caregiving roles, enable informal livelihoods, and strengthen everyday social connections.
- For the city, they optimise the use of shared spaces—fostering equity, wellbeing, and resilience.
- For governance, they offer a pathway to align policies and infrastructure with lived realities—ensuring responsive, inclusive, and effective urban development.

Design is a powerful tool that shapes how people experience their environment. When approached inclusively, it can break down barriers and contribute to a more just and vibrant city.

This manual offers practical guidance on design interventions that make public spaces welcoming, navigable, and safe for everyone. By focusing on visibility, comfort, access, and care, Gender Inclusive Design becomes a strategic framework to enrich public spaces—not only in their function but also in their social and emotional impact.

At its core, this approach ensures dignity, presence, and meaningful participation—ensuring that everyone can fully experience and engage with the city.

"I live in this city and if I have to be happy in the city I should feel comfortable, safe, and go where I need to go, when I need to go. I want Chennai to be the city that makes me happy."

- Nakshatra Mythili, 34, Chennai

"For us, it's about a future where every space, every journey, every opportunity is open to us. Where we move with ease and joy, not burdened by barriers."

- Radha Rajan, 66, Chennai

"A city where women's voices are heard, where we are part of the decision-making process – that's what I dream of. Not just being seen, but being listened to."

- Gayathri Venkatraman, 25, Chennai

"My only problem with Chennai is the lack of lighting. Once, while walking alongside the Egmore flyover, I realized there are no lights and a lot of bushes adjacent to the compound walls. It would be so easy for someone to jump from the wall and attack someone without getting caught."

- Dhanushiya, 22, Chennai

"Recently I went to a park. There was nothing there for us. There's only facilities for kids. One day me, my brother and sister had gone. We took a photo but there was an incharge said you can't take photos and all."

- Logeshwari, 48, Chennai

"All parks should have toilet facilities. Especially for girls. CCTV should be there. Lighting should be proper. We need a peaceful environment in the park with trees and less restrictions."

- Dharshini, 20, Chennai

Photo Credit: Shuchi Kapoor

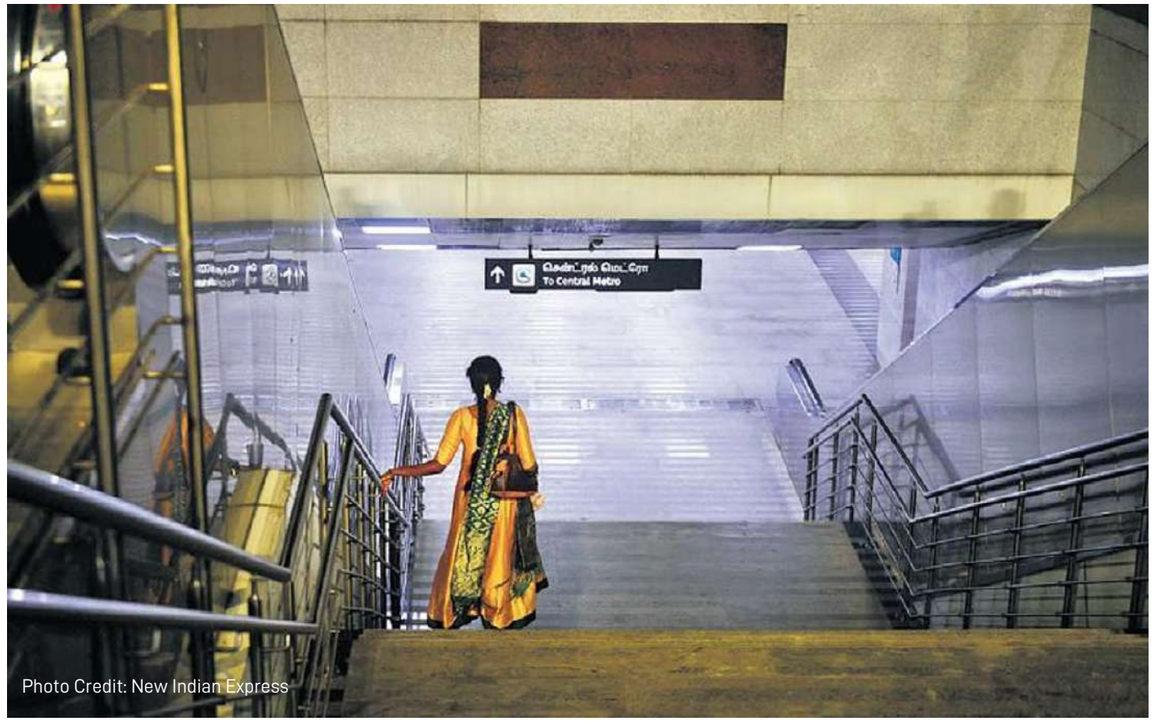


Photo Credit: New Indian Express

OBJECTIVES OF THIS MANUAL

This manual is intended to function as a citywide capacity-building tool, aiming to address gender through the lens of design. It brings together learnings from community voices, on-ground observations, gender studies, and inclusive design thinking to guide the transformation of 12 key urban infrastructure typologies across Chennai. It is written for a broad audience — from engineers, architects, and planners, to consultants, contractors, administrators, and even the public.

Its key objectives are to:

- Offer practical, scalable design guidance that integrates gender-inclusive principles into Chennai's built environment.
- Promote awareness among city officials and design professionals of how design decisions directly impact comfort, safety, and usability for diverse genders.
- Encourage a people-first design approach, where spatial solutions are grounded in the lived realities of users, not generic templates.
- Act as a learning and reflective tool to question existing practices and explore more empathetic, inclusive alternatives.
- Bring multiple perspectives into a single conversation — combining technical, social, and experiential insights to shape holistic design outcomes.
- Enable greater public participation and accountability in infrastructure development.

A distinctive feature of this manual is the inclusion of practical checklists with scoring tailored for:

- Engineers, architects, and administrators overseeing the design and execution of public infrastructure — to ensure that inclusion and safety are embedded at every stage of a project.
- The public and community members — empowering them to assess, reflect, and contribute feedback on the inclusiveness and usability of public spaces in their neighborhoods.

By embedding these tools within the design process, the manual encourages a culture of shared responsibility and continuous improvement — where gender inclusion is not an afterthought, but a foundational element of design practice.

Through this initiative, the Greater Chennai Corporation signals a shift: toward a more responsive and participatory approach to city-making — one where every design detail contributes to a more just and caring urban experience.

Making of this Manual: Research Methodology

This manual is grounded in an extensive, field-based research process that prioritised lived experience, spatial equity, and design responsiveness. It was developed to address a specific scope and understanding of public space and people as relevant to the context of Chennai.

DEFINING PUBLIC SPACE AND USERS

For the purpose of this project, public space is defined as state-sponsored infrastructure that people gather in to access a service, for leisure, livelihoods, commute, or shelter. This does not include public institutions such as banks, hospitals, courts, police stations, or shelters governed by other departments.

The term "people" in this project refers primarily to women across a wide range of age groups, socio-economic backgrounds, abilities, sexualities, and gender expressions, including trans and non-binary persons — recognising the diversity of their experiences and their interactions with urban space.

RESEARCH PROCESS

The development of this guideline followed a multi-stage research process that combined literature review, infrastructure audits, primary research, and community-led insight generation.

A.Literature Review

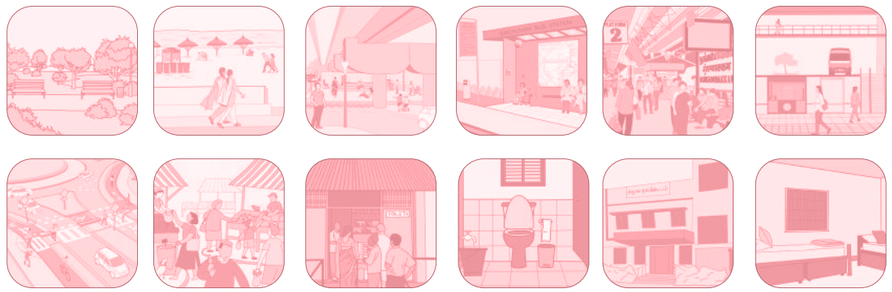
- User Experience of Public Infrastructure
- Gender Responsive Urban Design
- Exisitng Urban Design Guidelines
- Global and Indian Best Practices
- Governance of Public Space

B.Identifying Focus Infrastructure

Chennai, like all large cities, is home to a wide variety of public infrastructure — from beaches and parks to bus stops, markets, community halls, and more. Given the project's resource and time constraints, a tool was developed to narrow down and prioritise 12 key infrastructure typologies from over 50 infrastructures for deeper study. Selection parameters included:

- Specific infrastructure focus and interests of Greater Chennai Corporation (GCC)
- Availability of existing audit data from GCC
- Built and/or managed by GCC
- Presence of existing design guidelines or gaps (from literature)
- Infrastructure with high or potentially high female footfall
- Scope for improvement through design, rather than behaviour change alone

B1.Priority Infrastructure



PARKS & PLAYGROUNDS | BEACHES | SPACES UNDER FLYOVERS | BUS SHELTERS | TRANSIT STATIONS | SUBWAYS & FOOT OVER BRIDGES | STREETS | OPEN AND CLOSED MARKETS | URBAN DELIVERY CENTRES | COMMUNITY HALLS | SHELTERS FOR THE URBAN HOMELESS | PUBLIC TOILETS

C.Field Research Methodology and Study Design

Once the typologies were finalised, the research team undertook the design of a comprehensive field research methodology to capture both spatial and experiential aspects of the selected public infrastructures. This phase included:

- Designing pilot tools for observation, physical audit, and user interaction
- Development of data collection formats and templates that could capture both qualitative and quantitative indicators
- Stratified sampling of sites to ensure geographic, functional, and socio-economic diversity — across North, Central, and South Chennai
- Identification of variables such as user footfall, time of use, seasonality, infrastructure type, and social dynamics
- Designing protocols for ethnographic observation, vox pops, and user behaviour mapping

The research team prioritised participatory, non-intrusive, and inclusive methods to ensure that the user voice remained central to the data collection process.

C1.Field Audits and Tool Development

Following the study design, fieldwork began with the testing and refinement of pilot tools. These tools were used to conduct detailed assessments of 25 sites, using methods such as:

- Physical audits to document spatial features and gaps
- Qualitative audits focused on experience, visibility, and comfort
- Participatory observations of user movement, engagement, and interaction with space.
- Vox pop interviews with diverse users at each location

Audits were performed across different times of day and across geographic contexts to build a layered understanding of user experience.

C2.Community Engagement and Focus Group Discussions

Insights from the audits informed the design of eight focus group discussions (FGDs). These sessions brought together over 80 individuals from a diverse range of communities and user groups, including:

- Young Women and Girls
- Gender Queer, Trans, and Non-Binary Persons
- Women from Urban Poor Settlements
- Migrant Women
- Women from North Chennai (Zones 1 & 2)
- Women with Physical Access Barriers
- Women Staff at Public Spaces
- Women Police Personnel

These discussions revealed how women navigate public infrastructure—shaped by mobility needs, caregiving roles, time use, and access. They shared insights on daily routines, safety, participation in public life, and offered clear, design-focused recommendations grounded in lived experience.

D.From Research to Manual

The manual was developed over a nine-month period between Mar 2024-Nov 2025. It draws on direct user experience research and spatial analyses conducted for this purpose as described here by Design Co:Lab and with inputs from prior and ongoing research from GCC's Gender and Policy Lab. The recommendations are anchored in five foundational pillars:

ACCESS | **VISIBILITY** | **SPACE PLANNING** | **COMFORT** | **SAFETY**

Together, these pillars anchor gender-inclusive design as a deliberate, evidence-based practice rooted in lived experience. This manual is a tool for learning and accountability—equipped with checklists to help assess infrastructure through an inclusion lens, and build cities that are not just functional, but fair.

How to read the Chapters?

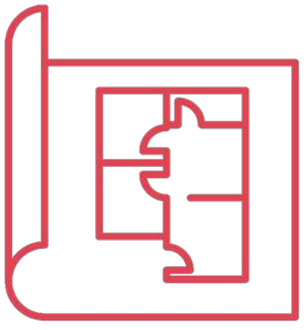
This manual is structured to be read progressively, moving from the external context of an infrastructure to its internal design. It provides a comprehensive understanding of how each component interacts with its users and the urban environment. The guidelines offer a step-by-step approach to assessing, designing, and improving infrastructure for inclusivity, accessibility, and safety.

EXISTING CONDITIONS
Identifies the current state of the infrastructure and suggests quick retrofitting solutions to address immediate accessibility and safety gaps.

BOUNDARY AND EDGE CONDITIONS
Examines the placement of the infrastructure within its local and city-wide context, ensuring it integrates well with the surrounding environment.

ACCESS TO THE INFRASTRUCTURE
Evaluates how people arrive at the infrastructure using various modes of transport, identifying and mitigating barriers to access.

ACCESS WITHIN INFRASTRUCTURE
Focuses on seamless movement inside the infrastructure, ensuring all areas are accessible to persons with disabilities and other vulnerable groups.



SPATIAL ORGANISATION
Addresses site planning, floor layouts, and the zoning of various functions to ensure an efficient and inclusive design.

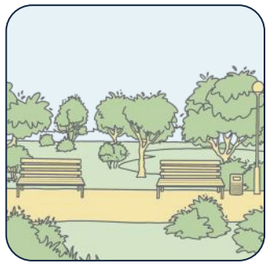
COMFORT
Highlights design elements such as seating, shading, ventilation, and wayfinding that enhance user experience and ease of use.

SAFETY
Identifies strategies to improve visibility, lighting, surveillance, and emergency response to create a secure environment for all users.

CHECKLIST
Provides a structured design checklist with a scoring system to guide implementation, assess existing infrastructure, and plan for retrofitting and funding improvements.

2

DESIGN RECOMMENDATIONS



PARKS AND PLAYGROUNDS

STREETS

BEACHES

OPEN & CLOSED MARKETS

SPACES UNDER FLYOVERS

URBAN DELIVERY CENTRES

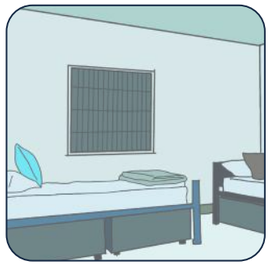
BUS SHELTERS

PUBLIC TOILETS

TRANSIT STATIONS

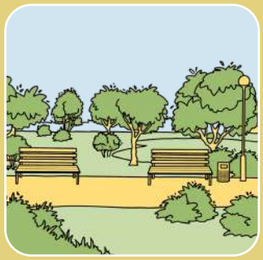
COMMUNITY HALLS

SUBWAYS & FOOT-OVER BRIDGES



SHELTERS FOR THE HOMELESS

RECREATIONAL SPACES



01 PARKS AND PLAYGROUNDS
02 BEACHES
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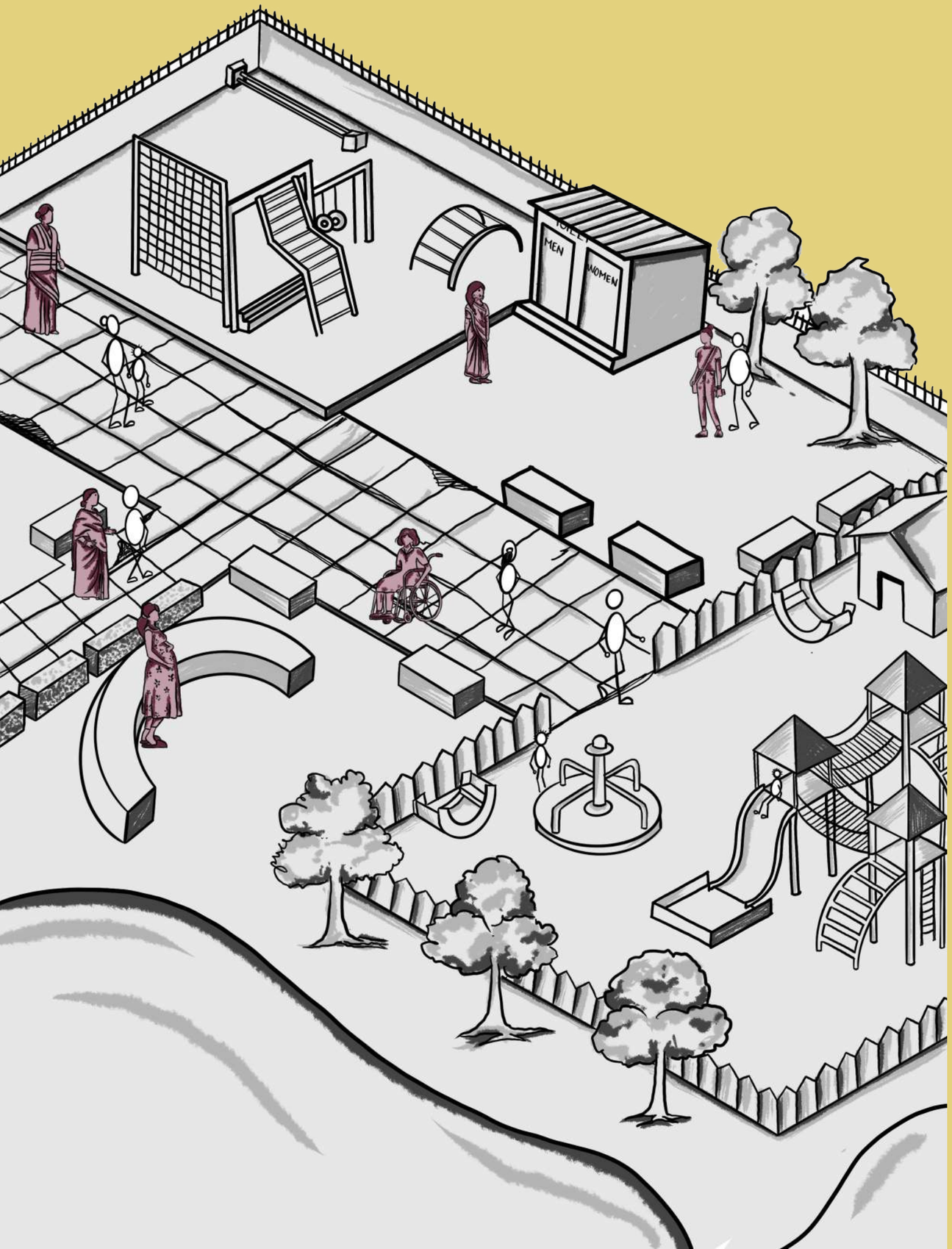


01

PARKS AND PLAYGROUNDS

Parks and playgrounds form critical infrastructure to support physical activity, community building, and public well-being. Spaces designed for play include a wide range of structures, including those intended for organized sports and spaces open for free play. These play fields, intended for public use, offer facilities targeted towards designated sport or play, including hard and soft courts, fitness equipment, and indoor and outdoor facilities. Parks offer green and blue spaces that make the city livable not just for its citizens, but also for its flora and fauna.

GCC currently manages 462 equipped public play fields, including 254 designed for children, and 208 multi-age facilities with indoor and outdoor equipment, including 6 gymnasiums for women. These are further categorised according to the nature of designated sport and play spaces with hard courts, soft courts, and fitness equipment, indoor and outdoor facilities.

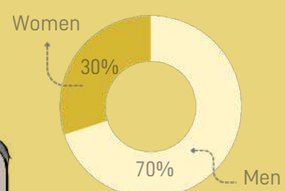
The city has 835 public parks, 113 traffic islands, and 104 road medians filled with greenery. These parks are connected to various waterbodies and transportation infrastructure in the city, including rivers, beaches, and roadways. While offering aesthetic and green spaces for public leisure, several of the parks also support the city's sustainability and road safety.

In India, organized play spaces and leisure parks have often been perceived as spaces for young, able-bodied men and children, discouraging women and girls from utilizing them. However, people far exceeding this stereotype have a long history of a culture of play in Tamil Nadu, and most recently excelled in competitive sports at the national and international fronts. People of diverse social identities relate to its water resources and greenery. How do we dismantle gender and age stereotypes and sustain inclusive public play areas and parks? What play infrastructures can encourage women of all ages and abilities to participate in physical activity, recreation, leisure, and social interaction? Gender, age, and ability-inclusive play fields and parks are pathways to reduce barriers to public spaces in the city.

This section explores how to dismantle stereotypes and create truly inclusive playfields that encourage women of all ages to participate in physical activity and social interaction. Breaking the notion that playgrounds are for men. This section aims to discuss how to make them more accessible for women of diverse walks of life and how to augment this critical state infrastructure to enable more women to use them.

Gender Participation in Survey & Park Usage

Women's lower participation in the survey indicates a potential correlation with their lower park usage.



According to the findings, **24%** of women pointed to better toilets and **20%** to improved infrastructure as essential improvements for creating a more welcoming park environment.

We have very few leisure opportunities in a park - wish there was an adult swing or something fun for us to relive our childhood. A toilet is a must for older people.

My daughter and I come to this smaller park because it feels safer. The bigger park near our home has overgrown shrubs, and is not as well-lit.

Frequency of visits

43% Of men use the park daily

29% Of Women use the park daily.

Reason of Use

Exercise — Play — Sports

High — Medium — Low

Most men prefer using parks in the morning between 6 AM and 12 PM

Most women prefer visiting parks in the evening after 6 PM

Women's Park Usage

- Women frequently use parks during after-school hours with their children for exercise and leisure.
- A significant number of women utilize parks to supervise children in play areas. Users suggested that seating capacity be increased near children's play areas.

Top User Recommendations

17% Lighting and Infrastructure

23% Stricter Rules

Therefore, the above user recommendations align with the observation that women tend to visit parks in the evenings, a time when safety is a greater concern.

Most of the times it is very difficult to navigate through the narrow pathways and the absence of kerb ramps makes it worse to access spaces.

A1. Existing Conditions

Parks in Chennai face numerous design and infrastructural challenges that limit accessibility, usability, and safety. These issues not only diminish visitor satisfaction but also exclude key user groups. One major concern is the lack of adequate and inclusive toilet facilities, with PWD-accessible toilets often poorly located or attached to gendered restrooms. Essential amenities like mother's feeding rooms, diaper-changing stations, and drinking water facilities are absent, creating significant inconvenience for families. Poor design choices, such as slippery floor tiles near fountains, granite seating that becomes unbearable in the heat, and narrow pathways, further compromise comfort and safety.

Accessibility is another pressing issue. Shared streets without proper pedestrian infrastructure, missing tactile tiles, and inadequate pathways make parks challenging for persons with disabilities or those with strollers. The absence of clear signage, distance markers, and specific amenities for children and seniors, such as playgrounds or exercise equipment, reduces usability and inclusivity. The GPL's month-long online survey to understand public usage of parks in Chennai highlighted lower use of parks by women compared to men (Out of 567 respondents, 43% of men use the park daily, as opposed to 29% of women). While men largely used parks in the mornings, women did so in the evenings, aligned with their responsibilities to care for children's after-school exercise and play. This time of use pattern also highlights the need for better lighting, seating, and security provisions. Security concerns stem from limited surveillance systems, inadequate emergency response measures, and frequent gate closures, restricting access and raising safety risks. Additionally, poor maintenance, such as broken seating and footpaths, worsens the overall experience.

Parks currently provide ample open spaces for leisure, supported through either greenery or structured play and exercise equipment. The parks offer varying levels of security based on the location. The parks lacked sanitary facilities to meet the needs of their users. In particular, toilet facilities and drinking water sources need careful design in terms of the number and distribution of these facilities, and signage to direct users. Users valued features such as accessibility via public transport, EV charging stations, and real-time air quality data. While newly built and spectacular structures drew an audience and were appreciated by their visitors, they were not without their setbacks. The specific materials, such as polished stone furniture and flooring, created slippery surfaces difficult to use in the region's heat.

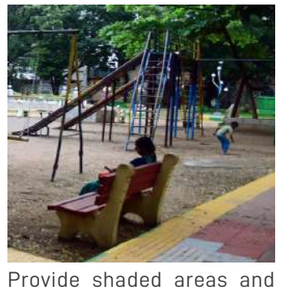
Quick Fixes

Boundary fences/walls must not be opaque and compound walls should be lowered to 1.2m height.

Increase interior circulation path width to 1m (for wheelchair access) or 2m (for two-way access).

Ensure all kerbs or transitions between sidewalks and paths are equipped with ramps and handrails.

Avoid extreme bright lighting that causes blinding glare and obstructs visibility.



Provide shaded areas and seating at regular intervals.

Remove heat-absorbing seating material in the areas that are not shaded.

Avoid flooring with polished stone or other slippery materials in circulation areas.

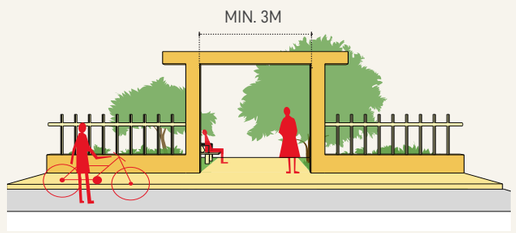
Fix cracks in walkways, potholes in parking lots, and other tripping hazards.

A2. Boundary / Edge Condition Design

PARKS

- Physical barriers like walls / fences should be minimized, with a maximum height of 1.5 meters.
- The barrier should avoid blocking sight lines and constitute no more than 25% of the total boundary wall surface area.
- Solid walls may be incorporated only up to a maximum height of 0.45 meters to provide additional seating options. Above 0.45m the boundary edge should be visually porous
- Ledges or steps can be added to boundary edges for seating.

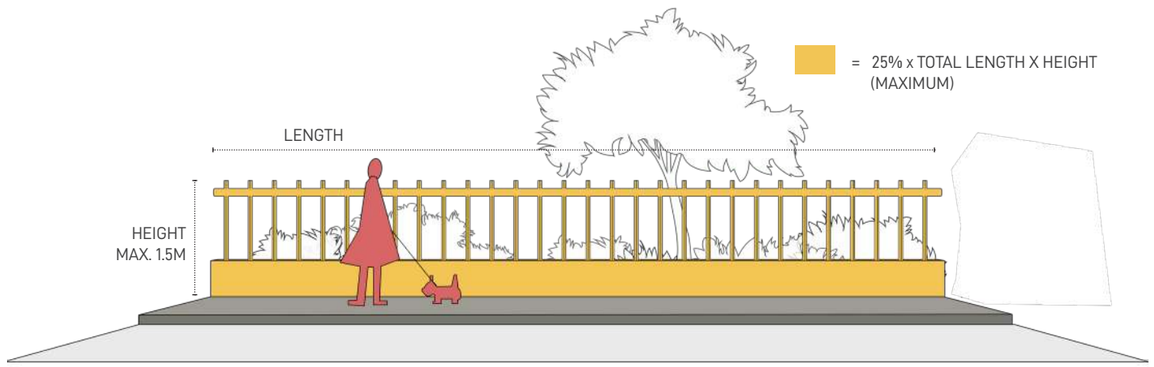
- Ensure wide and legible, highlighted entrance of park / playfield (atleast 3m wide).



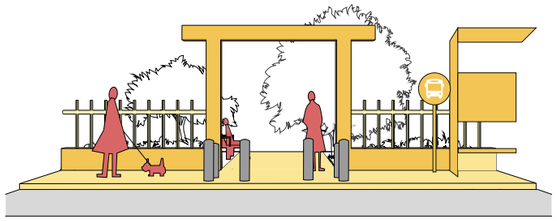
PLAYGROUNDS

- Install a 6-meter high, secure fence around the entire playground, emphasizing the road-facing side.
- If road-adjacent indoor facilities are necessary, the playground boundary must be visually open and comprise no more than 15% of the total wall area.

- Design the building facade facing the playground to be engaging and prevent misuse by incorporating elements like large windows, murals, public art, or interactive features.
- Integrate the building facade with the sidewalk by using landscaping, seating, or pathways to create a welcoming public space.



Maximum height of boundary wall to be 1.5 m. In Parks, non-porous edges must be under 25% of the boundary area, and solid walls must not exceed 0.45 meters in height.

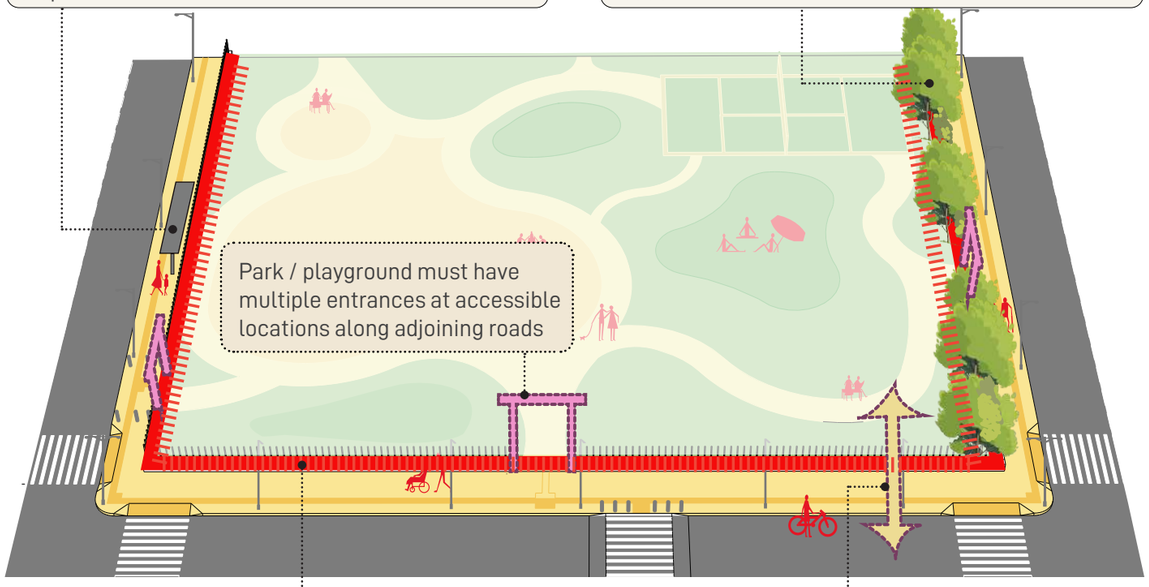


Ensure there is an entrance close to public transportation nodes with adequate directional signage at the entrance and at the transit station/ stop.

Fence/net around open sports grounds, especially road-facing side, maximum 6 meters.

Provide entrances closer to playground areas. Treat setbacks along road facing buildings or indoor play courts as accessible public space, programmed with seating and lights and other features.

Soft scaping with shrubs and vegetation can be used as physical barriers to demarcate edges. This would also prove to reduce the traffic and pollution from roads.



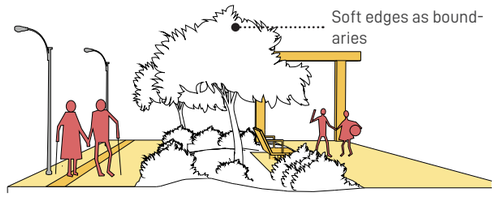
Delineate the park space to create a sense of ownership, to make potential offenders aware of a substantial risk of scrutiny, and to make park users feel safe.

If the playground abuts a road, prioritize complete visibility between the play area and the street. Avoid having indoor recreational buildings abutting the road.

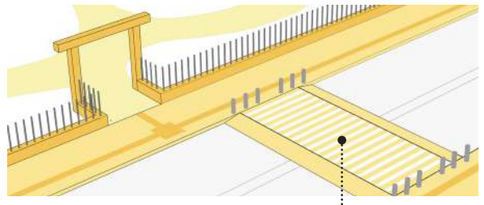
BEFORE and AFTER images of Fort Greene Park, New York. In 2016, Mayor De Blasio funded the 'Parks Without Borders' program focusing on three areas of the park: entrances, edges, and park-adjacent spaces to help unify park spaces with the neighborhoods they serve.
Photo and Image Credit: NYC Parks Department.

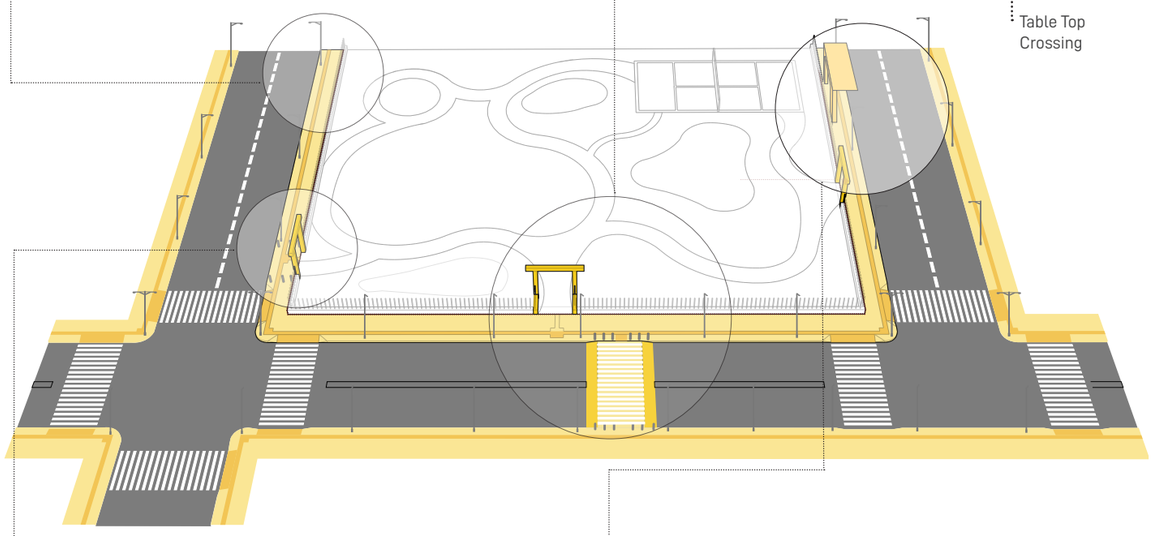
A3. Access to the Infrastructure

- **PARKSIDE WALKWAYS**
  - Provide a minimum 2m wide, unobstructed walkway on the park side of roads for safety and visibility. If no footpath exists, create a 2-meter accessible walkway within the park design.
  - Ensure continuous pedestrian network of min. 2-2.4m wide unobstructed, at grade, shaded, and protected walkway around a 500m radius of park/ playground.

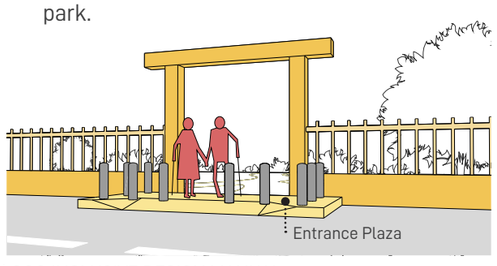


- **CROSSINGS**
  - At mid-block entrances, install staggered at-grade or table-top crosswalks.
  - For entrances within 50 meters of an intersection, implement raised crosswalks along with other traffic calming measures.
  - All at-grade crossings must include kerb ramps on both sides of the crossing of 1:12 gradient as per Harmonised Guidelines 2021.





- **PARK ENTRANCES**
  - Where footpaths exist, create entrance plazas matching footpath width or at least 2 meters wide, using bollards or planters for safety.
  - If no footpath exists, create a 2-meter wide entrance plaza with bollards or planters. Refer to Streets section for bollard placement details.
  - If the park and footpath are at different levels, ensure ramp access for seamless entry into the park.



- **PUBLIC TRANSPORTATION, IPT, AND OTHER NMT MODES (MEDIUM & LARGE PARKS)**
  - Locate medium and large parks near public transport.
  - Designate accessible drop-off/pick-up areas near park entrances.
  - Install clear signage directing users at public transport stops to parks and nearby amenities.
  - Provide space for IPT stands, cycle sharing facilities, and other NMT parking facilities with adequate signages.

A4. Access within the Infrastructure

Heirarchy of Pathways in a Park in the South of England.
Photo Credit: Nerea Marti Sesarino

One-acre barrier-free Always a Dream Play Park in Fremont, California. Photo Credit: MIG

Dedicated cycling lanes in Simon Bolivar Park
Photo Credit: Peek Travel

A4.1 MINIMUM UNOBSTRUCTED WIDTH & PATHWAY HIERARCHIES

- All pathways within the park must be of a minimum width of 2.5 meters.
- Main Paths (4 meters minimum): In medium and large parks, designate wider pathways (at least 4 meters) as main arteries. This allows for higher foot traffic and accommodates security vehicles if necessary.
- Secondary Paths (2.5-4 meters): These can connect main paths to various park features, catering to moderate foot traffic.
- Tertiary Paths (2.5 meters): For leisure walks, exploration, or providing a more secluded experience.

A4.2 UNIVERSAL ACCESSIBILITY

- Ramps must be at least 1.2m wide (excluding safety edges), with a maximum cross slope of 1:50 and a maximum length slope of 1:12. Landings should match the ramp's width. Refer to Harmonised Guidelines 2021 for details.
- All ramps exceeding 300mm in height must have handrails with a top height of 900mm. Ramps and landings should prevent water accumulation. Refer to Harmonised Guidelines 2021 for details.
- All pathways must include TGSI (Tactile Guidance Surface Indicators) as per standards specified in Harmonised Guidelines 2021.

A4.3 PARK ELEMENTS AND DETAILS

- Keep pedestrian paths clear of obstructions like lights, signs, bins, trees, bollards, benches, and other furniture.
- Carefully manage level changes in open areas. Avoid single-step differences in landscaped zones.

A4.4 OTHER MODES OF MOVEMENT

- Provide separate lanes or areas for bikes, scooters, and other NMTs. Two-way lanes must be at least 2.4 meters wide, and one-way lanes must be at least 1.5 meters wide.
- Avoid vehicle access within the park. If necessary, strictly separate pedestrians and vehicles with lanes, fences, or kerbs.
- Enforce a 15 km/h speed limit and implement traffic calming measures like speed humps, table-top crossings, or roundabouts.
- Provide adequate access for fire, emergency response, and maintenance vehicles in large parks and open space areas.

A5. Space Planning

Park programming varies by size. Small parks feature multi-use spaces like walking paths, play areas, and fitness equipment. Medium parks have zoned areas for activities such as playgrounds, fitness, reading, and gardening. Large parks include sports fields, nature trails, and specialized facilities, all connected by pathways with picnic facilities. While programming options are extensive, the following design principles enhance safety and comfort for women.

A5.1 DESIGN PRINCIPLES

1. Design adaptable, multi-use spaces for diverse activities.

2. Design smaller, connected zones within these areas for a sense of security and comfort

3. Separate activities with the potential for noise or physical exertion to minimize conflict between users.

4. Activities shall be grouped to maximize desirable effects (accessibility, control of participants, multi-uses).

5. Design versatile playgrounds for diverse activities beyond traditional team sports, including walking, running, yoga, and group fitness.

6. In parks and playgrounds, incorporate designated areas for socializing, such as picnic tables or shaded pavilions.

7. Ensure universal accessibility in the park/playgrounds. Provide ramps in addition to steps for accessing elevated areas.

8. Provide accessible play options for people with disabilities, including ground-level activities, transfer points to elevated areas, and ramps.

A5.2 PROGRAMMING AND DIVERSITY

Play spaces should be designed to be inclusive of all age groups, genders, and abilities. The NIUA guideline for Creating Accessible Parks and Play Spaces categorizes types of play by age groups: Infants and Toddlers (2–4 years), Young Children (4–12 years), Teenagers (13–18 years), and Young Adults (18+ years). Additionally, it is important to consider the needs of Adults and the Elderly, who may use parks and playgrounds for recreation, exercise, or social engagement.

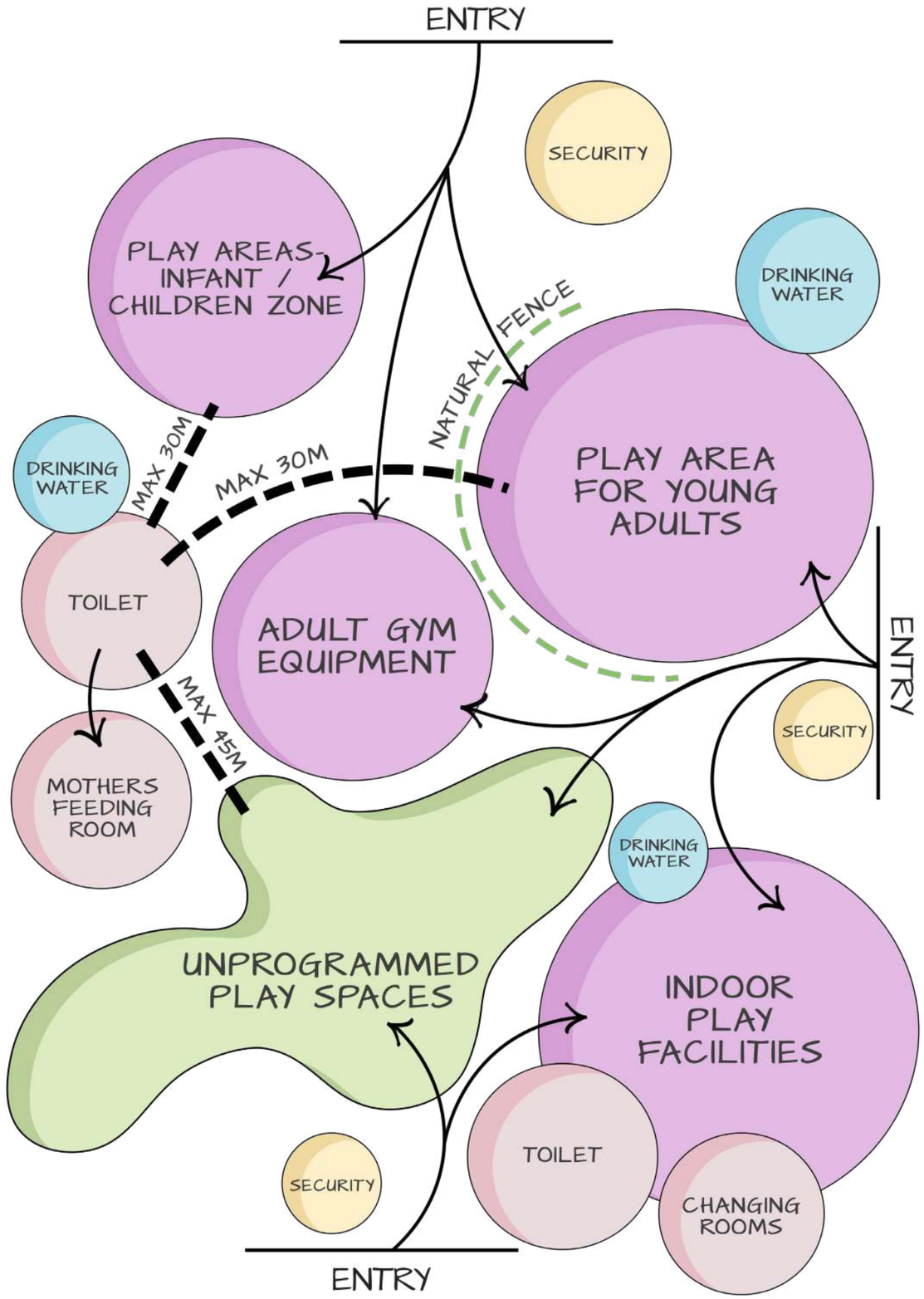
A5.2.1 PLAY AREAS - INFANT AND TODDLER ZONE

- Create a secure, enclosed play area with age-appropriate equipment and soft surfaces.
- Provide seating for caregivers.
- Inclusion of an accessible version for PWD of every play equipment - toddler swing, climbers, etc. is mandatory.

A5.2.2 PLAY AREAS - CHILDREN

- Provide a variety of equipment catering to different skill levels and abilities.
- Include caregiver seating areound all play areas.
- Ensure the play area is accessible for children with disabilities. Inclusion of an accessible version for PWD of every play equipment - swing, slide, climbers, etc. is mandatory.

Wheelchair-friendly Merry-go round
Photo Credit: Cunningham Recreation



A5.2.3 PLAY AREAS - YOUNG ADULTS

- Develop multi-use outdoor courts for skating, badminton, volleyball, yoga, etc.
- Provide flexible open play areas.
- Ensure accessibility of all facilities, including play equipment, for people with disabilities.

A5.2.4 ADULTS AND ELDERLY

- Provide diverse equipment for all fitness levels and abilities.
- Consider separate gym areas for men and women in medium and larger parks.
- Include instructions and diagrams for proper usage. Incorporate senior-friendly equipment for balance and flexibility.
- Provide a walking path in the periphery of the park.

A5.2.5 INDOOR PLAY FACILITIES

- Equip indoor courts with multi-use features and adaptable layouts for various sports, fitness classes, and community events.
- Consider childcare facilities within the building for parents.
- Provide accessible storage options like lockers, cubbyholes, and basket rentals.
- Offer unisex or exclusive gyms with designated areas for workouts and group classes.
- Ensure accessible entrances and exits with ramps and handrails.
- Install tactile tiles with directional indicators throughout the building.

A5.2.6 ADJACENCIES IN PARK AREAS

- Install a physical or natural fence to separate play areas and traffic zones.
- Maintain a 10-20 meter buffer between playgrounds and active areas like sports fields.
- Use fencing to separate areas if a buffer isn't possible.
- Locate restroom buildings within a 45 meters radius of recreation playfields and a 30 meters radius of children's play areas.

A6. Comfort

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SEATING	• Minimum seating section length: 1.5 meters. • Offer various seating options (backrests, armrests, open layouts). • Provide creative seating typologies for diverse uses. Accommodate those with mobility restrictions and PWD in seating arrangements. • Position seating along walkways off the path for privacy and safety.	• Provide well-lit seating areas with a variety of heights (0.45 meters being the majority) at regular intervals (minimum every 100 meters)	• Locate seating options in areas with natural shade or install artificial shade structures. • Position seating near playgrounds and children park areas to be easily accessible for caregivers.
WASTE MANAGEMENT	• Encourage waste segregation by implementing clear signage and bin designs. • Ensure bins are visible without obstructing pedestrian pathways.	• Provide accessible waste disposal bins (including child-sized bins at 0.45-0.5 meters height) at regular intervals (every 100 meters) and near seating areas.	• Provide refuse/recycling containers at entrances and in gathering areas.
THERMAL COMFORT	• Pavilions and pergolas should be oriented east-west for maximum shade. • Pergolas for sitting and rest should be located away from main walkways. • Maintain a 1:1 ratio of roof width to height for effective shade. • Combination of mature trees and pavilions.	• Medium and Large Parks: 70% shade on primary walkways (min. 1.8m wide). 50% shade on secondary/tertiary walkways (min. 1.8m wide). • Small Parks: 50% shade on walkways. • Primary Walkways: 3 shaded rest areas per 500 meters. Secondary/Tertiary Walkways: 5 shaded rest areas per 1,000 meters.	• Playground Shade: All seating areas within playgrounds should have shade (natural or artificial) • Car Parking Shade: At least 40% shade coverage for parked vehicles.
LANDSCAPING	• Provide open lawn area for unstructured play. Select low-maintenance lawn types that require less mowing and water. • Designate space for community gardening in small parks and playgrounds.	• Maintain a minimum of 1 tree per 80 sqm for parks over 100 sqm. Provide 1 tree per 50 sqm of park area. • Implement compensatory plantation at a 1:3 ratio for felled or transplanted trees.	• Plant medium canopy trees with non-invasive roots near paved areas - walking routes, parking for shade, heat reduction, and glare minimization. • Ensure trees planted at edges to provide visibility upto 2.4m height. Shrubs in open areas to a maximum height of 1.2 meters.
PUBLIC ART	• Feature diverse art forms: Sculptures, murals, installations, wall paintings, indoor installations. • Showcase women and transpersons in diverse roles. • Limit interactive sculptures: Maximum height of 1.8 meters.		• Incorporate lighting in public art installations, particularly in areas with lower foot traffic after dark.
PARKING	• Encourage NMT usage with adequate signage and safety provisions. • Allocate a minimum of 5% of total parking spaces to PWD and pregnant persons.	• Provide minimal and paid parking based on public transportation and off-street parking availability. • Priority parking spots can be reserved for senior citizens.	• Locate parking strategically near major park features. • Provide bicycle racks near entrances and other amenities accessible by roads.
DRINKING WATER SUPPLY	• Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access. • All indoor recreational buildings must include at least one drinking water provision. • Provide anti-skid paving around the drinking fountain, gradually sloping towards the adjacent softscape.	• Drinking water facilities must be provided adjacent to every restroom building.	• Drinking water facilities shall be located at a minimum distance of 7.5m. from all play areas • Position drinking fountains so that pathways are unobstructed by the fountain user.

Grange Park benches designed with wider seats and without an outside armrest for easy transfer. They are also designed with backrest and armrest for comfort.
Photo Credit: UnitedWay, Greater Toronto

Public Toilets in the Tête d'Or Park with two unisex toilet, one of which is accessible. Seating provided outside for caregivers or companions to wait.
Photo Credit: Jacky Suchail Architects

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
TOILETS	• Small Parks: Minimum of two accessible toilets. • Medium and Large Parks: Provide toilets based on park size and expected footfall. • At least one toilet each in men's and women's facilities should be universally accessible. • Provide one family/gender-neutral restroom in medium and large parks. • Incorporate low-height wash basins for children, short stature individuals, and wheelchair users. • Refer to the Public Toilets section for more details.	• Place restrooms every 300 meters, prioritizing accessibility near high-traffic areas like playgrounds.	• Locate restroom buildings within a 45 meters radius of recreation playgrounds and a 30 meters radius of children's play areas. • Avoid placing toilets in isolated corners, as this can encourage hiding spots, neglect, and poor upkeep.
FEEDING CUBICLES	• In medium and large parks, provide clean and well-lit feeding booths for nursing mothers with diaper changing tables and comfortable seating. • Allocate enough space (minimum 2.1m x 2.4m) to accommodate at least two nursing mothers with screens.	• In small Parks, provide minimum one feeding cubicle • In medium and large parks, provide one for every toilet block provided.	• These booths may be attached to the toilet complex. • First Aid facility may be combined with Feeding Cubicles.
MAINTENANCE PERSONNEL ROOM	• Provide a dedicated space for maintenance staff, including changing areas and storage. • Minimum size: 2.1m x 2.4m. The size of this space is dependent upon the number of service personnel.		• In small Parks, provide a room adjacent to the main entry gate. • In Medium and Large parks, provide rooms in different locations of the park, dependent upon the number of service personnel.

Solar Powered Charging Point and Wifi Station
Photo Credit: Tolerie Forezienne

Multisensory maps and signage. Including helpline numbers.
Photo Credit: InclusiveCityMaker.com

A7. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Utilize warm-toned pedestrian lighting with a minimum brightness of 10 lux. • Maintain a minimum light fixture height of 2.4 meters, with a maximum height not exceeding the walkway width (up to 5 meters). This ensures adequate light coverage without obstructing pedestrian movement. • Provide warm bollard lighting of ht. 0.2-0.3m, c/c spacing 2.4m or ht. 0.5-0.55m, c/c spacing 4.6m or ht. 0.8-0.9m, c/c spacing 9m to illuminate the ground surface without causing light pollution.	• Single-Side Placement: If light fixtures are mounted on one side of the walkway, space them at intervals equal to the height of the pole. • Staggered Placement: If lights are staggered on both sides of the walkway, space them at intervals of twice the pole height.	• Illuminate treads, risers and any other level differences along primary and secondary pathways • Consider incorporating floor inset lighting, strip lighting, focus lights, up/downlights, flood lights, etc. for additional illumination in specific areas. • Provide exterior emergency security lighting at the following locations: Entrance, restroom buildings, primary circulation routes, and parking areas.
WAYFINDING AND SIGNAGE	• Incorporate tactile signage and braille in all information boards, including maps and plaques lettering. • Incorporate easy to understand signage, with symbols and pictorial support, with navigational strips. • Include helpline numbers. Design inclusive signage representative of all genders. • Insist on Bright, contrasting, and consistent color palette. • Child-friendly signage (0.5-0.55 meters) for education.	• Incorporate signage at regular intervals on poles, plaques, pathway markers, digital displays. Distance markers along paths.	• Install well-lit signage at entrances/exits with entry/exit points and park maps (medium/large parks). • At all entrances provide space for a display board for public service announcements, community activies, and other engagements.
WIFI AND ELECTRICAL CHARGING POLES	• Provide free and reliable Wi-Fi connectivity in parks to encourage longer stays and natural surveillance. • Install electrical charging stations for mobile devices.	• Install charging points at regular intervals, ideally every 50 to 100 meters.	• Wi-Fi and charging stations should be located in high-traffic areas, such as seating zones, near commercial areas, and at transit hubs.
SECURITY AND SURVEILLANCE	• Provide battery-operated vehicles for security personnel. • Encourage a mix of active and passive zones for natural surveillance. • Ensure CCTV footage is recorded and monitored in a local police station. • Clearly mark CCTV camera usage to build trust and ensure responsible data collection.	• Install emergency call buttons at 300-meter intervals. • Cellphone charging stations & wi-fi connectivity in large / medium size parks for ensuring access to information at all times.	• Strategically place CCTV cameras in areas with lower visibility.

Inclusive & Sensory Public Park
Photo Credit: Playworld

Inclusive & Sensory Public Park in Chennai
Photo Credit: Playworld

A8. Design and Planning Checklist for Parks

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Does the park's boundary wall allow partial or full visibility from the street?	Full visibility	Partial visibility	No visibility
	If a boundary wall exists, is the height lesser than 1.5m?	Yes		No
	Does planting along the park boundary allow clear visibility?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Is there a minimum 2m walkway or egress (Entry/ Exit) leading to the park?	Yes		No
	Is this footpath continuous and unobstructed? Obstructions include bollards, gate guardrails, drains, trees, etc. that hinder wheelchair movement	Yes		No
	Is the access route to the park well-lit after sunset for ease of visibility and safety?	Yes		No
	Are the footpaths connected to safe, wheelchair-accessible pedestrian crossings at the nearest intersections?	Yes		No
	Are traffic calming measures used near the entrances of the parks? (speed beakers, roundabouts, chicanes, etc)	Yes		No
	If there a level difference between the park premises and the footpath outside the park, is a ramp with handrail provided to enter the park premises?	Yes	Yes, but the ramp slope is very steep.	No
	Is the park entrance wider than 2 metres?	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes	Yes, but some tiles are broken.	No
Vehicular/ Public Transportation	Is public transportation (Bus, Metro Trains, MRTS) available within 500 metres walking distance from the park?	Yes		No
	Are there clear signage & wayfinding indicating public transportation availability, and access points at the park entrance?	Yes	Yes, but not very clear.	No
	Are IPT options like autos, share autos, cycle-sharing facilities, taxis, and ride-sharing services available nearby?	Yes		No
	Are there clear, designated parking areas available for PWD and pregnant women?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area outside the park?	Yes		No

INDICATORS	SCORING	1	0.5	0
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	Are there accessibility features like ramps and continuous, unobstructed walkways wider than 2 metres within the park?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Are there tactile tiles for warning and navigation around edges, turns and dangerous areas within the infrastructure?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Are there any braille, tactile maps or auditory signage to guide PwDs to elevators, toilets and other key destinations?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Are staircase treads and riser heights provided as per standards?	Yes		No
	Are railings provided along walking paths for support and safety?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Are there security or staff to help with navigation or user questions?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Atleast one emergency exit route or additional exits/entry points are available	Yes		No
DIVERSITY OF USERS				
	Is there presence of female/ transpersons who are working as staff?	Yes		No
	Is the park used by wheelchair users?	Yes		No
	Is the park used by blind persons?	Yes		No
	Is the park used by transgenders and non-binary person?	Yes		No
	Do you observe presence of women, transpersons and/or children in the park during the daytime? (Tick yes if you see any one user group)	Yes		No
	Do you observe the presence of women, transpersons and/or children in the park after 7PM? (Tick yes if you see any one user group)	Yes		No
	Does the park have play equipment for children?	Yes		No
	Does the park have play equipment and multi-sensory play spaces?	Yes		No

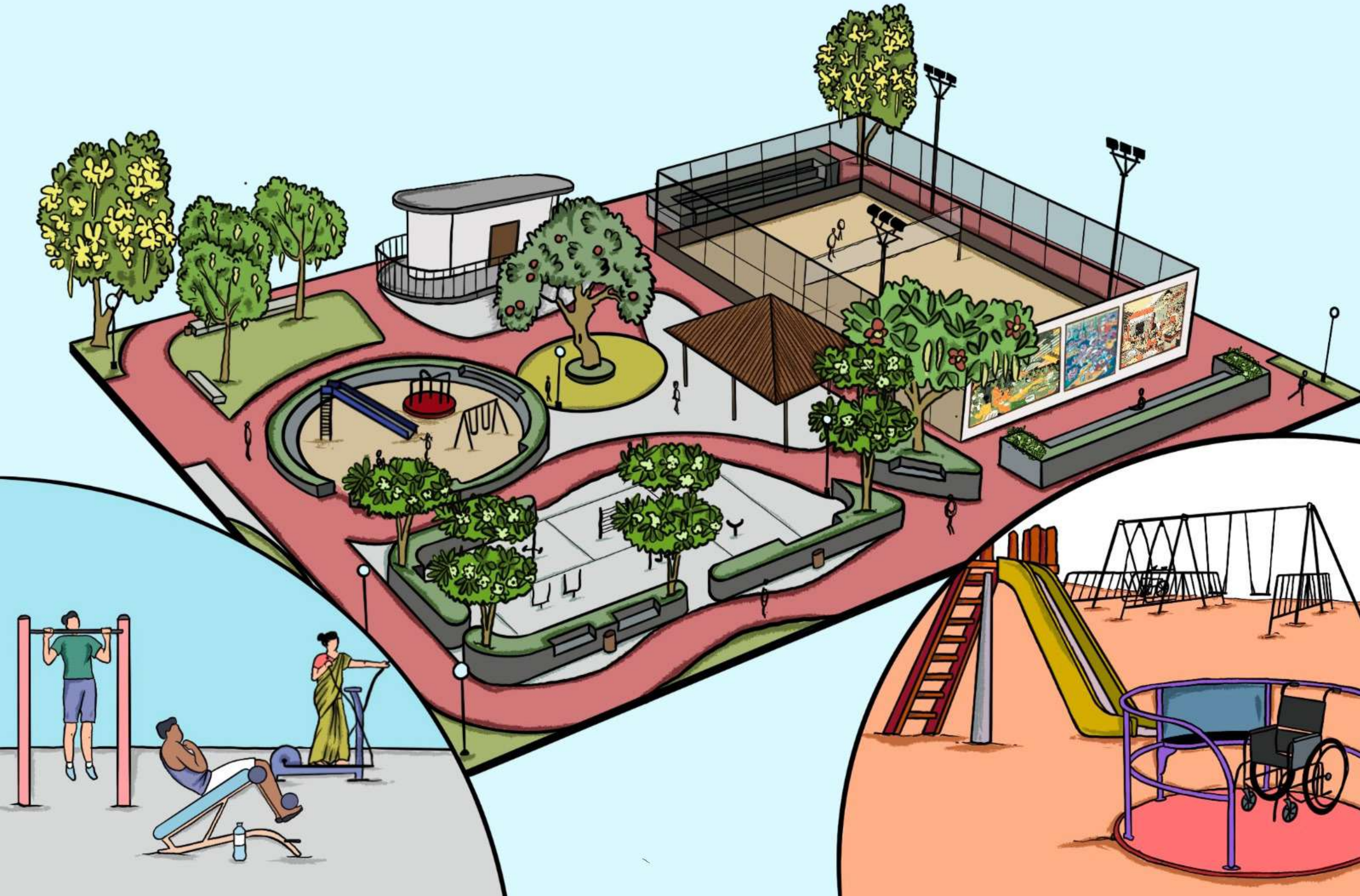
INDICATORS	SCORING	1	0.5	0
COMFORT				
Drinking water	Are drinking water facilities located at a minimum distance of 7.5m. from all play areas inside the park?	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
	Is there wheelchair clearance to access the low height drinking water tap?	Yes		No
Seating Provisions	Seating or resting area is provided every 50 metres along the walking path?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Does the seating obstruct the pedestrian walkway?	Yes	Yes, in some cases.	No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
	Do seats have backrests and armrests for comfort?	Yes	Yes, in some cases.	No
	Does the seating become too hot to sit on during the day?	Yes	Yes, in some cases.	No
	Are there phone charging points near the seating areas?	Yes	Yes, in some cases.	No
Shade	Is there a shade structure/ resting spot for park users to take refuge during rain or excessive heat?	Yes	Yes, but not adequate for the crowd	No
	In the case of large and medium-sized parks, are 70% of primary walkways shaded? And in the case of small parks, are 50% of the walkways shaded?	Yes		No
Walkway Materials	Are walkways made with anti-skid material?	Yes		No
	Are walkways made with permeable or semi-permeable materials?	Yes		No
Waste Disposal	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are waste bins adequately managed without overflowing?	Yes	Yes, in some cases.	No
Landscape	A minimum of one tree per 80 sqm. of park area for park sizes larger than 100 sqm. must be ensured. Is this the case here?	Yes		No
	Is plant maintenance ensured with care provisions like staff, water access, and an O&M plan?	Yes		No

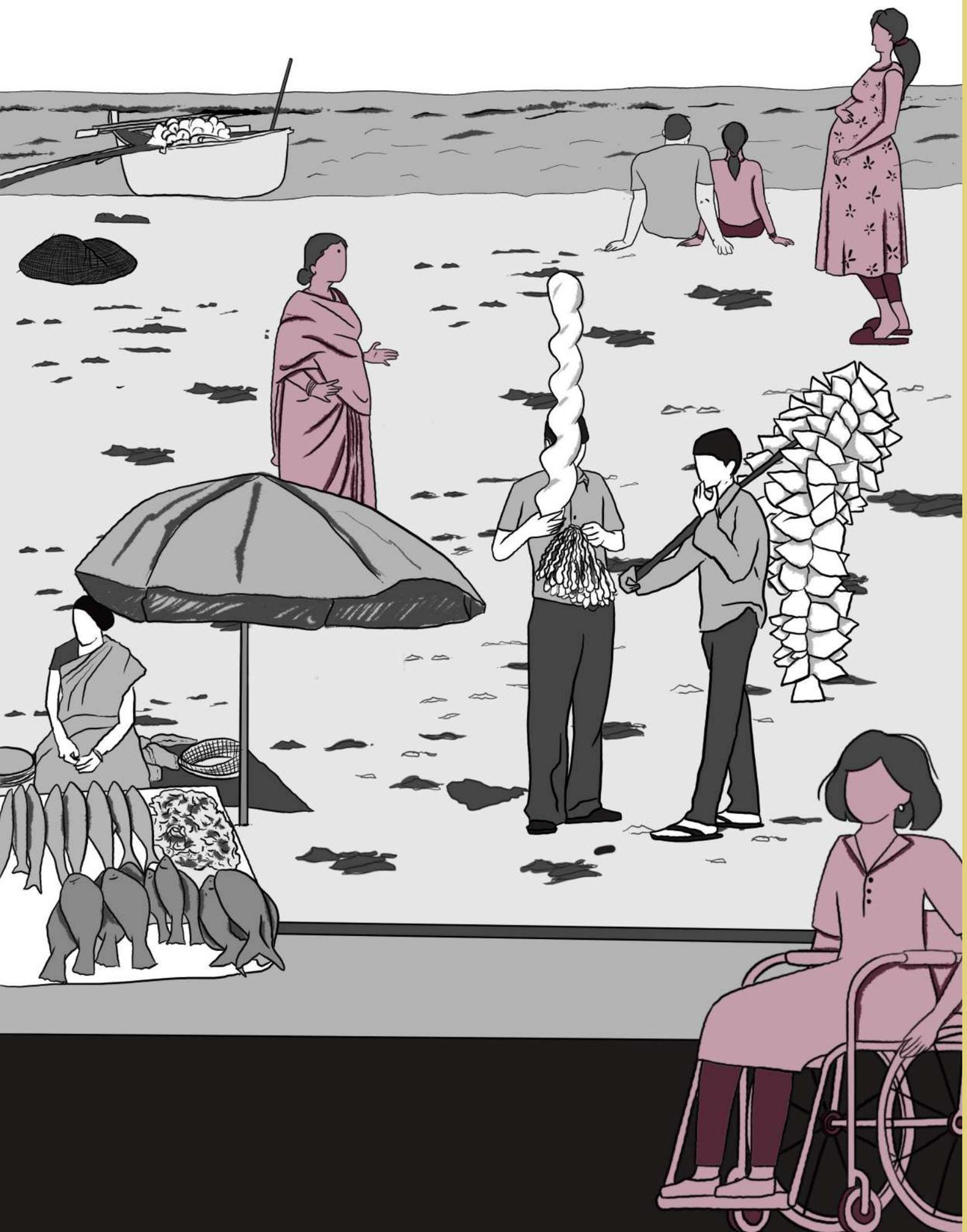
INDICATORS	SCORING	1	0.5	0
Public Art	Is public art present inside the park?	Yes		No
SAFETY				
	Does the park have security personnel? And do they have a dedicated space for keeping their belongings?	Yes	Yes, but no dedicated space for keeping their belongings	No
	Is there adequate visbility to and from active and passive play areas?	Yes	Slightly obstructed view in some areas	No
	Are there CCTV Cameras at every 30-50 meters/ with no blind spots?	Yes	Yes, but has blind spots/ are not functional	No
	Is the park free from vandalism, alcohol bottles, and cigarette butts, ensuring a safe environment for users?	Yes		No
	Is the area free from user groups engaging in activities like gambling, unruly behavior, or intoxication that may cause discomfort to others?	Yes		No
	Is the park located more than 500m walking distance from any liquor sale point?	Yes		No
	Are there emergency call buttons at 300m interval?	Yes		No
LIGHTING				
	Are all pathways, features, buildings, and exits are evenly and adequately lit with a lux level of 10 or more, providing optimal visibility and safety?	Yes	Yes, but not with adequate lighting lux level	No
	Are light fixture heights between 2.4m and 5m, ensuring adequate coverage?	Yes	Yes, but some are not working	No
	Is exterior emergency lighting provided at key points like primary circulation routes, toilets, play and parking areas?	Yes	Yes, but not well-lit	No
	Are treads, risers, and other level differences illuminated along the pathways to avoid tripping and falling?	Yes		No
	Do semi covered spaces/ resting spots have adequate lighting provision?	Yes	Yes, but not well-lit	No

INDICATORS	SCORING	1	0.5	0
SIGNAGE				
	Is the park entrance marked with legible and clear signage?	Yes		No
	Is there informational signage provided? E.g. map layout of the park	Yes	Yes, but it is not located correctly for users.	No
	Is there a Public Address System in the park?	Yes		No
	Are there signages with Helpline numbers or nearest police booth info?	Yes		No
	Is there voice-activated wayfinding systems that provide descriptions of directions or key features in the park, including closing times, emergency routes, regular information,etc.	Yes		No
	Are the signages at a correct reading height for adults and children?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Is there tactile map provided for the map at the entrance?	Yes	Yes, but it is not located correctly for users.	No
	Are all signages multi-lingual?	Yes	Yes, but they are not consistent or available throughout the park.	No
	Is the signage consistent in design throughout the park?	Yes		No

TOTAL PARK SCORE: _____ / 72
TOTAL TOILET SCORE: _____/ 53

Inclusive & Sensory Public Space in Chennai
Photo Credit: C40 Cities





02

BEACHES

The Greater Chennai Corporation has 43 kilometers of coastline, including multiple popular beaches that are used by people from all walks of society. The types of beaches within Chennai city fall under two broad categories — Recreational and Livelihood. Beaches that are largely leisure spaces—those that see a large footfall of visitors, such as Besant Nagar beach—are dotted with food and game vending stalls, outdoor event spaces, and are havens for recreation. Beaches like Kottivakkam Kuppam are the commons of the fishing community where boats are parked, nets are dried, and fish is sold—this is the space for both life and livelihood of those who have lived and made a living dependent on the sea and coastal commons for centuries.

The vast expanse of beaches and the diversity of the people who visit and occupy these spaces pose several challenges in ensuring safety and comfort across gender, age, and the nature of work or leisure. Examples from beach users abound, including safety and policing threats to cleaning personnel, couples, and trans people from fellow beach users and a lack of shelter spaces for women vendors and workers during late-night and early-morning shifts. The general lack of lifeguards at the beach is also a problem for swimmers. How do we design physical infrastructures on beaches that help address and overcome barriers that people of different genders, ages, and socioeconomic groups face in these spaces?

Gender-sensitive design guidelines are crucial to addressing these disparities by ensuring that all beach-goers feel safe, respected, and included. Thoughtful interventions such as the installation of gender-segregated restrooms, shaded areas for women vendors, and clear signage for safety can help create an inclusive and supportive environment. Additionally, designing with accessibility in mind, such as ramps for wheelchair users and designated spaces for various activities, ensures the beach is truly accessible for all. By considering the diverse needs of different groups, we can foster a more equitable and enjoyable beach experience.

B1. Existing Conditions

City's most popular and frequently visited public space, the beach, holds significant potential for enhancing the overall user experience. However, both the recreational and livelihood areas face several challenges that affect accessibility and safety. The access roads and sidewalks are often in poor condition, with broken surfaces and no designated crosswalks or curbs, making it difficult and unsafe for pedestrians to navigate. The lighting along the beach is primarily provided by high-mast lights and streetlamps, which may not offer adequate illumination for all areas. Additionally, there is a lack of clear and informative signage, particularly regarding street boundaries, distances to amenities, and other essential information. This absence of guidance can leave visitors feeling confused and disoriented. Addressing these issues could greatly improve the safety, accessibility, and overall experience of the beach for all users.

The beach faces several challenges in terms of providing adequate facilities and safety for its users, particularly for night shift maintenance workers, especially women, who often have to sleep in unsafe conditions. Additionally, there are insufficient shaded areas, and public toilets are often locked or not accessible.

The lighting along the access roads is inadequate, which further compromises safety, and there is a significant disparity in the number of toilet stalls available for men and women. While there have been some efforts to improve accessibility, these changes are not comprehensive and do not address all the needs of the beach's diverse user groups. However, one positive aspect is the regular hosting of free events and activities, which help bring together different communities and foster a sense of unity. Overall, addressing these infrastructure and safety concerns would significantly improve the beach's functionality and experience for all users.

Quick Fixes

Redo toilets to be accessible, inclusive, and gender neutral, if lack of space. Provide changing rooms.

Provide accessible kerb ramps for seamless accessibility.

Ensure pedestrian paths to toilets, drinking water facilities and public transportation nodes are free from obstructions.

Ensure waste bins are available throughout the area and that waste is collected regularly to prevent littering on the shore.

Ensure the pathways, shelters, or police booths are not difficult to access or navigate.

Add sufficient lighting around toilets, pathways, and shelters to maintain visibility and safety after dark.

Penalise vendors or visitors to leave plastic waste or biodegradable waste on the shore.

Include signages indicating visitors of public facilities on the beach.

B2. Boundary/Edge Conditions

1. Unobstructed sightlines provide a sense of security, beach edges therefore should have clear yet non-intrusive boundaries, such as low walls, fences, or landscaping (e.g., plants, rocks).
2. The natural slope and elevation of the beach significantly influence the design of boundary edges. Where possible, these edges should blend seamlessly with the natural environment.
3. Understanding the sea's roughness and tidal range is essential when determining the height and position of the boundary edge.
4. Shore protection mechanisms should be designed to avoid creating imposing visual barriers. Keeping these structures low or integrating them with design is essential.
5. The design of the low barriers should serve multiple purposes, including seating or temporary shelters.

B3. Access to the Infrastructure

B3.1 RECREATIONAL BEACHES

Identifying primary access routes to the beach is essential for connecting the beach to nearby neighborhoods and integrating it into the city's street network. These roads must be capable of managing traffic and congestion during peak times, such as weekends, holidays, and events, when the number of visitors can exceed expectations. Proper access planning is crucial to determine the extent of commercial activities and for ensuring that emergency services can operate efficiently during periods of high traffic.

B3.1.1 PEDESTRIAN ACCESS

1. A continuous pedestrian footpath of at least 2 meters in width should be provided alongside all the roads approaching, adjacent, and along the beach within a 500m radius should be ensured.
2. As per ITDP Complete Streets guidelines, the total width of the footpath, including frontage area and multi-use zones is based on the surrounding landuse. Refer Streets section for further guidance.
3. Provide appropriate spaces for pedestrian and cycle crossings from the footpath to the beach.
4. Kerb ramps or table top crossings with pedestrian signals and street lighting are mandatory in areas with heavy vehicular movement.

B3.1.2 PUBLIC TRANSPORTATION ACCESS

1. Create designated alighting points for buses, autos, and taxis near high-traffic streets. These points should be marked with clear signage and have designated waiting areas for passengers.
2. Plan with concerned agencies for public transportation stops (bus/rail) services within 1.5 kilometers of the Beach entry points.
3. Ensure pedestrian accessibility from public transportation nodes are safe and barrier-free.
4. Designated pick-up and drop-off points should be planned along beach stretches. Stands for autos and intermediate public transport (IPTs) should be clearly marked, with visible signage to ensure easy identification and efficient use.

B3.1.3 PRIVATE VEHICULAR ACCESS

1. Based on the type of commercial and recreational activities planned on the beach and surrounding land uses, designate adequate parking facilities.
2. Use clear and visible signage at key access points to indicate parking availability and guide traffic flow efficiently, ensuring minimal disruption to road traffic, pedestrian and cyclist movements.
3. Beach areas experience heavy pedestrian traffic, often with frequent jaywalking. Careful planning of access and exit points is crucial to ensure safety, minimize traffic disruptions, and reduce the risk of accidents.

Parking along Elliots Beach Promenade
Photo Credit: Pavithra Sriram

Parking provisions at Santa Monica Pier
Photo Credit: iStock

B3.2 FISHING COMMUNITY BEACHES

Access to livelihood beaches is crucial for connecting fishermen's communities to their primary workspace. These beaches serve as extensions of their homes, where they sell their catch, socialize, and celebrate local festivities and events. To preserve the nature of activity and residential quality of such beaches, it is fundamental that the access is treated as slow streets that are intended for low vehicular volumes and speeds.

As with any residential street, pedestrian access is essential. A continuous footpath of at least 2 meters in width should be provided to ensure safe movement. Safe crosswalks should be planned at all intersections and mid-blocks where desired line of movement is identified. Public transportation should be accessible within 1.5 kilometers of homes, and on-street parking should be available for residents for general use. Refer Streets section for further guidance.

Fishing women in all aspects of the trade.
Photo Credit: Alamy, Locavore, The Hindu

B4. Access within the Infrastructure

1. The promenade should provide visual connectivity to all parts of the beach, allowing pedestrians to move freely along its length. Where there are no promenades, access points to be marked clearly.
2. On recreational beaches, the promenade must have a minimum clear width of 4 meters, excluding seating areas and legroom.
3. The ITDP Complete Street guidelines recommend a 7-meter footpath width for high pedestrian traffic areas in on-street conditions, consisting of a 4-meter walking zone, a 2-meter multi-utility zone, and a 1-meter frontage/dead zone. While these dimensions are designed for on-street applications, they can be considered for off-street public spaces like beachfront promenades for optimal pedestrian flow and functionality.
4. Safety barriers, such as bollards or railings, should protect the promenade from road traffic.
5. For raised promenades, adequate provisions must be made for Persons with Disabilities (PWD) to access the promenade.
6. Where the beach or sand area is at a lower level, access should be provided through steps and ramps with railings.
7. Every commercial beach must include at least one accessible route with standard railings on both sides that allows PWD, strollers, and walkers to reach the ocean or sea edge and essential facilities like toilet, drinking water spouts, etc.
8. The materials used for this path must comply with environmental considerations, Coastal Regulation Zone (CRZ) guidelines, and other applicable regulations.
9. Clearly designated entry and exit points should be provided at regular intervals along the promenade to ensure smooth pedestrian movement and prevent congestion.
10. Adequate wayfinding signage, including multilingual and pictorial signs, should be installed to guide visitors to key amenities such as restrooms, first-aid stations, accessible pathways, and commercial areas.

Tel Aviv's Central Beach Promenade
Photo Credit: Mayslits Kassif Roytman

248m permanent wooden pedestrian ramp in Marina Beach.
Photo Credit: S.R. Raghunathan

B5. Space Planning

B5.1 RECREATIONAL BEACHES

1. Following the "Power of 10" principle, successful public spaces require a diverse range of uses to be safe and inviting. Commercial beaches are no exception. By offering a variety of activities and amenities, we can encourage more people to use and inturn make them safer for all users.
2. Local needs, community participation, and stakeholder consultations are essential in determining the best uses for a beachfront. Balancing the interests of tourists and residents is crucial to ensure the space is accessible and welcoming to all.
3. The design and layout should be carefully planned to integrate with the surrounding urban environment and meet the needs of the community. This includes considering factors like land use, activities, and accessibility.
4. Commercial facilities like kiosks and vending zones can be strategically located along accessible routes and promenades.
5. Historic, religious, politically or socially significant structures and buildings along the beach, and ecologically sensitive areas are to be marked with relevant signage for tourists and locals alike in order to understand the sensitivities.
6. Beaches with public access to the water should be equipped with essential safety facilities, including lifeguard towers, to ensure the safety of beachgoers.
7. Unlike in the West, where beaches may primarily serve as leisure spots, Indian beaches often host cultural, religious, and seasonal festivals. Design should accommodate these dynamic uses without compromising accessibility and safety.
8. Allocate space for local artisans and traditional market stalls within vending zones, supporting community livelihoods while enhancing the beach's cultural and commercial vibrancy.

ACTIVATION AND PROGRAMMING BEACHES

To create a welcoming and inclusive space for all users, including people with disabilities, transgender individuals, women of all ages, children, elderly, shopkeepers, residents, tourists, and maintenance workers, it's essential to design amenities that prioritize safety and comfort. Even large spaces like beaches can be programmed to offer a variety of activities, from passive relaxation to active recreation. These programs can foster community engagement, social inclusion, and awareness-building. While this list is not exhaustive, these suggested uses can help beaches become integral parts of the city's unique character and identity.

ACTIVE USES	PASSIVE USES	SEASONAL USES

• Walking is a common activity along beach promenades and shoreline areas.
• Provide spaces for non-contact sports like frisbee, beach volleyball, football, skating, etc.
• Include a Children's play area
• Install outdoor gyms and pebble walking paths.
• Where applicable, offer beach and water sports with designated zones and equipment rental.
• Include activities like merry-go-rounds, balloon shooting, and horse riding.
• Giant wheel and Amusement park areas.
• Designate spaces for yoga and meditation.
• Plan formal and informal food and other commercial stalls in areas of high foot traffic.
	• Educational and Nature based awareness building programing and activities.
	• Fishing Hamlet Youth and women stewardship for eco-tourism and beach management. This can include
	  • Local cuisine and cooking classes, showcasing traditional recipes.
	  • Beach tours and oral history narratives, sharing stories about the beach and its communities.
	  • Living museum story walks, with curated infographics and historical photos installed on plexiglass panels.
	• Outdoor plazas and open air theatre seating for small events.
	• Sunrise viewing decks.
	• Tactile play spaces on the sand.
		• Beach clean-up and marine and coastal awareness programs.
		• Larger annual events such as outdoor movie screenings.
		• Annual Beach Concerts and Community Cultural festivals
		• Beachside Religious festivals.
		• Olive Ridley nesting and breeding - Environmental education and night walks.
		• Open Streets Program during carfree sundays - Outdoor Zumba, Music and dance.
		• Seasonal markets and craft fairs, kite festivals, are other locally planned events.

Movies on the beach
Photo Credit: Eastofmalaga.net

Torre del Mar's wide promenade and adjacent seafront gardens.
Photo Credit: Eastofmalaga.net

Passeio das Dunas seafront promenade with solar lighting solution.
Photo Credit: Schreder

Temporary gazebo structures along Pondicherry Beach
Photo Credit: Pondicherry Tourism

B5.2 FISHING COMMUNITY BEACHES

Fishing community beaches are dynamic spaces shaped by the needs, traditions, and deep-rooted knowledge of local fishing communities. Unlike recreational beaches, which are designed primarily for leisure and tourism, these livelihood beaches are built and rebuilt incrementally by the community itself, fostering a strong sense of ownership and responsibility. The planning, infrastructure, and functional requirements of these spaces are distinctly different from those of recreational beaches, as they directly support the economic and social well-being of the fishing communities.

B5.3 THE ROLE OF THE BEACH IN THE FISHING COMMUNITY

For fishing communities, the beach is an extension of their homes and a foundation for their livelihoods. It is essential that the spatial planning of these areas captures the intricate workflow of the fishing process. Activities such as launching boats, sorting the catch, drying fish, repairing nets, and conducting local trade are all part of the daily rhythm of these beaches. Any changes to the built environment must be sensitive to these activities, as even minor disruptions can significantly impact productivity and income.

Fishing communities possess invaluable knowledge about the local environment, including the behavior of sand dunes, tidal patterns, water quality, and seasonal variations that affect their livelihoods. Their dependence on nature makes them highly attuned to ecological changes, and any intervention—whether infrastructural or regulatory—must respect and integrate this local wisdom.

Beyond the residential boundaries of each fishing village, there is an informal but well-respected understanding between villages regarding territorial boundaries for fishing activities. These boundaries are determined by practical needs, such as the use of shore seine (periya valai) nets, which require a considerable stretch of beach for their operation. This spatial organization is essential for maintaining harmony and efficiency in fishing practices. Every fishing village has essential infrastructural elements that support its daily activities. These typically include:

Fishermen and women manoeuvre a shore seine net
Photo Credit: WordPress - SaveEnnoreCreek

B5.4 KEY FACILITIES AND INFRASTRUCTURE IN FISHING BEACHES

With generations of experience in navigating the forces of nature, fishing communities construct their spaces using temporary, adaptable, and vernacular materials. Struc-

- Fish Landing Centers: Areas where freshly caught fish are brought ashore, sorted, and distributed.
- Drying Yards: Spaces designated for drying fish, a crucial process for preservation and trade.
- Local Fish Markets: Markets where fishers sell fresh produce directly to consumers and vendors.
- Boat Docking Yards: Safe spaces for docking and maintaining boats. The location of these may require change based on tides.
- Net Mending Areas: Locations where fishers repair and maintain their nets, an essential routine task.
- Ice Storage Facility: Facilities for storing and preserving fish before transporting to larger markets and smaller ice boxes for local sales.

While fishing is primarily done by men, women play a vital role in supporting these activities through net mending, fish processing, and local sales. Their daily lives are closely intertwined with both household responsibilities and livelihood needs, making their contributions inseparable from the broader fishing economy.

B5.5 BUILDING WITH VERNACULAR WISDOM

tures such as drying racks, storage sheds, and market stalls are often made of wood, palm leaves, or locally available materials that can withstand harsh coastal conditions. This approach not only respects the environment but also allows communities to quickly rebuild and adapt to seasonal changes, cyclones, and storms.

Modern interventions that introduce rigid, permanent structures without considering local needs can be detrimental. Concrete constructions may not only disrupt the traditional workflow but also lead to environmental degradation.
Given the deep-rooted connection between fishing communities and their coastal environment, any planning initiative must actively involve local stakeholders. Community participation ensures that interventions align with tradi-

B5.6 THE IMPORTANCE OF COMMUNITY PARTICIPATION

tional knowledge and practical requirements, rather than imposing externally designed, one-size-fits-all solutions. Engaging fishers in decision-making processes helps to balance development with sustainability, preserving both livelihoods and the coastal ecosystem.

Net mending outside temporary thatch roofings
Photo Credit: Dreamstime

Net mending yard under a concrete structure in Arthungal, Kerala
Photo Credit: Keralacoast.org

Outdoor fish markets along beaches, Chennai. Photo Credit: Dreamstime

Temporary thatch roofing fish market in Kottivakkam Kuppam Beach. Photo Credit: Pavithra Sriram

Preparation for local community events on the beach, Kottivakkam Beach. Photo Credit: Pavithra Sriram

B6. Comfort

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SEATING (IN RECREATIONAL BEACHES ONLY)	• To maximize seating capacity along beaches, consider integrating seating elements with design features like low barriers and planter boxes. • Minimum seating section length: 1.5 meters for individual benches. • Prioritize seating with backrests and armrests for enhanced comfort. • Incorporate a variety of seating sizes, creative designs, and arrangements that facilitate group socializing. • Ensure all seating zones are accessible for persons with disabilities.	• Placement of benches should be at regular intervals minimum every 100 meters. Recommended at every 50m. • Design shacks and furniture elements to minimize ecological impact, preserving beach access and natural habitats.	• Consider the layout of the beach, including the presence of natural features or obstacles that may affect seating placement. • Seating should not obstruct the flow of foot traffic. • Place more seating in high-use zones, such as near recreational or active areas (playgrounds, exercise zones, etc.), vending zones, etc.
WASTE MANAGEMENT	• Implement waste segregation through clear signage and compact bin designs. • Ensure bins are visible without obstructing pedestrian circulation paths. • For areas with food stalls or vending, adequate provision for bio-waste disposal must be ensured. • To manage high volumes of trash on sandy beach areas, consider using color-coded garbage bags hung from poles mounted on the ground.	• The frequency of waste bins should vary based on beach size, visitor density, and activity levels. • For high-traffic beaches, consider placing bins every 30 to 45 meters. In lower-traffic areas, spacing can be increased to 60 to 90 meters. • Near areas with high foot traffic, such as food stalls, vending spaces, or seating areas, provide additional waste bins to accommodate increased waste generation.	• Place waste bins at all entry points, along promenades, seating, within beach sandy areas, and high-traffic areas in playgrounds, gyms, markets, and food kiosks and ensure waste segregation. • In fishing community beaches, provide large segregated bins near the markets are set up.
THERMAL COMFORT	• Install shaded structures, such as pergolas or canopies, along the promenade to provide relief from the sun for walkers, cyclists, and those resting. • Encourage commercial establishments and fish markets, to use natural materials like cloth, dried leaves, and bamboo to create shaded areas for visitors.	• Ensure atleast 40% of the promenade and seating area is shaded from sun/rain. • Encourage commercial establishments to provide shaded areas at a reasonable frequency along the beach.	• Strategically locate shaded areas with seating in areas with direct sunlight exposure, such as open spaces near the water or areas without natural shade.
DRINKING WATER SPOUTS	• Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access. • Provide anti-skid paving around the drinking fountain, gradually sloping towards drain.	• Drinking water spouts should be installed at intervals of at least every 100 meters in high-traffic areas. • Facility should be visible and highlighted with signage and lighting for visibility at night.	• Drinking water spouts should be placed in several convenient, high-traffic areas throughout the infrastructure, such as near entrances, toilets, rest areas, plazas, and playing areas.

Colour-Coded garbage bags hanging from pole mounted on floor ideal for high volume and overflowing trash.
Photo Credit: Shutterstock

Torre del Mar's adapted showers and drinking fountains.
Photo Credit: Eastofmalaga.net

Torre del Mar's tactile and braille signage.
Photo Credit: Eastofmalaga.net

Esbjerg Beach Promenade with offset seating spaces
Photo Credit: Asger Simonsen

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
TOILETS	• All beaches should be equipped with accessible and well-maintained restrooms. These facilities should include changing rooms, indoor or outdoor showers, and leg-washing facilities. Outdoor facilities should be designed to provide adequate privacy. • Refer the Toilets section for sizing, design, and provisions of toilets.	• Public Toilets should be provided at atleast every 500m distance. • The number of toilet facilities within this infrastructure is based on size/length of stretch, access points, proposed use of the beach.	• Place toilets at locations accessible from different sections of the beach. • Should be located near entrances, gathering and resting zones, and high activity zones. • Toilets should be located in well-lit, visible, and safe areas.
LANDSCAPING (IN RECREATIONAL BEACHES ONLY)	• Minimize dense vegetation near walkways and seating areas to maintain clear sightlines . • Create open spaces around high traffic areas like commercial establishments, restrooms, changing rooms, and parking area. • Local species that are ecologically sensitive are crucial to use.		• Ensure that landscape elements do not obstruct visibility from street level, maintaining safety for pedestrians and drivers alike.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
PUBLIC ART (IN RECREATIONAL BEACHES ONLY)	• Promote social cohesion and awareness through interactive art. • Showcase art to depict women and transpersons in diverse roles. • Limit interactive sculptures to a maximum height of 1.8 meters.		• Place public art in areas that may feel isolated or unsafe to visitors, encouraging activity and engagement in these spaces. • Create landmarks with statues or memorials to attract visitors and spark interest.
PARKING (IN RECREATIONAL BEACHES ONLY)	• Optimise available on-street parking area. Explore availability of any off-street parking spaces in the landward side of the beach. • Allocate a minimum of 5% of total parking spaces to PWD and pregnant persons. • Provide at least one bicycle parking space for every 5-10 car parking spaces to encourage cycling. • Consider electric vehicle charging stations.	• Ensure that parking areas are well-connected to the beach through accessible pathways and walkways. • Priority parking spots can be reserved for senior citizens.	• Locate parking areas near entrance, exits, and walkways for easy access and egress.

Pre-fab toilet and first aid kiosks in Havana, Cuba
Photo Credit: Urbadis

Metal and Wood Toilet structure with ramps to access PWD toilet.
Photo Credit: Urbadis

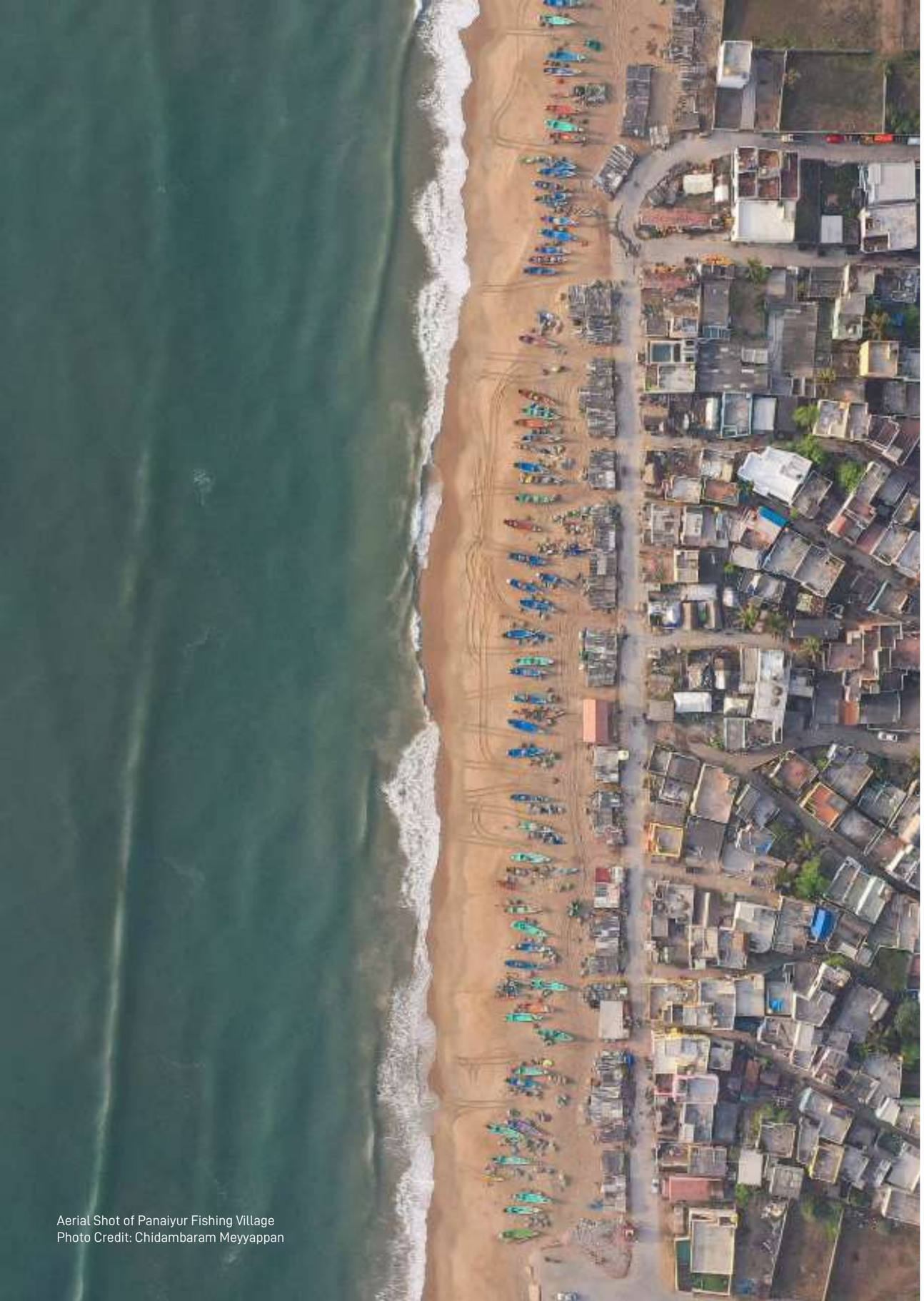
B7. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
STREET VENDING AND COMMERCIAL ACTIVITY (IN RECREATIONAL BEACHES ONLY)	• In High-Intensity areas well-lit, designated vending zones ensure active surveillance, reducing the risk of harassment. • In Medium-Intensity areas scattered vending provides natural surveillance and can act as informal guardians. • Encourage women-led businesses to create a more inclusive and comfortable public space.	• High-Intensity Areas (Entry Points, Parking, Promenades) Dense vendor presence in designated clusters to manage congestion. • Medium-Intensity Areas (Walkways, Resting Spaces) Scattered mobile stalls with limited vendors to balance commerce and recreation. • Low-Intensity Areas (Waterline, Natural Zones) Minimal/restrict vending, no permanent structures.	• In Promenade & Plaza Zone - formal and informal kiosks stalls integrated into the urban design. • Nature Conservation Zone – No vending allowed to preserve ecological balance and biodiversity. • Designated spaces for seasonal or weekly night markets, ensuring vibrant yet organized commercial activity.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT

LIGHTING	• Utilize warm-toned pedestrian lighting, minimizing blue light which can disrupt wildlife.
	• Ensure lights are fully shielded to direct illumination downward and reduce light pollution.
	• Recommended Lux Levels:
	  • General Beach Areas: 1-5 lux for sandy areas where marine species are present.
	  • Pathways/Access: 5-15 lux for safe navigation.
	  • Critical Nesting Areas: <1 lux to minimize disturbance during nesting season.
		• Walkways and Promenades:
		  • Single-Side Placement: If light fixtures are mounted on one side of the walkway, space them at intervals equal to the height of the pole.
		  • Staggered Placement: If lights are staggered on both sides of the walkway, space them at intervals of twice the pole height.
		• Provide adequate lighting with signage on all sides of toilet blocks and police booths.
			• Ensure that lighting fixtures are installed out of reach from potential vandals to minimize damage and maintain functionality.
			• Focus on areas where pedestrian traffic is expected, ensuring that all walking paths are well-lit to enhance safety and security.
			• Provide exterior emergency security lighting at entryways, toilet blocks, primary circulation routes, and parking areas.

SIGNAGE (IN RECREATIONAL BEACHES ONLY)	• Provide bilingual and tactile signage, including local maps, pedestrian-friendly signs, and visible pickup/drop-off indicators. • Install informational signs and directional wayfinding on floors and vertical elements, incorporating helpline numbers. • Use clear warning signs, green and red flags, and floating markers to indicate hazards and safe swimming areas. • Use simple designs and colors for enhanced readability.	• Incorporate signage on all entrances and major paths. • Install voice-activated wayfinding systems that provide audio descriptions of directions or key features in the beach, emergency situations, or event notifications.	• Install well-lit signage and auditory systems at entrances/exits. • Safety and Emergency signage and auditory systems at all exits, high-risk areas, and next to emergency equipment. Visible from 15-20 meters.
SURVEILANCE AND SECURITY	• Ensure the presence of lifeguards to monitor safety and respond to emergencies. • Provide well-lit and easily accessible emergency SOS buttons. • Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Police Booth with male and female personnel for surveillance at night.	• Cameras should be installed every 30-50 meters. Ensure no blind spots in surveillance. CCTV has to cover edges and bends. • Place SOS buttons and CCTV cameras within a 5-10 minute walking distance from any point on the beach for quick access in emergencies.	• Strategically place CCTV cameras at all major sections of the beach.
WIFI AND ELECTRICAL CHARGING POLES (IN RECREATIONAL BEACHES ONLY)	• Enhanced connectivity can serve as a crucial safety parameter in isolated areas, especially at night. • Provide free and reliable Wi-Fi connectivity in beaches along promenades and walkways to enhance user experience and encourage longer stays and natural surveillance. • Install electrical charging stations for mobile devices. Incorporate these features in seating areas.	• Install charging points at regular intervals, ideally every 50 to 100 meters.	• Wi-Fi and charging stations should be located in high-traffic areas, such as seating zones and near commercial areas.



Aerial Shot of Panaiyur Fishing Village
Photo Credit: Chidambaram Meyyappan

B8. Design and Planning Checklist for Beaches

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Can people see clearly across the beach area to help keep it safe?	Full visibility	Partial visibility	No visibility
	Does the boundary follow the beach's natural slope and terrain without harming the environment?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
RECREATIONAL BEACHES				
Pedestrian Access	Is there a continuous footpath at least 2 meters wide along all roads within 500 meters of the beach?	Yes		No
	Does the footpath connect to the beach promenade with safe wheelchair accessible pedestrian crossings and kerb ramps where needed?	Yes		No
	Are there kerb ramps at the drop-off areas?	Yes		No
	Are there tactile tiles/indicators on the ground to guide people to the beach entry points?	Yes		No
	Are the entrance points to the beach promenade clearly marked with readable signs?	Yes		No
	Is the entrance to the beach/promenade clear of obstacles like steep level differences, poorly spaced bollards, gates, guardrails, or drains?	Yes		No
	Are there signs outside and around the beach to help people find their way?	Yes		No
Vehicular / Public Transportation	Is public transportation (Bus, Metro Trains, MRTS) available within 500 metres walking distance from the beach?	Yes		No
	Are there clear signage & wayfinding indicating public transportation availability, and access points at the beach entrance?	Yes	Yes, but not very clear.	No
	Are IPT options like autos, share autos, cycle-sharing facilities, taxis, and ride-sharing services available nearby?	Yes		No
	Are there clear, designated parking areas available for PwD, pregnant women, injured etc?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area outside the park?	Yes		No
FISHING COMMUNITY BEACHES				
Pedestrian Access	Is there a continuous footpath at least 2 meters wide along all roads within 500 meters of the beach?	Yes		No

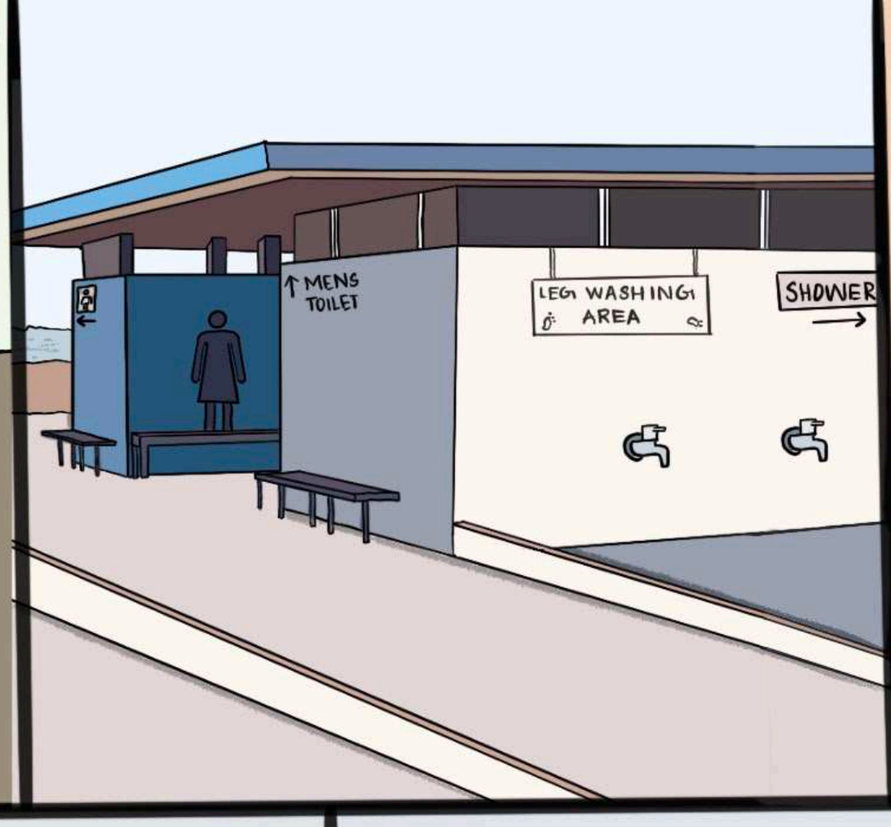
INDICATORS	SCORING	1	0.5	0
Pedestrian Access	Are pedestrian pathways from public transportation nodes to the beach safe, accessible, and barrier-free?	Yes		No
	Are there measures to slow down vehicular speeds (speed humps, signages, roundabouts, chicanes, etc.) at nearby intersections?	Yes		No
Vehicular / Public Transportation	Is the fishing community connected to public transport like buses, metro trains, or MRTS within 1.5 km?	Yes		No
	Are IPT options like autos, share autos, cycle-sharing facilities, taxis, and ride-sharing services available nearby?	Yes		No
ACCESS WITHIN THE INFRASTRUCTURE				
FOR ALL BEACHES				
Pedestrian Access	Is there a clear, unobstructed path for pedestrians from the access road to the beach promenade?	Yes		No
FOR RECREATIONAL BEACHES				
Pedestrian Access	Is the promenade or main walkway at least 4 meters wide?	Yes		No
	Does the beach have at least one accessible route with railings on one side for PWD, strollers, and walkers to reach key areas like the sea, toilets, and drinking water?	Yes		No
	Are other accessible paths, ramps, and walkways wider than 2 meters at the beach?	Yes	Yes, but they are not consistent or available throughout the beach.	No
	Are railings provided along walking paths for support and safety?	Yes		No
	Are all walking areas flat for wheelchair access, with ramps where the ground changes level?	Yes		No
	Is there at least one emergency exit or extra entry/exit points available?	Yes		No
	Are tactile warning tiles installed along beach walking paths?	Yes	Yes, but they are not consistent or available throughout the beach.	No
	Are there any braille, tactile maps or auditory signage to guide PwDs to ramps, toilets, drinking water spouts, and other key destinations?	Yes	Yes, but they are not consistent or available throughout the beach.	No

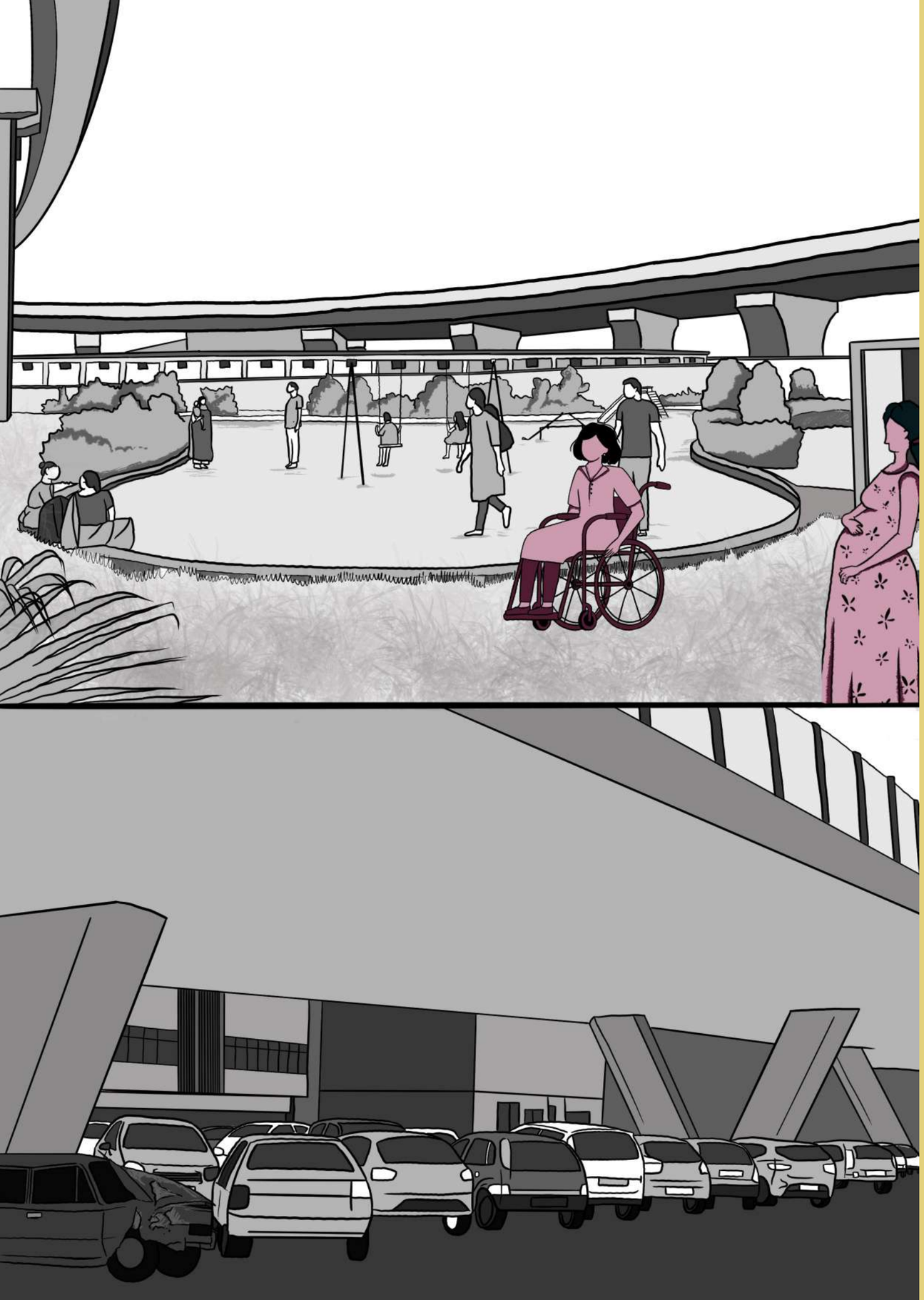
INDICATORS	SCORING	1	0.5	0
VISIBILITY				
	Has the planning process involved community input and stakeholder consultations to balance the needs of tourists and residents?	Yes		No
FOR RECREATIONAL BEACHES				
	Is there presence of female/ transpersons who are working as staff?	Yes		No
	Do wheelchair users use the beach?	Yes		No
	Do blind persons use the beach?	Yes		No
	Do transgenders and non-binary persons use the beach?	Yes		No
	Do you observe presence of women, transpersons and/or children in the infrastructure during the daytime?	Yes		No
	Do you observe the presence of women, transpersons and/or children in the infrastructure after 7PM?	Yes		No
	Are shops, kiosks, and vending zones placed along easy-to-access paths and promenades?	Yes		No
COMFORT				
Drinking water	Are drinking water facilities located at a minimum distance of 7.5m. from all play areas in the beach?	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
Shade	Is shading for fishing, shops, and leisure made using natural or removable materials like cloth, dried leaves, or bamboo?	Yes		No
	For Recreational Beaches, Is there a shade structure/ resting spot along walking paths for beach users to take refuge during rain or excessive heat?	Yes	Yes, but not adequate for the crowd	No
Walkway Materials	Are walkways made with anti-skid material?	Yes		No
	Are walkways made with permeable or semi-permeable materials?	Yes		No
Waste Disposal	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are waste bins adequately managed without overflowing?	Yes	Yes, in some cases.	No
	For Fishing Community Beaches, Is there a separate disposal point for seller wet and other dry waste?	Yes		No

INDICATORS	SCORING	1	0.5	0
FOR RECREATIONAL BEACHES				
Seating Provisions	Does any seating with leg space reduce the clear width of the walkway?	Yes	Yes, in some cases.	No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
	Do seats have backrests and armrests for comfort?	Yes	Yes, in some cases.	No
	Does the seating become too hot to sit on during the day?	Yes	Yes, in some cases.	No
	Are there phone charging points near the seating areas?	Yes	Yes, in some cases.	No
	Is there extra seating in busy areas like playgrounds, exercise zones, promenades, and vending areas?	Yes	Yes, in some cases.	No
SAFETY				
Surveillance	Are there CCTV Cameras at every 30-50 meters/ with no blind spots?	Yes	Yes, but has blind spots/ are not functional	No
	For Recreational Beaches, Are lifeguards available to ensure safety and help in emergencies / are there signages to disallow people to enter the water?	Yes		No
Street Vending and Commercial Activities (Only for Recreational Beaches)	Are vendors in busy areas managed to avoid crowding?	Yes		No
	Are vendors in walking and resting areas spread out to keep the space safe and comfortable?	Yes		No
	Are vendors limited in quiet areas like near the water, with no fixed stalls?	Yes		No
	Are there signage with Helpline numbers or nearest police booth info?	Yes		No
Electrical Charging Poles	In Recreational Beaches, Are electrical sockets/charging points provided?	Yes		No
	Are emergency call buttons at 300m intervals?	Yes		No
LIGHTING				
	Are warm-toned lights (3000K) used to avoid disturbing local wildlife?	Yes		No
	Do light fixtures point downward to reduce light pollution?	Yes		No
	Are the right light levels maintained in each area? General Beach areas: 1–5 lux Pathways: 5–15 lux Nesting zones: < 1 lux during nesting season	Yes	Yes, but not with adequate lighting lux level	No
	Along walking paths, are light fixture heights between 2.4m and 5m, ensuring adequate coverage?	Yes	Yes, but some are not working	No

INDICATORS	SCORING	1	0.5	0
	Is exterior emergency lighting provided at key points like primary circulation routes, toilets, play and parking areas?	Yes	Yes, but not well-lit	No
SIGNAGE				
	Are signages provided at all entrances and major circulation paths?	Yes	Yes, but it is not located correctly for users.	No
	Is there informational signage provided? E.g. map layout of the beach, toilets	Yes	Yes, but it is not located correctly for users.	No
	Is there tactile map provided for the map at the beach?	Yes	Yes, but it is not located correctly for users.	No
	Is there a Public Address System in the beach?	Yes		No
	Are there signage with Helpline numbers or nearest police booth info?	Yes		No
	Is there voice-activated wayfinding systems that provide descriptions of directions or key features in the beach, including emergency routes, regular information,etc.	Yes		No
	Are the signages at a correct reading height for adults and children?	Yes	Yes, but they are not consistent or available throughout the beach.	No
	Are all signages multi-lingual?	Yes	Yes, but they are not consistent or available throughout the beach.	No
	Is the signage consistent in design throughout the beach?	Yes		No
TOILETS				
	Is there a toilet along the beach that is easy to reach from the walking path?	Yes		No
FOR RECREATIONAL BEACHES				
	Are there shower, leg washing, and changing room facilities attached to the toilet?	Yes		No
	Are there shower, clothes washing facilities in the toilet?	Yes		No

TOTAL PARK SCORE: _____ / 77
TOTAL TOILET SCORE: _____/ 53


MENS TOILET
LEG WASHING AREA
SHOWER



03

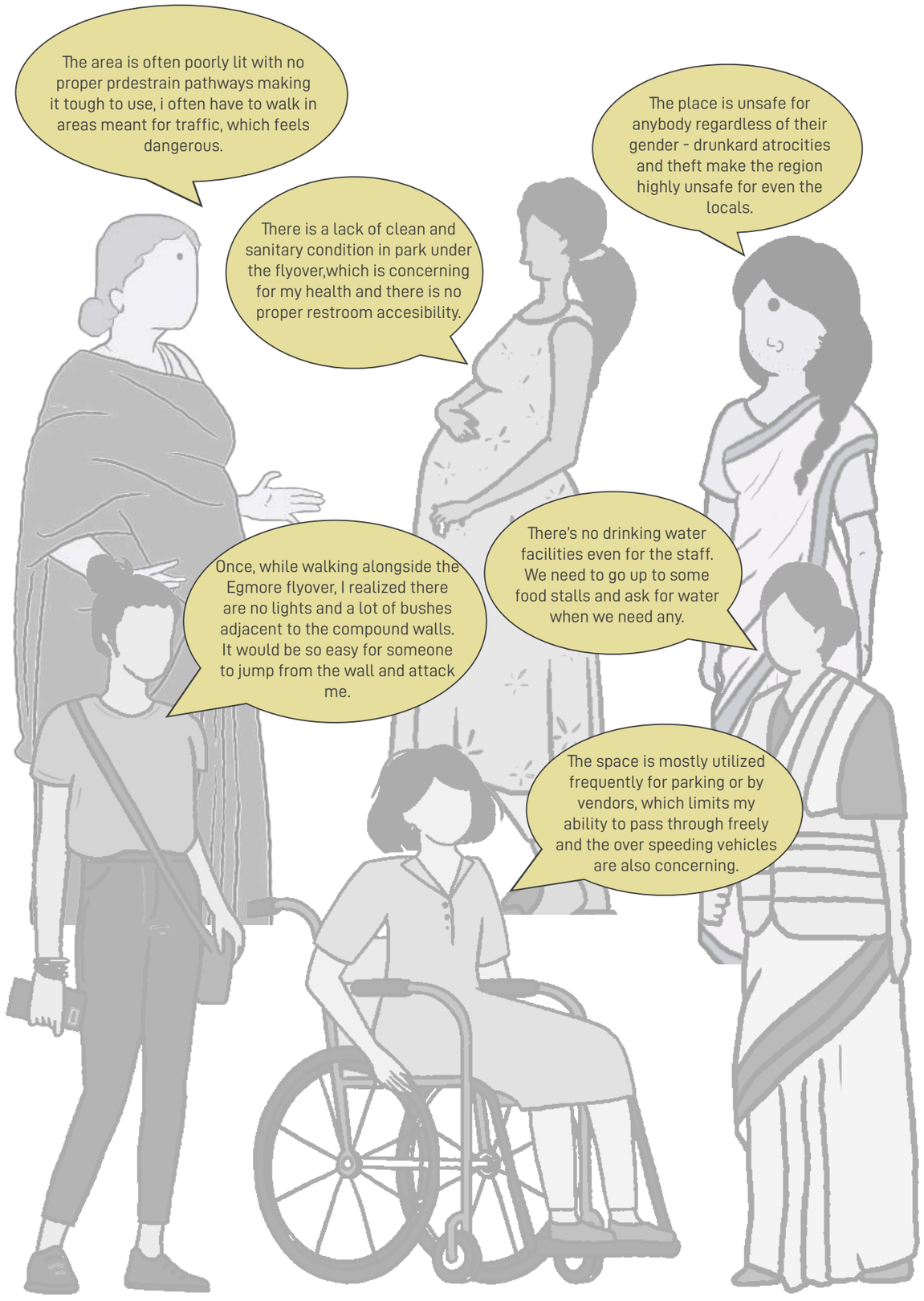
SPACES BELOW FLYOVERS

As of 2016, there were 42 functional flyovers in the city. This number has been steadily increasing despite studies that show that flyovers do not necessarily solve traffic congestion. By the completion of ongoing projects such as the 1.2 km South Usman Road Steel Flyover and the 3.5 km elevated road from Teynampet to Saidapet on Anna Salai, the total flyover network in the Greater Chennai area could extend over 70 km (approx.). This also means an almost equivalent length of residual spaces under flyovers and similar elevated infrastructures, which could potentially serve as vibrant public spaces and transitory areas.

Typically characterised as dark and dingy spaces avoided by women, children, and the elderly, especially at night, in recent years, such spaces have been getting a lot of attention from city planners as public spaces that can be better utilized, designed, maintained, and programmed. Case studies such as the active recreational stretch along the Indira Nagar Railway Station and the Kathipara Junction have shown what the possibilities are in a space-starved city.

Mostly used as shaded parking, vending spaces, and in some cases also as shelter for the homeless, these linear spaces have the potential to incorporate more diverse functions and serve as crucial transitionary spaces towards and away from traffic.

Depending on the programming, maintenance levels, and urban elements provided, a flyover under space can promote or deter users from staying and spending time there. These areas offer a unique opportunity to reimagine urban spaces by integrating seating, lighting, greenery, and artistic elements that make them more inviting and safer for diverse groups. Thoughtful planning can transform these spaces into essential community hubs that provide a balance of functionality, public engagement, and connectivity for pedestrians, cyclists, and vendors alike. Additionally, incorporating waste management solutions, security features, and clear signage can ensure that these spaces remain sustainable, well-utilized, and conducive to a thriving urban environment.



C1. Existing Conditions

Traditionally seen as dark and neglected areas that are often avoided by women, children, and the elderly, particularly at night, flyover under spaces are now receiving growing recognition that these spaces have untapped potential and could be transformed into vibrant, multi-functional public areas with proper planning, design, and maintenance. Once primarily used for shaded parking, vending, or even as shelter for the homeless, these spaces have the potential to serve a variety of functions and become valuable transition areas between traffic and other urban spaces.

Due to poor lighting, inadequate maintenance, and the lack of proper infrastructure, these spaces often become hotspots for criminal activities, discouraging women, children, and the elderly from using them. Additionally, there is a lack of clear signage or wayfinding, making these areas difficult to navigate. With the absence of programming or regular upkeep, the spaces under flyovers are primarily perceived as transitional, rather than places that can be actively used or enjoyed by the public.

Flyovers in Chennai exhibit a wide range of designs and functions. While some incorporate features such as food courts and linear parks for recreational use, many others are lacking basic safety measures, particularly in terms of designated safe crossings and effective separation from high-speed traffic. As a result, the safest way to access these areas often involves private vehicles, yet there are no clear lane demarcations to guide vehicles safely to these spaces, posing potential risks. Existing ramps are steep, uneven, and frequently lack proper handrails, which further compromise accessibility and safety. The absence of security features, such as emergency call points or regular surveillance, heightens the risk of vandalism and crime, making these spaces feel unsafe, especially after dark. Although some flyovers have introduced vertical planting as green buffers and improved lighting, this practice is not consistent, and in many cases, the greenery is poorly maintained, diminishing its intended effect. Overall, the lack of standardization and inadequate maintenance of these elements contribute to the underutilization of flyover spaces as functional, safe public areas.

Quick Fixes

Trim the overgrown bushes and trees to Improve visibility and eliminate hiding spots.

Ensure pedestrian walkways remain free from long-term parked or unused vehicles.

Prevent debris and waste from accumulating under the flyover; ensure regular cleaning.

Add clear signage for pedestrians and vehicles to improve navigation and highlight important safety information.

Install adequate lighting, especially in less frequented areas, to eliminate shadows and improve safety.

Ensure proper surveillance or monitoring is in place for spaces below flyovers to increase security.

Provide clear, safe crossings and pathways for pedestrians around flyovers.

Provide seating for local users to build ownership of public space.

C2. Boundary/Edge Conditions

1. The design and programming of spaces under flyovers should be responsive to the surrounding urban context, local land use, and activities. Understanding the potential uses of the space is key to determining appropriate edge conditions.
2. Design edge conditions based on the size and shape of the space available. Allow flexibility for diverse uses such as seating, community activities, and services. Incorporate multi-use features to maximize functionality.
3. Avoid the use of high fences or barriers that restrict access to these spaces. Encourage open designs where possible to maintain visibility and accessibility. If barriers are unavoidable, ensure at least 80% transparency.
4. If the space below the flyover is used for services (such as utilities or maintenance access), the edges should maintain atleast 40% transparency.
5. Integrate planters, lighting, and greenery into the edge design to soften the space, provide visual appeal, and contribute to a better urban environment.
6. If no activity or use is proposed for a space due to height restrictions or other constraints, block full access by constructing walls on all sides, extending up to the height of the bridge's soffit.
7. Plan for strategic access points aligned with crosswalks, public transportation nodes, and nearby on-street or off-street parking facilities.
8. At the interface between the road and the space beneath the bridge, including at intersections, install safety barriers like bollards to prevent vehicles from entering pedestrian areas.
9. Where activities under the bridge connect two sides of the road or intersection provide adequate safety measures to cross, access, and synonymously use the space.
10. Ensure that entry points of the infrastructure connect to sidewalks equipped with kerb ramps and regular crossings or tabletop crossings within 150m of the entrance.

C3. Access to Infrastructure

C3.1 PEDESTRIAN ACCESS

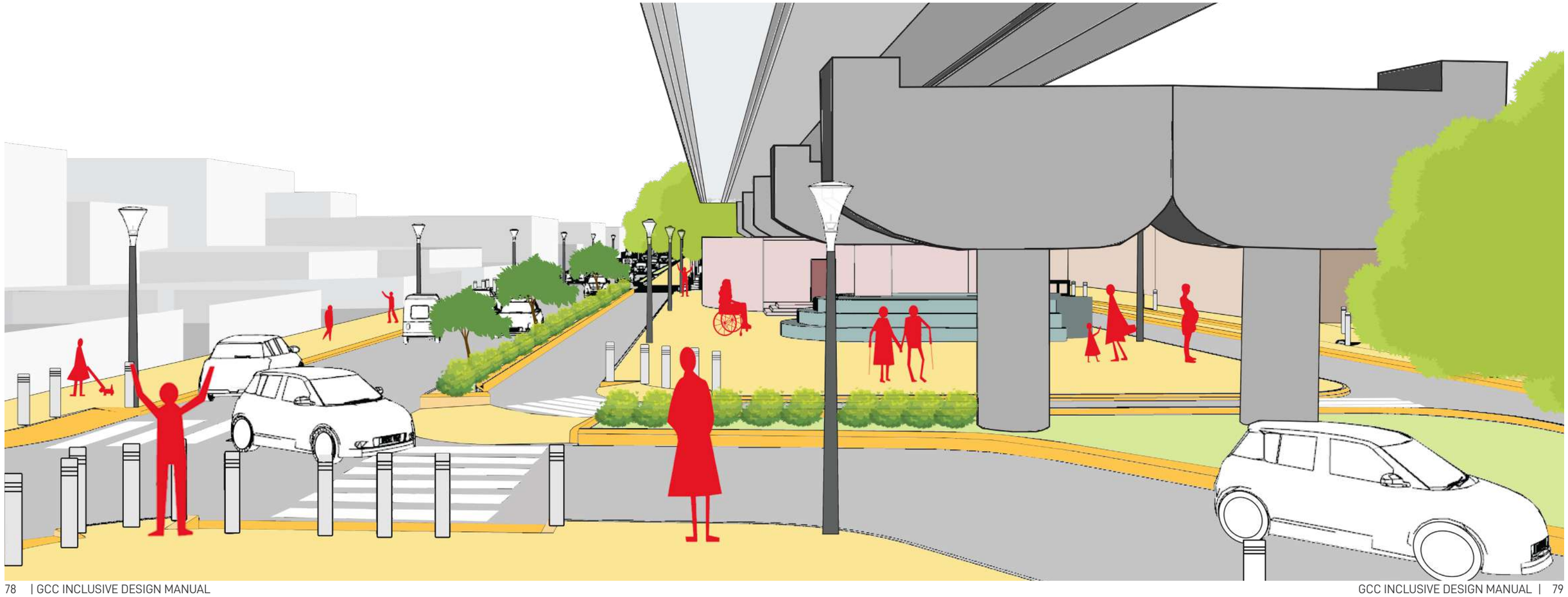
1. A continuous pedestrian footpath of at least 2 meters in width should be maintained within a 500m radius of each access entry point and along connecting streets with high footfall.
2. Footpaths should be provided on all sides of the infrastructure or, if not feasible, on the opposite side with safe crossings.
3. Provide appropriate spaces for pedestrian and cycle crossings from the footpath to the area under the elevated structure are provided where necessary.
4. Kerb ramps or table top crossings with pedestrian signals and street lighting are mandatory in areas with heavy vehicular movement.
5. Provide openings of at least 2 meters wide to allow easy access for pedestrians and wheelchair users.

C3.2 PUBLIC TRANSPORTATION ACCESS

1. Create designated alighting points for buses, autos, and taxis near high-traffic streets. These points should be marked with clear signage and have designated waiting areas for passengers.
2. Plan with concerned agencies for public transportation stops (bus/rail) services within 1 .5 kilometer of the infrastructure.
3. Ensure a minimum 2-meter-wide footpath from public transportation nodes to the entry points of the space, providing a safe, accessible, and barrier-free pedestrian route.

C3.3 PRIVATE VEHICULAR ACCESS

1. Based on type, scale, and area of programming and activities, designate parking areas for 2 wheelers and 4 wheelers in proximity to the elevated structure.
2. Provide designated spots for PWD and pregnant women.
3. Use clear and visible signage at key access points to indicate parking availability and guide traffic flow efficiently, ensuring minimal disruption to road



traffic, pedestrian and cyclist movements.

4. Not all spaces under flyovers or bridges require vehicular access; some may be designated specifically for parking. Since entry and exit points for these areas are located on the driving side of the road, the risk of road crashes is high. Careful planning of access and egress points is essential to ensure safety, minimize traffic disruptions, and reduce the likelihood of accidents.

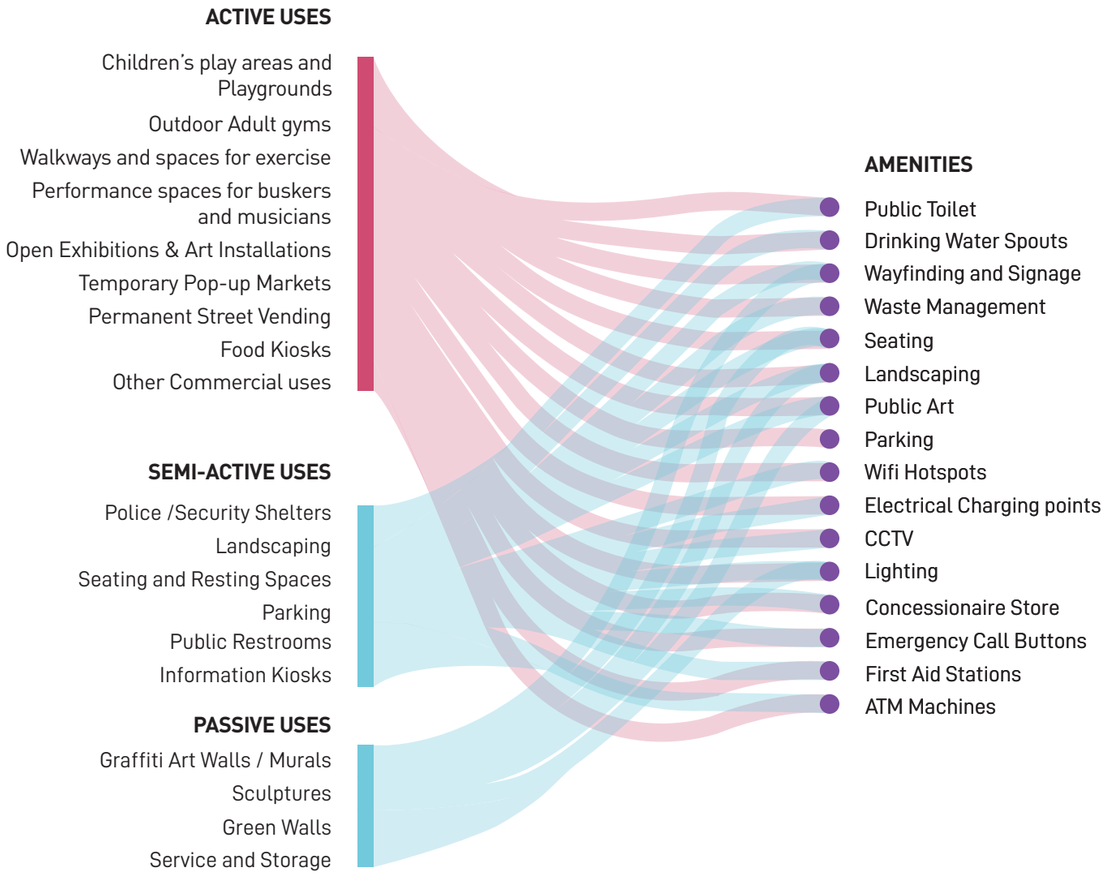
C4. Access within the Infrastructure

1. Ensure clear, unobstructed pedestrian pathways with a minimum width of 2 meters. Based on expected users in a day, provide a hierarchy of pathways that provide clarity in access of the space.
2. Avoid placing any permanent or temporary obstacles (e.g., signage, furniture) within pedestrian pathways.
3. Minimize level changes within the space. If necessary, provide adequate ramps with railings to ensure accessibility for all users. (Refer Harmonised Guidelines 2021 for further guidance)
4. Ensure that safety barriers and bollards are spaced widely enough to allow wheelchair users to pass through comfortably.
5. Install tactile flooring to provide safe navigation for people with visual impairments.

C5. Space Planning

C5.1 CONTEXTUAL SPACE PLANNING

1. The design and layout should consider the surrounding urban environment, ensuring the space is efficiently utilized in line with local land use, activities, and community needs.
2. Typical user groups may include:
    - Children accompanied by caretakers during school hours and leisure
    - People using transit areas and commercial areas
    - Working persons, vendors and night time workers
    - Persons with Disabilities
    - Senior Citizens
    - Homeless persons
    - Temporary vendors
    - Traffic Police
    - Security Personnel
    - Auto/Taxi drivers who use the space for pick-up and drop-off
    - Persons looking for parking
3. Flexible Programming for active and passive uses is critical as these may attract heavy vehicular and pedestrian traffic or be completely underutilised.
4. Some active and passive programming is listed below. Several of these uses can occur synonymously with each other.
5. Each of these active and passive uses demand a different space planning strategy.



The chart outlines the amenities needed for different uses of spaces below bridges/flyovers.

PLAYscapes Mill St. Skatepark, Capetown, re-uses a space transforming an under used and blighted underpass into a community led skate park.
Photo Credit: Bustler.in

Infra-Space 1 is the pilot project of a state-wide Massachusetts Department of Transportation (MassDOT) led study to revitalize landscapes under elevated highway viaducts.
Photo Credit: Landing Studio

An outdoor bouldering wall in Melbourne, Australia, for outdoor activity and activation of public space in Polhamus Park in Granby.
Photo Credit: Skyhighnews

C6. Comfort

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SEATING	• Minimum seating section length: 1.5 meters. • Where appropriate planter boxes can extend as seating. (0.45m height) • Incorporate a variety of seating sizes, creative designs, and seating options (backrests, armrests, open layouts). • For low maintenance immovable brick/concrete seating can prevent vandalism and theft. • Ensure all seating zones are accessible for persons with disabilities.	• At regular intervals minimum every 100 meters. Recommended at every 50m.	• Provide seating in all zones that are accessible to public • Place more seating in high-use zones, such as near entrances, exits, transportation alighting points, and recreational or active areas (playgrounds, exercise zones, etc.).
WASTE MANAGEMENT	• Implement waste segregation through clear signage and compact bin designs. • Ensure bins are visible without obstructing pedestrian circulation paths. • For areas with food stalls or vending, adequate provision for bio-waste disposal must be ensured.	• Placed at regular intervals (every 100 meters) along the length of the infrastructure. • In spaces with high foot traffic, such as near food stalls, vending spaces, or seating areas, additional waste bins should be provided to handle increased waste volumes.	• Position waste bins near seating and high-traffic areas in playgrounds, gyms, markets, and food kiosks and ensure waste segregation. • Integrate waste bins discreetly in resting areas, landscaping, or art installations.
TOILETS	• Toilets are mandatory in all programmed spaces designed for active use. • Refer the Toilets section for sizing, design, and provisions of toilets. • Where connection to main sewer lines is difficult install bio-toilet cubicles in areas where passive use by security or police personnel is expected. Ensure these are accessible and well-lit. • For transitionary spaces that are not intended for recreational use, it is best to avoid providing toilet facilities.	• If the nearest accessible public toilet is more than 1 kilometer away, it becomes necessary to provide a toilet facility under the flyover. • The number of toilet facilities within this infrastructure is based on size/length of stretch, access points, proposed use of the space.	• Place toilets at locations accessible from different sections of the space. • Should be located at entrances, gathering and resting zones, and high activity zones. • Toilets should be located in well-lit, visible, and safe areas.
DRINKING WATER SPOUTS	• Provide anti-skid paving around the drinking fountain, gradually sloping towards drain. • Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access.	• Drinking water spouts should be installed at intervals of at least every 100 meters in high-traffic areas under the flyover, where people are likely to spend more time.	• Drinking water spouts should be placed in several convenient, high-traffic areas throughout the infrastructure, such as near entrances, toilets, rest areas, plazas, and playing areas.
LANDSCAPING	• It is essential that all kinds of greening strategies should be low on maintenance and resilient to the high pollution levels and potential vandalism.	• At least 50% of the linear space should include soft landscaping and permeable surfaces.	• Ensure that landscape elements do not obstruct visibility from street level, maintaining safety for pedestrians and drivers alike.
LANDSCAPING	• Vertical landscapoing should be avoided as it involveds regular maintenace and upkeep. • Provision for bioswales along roadways to help with surface run-off.		• Ensure trees planted at edges to provide visibility upto 2.4m height. Shrubs in open areas to a maximum height of 1.2 meters.
PUBLIC ART	• Where appropriate, incorporate contextual and interactive public art that resonates with local history, stories, or identities. • Encourage local artists and community members to participate in the design and installation process, fostering a sense of ownership and pride in the public art	• Install public art at key locations throughout the space to maximize visibility and engagement. Consider focal points in areas with high foot traffic, such as near seating areas, pathways, and gathering spaces.	• Public art should be integrated thoughtfully with landscape elements. • Incorporate sustainable design elements into public art, such as features for rainwater harvesting or solar power generation.
PARKING	• Where necessary, provide clearly marked vehicular parking spots, including a minimum of 5% of total parking spaces to PWD and pregnant persons. • In commercial areas, ensure parking is available to prevent illegal parking and traffic congestion. • Install visible signage to direct users to available parking.	• Provide a minimum of one accessible parking area and five bicycle parking spots per infrastructure. • Position two-wheeler and four-wheeler parking away from pedestrian crossings and active areas to ensure safety and accessibility. • Priority parking spots can be reserved for senior citizens.	• Situate parking primarily adjacent to transit hubs or commercial areas at the flyover's extreme ends to minimize pedestrian disruption. • Adjust the number and location of parking spots based on surrounding land use, foot traffic patterns, public transit access, and programming types.

Community open space along with Aanganwadi in Vadodara.
Photo Credit: Vadodara Smart City

Futsal under Thomson Flyover.
Photo Credit: Singapore Land Authority

One Green Mile combines seating spaces, play areas, and is an integral community space. Photo Credit: Suleiman Merchant

Valankulam Underbridge Project, Coimbatore
Photo Credit: Oasis Designs Inc.

C7. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Utilize warm-toned pedestrian lighting. • For spaces next to High-speed highways lux levels between 20 and 50 lux is recommended, for major roads between 10 and 30 lux is ideal. • Provide different types of lights including strip lights, up lights, space lights, and floor inset lights etc to ambient adequate ambient lighting. • Incorporate downlighting with appropriate LED fixtures, or floor lighting for navigation at night.	• Avoid excessive illumination to prevent glare for both drivers and pedestrians. • Install lighting at critical points, including pedestrian crossings, underlit areas and spaces where height restrictions disallow appropriate use, Signage, restrooms, and security booths for visibility and safety. • Staggered lighting on both sides preferable spaced at intervals of twice the pole height.	• Ensure that lighting fixtures are installed out of reach from potential vandals to minimize damage and maintain functionality. • Focus on areas where pedestrian traffic is expected, ensuring that all walking paths are well-lit to enhance safety and security. • Provide exterior emergency security lighting at the following locations: Entryways, restroom structures, primary circulation routes, and parking areas.
SIGNAGE	• Provide bilingual signage for maximum accessibility, including local maps, pedestrian-friendly signs, and visible pickup/drop-off indicators from road level. • Install informational signs and directional wayfinding on floors and vertical elements, incorporating helpline numbers. • Utilize simple designs and colors to enhance readability and minimize confusion.	• Incorporate signage on all entrances and major paths. • Install voice-activated wayfinding systems that provide audio descriptions of directions or key features, emergency situations, or event notifications.	• Install well-lit signage and auditory systems at entrances/exits. • Safety and Emergency signage and auditory systems at all exits, high-risk areas, and next to emergency equipment. Visible from 15-20 meters.
SURVEILANCE AND SECURITY	• Provide well-lit and easily accessible emergency SOS buttons. • Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station. • Police Booth with male and female personnel for surveillance at night with access to CCTV footage.	• Cameras should be installed every 30-50 meters. Ensure no blind spots in surveillance. CCTV has to cover edges and bends. • One SOS button each placed at the start and end points of the infrastructure. • For length of infrastructure more than 500m an additional SOS button to be provided.	• Strategically place CCTV cameras at all entrances, parking areas, play areas, near restrooms, and all major circulation zones. • At all edge points and at pedestrian crossings. • Near / Around vending kiosks and high traffic areas
WIFI AND ELECTRICAL CHARGING POLES	• Enhanced connectivity can serve as a crucial safety parameter in isolated areas, especially at night. • Provide free and reliable Wi-Fi connectivity in spaces below flyovers to enhance user experience and encourage longer stays and natural surveillance. • Install electrical charging stations for mobile devices.	• Install charging points at regular intervals, ideally every 50 to 100 meters.	• Wi-Fi and charging stations should be located in high-traffic areas, such as seating zones, near commercial areas, and at transit hubs, to maximize usage and visibility.

Public Art in Claiborne Corridor, New Orleans, USA, that is reflective of local artists and community members to participate in the design and installation process
Photo Credit: nextcity.org

Public Toilet beneath the Kwun Tong Bypass, Kowloon East, Hong Kong
Photo Credit: www.ekeo.gov.hk

Lighting Installation below San Antonio River, Texas.
Photo Credit: San Antonio River Foundation

Natural Surveillance under flyover in Cairo, Egypt
Photo Credit: thenextbigcity.com

C8. Design and Planning Checklist for Spaces below Flyovers

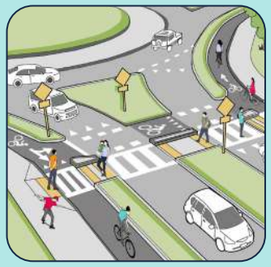
INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Are there multiple entry points to the space under the flyover?	Yes		No
	Are fences or walls in open areas under flyovers, where access is allowed, at least 80% see-through? Where access is not allowed, at leat 40% see-through?	Yes	Less than prescribed percentage	No - Completely Solid fence/ wall
	Where access is allowed, is the boundary (fence, wall, plants, etc.) higher than 0.9 meters?	Yes		No
	Are trees, plants, or design features placed in a way that blocks the view of crossings, signs, or infrastructure?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Can people enter the space below the flyover without steps? If not, is a ramp provided?	Yes		No
	If the space is open to the public, is there a clear sign at the entrance?	Yes		No
	Are all entry points at least 2 meters wide?	Yes		No
	Can people easily see the entrance from the footpath or street?	Yes		No
	Is the entrance to the space clear of obstacles like steep level differences, poorly spaced bollards, gates, guardrails, or drains?	Yes		No
	Is there a clear footpath (at least 2 meters wide) for a 500 meters radius of each entrance, and 4 meters wide on busy streets?	Yes		No
	Does the footpath connect smoothly to the entrances with safe crossings and kerb ramps where needed?	Yes		No
	Are there tactile tiles/indicators on the ground to guide people to the entry points?	Yes		No
	Is there clear signage outside and near the entry points?	Yes		No
	Do parking spots for people with disabilities or pregnant persons connect to a safe walking path leading to the entry?	Yes		No
Vehicular / Public Transportation for Active and Semi-active use spaces	Is public transportation (Bus, Metro Trains, MRTS) available within 1km walking distance from the entry points of the space?	Yes		No
	Is there clear signage showing nearby transport options like buses, metro, autos, or taxis?	Yes	Yes, but not very clear.	No
	Are IPT options like autos, share autos, cycle-sharing facilities, taxis, and ride-sharing services available nearby?	Yes		No
Private Transporation - Off-street Parking for Active and Semi-active use spaces	Is cycle and other vehicular parking available?	Yes		No
	Are the drop-off and pick-up locations close to entry points?	Yes		No
	Is there clear signage for parking spots reserved for persons with disabilities and pregnant persons near the main entrance?	Yes		No
	Are there clear, designated parking areas available for PwD, pregnant women, injured etc?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area outside the park?	Yes		No
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	Are railings provided along walking paths for support and safety?	Yes		No
	Are all walking areas flat for wheelchair access, with ramps where the ground changes level?	Yes		No
	Are tactile tiles provided for both warning and navigation?	Yes	Yes, but they are not consistent or available throughout the space.	No
VISIBILITY				
Only for spaces designed for active / semi-active use	Does the Subway/FOB include at least three of the following features: 1. Commercial facilities like coffee shops, kiosks, or hawker spaces? 2. Spaces for busking, entertainment, or activities? 3. Artwork or landscape (with provisions for maintenance) for visual appeal?	Yes		No
COMFORT				
Seating Provisions	Is seating available every 50–100 meters?	Yes		No
	Does any seating with leg space reduce the minimum clear width of the walkway?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Do seats have backrests and armrests for comfort?	Yes	Yes, in some cases.	No
	Does the seating become too hot to sit on during the day?	Yes	Yes, in some cases.	No
Drinking water	Is drinking water available next to the toilet or at least once every 100 meters?	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
Walkway Materials	Are walkways made with anti-skid material?	Yes		No
	Are walkways made with permeable or semi-permeable materials?	Yes		No
Waste Disposal	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are waste bins adequately managed without overflowing?	Yes	Yes, in some cases.	No
Landscape	Is plant maintenance ensured with care provisions like staff, water access, and an O&M plan?	Yes		No
SAFETY				
Surveillance	Are there CCTV Cameras installed along the length of the space with no blind spots?	Yes	Yes, but has blind spots/ are not functional	No
	Are there signage with Helpline numbers or nearest police booth info?	Yes		No
Electrical Charging Poles	Are electrical sockets/charging points provided?	Yes		No
	Are emergency call buttons installed at 300m intervals?	Yes		No
LIGHTING				
	Are light levels maintained between 20–50 lux near highways and 10–30 lux near major roads?	Yes	Yes, but not with adequate lighting lux level	No
	Is lighting spaced at equal intervals along the length of the infrastructure, considering height, type, and luminance of the lights?	Yes		No
	Is exterior emergency lighting provided at key points like primary circulation routes?	Yes		No

INDICATORS	SCORING	1	0.5	0
SIGNAGE				
	Are signages provided at road-level crossings and entrances - showing maps, locality details, pedestrian directions, and pick-up/drop-off points clearly visible from the street?	Yes	Yes, but it is not located correctly for users.	No
	Are there signage with Helpline numbers or nearest police booth info?	Yes		No
	Are the signages at a correct reading height for adults and children?	Yes	Yes, but they are not consistent or available throughout the space.	No
	Are all signages multi-lingual?	Yes	Yes, but they are not consistent or available throughout the space.	No
TOILETS				
	Is a toilet provided under the flyover if the nearest public toilet is over 1km away?	Yes		No

TOTAL SPACE BELOW FLYOVER SCORE: _____ / 51
TOTAL TOILET SCORE: _____/ 53

TRANSIT AND MOBILITY

04

BUS SHELTERS

Urban Bus Stops are critical mobility infrastructures and nodes of public transportation in the city. Affordable and comprehensive bus networks ensure safe and vital connectivity across economic classes for those who cannot afford private automobiles. Simultaneously, they help reduce overall carbon emissions. Bus stops support public access to the bus network, which is often the cheapest form of motorized public transportation in the city. Chennai's bus fleet reaches every corner of the city. To enable this fleet, the Metropolitan Transport Corporation (MTC) operates a vast network of bus stops across Chennai, covering various residential, commercial, and industrial areas. However, bus stops are often difficult to access and poorly designed. The bus stops are accommodated within the limited width of the pedestrian walkway, inconveniencing both bus users and pedestrians. As roads improve through better infrastructure, we have come to aspire for private motorized vehicles, which increase air pollution and reduce the safety and efficiency of our roads. A great city's lifeline is only as strong as the efficiency and comfort of its public transportation system. While sidewalk widths throughout the city require significant revision through proper alignment of carriageway widths, the placement of bus stops remains critical to the overall functionality of the system.

A good bus shelter is an essential part of any successful urban mass-transit system. What constitutes "good," however, depends upon one's point of view. From the perspective of the city agency that is responsible for its management, a good shelter has low maintenance requirements and is vandal-resistant. From the rider's point of view, an ideal shelter allows visibility and easy access to the bus, is comfortable and convenient, provides clear information, and is safe.

Both viewpoints are equally important to consider because an unused shelter is a waste of money and an unnecessary maintenance problem. A well-designed, comfortable shelter can make waiting for a bus a pleasant -- and even interesting -- experience! Deciding what type of shelter to use in a particular area requires an analysis of existing and anticipated conditions, as well as knowledge of the characteristics of good shelter location and design. Moreover, integrating accessibility features, such as ramps for people with disabilities, and ensuring shelters are adequately lit and secure, further enhances the usability and safety of these public spaces. Women and those undertaking care work typically make more complex, multi-stop journeys and utilize public transport to do so, compared to home-to-work direct commuting patterns. The design of bus shelters must also take into account such gendered travel patterns.

Gender Survey on Bus Shelters

A study conducted by Gender and Policy Lab analyzed the top 10 Chennai bus routes with the highest female ridership to pinpoint safety and accessibility issues faced by women. The goal was to recommend gender-sensitive solutions for improved safety, accessibility, and comfort for these commuters.

When it rains it's difficult to take shelter under the bus stop -the roof will leak, seating would be rusted. It feels like they need better maintenance.

94.4% are walking to to the bus shelter indicating strong need for pedestrian infrastructure around bus shelters.

92.8% users were carrying two bags, convenience presents a significant challenge.

Safety Concerns

Women reported feeling most unsafe inside the buses, particularly less-crowded buses.

A substantial number of women have reported feeling insecure or vulnerable at bus stops.

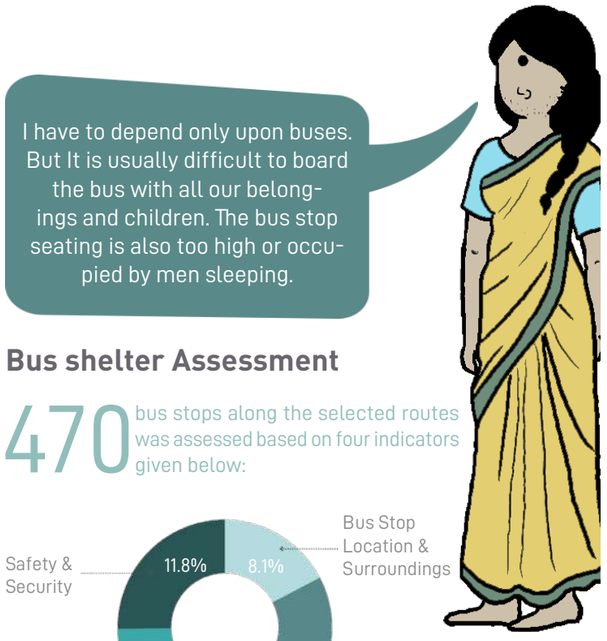
According to the survey, **24.8%** prioritize safety when choosing route.

Infrasctucture Gaps

46.6% Lack of Public Toilets

43.4% Signage indicating reserved seating

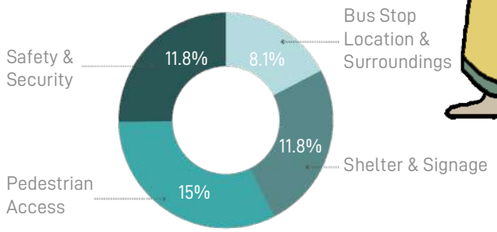
57.4% Signage indicating presence of CCTV cameras.



I have to depend only upon buses. But It is usually difficult to board the bus with all our belongings and children. The bus stop seating is also too high or occupied by men sleeping.

Bus shelter Assessment

470 bus stops along the selected routes was assessed based on four indicators given below:



Common User Concerns

- -Lack of Lighting & Signage
- -No Pedestrian Crossing Nearby
- -Proximity to liquor shops
- -Dark Approach Roads
- -Unkempt spaces behind shelters
- -No Shelter (at some stops)

Existing amenities surrounding Bus shelters

80% +	Tea Shops	~11%	Liquor Shops
63.4%	Cafés/Restaurants	14%	Toilets Nearby
59.1%	ATMs	<2%	Drinking Water

I often find that the pathways leading to bus stops are blocked by obstructions, some are located in areas with poor lighting making it impossible to reach, wait, or board.

D1. Existing Conditions

Chennai has an extensive bus network and a fleet that reaches every corner of the city. It is often the most affordable mode of public transport. However, the bus stops that support this fleet suffer from significant accessibility and design issues impacting passenger experience and accessibility. Passengers face several critical challenges largely due to inadequate infrastructure and safety measures.

Many lack basic amenities such as proper seating, shaded areas, and functioning toilets, leaving passengers, especially women, exposed to the elements for extended periods. GPL's Citizens for Safe Mobility (CSM) report highlights that only 14% of 470 assessed bus stops had toilets, and only 2% had drinking water facilities. Over 90% of 1367 women bus commuters CSM surveyed in Chennai reported walking to bus stops (first- and last-mile connectivity) and carrying heavy bags, most bus stops assessed had limited pedestrian access to the bus stops. Safety concerns are heightened due to poor lighting, making bus stops feel unsafe, especially after dark.

The absence of designated waiting areas often leads to overcrowding, while the lack of clear signage and information about bus routes and schedules adds to confusion. Passengers also face discomfort due to the lack of adequate privacy or safety features, such as barriers from traffic and surveillance. In some areas, the bus stops are poorly maintained, with broken seating, damaged pavements, and unclean surroundings, which exacerbate the overall experience.

Additionally, the absence of designated spaces for women further limits their safety and convenience while using public transportation. These challenges, combined with bus stops lacking real-time digital schedule displays, leave bus stops a difficult environment for the commuters.

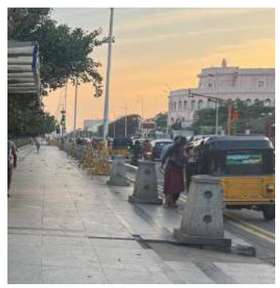
Quick Fixes

Ensure buses stop only at designated stops to maintain proper flow.

Avoid permitting liquor stores within 1km of public transit areas and near schools or colleges.

Enforce police surveillance booths or commercial activity for safety in the bus stops at deserted areas.

Provide a Bus landing platform by attaching one or raising the existing bus shelter level.



Ensure pavements are slip-resistant and free of obstacles, with a clear width of at least 1.8 meter for PWD access.

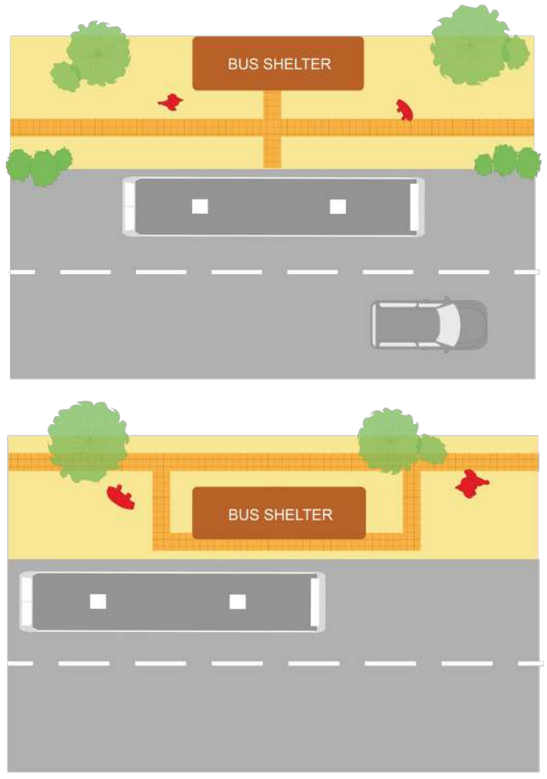
Provide real time updates of buses and implement clear, easy-to-read signage for bus routes and stop locations to aid navigation.

Ensure lighting is at least 50 lux in bus shelters and there are no dead spaces around the bus shelter.

Install seating no higher than 450mm from pavement level for better comfort for all users.

D2. Positioning and Boundary Conditions

1. **Location Considerations:** Near retail stores, institutions, and other establishments that meet riders' needs. Locating bus shelters near late-night establishments and/or visible security presence can contribute to active surveillance. However, it is important to avoid placing bus shelters near liquor shops.
2. **Existing road alignment:** Road geometry mainly road width, footpath width, cycle track determine the location of bus stop.
3. **Clear Walkway Space:** Maintain a minimum of 2 meters of unobstructed walkway on at least one side of the Bus Shelter. Minimize unused space behind bus shelters to prevent potential misuse and enhance safety.
4. **Clearance from Kerb:** Bus shelters must have a clear path of at least 1 meter between the shelter and the kerb for easy boarding and exiting.
5. **Proximity to Crosswalks:** Ensure that bus stops are sited within 25m from pedestrian crosswalks, median breaks, refuge islands, encouraging safe pedestrian movement across busy streets.
6. **At intersections:** Bus stop to be in the vicinity of the junction but should be located at a distance of 25 m away from any junction. It is recommended to place the bus stop on the far side of the intersection rather than the near side. This reduces congestion and pedestrian-bus conflicts near intersections.
7. **Alignment:** Bus shelters should have their long side parallel to the footpath to minimize interference with pedestrian traffic.
8. **Good Visibility:** Shelters should not obstruct views of oncoming buses or other vehicles. Avoid placing shelter upstream of objects including obstructing information boards, trees, transformers, authorised street vending, or on-street parking, street bends, where they might block sightlines. Ensure women and other passengers can clearly see approaching buses and avoid waiting in isolated, obscured spots.
9. **Integration with local public spaces:** Where possible, integrate bus stops with active community spaces, such as parks or plazas, providing a safe, engaging environment for passengers to wait. This encourages a sense of community surveillance, improving safety.
10. **On-street Parking:** In areas with on-street parking, a short kerb extension can create a space for buses to stop adjacent to the footpath. No parking should be allowed 5m before or after the bus stop. Adequate floor marking and signage should indicate the same.



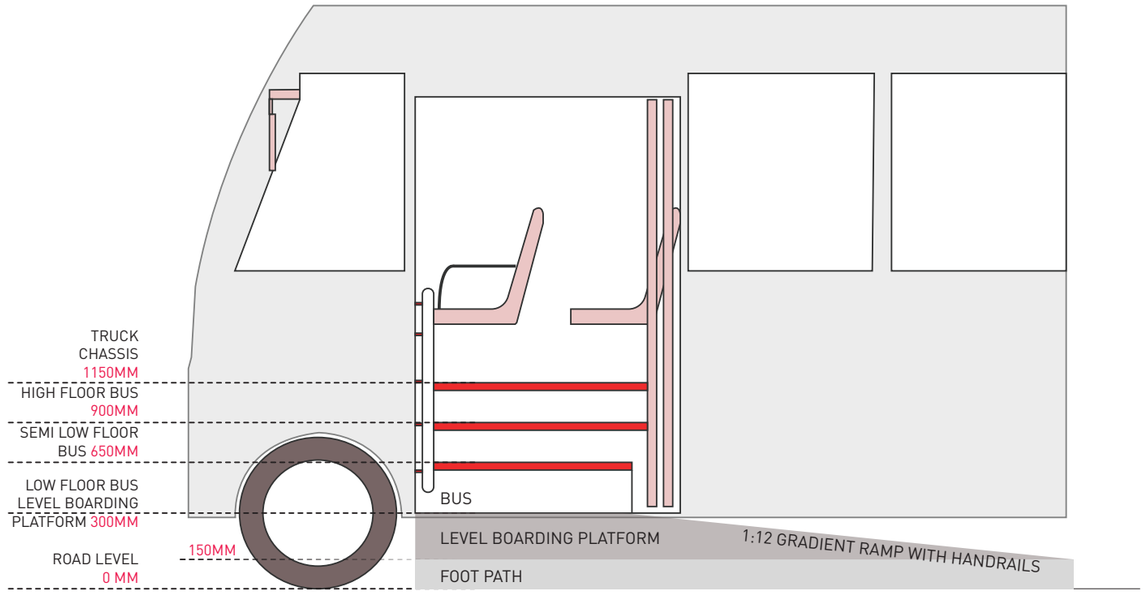
Placement of Bus shelter on a pedestrian footpath and its relation to the surrounding context.

D3. Access to the Bus Shelter

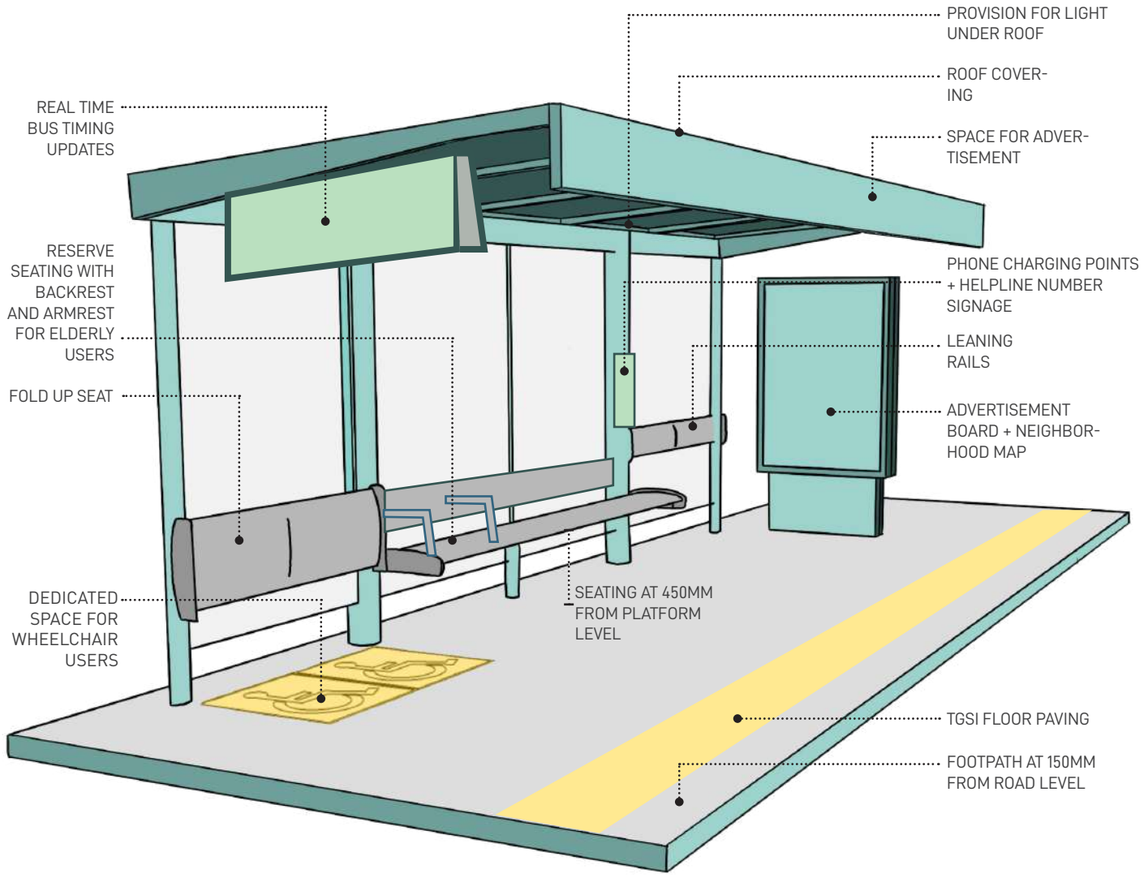
1. Bus Shelters should be located along the length of pedestrian walkways that are maximum 150mm from road level. Where the bus stop is not level with the surrounding walkway or pathway, it is essential to provide two separate ramps—one for boarding and one for alighting.
2. Ramps should have a gradient no steeper than 1:12 to accommodate all user types and have continuous double-height railings (900 mm and 760 mm) extending at least 300 mm on both sides of the 1200 mm (minimum) wide ramp for additional support. (Refer Harmonised guidelines 2021 for further details)
3. Colour contrasted tactile warning strips (TGSIs) should be present 300 mm before and 300 mm after the ramp run as well as the platform edge.
4. Bus shelter flooring should ideally be different in colour from surrounding paved areas and non-slip with proper drainage.
5. An accessible route should connect the bus stop to the building entrance, allowing people with disabilities to board and disembark the bus and access the building.
6. Since most of the city buses have separate entrance and exit doors, atleast 10meters of clear kerb should be provided.
7. Vehicle Interface: Buses should stop close and parallel to the footpath to allow passengers to easily board and exit without crossing a large gap or board from carriageway level. Concave or bevelled Kassel Kerbs enable the bus to come close to the boarding platform without damaging tyres / body.

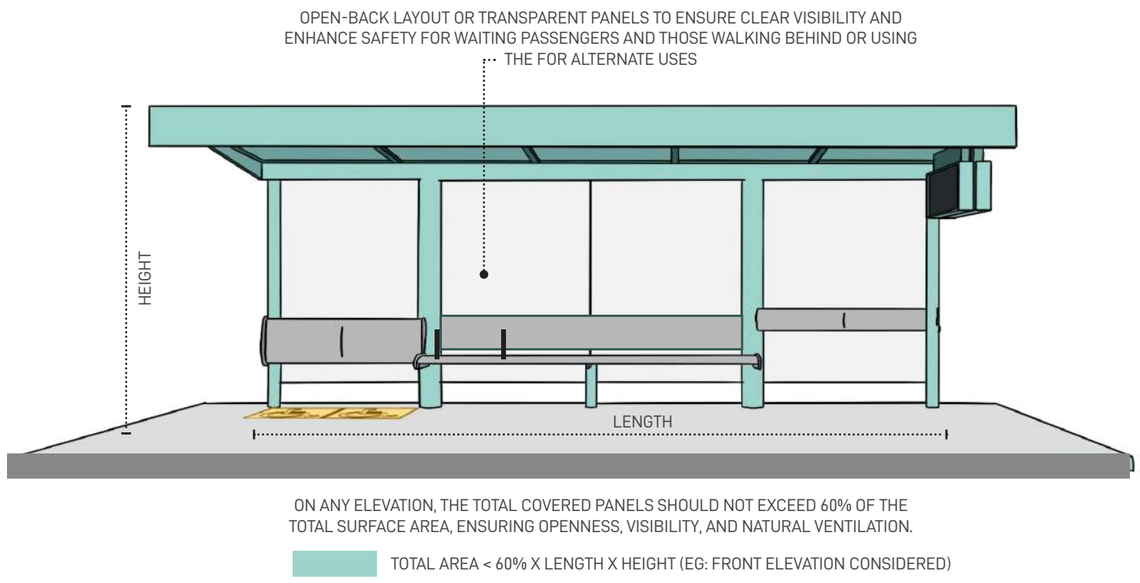
Kassel Kerb. Photo credit: WikiCommons

8. Step height from the kerb to the (kneeling) bus platform should not exceed 150 mm to accommodate passengers with limited mobility.
9. Level Boarding Platform: Raise the entire footpath platform to 300mm to be able to board low floor buses without difficulty.
10. If raising the entire footpath is difficult provide a minimum 900mm wide platform to accommodate wheelchair users and passengers with mobility aids. Double-height handrails can further support movement up and down ramps.



Level boarding Platform details.





D4. Space Planning

D4.1 SIZING

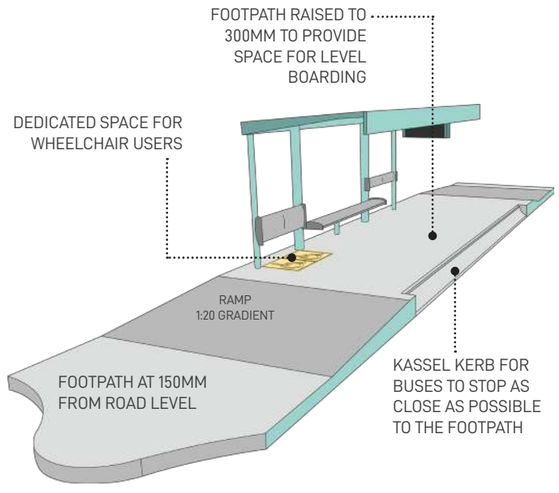
1. The ideal minimum dimensions for a bus shelter are 10m (L) x 1.5m (W) x 2.2m (H) as per ITDP Guidelines. Based on passenger volume and space constraints sizes of bus shelters should vary.
2. For high-demand areas, the shelter size should increase to accommodate peak passenger volumes, ensuring passengers aren't left exposed to the elements.
3. Extended Shelters: Longer bus shelters or "Super Shelters" should be considered for interchange points or high traffic locations. These shelters provide larger waiting areas, improved accessibility, and enhanced passenger amenities.

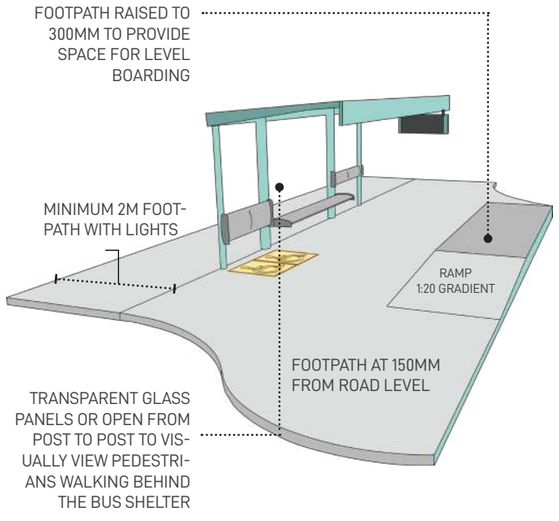
D4.2 VISIBILITY

1. 60% Minimum Transparency: No surface of the bus shelter—whether sides, front, top, or back—should be opaque from top to bottom. A minimum of 60% of each surface area should be transparent.
2. For bus shelters near active spaces such as walkways, parks, beaches, landscapes, or shops, transparency should be increased to 80%. This ensures unobstructed views and promotes safety, allowing passengers to stay visually connected to the surrounding environment.
3. Essential elements such as signage, information boards, and small advertising panels can be used, but should not exceed the minimum necessary to maintain the visual openness of the shelter.
4. If design includes side panels they should be mounted 3 inches off the ground so that debris will not collect inside the shelter. They should not compromise visibility.

D4.3 AMENITIES

1. In busy areas with a lot of foo traffic, a toilet facility should be planned adjacent to the shelter. In other places, toilet should be available within 1.5kms distance with adequate signage in shelter indicating the same.
2. All bus shelters must have drinking water provision.
3. Cycle Parking: Bicycle parking zones near bus stops encourage sustainable commuting and improve last-mile connectivity for passengers.
4. Advertisement Boards: If the placement of bus shelter provides a minimum of 2m of walkway space behind the shelter, no advertisements should be placed along the length of the shelter.
5. Wi-Fi Connectivity – Where possible, provide WiFi facilities atleast in busy areas to increase connectivity.
6. Integration with Technology: Provide QR codes in bus stops to provide real time bus tracking and information.
7. Incorporate smart ticketing systems and recharge kiosks at the bus shelters and facilitate ease through digital payments.
8. Micro-Retail Kiosks: Incorporate Small stalls or vending booths for newspapers, snacks, or local crafts.





Images of Bus Shelter design and Low Floor Bus Boarding from Road and Level Boarding Platform. Photo Credit: Harmonised Guidelines 2016

Temporary Level Boarding Platform. Photo Credit: Bloomberg News

Drinking Water Spout and Garbage disposal. Photo Credit: The Work

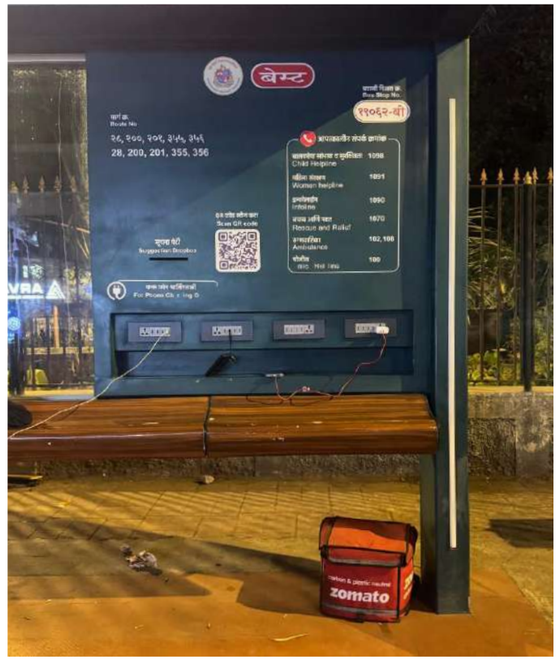
D5. Comfort

FEATURE	DESCRIPTION	ZONING / PLACEMENT
SEATING AND LEANING RAILS	• Seating at 450mm height is mandatory in all Bus Shelters. • Ends of benches to have arm rests and mobility aid holder bracket. • Leaning rails at 1150mm should be provided where possible. • The sheltered floor space must include one minimum 762 by 1219 mm space for wheelchair users demarcated and floor marked with international symbol of access. • This place can also have a folded seat that can increase seating space.	• Seats should be positioned such as not to impede the movement of wheelchair users. •
INFORMATION BOARD STATIC AND DYNAMIC	• All bus stops must include multilingual static information boards indicating route, forthcoming stops, timetable, fare and ticketing information, local area map, emergency helpline information etc. • Use high-contrast colors (e.g., black text on white background) to make information legible from a distance. Ensure good visibility for both day and night use. • Include Tactile maps and Braille descriptions. • Incorporate backlit displays or LED lights around the boards to ensure visibility during nighttime. • Dynamic Information on LED/LCD Displays should be multilingual, have real-time arrival information, service alerts, and current time. • Include audio information service at bus stops for intimating approaching bus. • Advertisements should not obstruct route information display maps, statutory signage etc.	• Static Information should be displayed at the front or sides ofthe shelter and placed at eye level for easy reading, typically between 1.2m and 1.7m above ground. • Static boards should be located inside or directly adjacent to the shelter, ensuring they are protected from weather and easily accessible to commuters. • Dynamic Information boards can be at eye level or at a higher level providing high visibility from a distance.
ROOF COVERING	• The roof should extend beyond the footprint of the shelter and be wide enough to cover the seating area. • The roof should primarily extend towards the front and sides to provide shelter to passengers standing or sitting. This maximizes protection where passengers need it most while preventing space wastage. • Avoid roof extensions behind the shelter, as this area is not used by passengers and can create unused, redundant space.	• The angle of the roof should be optimized to block the sun during peak hours while still allowing visibility for passengers. • The roof should have a slight slope to allow for proper water drainage.
DRINKING WATER SPOUTS	• Prioritize installing water spouts at high-traffic bus stops, especially those with long waiting times. • Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access. • Ensure there is at least 1.5 meters of clear space around the water spout.	• Drinking water spouts should be placed adjacent to bus shelters, not inside. • The spouts should be located where they do not obstruct pedestrian flow and boarding or alighting buses.
GARBAGE DISPOSAL	• Install hands-free, pedal operated waste bins with segregation near all Bus Shelters. • In high-traffic bus stops, install multiple bins to handle the increased volume of waste, preventing overflows.	• Place waste bins next to or near the bus shelter but not inside it to prevent overcrowding. Ideally, they should be located 1 to 3 meters away from the shelter, ensuring easy access while keeping the shelter clean.
GUARDRAILS OR SAFETY BARRIERS	• For shelters with ramps, handrails should be installed along both sides of the ramp, with the height varying between 760mm (for wheelchair users) and 900mm (for standing passengers). • If the shelter has a raised boarding platform, handrails and safety barriers should guide passengers toward the designated boarding area.	• Barriers should be installed along the edges of ramps or elevated platforms to prevent falls.

D6. Safety

FEATURE	DESCRIPTION	ZONING / PLACEMENT
LIGHTING	• The bus stand shall have minimum illumination level of 50 lux. • Lights should be housed in a protective casing to reduce vandalism, and directed so that they illuminate the waiting and boarding areas.	• Overhead lighting should be integrated withroof structure. • Light is usually integrated with back-lit advertisement boards. These must be supplemented with shelter lighting.
SIGNAGE	• Warning signs placed before the bus stop to alert drivers to slow down and anticipate stopping buses. • Helpline numbers should be placed at accessible heights. • Signs indicating that the bus stop and bus are wheelchair accessible with appropriate ramps or level boarding platforms. • Regulatory and warning signs (e.g., "Bus Stop Ahead", "No Parking") should be made of retroreflective material to ensure they are visible at night or in low-light conditions.	• Warning signs such as "Bus Stop Ahead" should be placed at least 50–100 meters (150-300 feet) before the stop to give drivers enough time to adjust their speed.
EMERGENCY CALL BUTTONS	• The button should be highly visible, marked with universal emergency symbols (e.g., a red "Emergency" button), and contrasting colors (red or yellow) to stand out. • Emergency buttons should have tamper-proof features to prevent misuse or damage. • Equip the button with a two-way speaker system to allow verbal communication between the passenger and emergency services. • Place clear signage near the emergency button to indicate its function, such as "Press Here for Emergency Assistance" in multiple languages or with universal symbols.	• Emergency call buttons should be placed within easy reach of seating areas and shelters, ensuring that waiting passengers can quickly access them. • In large bus stops or those with multiple waiting areas, install multiple call buttons so that all areas of the stop are covered.
ELECTRICAL POWER SOCKETS	• Install multi-standard sockets (e.g., USB-A, USB-C, and standard electrical outlets) to accommodate different devices and charging needs. • The sockets should be protected against dust, rain, and moisture. • Power sockets should be made from robust, anti-vandal materials, such as stainless steel or high-strength plastic, to withstand intentional damage. • Consider using a recessed or flush-mounted design to minimize the potential for vandalism.	• Place sockets near seating or leaning areas within the shelter. • Install the sockets at an accessible height, typically 0.6 to 1 meter above ground level.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station.	• CCTV cameras should be positioned to cover the entire bus shelter, including entry and exit points, seating areas, and surrounding pedestrian walkways. • Cameras should also cover the boarding area to monitor passenger-bus interactions.

Mumbai's Bus Shelters. Photo Credit: Signpost, Instagram



Mumbai's Bus Shelters with bus routes, helpline numbers, charging ports, space to keep belonging. Photo Credit: Pavithra Sriram

AC/Heated bus Shelters in Toronto
Photo Credit: JCDecaux

D7. Design Checklist for Bus Shelters

INDICATORS	SCORING	1	0.5	0
LOCATION				
	Can people clearly see the bus coming, without trees, boards, turns, or parked vehicles blocking the view?	Yes		No
	Is the bus stop placed before the intersection (near side) or after it (far side)?	Far side	Neither. It is a mid-block bus stop.	Near side
	Is the bus stop located on a high footfall street?	Yes		No
ACCESS				
	Are mandatory unobstructed footpaths (minimum 2m wide) provided within a 500m walking distance of the bus shelter?	Yes		No
	If located on a high footfall street, is the footpath width at least 4 metres?	Yes		No
	What is the condition of this footpath? Poor condition: Completely broken or does not exist Moderate condition: Partially broken, wheelchair can move without difficulty Good condition: Wheelchair can easily move	Good	Moderate	Poor
	Is there at least 1 meter of space between the shelter and the road edge to help people get on and off the bus easily?	Yes		No
	Is the entire bus shelter platform at 300mm from the road for easy access to low-floor buses? Or is there a separate 900mm wide platform with a ramp and double-height handrails for easier boarding for PWD?	Yes		No
	Are there colour-contrasted tactile warning strips to provide access to the bus shelter and level boarding platform?	Yes		No
	Is there less than 2 meters of space behind the bus shelter?	Yes		No
	Is parking not allowed within 15 meters before or after the bus stop?	Yes		No
	Are Kassel kerbs provided for buses to stop close and parallel to the footpath?	Yes		No
DESIGN				
	Is the Bus shelter of a minimum dimension of 10m(L) x 1.5m (W) x 2.2m (H)?	Yes		No
	Is there proper provision for rain water run-off from the roof of the bus shelter?	Yes		No
	Is at least 60% of each side of the bus stop see-through (transparent)?	Yes	Between 30-60% see-through	No
COMFORT				
	Is seating provided at 450mm from floor level?	Yes		No
	Is there space for at least one wheelchair user to wait inside the bus shelter?	Yes		No
	Are leaning rails provided at 1150mm from floor level?	Yes		No
	Are there segregated and accessible waste disposal bins (including child-sized bins at 0.45-0.5 meters height) provided?	Yes		No
INFORMATION				
	Is there Real time arrival information, Service Alerts?	Yes		No
	Is there Audio Information Service for bus arrivals?	Yes		No
	Are bus route numbers mentioned clearly in the bus shelter?	Yes		No
	Are the bus numbers provided in Braille?	Yes		No
	Is information about routes, timetables, fares, tickets, and local maps, available in multiple languages?	Yes		No
	Are there signages with Helpline numbers or nearest police booth info?	Yes		No
	Is the information board lit and clearly readable at all times of the day and night?	Yes		No
SAFETY				
	Is the bus shelter equipped with CCTV Cameras?	Yes		No
	Are there emergency call buttons at the bus shelter?	Yes		No
	Are there electrical sockets?	Yes		No
LIGHTING				
	Is the minimum lighting level of 50 lux maintained?	Yes		No
	Is the light fixture housed in protective casing to protect from vandalism?	Yes		No
SIGNAGE				
	Are bus stop poles and street signs (like 'No Parking') installed at the shelter?	Yes		No

TOTAL BUS SHELTER SCORE: _____ / 35

BROADWAY BUS STOP

BUS STOP

TIMING.
CHART.

1	ORD	1	TONDIARPET	TRIPLICANE	1	46	4
	NSCBT	1	ZHORE	THIRUVANMIYUR	1	48	42
	NSCBT	1	THIRUVOTRIYUR	THIRUVANMIYUR	1	74	42
	LSS	1	THIRUVOTRIYUR	THIRUVANMIYUR	37	88	4.5
	EXP	1	THIRUVOTRIYUR	THIRUVANMIYUR	2	74	4
2	ORD	8	TOLLGATE	BESANT NAGAR	2	93	4
	LSS	9	TOLLGATE	BESANT NAGAR	8	88	4.5
3	ORD	9	PARRYS	ADAYAR D.S.	5	55	4.5
4	ORD	9	T.NAGAR B.S.	PARRYS	3	45	4.5
5	ORD	10	PARRYS	T.NAGAR B.S.	3	55	4.5
6	ORD	11	PARRYS	T.NAGAR B.S.	3	45	4
	GS	11	PARRYS	T.NAGAR B.S.	3	45	4
7	ORD	12	T.NAGAR B.S.	VIVEKANANDA HOUSE	4	88	3.5
8	ORD	13	T.NAGAR B.S.	TRIPLICANE	9	88	4.5
9	ORD	13	ANNANAGAR B.S.	PARRYS	2	38	4
10	ORD	17	PARRYS	VADAPALANI D.S.	5	88	4.5
11	ORD	18	PARRYS	SAIDAPET	3	45	4
12	ORD	19	T.NAGAR B.S.	KAVALAMMA	3	78	4

13	ORD	20	VELLIVEEDHI	PARRYS	12	45	4
14	ORD	21	MANDAVELI	PARRYS	11	38	4
15	ORD	22	AYANAVARAM B.S.	ANNA SQUARE	5	85	4
16	ORD	25	VADAPALANI B.S.	TRIPLICANE	2	56	4.5
17	ORD	26	S.I.E.	T.NAGAR B.S.	3	88	4.5
18	ORD	27	ANNANAGAR B.S.	ANNA SQUARE	1	88	4.5
19	ORD	28	THIRUVOTRIYUR	ZHORE B.S.	7	88	4.5
	GS	28	THIRUVOTRIYUR	ZHORE B.S.	1	88	4.5
20	ORD	29	PERIYAR NAGAR	Q.M.ARTS COLLEGE	6	78	4.5
21	ORD	31	ROYAPURAM (R.M.E.)	DR.AMBEDKAR BRIDGE	8	58	4
22	LSS	32	VALLALAR NAGAR	VIVEKANANDA HOUSE	8	88	3.5
23	ORD	33	M.E.D.NAGAR	HIGH COURT	8	88	3
	GS	33	M.E.D.NAGAR	HIGH COURT	1	88	3
24	ORD	34	AMBATTUR ESTATE	THIRUVOTRIYUR	2	85	4
	LSS	34	THIRUVOTRIYUR	AMBATTUR ESTATE	8	75	4.5

05

TRANSIT STATIONS

Transit hubs are central locations, generally a building or semi-enclosed space, where various modes of transportation intersect, making it convenient for passengers and cargo to transfer between them.

Globally, modern transit hubs are becoming more connected and integrated to support Non-Motorised Transit (NMT) and are vital for the economic growth of cities and urban resilience of the region. A Multi-Modal Transit Hub (MMTH) is a transportation facility designed to integrate various modes of transportation, such as rail, road, and mass transit systems, in a single location. The MMTH could serve national, regional, metropolitan, or city scales. The primary objective of an MMTH is to provide seamless connectivity and efficient transfer of passengers and goods between different modes of transportation. In Chennai, these hubs include:

- Railway Stations
- Interstate Bus Terminus (ISBT)
- Mass Rapid Transit System Stations (MRTS)
- Transportation Catchment Zones

Transit hubs form a nodal and integral position in urban infrastructure, embedded with technologically advanced features and architectural design. However, they experience fluctuating user traffic with highly crowded peak hours and relatively empty low-traffic periods. Public transit hubs are spaces with a high incidence of sexual harassment. Women who work night shifts as well as in the daytime often feel unsafe using isolated and vast transit hubs.

In 2005, only 6.9% of the transportation workforce in India were women, and that number is only set to increase. Encouraging women in the transportation sector jobs can be a long-term policy initiative. This will improve spaces and amenities for women while also improving safety in transit hubs.

Women's travel needs and patterns are often more complex than men who commute between a single workplace and home. Women tend to make shorter trips in duration and distance, tend to combine multiple tasks in trips, and undertake multiple stops. Such complexity is heightened amongst domestic helpers, service providers, vendors, and those with caregiving needs, who often carry luggage or support children. Increasing women's participation in the decision-making around and design of transit stations is critical to support their access and comfort in this infrastructure.

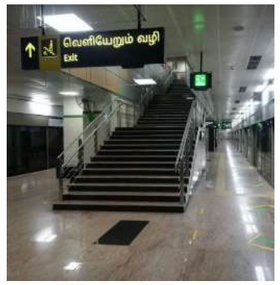
E1. Existing Conditions

Despite the advanced technological features and architectural design elements, public transit hubs remain spaces with a high incidence of sexual harassment. Women, particularly those working night shifts as well as during the day, increasingly feel unsafe when using these isolated and expansive transit hubs.
At train stations, the absence of elevators or escalators to access platforms creates significant inconvenience for travelers, particularly those with heavy luggage.

Commuters with mobility challenges, such as the elderly and persons with disabilities (PWDs), are further impacted by the lack of accessible options. highlighting the need for easily accessible points where wheelchairs can be rented. Moreover, many commuters are unaware of the available amenities due to inadequate signage and unclear wayfinding maps. To address these issues, it is critical that elevators are accessible from multiple entry points and are directly linked to the platforms to facilitate seamless movement for passengers with luggage and those requiring mobility assistance.
Additionally, there are several unused and vacant spaces within the station infrastructure, suggesting underutilization and presenting opportunities for improvement or repurposing. The existing drinking water points also require urgent repairs, as many have become non-functional and are now potential contamination zones due to poor maintenance. The limited operating hours of shops in transit hubs, which close by 8 PM despite train services running until 10 PM, indicate potential problems with passenger safety and community surveillance in the area. The absence of clear signage directing passengers to terminals with ramp access and accessible parking facilities makes navigation difficult, especially for persons with disabilities. Additionally, there is a growing demand for wider token scanning bays within metro rail stations to better accommodate the flow of passengers, particularly for women, ensuring that the space is efficient and comfortable for all users.

Quick Fixes

Ensure that all transit hubs are equipped with elevators and escalators for easy access, especially for people with mobility challenges.



Clearly mark and keep emergency exit routes clear and easily accessible for all, especially in crowded transit areas.

Include seating with backrest and armrest.

Long transit corridors provide adequate seating and travelators for ease in movement.

Provide anti-slip pavementse, incorporate TGSI sticker tiles, to improve accessibilty and pedestrian movement.

Ensure there are safe, comfortable waiting areas for passengers, especially those with disabilities or the elderly.

Ensure that the platform and public transportation modes—such as trains and buses—are at the same level.

Place clear, visible signs to direct users to accessible routes, elevators, and other services to make navigation easier.

E2. Master Planning Station Areas

E2.1 LOCATING THE STATION

1. **Station Accessibility and Legibility:** Ensure the station is well-integrated into the existing urban fabric, easily identifiable, and accessible through clear wayfinding signage.
2. **Connectivity:** Provide direct, safe, and pedestrian-friendly pathways to and from key destinations such as schools, colleges, hospitals, and markets. In residential or low-traffic areas, integrate small commercial establishments around station exits or within the station building facing public roads, remaining open until the end of service hours.
3. **Interchange and Intermodal Provisions:** Position stations near bus stops, feeder services, and taxi/ride-hailing stands to promote seamless multimodal travel. Design intermodal transfer areas with covered walkways, well-lit waiting zones, and sufficient seating. Include secure cycle parking and integrate walking and cycling paths into station access routes.
4. **Adjacencies:** Avoid bars or TASMAC shops within 500 meters of routes leading to transit stations to enhance safety and comfort.

E2.2 STATION AND CONTEXT

1. Assess the station's significance in the transportation network (e.g., intermodal connectivity, role in commuter flow).
2. Identify the station's impact on adjacent land uses, including its potential to support commercial, residential, and cultural activities. Recognize the station's potential to catalyze economic and social regeneration of its surrounding area.
3. Analyze the demographic composition (age, gender, income levels) of the surrounding community and incorporate inclusive design features.
4. Evaluate existing public spaces, pedestrian pathways, and cycling infrastructure to identify gaps in connectivity and accessibility.
5. Examine current land uses and identify opportunities for mixed-use developments that prioritize inclusivity and safety.
6. Strengthen safe and inclusive last-mile options, such as bike-sharing systems, reliable paratransit, or female-only ride services.

E3.3 VALUE CREATION

1. Adjacent Station Development: Encourage blend of building uses that promotes safe pedestrian connectivity, affordable housing, and equitable community spaces.
2. Over Station Development: Utilize the vertical space above stations for commercial, residential, or institutional purposes to maximize land value.
3. Commercial and Retail offerings at the station: Provide diverse retail options catering to different gender-specific needs, such as personal safety devices, groceries, and pharmacies. Locate stores and kiosks strategically for quick and easy access during transit.
4. Wider Commercial development opportunities around the station: Transit-Oriented Development (TOD): Focus on high-density, walkable, and mixed-use developments around stations.
5. Ensure well-lit, vibrant nighttime activities supported by visible security measures to encourage safe usage of the area.

E3. Boundary/Edge Conditions

1. **No Fencing/ Barricades at Intermediate Stations:** Station entry vestibules should be designed without fencing or barricades to promote easy access and visual openness.
2. **Placement of Station Buildings:** At large transit hubs with extended surface areas (e.g., including bus shelters, parking), station buildings must be adjacent to roads for easier access.
3. **Limit Walking Distances:** Where station buildings are away from access roads, ensure walking distances from roads to station buildings do not exceed 50 meters. Where greater distances are unavoidable, provide ample seating and shaded rest spots along the way.
4. **Transparent, Low Boundary Walls:** For large terminals where boundaries are necessary, use transparent fencing or barriers with at least 80% visibility. Keep boundary walls at a maximum height of 1.5 meters, promoting a clear line of sight to station activities while enhancing user security.
5. **Landscaped Boundaries:** Where possible, use landscaping elements like hedges, low shrubbery, and trees as natural boundaries.
6. **Design for Interaction:** The transit station/terminal exterior facing the public street should have an active frontage with shops, public art and placemaking programming.
7. **Identification of Entrances/Exits:** Clearly demarcate all entrances, exits, and emergency routes on the exterior building design.

ARRIVAL EXPERIENCE

STATION PRESENCE

ACTIVE STATION FACADES

ACTIVATE AND LINK TO SURROUNDING UNDERUSED SPACES

PUBLIC REALM

INTERCHANGE

DESIGN PRINCIPLES THAT SHOULD GOVERN TRANSIT STATION'S EDGE CONDITIONS

Photo Credit: (Top Row, from the left)
1. University of Washington, Sound Station, LMN Architects
2. San Bernardino Transit Center, Wikipedia
3. Grand Central Station, NY, WeLoveNewYork.com

Photo Credit: (Bottom Row, from the left)
1. Shinjuku Station, JapanRailPass
2. London King's Cross Railway Station, Wikipedia
3. Stockport Interchange Station, Wikipedia

E4. Access to the Infrastructure

E4.1 PEDESTRIAN ACCESS

- **Connectivity Evaluation:** Assess connectivity in the 500-meter radius around transit hubs to identify gaps in walkability and accessibility for pedestrians and cyclists.
- **Unobstructed Pedestrian Pathways:** Establish compulsory footpaths (minimum 2m wide) around a 500m radius around transit hubs, with a minimum width of 4 meters in areas expecting high pedestrian traffic. Incorporate a 2-meter-wide Multi-Use Zone.
- **Mid-Block Crosswalks and Raised Intersections:** Install mid-block crosswalks and raised intersections within 50m of station entrances if the main intersection is beyond
- **Traffic Calming Measures:** Implement traffic calming measures, such as speed bumps, roundabouts, and chicanes near station entrances.
- **Digital Information Boards:** Utilize digital boards at entry and exit points to share real-time transit schedules, emergency contacts, or station information.

E4.2 PUBLIC TRANSPORTATION

- If other transit modes stop near the transit station, integrate them to enable seamless movement between modes.
- Provide designated drop-off and pick-up areas for auto-rickshaws, and IPTs near the entrance.
- Drop-off points should connect to accessible paths, allowing seamless access to the facility without barriers for senior citizens, PWD or those with mobility aids.
- Install clear, visible signage within shelter directing

users to the nearest available public transportation nodes.

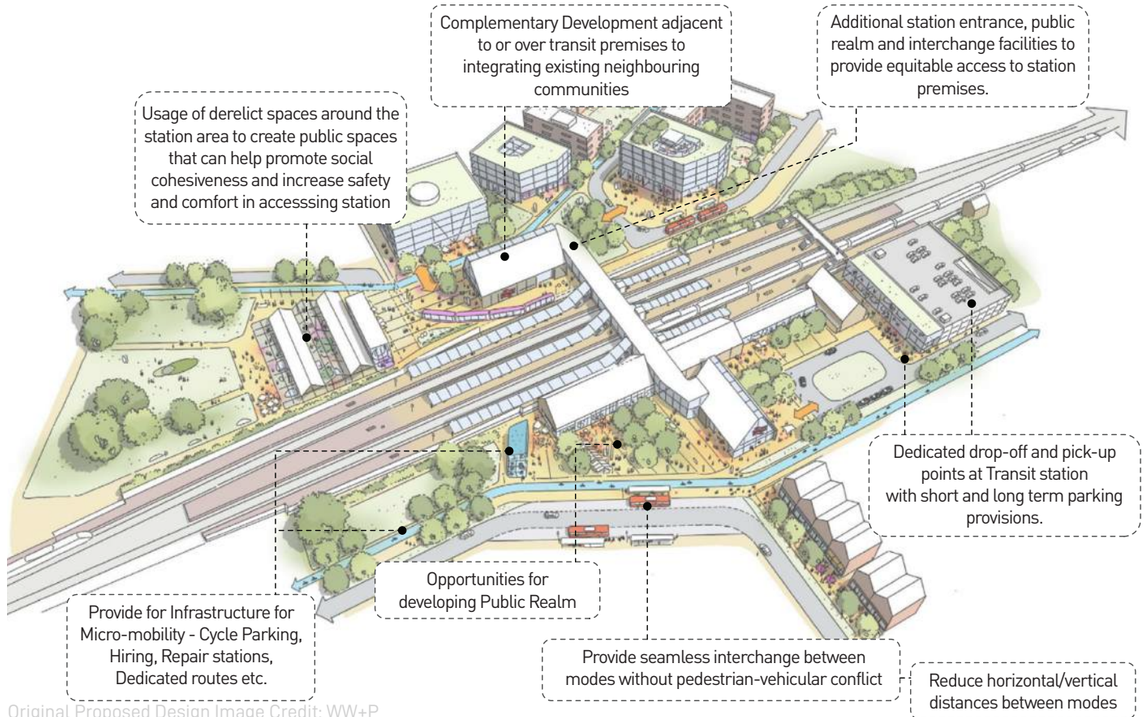
- Shuttle Services for After-Hours Transit: For transit hubs near IT parks, office districts, or areas that become deserted after business hours, consider implementing a shuttle service during evening and night hours.

E4.3 PRIVATE TRANSPORTATION

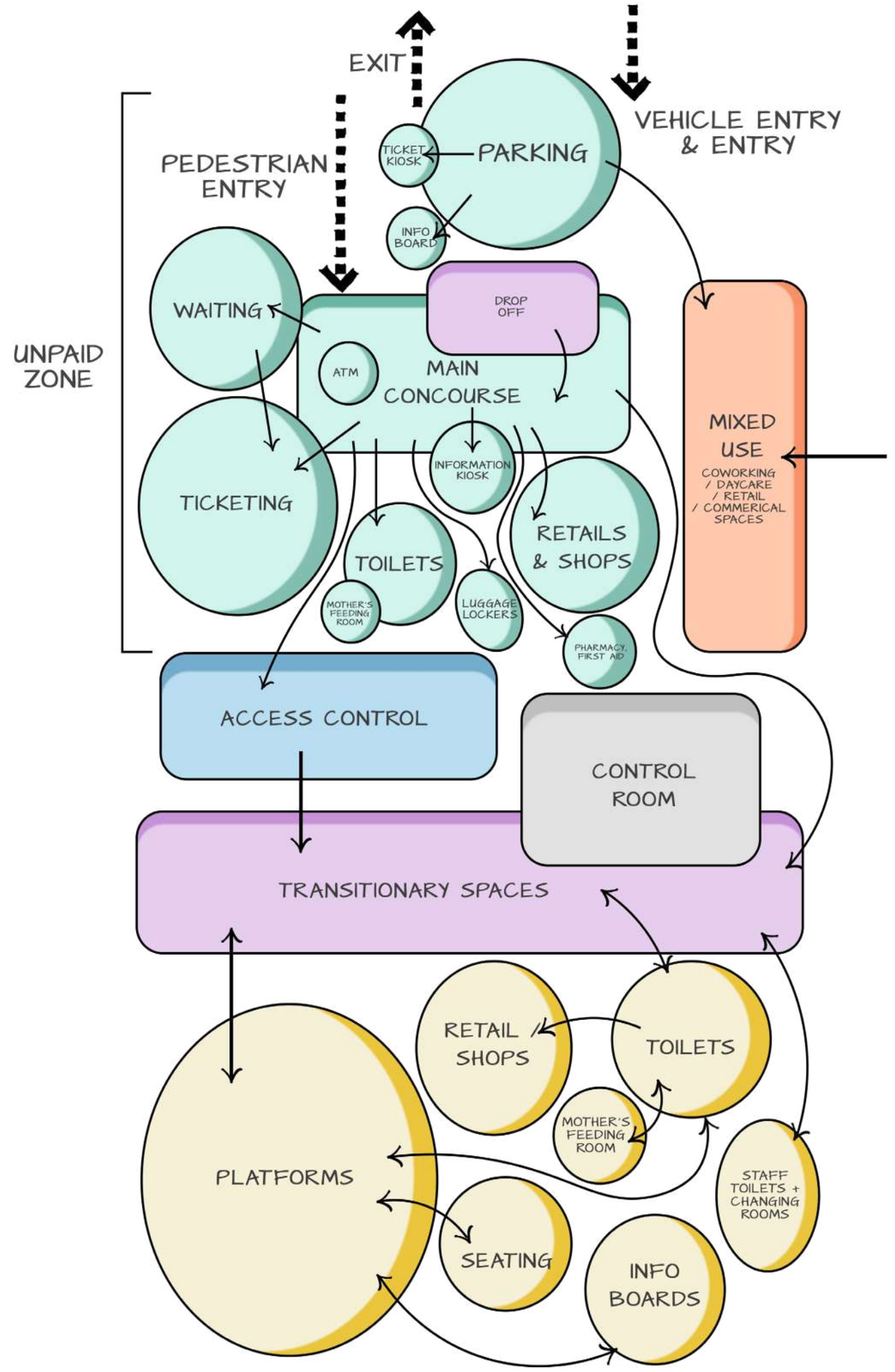
- **Designated Areas:** Provide clearly marked, well-lit drop-off and pick-up zones close to station entrances connecting to accessible paths to the station.
- **Protected Zones for Vulnerable Users:** Create designated pick-up areas with extra protection, such as covered walkways or sheltered spaces for waiting.
- **Proximity to Entrances:** Prioritize parking spaces closer to station entrances for people with disabilities, pregnant women, and senior citizens.
- **Parking:** Provide off-street parking at major transit hubs and terminals as prevalent building norms.

E5. Access within the Infrastructure

- **Physical Access:** Where station areas or buildings are elevated or below ground, provide ramps alongside stairs to ensure accessible entry. Ramps should comply with Harmonized Accessibility Guidelines, featuring appropriate width, slope, handrails, and non-slip surfaces to accommodate all users.
- **Spacious Corridors:** Ensure a minimum corridor width of 4.50m to comfortably accommodate high foot traffic and prevent crowding.
- **Ramps, Lifts, and Escalators:** Include ramps, lifts and escalators for easy access between floors in multi-level stations. Install foot-operated buttons and fixtures to enhance convenience for all users.
- **Adequate Emergency Access:** Designate accessible routes for emergency, fire response, and maintenance vehicles and equipment. These routes should be well-marked, wide, and easily accessible to ensure quick emergency response.
- **Automatic Doors:** Where applicable, install sensor-activated automatic doors that provide effortless, touch-free entry, improving ease of access and flow.
- **Wheelchair Rentals:** Provide a dedicated wheelchair rental area for those who may need assistance, enhancing convenience and accessibility.
- **Horizontal Movement Belts:** Where feasible, incorporate horizontal movement belts to ease travel in large stations with long corridors. If the distance from the station entry to the platform or boarding point exceeds 300 meters, consider installing these belts to enhance accessibility and reduce walking fatigue for all users.
- In large stations provide internal buggy services, provision space for parking these vehicles.



Original Proposed Design Image Credit: WW+P



E6. Space Planning

E6.1 SITE PLANNING

- Determining the size of anticipated users and local context are crucial factors in station design. Exploring flexible usage options throughout the day and considering alternative mixed-use functions and diverse user programming, such as coworking and office spaces, 24/7 retail and concessionaires, and/or day care facilities can enhance the station's usage and vibrancy.
- Provide multiple, clearly marked entry and exit points from all adjoining and abutting roads to ease traffic flow, facilitate easy movement, and support crowd dispersal during peak times.
- Minimize enclosed, isolated areas such as car parks, poorly lit parks, and under-construction sites around or within transit infrastructure. If these are unavoidable, provide increased security and monitoring.
- Design pathways that prioritize pedestrian movement with appropriate seating, greenery, and signage to guide passengers easily through the space. Adequate seating should be planned near the entrance(s), for refuge or waiting for pick up.
- Plan entry and exit of buses, at bus terminals, and other service vehicles and their movement without disturbing pedestrian and private vehicular traffic flow.

Automated Fare Collection barrier gates at a train station;
Photo Credit: Wikipedia

Vehicle and Plaform Level design integrated with Detectable Warning Surfaces. Photo Credit: SBB.CH

E6.2 STATION BUILDING LAYOUT

- Ensure Waiting and Queuing spaces (such as at information kiosks, ticket counters, and ATMs) are well-lit, visible and easily accessible.
- Position shops, concession stands, and exhibit spaces in high-traffic areas to increase visibility and promote natural surveillance. Ensure shops are functional until end of services.
- Inclusive Toilets and Facilities: Design toilets with gender-neutral locker rooms, vending machines for sanitary products, and diaper-changing stations. Place these facilities close to main corridors and at each entry point.
- Avoid narrow, dingy corridors, hidden corners, and paths with few exits. MoHUA guidelines suggests to to maintain a clear corridor width of 2 meters in public transport stations. The preferred uninterrupted width of the corridors or walksways is 4.50m.
- For walkways longer than 50 meters and up to 100m, it is desirable that a 1:10 width to length ratio should act as a guide in setting the width required.
- At stations where access control is provided through turnstile machines, it is essential to ensure that multiple entry points of widths 1.0 to 1.2 m are incorporated and accessible to users.
- Provide ticket counters inside and outside the station building. Specifically if they are on two separate levels.
- Integrate Vehicle and Platform Design ensuring the train/bus work together as a system to achieve accessible and fast boarding.
- To enhance the passenger experience in transit stations, consider including the following amenities:
  - Paid luggage lockers or baggage deposit services for local and tourist travelers.
  - Daycare space that also serves as a feeding room and a play area for children, providing a family-friendly environment, typically 20-30 sqm in area.
  - Pharmacy with a first aid area to address immediate health needs.
  - Integrated with retail and office spaces.

E7. Comfort

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SEATING	• Minimum seating section length: 1.5 m. • Each seat should be 45 to 60 cm wide and at a height no higher than 45 cm. • For outdoor or semi-outdoor seating, provide shelter from sun and rain with shades, overhangs, or covered seating areas. • Ensure that at least 10% of all seating is accessible for persons with disabilities, with backrests, armrests, and spacing for easy maneuverability. • While seating should discourage extended sleeping, allow flexibility for users to rest or recline, especially in long-haul transit hubs.	• Place seating every 15 to 30 meters in high-traffic areas, allowing people to rest frequently as they navigate the station.	• Position seating near key activity zones, such as ticketing areas, boarding zones, and waiting areas for buses and trains. • Place seating at transit connection points, such as bus terminals, train platforms, and areas where passengers may need to wait for connections. • Create designated waiting zones with ample seating near pick up and drop-off points.
TOILETS	• Refer the Toilets section for sizing, design, and amenity provisions in toilets. • Toilets should be clearly marked with signage that is visible from a distance.	• The number of toilet facilities within this infrastructure is based on the size/length of station, access points, allied infrastructure.	• As these are typical urban centres provide toilets both after and before security checkpoints. • Should be located near entrances, waiting lobbies, and platforms/boarding areas.
COMMERCIAL KIOSKS/ VENDING MACHINES/ RETAIL SHOPS	• For instilling means of natural surveillance, incorporate commercial kiosks. • Commercial shops can be planned on platforms, along a multi-use zone.	• In long subways, avoid placing kiosks too close together. A good spacing metric is every 20-30 meters.	• Position kiosks/vending units along the walkway length without obstructing path of pedestrian flow. • Position kiosks near areas where pedestrian traffic is high, such as entrances, exits, or near popular attractions.
DRINKING WATER SPOUTS	• Provide anti-skid paving around the drinking fountain. • Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access.	• Drinking water spouts should be installed at intervals of 30-50m.	• As these are typical urban centres provide drinking water spouts both after and before security checkpoints. • Drinking water spouts should be placed in several convenient, high-traffic areas throughout the infrastructure, such as near entrances, ticketing stations, toilets, waiting lobbies, boarding points.
WASTE MANAGEMENT	• Implement waste segregation through clear signage and compact bin designs. • Ensure bins are visible without obstructing pedestrian circulation paths. • For areas with food stalls or vending, adequate provision for bio-waste disposal must be ensured.	• In busy areas like ticketing zones, waiting areas, food courts, and boarding zones, bins should be placed approximately every 15–30 meters. • Provide extra waste stations around food kiosks, vending machines and retail areas.	• Place waste bins near ticket counters, waiting zones, and information desks, where people may consume items and discard related waste, along pathways, near waiting areas, platforms, and toilets.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
PARKING	• Where necessary, provide clearly marked vehicular parking spots, including a minimum of 5% of total parking spaces to PWD and pregnant persons. • Install visible signage to direct users to available parking.	• Position two-wheeler and four-wheeler parking away from pedestrian crossings and active areas to ensure safety and accessibility. • Priority parking spots can be reserved for senior citizens.	• Adjust the number and location of parking spots based on surrounding land use, foot traffic patterns, public transit access, and programming types.

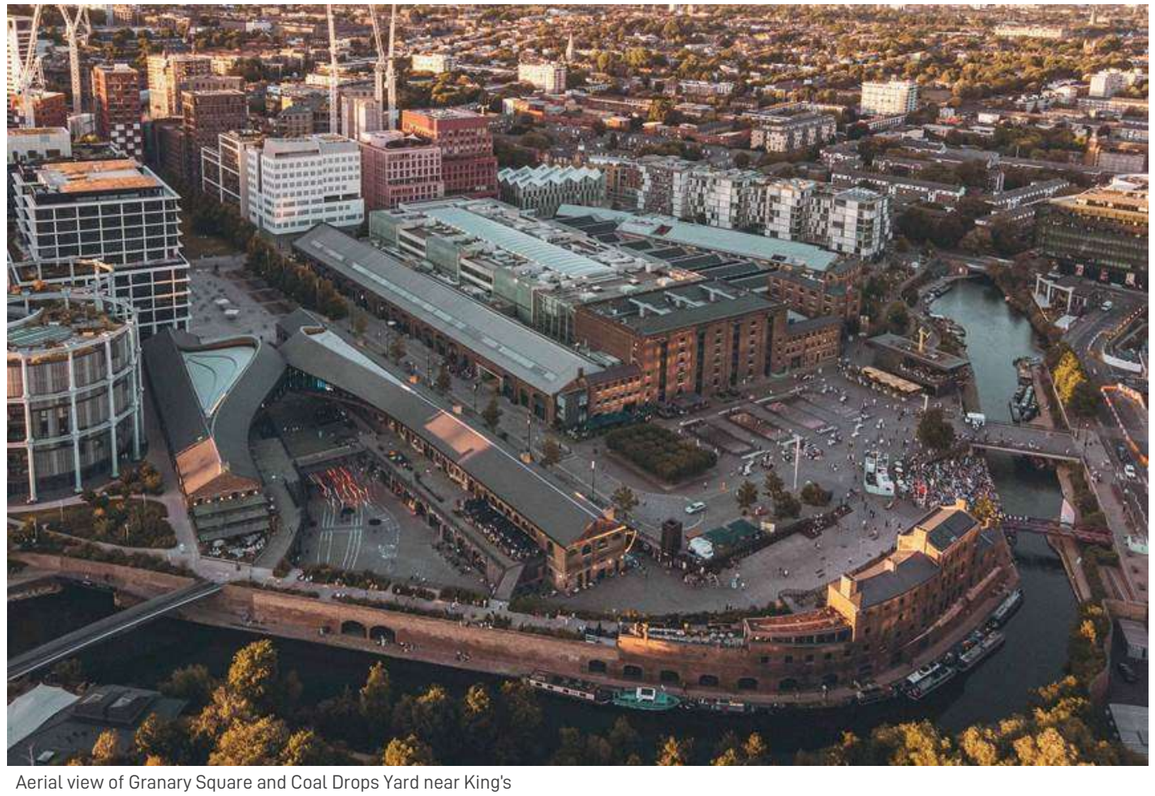
E8. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Emphasize on natural lighting in transit stations and integrate skylights and large windows where feasible. • Outdoor bus shelters, platforms, pick-up points shall have minimum illumination level of 50 lux. • In underground or completely enclosed spaces maintain an average illumination level of 100-300 lux. • Use light temperature that mimics natural daylight conditions. • 150–300 lux for circulation areas and corridors. • Platforms, ticketing zones, and waiting areas - 300-500 Lux • High-lumen floodlights or similar for parking lots and entry/exit areas.	• The overall lighting of the station/terminal should be evenly distributed with no dark or unsafe corners. • Lighting should cover all pathways, waiting zones, and parking areas. • Exterior lighting should be placed every 10-15 meters.	• Provide exterior emergency security lighting at the following locations: Entrance, emergency exits, restrooms, facade, and primary access routes. • Perimeter lighting/ site level lighting is critical. All publicly accessible and service zones of the premises have to be well lit. • Incorporate wall lights with advertisements along wall surfaces to ensure all day lighting.
WAYFINDING AND SIGNAGE	• Incorporate braille or tactile in all signage, including neighbourhood maps with key landmarks and routes. • incorporate easy to understand signage, with symbols and pictorial support, navigational strips. • Include floor stickers for aiding in the navigation of different routes within the station. • Bright and consistent color palette. • Combine Braille signage with audio signals (triggered by buttons or sensors) to provide multisensory cues.	• Incorporate signage on all entrances and major paths. A minimum of one directional sign should be placed at every 30 m in areas of directional changes. • Install voice-activated wayfinding systems that provide audio descriptions of directions or key features in the transit station, closing times, real time train/bus informations, and emergency situations.	• Accessibility infrastructure related signage to be present next to entry and exits. • For visibility of all users, place signs at 1.5 to 2 m above floor level. • Install well-lit signage and auditory systems at entrances/exits, at major intersections, and key locations where passengers may need guidance (e.g., rest areas, stairs, elevators, or ramps) • Safety and Emergency signage and auditory systems at all exits, high-risk areas, and next to emergency equipment. Visible from 15-20 meters.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station. Where possible incorporate monitoring in within the campus with reources to act on any emergency purpose. • Install a special booth for addressing sexual assault, and crimes against women and children.	• Cameras should be installed every 10-30 meters across the station/terminal building and premises without missing any corner or location.	• Strategically place CCTV cameras at all areas such as entrances/exits, waiting areas, ticketing and information areas, platforms, boarding and alighting zones, etc.
EMERGENCY CALL BUTTONS	• The button should be highly visible, marked with universal emergency symbols (e.g., a red "Emergency" button), and contrasting colors (red or yellow) to stand out. • Emergency buttons should have tamper-proof features to prevent misuse or damage. • Equip the button with a two-way speaker system to allow verbal communication between the passenger and emergency services. • Place clear signage near the emergency button to indicate its function, such as "Press Here for Emergency Assistance" in multiple languages or with universal symbols.	• Panic buttons should be placed within 20 meters of high-risk areas, such as near restrooms, cash machines, or platforms, ticketing areas.	• Place them along walkways with adequate signage, entrances/exits, waiting areas, ticketing and information areas, platforms, boarding and alighting zones, etc.

ELECTRICAL POWER SOCKETS AND WIFI	• Make Wifi available in the entire transit station/terminal with good range and universal connectivity.
	• Install multi-standard sockets (e.g., USB-A, USB-C, and standard electrical outlets) to accommodate different devices and charging needs.
	• The sockets should be protected against dust, rain, and moisture.
	• Power sockets should be made from robust, anti-vandal materials, such as stainless steel or high-strength plastic, to withstand intentional damage.
	• Consider using a recessed or flush-mounted design to minimize the potential for vandalism.
		• 1 charging station for every 200 to 300 passengers in high-traffic transit hubs
		• Charging stations frequency
		  • Low Volume (up to 1,000 ppl/day): 4 to 6 minimum
		  • Moderate Volume (1,000 to 5,000 ppl/day): 8 to 12
		  • High Volume (over 5,000 ppl/day): 15 or more
			• Position charging stations near other amenities like cafes or information desks to encourage use.
			• Ensure they are staggered to prevent crowding.
			• Places near or next to seating and have a direct view
			• In areas where passengers spend time waiting, such as waiting lounges, food courts, and near seating areas.
			• Install the sockets at an accessible height, typically 0.6 to 1 meter above ground level with a platform to place the device.

Nehru Place Metro Station A nodal city hub
Photo Credit: Getty Images



Aerial view of Granary Square and Coal Drops Yard near King's Cross Station in London, England.
Photo Credit: Getty Images, Wirestock

E9. Design Checklist for Transit Stations

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Does the station's boundary wall allow partial or full visibility from the street?	Full visibility	Partial visibility	No visibility
	If a boundary wall exists, is the height lesser than 1.5m?	Yes		No
	Is parking along the building/road edge obstructing direct access to the station?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Are mandatory unobstructed footpaths (minimum 2m wide) provided within a 500m walking distance of the transit station?	Yes		No
	Along all edges of the transit station, is the footpath width at least 4 metres?	Yes		No
	What is the condition of this footpath? Poor condition: Completely broken or does not exist Moderate condition: Partially broken, wheelchair can move without difficulty Good condition: Wheelchair can easily move	Good	Moderate	Poor
	Is this footpath continuous and unobstructed? Obstructions include bollards, gate guardrails, drains, trees, etc. that hinder wheelchair movement	Yes		No
	Is the access route to the station well-lit after sunset for ease of visibility and safety?	Yes		No
	Are the footpaths connected to safe, wheelchair-accessible pedestrian crossings at the nearest intersections?	Yes		No
	If the main intersection is more than 50 meters away, is a mid-block crosswalk or raised intersection provided near the station entrance?	Yes		No
	Are traffic calming measures used near the station entrance? (speed beakers, roundabouts, chicanes, etc)	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes	Yes, but some tiles are broken.	No
	If there a level difference between the market premises and the footpath outside the station, is a ramp with handrail provided to enter the station premises?	Yes	Yes, but the ramp slope is very steep.	No
	Is the station pedestrian entrance atleast 2 metres wide?	Yes		No

INDICATORS	SCORING	1	0.5	0
Vehicular / Public Transportation	Can a person using a wheelchair easily move between transit modes like buses, taxis, or metro, with clear signs showing the way?	Yes		No
	Is there a designated drop-off and pick-up spot for autos and other IPTs within 50 meters of the station entrance?	Yes		No
	Is parking available as per local building norms?	Yes		No
	Are there clear, designated parking areas available for PWD and pregnant women?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area?	Yes		No
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	Is there a clear walking path from the gate to the station building without vehicular conflicts?	Yes		No
	Is the transit station floor surface non-slip?	Yes		No
	Are handrails provided along the edges of the station corridor?	Yes		No
	Are tactile tiles installed for warning and guidance?	Yes		No
	Are slopes inside designed to avoid water stagnation?	Yes		No
	Are all interior station areas flat, with ramps where there are level changes?	Yes		No
	Are all stair steps at least 300mm deep?	Yes		No
	Are all stair risers 150mm high?	Yes		No
	Do the lift controls have accessible features like foot-operated buttons?	Yes		No
	Are ramps or lifts provided next to stairs in elevated or underground stations, as per Harmonised Guidelines, 2016?	Yes		No
	Are station corridors at least 4.5 meters wide?	Yes		No
	Is a moving walkway (horizontal movement belt) provided if the distance from the station entrance to the platform is more than 300 meters?	Yes		No
DESIGN				
Overall Site	Does the station have multi-utility spaces like coworking spaces, 24/7 shops, or daycare?	Yes		No
	Are there multiple clear entry and exit points to manage crowd flow?	Yes		No
	Is the site layout planned so that pedestrians and vehicles can move without crossing paths or with conflicts?	Yes		No
Design	If any corridor within the station is 50–100 meters long, is the width at least one-tenth of the length?	Yes		No
	(If applicable) Are there multiple fare gate entry points, with at least more than one gate measuring 1.0 to 1.2 m wide?	Yes		No
	Are ticket counters available both outside and inside the station building?	Yes		No

INDICATORS	SCORING	1	0.5	0
Amenities	Are waiting and queuing areas (kiosks, ticket counters, ATMs) well-lit, visible, and accessible for wheelchair users?	Yes		No
	Are shops and kiosks placed in high-traffic areas for visibility and natural surveillance, and do they remain open until service hours end?	Yes	Yes, but not open until last bus/train service	No
	Are toilets and other user facilities located near main corridors and entry points?	Yes		No
	Are amenities like luggage lockers, daycare, a pharmacy, and first aid available?	Yes		No
COMFORT				
Entrance Roof	Does the entrance roof fully cover the width and length of stairways, escalators, ramps, and lifts, extending at least 300mm beyond?	Yes		No
Seating	Is seating provided every 15-30 meters?	Yes		No
	Is each seating section at least 1.5 meters long?	Yes		No
	Does the seating stay clear of minimum walking paths width?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
	Is the seat width at least 450mm?	Yes		No
	Is at least 10% of all seating equipped with backrests, armrests, and adequate spacing?	Yes		No
Commercial Kiosks / Vending Machines/ Retail Stores	Do kiosks/commercial outlets avoid obstructing pedestrian flow?	Yes		No
	Is the kiosk/commercial outlet layout compact without compromising visibility?	Yes		No
	Are kiosks positioned near entrances, exits, and amenities?	Yes		No
Drinking Water	Are Drinking water facilities provided adjacent to every restroom facility or atleast one in every 30-50m.	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
	Is there wheelchair clearance to access the low height drinking water tap?	Yes		No
Waste Disposal	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are waste bins adequately managed without overflowing?	Yes	Yes, in some cases.	No

INDICATORS	SCORING	1	0.5	0
INFORMATION				
	Is there Real time arrival information, Service Alerts?	Yes		No
	Is there Audio Information Service for arrival and departures?	Yes		No
	Are the station provided in Braille?	Yes		No
	Is there information on route time table?	Yes		No
	Is the information board lit and clearly readable at all times of the day and night?	Yes		No
SAFETY				
Surveillance	Does the station have security personnel? And do they have a dedicated space for keeping their belongings?	Yes	Yes, but no dedicated space for keeping their belongings	No
	Is the station equipped with CCTV camera covering all interior and exterior spaces and avoiding blind spots?	Yes		No
	Are there emergency call buttons at the station?	Yes		No
	Are there electrical sockets for people to charge phones?	Yes		No
	Is there a two way speaker system for verbal communication at information kiosks?	Yes		No
LIGHTING				
	Is the average lighting level at least 50 lux in outdoor areas around the station?	Yes		No
	Are underground or enclosed spaces lit with 100–300 lux?	Yes		No
	Are circulation areas and corridors lit with 150–300 lux?	Yes		No
	Are platforms, ticketing zones, and waiting areas lit with 300–500 lux?	Yes		No
	Is the average lux level on all pedestrian bridges 20, if any?	Yes		No
	Is there adequate foot-level lighting in addition to the space lighting?	Yes		No
	Are high-lumen floodlights used in parking and other exterior areas?	Yes		No
	Is the light fixture housed in protective casing to protect from vandalism?	Yes		No
	Is emergency security lighting installed at all entrances and main access routes inside and outside the station?	Yes		No
	Does the light temperature mimic daylight conditions (around 4000K)?	Yes		No
SIGNAGE				
	Are signages incorporated at the infrastructure level with maps, transportation nodes, points of interest, and locality descriptions?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Is there a Public Address System in the station?	Yes		No
	Are there signages with Helpline numbers or nearest police booth info?	Yes		No
	Is there voice-activated wayfinding systems that provide descriptions of directions or key features in the station including service times, emergency routes, regular information,etc.	Yes		No
	Are the signages at a correct reading height for adults and children?	Yes	Yes, but they are not consistent or available throughout the station.	No
	Is there tactile map provided for the map at the entrance?	Yes	Yes, but it is not located correctly for users.	No
	Are all signages multi-lingual?	Yes	Yes, but they are not consistent or available throughout the station.	No
	Is the signage consistent in design and/ or as per standards?	Yes		No

TOTAL TRANSIT STATION SCORE: _____ / 85
TOTAL TOILET SCORE: _____/ 53

Ladies
Waiting room
DRINKING WATER
TICKET VENDING MACHINE
TRAINS→
TOILET
FEEDING ROOM
LIFT

06

SUBWAYS & FOOT OVER BRIDGES

At-grade pedestrian crossings are generally preferable, offering safe, ground-level access. However, in cases of heavy automobile traffic or rail corridors, separation of pedestrians from automobiles through a slight grade separation by elevating or sinking both the automobile and pedestrian pathways should be considered. This will allow for both modes of transport to share the burden of the grade changes, including the additional climb and travel. Only if the roads or rail pathways cannot be modified should subways or foot over bridges (FoBs) be considered necessary, as these unduly require the pedestrians to travel the additional climb. To encourage usage, these structures must provide enhanced accessibility, amenities, and a superior experience compared to at-grade crossings.

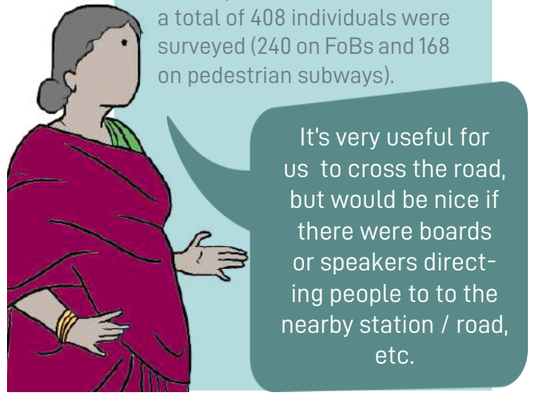
From the urban budget perspective, subways are more expensive to build and maintain compared to FOBs. However, they are better used. Pedestrians generally prefer subways for their ease of use and reduced physical exertion. Typically, FoBs are located 5.5 meters above the road level, and subways are constructed 3 meters below, making them relatively less demanding for pedestrians. FoBs can sometimes clash with the surrounding environment and impact residential privacy, but they can be beneficial in specific situations, such as integration with elevated walkways.

Negative experiences such as theft, poor accessibility, bland design, hygiene issues, vandalism, and crime contribute to low usage of these structures. Maintenance, drainage, lighting, and poor surveillance problems can further hinder their usability. At grade openings in medians without appropriate pedestrian pathways and automobile speed controls, discourage the use of subways with visible options to avoid the climb. However, such openings increase the risk of accidents for pedestrians who may sprint across roads busy with automobile flow. This is particularly dangerous for children, the elderly, and individuals with mobility impairments.

Despite these challenges, subways and FoBs remain necessary in complex urban environments with multiple and crisscrossing transportation modes. Careful design can optimize their value and ensure a positive user experience. By addressing issues such as safety, accessibility, and maintenance, these structures can be transformed into valuable assets for urban communities.

Gender Survey on Subways & Foot over Bridges

The study conducted by GPL investigated pedestrian usage patterns, safety perceptions, and reasons for adopting or avoiding specific subways and FoBs. For this research, six FoBs and five pedestrian subways were selected, and a total of 408 individuals were surveyed (240 on FoBs and 168 on pedestrian subways).



Primary Reason for the Usage

- Connenctions to public transportation node.
- Providing a safe alternative to crossing congested roads.
- Making pedestrians feel more secure compared to crossing at road level.

Key Deterrents to Usage

- More time-consuming and lengthier walk.
- Physical Exertion
- Lack of Cleanliness
- Lack of Connectivity
- Antisocial Activities
- Poor lighting

Safety Perceptions of FoBs & Subways

Factors contributing to safety during Day hours

- Good visibility due to the presence of other users.
- Presence of other women users (specifically for women).
- Good lighting conditions.
- High usage throughout the day.

Factors limiting usage during Nighttime and Off-peak hours

- Poor Lighting
- Poor Visibility
- Lack of Security and Surveillance
- Presence of Anti-social Elements like drunk or drugged users.
- Sense of isolation as the place feels deserted.

Non-Users Views on Road Crossing Safety

- 33% Always felt safe crossing at grade.
- 45% Crossing felt unsafe, FOBs/subways too clumsy.
- 22% Felt safe crossing at grade when there is less traffic.

F1. Existing Conditions

Infrastructural and maintenance challenges in subways and FoBs create significant barriers for women and persons with disabilities (PwDs). These facilities add walking effort for pedestrians. The additional exertion is particularly exacerbated for daily commuters, load-carrying pedestrians, and individuals who may not benefit from walking as physical exercise. Further, this encourages pedestrians to cross busy roads with heavy automobile traffic through medians, increasing the risk of road injuries.

GPL and the Institute for Transport and Development Policy (ITDP) surveyed 240 FoB users and 168 pedestrian subway users across 11 sites in the city, many of whom used these structures as access pathways to public transit train systems. These structures helped the users avoid crossing roads with motor vehicle traffic. However, several people who crossed automobile carriageways adjacent to FoBs and subways mentioned they crossed at-grade despite feeling unsafe, as they found the grade-separated structures too cumbersome.

During the research for this project, a notable contrast was noted between older subways beneath suburban railways and roads and newer subways connected to metro stations. Older subways lack essential amenities such as seating, accessible ramps, elevators, sanitation and proper drainage. These spaces are also poorly lit, have broken surfaces, are locked at night, and lack surveillance and security. Unintended uses of these facilities also raise concerns; older subways near alcohol shops are used as resting or sleeping spots by intoxicated individuals, leading to discomfort and fear among female users. Many subways feature poorly designed ramps and inaccessible slopes for PwDs, while others close early, forcing women to walk longer distances, often in unsafe conditions. Additionally, uneven step risers create tripping hazards.

While some spaces, like the Park Station subway, are well-lit and experience high pedestrian traffic, they still lack essential amenities and safety measures. In contrast, the FoBs score well on safety but need improved access. Issues such as the lack of tactile tiles, the absence of PwD-accessible elevators, trash disposal facilities, and dedicated lighting during emergencies must be addressed. Users frequently expressed the need for commercial activities, improved lighting, cleanliness, and signage to enhance the perception of safety in these spaces.

Quick Fixes

Avoid slippery flooring and ensure edges have tactile markers and hand rails for safety.

Include distance information to exits, nearest police booth, emergency helplines, etc in subways longer than 30m.

Eliminate CCTV blind spots to ensure full surveillance coverage.

Ensure FOB length has roof covering.

Ensure there is adequate drain planned to avoid stagnation or flooding.

Ensure street-level entrances and exits are covered and have shade.

Provide resting zones or seating along the length of the subway/FOB.

Ensure step risers are even and ramps have proper railings for safety.

Rationale for employing a Subway / Foot over Bridge

To determine the feasibility of a subway, it is essential to consider vulnerable users and assess key factors such as pedestrian and cycle traffic volumes, pedestrian behavioral patterns, site constraints (including maintenance challenges and service relocation difficulties), topography, land use patterns, vehicular traffic conditions, alternative route accessibility, environmental impacts, construction costs, aesthetic considerations, and potential long-term effects on land use and recreational spaces.

According to IRC 103-1988, a grade-separated pedestrian facility may be warranted when one or more of the following conditions exist:

- Pedestrian and vehicular traffic volumes are so high that incorporating an exclusive pedestrian phase would extend traffic signal cycle times beyond 120 seconds.
- Vehicular traffic requires uninterrupted flow, as seen on major arterial roads and expressways.
- At-grade pedestrian crossings fail to mitigate pedestrian-vehicle collisions effectively.
- The feasibility of a grade-separated pedestrian facility should be evaluated against the delay costs for both pedestrians and vehicle users, including increased vehicle operating costs due to extended delays.

While the Indian Roads Congress (IRC) emphasizes pedestrian safety and their interaction with vehicles, its approach often assumes vehicular speed and traffic flow as fixed factors. This perspective can be limiting when designing truly safe and inclusive urban environments. Instead of adapting pedestrian infrastructure to accommodate high-speed traffic, authorities should also consider measures to control vehicular speeds and create pedestrian-friendly urban spaces.

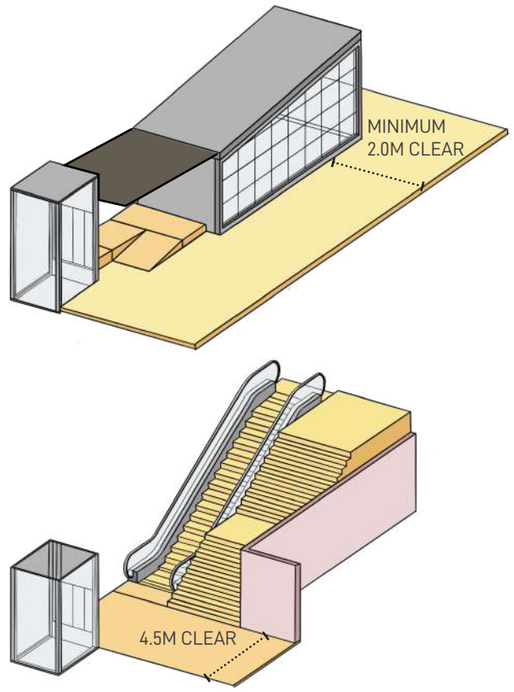
Entrance Canopies with signage and neighbourhood maps leading to a transit station.
Photo Credit: NYCDOT

Grade level crossing where FOBs or Subways are provided.
Photo Credit: Exporters India

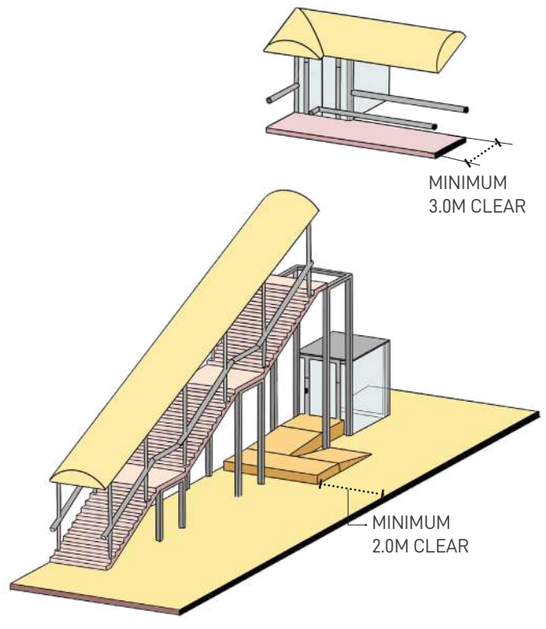
F2. Interface with Roads

F2.1 SITING A GRADE SEPARATOR

- To increase visibility and security, subways and FOBs should be located in busy areas rather than secluded locations, taking advantage of passive surveillance from surrounding buildings and public spaces.
- To optimize use, the alignment of the subway/FOB should be along the desired line of travel for the majority of subway users. For example, if the underpass is being provided, it should be located such that connectivity is maintained and that there would be only a minimal net increase in travel time by using the underpass.
- The subway should be as short as possible.
- If pedestrian volume is large, an option might be to alter the level of the road and reduce the height and length of pedestrian stairs and ramps.
- Where possible, subway/FOB should be located in busy areas rather than secluded locations, to maximize the available passive surveillance from surrounding areas of activity, buildings and public areas.
- To maximize ridership and traffic, it is crucial that subways or FOBs attempt to connect to multiple facilities, such as transportation hubs, commercial buildings, residential locations, or educational institutions in the same area. This interconnectedness will encourage more people to use the facility.
- In busy city centre areas, creating space for musicians or other forms of entertainment can help provide a more frequented infrastructure.
- Subway/FOB entrance vestibules often require substantial ground space at road level to accommodate passenger flow - minimum stairway widths, elevators, and/or escalators and ramps. To maintain pedestrian safety and accessibility, it is crucial to ensure that there is an uninterrupted 2-meter continuous pedestrian pathway along the road adjacent to the entrances.
- Identifying a road stretch where adequate space for entrance vestibule and walkway space is available is crucial in siting the Subway/FOB.



Subway entrance and its relation to the street footpath.



Foot over bridge entrance and its relation to the street footpath.

F3. Access to the Infrastructure

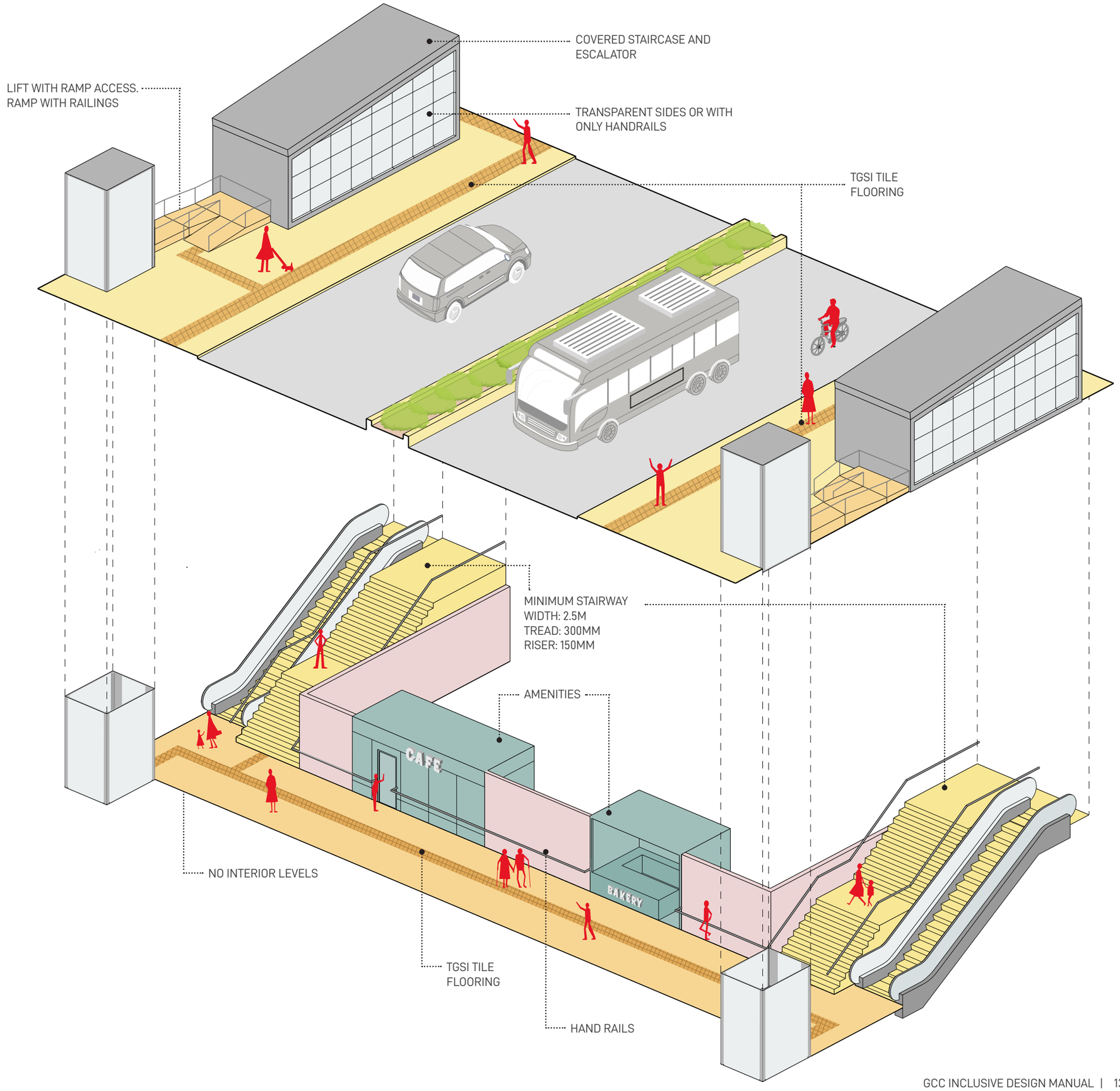
- Maintain a minimum of 2.0m of unobstructed walkway adjacent to the subway/FOB. This 2.0m walkway should have adequate lighting and at least connect to the nearest public transportation stop.
- Both active (e.g., CCTV cameras) and passive (e.g., nearby shops, street vending, well-lit areas) surveillance measures along this 2 meter pathway can help deter crime and ensure public safety.
- Maintain clear sightlines and distances at subway entrances.
- Pedestrians approaching stairs or ramps from road should face oncoming traffic.
- Provide a landing space outside the subway/FOB of width equal to or wider than the stairway/escalator/lift/ramp.
- Maintain a minimum of 2 meters of space outside lift entrances. Equip entrances with shade and shelter.
- Provide maps of the length and exits at the ends and interior of the tunnel / skywalkfor navigation. If infrastructure is of such dimensions that the exit is not clearly visible from the entrance, it can deter female users due to safety issues.
- Ensure that the stairway/escalator leading to the subway/FOB is supplemented with an elevator or ramp to provide access to senior citizens and individuals with disabilities.

F4. Access within the Infrastructure

- Maintain a minimum stairway width of 2.5 meters for comfortable movement. Tread should be 300mm deep, Riser not higher than 150mm.
- Step edges must contrast in colour to the risers and the treads. Contrast colour bands 50 mm wide should be provided on the edge of the tread.
- Each flight of stairs shall have a maximum of 12 steps.
- Consider wider stairways in high-traffic areas or for individuals using mobility aids.
- Install sturdy handrails along the edges of the subway/FOB.
- Use tactile tiles to alert visually impaired users to changes in the walking surface.
- Ramp slopes should not be steeper than 1:12. It is recommended to adopt a gradient of 1:15 or lower to enable independent mobility to the greatest extent possible.

F5. Space Planning in Subways

1. **Subway Section:** For optimizing cost of infrastructure and to ensure clear visibility, adopting a rectilinear subway section is desirable.
2. **Width:** Ensure ample width throughout the subway, especially if sightlines are limited. The width should be consistent throughout and not narrowed at either end.
3. **Minimum Width:** As per IRC standards, the minimum width of the subway is 2.5 m. The preferred uninterrupted width of the subway is 4.5m.
4. **Width-to-Length Ratio:** For subways longer than 50 meters and up to 100m, it is desirable that a 1:10 width to length ratio should act as a guide in setting the width required. For example a 60 metre long underpass should be 6 meters wide.
5. **Cycle and Walking Paths:** If a separated cycle and walking path is planned in the subway, the desirable minimum is 5m clear width.
6. **Minimum Height:** A minimum height of 3 meters for subways is preferred and helps provide a more open, less tunnel-like effect with flexibility for future changes in use.
7. **Vertical Core:** Provision of stairs/escalators/elevators/ramps should be decided in consultation with the appropriate authority. However, ramps would be preferable to stairs/escalators. The location and design of the vertical core, including the stairway, elevator, ramp, and escalator, are crucial for the functionality of the subway. These elements must be planned to efficiently use the available space, at grade, along the footpath. Equip elevators with accessible controls, including foot-operated buttons.
8. **Interior levels:** Design the interior slopes of the subway/FOB to prevent water stagnation. Ensure all interior spaces are on a level surface to accommodate wheelchair users. Provide ramps with appropriate slopes and handrails for any level changes.
9. **Natural Light:** Light wells can be planned if possible to allow for natural light.
10. **Noise Mitigation:** Implement measures to reduce noise and vibration from road traffic. This can help alleviate the sense of fear that excessive noise can generate in some users.
11. **Amenities:** Enhance subway usage by adding amenities like coffee shops, hawker zones, vending machines, and integrating with underground parking. Strategically locate toilets within the subway and ensure that the maintenance personnel are equipped to support security measures as well.
12. **Placemaking and programming:** Create a more inviting atmosphere by programming entryway spaces and offering subway-level entertainment, such as performances or art displays. This can attract additional foot traffic, especially in busy city centers.



The entrance canopy at 2nd Avenue Subway Station is designed to be both functional and inviting. Its open-sided design, with glass only on the roof and overhangs, allows for natural light and facilitates surveillance, making it less susceptible to vandalism and poster sticking.
Photo Courtesy: Flickr CC

The entrance canopy at Wynard Wak is obvious, clearly identifying location and use and light and welcoming.
Photo Courtesy: Pedestrian underpass guideline June 2023

The entrance canopy at Wynard Wak is obvious, clearly identifying location and use and light and welcoming.
Photo Courtesy: Pedestrian underpass guideline June 2023

Metal grilles in NY Subways bringing light and air to underground subways also acts a a flood-control device, creating a protective collar.
Photo Courtesy: https://archive.nytimes.com/cityroom.blogs.nytimes.com/2008/09/19/new-subway-grates-add-aesthetics-to-flood-protection/

F6. Comfort

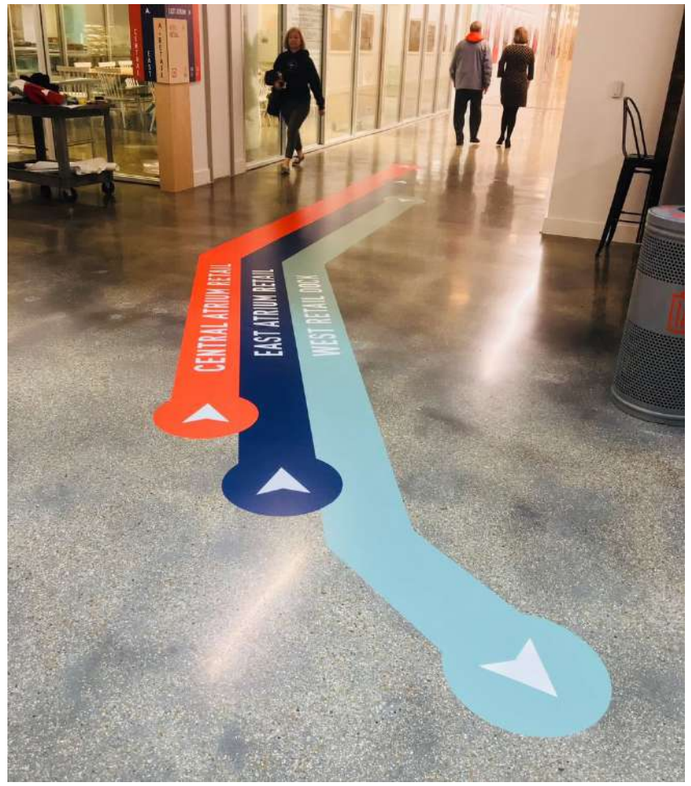
FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
ENTRANCE CANOPIES AND VESTIBULE DESIGN	• Design entrance canopies that help protect users from inclement weather conditions. • Design sides of the entrance canopy to deter poster sticking, vandalism, or appearing closed. If feasible, leave it open with adequate drainage	• Place canopies at all entrances to the subway.	• The canopy should extend above length of the stairway/ ramp/ escalator by atleast 300mm.
SEATING	• Seating in subways help women carrying belongings, and elderly persons to pause • Minimum seating section length: 1.5 meters. • Design seating to accommodate people with disabilities.	• Provide well-lit seating areas - one for every 20m.	• Ensure that seating does not obstruct views for pedestrians and emergency personnel. • Position seating along walkway length, without obstructing path of pedestrian flow.
COMMERCIAL KIOSKS/ VENDING MACHINES	• For instilling means of natural surveillance, incorporate commercial kiosks. • Subways have limited space, so kiosks must be compact. • Saleable items in kiosks should not pose any safety hazards to pedestrians.	• In long subways, avoid placing kiosks too close together. A good spacing metric is every 20-30 meters.	• Position kiosks/vending units along the walkway length without obstructing path of pedestrian flow. • Commercial shops can be placed along the sides of the subway, away from the center path. • Position kiosks near areas where pedestrian traffic is high, such as entrances, exits, or near popular attractions.
WASTE MANAGEMENT	• Encourage waste segregation by implementing clear signage and bin designs. • Ensure bins are visible without obstructing pedestrian pathways. • Provide bins near commercial shops, vending stations, etc.	• Provide accessible waste disposal bins (including child-sized bins at 0.45-0.5 meters height) at regular intervals (every 20 meters) and near seating areas.	• Provide refuse/recycling containers at entrances and in gathering areas.
VENTILATION	• Provide openings at the ends of the subway or along the sides to allow for natural airflow. • Design the subway with a layout that encourages cross-ventilation • Design sufficient mechanical ventilation systems where required.	• Provide adequate ventilation to prevent the buildup of odors or smoke. And prevent the spread of fire or smoke in case of an emergency.	• Ensure that ventilation systems do not create drafts or excessive noise that can discomfort pedestrians.
ACOUSTICS	• Ensure that noise levels remain within acceptable limits to prevent discomfort or hearing damage. • Address vibration issues from trains or other sources to minimize discomfort for pedestrians. • Adequate ventilation can help reduce noise levels and improve air quality.		• As Design elements, install metal panels, acoustic plaster, or panels, on walls, ceilings, and columns. • Strategically locate speakers to ensure even sound distribution.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
TOILETS	• Provide separate facilities for men and women, and gender-neutral accessible family restrooms as per guidelines. (Refer Public Toilect Section for further details) • To accomodate a toilet in the subway, ensure the drainage system is robust, there is regular maintenance and adequate ventilation.	• Plan restrooms in subways that have a high volume of pedestrian movement and based on nearest public restroom facility. • In dense transit / commercial zones, where space for allocating space for public toilets at grade is difficult, subways can be a good location to place them.	• Place restrooms in a central location within the subway, easily accessible from multiple points.
DRINKING WATER SPOUTS	• Provide anti-skid paving around the drinking fountain, gradually sloping towards drain. • Ensure accessibility in drinking water provisions as per Harmonized Guidelines. • Provide adequate signage indicating the facility.	• Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access.	• Place drinking water spouts in high-traffic areas, near entrances, exits, or along pedestrian paths. • If a toilet is provisioned, place drinking water spouts adjacent.

F7. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Maintain an average illumination level of 100 lux. • Use light temperature that mimics natural daylight conditions. • Opt for industrial-grade, efficient, low-energy LED fixtures with an IP65 rating. • Ceiling recessed lighting is preferred to avoid theft.	• Achieve a uniformity ratio of at least 0.4. • Incorporate daytime artificial lighting for underpasses with a length-to-height ratio exceeding 10:1 to prevent the "black hole" effect. This helps users adjust to the contrast in light levels when entering or exiting.	• Provide exterior emergency security lighting at the following locations: Entrance accessways and primary access routes. • Incorporate wall lights with advertisements along wall surfaces to ensure all day lighting.
WAYFINDING AND SIGNAGE ACCESSIBILITY	• Incorporate braille or tactile in all signage, including maps with exits, amenities, and points of interest. • Distinguish the subway with a unique design, color, or logo to make it easily recognizable. • Incorporate signages with helpline numbers	• Provide adequate signage at regular intervals to alight users on desired destinations. • Reflective signs for emergency exit routes can improve visibility at night, ensuring that people can quickly and safely evacuate in case of an emergency.	• Install well-lit signage at entry/exit points • Ceiling can have suspended signs indicating the routes, landmarks, police stations and restrooms nearby. • Painted floor markings can provide clear guidance for pedestrians, even in low-light conditions.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station.		• Strategically place CCTV cameras at entry, exit and within the corridors • Integration with commercial activities, space for hawkers will enhance natural surveillance.
EMERGENCY CALL BUTTONS AND ELECTRICAL SOCKETS	• Install emergency call buttons at regular intervals • Incorporate a limited number of electrical outlets for temporary phone charging.		• Place them along the walkway with adequate signage.

Light backed advertisements along pedestrian pathways
Photo Credit: Freepik Website

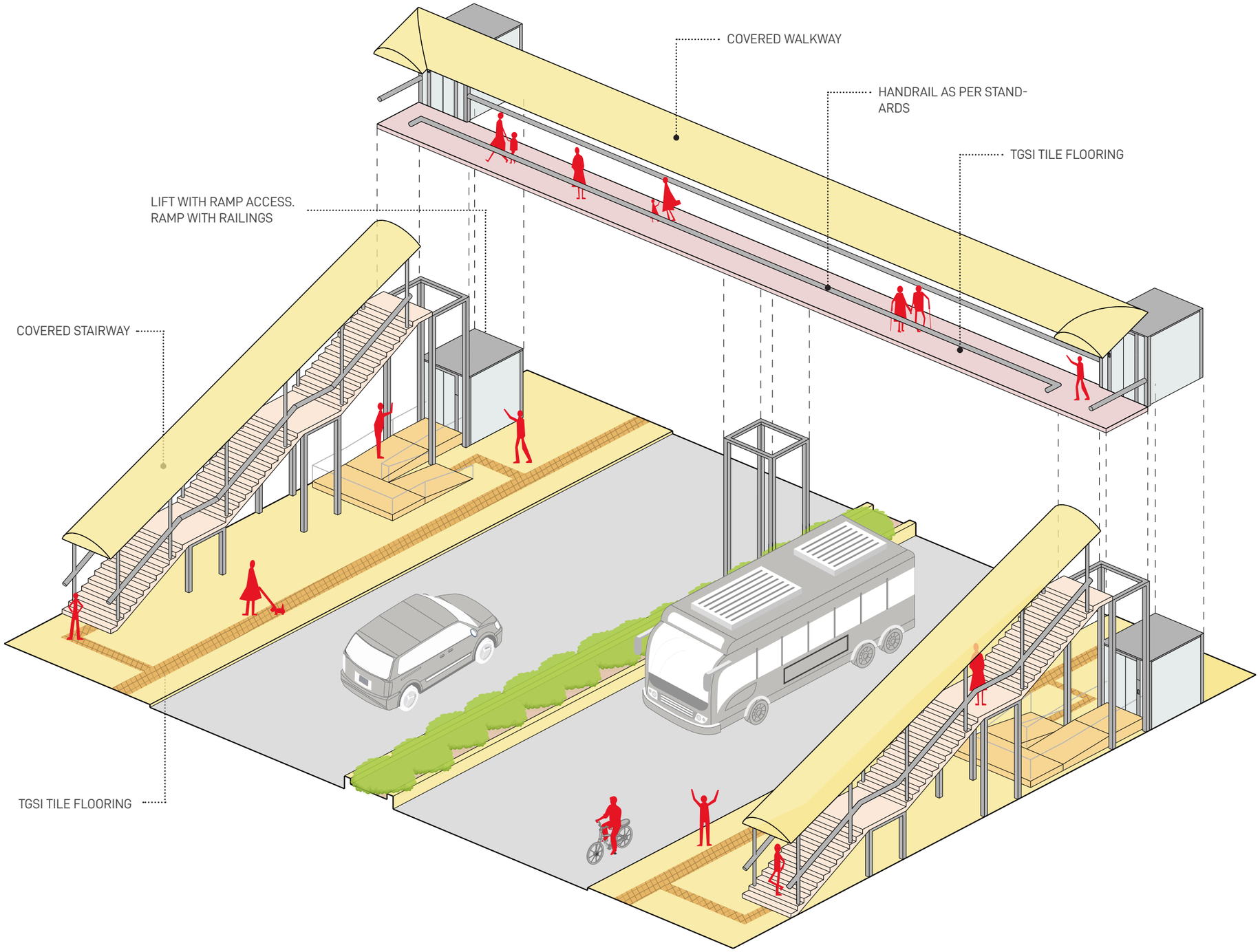


Floor Sticker Signage
Photo Credit: The One Inkjet

Light backed advertisements along pedestrian pathways
Photo Credit: Freepik Website

F8. Space Planning in Foot Over Bridges

1. **Pedestrian Bridge Layout:** For optimizing cost of infrastructure and to ensure clear visibility, adopting the shortest route layout is desirable. Consider adjacent building typologies and uses to determine the layout of the bridge. ensuring visual access does not intrude on the privacy of nearby buildings.
2. **Sightlines:** Ensure clear sightlines throughout the FOB to prevent accidents and create a sense of security. Avoid obstructions that could obscure views or create blind spots.
3. **Access Points:** Should be tailored to the specific needs of the location and pedestrian traffic.
4. **Minimum Width:** As per IRC SP:056 standards, the minimum width of the foot over bridge is 1.8 m. The preferred uninterrupted minimum width of the bridge is 3.0m.
5. **Cycle and Walking Paths:** In case cycling is allowed on the pedestrian bridge, separate and dedicated lane(s) should be provided for the use of cyclists. The desirable minimum is 3m clear width for cycling.
6. **Minimum Height:** The bridge should be covered. A minimum clear height of 2.5 meters from the floor level of the bridge is preferred. The same can be maintained along stairways/ramps. FoBs should be equipped with roofs that span the entire width of the walkway and provide adequate overhangs to collect and drain rainwater, preventing water accumulation during inclement weather.
7. **Vertical Core:** The location and design of the the stairway, elevator, ramp, and escalator are crucial for the functionality of the subway. These elements must be planned to efficiently use the available space, at grade, along the footpath.
8. **Noise Mitigation:** Implement measures to reduce noise and vibration from road traffic to alleviate sense of fear that excessive noise can generate in some users.
9. **Amenities:** To enhance the functionality and usage, consider integrating the FOB with nearby facilities and direct access to surrounding commercial buildings.
10. **Placemaking and programming:** Program spaces around the entry stairway and lifts at road level to discourage misuse. At elevated bridge level, designated areas for entertainment, such as performances by musicians, art displays, hawkers, etc. The presence of people in these spaces can attract additional foot traffic.
11. **Aesthetics:** Design the FOB to be visually appealing and inviting, using attractive materials, colors, and lighting. Plan viewing decks, locations where views may be capitalised on, and provide selfie points for the same.



F9. Comfort

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
ENTRANCE CANOPIES AND VESTIBULE DESIGN	• Design entrance canopies that help protect users from inclement weather conditions. • Design sides of the entrance canopy to deter poster sticking, vandalism, or appearing closed.	• Place canopies at all entrances to the FOBs. • All stairways, ramps, and escalators have to be covered for shade and adequate drainage channels provided to avoid dripping.	• The canopy should extend above length of the stairway/ramp/ escalator by atleast 300mm.
HANDRAILS	• Ensure handrails are smooth, free of sharp edges, and have a diameter between 38 and 50mm. • Provide railing with height 1.20m for pedestrian only and maintain a minimum height of 1.40m for cyclist bridges.	• Provide handrails at two heights as per Harmonised Guidelines 2021.	• Install sturdy handrails on both sides of the walkway for support, especially for elderly or disabled individuals.
SEATING	• Seating in FOBs help women carrying belongings, and elderly persons to pause • Minimum seating section length: 1.5 meters. • Design seating to accommodate people with disabilities.	• Provide well-lit seating areas - one for every 20m. • Stairway landing areas can serve as rest stops, especially for individuals who may need a break during their journey. Consider adding benches and providing shade, creating a more inviting environment for pedestrians.	• Ensure that seating does not obstruct views for pedestrians and emergency personnel. • Position seating along walkway length, without obstructing path of pedestrian flow.
WASTE MANAGEMENT	• Encourage waste segregation by implementing clear signage and bin designs. • Ensure bins are visible without obstructing pedestrian pathways.	• Provide accessible waste disposal bins (including child-sized bins at 0.45-0.5 meters height) at regular intervals (every 20 meters) and near seating areas.	• No requirement for garbage disposal on the bridge as it is a transitionary space. However, provision of garbage bins at the ground level at two ends of the bridge is advisable. • If any commercial activities/street hawking is incorporated, provision for a garbage bin adjacent to the same.
LANDSCAPE	• Select plants that complement the overall aesthetic of the footbridge and surrounding area. • Ensure that plants do not obstruct walkways or create visual barriers that could pose a hazard to pedestrians with visual impairments.		• Planting schemes which create enclosed areas causing potential anxiety or security risk to users, or which can eventually cause trip or slip hazards from root and branch growth or leaf-fall, should be avoided.

F10. Safety

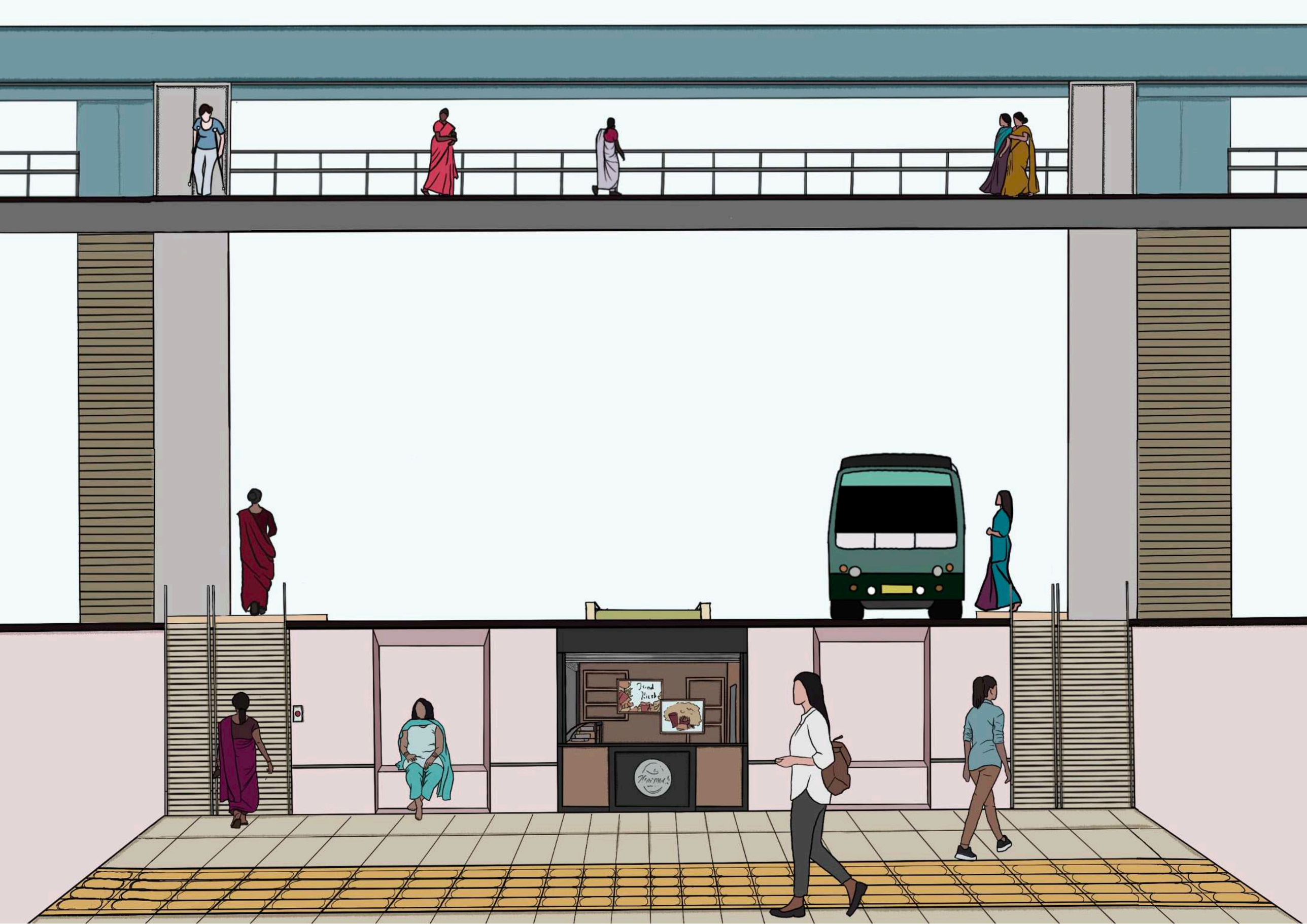
FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Maintain an average illumination level of 20 lux. • Use warm light temperature. • Opt for industrial-grade, exterior, low-energy fixtures. • Incorporate light along the railing to provide adequate foot level lighting in addition to space lighting and aesthetic fixtures.	• The frequency of light points should be 2.5-3 times the height at which the light is fixed to avoid dark zones. • The density, speed of travel, and the type of light source along the corridor will also determine the height and spacing.	• Provide exterior emergency security lighting at the following locations: Entrance accessways and primary access routes.
WAYFINDING AND SIGNAGE ACCESSIBILITY	• Incorporate braille or tactile in all signage, including maps with exits, amenities, and points of interest. • Distinguish the FOB with a unique design, color, or logo to make it easily recognizable. • Incorporate signages with helpline numbers	• Provide adequate signage at regular intervals to alight users on desired destinations. • Reflective signs for emergency exit routes can improve visibility at night, ensuring that people can quickly and safely evacuate in case of an emergency.	• Install well-lit signage at entry/exit points • Ceiling can have suspended signs indicating the routes, landmarks, police stations restrooms, and drinking water facility nearby. • Painted floor markings can provide clear guidance for pedestrians, even in low-light conditions.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station.		• Strategically place CCTV cameras at entry, exit and along the bridge walkway • Integration with commercial activities, space for hawkers will enhance natural surveillance.
EMERGENCY CALL BUTTONS	• Install emergency call buttons at regular intervals.		• Place them along the walkway with adequate signage.

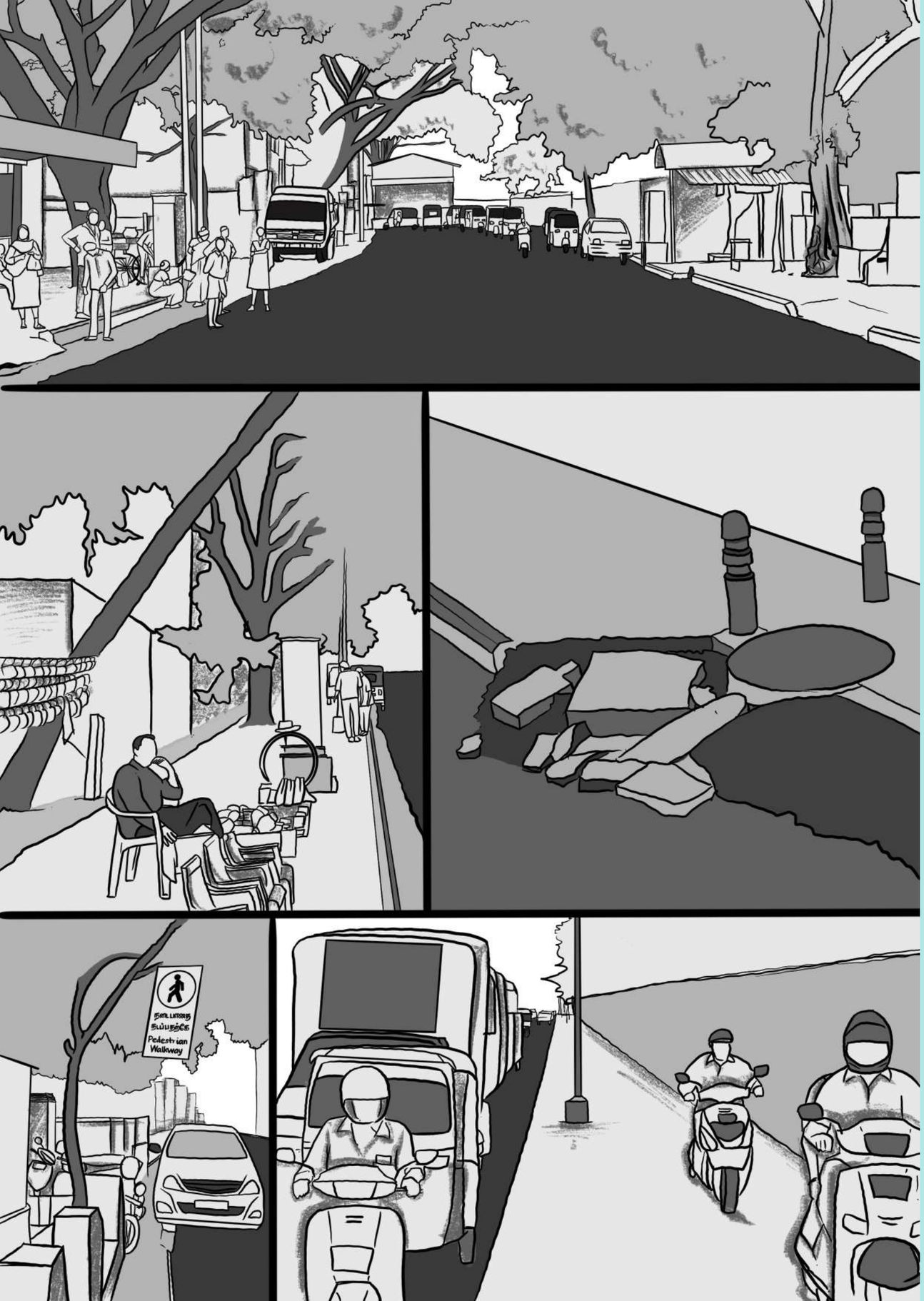
F11. Design Checklist for Subways and Foot Over Bridges

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Is at least 70% of the ground floor around the Subway/FOB entrance open or see-through to support street activity?	Full visibility	Partial visibility. Less than 70%	No visibility
	Does the Subway/FOB entrance block the footpath and make it narrower than 2 meters?	Yes		No
	Is the subway/FOB entrance far from where most people naturally want to cross?	Yes		No
	Are any entrances hidden or in areas without people around to watch?	Yes		No
	Is the Subway/FOB entrance area fully closed, partly open, or see-through?	Yes		No
	Do people walking towards the stairs or ramps face traffic coming toward them?	Yes		No
	Are the sides of the Subway/FOB entrance fully closed, partly open, or see-through?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Is there a lift or ramp for persons on wheelchair to access the subway/FOB?	Yes		No
	Is there enough open space outside the subway/FOB for people to stand, wait, or move easily?	Yes		No
	Does the stairway and ramp have handrails on both sides?	Yes		No
	Is there a roof or cover over the ramps, stairs, and escalators at the entrance?	Yes		No
	Is there enough street lighting along the way to the subway/FOB entrance?	Yes		No
	Is the entrance free from obstacles like plants, bollards, guardrails, or drains?	Yes		No
	Is the footpath around the Subway/FOB entrance smooth and easy for a wheelchair to use?	Yes		No
	Are kerb ramps available at nearby intersections and drop-off points?	Yes		No
	Are tactile tiles or markers on the footpath to guide people to the subway/FOB?	Yes		No
	Is there clear signage outside and around the subway/FOB to help people find their way?	Yes		No
ACCESS WITHIN THE INFRASTRUCTURE				
	Is the subway/FOB floor surface non-slip?	Yes		No
	Are handrails provided along the edges of the subway/FOB?	Yes		No
	Are tactile tiles installed for warning and guidance?	Yes		No
	Are slopes inside designed to avoid water stagnation?	Yes		No
	Are all interior subway/FOB areas flat, with ramps where there are level changes?	Yes		No
	Are all stair steps at least 300mm deep?	Yes		No
	Are all stair risers 150mm high?	Yes		No
	Do the lift controls have accessible features like foot-operated buttons?	Yes		No
FOR SUBWAYS				
	Is the subway at least 4.5 meters wide? Or, if it's 50–100 meters long, is the width at least one-tenth of the length?	Yes		No
	Is the height of the subway at least 3 meters from the finished floor level (FFL)?	Yes		No
FOR FOBs				
	Is the pedestrian bridge at least 1.8 meters wide?	Yes		No
	If cycling is allowed, are there separate lanes for cyclists, with the bridge being at least 3.0 meters wide?	Yes		No
	Is the height of the pedestrian bridge at least 2.5 meters from the finished floor level (FFL)?	Yes		No
VISIBILITY				
Programming and Activation	Does the Subway/FOB include at least three of the following features: 1. Direct connection to adjacent buildings for easy access? 2. Commercial facilities like coffee shops, kiosks, or hawker spaces? 3. Connection to parking facilities? 4. Spaces for busking, entertainment, or activities? 5. Artwork or decorative elements for visual appeal? 6. Public conveniences like vending machines?	Yes		No
	Is a toilet provided within the subway, or near the entrance vestibule, or within 1 km?	Yes		No
	Is the subway/bridge visible from the lift, stairs, ramp, or escalator without any obstructions?	Yes		No
	Are the signages and entrances to connecting amenities clear and easy to see?	Yes		No
COMFORT				
Shade	Does the canopy at all entrances cover the full width and length of the stairway, escalator, ramp, and lift, extending at least 300mm beyond?	Yes		No

INDICATORS	SCORING	1	0.5	0
Seating Provisions	Is there seating every 20 meters?	Yes		No
	Is each seat at least 1.5 meters long?	Yes		No
	Does the seating stay clear of minimum walking paths width?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
Toilets (Applicable for Subways)	If a public toilet is not available within 1 km, is a toilet provided inside the subway?	Yes		No
Drinking water	Is drinking water available next to the toilet or at least once every 100 meters?	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
	Is there wheelchair clearance to access the low height drinking water tap?	Yes		No
Waste Disposal	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are waste bins adequately managed without overflowing?	Yes	Yes, in some cases.	No
Noise and Sound Mitigation	Are noise or sound mitigation measures installed to reduce excessive noise?	Yes		No
Commercial Kiosks / Vending Machines (Applicable only for Subways)	Do kiosks/vending machines avoid obstructing pedestrian flow?	Yes		No
	Is the kiosk/commercial outlet layout compact without compromising visibility?	Yes		No
SAFETY				
	Does the subway have security personnel?	Yes	Yes	No
	Is the subway/FOB fully covered by CCTV cameras in all areas?	Yes	Yes, but has blind spots/ are not functional	No
	Is the subway/FOB free from vandalism, alcohol bottles, and cigarette butts, ensuring a safe environment for users?	Yes		No
	Is the surrounding area free from user groups engaging in activities like gambling, unruly behavior, or intoxication that may cause discomfort to others?	Yes		No
	Are there emergency call buttons?	Yes		No
	Are there signage with Helpline numbers or nearest police booth info?	Yes		No
Only for subways	Are there phone charging stations in the subway?	Yes		No
LIGHTING				
	Is there 50 lux lighting at road-level entrance to the subway/FOB?	Yes	Yes, but not with adequate lighting lux level	No
	Are stairways, escalators, ramps, and lift lobbies have adequate lighting?	Yes	Yes, but some are not working	No
Lighting - Subway Interior	**Is the interior lighting at an average lux level of 100?**	Yes	Yes, but not well-lit	No
	Is emergency security lighting provided outside, especially at entrances and main access paths?	Yes		No
	Is the lighting temperature similar to daylight (around 4000K)?	Yes		No
	For long subways with a length-to-height ratio over 10:1, are light wells or similar features provided to ensure daylight-like lighting?	Yes		No
Lighting FOBs	Is the average lux level on the bridge 20?	Yes		No
	Is there adequate foot-level lighting on the bridge, in addition to general space lighting?	Yes		No
SIGNAGE				
	Is wayfinding signage provided at the infrastructure, including subway/FOB maps, local points of interest, and locality descriptions?	Yes	Yes, but it is not located correctly for users.	No
	Are informational signs (e.g., toilets, amenities, helplines) and instructional signs (e.g., garbage disposal methods) provided at the entrance of Subway/FOB?	Yes	Yes, but it is not located correctly for users.	No
	Is there informational signage provided? E.g. map layout of the park	Yes	Yes, but it is not located correctly for users.	No
	Are the signages at a correct reading height for adults and children?	Yes		No
	Is there tactile map provided for the map at the entrance?	Yes		No
	Are all signages multi-lingual and design consistent?	Yes		No

TOTAL SUBWAY/FOB SCORE: _____ / 71
TOTAL TOILET SCORE: _____ / 53
(IF INCLUDED IN THE SUBWAY)





07

STREETS

Streets have a long history of careful design and planning intervention worldwide and in Chennai. As everyday infrastructures, streets of some kinds are utilized by almost all the city's population for transit daily. Ample guidelines have been created and continue to be made on streets and their design, drawing from and catering to universal principles of access and to local needs and contexts.

Chennai has a highly complex network of roads, from narrow residential lanes to multi-level flyovers along its major arterials. These roads are critical infrastructures that support the functioning of various systems including public transit such as buses, metro and sub-urban rail, and bicycle sharing networks. They also serve as vital connectors to schools, hospitals, government offices, and markets. Womxn's access to these urban systems is deeply linked to the condition, comfort, and safety of the roads they must use to reach them.

From the smallest lane to the widest arterial, most streets in Chennai are shared by a wide and diverse set of users. Pedestrians, bicyclists, two-wheelers, autorickshaws, private cars, buses, and trucks move alongside each other at varying speeds and engage in a range of everyday activities — commuting, vending, rendering services, waiting, loitering, or simply passing through. Streets are not just conduits for movement, but spaces of livelihood, care work, social exchange, and urban experience.

The streets are classified by their width, right of way, and types of use. Importantly, the nature of use and access tends to vary by gender, age, and ability. These factors shape who uses the street, for how long, what activities they undertake, what vehicles they wield, and which streets feel safe and welcoming. This disparity highlights how deeply social experience is embedded in street design. Working with these differences allows us to reimagine street design — from surface quality to lighting, from traffic speed to pedestrian infrastructure — not merely as technical interventions, but as tools to ensure equity, comfort, and safety for all.

Gender Survey on Streets/Approach roads/Footpaths

Gender and policy lab conducted 387 safety audits were conducted at 47 public spaces and transit points using the Safetipin app on 9 parameters: lighting, openness, visibility, people, security, walk path, public transport, gender usage, and feeling. In addition to this, a more details were gathered toilets, bus stops, railway stations, and bus depots.

These pavements are becoming quite a challenge for older knees. I wish there is more space to walk without dodging traffic and obstructions like bollards, parking, and transformers.

Assessment of Road and Footpath Safety

42 access paths, including approach roads and footpaths, were reviewed by GPL. These paths are crucial for safety, particularly in emergencies where individuals may need to quickly evacuate from a dangerous situation.

Common Issues

- Lack of Signage
- Obstructions due to Parked vehicles
- Obstructed lines of sight.
- obstructions due to utility boxes
- Vendor Encroacments
- Lack of Footpaths

Safety audits have revealed critical areas demanding immediate attention to improve the safety and accessibility of public spaces and transit points. Therefore, enhancing street lighting, approach roads, and footpaths is essential for creating a safer and more inclusive urban environment.

I try my best not to venture out of the house at night. I meet my friends, other house wives of my area in the evenings. But we come back before it gets too dark.

Assessment of Street Lights

Street lights were assessed by GPL in the year 2023 on 156 streets

64 street locations were identified as having inadequate or poor lighting, highlighting a widespread issue that can significantly impact public safety, particularly for women and other vulnerable groups.

Problems observed

- Poor placement of street lighting.
- Insufficient Lighting
- Light is blocked by big trees.
- Low light levels: Poorly lit.

These findings suggest that street lighting requires improvements with respect to the location, illumination, and maintenance.

I depend on a car because footpaths are never accessible. I visit the beach for some relaxation, the beach access path is a blessing. But reaching all parts of the beach is still difficult.

G1. Existing Conditions

Street design and infrastructure in Chennai vary widely across neighbourhoods. While some areas feature elements of complete streets, these are often fragmented, lacking continuity and integrated accessibility. Features such as bollards or ramps are frequently installed without attention to usability — for example, bollards placed at irregular intervals can pose more barriers than the parked vehicles they aim to prevent. This piecemeal approach undermines the potential of streets to function as safe, inclusive public spaces.

In many other parts of the city, the challenges are more acute. Narrow lanes, high crime prevalence, poor lighting, lack of seating or shade, and limited pedestrian infrastructure discourage women from using streets unless absolutely necessary. These issues are compounded by vacant lots, underutilised spaces, and deteriorated surroundings, which foster a perception of danger and make streets feel isolating or unsafe.

Safety concerns are especially pronounced in school zones, where long signal wait times and inadequate crossings endanger children — many of whom walk or cycle to school. The absence of pedestrian-friendly infrastructure in such high-footfall areas further restricts access and mobility.

Littering and poor street maintenance add to this burden. While waste management is partly behavioural, design solutions — such as accessible bins, better street furniture, and cleaner, well-marked zones — can support better public habits. Neglect in the execution and upkeep of street infrastructure contributes to a run-down appearance, reinforcing perceptions of neglect and insecurity even in otherwise stable neighbourhoods.

Quick Fixes

Adjust lane widths and use leftover space for pedestrian infrastructure. Apply tactical improvements for quick impact.

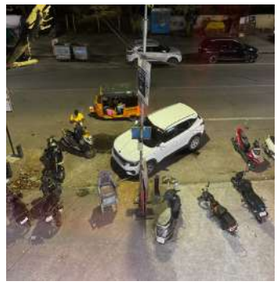
Activate Vacant Lots and Shop Fronts to avoid blight and improve street vibrancy.

Reduce turning radii on pedestrian streets to enhance safety and walkability. Use tactical improvements for quick impact.

Provide pedestrian refuge islands for roads with more than three lanes.

Allocate paid two wheeler and four wheeler parking areas along commercial streets.

Provide clear, visible announcements and directions for safe reroutes around construction zones to ensure pedestrian safety and avoid confusion.



Prevent parking on pavements and footpaths to ensure clear walkways for pedestrians and improve overall street accessibility.

Install and maintain uniform street lighting to enhance visibility, safety, and comfort for pedestrians and drivers alike, especially at night.

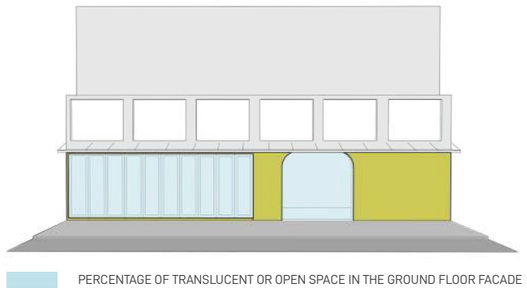
Guidelines for Street Design

This section highlights key elements of gender-sensitive design, considering women across all intersectionalities, ages, abilities, and the gender spectrum. Women use streets for various purposes—livelihoods, commuting, leisure, daily chores, and commerce—shaped by job patterns and responsibilities. Ensuring both physical and perceived safety is essential in empowering women to claim public spaces. Streets should not only facilitate movement but also create environments where women can thrive. This section explores design strategies that foster inclusive and empowering street environments. By integrating behavioral insights, community-driven approaches, and intersectional gender perspectives, it aims to enhance women's participation in public spaces, contributing to the development of truly inclusive cities. A comprehensive Street Design Guideline is being currently developed by Chennai Unified Metropolitan Transportation Authority (CUMTA) and will be an essential guiding document for planning and building streets.

G2. Edge Conditions

Active Frontage

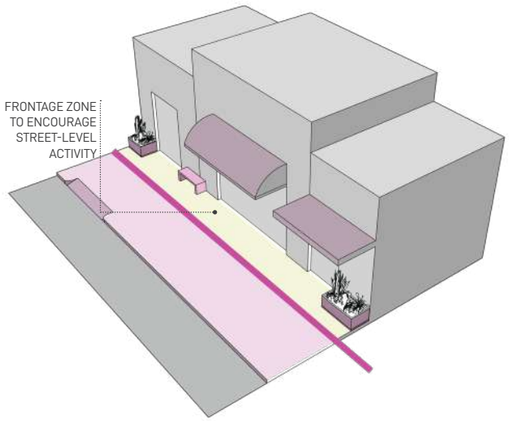
1. Active frontage refers to the design of street-facing building facades to encourage activity and interaction between the building and the street.
2. Encouraging 70% of the ground floor of such buildings translucent or open is essential.
3. Set buildings closer to the street, providing front setback spaces for social interactions where possible, to create a more intimate pedestrian environment.
4. Encourage stores to use creative displays with light that enhance visual interest and engage passersby.



PERCENTAGE OF TRANSLUCENT OR OPEN SPACE IN THE GROUND FLOOR FACADE

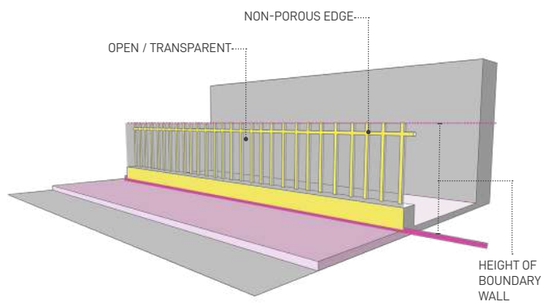
Visibility

1. Visibility involves ensuring that people, spaces, and activities on the street are easily seen and recognizable from a distance or by others in the vicinity.
2. Encourage mixed-use development.
3. Integrate ambient lighting along the street and building facades to ensure visibility after sunset, especially near entrances, corners, and public seating.
4. Position residential balconies, terraces, and windows to overlook streets and public spaces.
5. Include areas for café seating, outdoor tables, and social zones to invite street-level activity



Transparency

1. Transparency refers to the physical openness of building facades, specifically the degree to which the interiors of buildings are visible from the street.
2. Ensure adjacent boundary walls are only 20-40% non-porous to maintain clear sightlines and safety of passersby.
3. Encourage establishments, especially those fronting footpaths to maximize transparency with a clear view into the stores is essential.
4. For buildings along the footpath, ensure that ground floors and plinths (raised building bases) are at the same height. This consistency enhances visual continuity.



G3. Planning and Design

G2.1 TYPES OF STREETS

- In cities and urban areas, streets are typically categorized into four major types: expressways, arterial, collector, and local streets.
- Each type varies significantly in speed limits, traffic volumes, and the presence, size, and type of street elements, such as footpaths, cycle tracks, parking spaces, carriageway designs, crossings, and public transport facilities.
- As the city continues to grow, dense commercial developments are emerging along expressways, creating multiple desire lines for pedestrian crossings on either side. Simultaneously, updates to services and infrastructure are rerouting public transportation through minor local streets originally designed for pedestrian movement and low-speed vehicular traffic. Therefore, regular planning and flexible, temporary design solutions are essential for cities.
- In city planning, the roads defined in the Master Plan determine the Right of Way (RoW). The RoW covers the entire width of the roadway, including the carriageway, sidewalks, medians, landscaping, and utilities.

G2.2 CARRIAGEWAY DESIGN

- The width of the carriageway is designed to accommodate the traffic volume on the street while allowing vehicles to travel at appropriate speeds, as determined by the type of street and the local context.
- To ensure a smooth flow of traffic and minimize the risk of collisions, the carriageway width should be consistent throughout.
- The carriageway requires lane markings that delineate the width with function and floor marked signage to guide riders and drivers.
- In some cities in India, separate lanes for two-wheelers have been tested with success. This approach may be considered to improve the smooth flow of traffic and enhance safety.
- Medians reduce conflicts between vehicles moving in opposite directions. The Complete Streets Design Workbook recommends minimum 1.2 m wide medians on streets with 3 or more lanes, minimum and design speeds above 20-25 km/h.

G2.3 TRAFFIC CALMING MEASURES

- Lower vehicular speeds automatically create safer streets for everyone, including women, the elderly, children, pedestrians, cyclists, and motorists. Slower speeds reduce the likelihood and severity of accidents, making streets more accessible and comfortable for all users, especially vulnerable road users.
- There are several strategies to calm vehicular speeds, they include:
  - Speed bumps and humps
  - Speed tables
  - Raised Crossings
  - Raised Intersections
  - Lane Narrowing
  - Chicane
  - Roundabout
  - Textured pavements

Raised Crossing as a safety measure to reduce vehicular speeds at pedestrian crossings.
Photo Credit: ITDP Footpath Design Handout

Chicane as a vehicular speed calming measure.
Photo Credit: SidewalkingVictoria.com

The clock tower junction on D.B. Road at R.S. Puram with cobbled stone pavers to calm traffic speeds.
Photo Credit: The Hindu, S. Siva Saravanan

The clock tower junction on D.B. Road at R.S. Puram in the city which lacks traffic signals.
Photo Credit: The Hindu, S. Siva Saravanan

Pedestrian Median Refuge in New York City.
Photo Credit: NACTO

Bus Bulb-Out in San Francisco
Photo Credit: NACTO

Kerb Ramps with tactile ground surface indicators, Illinois
Photo Credit: Maurer-Stutz

G2.4 INTERSECTIONS AND CROSSINGS

- Compact intersection geometries with smaller turning radii help reduce vehicular speeds at intersections, particularly in areas with pedestrian crossings and blind turns.
- Raised Intersections should be protected with bollards or safety barriers at crossings.
- Pedestrian crossings should have a minimum width of 3 meters, or the same width as the adjacent footpath, whichever is greater. In areas with high pedestrian movement, the crossing width should be at least 4 meters.
- They should be at an interval of 80-100m and on every arm of an intersection. Identifying desire lines in commercial, institutional areas, and near public transportation hubs is crucial to prevent median jumping and ensure safe pedestrian movement.
- All at-grade crossing must lead to a Kerb Ramp to access the foot path. Detectable warning strips (Tactile Tiles) must be applied at all kerb ramps and be at least 0.6 metres deep for their entire width, or at any location where pedestrians cross into another modal zone (i.e.cycling lanes or vehicle lanes) along a flush transition.
- Tabletop crossings are recommended to reduce vehicle speeds and also physically emphasise of the pedestrian crossing.
- Tabletop crossings should be of minimum 4m wide, raised to the level of the footpath (maximum 0.15 m with vehicle 1:8 - 1:10 slope.
- Pedestrian median refuges are essential on roads with a total of 3 or more lanes and should have a minimum width of 1.2 meters. Safety barriers should be installed to protect pedestrians waiting to cross.
- Pedestrian signals should be timed for an average walking speed of 0.8 meters per second, providing sufficient crossing time for women, the elderly, and those with mobility challenges. Audible signals should be incorporated at crossings, eliminating the need for push buttons.

Timing of Pedestrian signals must consider vulnerable road users, Mumbai. Photo Credit: Hindustan Times

G2.5 MODES OF TRAVEL AND THEIR NEEDS

G2.5.1 CYCLING

- Cycling lanes should be incorporated in the carriageway width and should be integrated with the street network.
- On collector and arterial roads, it is advisable to include protected cycling lanes with shade.
- Cycling lanes should be atleast 2m wide for one-way movement and atleast 3m wide for two-way movement. Provide cycle parking where possible.
- Refer Complete Streets Guidelines to refer how to incorporate cycling lanes in each street typology.

G2.5.2 PRIVATE VEHICLES (2 AND 4 WHEELERS)

- A minimum lane width of 3 meters is suitable for two-wheelers and four-wheelers. For roads with bus movement, the IRC recommends a lane width of 3.5 meters.
- On-street paid parking should be provided for both two-wheelers and four-wheelers where permissible. When parking needs are anticipated signage should indicate the nearest on-street or off-street parking facility.
- For four-wheeler parking, parallel parking is recommended with a parking bay width of 2 meters.
- Angular parking for two-wheelers can be planned on narrow streets, with parking bay widths between 1.2 to 1.5 meters.
- Parking should be avoided at intersections and mid-block crossings; instead, provide bulb-outs to reduce crossing distances.
- Avoid continuous parking stretches along a street; provide a bulb-out every 25 meters to break up parking.
- Maintain a 25-meter distance from bus stops for parking, using bulb-outs near bus stops to place shelters without obstructing the pedestrian footpath.

G2.5.3 INFORMAL PUBLIC TRANSPORT (IPT)

- Based on surrounding land use, dedicated drop-off/pick-up points (no longer than 25 meters) should be provided, especially near institutions, commercial areas, and transit stations. These zones serve cab services, autos, and private vehicle drop-offs.
- The recommended parking space dimensions are 3m x 1.5m.
- Avoid auto parking near intersections, mid-block crossings, and bus stops.
- Place rickshaw stands in high-footfall areas like entrances to schools, colleges, markets, commercial centers, and office zones.

G2.6 PLACEMAKING

- Where possible, include small plazas, parklets, or pocket parks.
- Ensure spaces can adapt to various activities or gatherings, such as seasonal events, open street days, art installations, or community markets.
- It is essential to include demand based vending areas along streets.
- Establish clearly marked, accessible areas for street vendors to operate without obstructing pedestrian flow.
- These areas should have basic amenities like waste disposal and access to water or electricity where possible.
- Provide or encourage vendors to use canopies or umbrellas to protect against sun and rain
- Street vending, parklets or any such activation should not encroach on footpaths and cycle tracks. A clear pedestrian zone of width 1.8m should be provided beyond the vending spaces and their expected spillovers.
- Public art, murals, sculptures, or historic markers add unique character and foster a sense of belonging.

Parklet incorporated in a Tactical Redesign of Crosscut Road, Coimbatore. Photo Credit: GIZ

Street Vending along the uninterrupted pedestrian pathway for natural surveillance. Photo Credit: CPPR

G4. Comfort & Safety

FOOTPATH

A footpath typically consists of three zones: the frontage zone, which serves as a buffer between pedestrians and the property edge; the pedestrian zone, an uninterrupted path for walking; and the multi-utility zone, designated for vending, street furniture, landscaping, bus stops, access ramps, trash cans, and similar amenities. Footpaths should not exceed a height of 0.15 meters and must have an adequate gradient to allow for surface runoff. To enhance safety and accessibility, footpath surfaces should be anti-skid and incorporate tactile pavers as per Harmonised Guidelines 2021. The following pedestrian footpath width guidelines are based on ITDP's Complete Street guidelines.

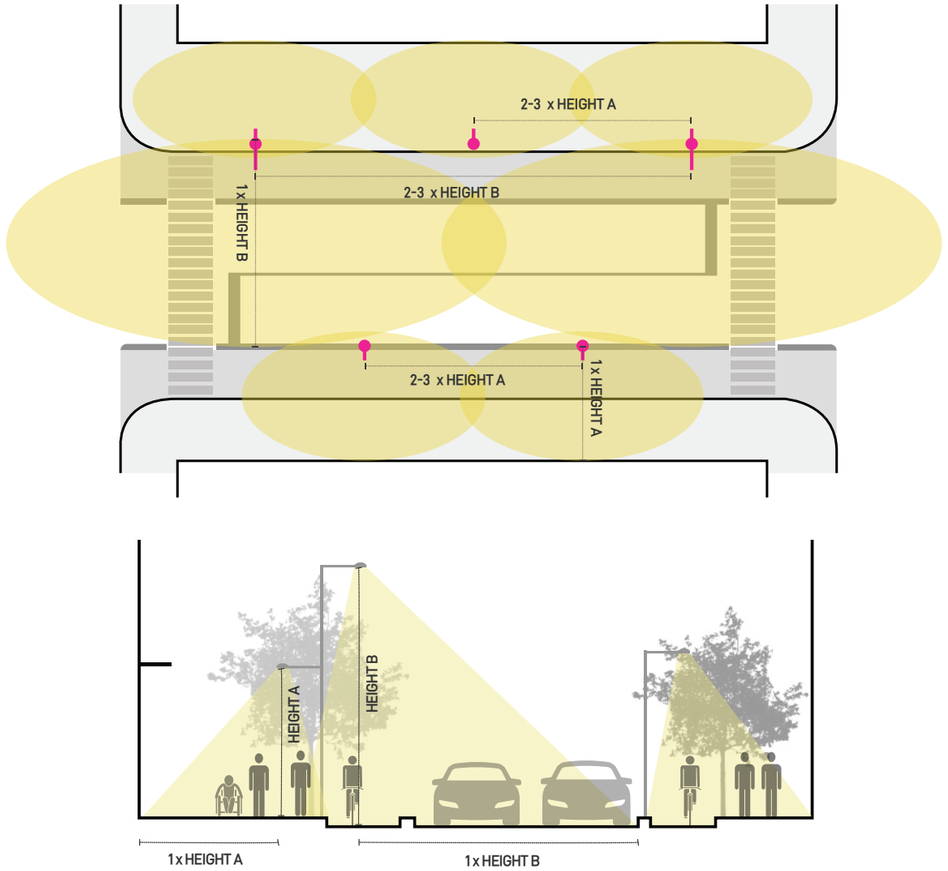
	FRONTAGE ZONE	UNOBSTRUCTED PEDESTRIAN ZONE	MULTI-USE ZONE
NARROW STREETS	0.5 M	1.8 M	
RESIDENTIAL ZONE	0.5 M	2.0 M	1.0 M
COMMERCIAL ZONE	1.0 M	2.5 M	1.5 M
HIGH INTENSITY COMMERCIAL ZONE	1.0 M	4.0 M	1.5 M

Footpath widths determined based on the surrounding ground-level building use to ensure safe and comfortable pedestrian movement.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SEATING	• Minimum seating section should be 1.5m long. • Benches, chairs, or low walls can serve as seating, and should be designed under shade and to be durable, weather-resistant, and ergonomically comfortable. • 50% of the seating area planned along a street should have back rests and arm rests.	• Seating should be provided at intervals of 50 to 100 meters in high-pedestrian areas, such as commercial zones, parks, transit stops, and near public facilities. • In less dense or residential areas, seating intervals can be longer, about 100 to 150 meters.	• In the MUZ or within the width of the footpath without interupting pedestrian flow. • Seating should have clear sightlines to surrounding areas and lighting for use after dark.
WASTE MANAGEMENT	• A combination of smaller trash cans (60L) for passerby waste and larger bins (660L) for neighborhood users ensures effective waste management. • Door-to-door or scheduled day-based waste collection can reduce the need for large bins on roads. • Garbage bins should be sturdy, weather-resistant, and easy to empty. • Bins with lids are recommended to prevent spillage and reduce odours.	• Based on collection method, every street must have a dedicated large bin location that is tucked in a niche 1mx3m per container. • The smaller trash cans should be placed at every 50-80m interval.	• In the MUZ or within the width of the footpath without interupting pedestrian flow. • Combine trash can locations with entrances of parks, bus stops, intersections, and public facilities. • Bins should be placed near seating areas, at street corners, and close to food vendors to encourage proper disposal.
SHADE	• The footpath should be well shaded. • Tree canopies, architectural shade structures and abutting building's awnings can provide necessary shade. • A vertical clearance of 2.4m is suggested to avoid blocking of sightlines.	• Ensure that shaded areas are consistently spaced, with shaded spots every 20-30 feet in high-pedestrian zones. • Large open areas should have a mix of fixed and flexible shading options.	• Place trees and shade structures along the south and west sides, where they block the hottest afternoon sunlight.
LANDSCAPE	• Place water management features like bioswales along sidewalks or in medians, especially near intersections or areas prone to flooding. • Use native and drought-tolerant plants to reduce water needs, minimize maintenance, and support local biodiversity. • Raised tree pits can double as seating, while trees planted below footpath level should have surmountable grates to ensure accessibility.	• Trees should generally be spaced 15-30 feet apart, depending on the species' canopy width. • Bioswales, shrubs, and other vegetation should be planned along the length of the street where possible.	• Can be planned along street edge, in the MUZ, as buffer between cycling lane /service lane and footpath, within bulouts in parking lane.
SIGNAGE	• Please refer IRC 067 (2012): Code of Practice for Road Signs for signage details and standard sizes. • Provide Information signages specifying distance to nearest public utility, transportation spot at regular intervals. • Combine mulitple signages and advertisements with existing poles to avoid clutter.		• Signage should be placed perpendicular to the line of traffic, on the left side of the road. • Signage should be located at the edge of the footpath with minimum 2.4m vertical clearance below the lowest point of the board.

FEATURE	DESCRIPTION	FREQUENCY	ZONING/PLACEMENT

LIGHTING	• A single light in the MUZ can be used to illuminate the entire RoW (up to 12m). Alternatively, a pedestrian light should be mounted at a lower level on the same pole to avoid clutter.
	• Lux Levels (as per NIUA standards):
	  • NMT/Local Streets: 10-15 lux
	  • Collector Streets: 15-20 lux
	  • Expressways: 20-30 lux
		• Ensure proper illumination based on guidance provided below.	• In the MUZ or within the width of the footpath without interupting pedestrian flow.
			• Median can be used to place carriageway lights on streets. In such case, pedestrian lights at lower heights have to be included in the sidewalk.
			• Pedestrian-scale lighting, typically including lamps less than 25 feet high, increases comfort and safety around stops.



Graphic representing spacing of streetlights in relation to their height and light distribution coverage.

Street RoW		Lesser than 9m	9m	12m	15m	21m	24m	27m	30m	33m	36m
Type of Street		NMT	LOCAL STREETS		COLLECTOR STREETS		ARTERIAL ROADS			EXPRESSWAYS	
	A	3M	4M	4M	6M	6M	6M	6M	6M	6M	6M
	B		6M	6M	8M	8M	8M	10M	10M	12M	12M
Light Spacing Multiple (Y)		2	2	2	2	2.5	2.5	2.5	3	3	3

FEATURE	DESCRIPTION	FREQUENCY	ZONING/PLACEMENT
BOLLARDS	• Bollards are installed to prevent vehicles from parking or driving on sidewalks, safeguarding pedestrian spaces. While stronger enforcement is needed, bollards also serve as a design solution to protect these zones. However, gaps between bollards can allow two-wheelers through, and inconsistent execution may obstruct even able-bodied pedestrians, negating their purpose. Careful placement and strict enforcement are crucial.	• Bollards should be 0.5 to 0.7 meters high with a clear width of 0.6 meters between them. At least one section should have a 0.9-meter clear width to allow wheelchair access. • They should have reflective strips.	• Bollards should be placed at entrances to properties or driveways where vehicles may conflict with pedestrian paths. • They are best suited for sidewalks wider than 3 meters; on narrower sidewalks, bollards can become more of an obstacle for pedestrians than a deterrent for vehicles.
RAILING	• Railings are used to physically separate pedestrian spaces from vehicular traffic, preventing pedestrians from prevent unsafe crossings. • The railings must be of lesser than 0.9m and ensure maximum transparency.	• Railings should be only installed in high-risk areas, such as along roads with high vehicular speeds, at busy intersections, near transit stations, schools, and other commercial zones.	• They should not obstruct access on to and off the footpath or movement, especially for people with disabilities.
UTILITIES	• Utility boxes should be parallel to pedestrian movement with minimum 2m clearance. • Manhole covers should be flushed with footpath level. • Where services are not running below ground, street poles should not obstruct pedestrian movement.		• Utilities like transformers, manholes, and junction boxes should be consolidated within MUZ or in spaces that are away from main pedestrian movement.
SURVEILLANCE	• Cameras should be high-resolution, weather-resistant, and equipped with night-vision capability to ensure visibility under various conditions. • Ensure CCTV footage is recorded and monitored in a local police station.	• Cameras should be positioned at 50-100m or as suggested by vendor, positioned to minimise blind spots.	• Cameras should be mounted at a height of 3–6 meters to cover a broad area without obstructing the pedestrian or vehicular view. • Cameras can be mounted on existing street light poles

Graphic representing bollard spacing on footpaths.

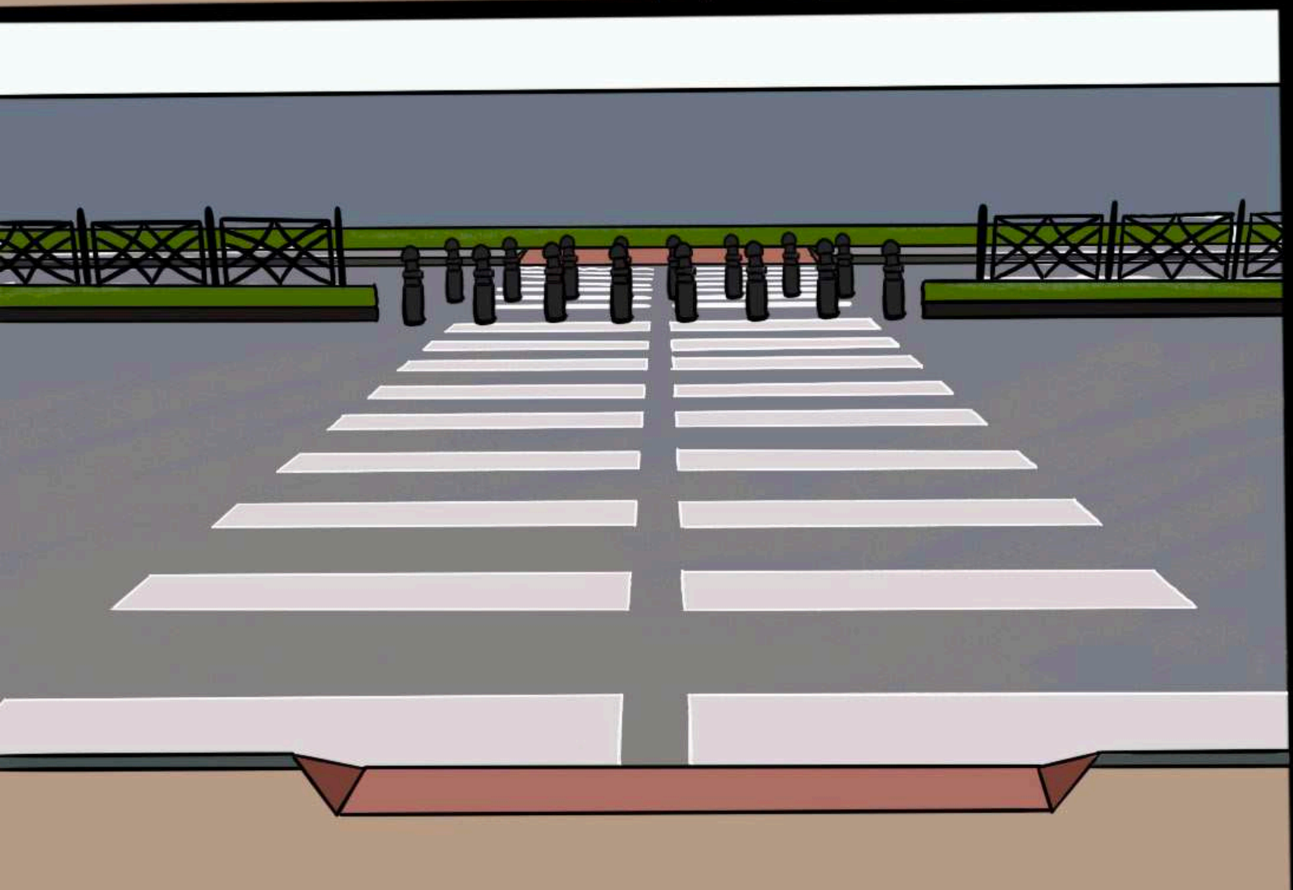
A Complete Street design with designated spaces for cyclists, cars, pedestrians and transit. Surrounding built environment creates opportunity to oversee street activities.
Photo Credit: Crandall Arambula

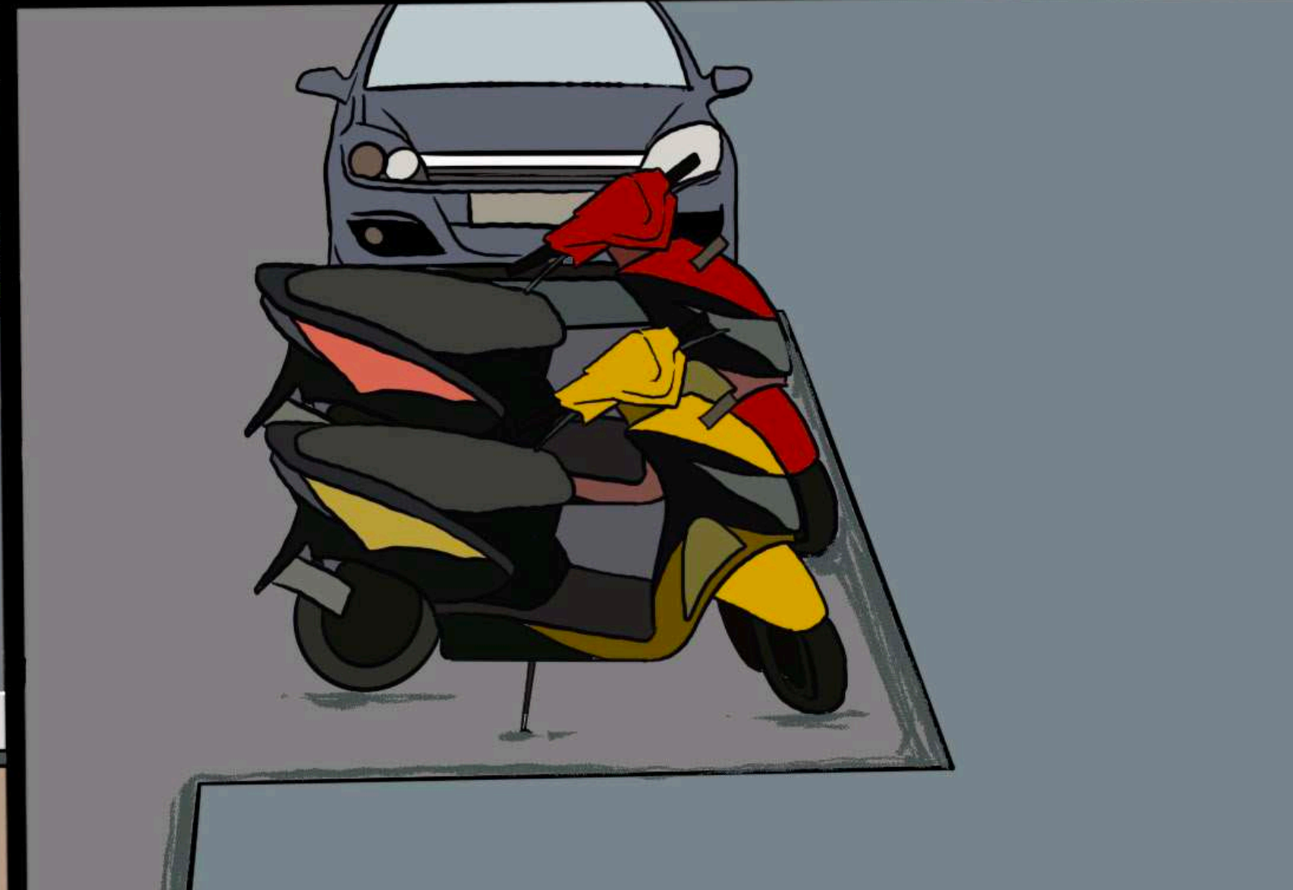
G5. Design Checklist for Streets

INDICATORS	SCORING	1	0.5	0
PLANNING AND DESIGN				
Carriageway	ls the lane width as per standard IRC guidelines following traffic volume - 3M per lane for non-bus routes, and 3.5M per lane along bus routes?	Yes		No
	Is the road width (right-of-way) consistent between intersections?	Yes		No
	Is the road designed to reduce accidents at merging and diverging points?	Yes		No
	Is the design speed of the road lower than or equal to the posted speed limit?	Yes		No
For arterial, collector and local streets	Are there any traffic speed calming measures employed? E.g. Speed humps, Rumbler strips, Projecting kerbs, Material changes, Barricades etc.	Yes		No
Intersections and crossings	Are pedestrian crossings provided on all sides of the intersection?	Yes		No
	Are pedestrian crossings of width 3 metres or more?	Yes	Yes, only at some locations	No
	Are crossings/ mid-block crossings at logical locations e.g. entrances/exits to key destinations or connections to other paths?	Yes	Yes, only at some locations	No
	For at-grade pedestrian crossings: Are the crossings wheelchair accessible with kerb ramp on both ends leading safely to the footpath?	Yes	More than one set of kerb ramps is accessible	No
	For table-top crossings: Are there efficient safety barriers to avoid vehicles entering the footpath and accessible for wheelchair users?	Yes	Yes, only at some locations	No
	For roads with 3 or more lanes in one direction, is there a 1.2m wide pedestrian refuge island for safe crossing?	Yes		No
	Are the turning radii designed correctly for bus route roads and non-bus route roads?	Yes		No
	Is there a pedestrian signal?	Yes		No
	If yes, does the pedestrian signal timing allow for a crossing speed of 0.8 meters per second?	Yes		No
	Does the pedestrian signal include audible signals that activate automatically without the need for push buttons?	Yes		No
	Are there dedicated cycling lanes on the street?	Yes		No
On-street parking	Is paid parking provided for both two-wheelers and four-wheelers with clear signage?	Yes	Yes, but no signage is present	No
	Are parking restrictions implemented at intersections and mid-block crossings?	Yes		No
	Is parking provided continuously 25 metres along the street or less?	Yes		No
	Are no parking zones clearly demarcated?	Yes		No
IPT Infrastructure	Are dedicated drop-off/ pick-up zones provided near institutions, commercial areas, and transit stations?	Yes		No
	Is IPT parking restricted near intersections, mid-block crossings, and bus stops?	Yes	Yes, but only in some areas	No
COMFORT & SAFETY				
Footpath	Is there a minimum 1.8m wide footpath?	Yes	Yes, but it varies along the street - with some areas < 1.8m	No
	Is this footpath continuous and unobstructed suitable for use by prams, wheelchairs and mobility-impaired persons?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Is the height of footpath 0.15m?	Yes		No
	Is there a 0.5m (minimum) utility strip in addition to the 1.8m pathway for trash cans, light and electric poles, trees, safety barriers, and street furniture?	Yes	Yes, but only in some areas	No
	Is there a minimum vertical clearance of 2.4 meters above the footpath so that poles, signs, trees, or other objects don't block visibility or movement?	Yes	Yes, but only in some areas	No
	Is the slope from the footpath to the road as per Harmonised Guidelines?	Yes	Yes, but only in some areas	No
	Can vision impaired pedestrians identify the crossing via tactile surfaces provided?	Yes	Yes, but only in some areas	No
Seating	Is seating provided at intervals of 100m or lesser along the footpath?	Yes	Seating is provided but at larger intervals than 100m	No
	Are atleast 50% of the seats with back rests and arm rests?	Yes		No
Waste Management	Are there garbage bins every 50-80m?	Yes		No
Shade	Is the footpath shaded?	Yes	Yes, but only in some areas/ some times of the day	No
SAFETY				
	Is separation provided between motorists and pedestrians? E.g. Level difference, Safety Rail, Bollards, Trees, shrubs etc.	Yes		No
Safety Barriers - Bollards	Are bollards installed at the recommended height (0.5 to 0.7 meters) with a clear width of 0.6 meters between them, and at least one section with a 0.9-meter width for wheelchair access?	Yes		No
	Are bollards equipped with reflective strips for visibility, especially in low-light conditions?	Yes		No
	Are bollards placed in a way that blocks vehicles but still allows people, including wheelchair users, to pass through easily?	Yes		No
Safety Barriers - Railing	Is a railing used only where it's really needed — like near high speed traffic, busy crossings, transit stations, schools, or markets?	Yes		No
	Are railings at a height of less than 0.9 meters and ensures maximum transparency?	Yes		No
	Do the railings allow people, including those using wheelchairs, to move freely on and off the footpath without blocking the way?	Yes		No
Surveillance	Are the cameras clear (high-resolution), durable in all weather, and able to see well at night?	Yes		No
	Is CCTV footage recorded and monitored in a local police station or appropriate control center?	Yes		No
	Are cameras positioned at 50-100 meters apart (or as per vendor recommendations) to minimize blind spots?	Yes		No
	Are cameras mounted at a height of 3-6 meters, covering a broad area without obstructing pedestrian or vehicular views?	Yes		No
LIGHTING				
	Are lux levels as per street type: NMT/Local Streets: 10-15 lux Collector Streets: 15-20 lux Expressways: 20-30 lux	Yes		No
	If the streetlight is placed in the central median, is there sufficient light distribution along the footpath?	Yes		No
SIGNAGE				
	Is the road signage clutter-free?	Yes		No
	Is the signage text readable by size and colour?	Yes		No
	Is signage provided to guide and direct pedestrians to the key destinations in the area?	Yes		No
	Are street names clearly visible to pedestrians?	Yes		No
	Are pedestrian routes/crossings clearly visible to motorists via warning signs and pavement markings?	Yes		No
	Are the signage and pavement markings visible during day & night?	Yes		No

TOTAL STREET SCORE: _____ / 52





COMMERCE AND ECONOMY

08

OPEN & CLOSED MARKETS

The markets in Chennai are a crucial economic engine for small businesses and local farmers. These spaces are predominantly run by female vendors and are also frequently visited by women and children. According to the Periodic Survey of India (2017-18), there were around 1.2 million women street vendors in India. Yet, these markets lack sufficient social and physical infrastructures that cater to the vendors' needs, such as sufficient and sanitary public toilets and safe spaces for their children to play.

During disasters and pandemics, these vendors are a critical infrastructure for local access to healthy food. Despite their critical role in the communities they serve, they are the most vulnerable due to their informal nature, gender and caste composition, and lack of alternate economic opportunities. Markets are not just a place to do business and buy fresh groceries, but they are also spaces offering opportunities for convivial interactions among vendors and patrons, as well as amongst the local community and other visitors participating in these environments. In cities like Chennai, markets can be categorised in different ways, providing a framework for determining the infrastructure they need.

Markets vary by the nature of products and services traded — dry and wet consumables with varying levels of perishability, ranging from fresh fish and greens to grains and pulses, non-perishable commodities including trinkets, fabric, and furniture, and services such as vehicle repair and tailoring. Markets also vary by their spatial structure and allocation, with unique needs and offerings, e.g., open and closed markets face varying vulnerabilities to weather changes; the vendors and service providers may also spread out or concentrate to various degrees, interacting with automobile and pedestrian traffic differently.

The complex market infrastructure ecosystem in Chennai opens unique opportunities to learn from and design structures that are welcoming, safe, and comfortable for people from all walks of life in the city.

H1. Existing Conditions

Markets in Chennai are vital to the local economy, supporting small businesses and local vendors, with a significant proportion of these sellers being women, and the spaces are frequented by women of varying ages, abilities, and life circumstances. However, these markets lack adequate social and physical infrastructure, failing to meet the needs of shoppers, such as access to sufficient, sanitary public toilets and designated areas to rest or wait.

For the vendors, open markets often lack basic provisions such as fans or shaded areas, lockable infrastructure, exposing vendors, predominantly women, to harsh weather conditions and potentially unsafe and vulnerable working environments. There are no dedicated toilets for the vendors and no space for storing belongings, drinking water spouts, or garbage disposal points.

Parking arrangements are frequently disorganized, impeding smooth movement within the market and creating congestion. Confusing layouts and the absence of wayfinding signage further complicate navigation for both vendors and customers, impacting accessibility and overall market flow.

Vendors also report significant challenges due to the lack of secure shutters and adequate storage space, which increases setup and pack-up time and can lead to product damage or loss. The absence of cold storage facilities for perishable goods adds another layer of difficulty, potentially affecting product quality and vendors' income. Finally, inadequate public transportation options and a lack of last-mile connectivity force vendors, especially women, to carry heavy goods and navigate through adverse weather conditions, including heat and rain.

Quick Fixes

Standardize stall layouts by providing a clear design guide for consistency.

Ensure market service vehicle circulation is separated from pedestrian circulation routes.

Ensure proper lighting is installed around market stalls for safety and visibility.

Use covered, segregated dustbins and place smaller bins near shops for easy waste disposal.

Keep customer and shopkeeper toilets separate.

Provide clear signage for stall locations to improve navigation in markets.

Offer sheltered seating areas for customers to rest and improve overall comfort.

Create wider aisles for better customer flow and accessibility.

H2. Interface with Roads

H2.1 KEY PRINCIPLES

Openness and Accessibility:
Prioritize pedestrian traffic and maintain visual transparency.

Safety and Comfort:
Provide safe entry/exit points, shaded areas, and avoid hazards.

Community Engagement:
Encourage active frontage and integrate the market into the surrounding neighborhood.

Boundary Walls and Separators:

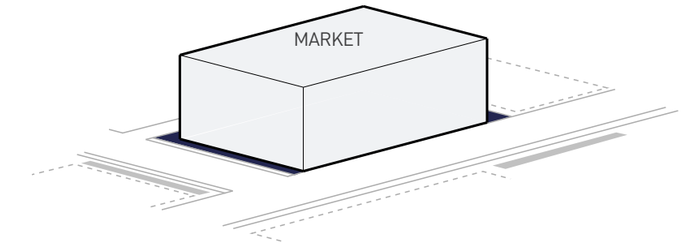
1. Minimize the use of boundary walls and opt for subtle demarcation using changes in paving or low-height barriers.
2. If a wall is necessary, ensure it is visually porous and doesn't exceed 25% of the total surface area.
3. Limit the height of boundary walls to 1.5 meters for better visibility and accessibility.

Road Interface:

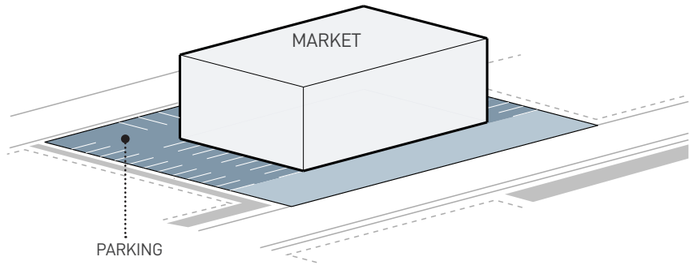
1. Encourage shops to face the road with a common plinth level, creating a seamless transition.
2. Avoid vehicular parking in front of shops and treat the front setback as an extension of the footpath.
3. Provide numerous access points to facilitate easy movement and escape routes.

Safety and Comfort:

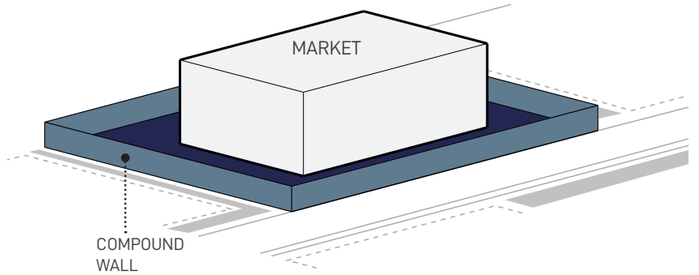
1. Incorporate porches at entrances for shaded seating and potential repurposing as stalls or activity areas.
2. Avoid gates with protruding elements at floor level, especially in sliding gates.
3. Use low-height barriers (bollards, planter boxes) for physical separation while maintaining visual transparency.



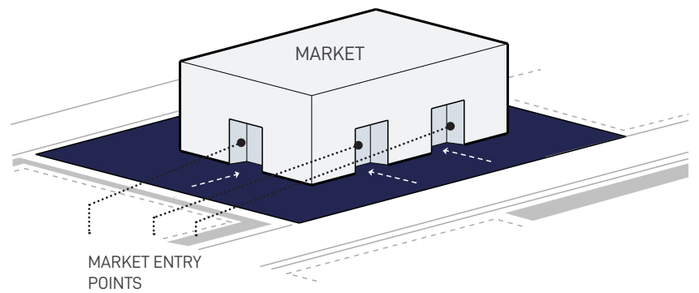
The market building directly abuts the road with no footpath, leaving minimal space for vehicular parking. This non-compliance with parking regulations forces need for on-street parking, and creates a hazardous environment for pedestrians.



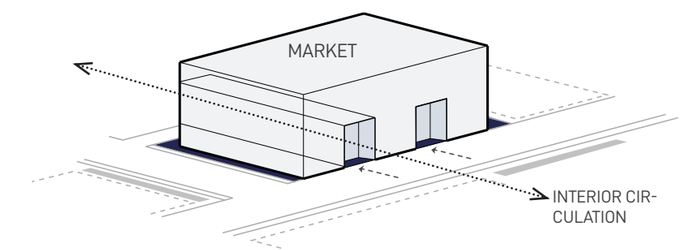
Where feasible, the front setback should be designated exclusively for pedestrians, creating a public plaza for community activities and market spillover. Side and rear setbacks can be allocated for parking, loading, and unloading to ensure efficient market operations.



Avoid solid compound walls around the market to maintain its fluid, community-oriented nature. Maximizing access points and frontage along abutting roads reduces walking distances and enhances accessibility. For surveillance and control outside operational hours, explore alternative closure methods that do not compromise openness and permeability.



The market must feature multiple entry and exit points, strategically positioned to connect with different corridors where shops are aligned, ensuring smooth movement and accessibility for all users.



Clear circulation routes within the market are essential for ease of movement. Exit gates or doors should be prominently visible, with consistent signage indicating the nearest exit to ensure safety and accessibility.

H3. Access to the Market

H3.1 PEDESTRIAN ACCESS

- **Walkway Width:** Ensure a minimum 2-meter unobstructed walkway in a 500m radius around market.
- **Waiting Spaces:** Provide waiting space inside the market or pedestrian refuge areas where footpaths are unavailable.
- **Entrance Plazas:** Designate entrance plazas with signage, drop-off/pick-up zones, and safety barriers to separate them from vehicular traffic.
- **Traffic Calming:** Implement traffic calming measures like speed bumps or roundabouts to reduce vehicle speeds near market entrances.
- **Crossings:** Incorporate raised intersections or mid-block crosswalks within 50m of market entrances.

H3.2 PUBLIC TRANSPORTATION

- **Proximity:** Locate markets near public transportation nodes.
- **Drop-off/Pick-up Areas:** Designate accessible areas for public transport near entrances. Signage: Install clear signage at public transport stops directing users to the market.

H3.2 OFF-STREET PARKING

- **Adequate Parking:** Provide sufficient cycle, two-wheeler, and four-wheeler parking as per prevalent building norms.
- **Accessibility:** Ensure parking facilities are accessible to people with disabilities and pregnant individuals, located closest to the market entrance. Reserve priority parking spots for senior citizens.
- **Signage:** Clearly mark parking bays for people with disabilities and preganant women.

H4. Access within the Market

- **Closed markets**: where building frontage is directly accessed from footpath, fencing and barriers (e.g., gates, bollards) can be used to control entry and prevent vehicles from entering pedestrian zones.
- **Open markets** can use retractable barriers or security fencing to close off sections after hours.
- **Multiple Access:** Provide multiple entry and exit points to facilitate easy movement and escape routes.
- Market Areas / Buildings accessed with steps or on a plinth elevated from the surrounding ground should be supplemented with ramps. Ramps should comply with the Harmonized Guidelines on Accessibility, ensuring appropriate width, slope, handrails, and non-slip surfaces.
- **Signage:** Clearly mark all entry and exit points with signage to guide customers.
- **Interior planning:** Minimum 2.0meters wide corridor space is mandatory.
- **Avoid Levels:** Minimize level differences within the market to prevent falls.
- **Vertical Mobility:** Include lifts for multi-level markets to provide vertical accessibility.
- **Emergency Access:** Provide adequate access for fire, emergency response, and maintenance equipment.

H5. Space Planning

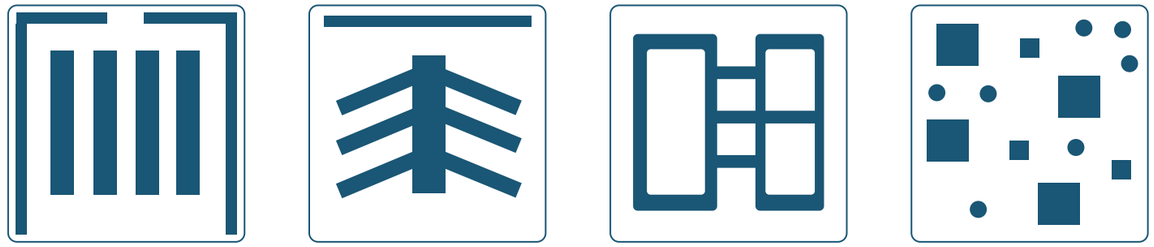
H5.1 SITE PLANNING

- Determining the type of market, its proximity to local facilities, and the intended usage are crucial factors in market design. Exploring flexible usage options throughout the day and considering alternative functions, such as night food markets or community spaces, can enhance the market's utility and vibrancy during off-peak hours.
- Provide multiple, clearly marked entry and exit points from all adjoining and abutting roads to ease traffic flow, facilitate easy movement, and support crowd dispersal during peak times.
- Design pathways that prioritize pedestrian movement with appropriate seating, greenery, and signage to guide visitors easily through the space. Adequate seating should be planned near the entrance(s), for refuge or waiting for customer pick up.
- Position parking areas towards side and rear setbacks to maximise visibility of the market for the road users, ensuring pedestrian safety and preserving a welcoming frontage.
- Plan entry and exit of service vehicles, location of loading/unloading of goods, and their movement without disturbing pedestrian and private vehicular traffic flow.
- Orient market building or open stalls strategically to prioritise circulation, prevailing wind direction, and sun paths.
- Plan for shop frontages to have direct access from the road.

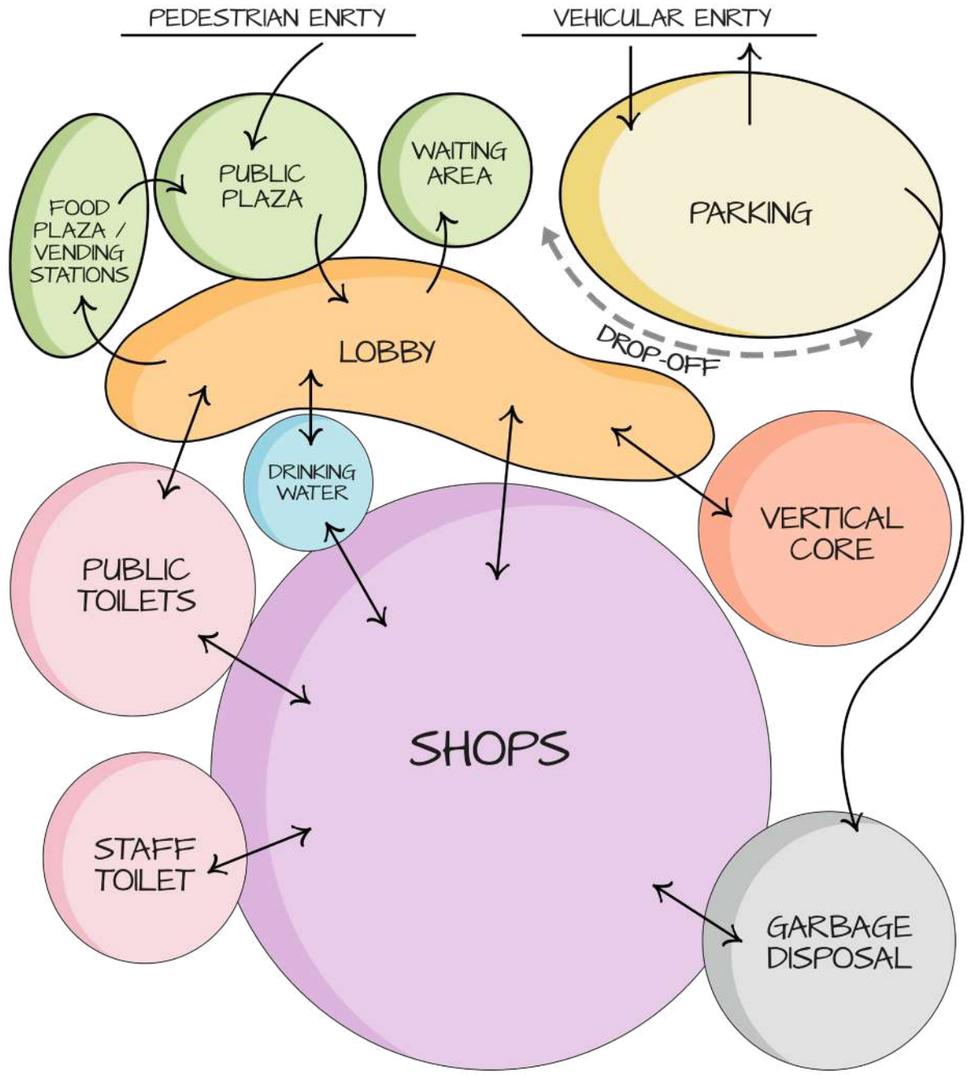
H5.2 SIZING AND LAYOUT

- Optimize the number of vendor spaces based on type of Market: Neighbourhood, Community, or City-level markets, available area, current market demands, and projected growth, ensuring overcrowding is prevented while allowing market potential to flourish.
- Prioritize fair visibility for all vendors by configuring shop layouts that encourage customer flow to all areas, enhancing market exploration. Overall layout of the market must also prioritise natural light and ventilation.
- Include a central atrium or public plaza, featuring key amenities such as vertical cores (stairways, lifts, escalators), toilets, drinking fountains, baby feeding rooms, prayer rooms, and information displays about the market layout and services.
- Provide varied stall sizes to cater to different vendor types, allowing flexibility for large anchor tenants and smaller independent traders. Adapt to the scale and nature of the goods sold.
- Spatial layout of each stall must efficiently allocate space for seller to sit, keep personal belongings, and efficient display products. Perishable sellers typically require simpler facilities compared to traders dealing with non-perishables who require secure storage options.

MARKET TYPOLOGIES



GRID | HERRINGBONE | LOOP | FREE FLOW



H5.3 CIRCULATION

- Design the circulation plan to foster an intuitive flow that naturally draws customers through the entire market. Use signage and design cues to guide visitors seamlessly.
- For multi-story markets, ensure vertical connectivity with lifts, staircases, and escalators where feasible. Incorporate clear visual connections between levels to maintain a sense of openness and continuity.
- In multi-story markets provide dumbwaiters or service elevators of appropriate size and capacity to provide ease in movement of products.
- Maintain clear corridor widths, ensuring 2.0-2.4 meters for single-loaded corridors and 2.4-3.0 meters for double-loaded corridors. All other circulation paths should have a minimum width of 2.0 meters to support smooth movement and interaction with shopfronts.

H5.5 CONTEXT SPECIFIC CONSIDERATIONS

Wet Markets

- Ensure strict hygiene and sanitation practices to prevent the spread of foodborne illnesses.
- Provide dedicated cutting stations with proper drainage and sanitation facilities.
- Design cutting stations with stainless steel surfaces for easy cleaning and sanitation.
- Install insulated ice storage units to maintain product freshness.
- Provide hooks and blocks for hanging and displaying meat and storage for tools.
- Ensure proper ventilation to control odours and improve air quality.
- Install drainage outlets in strategic locations throughout the market, particularly near fish and meat cutting areas.
- Use grates and traps to prevent debris from clogging drains.
- Provide sufficient lighting to inspect products and maintain a safe environment.

Perishable Markets

- Maintain appropriate temperature levels for different types of perishable goods.
- Implement measures to prevent cross-contamination between different food items.

Drainage channels at the Ribera Market in Bilbao- North Spain.
Courtesy: ULMA Architectural

Light and Ventilation of open markets, Narindrapur Village, India.
Courtesy: Designboom

H6. Comfort

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SEATING	• Minimum seating section length: 1.5 meters. Seat height at 450mm from floor level. • Ensure seating has backrests and armrests. • Provide creative seating typologies for diverse uses. Accommodate those with mobility restrictions in seating arrangements. • In open markets, provide shade for seating areas.	• Provide seating for every 20m of walking length.	• Place seating areas in central locations within the market, such as near waiting areas. food stalls, or gathering spaces. • Provide seating near entrances and exits • Install benches or chairs along walking paths • Locate seating areas near restrooms for convenience.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
VENTILATION	• In enclosed or semi-enclosed markets, it is crucial to ensure that each market stall has either a window and the stall partitions are of a maximum height of 2.10 meters, with an open ceiling to facilitate natural air exchange. • In perishable markets, ample ventilation is essential.		• Overcrowded areas, such as busy stalls or queuing zones, should have adequate ventilation to prevent discomfort and reduce risks of heat stress.
TOILETS	• National Building Code (NBC) necessitates separate toilets for shop owners, common toilets in enclosed market building, and public toilet for floating population. (Clause 4.2.5.1) • Refer the Toilets section for sizing, design, and amenity provisions in toilets.	• The gender ratio in NBC guideline for common toilets, that is, the ratio of male:female is 1.3:1. It is suggested that the ratio of provisioned toilets for customers is 1:2. (Refer Public Toilets D4.1 for further guidance) • Provision of gender-neutral accessible family toilets are essential. (Refer Public Toilets Section for further guidance)	• Place toilets at locations accessible from different sections of the market. • Should be located at entrances, gathering and resting zones, and high traffic areas. • Toilets should be located in well-lit, visible, and safe areas.

Accessibility and circulation within Matamoros Market
Courtesy: Rafael Gamo

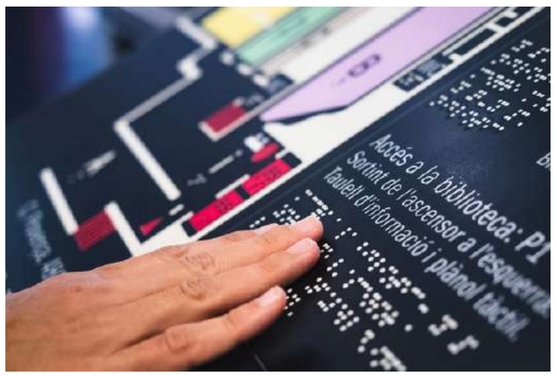
Public plaza outside markets in Vancouver.
Courtesy: Paul Krueger

Natural Light in Closed Market in Braga Municipal Market
Courtesy: Fernando Guerra

Pedestrian and NMT-only movement and waiting area outside Baltic Station Market (Adaptive Reuse Project)
Courtesy: Tõnu Tunnel

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
DRINKING WATER SPOUTS	• Provide anti-skid paving around the drinking fountain, gradually sloping towards drain. • Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access.	• Drinking water spouts should be installed at intervals of at least every 100 meters.	• Drinking water spouts should be placed in several convenient, high-traffic areas throughout the market, such as near entrances, toilets, rest areas, and waiting zones.
FOOD STALLS, VENDING STATIONS	• Public conveniences at accessible distances adds to the comfort of using spaces. • Adequate space to queue and rest around these stations are important.		• Food stalls/vending stations should be zoned in designated areas, often near entrances, seating areas, and high-traffic zones.
WASTE MANAGEMENT	• Waste in markets typically comes from two sources: customers and sellers. • Customer Waste: Standard public bins with a capacity of 60-100 liters are typically sufficient. • Seller Wet Waste: Bins should be leak-proof, covered, and made from non-corrosive materials to prevent odors and contamination. Typically 120-240 liters. • Seller Dry Waste: Bins should segregated by implementing clear signage and bin designs. Typically 120-240 liters. • Ensure bins are visible without obstructing pedestrian circulation paths.	• Customer Waste: Provide accessible waste disposal bins (including child-sized bins at 0.45-0.5 meters height) at regular intervals (every 20 meters) and near seating areas. • Seller Waste: Dedicated garbage disposal points should be allocated in the Site for frequent removal.	• Provide reuse/recycling containers at entrances and in gathering areas. • Seller Wet Waste: Place these bins close to seller stalls, especially near vendors dealing with fresh produce, meat, or seafood. Ensure ease of access to these bins and encourage hourly disposal. • Seller Dry Waste: These bins should be located near vendor stalls, particularly near stores that generate large amounts of packaging waste.

Wayfinding signage to be installed across the market.
Courtesy: Front Signs



Tactile and Braille wayfinding signage at all critical junctions within the market.
Courtesy: ColorReflections

H7. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Integrate skylights and large windows where feasible. • Provision for light in individual stalls is necessary. • 300–500 lux for general ambient lighting throughout the market. • 500–1000 lux for display lighting in individual stalls. • 150–300 lux for circulation areas and corridors. • High-lumen floodlights or similar for parking lots and entry/exit areas.	• The overall lighting of the market should be evenly distributed with no dark or unsafe corners. • Lighting should cover all pathways, vendor zones, and parking areas, with minimal dark spots. Exterior lighting should be placed every 10-15 meters.	• Provide exterior emergency security lighting at the following locations: Entrance, emergency exits, restrooms, facade, and primary access routes. • Perimeter lighting/ site level lighting is critical. All publicly accessible and service zones of the premises have to be well lit.
WAYFINDING AND SIGNAGE	• Incorporate tactile signage and braille in all information boards, including maps and plaques lettering. • Incorporate easy to understand signage, with symbols and pictorial support, with navigational strips. • Include helpline numbers in all signages. • Include Bright and consistent color palette. • Combine Braille signage with audio signals (triggered by buttons or sensors) to provide multisensory cues.	• Incorporate signage on all entrances and major paths. A minimum of one directional sign should be placed at every major intersection or zone within the market. • Install voice-activated wayfinding systems that provide audio descriptions of directions or key features in the market, closing times, emergency situations, or event notifications.	• Install well-lit signage and auditory systems at entrances/exits, at major intersections, and key points where customers may need guidance (e.g., rest areas, stairs, elevators, or ramps) • Safety and Emergency signage and auditory systems at all exits, high-risk areas, and next to emergency equipment. Visible from 15-20 meters.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station.	• Cameras should be installed every 30-50 meters in high-traffic areas such as entrances/exits, food courts, or central vendor spaces. In quieter areas, spacing can be greater but still within sight range.	• Strategically place CCTV cameras at all entrances, parking areas, service loading zones, near restrooms, all major circulation zones.
EMERGENCY CALL BUTTONS	• Install emergency call buttons at regular intervals.	• Panic buttons should be placed within 20 meters of high-risk areas, such as near restrooms, cash machines, or secluded areas.	• Place them along walkways with adequate signage.
ELECTRICAL POWER SOCKETS	• Install electrical charging stations for mobile devices.	• Install charging points at regular intervals, ideally every 50 to 100 meters.	• Install the sockets at an accessible height, typically 0.6 to 1 meter above ground level. • Install near seating areas, near food stalls, and entry and exit locations.

Chandni Chowk Redevelopment
Courtesy: Getty Images

New Market, Kolkatta - Indoor
Courtesy: Tripoto

H8. Design Checklist for Open and Closed Markets

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Does the boundary wall allow partial or full visibility from the street?	Full visibility	Partial visibility	No visibility
	If a boundary wall exists, is the height lesser than 1.5m?	Yes		No
	Is parking along the building/road edge obstructing direct access to the market?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Are mandatory unobstructed footpaths (minimum 2m wide) provided within a 500m walking distance of the market?	Yes		No
	What is the condition of this footpath? Poor condition: Completely broken or does not exist Moderate condition: Partially broken, wheelchair can move without difficulty Good condition: Wheelchair can easily move	Good	Moderate	Poor
	Is this footpath continuous and unobstructed? Obstructions include bollards, gate guardrails, drains, trees, etc. that hinder wheelchair movement	Yes		No
	Are the footpaths connected to safe, wheelchair-accessible pedestrian crossings at the nearest intersections?	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes	Yes, but some tiles are broken.	No
	If there a level difference between the market premises and the footpath outside the market, is a ramp with a handrail provided to enter the Market premises?	Yes	Yes, but the ramp slope is very steep.	No
	Is the market pedestrian entrance atleast 2 metres wide?	Yes		No
Vehicular / Public Transportation	Is the market entrance within 500m or less from public transport options like buses, metro, or MRTS?	Yes		No
	Is there a designated drop-off and pick-up spot for autos and other IPTs within 50 meters of the market entrance?	Yes		No
	Is there signage indicating the transportation options, such as public transit (buses, metros, etc.) and IPT services (autos, taxis, ride-sharing) inside/outside the market?	Yes		No
	Is parking available as per local building norms?	Yes		No
	Are there clear, designated parking areas available for PWD and pregnant women?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area?	Yes		No

INDICATORS	SCORING	1	0.5	0
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	Is the market floor surface non-slip?	Yes		No
	Are tactile tiles installed for warning and guidance?	Yes		No
	Are slopes inside designed to avoid water stagnation?	Yes		No
	Are all interior market areas flat, with ramps where there are level changes?	Yes		No
	If the market is multi-level, are there stairs, lifts, and escalators(optional) present?	Yes		No
	If the market is multi-level, do the stairs have consistent depth of 300mm, 150mm risers, and width as per norms?	Yes		No
	If the market is multi-level, do the lift controls have accessible features like foot-operated buttons?	Yes		No
DESIGN				
Overall Site	Is there a safe space to wait near the market entrance, pick up and drop-off point or gate?	Yes		No
	Do service vehicles enter, exit, and move without crossing paths with people walking or other vehicles?	Yes		No
	Is there a clear walking path from the gate to the market building without vehicular conflicts?	Yes		No
	Do shop frontages provide direct access from the road?	Yes		No
	Are frontages of the building active with features like open shops, displays, or seating (not just closed windows or inward-facing shops)?	Yes		No
Design	Does the layout make sure all vendors are easy to see and get regular foot traffic from main walking paths?	Yes		No
	Do individual shop layouts have enough space for the seller to sit and stand comfortably and display products clearly?	Yes		No
	Is there a minimum corridor width of 2m?	Yes		No
	Are corridors wide enough? – One-side shops: 2 to 2.4 meters wide – Both-side shops: 2.4 to 3 meters wide	Yes		No
	Is there enough space in front of the shops for people to interact with shopkeepers without blocking the minimum corridor widths?	Yes		No
	Do stairs, ramps, lifts, and escalators have enough landing space on all floor levels without blocking the minimum corridor widths?	Yes		No
Wet Markets (Vegatable/ Meat/Fish Markets)	Is there sufficient provisions for drainage planned in the market?	Yes		No
	Are there sufficient provisions for light and ventilation to control odours and air quality?	Yes		No
	Are there cutting stations, ice storage units, at fish/meat markets?	Yes		No
	Are there grates and traps to stop debris from blocking the drains?	Yes		No
COMFORT				
Toilets	Separate toilets for shop owners, common toilets in enclosed market building, and/or public toilet for outdoor floating population has been provided as per NBC norms?	Yes		No
Seating	Is seating provided every 20 meters?	Yes		No
	Is each seating section at least 1.5 meters long?	Yes		No
	Does the seating block the minimum corridor widths?	Yes	Yes, in some cases	No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
Light and Ventilation	Does each stall have enough light and fresh air through windows or the partitions are 2.1m high and open above that?	Yes		No
	Does each stall have individual artificial light (tubelights/ bulbs) and ventilation (fan/HVAC) provisions	Yes		No
Drinking Water	Are Drinking water facilities provided adjacent to every restroom facility or atleast one in every 50m.	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
	Is there wheelchair clearance to access the low height drinking water tap?	Yes		No
Waste Disposal	Are customer wastebins at 20m intervals in the market areas?	Yes		No
	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Is there a separate disposal point for seller wet and dry waste?	Yes	Yes, but no segregation between wet and dry waste	No
	Are all waste bins (customer and seller) managed without overflowing?	Yes	Yes, in some cases.	No

INDICATORS	SCORING	1	0.5	0
SAFETY				
Surveillance	Does the market have security personnel? And do they have a dedicated space for keeping their belongings?	Yes	Yes, but no dedicated space for keeping their belongings	No
	Is the market equipped with CCTV camera covering all interior and exterior spaces and avoiding blind spots?	Yes		No
	Are there emergency call buttons at the market?	Yes		No
	Are there electrical sockets for people to charge phones?	Yes		No
LIGHTING				
	Is the average lighting level at least 50 lux in outdoor areas around the market?	Yes		No
	Is the average lux level for general lighting between 300-500 lux?	Yes		No
	Is the average lux level for display lighting between 500-1000 lux?	Yes		No
	Is the average lux level for corridors between 150-300 lux?	Yes		No
	Are high-lumen floodlights used in parking and other exterior areas?	Yes		No
	Is emergency security lighting installed at all entrances and main access routes inside and outside the market?	Yes		No
SIGNAGE				
	Are signboards placed at all entrances and along main walking routes?	Yes		No
	Are there clear signs showing maps, shop lists, toilet locations, and helpline numbers?	Yes		No
	Is there a Public Address System in the station?	Yes		No
	Are there signs that give instructions, like how to throw away garbage?	Yes		No
	Is there a voice-activated wayfinding system that provides descriptions of directions or key amenities in the market including closing times, emergency routes, regular information on toilets, drinking water,etc.	Yes	Yes. Some information is available through voice systems	No

INDICATORS	SCORING	1	0.5	0
	Are the signages at a correct reading height for adults and children?	Yes	Yes, but they are not consistent or available throughout the market.	No
	Is there tactile map provided for the map at the entrance?	Yes	Yes, but it is not located correctly for users.	No
	Are all signages multi-lingual?	Yes	Yes, but they are not consistent or available throughout the market.	No
	Is the signage consistent in design and/ or as per standards?	Yes		No

TOTAL MARKET SCORE: _____ / 72
TOTAL TOILET SCORE: _____ / 53


EXIT
DRINKING WATER
TOILET

09

URBAN DELIVERY CENTRES

Urban Delivery Centres (UDCs) are public facilities that provide essential services to citizens, often at subsidized rates, to ensure equitable access to basic needs. As urban areas grow and government policies evolve, these centres have become a crucial component of urban infrastructure, facilitating the distribution of public services to residents. These centres, including e-Sevai Mayyams, Amma Unavagams, and Ration Shops, play a vital role in meeting the needs of society's most vulnerable groups. They are typically housed in either newly constructed buildings or repurposed spaces within existing urban infrastructure, offering government-mandated services such as ration distribution, public welfare support, and affordable meals.

Although the specific functions of these spaces vary, they share a common denominator: a significant proportion of their users are women. Whether it is women collecting subsidized rations, queuing for government welfare services, or obtaining affordable meals from Amma Canteens, these spaces see high female foot traffic. It is critical, therefore, to consider how the physical environment of these spaces can be better designed to promote safety, comfort, and access for women, while also ensuring inclusivity for people of all genders and abilities.

This section will explore gender-sensitive design guidelines aimed at improving these urban delivery centres, focusing on enhancing the overall experience of users and employees alike. There exist several kinds of UDCs, and as new policies and mandates emerge at the city, state, and central levels, more such services will be required. These services operate in either newly constructed facilities or spaces adapted within existing buildings.

These UDCs share a common purpose—providing government-subsidized services to civilian populations who must wait to receive them. Many urban poor women, particularly those in slums or informal settlements, rely on these services. Creating open, welcoming, and non-discriminatory spaces ensures that these services are accessible to all members of the community. By integrating gender-sensitive and inclusive design guidelines, UDCs can become more valuable to and supportive of the diverse needs of urban populations, helping to bridge gaps in service accessibility and promote social equity.

I1. Existing Conditions

The Urban Delivery Centers face several critical issues that affect both their staff and users. The Amma Unavagam chefs, 90% of whom are women, report poor working conditions, with broken toilets, inadequate water supply, and insufficient ventilation in the cooking area. Some also mention the presence of pests and unsanitary conditions. The waiting area lacks appropriate seating for persons with disabilities (PWDs), and inadequate lighting compromises safety and visibility, especially in the evenings. There is also a lack of dining space for women, and facilities lack information boards displaying menus, prices, or operating hours.

Similarly, customers at ration shops often wait for extended periods—sometimes over 2.5 hours—and must return multiple times when products are unavailable. These shops lack basic amenities like drinking water, shaded waiting areas, and public toilets, which, combined with the absence of PwD-friendly features, make visits to these shops arduous. Furthermore, there is no signage indicating the location of the ration shops or display boards for information on operating hours, available products, or prices. The lack of designated parking for customers also disrupts pedestrian and automobile traffic movement. Many ration shops do not provide facilities for employees, such as restrooms or break rooms.

UDCs, in general, lack clear signage, making it difficult for users to navigate, and limited waiting space inside these facilities compromises visitor comfort. The value of such facilities for users was evident in some centers where they did exist during the time of the research for this manual. For instance, Thiruvottriyur e-Sevai Maiyyam had shaded entrances and clean toilets, and the center was well appreciated by its users for its facilities. There is a need for standardized gender-sensitive comfort and accessibility features across all ration shops and urban delivery centers, including flexible operating hours for better convenience.

Quick Fixes

Improve natural ventilation by increasing window sizes.

Ensure spaces include sufficient seating, access to drinking water, and are shaded.

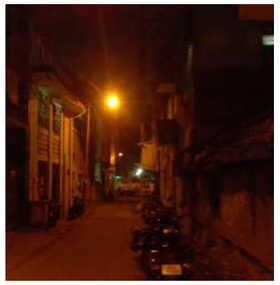
Provide separate toilets for staff and customers.

Install clearly marked waste and recycling bins in key areas, such as kitchens, bathrooms, to encourage proper waste management and reduce clutter.

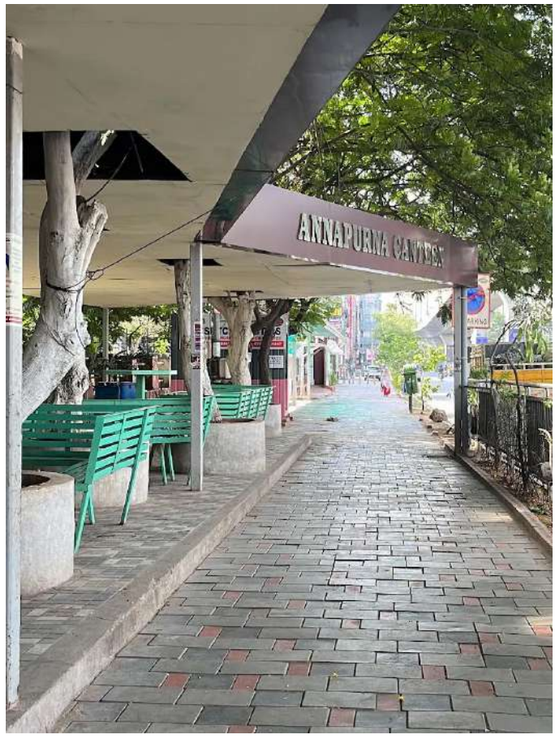
Provide toilets with an appropriate number of stalls, ensuring they are proportionate to the number of employees.

Include ramps, ergonomic counter heights, and other accessibility features to ensure spaces are inclusive and user-friendly.

Implement digital or manual boards displaying product/service availability, prices, and important announcements to keep customers informed.



Keep the exteriors of the UDC well lit and discourage access to dead spaces around the infrastructure.



Annapurna Canteen, a government-subsidized eatery in Hyderabad, Telengana, appears safe due to its open and well-designed space.
Photo Credit: Yappe.in

Exteriors edge seating in Ration Shop + Post Office Building in Auroville, Tamil Nadu
Photo Credit: Integral Architecture

I2. Boundary/Edge Conditions

1. Centres should be within 500m of dense residential areas, prioritizing vulnerable populations and underserved locations. Avoid high-speed roads or narrow streets lacking pedestrian infrastructure. Explore adaptive reuse of existing spaces like flyovers, markets, or community buildings.
2. For centers abutting sidewalks or roads, such as many ration shops, the absence of a formal boundary requires clear demarcation of spaces through pavement markings, bollards, or railings that do not obstruct pedestrian movement but provide separation from traffic.
3. Set back the building by a minimum of 1.0 meter from the street to create space for street furniture, such as benches and shaded rest areas.
4. In cases where a boundary is present, especially within a campus like E-Sevvai Centres within zonal offices, or stand alone Amma Canteens ensure that the boundary wall is not taller than 1.5 meters and maintains at least 70% transparency.
5. Adequate lighting along the boundary is crucial to improve visibility at night, preventing dark or unsafe zones.
6. Install clear, visible, multilingual signage indicating entry, exit, and waiting areas, incorporating tactile features for the visually impaired.

I3. Access to the Infrastructure

I3.1 PEDESTRIAN ACCESS

- Ensure a minimum of 2 meters of unobstructed pedestrian walkway on roads abutting the UDCs.
- Where footpaths are unavailable, create pedestrian refuge areas near the facility entrance.
- Implement traffic calming measures such as speed bumps or roundabouts near the entrance of the facility to slow down vehicle speeds.
- For larger facilities attracting significant foot traffic, incorporate mid-block crosswalks or raised intersections.
- The TN Civil Supplies and Consumer Protection Departments mandates service standards for Fair Price Shops (FPS) stating to ensure that no cardholder has to walk more than 2 kilometers to reach one.

I3.2 PUBLIC TRANSPORTATION

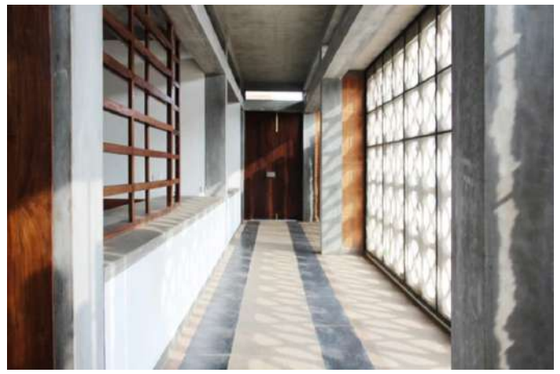
- Ensure that urban delivery centers are located within close proximity to public transport hubs, such as bus stops, metro stations, or shared transport systems, making it easier for users.
- Install clear, visible signage at public transport stops, directing users to the delivery center.
- Provide designated drop-off and pick-up areas for auto-rickshaws, and IPTs near the entrance.
- Drop-off points should connect to accessible paths, allowing seamless access to the facility without barriers for senior citizens, PWD or those with mobility aids.

I3.3 OFF-STREET PARKING

- Provide sufficient cycle, two-wheeler, and four-wheeler parking as per prevalent building norms.
- Ensure parking facilities are accessible to people with disabilities and pregnant persons and the bays are closest to the main point of entry.
- Clearly mark parking bays for people with disabilities and preganant women.
- Provide dedicated parking for two-wheelers and bicycles where feasible.

I4. Access within the Infrastructure

- For centres within a campus, establish a well-maintained and clearly marked walking pathway from the entrance gate to the building.
- Ensure that vehicular parking and circulation areas are kept separate from pedestrian movement zones.
- Buildings accessed with steps or on a plinth elevated from the surrounding ground should be supplemented with ramps. Ramps should comply with the Harmonized Guidelines on Accessibility, ensuring appropriate width, slope, handrails, and non-slip surfaces.
- Where the building's frontage is directly accessed from the footpath, ensure sufficient space is provided for users to step away from street pedestrian traffic.
- Create buffer zones or setbacks to prevent congestion at the entrance, especially during peak hours.
- Clearly mark all entry and exit points with signage to guide customers.
- From the entry door, provide a clear and unobstructed circulation pathway to all points within the center. Avoid narrow passages or areas with furniture or equipment that may impede movement.
- Minimize level differences within the centre to prevent falls. If unavoidable, ramps must be installed, and tactile tiles should be used to signal level changes to persons with visual impairments.
- Tactile tiles should be installed along the key circulation routes, guiding from the entrance to all service points.
- Provide adequate access for fire, emergency response, and maintenance equipment.

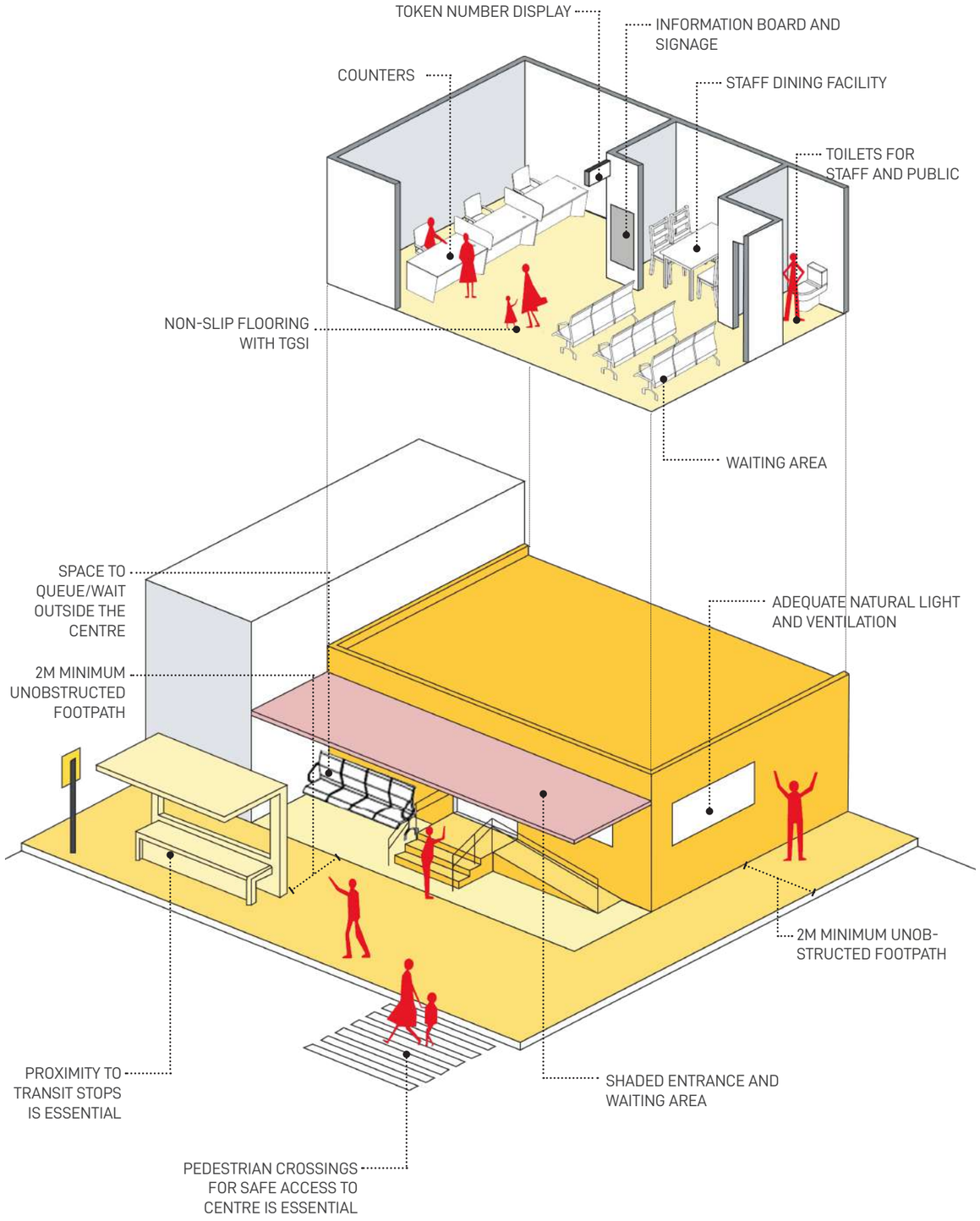


Interior quality of space - natural lighting, waiting areas, circulation corridor in Ration Shop + Post Office Building in Auroville, Tamil Nadu
Photo Credit: Integral Architecture

I5. Spatial Planning

I5.1 E-SEVVAI CENTRES

- Sizing of service centres is essentially based on the population they serve, types of services, proximity to other centres, and the expected footfall based on socio economic context of where the centre is located.
- For every 5,000 people, providing 3 service counters, with a waiting area, and an accessible restroom is recommended.
- Centres serving upto 5,000 people, a waiting area for 20-25 people allows for comfortable turnover during busy periods, assuming a typical 10-15 minute service time.
- Service centres serving a larger population should provide counters and waiting spaces of adequate scalable proportions.
- Service Counters should be at a dual height (for standing and seated users), with at least one section designed at 750mm height suitable for wheelchair users.
- Implement a token-based queue system to manage customer flow efficiently. A visual and auditory display of the token number can assist both hearing and visually impaired individuals.
- Install kiosks with screen readers, Braille keypads, and audio output to assist visually impaired users in navigating online services.
- Design the layout to allow for cross-ventilation, reducing the need for mechanical air conditioning, particularly in waiting areas.
- Ensure the centre and its surroundings are well-lit, especially in outdoor areas, walkways, and entrances.
- Design separate queuing zones to prevent overcrowding and ensure social distancing during peak times, with clear, marked pathways to guide customers efficiently through the process.
- Design the center to be adaptable to future changes in services or technology.
- Depending on the size of the center provide storage rooms for storing equipment, forms, and administrative materials.
- Multi-lingual signboards with information on services provided at the centre is essential near waiting zones.
- Provide dedicated spaces for cleaning staff to ensure the centre remains hygienic throughout the day, especially in high-contact areas like service counters and restrooms.



Covered waiting space, well-lit interiors in Ration Shop in Kotakkal, Kadampuzha, Malappuram. Photo Credit: Akhil Komachi

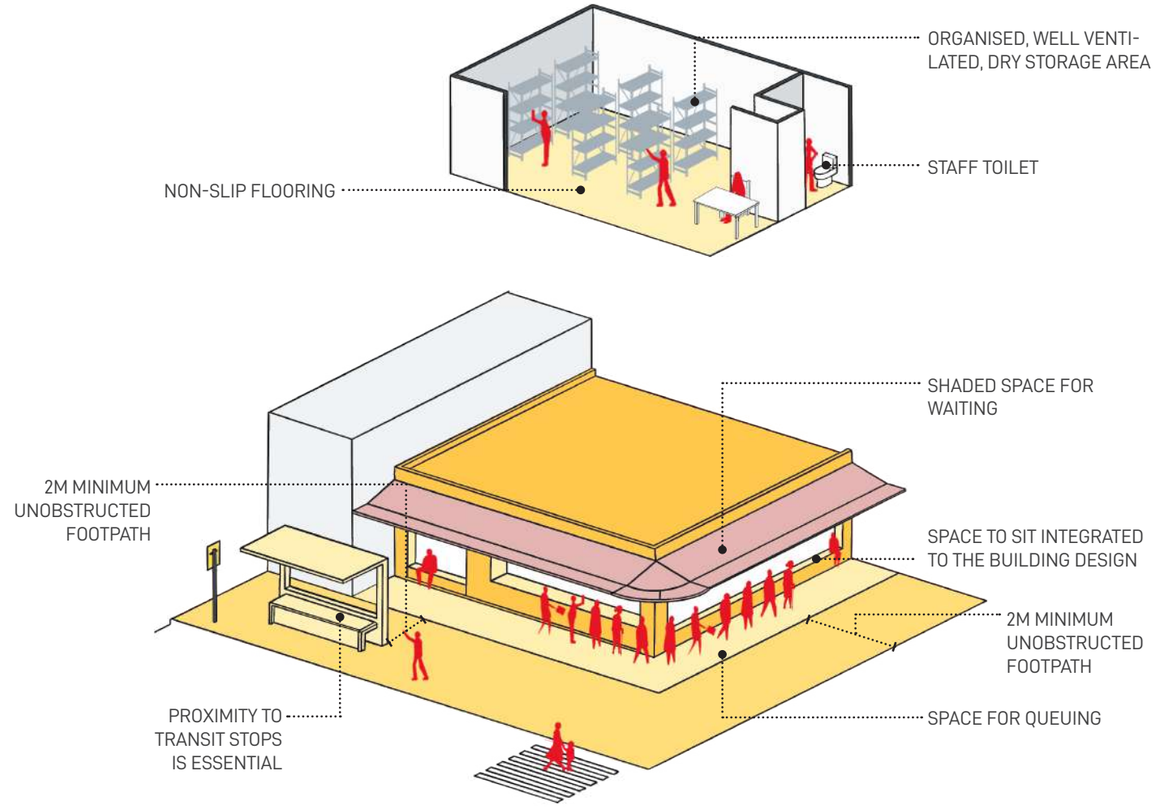
I5.2 FAIR PRICE SHOPS: RATION SHOPS

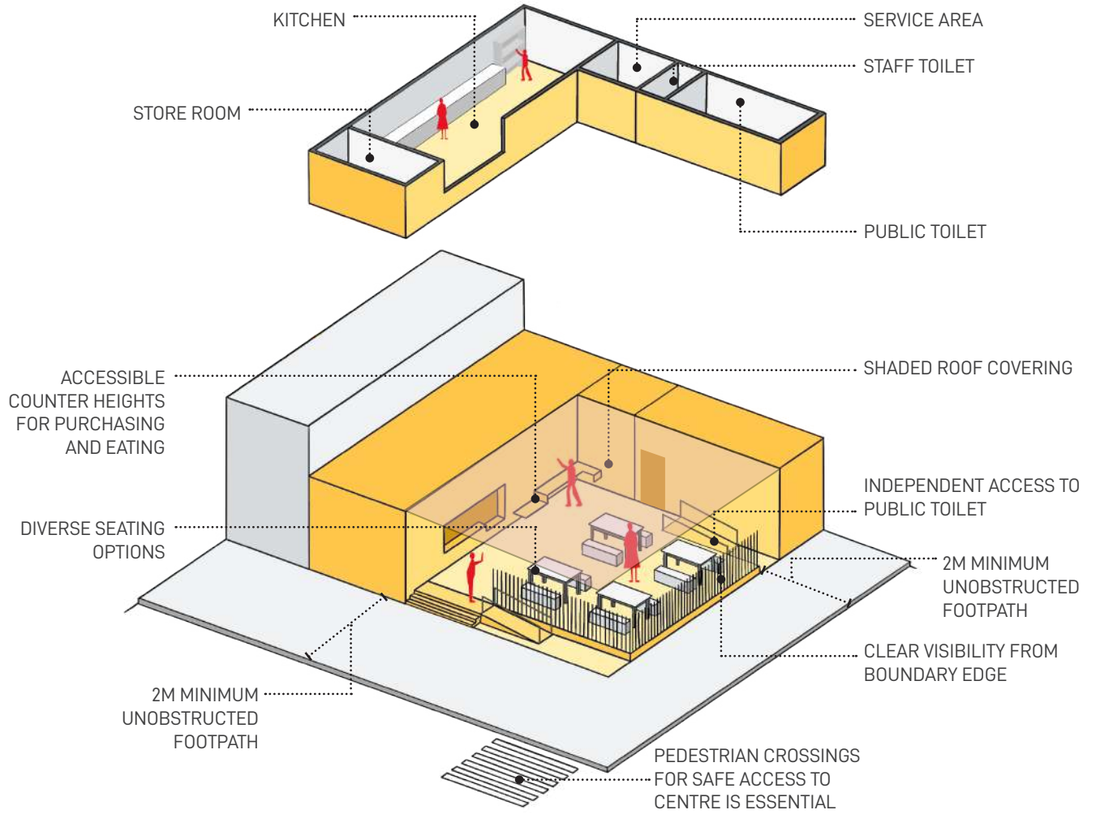
- Allocate 440 sq.ft. for shops with less than 500 ration cards and 550 sq.ft. for shops with more than 500 ration cards (as per Tamil Nadu Registrar of Cooperative Societies).
- Ensure the godown has clearly marked alleys between stacks for easy identification and efficient inventory management.
- Provide a counter area where multiple commodities are issued. Shops serving 500-700 people should have 2-3 service counters to prevent congestion and improve service efficiency.
- The godown should have a minimum height of 4.28 meters (14 feet).
- Provide a shaded area in front of the shop for at least 20 people to wait comfortably. Implement queue management systems such as railings and designated waiting zones to ensure orderly lines and safety.
- Allocate sufficient space for waiting areas inside the shop for at least 6-8 people, especially for elderly or disabled customers.
- Provide a covered loading and unloading platform in front of the ration shop, ensuring it does not obstruct customer movement or compromise the available space for other activities.

Annapurna Canteen with diverse seating, ample ventilation, and shaded areas for comfort.
Photo Credit: Yappe.in; Anand Dharmana

I5.3 SUBSIDIZED FOOD CANTEENS: AMMA UNAVAGAMS

- Canteen size should accommodate seating, food preparation, and circulation, typically seating 30-50 people for comfortable movement.
- Shift from stand-and-eat counters to proper seating arrangements or a mix of typologies based on expected footfall.
- Service counters should include a low section for accessibility, accommodating persons with disabilities.
- Install marked queue systems with designated waiting zones and railings to manage crowds.
- Ensure the kitchen is well-ventilated, with non-slip flooring and separated from the dining area to maintain hygiene.
- Provide handwashing stations near the dining area to promote hygiene.
- Equip the space with fire extinguishers and clearly marked emergency exits.
- Design large windows or open areas for cross-ventilation, reducing dependence on fans.
- Use bright, energy-efficient lighting throughout, especially in the kitchen and dining areas.
- Incorporate rainwater harvesting systems, especially in urban locations, to support water conservation.





I6. Comfort

FEATURE	DESCRIPTION	ZONING / PLACEMENT

SEATING	• Provide priority seating for the elderly, disabled, and pregnant women closer to the service counters for ease of access.
	• Ensure seating has backrests and armrests.
	• E-Sevai Centres
	  • Provide seating in waiting areas: 1 seat per 5 expected visitors per hour.
	  • Design inbuilt seating provisions in the building structure to provide additional facilities. Where there are space constraints leaning rails at 1150mm should also be provided.
	• Ration Shops
	  • Along the queue length, provide seating at regular intervals.
	• Amma Canteens
	  • Use fixed seating arrangements, like tables with attached benches.
	  • Include accessible tables with space for wheelchair users.
		• E-Seva Centres and Ration shops provide shaded seating in waiting areas and along queue lengths.
		• In the external shaded area, install benches to accommodate customers waiting in queues.
		• All seating heights at 450mm from floor level.
		• All table heights at 750mm from floor level.

CHILD CARE FACILITIES	• In Amma Unavagams, where many of the employees are women, and in Ration Shops and E Sevai Centres, where both employees and customers are often women, enabling them to bring their children is vital to supports their ability to continue employment, complete responsibilities, and childcare. • These spaces should include basic toys, books, seating, toilets, and supervised play areas. Soft flooring, such as rubber mats, should be used to ensure children's safety. • If space allows, small, fenced outdoor play areas with safety measures, including shading and secure gates, must be in place.	• A dedicated childcare facility / balwadis near or within the premises, but away from kitchen and other store areas of hazardous items should be planned.
SHADING / THERMAL COMFORT	• In all exterior areas surrounding the centre, canopies or overhangs are designed above entrance points, queueing lines, and waiting areas to protect visitors from rain and sun. • Design outdoor dining spaces with large canopies to provide ample shade for customers.	• The angle of the roof should be optimized to block the sun during peak hours during waiting periods. • The roof should have adequate slope for water drainage.
VENTILATION	• In all centres, design the structure with provisions for cross ventilation. • Position clerestorey windows or ventilators near the ceiling to allow hot air to escape. • Install exhaust fans in storage areas of Ration shops and kitchens of Amma Unavagams to prevent the accumulation of moisture, and remove cooking heat, smoke, and odours, respectively.	• Place ceiling or wall-mounted fans near counters and inside waiting areas, and seating areas to ensure air circulation in customer-facing sections.
TOILETS	• E-Sevai Centres & Amma Unavagams should have a toilet block attached to the facility. In Ration Shops where space constraints exist, a public toilet should be available within 1 km of the centre. • All delivery centers must provide separate toilet facilities for staff, ensuring they are located within the premises and are distinct from customer toilets, with separate access. • All public buildings should include at least one gender-neutral accessible family toilet in every toilet block, along with gender-segregated toilets. • Refer Public Toilets Section on guidelines for sizing, design, components, etc. • All delivery centres must also incorporate Diaper changing stations and nursing stations at close proximity.	• Toilets should be located near the waiting area but away from service counters for privacy. • Signage should clearly indicate toilet locations, including accessible routes. • In Amma Unavagams, toilets should be located adjacent to the dining area but not immediately near the kitchen to avoid cross-contamination.
DRINKING WATER SPOUTS	• Provide anti-skid paving around the drinking fountain, gradually sloping towards drain. • Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access. • Provide multiple spouts and along the queue length in larger centers to prevent overcrowding.	• Drinking water spouts should be located near the waiting areas, dining areas, and entrance/exit points to ensure easy access for visitors.

FEATURE	DESCRIPTION	ZONING / PLACEMENT
WASTE MANAGEMENT	• Implement a segregated waste management system that includes separate bins for dry waste, wet waste, and hazardous materials. • Provide accessible waste disposal bins (including child-sized bins at 0.45-0.5 meters height) near seating areas. • In Amma Unavagams, where wet waste is generated, bins should be leak-proof, covered, and made from non-corrosive materials to prevent odors and contamination. • Ensure bins are visible without obstructing pedestrian circulation paths.	• Provide reuse/recycling containers at entrances and in gathering areas. • Within kitchens, provide large bins that can be disposed multiple times through the day. Designate an area for bulk waste disposal on site for collection by municipal agencies.

I7. Safety

FEATURE	DESCRIPTION	ZONING / PLACEMENT
LIGHTING	• Buildings like Amma Unavagams and Ration shops interiors shall maintain a minimum illumination level of 150 lux; Workspaces like E-Sevai centre interiors must maintain a minimum illumination level of 500 lux. • All exteriors should have a minimum illumination level of 50 lux. • Exterior Lights should be housed in a protective casing to reduce vandalism, and directed so that they illuminate the waiting and boarding areas.	• Provide exterior emergency security lighting at the following locations: Entrance, emergency exits, restrooms, facade, and primary access routes. • Perimeter lighting/ site level lighting is critical. All publicly accessible and service zones of the premises have to be well lit.
SIGNAGE	• Provide Multi-lingual Informational signboards indicating services, wayfinding signboards to indicate facilities inside centre. • Helpline numbers should be placed at accessible heights. • Incorporate braille or tactile in all signage, including maps and information plaques lettering. Include audio signals (triggered by buttons or sensors) to provide multisensory cues. • Incorporate easy to understand signage, with symbols and pictorial support, navigational strips. • Bright and consistent color palette.	• Install well-lit signage and auditory systems at entrances/exits, at major intersections, and key points where customers may need guidance (e.g., waiting and sitting areas) • Safety and Emergency signage and auditory systems at all exits, high-risk areas, and next to emergency equipment. Visible from 5-10 meters.
EMERGENCY CALL BUTTONS	• Install emergency call buttons at regular intervals. • The button should be highly visible, marked with universal emergency symbols (e.g., a red "Emergency" button), and contrasting colors (red or yellow) to stand out. • Emergency buttons should have tamper-proof features to prevent misuse or damage.	• Emergency call buttons should be placed within easy reach of waiting / seating areas and specifically around the building where users may access.
ELECTRICAL POWER SOCKETS	• Install multi-standard sockets (e.g., USB-A, USB-C, and standard electrical outlets) to accommodate different devices and charging needs. • The sockets should be protected against dust, rain, and moisture. • Power sockets should be made from robust, anti-vandal materials, such as stainless steel or high-strength plastic, to withstand intentional damage. • Consider using a recessed or flush-mounted design to minimize the potential for vandalism.	• Place sockets near seating, waiting or leaning areas in and around centres. • Install the sockets at an accessible height, typically 0.6 to 1 meter above ground level.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station.	• Strategically place CCTV cameras at all entrances, parking areas, service loading zones, near restrooms, all major circulation zones.

I8. Design Checklist for Urban Delivery Centres

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	If a boundary wall exists, does the boundary wall allow partial or full visibility from the street?	Full visibility	Partial visibility	No visibility
	If a boundary wall exists, is the height lesser than 1.5m?	Yes		No
	If there is no boundary wall, is there at least a 1.0m setback for waiting and queuing, or is the facility located within a campus with clear signage to guide users?	Yes		No
	Is parking along the building/road edge obstructing direct access to the UDC?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Are mandatory unobstructed footpaths (minimum 2m wide) provided within a 500m walking distance of the UDC?	Yes		No
	What is the condition of this footpath? Poor condition: Completely broken or does not exist Moderate condition: Partially broken, wheelchair can move without difficulty Good condition: Wheelchair can easily move	Yes	Moderate	No
	Is this footpath continuous and unobstructed? Obstructions include bollards, gate guardrails, drains, trees, etc. that hinder wheelchair movement	Yes		No
	Are the footpaths connected to safe, wheelchair-accessible pedestrian crossings at the nearest intersections?	Yes		No
	If the main intersection is more than 50 meters away, is a mid-block crosswalk or raised intersection provided near the market entrance?	Yes		No
	For large facilities integrated with other public services, including a UDC, are traffic calming measures used near the entrances? (speed beakers, roundabouts, chicanes, etc)	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes	Yes, but some tiles are broken.	No
	If there a level difference between the UDC premises and the access pathway outside the market, is a ramp with handrail provided to enter the market premises?	Yes	Yes, but the ramp slope is very steep.	No
	Is the UDC pedestrian entrance atleast 2 metres wide?	Yes		No
Vehicular / Public Transportation	Is the UDC entrance within 1 kilometer or less from public transport options like buses, metro, or MRTS?	Yes		No
	Is there a designated drop-off and pick-up spot for autos and other IPTs within 50 meters of the UDC entrance?	Yes		No
	Is there signage indicating the transportation options, such as public transit (buses, metros, etc.) and IPT services (autos, taxis, ride-sharing)?	Yes		No
	Is parking available as per local building norms?	Yes		No
	Are there clear, designated parking areas available for PWD and pregnant women?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area?	Yes		No
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	If the facility is located within a campus, is there a clear walking path from the gate to the UDC building without vehicular conflicts?	Yes		No
	Is the UDC floor surface non-slip?	Yes		No
	Are tactile tiles installed for warning and guidance?	Yes		No
	Are all interior UDC areas flat, with ramps where there are level changes?	Yes		No
	If UDC is multi-level, are there stairs, lifts, and escalators(optional) present?	Yes		No
	If UDC is multi-level, do the stairs have consistent depth of 300mm, 150mm risers, and width as per norms?	Yes		No
	If UDC is multi-level, do the lift controls have accessible features like foot-operated buttons?	Yes		No
DESIGN				
Overall Site	Is there a safe space to wait near the UDC entrance, pick up and drop-off point or gate?	Yes		No
	If applicable, do service vehicles enter, exit, and move without crossing paths with people walking or other vehicles?	Yes		No
	Does the centre's frontages provide direct access from the road?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Are frontages of the building active with features like open shops, displays, or seating (not just closed windows or inward-facing shops)?	Yes		No
E-Sevvai Centres	Are there enough service counters based on the number of people using the facility? (For example: 3 counters for every 5000 people.)	Yes		No
	Is there enough space for people to wait comfortably inside? (Is it well-ventilated and does it have lights and fans?)	Yes		No
	Is the waiting area and office room designed for air to flow through from two sides?	Yes		No
	Is there shaded space outside for people to wait in line?	Yes		No
	Are services and token numbers shown clearly on screens and announced out loud?	Yes		No
	Are the information boards written in multiple languages?	Yes		No
Ration Shops	Is the shop size as per rules? (440 sq. ft. for less than 500 ration cards, 550 sq. ft. for more than 500 ration cards.)	Yes		No
	Is the storage room (godown) at least 14 feet (4.28 meters) high?	Yes		No
	Are there clear paths inside the godown to help identify and manage stock?	Yes		No
	Does the shop have 2–3 service counters if it serves 500–700 ration cards to avoid crowding?	Yes		No
	Is there a shaded waiting area outside the shop for at least 20 people?	Yes		No
	Is there enough space inside the shop for 6–8 people, including older or disabled persons?	Yes		No
	Is there a covered loading/unloading platform that doesn't block customers or daily activities?	Yes		No
Amma Unavagams (Food Canteens)	Are there different types of eating areas—some with chairs and some with standing counters?	Yes		No
	Do the service counters have a low section for persons with disabilities?	Yes		No
	Is the kitchen: - Well-ventilated? - Using non-slip flooring?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Are there handwashing stations and public toilets near the dining area?	Yes		No
	Are fire extinguishers installed, and are emergency exits clearly marked?	Yes		No
	Does the design include big windows or open spaces for fresh air and ventilation?	Yes		No
COMFORT				
Toilets	Is a toilet block attached to E-Sevai Centres or Amma Unavagams?	Yes		No
	In Ration Shops, where space is limited, is a public toilet available within 500 meters?	Yes		No
	Does the center provide separate toilet facilities for staff within the premises and separate customer toilets with independent access?	Yes		No
Seating (E-Sevvai Centre)	Is there 1 seat for every 5 visitors expected per hour?	Yes		No
	Is extra seating or leaning rails (at 1150mm height) provided outside for people who may need to wait in line on busy days?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
	Do the seats have backrests and armrests for better comfort?	Yes		No
Seating (Ration Shop)	Based on allocated space for queueing, is there seating provided at regular intervals?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
	Do the seats have backrests and armrests for better comfort?	Yes		No
Seating (Amma Unavagam)	Are there enough places for people to sit?	Yes		No
	Are there tables with space for wheelchair users?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
	Do the seats have backrests and armrests for better comfort?	Yes		No
Child Care facilities	Necessary for Amma Unavagams, Optional for E-Sevvai Centres and Ration shops - Is there a dedicated childcare facility/ balwadi near or within the premises, but away from kitchen and other store areas of hazardous items?	Yes		No
Shading/ Thermal comfort	Is there shade above entrance point, queuing lines, exterior waiting areas, and exterior dining areas?	Yes		No

INDICATORS	SCORING	1	0.5	0
Drinking Water	Are Drinking water facilities provided adjacent to every restroom facility or atleast one in every 50m.	Yes	Yes, but not within distance prescribed/ not functional.	No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
	Is there wheelchair clearance to access the low height drinking water tap?	Yes		No
Waste Disposal	In Amma Unavagams, is there a separate disposal point for wet and dry waste?	Yes		No
	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) at every 100 meters?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are all waste bins managed without overflowing?	Yes	Yes, in some cases.	No
SAFETY				
Surveillance	Does the UDC have security personnel? And do they have a dedicated space for keeping their belongings?	Yes	Yes, but no dedicated space for keeping their belongings	No
	Is the UDC equipped with CCTV camera covering all interior and exterior spaces and avoiding blind spots?	Yes		No
	Are there emergency call buttons at the UDC?	Yes		No
	Are there electrical sockets for people to charge phones?	Yes		No
LIGHTING				
	Is the average lighting level at least 50 lux in outdoor areas around the UDC?	Yes		No
	Is the minimum interior illumination levels: Amma Unavagam and Ration shops: 150lux. E-Sevai centres: 500lux.	Yes		No
	Is emergency security lighting installed at all entrances and main access routes inside and outside the UDC?	Yes		No
SIGNAGE				
	Are signboards placed at all entrances and along main walking routes?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Is there a voice-activated wayfinding system that provides information, descriptions of directions or key amenities in the UDC including closing times, emergency routes, regular information on toilets, drinking water,etc.	Yes	Yes. Some information is available through voice systems	No
	Are the signages at a correct reading height for adults and children?	Yes	Yes, but they are not consistent or available throughout the UDC.	No
	Is there tactile map provided for the map at the entrance?	Yes	Yes, but it is not located correctly for users.	No
	Are all signages multi-lingual?	Yes	Yes, but they are not consistent or available throughout the UDC.	No
	Is the signage consistent in design and/ or as per standards?	Yes		No

TOTAL UDC SCORE: _____ / 85
TOTAL TOILET SCORE: _____ / 53

நியாய விலை கடை
RATION SHOP

←TOILET

விலைபட்டியல்
அரிசி
பருப்பு
சர்க்கரை
எண்ணெய்
கோதுமை

DRINKING WATER

அரசு
இ-சேவை மையம்

கழிப்பறை
←
TOILET

TOKEN NO
13

விசாரணை
ENQ

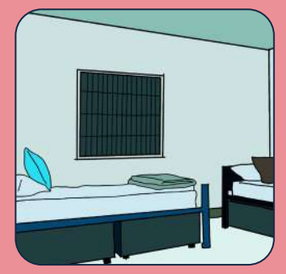
ADHAAR REGISTRATI
ஆதார் பதிவு மைய

←
கழிப்பறை

உணவு வழங்குமிடம்

உணவு விலை
பட்டியல்

PUBLIC FACILITIES



10

COMMUNITY HALLS

Community halls are essential to the fabric of urban life, serving as versatile spaces that cater to a wide range of community needs. The Greater Chennai Corporation manages 62 such halls across the city, which are crucial for fulfilling the local demand for affordable venues for public events, weddings, meetings, and other communal functions. These spaces play a central role in ensuring that neighborhoods have access to necessary infrastructure for various activities that strengthen social bonds and contribute to community building. Additionally, three auditoriums managed by the Corporation cater to larger events, providing more expansive spaces for cultural and civic engagements.

Beyond their everyday uses, community halls serve an even more vital function during emergency situations. These spaces have proven to be adaptable, doubling up as healthcare facilities, distribution centers, and, during the COVID-19 pandemic, as testing and isolation wards. Their capacity to quickly pivot to meet the needs of a city in crisis is a testament to their importance and the potential they hold in supporting community resilience in the face of challenges. In addition, many community halls have transformed into multipurpose spaces, functioning as children's libraries, daycare centers, tuition facilities, and gyms. People from diverse walks of life reply on these spaces. The design of community halls must reflect the different ways in which these spaces are used and experienced.

Given the growing demand for these versatile spaces, it is imperative to approach their design and planning with a keen understanding of the diverse needs of those who use them. Gender-sensitive design guidelines are crucial in ensuring that these community halls are welcoming, accessible, and safe for all members of the community, regardless of gender, age, or ability. As cities continue to grow and evolve, the importance of community halls as critical infrastructure becomes even more pronounced. Through thoughtful, context-sensitive design, community halls can continue to serve as vital hubs that promote social engagement, resilience, and empowerment for all members of the urban community.

J1. Existing Conditions

The community halls serve as vital spaces for various public functions such as weddings, meetings, local events, and neighborhood gatherings. These halls have also proven to be essential during emergencies, often transforming into clinics, distribution centers, and were even used as testing and isolation wards during the COVID-19 pandemic. Beyond their primary function, these spaces also cater to the community's diverse needs by doubling as children's libraries, daycare centers, tuition facilities, and even gyms. Such adaptability adds significant value to the local neighborhoods. The booking of these halls has been made easier through an online portal, allowing the public to access them with ease.

However, despite their importance, several infrastructural issues hamper the effectiveness and long-term sustainability of these community halls. Most of them are poorly designed with insufficient natural light and ventilation, making them less suitable for varied uses. Originally built with the singular purpose of hosting weddings, these halls are often rigid in design, lacking the flexibility needed for a wider range of activities. Many of these buildings are located in cramped spaces, with inadequate parking facilities and no service entries to accommodate the needs of large groups or logistics. The prevalent use of conventional building materials like brick, cement, and concrete does little to support natural thermal comfort, often making these spaces uncomfortable for extended use and during crowded events. Accessibility is another significant concern, as most halls fail to provide essential features such as exterior ramps, lifts for vertical mobility, or accessible toilets, making them difficult or impossible for persons with disabilities to use. Given these limitations, there is a pressing need to explore alternative building materials, such as vernacular options, that can improve thermal comfort and design these community halls to be more adaptable, accessible, and sustainable to meet the evolving needs of the city's residents.

Quick Fixes

Ensure that all areas, especially the stage and seating areas, are well-lit with adjustable lighting for different events.

Install fans and ensure windows are operable to improve lighting and ventilation. Make windows larger if possible.

Install clear, visible signs to guide visitors to key areas such as restrooms, exits, and emergency areas, as well as for room divisions within the hall.

Make sure entrances, ramps, and doorways are wheelchair accessible and that there are no barriers to entry for people with disabilities.

Place well-marked trash and recycling bins in accessible areas throughout the hall to encourage responsible waste disposal.

Incorporate permanent furniture in setback spaces to encourage use during non-event days.

Incorporate accessible toilets for PWD and drinking water provision.

Provide sufficient parking space closer to the community halls.

J2. Boundary/Edge Conditions

1. Community Halls should be centrally located within every neighborhood. Siting them requires careful consideration of surrounding land uses, preferably commercial or mixed use in nature, with availbility of public transportation and parking.
2. The hall is usually an enclosed space, with boundary walls fencing them from the access roads. Restricting unauthorised access to the community hall is vital, however, ensuring the boundary is visible from the street to promote a sense of safety is critical.
3. Avoid solid boundary wall structures that can create hidden zones, ensuring all areas around the entrance and along the perimeter are open to view.
4. The height of the boundary wall should not exceed 1.5 meters.
5. To strike a balance between privacy and openness, ensure that at least 60% of the road facing boundary wall is transparent.
6. Design the hall's exterior facing a public street to promote positive interaction. Incorporate landscaping, art, or information boards to raise awareness about the community hall and its events.
7. For vehicular access, provide a gate that is at least 6 meters wide for cars and at least 3 meters wide for two-wheelers to ensure smooth access without congestion.
8. Provide a pedestrian gate that is at least 2 meters wide.

J3. Access to the Infrastructure

J3.1 PEDESTRIAN ACCESS

- Ensure a minimum of 2 meters of unobstructed pedestrian walkway on roads abutting the Community Hall.
- Where footpaths are unavailable, provide adequate safety barriers to avoid running into road traffic by accident.
- In residential neighborhoods, equip streets with crosswalks at nearest intersections, and traffic calming measures for safety of residential pedestrian and vehicular movement.
- In mixed or other neighborhood typologies attracting significant foot traffic, and/or with heavy vehicular movement, incorporate mid-block crosswalks or raised intersections to access entrance gateways.

J3.2 PUBLIC TRANSPORTATION

- Community Halls should be located within 500 meters (a 10-minute walk) of a public transportation stop (such as a bus, metro, or tram station) to allow easy access for residents who rely on public transit.
- Install clear, visible signage within community halls directing users to and from the nearest available public transportation nodes.
- Provide designated drop-off and pick-up areas for auto-rickshaws, and IPTs near the entrance.
- Drop-off points should connect to accessible paths, allowing seamless access to the facility without barriers for senior citizens, PWD or those with mobility aids.

Kamwokya Community Centre, Uganda, seamlessly integrates with surrounding pedestrian streets, offering vibrant community play spaces. Photo Credit: Jaime Herraiz

Hidden Creek Community Center, Oregon, features public spaces and convenient cycle parking facilities at its immediate frontage.
Photo Credit: Jaime Herraiz

J3.3 PRIVATE VEHICULAR ACCESS AND PARKING

- All rights of way or other easements must be identified and their impact on the proposed development should be assessed.
- Provide sufficient cycle, two-wheeler, and four-wheeler parking as per prevalent building norms.
- Ensure parking facilities are accessible to people with disabilities and pregnant persons and the bays are closest to the main point of entry.
- Clearly mark parking bays for people with disabilities and preganant women.
- Ensure that the hall's layout allows for unobstructed access by emergency vehicles (ambulances, fire trucks, etc.). Gates for emergency access should be at least 6 meters wide.

Street facing Community Hall without a boundary wall in Anna Nagar, Chennai.
Photo Credit: Prithvi M Samy

J4. Access within the Infrastructure

- Establish a well-maintained and clearly marked walking pathway from the entrance gate to the building.
- Ensure that vehicular parking and circulation areas are kept separate from pedestrian movement zones.
- Buildings accessed with steps or on a plinth elevated from the surrounding ground should be supplemented with ramps. Ramps should comply with the Harmonized Guidelines on Accessibility, ensuring appropriate width, slope, handrails, and non-slip surfaces.
- From the entry door, provide a clear and unobstructed circulation pathway to all points within the hall.
- Ensure all circulation pathways are at least 1.8 m wide to allow for the safe movement of users, including wheelchair users. The width of primary pathways should be a minimum 4m.
- Minimize or avoid level differences wherever possible to reduce tripping hazards.
- All multi-floor community halls should have provisions for lift or ramp to access other levels.
- Staircases must have handrails on both sides and clear markings for people with visual impairments.
- All doors should have minimum clear width of 900 mm.
- Doors should be either two-way swinging or sliding to allow ease of use for people of all abilities, ensuring they are not heavy or difficult to open.
- Tactile tiles should be installed along the key circulation routes, guiding from the entrance to all service points.
- Provide adequate resting and waiting areas with seating along circulation paths.
- Clearly mark emergency exits and ensure they are unobstructed. Provide visual, auditory, and tactile emergency alerts for people with hearing and visual impairments. Emergency response infrastructure such as fire extinguishers, first aid kits, and emergency call buttons should be accessible and clearly indicated.

Internal and External level differences in Manav Gulzar Community Centre, Ahmedabad. Lack of ramps and accessible pathways.
Photo Credit: Vinay Panjwani; Courtesy: HPA

J5. Spatial Planning

J5.1 FLEXIBLE DESIGN SPACES

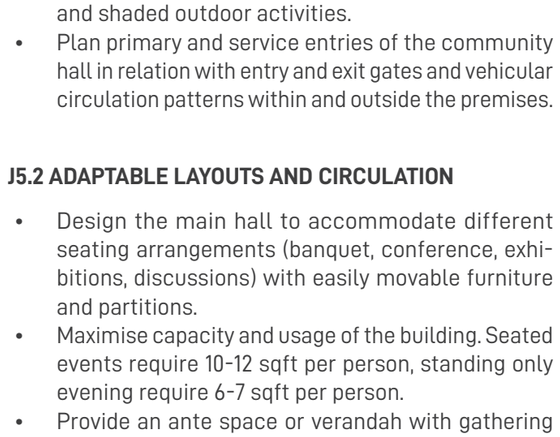
- Flexibility, accessibility and adaptability in configurations is the key determinant of a well-planned community hall.
- Consider usage of site area, for year round outdoor and shaded outdoor activities.
- Plan primary and service entries of the community hall in relation with entry and exit gates and vehicular circulation patterns within and outside the premises.

J5.2 ADAPTABLE LAYOUTS AND CIRCULATION

- Design the main hall to accommodate different seating arrangements (banquet, conference, exhibitions, discussions) with easily movable furniture and partitions.
- Maximise capacity and usage of the building. Seated events require 10-12 sqft per person, standing only evening require 6-7 sqft per person.
- Provide an ante space or verandah with gathering space and seating ahead of the entrance to the main hall.
- Include storage for footwear and belongings.
- If a main stage is being provided, plan for two green rooms that can have direct, yet private access to the stage.
- Create a small office or IT room with storage (15-20 m^2) for use as a management area. Ensure the room layout is flexible, with accessible desk options for all.
- Minimum ceiling height of 4 meters for small halls and 6 meters or more for larger halls to enhance space, air quality, and accommodate services is recommended. Halls used as play areas may require 6-8 meters for safety and ventilation. Provide 0.5 to 1 meter above false ceilings for maintenance and consider acoustic treatment for sound quality.
- Minimum width of primary accessing corridors should be 4m, secondary corridors should be 1.8m.
- Provide accessible restrooms with ample turning space, grab bars, and lowered sinks. Larger halls should offer these facilities near the main hall to accommodate diverse users.
- In multi-cubicle toilets, include at least one fully equipped, accessible cubicles with washbasins, WCs. Include a gender neutral accessible family toilet in the layout.
- Fire safety is a critical aspect of community hall design and operation. Provide prevention, detection, and suppression, systems as per applicable norms.

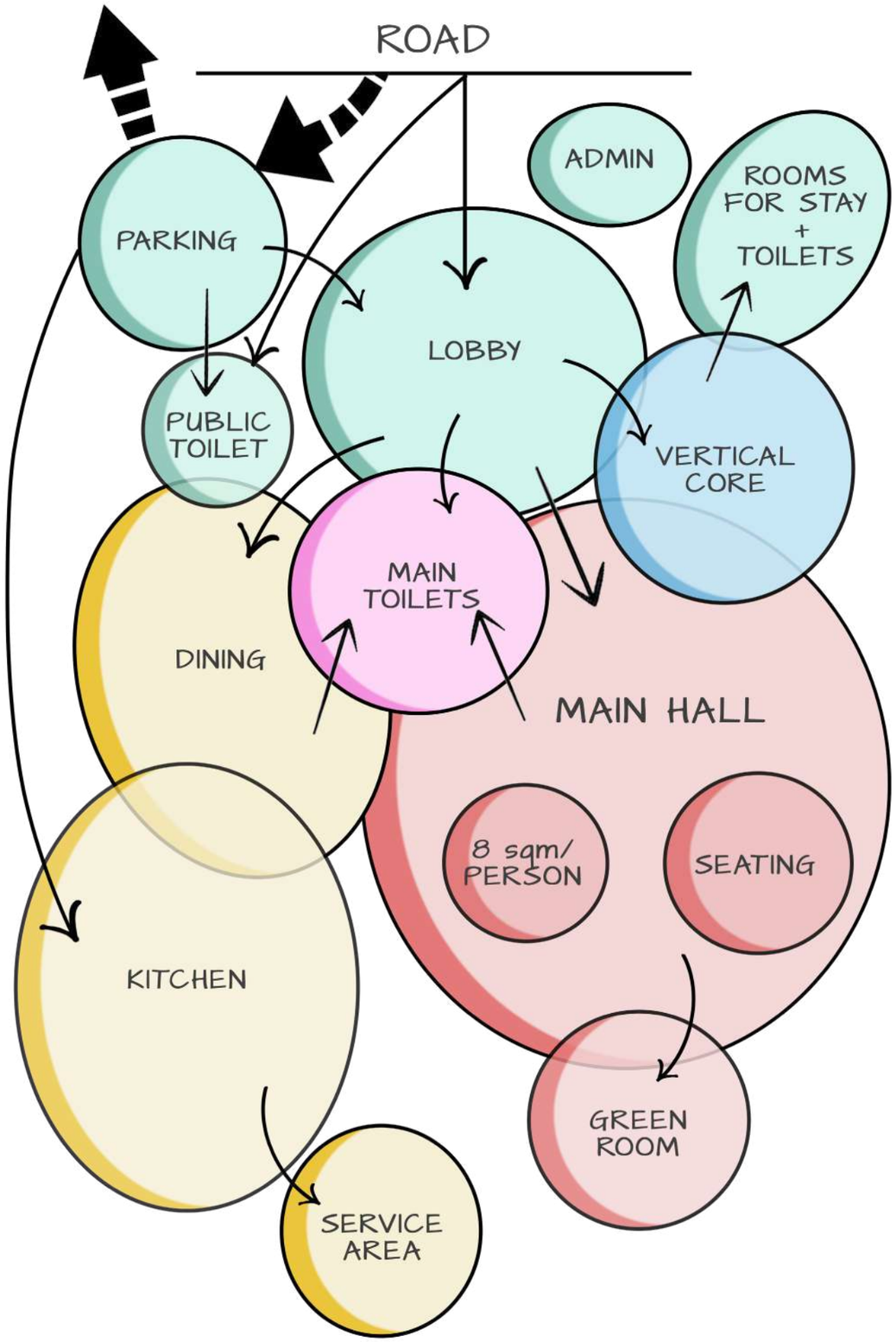
J5.2 SPECIALIZED ADDITONAL SPACES

- Plan for a small community room with storage adaptable into a library, co-working space, or learning centre.
- In larger halls, provide a community kitchen area, equipped with accessible countertops and appliances for inclusive use, supporting events, and communal meals.
- In larger halls, provide additional rooms for stay that can have toilets with bathing facilities.
- For halls doubled as anganwadis/day care space for young children, provide movable boards and seating in a 22 m^2 classroom and a 6.5 m^2 mothers' feeding room. Ensure materials and seating are accessible to caretakers and children alike.
- Where space permits, include an outdoor multi-use games area adjacent to the community hall to accommodate sports activities and offer outdoor space for events. Ensure it has accessible pathways and seating for participants and observers.
- Plan for adaptable areas to serve as health centers, quarantine zones, or emergency shelters as needed.



One Tree Hill Community Hall, Hosur
Photo Credit: Special Arrangement, The Hindu

Community Hall, Kathewadi, Maharashtra
Photo Credit: Borgen Magazine



J6. Comfort

FEATURE	DESCRIPTION	ZONING / PLACEMENT
SEATING	• Outdoor Seating: Maximize the use of exterior built-in and fixed seating around the building. • Indoor seating: Provide flexible, movable seating that can be easily arranged, stowed, and stacked as needed. Additionally, offer floor mats for informal seating that can be rolled out and stored when required. Indoor built-in seating can also double up as display or shelf, along the edges near the window. • Ensure that fixed seating is designed to be inclusive of people with disabilities, for easy wheelchair access, and height-adjustable or armrest-inclusive designs for people with varying needs.	• Place seating areas for drivers near parking or drop-off zones, at entrances for individuals waiting for pick-ups, and along the perimeter to encourage social interaction within the community.
TOILETS	• Refer the Toilets section for sizing, design, and amenity provisions in toilets. • In large halls that have separate dining areas, multiple wash basins should be provided adjacent to dining and toilet areas. • In all wash basin areas, provide a basin for children's height. • Include facilties including baby-changing area, lowered basin height etc in the toilets. • Provide accessible restrooms with ample turning space, grab bars, and lowered sinks. • Include gender neutral accessible family toilets in the layout. • Where possible, provide shower rooms in the multi-cubicle toilets.	• Depending on available space, plan for toilet facilities both in exterior areas within the boundary wall and inside the hall. • In larger halls, ensure that toilets are conveniently located near the main hall and are easily accessible from dining areas to accommodate diverse users.
DRINKING WATER SPOUTS	• Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access. • Drinking water spouts should be installed at intervals of 30-50m.	• For a typical community hall, one drinking water spout should be provided for every 100-150 people, depending on the hall's size and capacity. • Plan for facilities in the parking and drop-off zones as well.
LIGHT AND VENTILATION	• National Building Code recommends a minimum 10% of the floor area as window area for natural lighting in habitable rooms. • Openings for natural ventilation (windows, ventilators, etc.) should be at least 5% of the floor area for habitable rooms. • Even if HVAC is planned, natural ventilation norms have to be adhered to. • Explore passive design techniques to provide thermal comfort.	• Design openings on opposite walls for cross-ventilation, especially in deeper rooms. • Openings at the top of the walls and/or ventilators help to dissipate heat.
ACOUSTIC INSULATION	• The height of your ceiling can have a significant impact on the acoustics in a space. • Rectangular rooms, especially those with parallel walls and no windows to dissipate sound, are more prone to reverberation • Incorporate sound-absorbing materials such as fabrics, foam panels, acoustic wall panels, and ceiling tiles. • If the hall features large windows, use acoustic glazing or install soundproof drapes to mitigate sound leakage from outside. • Use acoustic doors or install soundproofing materials around entrances and exits to prevent noise from entering or leaving the hall. • Plant trees and shrubs at appropriate distances from the community hall to act as natural sound barriers.	• Install acoustic panels along the walls, particularly at reflective points where sound may bounce back into the hall. • Acoustic tiles or foam panels should be placed in the ceiling to prevent sound from reflecting off hard surfaces. • Carpeted flooring or raised floor panels can provide sound insulation and absorb footstep noise.
WASTE MANAGEMENT	• Procure or rent garbage bins specifically for different types of events. • For halls with kitchen facilities, place large, segregated waste bins near the service entry or loading dock area. • Implement waste segregation through clear signage and compact bin designs. • Ensure bins are visible without obstructing pedestrian circulation paths.	• Ensure that service staff have easy, direct access to these waste disposal points, avoiding clutter in the main hall or event space.

J7. Safety

FEATURE	DESCRIPTION	ZONING / PLACEMENT
LIGHTING	• Illumination levels of the main hall should range between 200-500 lux. • All exteriors should have a minimum illumination level of 50 lux. • Exterior Lights should be housed in a protective casing to reduce vandalism, and directed so that they illuminate the waiting and boarding areas.	• Provide exterior and interior emergency security lighting at the following locations: Entrance, emergency exits, main halls, restrooms, facade, and primary access routes. • Perimeter lighting/ site level lighting is critical. All publicly accessible and service zones of the premises have to be well lit.
SIGNAGE	• Provide Multi-lingual Informational signboards indicating services, wayfinding signboards to indicate facilities inside centre. • Helpline numbers should be placed at accessible heights. • Incorporate braille or tactile in all signage, including floor plan maps and information plaques lettering. Include audio signals (triggered by buttons or sensors) to provide multisensory cues. • Incorporate easy to understand signage, with symbols and pictorial support, navigational strips. • Bright and consistent color palette.	• Install well-lit signage and auditory systems at entrances/exits, main halls, near restrooms, where users may need guidance. • Safety and Emergency signage and auditory systems at all exits and next to emergency equipment. Visible from 5-10 meters.
EMERGENCY CALL BUTTONS	• Install emergency call buttons at regular intervals. • The button should be highly visible, marked with universal emergency symbols (e.g., a red "Emergency" button), and contrasting colors (red or yellow) to stand out. • Emergency buttons should have tamper-proof features to prevent misuse or damage.	• Emergency call buttons should be placed within easy reach of waiting / seating areas and specifically around the building where users may access.
ELECTRICAL POWER SOCKETS	• Install multi-standard sockets (e.g., USB-A, USB-C, and standard electrical outlets) to accommodate different devices and charging needs. • The sockets should be protected against dust, rain, and moisture. • Power sockets should be made from robust, anti-vandal materials, such as stainless steel or high-strength plastic, to withstand intentional damage. • Consider using a recessed or flush-mounted design to minimize the potential for vandalism.	• Place sockets near outdoor seating areas, and inside halls along the length of the hall. • Install the sockets at an accessible height, typically 0.6 to 1 meter above ground level.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station.	• Strategically place CCTV cameras at all entrances, parking areas, service loading zones, near restrooms, all major circulation zones.

J8. Design Checklist for Community Halls

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	If a boundary wall exists, does the boundary wall allow partial or full visibility from the street?	Full visibility	Partial visibility	No visibility
	If a boundary wall exists, is the height lesser than 1.5m?	Yes		No
	Does the community hall's exterior promote interaction with the public street—like plants, art, or info boards that invite people to stop and engage?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Are mandatory unobstructed footpaths (minimum 2m wide) provided within a 500m walking distance of the community hall?	Yes		No
	What is the condition of this footpath? Poor condition: Completely broken or does not exist Moderate condition: Partially broken, wheelchair can move without difficulty Good condition: Wheelchair can easily move	Good	Moderate	Poor
	Is this footpath continuous and unobstructed? Obstructions include bollards, gate guardrails, drains, trees, etc. that hinder wheelchair movement	Yes		No
	Are the footpaths connected to safe, wheelchair-accessible pedestrian crossings at the nearest intersections?	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes	Yes, but some tiles are broken.	No
	If there a level difference between the community hall premises and the footpath outside the hall, is a ramp with a handrail provided to enter the hall premises?	Yes	Yes, but the ramp slope is very steep.	No
	Is the community hall pedestrian entrance atleast 2 metres wide?	Yes		No
	Are traffic calming measures used near the community hall entrance? (speed beakers, roundabouts, chicanes, etc)	Yes		No
	In residential neighborhoods, are traffic calming measures used near the station entrance? (speed beakers, roundabouts, chicanes, etc) In mixed-use or high-traffic neighborhoods, are mid-block crosswalks or raised intersections provided for safe access to entrance gateways?	Yes		No
Vehicular / Public Transportation	Is the community hall entrance within 500m or less from public transport options like buses, metro, or MRTS?	Yes		No
	Is there a designated drop-off and pick-up spot for autos and other IPTs near the entrance?	Yes		No
	Is there signage indicating the transportation options, such as public transit (buses, metros, etc.) and IPT services (autos, taxis, ride-sharing)?	Yes		No
	Is parking available as per local building norms?	Yes		No
	Are there clear, designated parking areas available for PWD and pregnant women?	Yes		No
	Are there electrical charging points for EV vehicles in the parking area?	Yes		No
	Does the hall's layout allow unobstructed access for emergency and service vehicles, with gates at least 6 meters wide?	Yes		No
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	Are tactile tiles installed for warning and guidance?	Yes		No
	Is there a ramp (as per Harmonised Guidelines 2016 standards) next to the steps for entering the building?	Yes		No
	Are all interior community hall areas flat, with ramps where there are level changes?	Yes		No
	If the hall is multi-level, are there stairs, lifts, and escalators(optional) present?	Yes		No
	If the hall is multi-level, do the stairs have consistent depth of 300mm, 150mm risers, and width as per norms?	Yes		No
	If the hall is multi-level, do the lift controls have accessible features like foot-operated buttons?	Yes		No
	Do staircases have handrails on both sides and clear markings for visual impaired users?	Yes		No
	Are main corridors at least 4 meters wide and other paths at least 1.8 meters wide?	Yes		No
DESIGN				
Overall Site	Is there a safe space to wait near the community hall entrance, pick up and drop-off point or gate?	Yes		No
	Do service vehicles enter, exit, and move without crossing paths with people walking or other vehicles?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Is there a clear walking path from the gate to the community hall building without vehicular conflicts?	Yes		No
Design	Is storage provided for footwear/belongings?	Yes		No
	If a stage is provided, are there two green rooms with direct, private access to the stage?	Yes		No
	Does the hall have the recommended ceiling height (4m for small halls, 6-8m for larger halls or play areas)	Yes		No
	Are fire safety systems (prevention, detection, suppression) implemented as per applicable norms?	Yes		No
COMFORT				
Handwash	Are multiple wash basins provided adjacent to dining and toilet areas in large halls with separate dining spaces?	Yes		No
	Is at least one wash basin designed at a child-friendly height?	Yes		No
Toilets	Are toilet facilities provided both in exterior areas within the boundary wall and inside the hall?	Yes		No
Seating	Is outdoor and indoor seating provided?	Yes		No
	Is the height of the seating provided at 450mm from the floor level?	Yes		No
Light and Ventilation	Is the hall's window area at least 10% of the floor area, as per NBC recommendations?	Yes		No
	Does the main hall have openings (windows) on opposite walls to allow cross ventilation?	Yes		No
	Are openings or ventilators placed high on the walls to help dissipate heat effectively?	Yes		No
Drinking Water	Are Drinking water facilities provided adjacent to every restroom facility?	Yes		No
	Are drinking water facilities provided in the exterior areas?	Yes		No
	Are drinking water taps provided at both adult and child/ wheelchair (0.5-0.55m) heights?	Yes		No
	Is there wheelchair clearance to access the low height drinking water tap?	Yes		No
Waste Disposal	Are there waste bins (including child-sized bins at 0.45-0.5 meters in height) every 100m?	Yes		No
	Are the bins segregated with signage communicating the type of waste?	Yes		No
	Are waste bins providied in exterior areas?	Yes		No

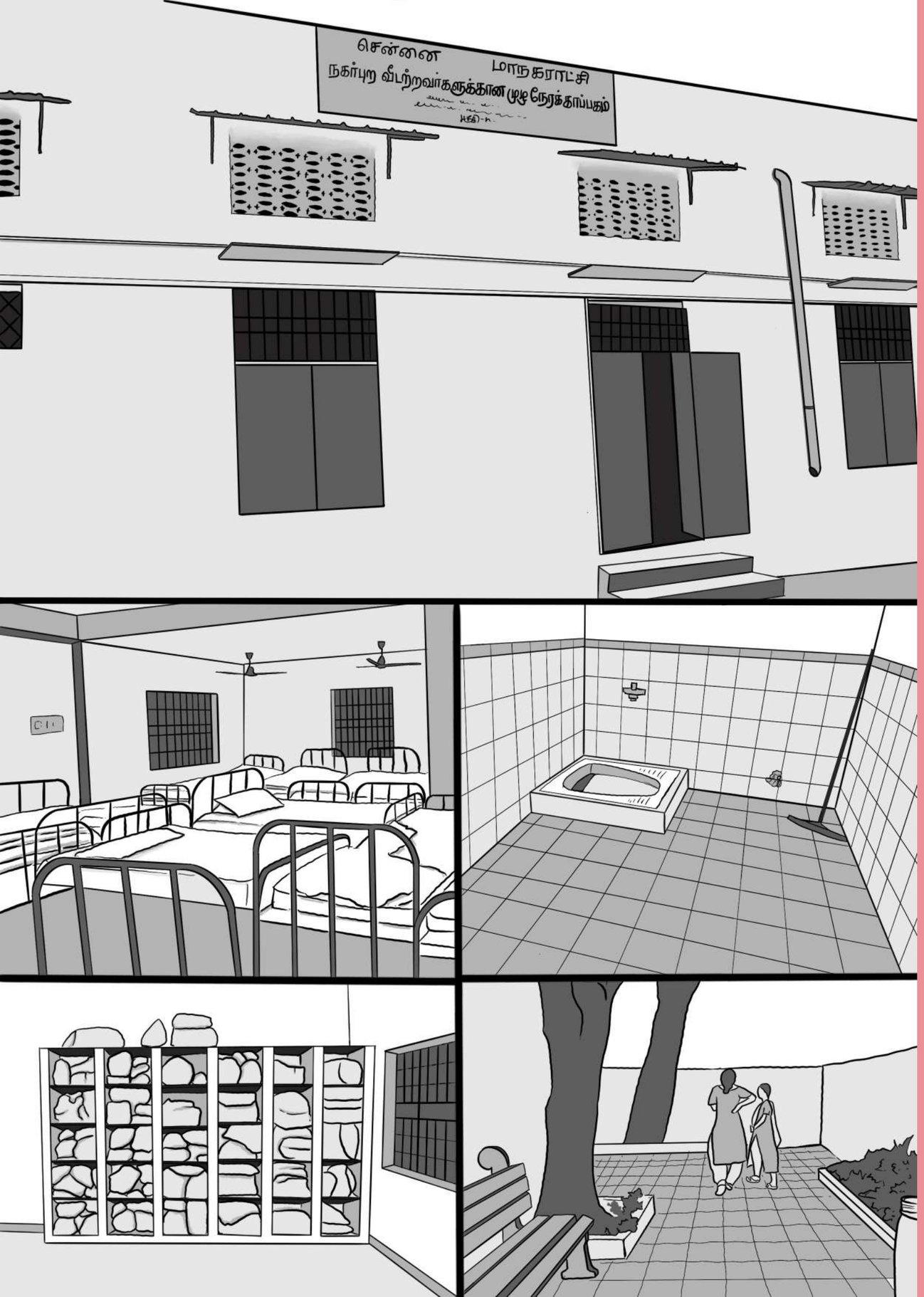
INDICATORS	SCORING	1	0.5	0
SAFETY				
Surveillance	Does the community hall have security personnel? And do they have a dedicated space for keeping their belongings?	Yes	Yes, but no dedicated space for keeping their belongings	No
	Are CCTV cameras installed at all entrances, interior halls, parking areas, service/loading zones, near restrooms, and major circulation zones?	Yes		No
	Are there emergency call buttons at the station?	Yes		No
	Are there electrical sockets for people to charge phones?	Yes		No
LIGHTING				
	Is the average lighting level at least 50 lux in outdoor areas around the community hall?	Yes		No
	Is the average lux level for interior lighting of the hall between 200-500 lux?	Yes		No
	Are high-lumen floodlights used in parking and other exterior areas?	Yes		No
	Is emergency security lighting installed at all entrances and main access routes inside and outside the community hall?	Yes		No
SIGNAGE				
	Are well-lit signages installed at entrances, exits, main halls, and near restrooms to provide clear guidance?	Yes		No
	Are safety and emergency signages placed at all exits and near emergency equipment?	Yes		No
	Are the signages and auditory systems visible and audible from 5-10 meters away?	Yes		No
	Are the signages at a correct reading height for adults and children?	Yes	Yes. Inconsistent / not throughout the hall.	No
	Are all signages multi-lingual?	Yes	Yes. Inconsistent / not throughout the hall.	No
	Is the signage consistent in design and/ or as per standards?	Yes		No

TOTAL COMMUNITY HALL SCORE: _____ / 66
TOTAL TOILET SCORE: _____ / 53

சமுதாய நலக் கூடம்

IWC

IWC



11

SHELTERS FOR THE URBAN HOMELESS

Shelters for the urban homeless are key to ensuring a city's liveability. While built housing and structures through private ownership and rent cater to most of a city's housing needs, assuming such housing to be the only kind would lead to the marginalization of several other ways in which people live. Such assumptions particularly affect women, girls, transpeople, elderly, and those who may have limited access to public spaces and infrastructures compared to adult cis men. Shelters for the urban homeless offer critical infrastructures of shelters, sanitation, rest, and safety.

Greater Corporation of Chennai currently supports nearly 50 such shelters run by charitable trusts and organizations including 7 exclusively for women, including 2 for elderly women and 1 for women with psychosocial disabilities and 3 exclusively for girls. These shelters offer critical infrastructures that are unavailable in urban commons and often relegated to domestic spaces, such as safe respite and rest at night, shelter from inhospitable weather, food, sanitation, and access to several other resources including a community. While some residents may view these shelters as transition spaces, they are homes for several others.

The quality and accessibility of the shelters for the urban homeless demonstrate its commitment to its diverse set of residents and their needs. As 'shelters', in essence, the built and physical structures of these places and their design play a critical role in their ability to function well. We ask: how can the planning and design of these spaces account for the lived experiences and needs of its diverse residents?

Design considerations should be sensitive to the realities of homelessness, particularly the vulnerability of women, children, and marginalized groups within these shelters. By considering the needs of various vulnerable populations, shelters can evolve into more than just a refuge—they can become spaces that promote healing, security, and inclusion for all residents.

K1. Existing Conditions

Shelters for the urban homeless are essential for a city's livability, providing crucial infrastructure and support. These shelters offer safe overnight accommodation, protection from harsh weather, food, sanitation facilities, and access to a supportive community. While some may consider these shelters temporary, for many residents they represent their primary, and often only, home. As fundamental built structures, the design and physical condition of these shelters are crucial to their effective operation and the well-being of their residents.

Accessibility is a primary concern from the point of entry, with broken ramps and inadequate door widths hindering wheelchair access. In some shelters, 30 to 50 women are confined to two multipurpose rooms due to a lack of space for other essential living activities. There is a lack of designated areas for dining, changing clothes, exercising, and studying, which negatively impacts the privacy and overall quality of life for residents. Additionally, the number of toilet stalls is inadequate for the resident population, causing inconvenience and hygiene concerns. The kitchen and utility areas are undersized, making meal preparation and maintaining cleanliness difficult. There are no secure storage or locker facilities, which poses risks to residents' personal belongings. The shelter design does not provide adequate space for residents in need of isolation, and the buildings' lack of ventilation and open plans can contribute to feelings of confinement and discomfort.

Furthermore, washing clothes on the terrace, as currently practiced, is difficultdue to the absence of lift access. The Scheme of Shelters for Urban Homeless in Tamil Nadu/ GCC supports shelters in various zones, including residential, commercial, industrial, and public/semi- public, and allows them in other zones with special permission. The current state of many shelters falls far short of providing adequate and dignified housing and opportunities to learn from its current residents' needs.

Quick Fixes

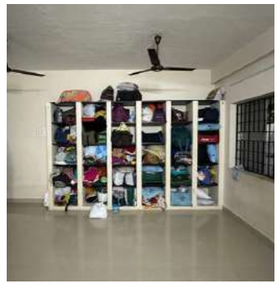
Make sure ramps, doorways, and common areas are wheelchair accessible and easy to navigate for individuals with mobility issues.

Convert outdoor setback spaces for recreational activities.

Avoid using slippery flooring, glass, or sharp-edged furniture; select materials that are safe and easy to maintain.

Improve toilet layout and design, incorporate separate clothes washing areas in the premises.

Increase the size of the window proportionally to the number of occupants for an optimal natural light and ventilation.



Provide adequate storage for all residents in the shelter - for shoes, helmets, to toiletries, luggages, and personal belongings.

Provide lighting and signage to the facility to ensure it is easily identifiable.

Provide parking space for residents, including for autos and pushcarts.

K2. Boundary/Edge Conditions

1. Shelters should be located near areas where homeless individuals congregate and work, such as railway stations, bus depots, markets, and wholesale mandis. This can be determined by mapping the concentration areas of the homeless population.
2. Shelters are best located in residential or mixed-use neighborhoods to provide easy access to essential services and benefit from lower traffic speeds.
3. Minimizing external visibility into living and private spaces and maintaining privacy within the shelter is vital.
4. The height of the boundary wall should not exceed 1.5 meters.
5. To strike a balance between privacy and openness, ensure that at least 50% of the road facing boundary wall is transparent using materials like grilles, perforated brick walls, or open metalwork.
6. Design the shelter's exterior facing a public street to promote positive interaction. Incorporate landscaping, art, or information boards to raise awareness about the shelter and its activities.
7. For vehicular access, provide a gate that is at least 6 meters wide for cars and at least 3 meters wide for two-wheelers to ensure smooth access without congestion.
8. Provide a pedestrian gate that is at least 1.5 meters wide to accommodate easy access for walkers, including those with mobility aids.
9. Design entry and waiting areas with weather protection, seating, and basic amenities like drinking water to support those seeking shelter.

Eva's Phoenix, a teen homeless shelter in downtown Toronto's Fashion District - prioritises frontage and pedestrian access to the facility. Photo Credit: Ben Rahn/A-Frame

George Town's homeless community, Malaysia creates an open yet private edge condition that emphasises on a mixture of passive design and active ventilation systems was integrated into the building to provide a comfortable refuge.
Photo Credit: Johnny Ooi Architect

K3. Access to the Infrastructure

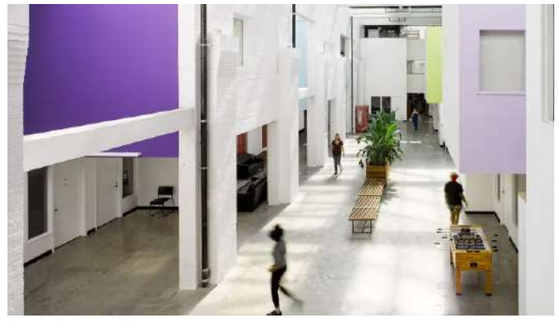
K3.1 PEDESTRIAN ACCESS

- Ensure a minimum of 2 meters of unobstructed pedestrian walkway on roads abutting the Shelter.
- Where footpaths are unavailable, provide adequate safety barriers to avoid running into road traffic by accident.
- In residential neighborhoods, equip streets with crosswalks at nearest intersections, and traffic calming measures for safety of residential pedestrian and vehicular movement.
- In mixed or other neighborhood typologies attracting significant foot traffic, and/or with heavy vehicular movement, incorporate mid-block crosswalks or raised intersections.

K3.2 PUBLIC TRANSPORTATION

- Shelters should be located within 500 meters (a 10-minute walk) of a public transportation stop (such as a bus, metro, or tram station) to allow easy access for residents who rely on public transit.
- Install clear, visible signage within shelter directing users to the nearest available public transportation nodes.
- Provide designated drop-off and pick-up areas for auto-rickshaws, and IPTs near the entrance.
- Drop-off points should connect to accessible footpaths.

Frontage and Access to Homeless Shelter in Warsaw, Russia
Photo Credit: XYStudio



Eva's Phoenix, Toronto, interior common area access routes
Photo Credit: Ben Rahn/A-Frame

K3.3 OFF-STREET PARKING

- Provide sufficient cycle, two-wheeler, and four-wheeler parking as per prevalent building norms.
- Ensure parking facilities are accessible to people with disabilities and pregnant persons and the bays are closest to the main point of entry.
- Clearly mark parking bays for people with disabilities and preganant women.
- Provide parking provisions for auto rickshaws, push carts, and other informal livelihood based vehicles.
- Ensure that the shelter's layout allows for unobstructed access by emergency vehicles (ambulances, fire trucks, etc.). Gates for emergency access should be at least 6 meters wide.

K4. Access within the Infrastructure

- Establish a well-maintained and clearly marked walking pathway from the entrance gate to the building.
- Ensure that vehicular parking and circulation areas are kept separate from pedestrian movement zones.
- Buildings accessed with steps or on a plinth elevated from the surrounding ground should be supplemented with ramps. Ramps should comply with the Harmonized Guidelines on Accessibility, ensuring appropriate width, slope, handrails, and non-slip surfaces.
- From the entry door, provide a clear and unobstructed circulation pathway to all points within the shelter.
- Ensure all circulation pathways are at least 1.25 meters wide to allow for the safe movement of residents, including wheelchair users. Avoid narrow corridors that may restrict movement.
- Minimize or avoid level differences wherever possible to reduce tripping hazards.
- All multi-floor shelters should have lift provisions.
- Staircases must have handrails on both sides and clear markings for people with visual impairments.
- All doors should have minimum clear width of 900 mm.
- Doors should be either two-way swinging or sliding to allow ease of use for people of all abilities, ensuring they are not heavy or difficult to open.
- Tactile tiles should be installed along the key circulation routes, guiding from the entrance to all service points.

K5. Spatial Planning

K5.1 ZONING AND LAYOUT

- Shelters can be divided into three distinct zones - public areas (entrance, lobby, staff offices), semi-private common areas (kitchen, dining halls, multipurpose activity areas), and private residential spaces (sleeping areas, boathrooms, and personal storage).
- Where existing infrastructure/public buildings are being adapted as shelters, suitable refurbishment maybe done to meet requisite services / space requirement.

K5.2 PRIVATE RESIDENTIAL SPACES

- Dormitories are typical sleeping rooms in shelters. The National Urban Livelihoods Mission's Scheme of Shelters for Urban Homeless guidelines suggests a minimum of 4.5-5 m^2 per resident.
- Consider provision of atleast a percentage of single and double occupancy rooms to provide options of flexibility and isolation, if required.
- Ensure bathrooms are near sleeping areas and provide accessible facilities for PWD. Follow NBC standards for sizing toilets in shelters for women, consider provisions under hostels (1 WC, 1 washbasin, 1 shower per 6 residents).
- Refer Public Toilets section for amenities, comfort and safety requirements as applicable for residential shelters.
- In multi-cubicle toilets, include at least two fully equipped, accessible cubicles with washbasins, WCs, and shower areas.
- Provide facilities for hand washing linen within bathing areas or in a separate shaded area on the premises.
- Include a dry ante space to be used as a dedicated dressing area before toilet entrances with mirrors and internal partitioning curtains.
- Provide locker and storage facilities of different sizes for each resident.

K5.3 SEMI - PRIVATE SPACES

- Multipurpose activity rooms are the spaces residents come together, spend most of their time in the shelter and build community.
- Allocate 2-2.5 m^2 per resident in common areas, depending on the activities and amenities the shelter provides.
- Should accommodate multiple functions, such as meetings, vocational training, and leisure activities and for additional bedding during emergencies.
- Flexibility in design is essential for different uses. Movable partitions or modular furniture can help transform spaces as needed.

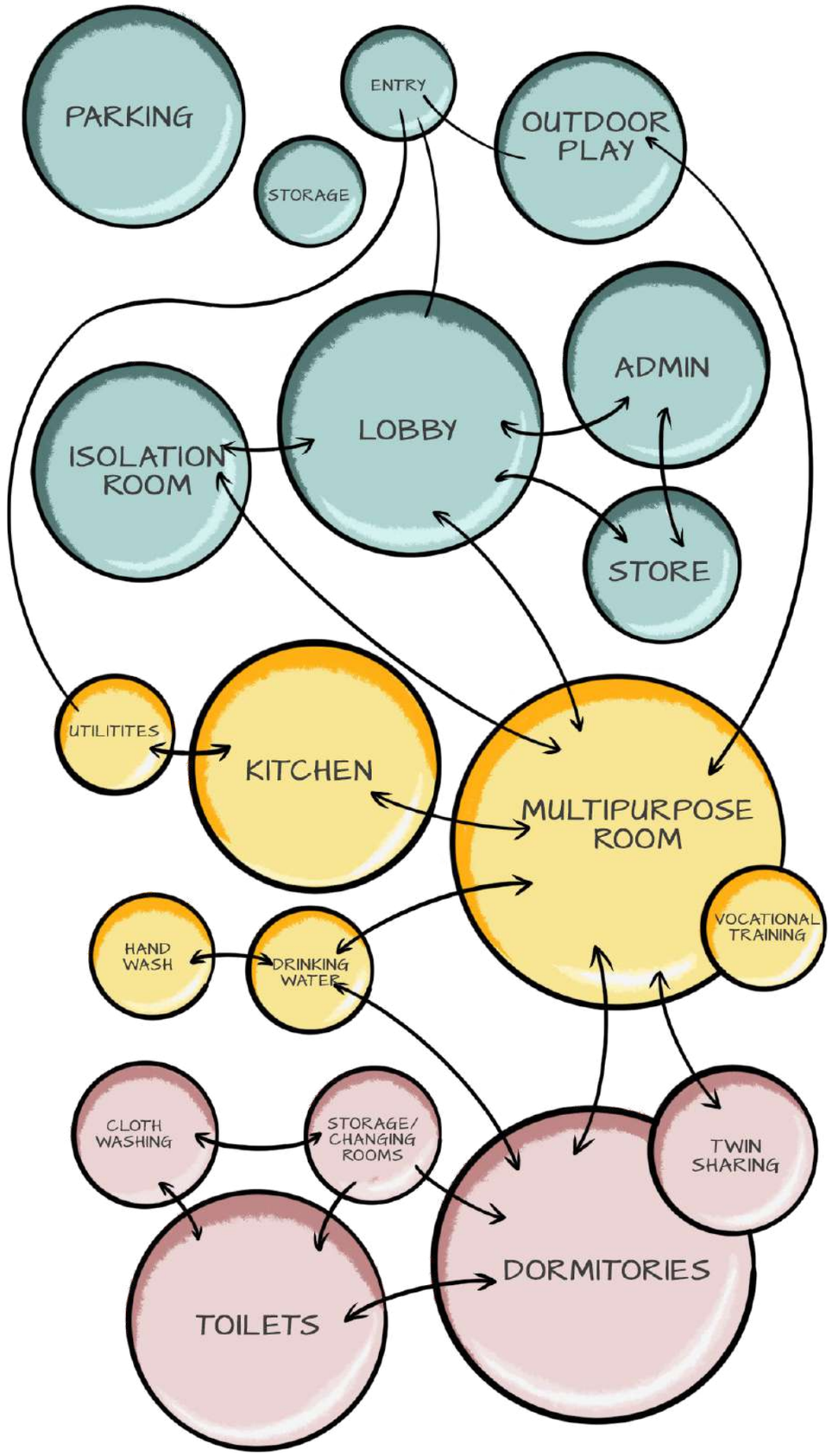
George Town's homeless shelter, Malaysia, natural light and ventilation in the dormitory to ensure air circulation.
Photo Credit: Johnny Ooi Architect

Interior Courtyard with no access barriers in Potters Lane, Midway City, CA - Shelter for Veteran Homeless.
Photo Credit: American Family Housing

- Kitchens should be designed based on the number of people served, with dedicated zones for food preparation, cooking, cleaning, and storage. For shelters serving around 50 people, an area of 15-20 m^2 is typically sufficient.
- Handwashing stations should be placed near dining areas and kitchens, with a minimum of 3-5 basins for shelters serving 50-80 people.
- Drinking water spouts should be placed near dining areas and activity rooms, accessible to both standing and wheelchair-bound individuals.

K5.4 PUBLIC AREAS

- Design an entrance and lobby as a reception, shoe, helmets, and wheelchair storage, leading towards administration, staff, and counselling rooms. Toilet facilities for staff is essential.
- The entrance should have a wide, barrier-free pathway (minimum 1.5 meters wide) for accessibility. Provide seating for visitors.
- Provide 10-15 m^2 (107-160 ft^2) for a functional workspace that accommodates 2-3 staff members with atleast one accessible workstation for PWD.
- Revenue Generation means can be explored by individual Shelters. Public areas can include a space for selling of products.



K6. Comfort & Safety

FEATURE	DESCRIPTION	ZONING / PLACEMENT
MEDICAL FACILITIES	• First-aid stations or basic medical care rooms for immediate health issues. • Counselling room should be 9-12 m^2, designed for privacy and comfort, with enough space for one-on-one or small group sessions. • Rooms or zones dedicated to rest or quiet reflection, especially for residents who need privacy or recovery is recommended.	
CHILD CARE FACILITIES	• Providing a Nursery or playroom for children below 5 years of age can be suitable furniture and play equipment is essential for working residents. • Baby-changing facilities with clean and sanitized stations for diaper changes, along with access to supplies such as diapers and wipes. • Planning toilets with atleast one handwashing stations suitable for young children can be installed.	
RECREATIONAL AMENITIES	• Multipurpose Activity Rooms to be equipped with books, newspapers, and space for vocational training like tailoring, computer literacy, and other skills. • Community rooms with televisions or other entertainment options for socializing and relaxation. • Provide computer desks with wifi access in the common areas for residents to use. • Using setback spaces within premises for outdoor play including badmonton, children and adult play and gym equipments is essential.	
LIGHTING	• All interior spaces should be lit • All exteriors should have a minimum illumination level of 50 lux. • Perimeter lighting/ site level lighting is critical. All publicly accessible and service zones of the premises have to be well lit.	• Provide exterior emergency security lighting at the following locations: Entrance, emergency exits, restrooms, and primary access routes.
VENTILATION	• Sleeping spaces require adequate natural ventilation for comfort. The size of the window openings (A), in relation to volume of the rooms (V) should be calculated as follows: A = 0.06 x V. • All corridor spaces should have adequate ventilation. • Toilets should have ventilation as prescribed in the Toilets sections.	
STORAGE	• Each resident should have space to store valuables, belongings, toileteries, and suitcases or bags. • The shelter must have storage provisions for kitchen, housekeeping, and security items.	
ELECTRICAL SOCKETS	• Sockets should be located near beds, common areas, and other essential facilities (kitchens, bathrooms) to provide easy access for charging devices and using appliances. • Install multi-standard sockets (e.g., USB-A, USB-C, and standard electrical outlets) at 900mm from floor level. • Ensure that essential outlets are connected to emergency power supplies or generators, particularly in medical or administrative areas.	
WASTE MANAGEMENT	• Garbage disposal areas should be located away from residential and food areas, with easy access for collection services. • Provide separate bins for wet, dry, and hazardous waste, using clear signage and color-coding for ease of use.	
SECURITY AND SURVEILLANCE	• CCTV surveillance is to be incorporated in public and semi-public areas of the shelters. • While these may be monitored and used only in cases of untoward incidents, it is essential that the organisation overseeing the management of the shelter stores the footage.	

George Town's homeless shelter, Malaysia, rooftop covered with greenery.
Photo Credit: Johnny Ooi Architect

Interior Courtyard in Potters Lane, Midway City, CA - Shelter for Veteran Homeless Render.
Photo Credit: American Family Housing

Dormitories in Orange County Homeless Shelters provides privacy for every occupant with dedicated storage space.
Photo Credit: GMBI.net

Mary's Place Family Homeless Shelter, Seattle, Washington's Children's Play space
Photo Credit: Amazon

K7. Design Checklist for Shelters for the Urban Homeless

INDICATORS	SCORING	1	0.5	0
OPENNESS / VISIBILITY				
	Does the boundary wall allow partial or full visibility from the street?	Full visibility	Partial visibility	No visibility
	Is the height of the boundary wall 1.5m or lesser?	Yes		No
ACCESS TO THE INFRASTRUCTURE				
Pedestrian Access	Are mandatory unobstructed footpaths (minimum 2m wide) provided within a 500m walking radius from the shelter's entry gates?	Yes		No
	What is the condition of this footpath? Poor condition: Completely broken or does not exist Moderate condition: Partially broken, wheelchair can move without difficulty Good condition: Wheelchair can easily move	Good	Moderate	Poor
	Is this footpath continuous and unobstructed? Obstructions include bollards, gate guardrails, drains, trees, etc. that hinder wheelchair movement	Yes		No
	Are the footpaths connected to safe, wheelchair-accessible pedestrian crossings at the nearest intersections?	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes	Yes, but some tiles are broken.	No
	If there a level difference between the shelter's premises and the footpath outside, is a ramp with a handrail provided to enter the shelter premises?	Yes	Yes, but the ramp slope is very steep.	No
	Is the shelter's pedestrian entrance atleast 2 metres wide?	Yes		No
	Are traffic calming measures used near the shelter entrance? (speed beakers, roundabouts, chicanes, etc)	Yes		No
Vehicular / Public Trasnportation	Is the shelter well-connected to public transportation options like buses, metro trains, or MRTS?	Yes		No
	Is there signage indicating the transportation options, such as public transit (buses, metros, etc.) and IPT services (autos, taxis, ride-sharing)?	Yes		No
	Is parking available as per local building norms?	Yes		No
	Are there clear, designated parking areas available for PWD and pregnant women?	Yes		No
	Does the hall's layout allow unobstructed access for emergency and service vehicles, with gates at least 6 meters wide?	Yes		No

INDICATORS	SCORING	1	0.5	0
ACCESS WITHIN THE INFRASTRUCTURE				
Pedestrian Access	Are tactile tiles - warning and navigation tiles present at least in the public areas of the shelter?	Yes		No
	Is there a ramp (as per Harmonised Guidelines 2016 standards) next to the steps for entering the building?	Yes		No
	Are all interior shelter areas flat, with ramps where there are level changes?	Yes		No
	Can people move easily from the entrance to all areas inside the shelter without anything blocking the way?	Yes		No
	Are all walkways at least 1.25 meters wide so people, including wheelchair users, can move safely?	Yes		No
	Are all doors at least 900 mm wide and designed for ease of use (two-way swinging or sliding, lightweight)?	Yes		No
	If the shelter is multi-level, are there stairs and lifts present?	Yes		No
	If the shelter is multi-level, do the stairs have consistent depth of 300mm, 150mm risers, and width as per norms?	Yes		No
	Do staircases have handrails on both sides and clear markings for visually impaired users?	Yes		No
	If the shelter is multi-level, do the lift controls have accessible features like foot-operated buttons?	Yes		No
DESIGN				
Public Areas	Is there enough space at the entrance and lobby for a reception/security desk, and for keeping shoes, helmets, and wheelchairs?	Yes		No
	Are staff toilets provided?	Yes		No
	Is the entrance path wide and barrier-free (at least 1.5 meters) for easy access?	Yes		No
Semi Private Spaces	Is there 2 to 2.5 square meters of space per person in common areas, depending on the activities and facilities available?	Yes		No
	Can the multi-purpose activity rooms be easily changed in layout using movable walls or modular furniture?	Yes		No
	Are the activity rooms designed to support different uses like meetings, skill training, and leisure?	Yes		No
	Is the kitchen at least 15–20 square meters in size for serving about 50 people?	Yes		No
	Are there handwashing basins near dining areas and kitchens, with at least 3 to 5 basins if the shelter serves 50–80 people?	Yes		No

INDICATORS	SCORING	1	0.5	0
Private Residential Spaces	Does each resident have at least 4.5 to 5 square meters of space in the dormitory, as per national guidelines?	Yes		No
	Are both single and double occupancy rooms available, to give options for privacy or isolation when needed?	Yes		No
	Are bathrooms close to sleeping areas and accessible for persons with disabilities?	Yes		No
	Are there enough toilets for women as per standards (1 toilet, 1 washbasin, 1 shower for every 6 women)?	Yes		No
	Are the toilet cubicles fully equipped and accessible, with washbasins, toilets (WCs), and showers?	Yes		No
	Is there a place to wash clothes inside the bathing area or in a separate shaded area in the shelter?	Yes		No
	Is there a dry area before the toilets with mirrors and curtains that can be used as a dressing space?	Yes		No
	Are lockers or storage spaces of different sizes provided for each resident?	Yes		No
COMFORT & SAFETY				
Medical Facilities	Are there first-aid stations/kits and basic medical care room?	Yes		No
	Is there a provision for a counselling room?	Yes		No
Children Care Facilities	Is at least one wash basin in toilets designed at a child-friendly height?	Yes		No
	In shelters for women and transpersons, is there a nursery/playroom for children below 5 years?	Yes		No
Recreational Amenities	Are the setback and the spaces around the shelter planned for outdoor play activities?	Yes		No
Light and Ventilation	Is there light provision given in all interior spaces?	Yes		No
	Do all exterior areas have lights of minimum 50lux level?	Yes		No
	Are the window sizes designed in relation to the size of the rooms?	Yes		No
Electrical Sockets	Are there sufficient electrical sockets provided in all sleeping areas, recreational areas at 900mm from floor level?	Yes		No
Waste Disposal	Are there adequate segregated garbage disposal areas provided?	Yes		No
Surveillance	Is the facility equipped with CCTV Cameras in public and semi-public areas?	Yes		No

TOTAL SHELTER FOR THE URBAN HOMELESS SCORE: _____ / 52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12

PUBLIC TOILETS

Chennai city boasts an impressive network of roads, stretching over 6,000 kilometers. Despite this extensive urban infrastructure, a crucial element remains lacking: accessible and user-friendly public toilets. With fewer than 1,000 facilities serving the entire city, even in 2024, the current provision falls short for all residents and visitors.

The Swachh Bharat Mission's focus on eliminating open defecation resulted in mass construction of toilets, including Community Toilets and Public Toilets. However, there have been challenges in ensuring the sustainability of operations and maintenance alongside concerns of design and functionality. The GCC's vision is to provide safe, accessible, clean, and economically sustainable public toilets across the city (GCC, 2022). The low usage rate, despite persistent efforts to increase the number of toilets, raises the question: How can we improve the design of the toilets to address people's long-held concerns about using them?

The TNUSSP assessment of Chennai's Community and Public Toilets, conducted in March 2022, suggests that there is demand for toilets, better maintenance, and improved physical conditions, and indicates that "most toilets also do not have facilities that cater to the specific needs of vulnerable groups such as women, children, physically challenged people and senior citizens." Public and community toilets are not mere amenities; they are essential services reflecting a city's commitment to its people's well-being. We must strive to create and sustain well-maintained sanitary infrastructures that are not plagued by safety and lighting concerns. To truly serve residents and tourists, Chennai needs restrooms that prioritize: ease of maintenance; functionality for diverse users (including women, transgender individuals, and people with disabilities); inclusivity across age, class, and caste; and responsive design for specific locations, such as high-traffic areas. The city can transform public toilets from underutilized facilities into welcoming and caring spaces that promote an equitable urban environment by focusing on accessibility, functionality, and user-centered design.

The Gender Usage Pattern In Public Community Toilets, Hygiene, Infrastructure Quality And Safety Of Women

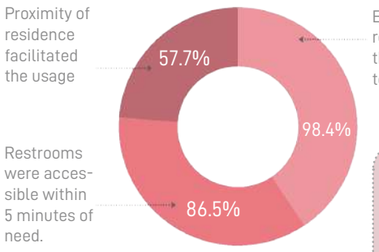
- Zone 5 selected as study site.
- Features 28 newly renovated public/community toilets.
- Data collected via infrastructure assessments and user interviews.

The toilets have Indian closets and knees hurt when I try and use them. The toilets are always wet and soil my clothes. Its unpleasant to go inside.

If the toilet is open, its always dark and dingy. It does not feel like safe to go. I wait all day and go home to use the toilet.

Overall Toilet Infrastructure & Usage

The study was carried to analyze 28 toilets which were newly renovated and refurbished.

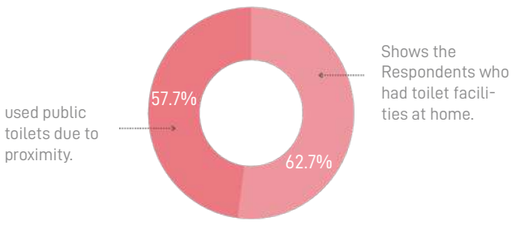


Safet & Comfort

94.3% of respondents felt safe inside the toilets.

92.4% of respondents felt the toilets were well-lit.

User Patterns (Based on 489 Respondents)



Factors Contributing to Safety & Comfort

- 51.9% Presence of a Caretaker
- 45.2% Adequate & Good Lighting
- 34.6% Clean & Well Maintained
- 22.9% Seeing Others Using It

Top 3 Expected Facilities

- 32% Soap Dispenser
- 15% Sanitary Napkin Vending Machine
- 11% Availability of Clean Water

Gender-Specific Infrastructure Issues

- Most toilets lacked hooks for bags/dupattas.
- Women avoid toilets requiring them to pass by men's toilets.
- Men (and sometimes women) loitering near toilets, causing inconvenience for women users.

Infrastructure Quality Concerns

- Less than 25% of toilets had wash basins.
- Approximately 50% of toilets had a bad odour.
- Many toilets lacked ramps or had ramps too steep for use.

We don't usually use these toilets because the floors are slippery or they have steps. We don't eat or drink much when outside.

L1. Existing Conditions

The need for adequate and usable sanitation facilities, particularly toilets, remains a concern across sites and types of infrastructure. Toilets that consider the diversity of user-needs beyond a standing male urinating were found lacking. The limitations include the distribution, accessibility, and availability of toilets with stalls that are either for women or are gender-neutral. The space allocated for such toilets was limited compared to the user-needs, particularly of workers, locals, and vendors who spend significantly longer hours in these public infrastructures than the visiting public. Except for a few places, such as malls, there is a lack of design standards followed in public restrooms for the accessibility and comfort of pregnant individuals, the elderly, and persons with different access needs.

These facilities fail to address diverse users' needs in their quality, design, and maintenance. While infrastructures where users are imagined to stay, linger, or live, such as parks and shelters, have relatively higher overall number of toilets, the lack of adequate, accessible, and well-distributed toilets is particularly evident in open transit-oriented infrastructures such as roads, spaces below flyovers, foot over bridges, and train stations that are spread over and connect large areas.

Clear signage, ramps, and other pathways that allow users to identify and access these toilets, and necessary accessories such as dustbins, sanitary items (e.g., soap, sanitary napkins), and running water in and close to these facilities are noticeably lacking in several facilities and need to be accounted for while considering toilets as a facility. Poor design and inadequate maintenance create significant challenges for the users, such as broken or locked toilets in transit-oriented infrastructures, and waterlogged toilets in locations where the number of toilets is not commensurate with the number and frequency of routine users.

Quick Fixes

Provide a washbasin (common) and a functional health faucet with comfortable water flow.

Ensure the diaper changing stations are accessible to both women's and men's restrooms.

Ensure that public restrooms and workplace facilities offer both Indian-style and Western-style toilets to accommodate the needs of injured, pregnant, or elderly individuals.

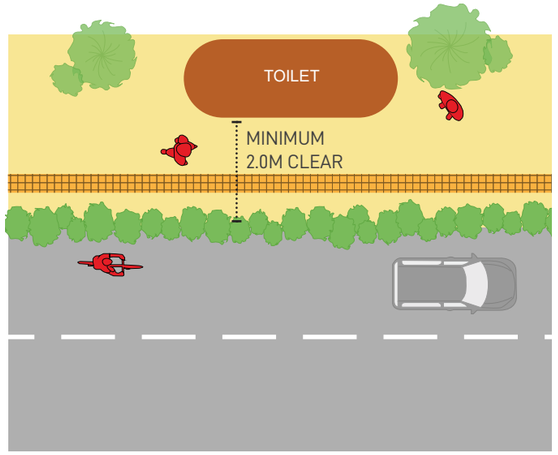
Ensure separate, clearly marked entrances for male and female toilets, with interiors not visible from outside.

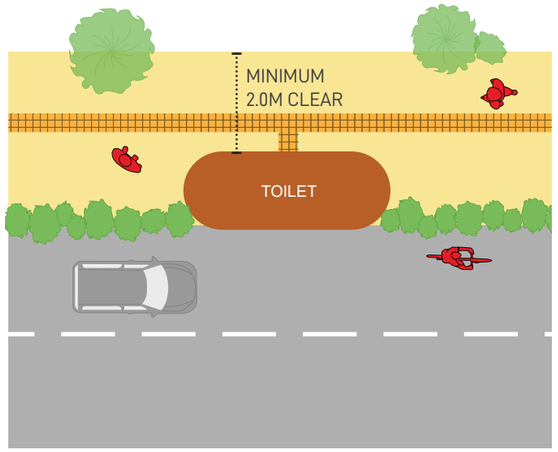
Ensure doors are at least 1 meter wide and open inward and outward or sliding for wheelchair access.

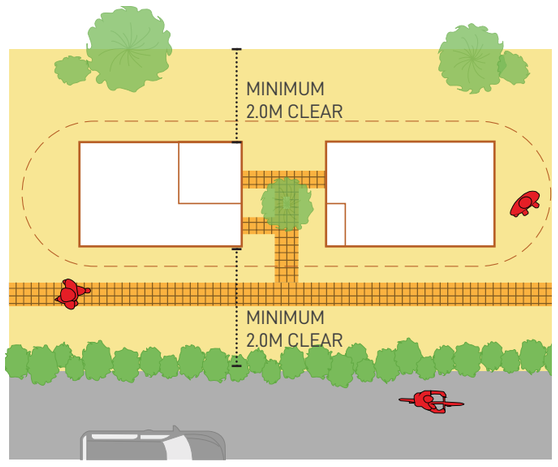
Avoid slippery surfaces and level differences, especially in restrooms for persons with disabilities (PwD).

Provide a unisex single stall that can be provided as gender neutral accessible family toilet.

Use inclusive signage in public restrooms to accommodate transgender individuals.







Placement of Toilet Block on a pedestrian footpath and its relation to the surrounding context.

L2. Boundary/ Edge Condition Design

1. Proximity to High-Traffic Areas: Position toilets near walkways, footpaths, vehicle parking lots, busy streets, and pedestrian areas. The entrance should face the most active areas for maximum visibility and ease of access.
2. Clear Walkway Space: Maintain a minimum of 2 meters of unobstructed walkway on the side of the entrance to the toilet block.
3. Dual Access (if space allows): For toilets with space on both sides, provide accessible entrances on both the front and rear for user convenience.
4. Integration with surrounding uses: Ensure toilets near parks, bus terminals, or transit stations are integrated within their premises per building norms. Where feasible, position at least one facility with direct footpath access, maintaining a 2m unobstructed entry. In such case, accessibility from multiple sides is essential to encourage usage.
5. Offset Entryways: While ensuring good visibility from the street, prioritize user privacy. Consider offset entryways or "mazes" that block direct views into the stalls but still allow for easy, hands-free access.
6. Visible Yet Private Facade: The toilet block's exterior should be visually prominent without compromising user privacy. Utilize bright facades for better visibility, following a consistent color scheme and signage standards across the city for easy recognition.
7. Regularly trim or remove surrounding vegetation (shrubs or trees) to prevent the toilet facility from becoming obscured.
8. Install clear and concise directional signage throughout the area, 150m in either direction, and guide users towards the next available public toilet locations as well.

Public Toilet abutting Race Course Road Walkway, Coimbatore.
Photo Credit: Tejaswini Baskaran

L3. Access to the Infrastructure

Public toilets often require a plinth to accommodate drainage facilities and prevent flooding. While typically necessary, reducing this to zero by adjusting surrounding ground levels can improve aesthetics and accessibility. However, if a plinth is unavoidable, steps, ramps, and other features are crucial for ensuring access for all users.

- **Steps:** Handrails: Install contrasting handrails on both sides of stairs, extending atleast 30cm beyond the top and bottom steps. Treads: Ensure treads are slip-resistant and have a nosing overhang for better visibility.
- **Ramps:** Incorporate ramps of a minimum clear width of 1200mm outside all toilet structures that require steps to access them. Refer Harmonised Guidelines 2021 for further guidance.
- **Tactile Indicators:** Install tactile tiles with a distinctive texture as per Harmonised Guidelines 2021.
- **Awnings:** Provide an awning that extends over the entire width of the entrance platform, covering the ramp and steps.
- **Lighting:** Maintain a minimum illumination level of 100 lux throughout the access route leading to the toilets.

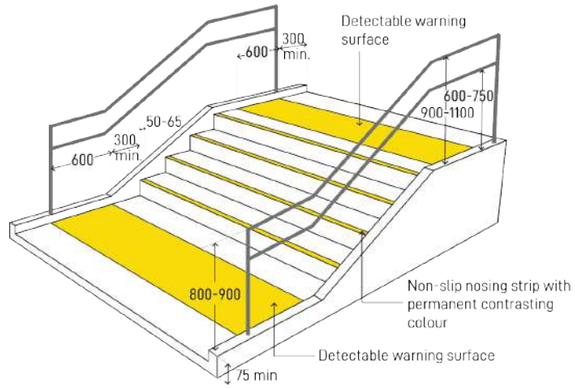
The design should prioritize quick drying and minimize contact with surfaces to promote a safe and hygienic environment. Additionally, the toilet infrastructure itself should be accessible to all users, with features that facilitate easy movement and prevent physical barriers.

- **Clear pathways:** Ensure clear circulation paths within the toilet infrastructure and turning radii,

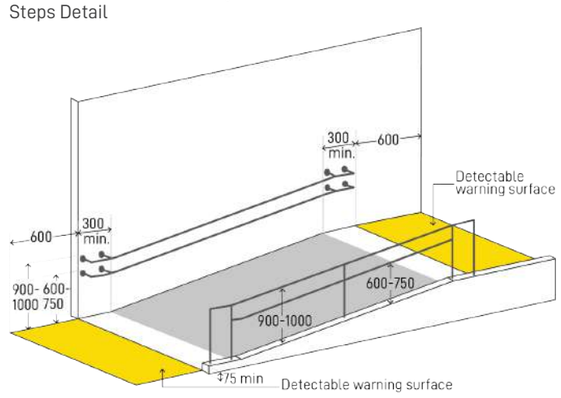
L4. Access within the Infrastructure

free of obstructions that could hinder wheelchair users or individuals with mobility impairments. **Sufficient space:** Provide ample space within the toilet stalls and common areas to allow for easy maneuverability.

- **Floor level changes:** Minimize floor level changes. Any level drop between interior spaces of toilets and stalls should not exceed 12mm and must be beveled for a smooth transition.
- **Doors:** The toilet door should be an outward-opening, two-way opening, or sliding type, with a clear opening width of at least 900 mm. Implement automatic door openers with a clear activation button or sensor for hands-free access.

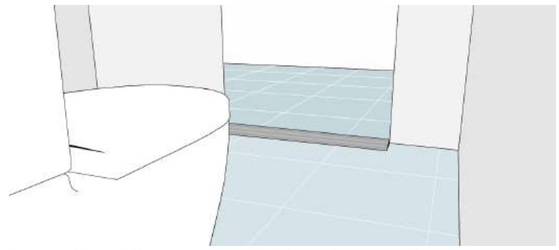


Steps Detail



Ramp Detail

Interior Corridor Widths



Interior floor differences bevelled for safe access for persons on wheelchair

L5. Space Planning

L5.1 SIZING

The size and configuration of toilet facilities should be determined based on the anticipated user volume and available space in the location. URDPFI guidelines suggest a public toilet should be available every 1 kilometer. In public spaces where more than 200 people in a day are expected, at least one male-designated, one female-designated, and one gender neutral toilet stall should be provided. Additional stalls may be necessary depending on the usage. When space is limited, consider incorporating one or more direct-access toilets. These can be conceived as gender-neutral single-occupancy stalls that offer full accessibility.

L5.1.1 MULTI-CUBICLE PUBLIC TOILETS

Accessible toilets are mandatory. While an accessible gender-neutral family toilet is beneficial, ensure at least one accessible stall is available within the designated male and female restrooms. Equip half of the stalls in both men's and women's restrooms with IWC options to cater to user preferences. To minimize wait times, allocate ample queuing space both outside and inside the restrooms.

The Swacch Bharat Mission Guideline provides the norms for seats in public and community toilets as per the table mentioned below

	Sanitary Unit	For Males	For Females
Public Toilets			
1	**Water Closet (WC)**	• One per 100 persons upto 400 persons; For over 400 persons, add at the rate of one per 250 persons or part thereof	• Two for 100 persons upto 200 persons; over 200persons, add at the rate of one per 100 persons or part thereof
2	**Ablution Taps**	• One in each WC	
3	**Urinals**	• One for 50 persons of part thereof	• Nil
4	**Wash Basin**	• One per WC and Urinal provided	• One per WC provided
Community Toilets			
5	**Water Closet (WC)**	• One seat for 35 men	• One seat for 25 women
6	**Bathing Facilities**	• Adequate bathing facilities	

A calculation of the Gender Ratio of the said toilet, that is, the ratio of male:female that can use the facility at a given time is 2.25:1. This contrasts with previous guidelines (Building Bye Laws 1983 and National Building Code 2005) that suggested a 1.5:1 ratio. In 2015, keeping in view increasing number of working women, Delhi Development Authority increased the ratio to 1:1 for new projects. URDPFI 2015 guidelines also stipulate 1:1 ratio in public toilets.

Number of men and women that can use a facility of equal male/female floor space, in a 5 minute period:

*Source: Knight and Bichard, 2011

Despite a 1:1 ratio, gender disparities persist in public toilets. Poor maintenance and inadequate facilities, particularly for women, contribute to infections and discomfort. To improve the experience, reforming the gender ratio is essential. Additionally, women often take longer to urinate due to various factors, including anatomical differences, pregnancy and childbirth effects, cultural factors, clothing challenges, and carrying belongings. These factors can contribute to longer wait times in women's restrooms, emphasizing the need for adequate toilet facilities and gender-balanced ratios. Therefore, an optimal gender ratio of 1:2 (male:female) for public toilets is recommended.

Number of men and women that can use a facility with 1:2 male/female ratio of facilities in a 5 minute period:

*Source: Knight and Bichard, 2011

The suggested guideline is as follows:

	Sanitary Unit	For Males	For Females
Public Toilets			
1	**Water Closet (WC)**	• One per every 200 persons or part thereof	• Three for every 100 persons or part thereof
2	**Ablution Taps**	• One in each WC	
3	**Urinals**	• One for 100 persons or part thereof	• Nil
4	**Wash Basin**	• One per WC and Urinal provided	• One per WC provided
Community Toilets			
5	**Water Closet (WC)**	• One seat for 30 men	• One seat for 15 women
6	**Bathing Facilities**	• One shower cubicle for every 30 men	• One shower cubicle for every 30 women

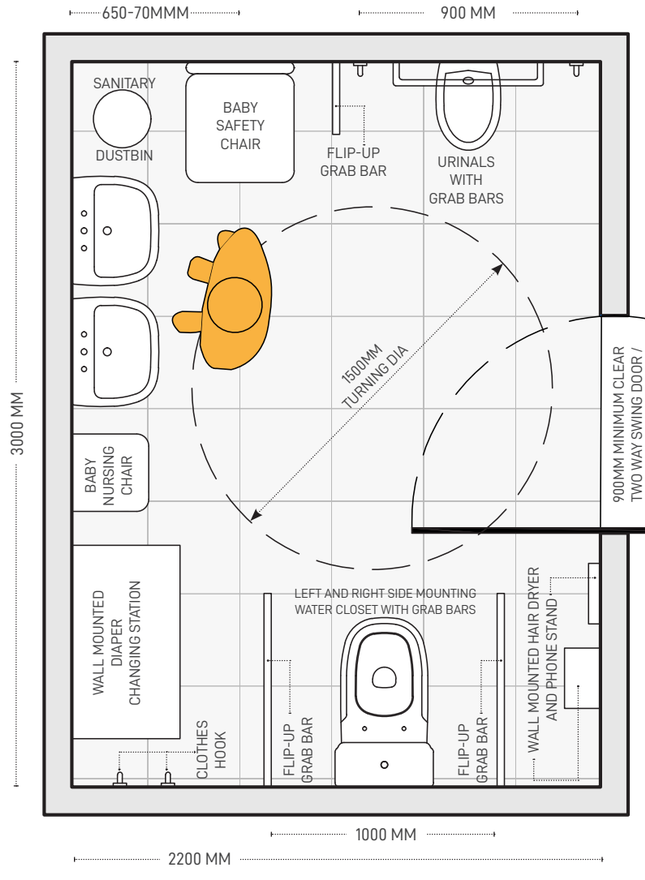
It is also recommended that in Community Toilets, atleast one fully accessible toilet is provisioned for, with WC, shower, and wash basins.

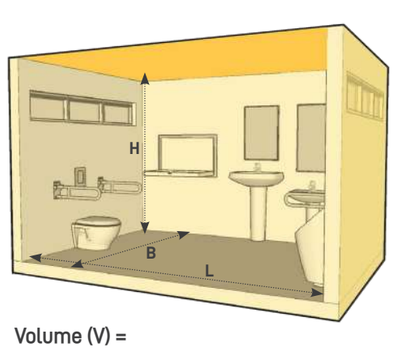
L5.2 GENDER NEUTRAL ACCESSIBLE FAMILY TOILETS

Gender-neutral accessible family toilets are inclusive restrooms designed to accommodate people of all genders, ages, and abilities for individuals, caregivers, and families with diverse needs. According to the Harmonized Guidelines 2021, gender-neutral accessible family toilets should have a minimum internal dimension of 2200mm x 3000mm. A clear maneuvering space of at least 1500mm in diameter is required in front of the toilet and sink to accommodate wheelchairs and other mobility aids. All features within the restroom, including grab bars, door details, toilet heights, flushing mechanisms, and sink placement, must adhere to harmonized accessibility standards. Signage should clearly indicate the restroom is all-inclusive, avoiding any gendered language or symbols. The restroom should also include handwashing facilities, a diaper changing station, grab bars, a WC that can be mount on from both sides, a urinal, and optionally a stool. Features like automatic faucets, automatic flushing, and doors with improved hygiene and accessibility can also be considered to enhance the user experience.

L5.3 LIGHT AND VENTILLATION

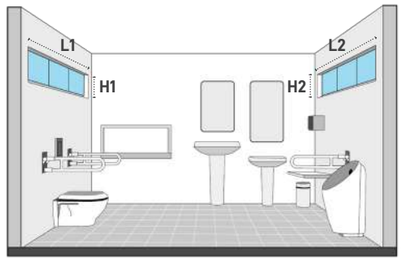
Maximize natural light and ventilation by designing the layout to facilitate cross-ventilation through strategically placed windows and vents. Prioritize layouts that allow ample natural light to enter the stalls, utilizing windows or strategically positioned clearstory windows. To ensure adequate ventilation, the cumulative minimum clear size of the openings (A) should be calculated as A = V x 0.06, where V is the total volume of the toilet and 0.06 is suggested for Chennai's average wind speed. If mechanical ventilation is necessary, install an appropriate system with a capacity of 50-70 CFM per toilet/urinal.





Volume (V) =
Length (L) x Breadth (B) x Height (H)

Total Window Area (A) =
(Length (L1) x Height (H1)) +
(L2 X H2) + (L3 X H3) + (L4 X H4) ...
To ensure adequate ventilation within public toilets,
Total Window Area (A) = Volume (V) x 0.06

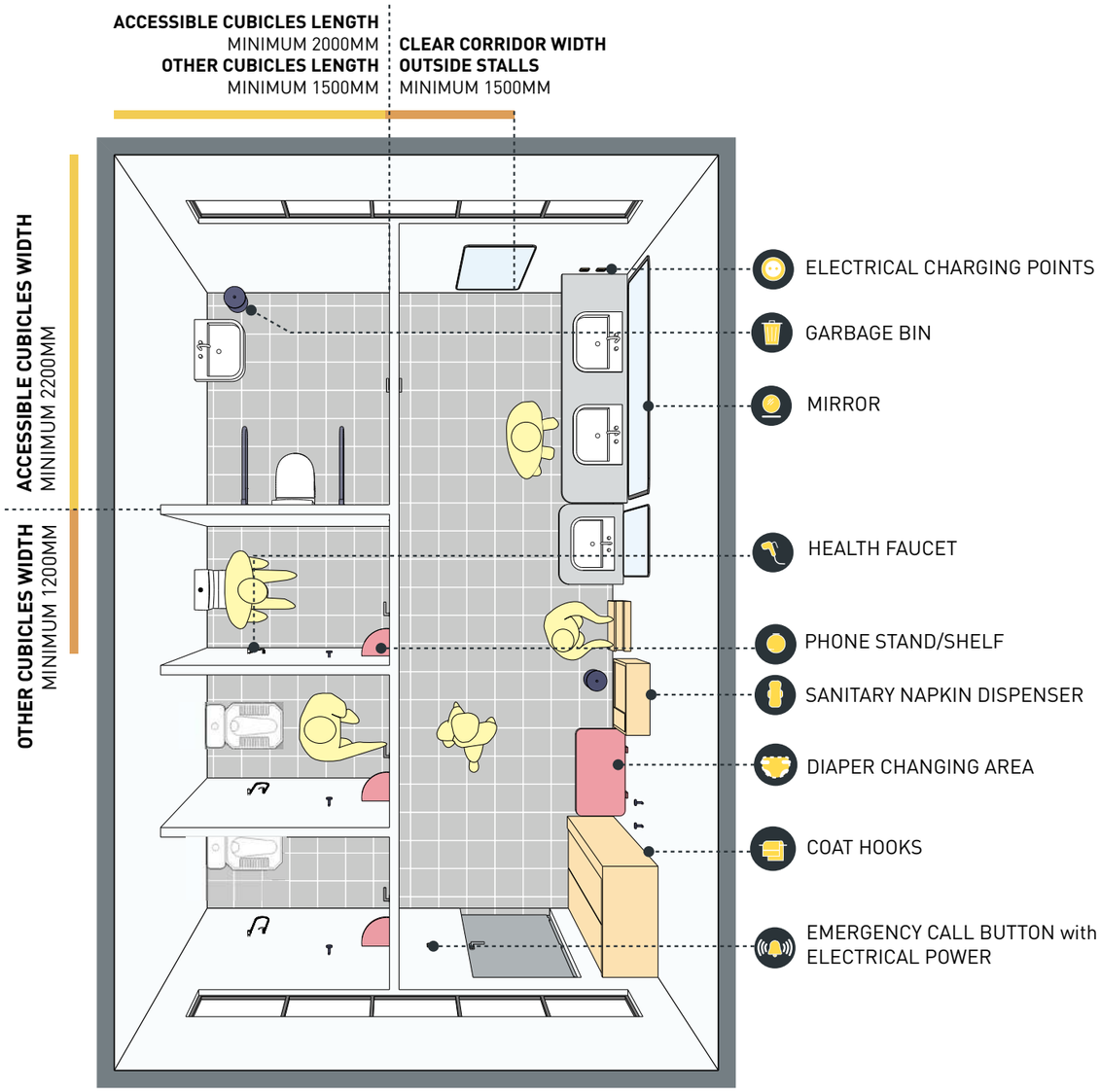


Gender Neutral Accessible Family Toilet Layout and Demonstration of the calculation for adequate ventilation in a Public Toilet.

L5.4 CONTEXT BASED AMENITIES

1. Changing Rooms: These are particularly useful in locations like beaches, playgrounds, and parks where people may need to change clothes after activities.
2. Showering Rooms: Parks, playgrounds, community toilets, or locations with a high volume of transient users can benefit from showering facilities, especially after physical activities or for personal hygiene.
3. Leg Washing Area: This is especially helpful in beaches, where users may have sand or salt on their feet.
4. Lockers: Secure lockers for storing belongings can be valuable in community toilets or sports facilities, providing convenience and security for users.
5. Cloth Washing Facilities: In community toilets serving urban poor populations, including designated areas for hand-washing clothes can be a valuable addition, providing a basic need for those who may not have access to laundry facilities at home.

L6. Comfort



Multi-Cubicle Toilet Layout and Amenities with IWC, EWC, and Wheelchair accessible toilet.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
WASH BASINS	• Provide a counter with sufficient space for backsplash. This countertop design offers a user-friendly surface for toiletries and allows women to comfortably place their belongings while using the basin. • Where possible provide one hand wash facility at Child-friendly height.	• In multi-cubicle toilets - Women: One per WC provided Men: One per WC and urinal provided • In Gender Neutral Accessible Family toilets - Provide two handwashing facilities at adult and child heights.	• Plan the hand wash facility adjacent to or in front of entry.
DIAPER CHANGING AREA	• A dedicated space for changing diapers should be provided. A collapsible or fold-down station is a space-saving option.	• Provide atleast one Diaper Changing spaces in Women's, Men's and Family toilets.	• Place the Diaper changing space adjacent to or at accessible distance from Wash Basins
ACCESSIBILITY	• All WCs must allow to mount from the right and left side. Adjustable grab bars should be provided accordingly. This accomodates individuals with varying mobility needs. • Install lever handles instead of knobs for easier operation, ensuring sufficient clearance for wheelchairs. Consider a push-and-pull mechanism for additional ease of use. • The male section shall have atleast one urinal with support grab bars for ambulant disabled.	• In multi-cubicle toilets, atleast one accessible toilet per toilet block should be provided. • All single stall, Gender Neutral Family toilets should be accessible	• Refer Harmonised Guidelines 2021 on placement and heights of grab bars, door/window hardware, etc.
FEEDING ROOMS	• Provide private spaces that are equipped with comfortable seating, a power outlet for pumping equipment (if possible), and a sink for cleaning supplies. This room is required to be a minimum of 2200mm x 2000mm.	• Ensure the provision for Feeding Rooms in all areas that have high foot traffic.	• The Feeding Rooms may be attached or adjacent to the Toilet block. • Natural and physical surveillance outside these rooms is necessary for safe usage of this facility.
BAGS AND PERSONAL BELONGINGS STORAGE	• Inside individual stalls, provide sturdy coat hooks for hanging personal belongings, positioned outside the user's direct line of sight for privacy. • Inside individual stalls, install a small shelf or designated space to securely place a phone or other belongings within easy reach. • In mutli-stall Toilets, provide a designated area, either a shelf or a counter, allows users to safely store luggage or large bags outside the immediate stall space.	• All cubicles must have atleast one coat hook, one phone stand. • Luggage storage space in toilets may be considered in areas with high foot traffic, closer to Transit stations, playgrounds, institutions, etc.	• Coat Hooks should be placed at an accessible height behind / adjacent to the door. • The Phone stand may be provided as a dedicated ledge or combined with the WC ledge if applicable in design. • In multi-cubicle toilets, provide luggage storage closer to stalls to avoid theft.

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
SANITARY NAPKIN DISPENSER	• A vending station or dispenser equipped with sanitary products to cater to diverse needs is recommended.	• One vending station in multi-cubicle toilet and one in Gender Neutral Accessible Family toilet is recommended	• This vending unit may be placed adjacent to individual stalls.
MIRROR	• Mirrors above Wash Basins are essential. • A large, full length well-lit mirror is recommended.		• Mirrors in toilets should be positioned to avoid compromising user safety. It's important to place mirrors in a way that prevents them from being visible from outside the restroom.
GARBAGE BINS	• Provide a lidded waste bin for used sanitary products, and a separate bin for disposing other types of waste. • If a paper tissue dispenser is provided, ensure the waste bin is of sufficient size. • Provide clear instructions on how to dispose of sanitary napkins.	• Each toilet facility should have a segregated toilet bin. • The number of bins should be determined based on usage and footfall.	• Place bins close to where garbage is generated, such as beside paper towel dispensers, near wash basins, and near individual stalls for sanitary napkin disposal. • In multi-cubicle toilets provide bins within each stall.
SEATING	• In some accessible stalls, particularly larger ones, consider providing a fold-down or in-built bench for individuals who may require additional support or a resting place while using the facilities.	• The number of seats and their placement should be determined based on the size and usage of the stall.	• Should be placed in a location that does not obstruct access to the toilet or other facilities within the stall.
HEALTH FAUCET (HAND SHOWER)	• Consider incorporating a handheld bidet sprayer for enhanced personal hygiene, especially beneficial for individuals who may require assistance.	• All toilet cubicles must provision for the same	• The health faucet should be placed on the right side wall/partition of the WC.
DRINKING WATER SPOUTS	• Drinking water fountains/units shall be made accessible and inclusive to diverse user groups. • Provide clean drinking water facilities at both adult and for wheelchair users or persons with low height (0.75-0.80m) heights for easy access. • Ensure accessibility in drinking water provisions as per Harmonized Guidelines.	• All toilets blocks must include a Drinking water spout.	• These must be placed at accessible distances from the entry ways of all the facilities.
JANITOR ROOM	• A dedicated space with a sink and storage for cleaning supplies is essential.	• All toilets blocks must include a janitor room.	• The janitor room should be located in a convenient and accessible location within the toilet block, ideally near the entrance or a central area.

L7. Safety

FEATURE	DESCRIPTION	FREQUENCY	ZONING / PLACEMENT
LIGHTING	• Access to the Infrastructure incorporate pedestrian lighting with a minimum brightness of 10 lux. • Utilize warm-toned interior room lighting with a minimum brightness of 150 lux. • Building facade and entrances must be adequately lit.	• The interiors of the toilet should be uniformly lit with no dark or unsafe corners	• Provide exterior emergency security lighting at the following locations: Entrance, restroom building facade, and primary access routes. • Provide all lighting controls in the interior and exteriors of the toilet.
WAYFINDING AND SIGNAGE ACCESSIBILITY	• Incorporate braille or tactile in all signage, including maps and information plaques lettering • Bright and consistent color palette. • Child-friendly signage (0.5-0.55 meters) where applicable		• Install well-lit signage at entry/exit points with information on nearby city infrastructure. • If toilet is unusable/under construction place signage on the nearest available public facility
SIGNAGE TYPOLOGY	• Directional/Wayfinding Signage should clearly indicate the direction and distance. • Infrastructure Signage should identify the types of facilities available, including location of drinking water spouts. • Informational and Instructional Signage should provide information such as helplines and garbage disposal methods, etc.	• Directional/Wayfinding Signage should be at strategic points within 150 meters of the infrastructure or in conjunction with nearby landmarks • Infrastructure Signage should be at the entrance of the infrastructure and at key junctions within the facility. • Informational and Instructional Signage should be planned based on context.	• Directional/Wayfinding Signage should be placed at major intersections, pedestrian crossings, and public transportation stops. • Infrastructure Signage should be placed at prominent locations that are easily visible from multiple angles. • Informational and Instructional Signage should be placed within toilets for better readability.
SECURITY AND SURVEILLANCE	• Clearly mark CCTV camera usage to build trust and ensure responsible data collection. • Ensure CCTV footage is recorded and monitored in a local police station. • Ensure the security person/ janitor of toilet and their waiting area is next to the entrances of the toilet.		• Locate toilets in places with medium to high foot traffic to ensure natural surveillance. • Strategically place CCTV cameras in areas with lower visibility.
ELECTRICAL SOCKETS	• Incorporate a limited number of electrical outlets within the stalls for temporary phone charging. • These outlets should be installed with safety features to prevent electrical hazards.		
EMERGENCY CALL BUTTONS	• Install emergency call buttons inside Women's, Men's and Gender Neutral Accessible Family toilets.		• Place them inside the facility near the entrance of the toilet with adequate signage

Public Toilet abutting Race Course Road Walkway, Coimbatore.
Photo Credit: Tejaswini Baskaran

L8. Design and Planning Checklist for Public Toilets

INDICATORS	SCORING	1	0.5	0
PLANNING AND DESIGN				
Location	What is the distance from the nearest public toilet?	1.5 kms or less		More than 1.5 kms
Openness	Is the toilet block and signage visible from the road?	Yes		No
	Are the toilet doors placed to block direct views into the toilet interiors?	Yes		No
Entering the Toilet	Is the path to the toilet at the same level as the surrounding footpath, or is there a ramp provided with handrails?	Yes		No
	Is there a roof or cover over the entrance, ramp, and stairs?	Yes		No
	Is the entrance clear of poles or drains that might block people with disabilities?	Yes		No
	Are there kerb ramps at the closest intersections and drop-off locations?	Yes		No
	Are there tactile floor markings to guide visually impaired users to entrances/exits?	Yes		No
	Can people with disabilities or pregnant persons easily move from on-street parking to the footpath and reach the toilet building safely?	Yes		No
Inside the Toilet	Is it easy for wheelchair users to turn and access the space? A minimum turning radius of 1.5M is provided where required?	Yes		No
	Are wheelchair-accessible stalls wide enough with doors at least 900mm?	Yes		No
	Do the doors in wheelchair stalls open out, both ways, or slide?	Yes		No
	Are there tactile floor markings to guide visually impaired users inside toilets?	Yes		No
	Are all areas at the same level for wheelchairs, or provided with ramps or sloped edges where there are minor floor level changes?	Yes		No
	Is the floor material slip-resistant?	Yes		No
	Does the toilet provide facilities for women, men, and persons with disabilities?	Yes		No
	Does the toilet provide facilities for gender-neutral or non-binary individuals, and families?	Yes		No
COMFORT				
	Is there enough space for people to wait in line, with seating options available?	Yes	No space for seating	No
	Are the entrances to Men's, Women's and other facilities away from each other?	Yes		No
	Are other toilet cubicles at least 1200mm x 1500mm in size?	Yes		No
	Are wheelchair accessible toilets at least 2200mm x 2000mm in size?	Yes		No
	Does the layout reduce unnecessary contact with walls or other surfaces with all corridors of minimum 1.5M width?	Yes		No
	Does the ratio of women's cubicles to men's cubicles and urinals meet a 2:1 ratio?	Yes		No
	Are there the same number of wash basins as cubicles?	Yes		No
	Is there a Diaper changing station in Women's, Men's and Gender Neutral toilet?	Yes		No

INDICATORS	SCORING	1	0.5	0
	Are there grab bars provided as per standards in all wheelchair accessible toilets?	Yes		No
	Are the WCs in all wheelchair accessible toilets mountable from both sides?	Yes		No
	Are changing rooms available if the toilet is next to a playground, beach, or similar place?	Yes		No
	Are at least half the stalls in all multi-cubicle toilets equipped with IWC options?	Yes		No
	Is there a Janitor facility attached to the Multi-cubicle toilet?	Yes		No
	Is the total size of wall openings at least 6% of the room's volume, or is proper mechanical ventilation provided (50–70 CFM per toilet or urinal)?	Yes		No
	Is the facility equipped with - 1. Coat Hooks 2. Phone stand/ shelf 3. Health Faucet 4. Sanitary Napkin dispenser 5. Mirror 6. Luggage/bag storage 7. Accessible Door and ventilator hardware	Yes all of these are provided	At least 4 of these are provided	None of these are provided
	Are drinking water facilities provided outside or adjacent to toilet building?	Yes		No
	Is drinking water available for both adults and people using wheelchairs or those of shorter height (0.75–0.80m)?	Yes		No
	Are waste bins easy to reach for everyone, including child-sized bins placed at 0.45–0.5 meters height?	Yes		No
SAFETY				
	Does the toilet have a janitor/security personnel? And do they have a dedicated space for keeping their belongings?	Yes	No dedicated space for belongings	No
	Are there shops or places nearby that bring people and make the area feel safer 24X7?	Yes	Not at all times of the day	No
	Are there CCTV cameras installed outside the public toilet covering all entrances and sides of the toilet?	Yes		No
	Does the toilet have electrical sockets?	Yes		No
	Are helpline numbers displayed on signs both inside and outside the toilet building?	Yes		No
	Does the toilet have lighting controls inside and outside the toilets?	Yes		No

INDICATORS	SCORING	1	0.5	0
LIGHTING				
	Is there enough lighting on the way to the toilet building?	Yes		No
	Are the entrances to the toilet facilities well-lit?	Yes		No
	Is the outside/front (facade) of the building properly lit?	Yes		No
	Is the lighting inside the toilet building provided for all areas?	Yes		No
SIGNAGE				
	Are clear direction signs placed within 150 meters of the toilet or near nearby landmarks?	Yes		No
	Do the signs clearly show the types of facilities available — like stalls for women, men, gender-neutral, accessible and family toilets, and drinking water points?	Yes		No
	Are there signs inside the toilet building on how to use facilities (e.g. sanitary napkin stations, garbage bins)?	Yes		No
	Do the signs include Braille and raised (tactile) information?	Yes		No
	Are all signages multi-lingual?	Yes		No
	Is the signage consistent in design throughout the park?	Yes		No
	Are the signs placed at heights that both adults and children can see?	Yes		No
	Are the signs easy to read, with good contrast, clear fonts, and placed in the right spots?	Yes		No

TOTAL TOILET SCORE: _____/ 53

TOILET

MEN'S TOILET ↑

↑ WOMEN'S TOILET

IC

IC

WC

WC

III

MATERIALS AND SPECIFICATIONS

The choice of materials used in public infrastructure projects is critical, influencing their longevity, maintenance, operations, and overall usability. Thoughtful material specifications can greatly enhance user experience, ensure safety, and foster sustainability.

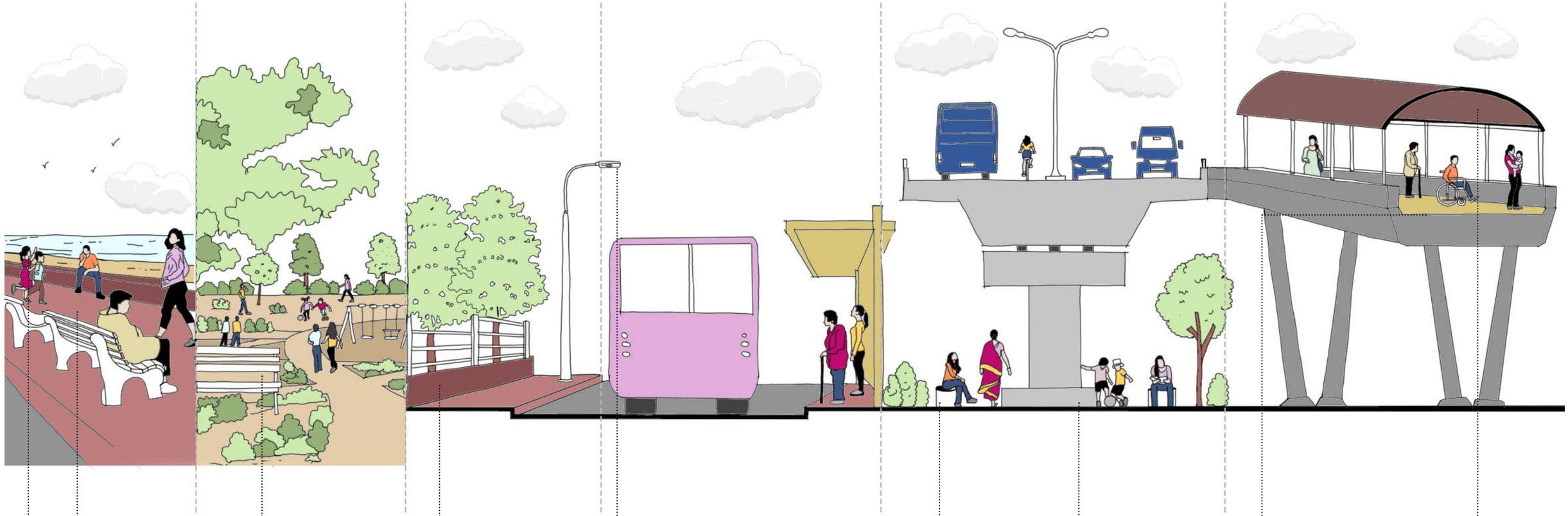
The durability of materials is paramount in public infrastructure due to their exposure to heavy usage and potential vandalism. High-quality materials that resist wear and tear, weather conditions, and frequent cleaning are essential to ensure long service life and reduce maintenance costs. For instance, stainless steel, treated wood, and anti-corrosive metals are often chosen for their robustness in outdoor settings. Similarly, anti-graffiti coatings and vandal-resistant surfaces help maintain the aesthetic and functional integrity of infrastructure.

Safety is another critical factor tied to material selection. Surfaces that become slippery when wet pose risks for users, particularly in parks, beaches, and transit stations. Non-slip tiles, rubberized surfaces, and textured pavements can mitigate such risks. Additionally, tactile paving is a necessary inclusion to assist visually impaired individuals, ensuring equitable access and adherence to universal design principles. Ease of usage is equally important, especially for diverse user groups. Materials should be lightweight and ergonomic where applicable, such as seating in transit stations or movable fixtures in markets. Materials that are easy to clean and maintain contribute to the operational efficiency of these facilities.

Sustainability is a growing concern in modern infrastructure development. The use of locally sourced and recycled materials reduces the environmental footprint and supports local economies. For example, reclaimed wood, recycled plastics, and locally quarried stones can provide durable and eco-friendly solutions. Innovative materials such as permeable concrete and solar-reflective coatings not only serve functional purposes but also promote environmental benefits like stormwater management and reduced heat absorption.

Beyond functionality, materials can define the aesthetic identity of a public space. Innovative designs using unique materials can create landmarks and foster community pride. For instance, incorporating bamboo or other indigenous materials can reflect local culture and heritage.

Exterior Surfaces & Elements



BEACH PATHS
- For Beaches and Coastal areas: Use temporary, removable materials like Babool, Red Meranti and Brazilian Wood.

TEMPORARY STRUCTURES
Fire safety, weather resistant, comfort, and durability are key considerations.
- Aluminium
- Steel
- Wood
- PVC
- Bamboo
- Coir

PATHS, PAVEMENTS, AND WALKWAYS
Anti-skid, slip resistant materials are top priority.
- Clay tiles
- Cork tiles
- Terrazzo flooring cast in situ
- High strength pavers
- Natural stones like granite, marble, limestone, or similar - Flamed finish or surface treatments like sandblasting and chemical etching.
- Cast Iron without gaps greater than 0.5mm width.
- PCC Stamped Concrete - textured finish or a non-slip aggregate
- Mastic Asphalt
- Rubber (sheets or tiles)

FENCES AND BOUNDARY WALLS
Maintaining visibility and balancing privacy based on typology of use. Solid wall sections should not exceed 45cm above abutting footpath.
- Shrubs and trees
- Bollards
- Metal grills
- Wire mesh
- Gabian walls
- Brick
- Stone

EXTERIOR LIGHTING
Energy efficient and sufficient lighting, avoiding dark spots and excessive brightness. Combine multiple lighting layers.
- 3000 Kelvin (K) is used for pedestrian paths and 5000K for vehicular paths.
- Use fixtures with diffusers or shields to reduce glare.
- Bollard lights
- Wall or ceiling mounted recessed fixtures
- Ground level uplights
- Strip lights
- Pole lights and High Masts

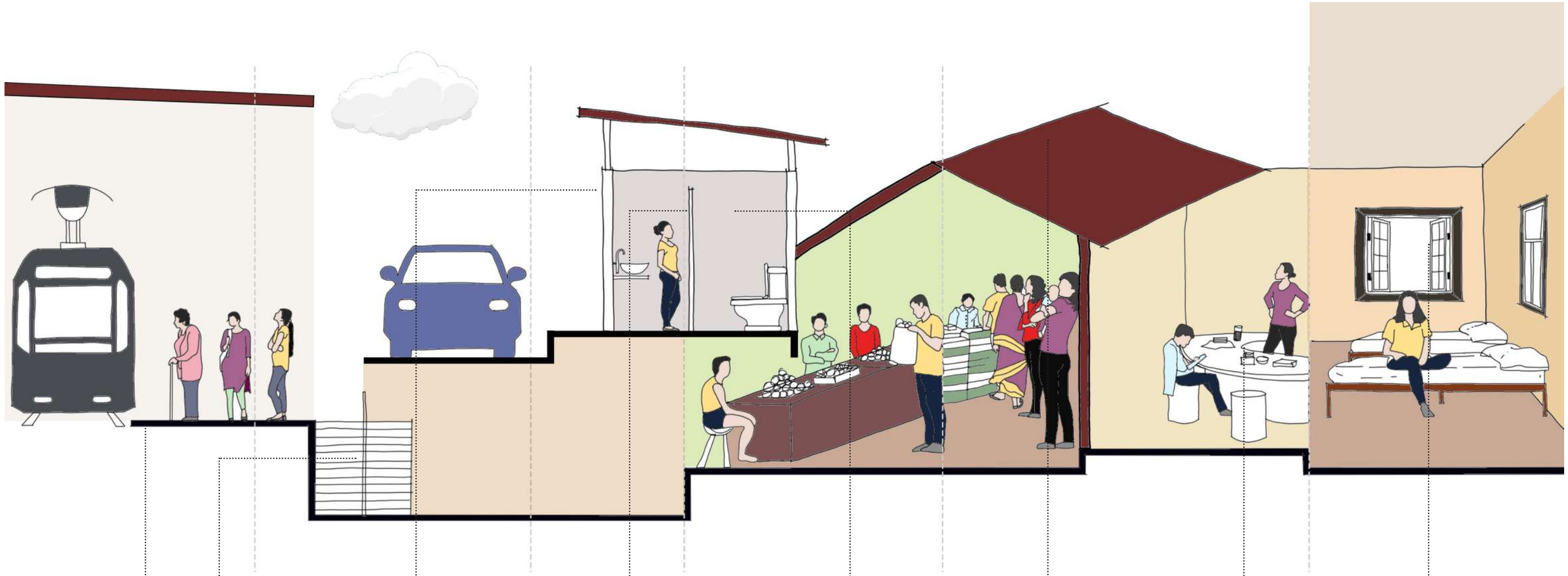
STREET FURNITURE
Durable, safe, considerations for its environmental impact, economic viability, ease of maintenance, and user comfort.
- Seater and Leaning Rails
  - Wood
  - High Density Corks
  - Brick / Concrete
  - Fibre-reinforced Polymer
  - Under shade: Natural Stone
  - Under shade: Metal
- Bollards
  - Stainless Steel
  - Aluminium
  - Concrete
  - Glass Fibre Reinforced Concrete
- Signages
  - Retro-reflective Boards

PARKING SPACES
Large paved surfaces require adequate means of drainage and ground absorption.
- Interlocking brick/cemet pervious pavers
- Cobble stone
- Stamped Concrete
- Natural stones like granite, marble, limestone, or similar - Flamed finish or surface treatments like sandblasting and chemical etching.

TACTILE PAVING SYSTEMS AND MOBILITY
- Two types of surfaces -
  - Blister Tactile (Raised bumps)
  - Corduroy Tactile (Parallel ridges)
- Tactile Access Paving
  - SS Studs
  - Iron Plates
  - Cement Tiles
  - Rubber Tiles
  - Plastic
- Handrails of a contrasting colour or texture from the parapet to which it is attached to assist those with visual impairment.

OUTDOOR ROOFING
- Roof elements should be planned based on the sun path and orientation of the structure.
- Thermally insulating and Cool reflective paint such as Thermatek can be used in existing and new construction to avoid heat absorption.
- Avoid dark colours and materials for the roof.
  - Natural Materials eg: Thatch, Cloth, Clay and Slate Tiles
  - Concrete Tiles
  - Metal
  - Poly Carbonate Sheets
  - Acryllic
  - Tensile Fabric Roof Membrane

Interior Surfaces & Elements



FLOORS

- All traversed surfaces must have a minimum coefficient of friction of 0.42 (ANSI A137.1), preferably higher, to ensure adequate slip resistance.
- Level differences or zone changes should be clearly indicated using color contrast stickers and raised floor patterns.
- In public transit areas with significant vibration and foot traffic and rough usage, prioritize increased strength and safety standards for surfaces.
- Porcelain Tiles
- Terrazzo flooring
- Polished Concrete
- Natural stones with flamed finish or surface treatments.

VERTICAL MOBILITY

- In Stairs and Ramps: Utilize anti-skid tiles, concrete flooring, or natural stone.
- In Elevators
  - Provide foot-operated controls outside elevators.
  - Neutral colours, and stainless steel finishes are ideal.
  - Use Mirrors or reflective metal surfaces to reduce claustrophobic feeling
  - Install Grab bar Handrails.
  - Equip all buttons with Braille and sound activation features.
- Implement tactile indicators at the end of each stair tread and flight; and to indicate edges, both inside and outside elevators.

WALLS

- Prioritize fire-resistant, vandal-resistant, and non-toxic materials. Easy-to-maintain materials that provide thermal comfort, acoustic quality.
  - Paint: Low-VOC, light-colored paints.
  - Wall Panels: Tiles, metal panels, or concrete.
  - Transit hubs: Integrated terrazzo panels or porcelain enameled steel.
  - High-traffic areas: Durable, easy-to-clean materials like ceramic tile or stainless steel.
  - Install Glass or reflective surfaces in high traffic areas with coloured stickers to avoid breakage of accidents.

PARTITIONS

- Fire resistant, soundproof, and durable partitions that do not create barriers for PWD.
- Interior Partitions can include:
  - Gypsym Boards
  - Brick partitions
  - Clay Brick Hollow Partition
  - Acoustic and Soundproof Walls
  - Movable Cubicles and Screens
  - Composite Partitions - wood and metal
  - Block Partition - woodblock, hollow brick, glass blocks.

PUBLIC TOILETS

- Walls painted with weather-shield paint for easy cleaning and durability.
- For floors, utilize non-slip ceramic tiles or natural stone with appropriate surface treatments.
- For Cubicle partitions use brickwork or solid plastic partitions in HPL or HDPE, that can be resistant to moisture, impact, and vandalism.
- Ceramic sanitaryware is widely used. Metal sanitaryware in humid environments is prone to rusting. Opting for high-grade stainless steel and regular maintenance can mitigate.

CEILINGS

- For taller and habitable infrastructures expose true ceiling with paint finish, if required, provides a clean look and allows for easy maintenance and access to utilities.
- Light-colored ceilings can help to brighten the space.
- Use acoustic ceiling tiles for noise reduction.
- Other options include:
  - Suspended Ceilings
  - Concealed Grid Systems
  - Perforated Aluminium Panels
  - Stretch Ceiling

INTERIOR FURNITURE

- Prioritize durable, fire-resistant, and non-toxic materials that can withstand heavy use, cleaning, and potential vandalism.
- Interior public spaces offer diverse design options. Common materials include wood, metal, and plastic.
- Incorporate built-in seating/furniture constructed from concrete or brick whenever feasible. This approach enhances longevity and significantly reduces the risk of vandalism or theft.

DOORS, WINDOWS AND VENTILATORS

- Provide Accessible doors and windows with lever-style handles or push-pull handles. Avoid knobs.
- Consider automatic doors, especially in high-traffic areas.
- Ensure operable windows for ventilation and emergency egress. Sliding windows may compromise on cross ventilation.
- Use easy-to-operate controls for ventilation systems.

IV

OPERATIONS & MAINTENANCE

In a city like Chennai, prone to extreme weather conditions, heavy rainfall and urban flooding, effective Operations and Maintenance (O&M) of public infrastructure is paramount for the safety and well-being of its citizens. This extends beyond basic upkeep and encompasses a holistic approach to ensuring the city's resilience and inclusivity.

Properly functioning drainage systems, regularly desilted and cleaned, are crucial for flood mitigation, reducing the risk of waterborne diseases and safeguarding vulnerable communities. Well-maintained streetlights enhance visibility, deterring crime and improving safety for women, especially during evening hours. Reliable and accessible public transportation systems, with well-maintained accessibility features, are essential for the safe and independent movement of people with disabilities.

Furthermore, O&M plays a vital role in creating inclusive and comfortable public spaces. Well-maintained footpaths, free from obstructions, and accessible public amenities like toilets and water fountains enhance the quality of life for all citizens. Clean and well-lit parks and community centers foster a sense of community and inclusivity. Effective O&M is not merely about maintaining assets; it's about creating a safer, more equitable, and more inclusive urban environment for all. By prioritizing O&M, Chennai can mitigate the impacts of urban challenges, enhance the safety and well-being of its citizens, and build a more resilient and equitable city for all.

GENERAL O&M SUGGESTIONS ACROSS INFRASTRUCTURE

PARKS AND PLAYGROUNDS:

- Regular cleaning of pathways, play equipment, and seating areas.
- Ensure working drainage to prevent waterlogging.
- Maintain greenery with scheduled tree trimming and grass cutting.
- Repair broken play equipment and ensure safety padding is intact.
- Provide adequate lighting and maintain security patrols.
- Keep parks and playgrounds open all day, if possible.
- Install drinking water stations and functional dustbins.
- Train first responders, such as park security personnel, with a clear Standard Operating Procedure (SOP) for effectively responding to incidents of harassment against women.

Conservancy Workers in Chennai
Photo Credit: Inmathi

UPKEEP OF BEACHES:

- Daily cleaning of sand and removal of waste/debris.
- Maintain clear signage for safety, restrooms, and emergency contacts.
- Ensure functional beach showers and changing rooms.
- Regular checks on accessibility features like ramps and boardwalks.

SPACES UNDER FLYOVERS

- Regular waste removal and pest control.
- Ensure good lighting and CCTV surveillance.
- Maintain designated seating, vending, or recreational zones.
- Prevent encroachments that hinder accessibility.
- Use tactical interventions to make spaces usable and safe.

BUS SHELTERS AND TRANSIT STATIONS

- Ensure proper signage and real-time transport information.
- Maintain seating and shelters for comfort.
- Regularly check for functional lighting and CCTV cameras.
- Keep drainage clear to prevent water stagnation.
- Provide accessible features like ramps and tactile paving.

SUBWAYS AND FOOT OVER BRIDGES

- Ensure well-lit, clean, and safe passageways.
- Maintain escalators and elevators for accessibility.
- Install and monitor emergency call buttons and CCTV surveillance.
- Regularly repaint and repair structural elements.
- Keep pathways clear of encroachments and vendors.

STREETS

- Ensure proper waste collection and street sweeping.
- Maintain footpaths, streetlights, and pedestrian crossings.
- Remove obstructions and encroachments from pathways.
- Regularly prune trees to prevent obstruction. Keep public seating areas clean and functional.

MARKETS AND DELIVERY CENTERS

- Provide waste bins and ensure timely garbage collection.
- Maintain adequate drainage and ventilation. Ensure clear pedestrian pathways for movement.
- Repair damaged roofs, stalls, and common areas.

- Provide clean drinking water and basic sanitation.
- Organize structured queue systems for efficient service.
- Provide shaded waiting areas with seating.
- Ensure clear signage for process clarity.
- Maintain accessible entrances and service counters.
- Regularly sanitize spaces for hygiene.
- Extend operational timings of ration shops and adequate supplies.

PUBLIC TOILETS

- Ensure regular cleaning and restocking of essentials.
- Maintain functional water supply and drainage.
- Ensure proper lighting and ventilation.
- Provide accessible stalls with ramps and grab bars.
- Implement digital monitoring for maintenance tracking.

COMMUNITY HALLS AND SHELTERS FOR THE URBAN HOMELESS

- Maintain cleanliness and functional utilities.
- Provide separate spaces for communal and private needs.
- Ensure proper ventilation and lighting.
- Conduct regular pest control and sanitation drives.

Women waiting outside a Ration Shop in Chennai
Photo Credit: BBC

Daily wage workers at leisure.
Photo Credit: Flickr

INNOVATIVE PARTNERSHIP AND FUNDING MECHANISMS

- Delaying maintenance significantly increases long-term fiscal costs. Proactive budgeting for staffing and materials is crucial to address issues promptly and maintain overall infrastructure quality.
- It's crucial to foster partnerships with consultant, contractors, and NGOs, empowering them with clear contracts and adequate budgets to oversee project implementation.
- "Friends of.." initiatives encourage community ownership by inviting various sectors to adopt and maintain public spaces. This fosters a sense of responsibility and builds meaningful stewardship opportunities.
- Public-Private Partnerships (PPPs), such as Improvement Districts, should be facilitated at the ward level. These districts, operating within a framework of O&M standards set by the city, can effectively manage and maintain critical infrastructure like transit hubs, beaches, and public toilets.
- Ensure spaces are managed by a designated local authority or a responsible private organization to prevent vandalism. Clearly display the contact information of the responsible entity to facilitate complaint resolution and ensure prompt action.
- Consider setting up Area Management Committees (AMCs), as seen in Japan, which bring together residents, businesses, developers, and officials to collaboratively manage public spaces. Common in commercial and redevelopment areas, AMCs coordinate cleaning, events, and improvements through strong community engagement and public-private partnerships.

COMMUNITY STEWARDSHIP TRAINING INITIATIVES

- Promote innovative partnerships by involving Self-Help Groups (SHGs) and community groups in the maintenance and management of parks. Provide training, resources, and revenue-sharing models to empower local stakeholders and ensure long-term sustainability.
- Implement programs such as community awareness campaigns, training workshops, and volunteer clean-up drives in parks and beaches to foster a sense of ownership and responsibility among users.
- Establish effective feedback mechanisms to collect complaints, suggestions, and user experiences from both the public and staff
- Actively engage with local communities to gather feedback on the placement of elements, assess the effectiveness of existing infrastructure, and make necessary adjustments based on user input.
- Anti-harassment and Gender sensitivity training to be given to all staff, security & maintenance personnel.
- Collaborate with cultural, art, educational, or social

organizations to enrich public spaces, incorporating programming and pop-up activities, leveraging local knowledge for data collection, and enhancing the overall experience of spaces like transit hubs and parks, transforming them into vibrant community hubs.

IMPROVING THE PERCEPTION OF SAFETY

- **Signage:** Implement clear and concise signage demarcating expected user behaviors, identifying hazardous areas, and prohibiting unsafe activities within and around public infrastructure.
- Install clear and prominently placed signage displaying women's safety helpline numbers.
- **Abandoned Spaces:** Collaborate with stakeholders, including local authorities and community groups, to address blight and abandoned spaces in the vicinity of infrastructure, as these contribute to a sense of insecurity.
- **Adequate Lighting:** Ensure the proper functioning of streetlights along all infrastructure corridors. Establish a system for promptly reporting and addressing faulty streetlights.
- **Maintenance:** Remove or repair broken, rusted, and vandalized equipment and furniture promptly. This not only enhances safety but also improves the overall aesthetic appeal of the space.

OPERATIONAL HOURS AND ACCESS

- Ensure availability of staff and access to infrastructure during the stipulated working hours
- Avoid closing main entrances and facilities like toilets during the operational hours. Toilets should be free of cost as they are essential services.
- To maximize accessibility and inclusivity, consider minimizing closing hours for essential utilities. Integrate key amenities like toilets, seating areas, and well-lit waiting spaces within public infrastructure to serve as vital nodes of support throughout the day.
- Prioritize 24/7 accessibility for these essential services whenever feasible. Implement robust security measures, including adequate natural and remote surveillance systems, to ensure the safety and comfort of all users.
- Designated disabled parking areas should be open at all hours where dedicated parking is provided. Fines should be imposed for violaters.

MAINTENANCE STAFF AMENITIES

- Provide safe and dignified shelter spaces/office rooms/resting areas for security guards, janitors, and other maintenance staff.
- Ensure staff spaces are well-ventilated and well-lit, with access to clean water, toilets, changing areas, and, where applicable, facilities such as day care or feeding rooms for working mothers.

WASTE MANAGEMENT

- Implement a schedule for regular bin emptying, with increased frequency during peak hours (weekends, holidays) to prevent overflows and litter.
- Increase the quantity of bins in high-volume areas to accommodate increased waste generation.
- Incorporate microchips and geotags into garbage bins to track their location and monitor waste collection levels at each location.
- Ensure the presence of waste disposal and recycling elements in all infrastructure, regardless of size.
- In areas with high bio-waste generation (e.g., vending areas, markets), provide segregated waste bins for organic waste and encourage composting initiatives.

TOILET HYGIENE AND SANITATION

- ULBs should establish and enforce stringent standards of safety, comfort, and maintenance for all community and public toilets, regardless of the operator (whether municipal or NGO).
- Implement a rigorous cleaning schedule, including multiple cleanings per day (morning, afternoon, evening, night) with a rotating staff.
- Maintain an inventory of cleaning schedules to ensure consistent and timely cleaning of each toilet stall.
- Prioritize frequent cleaning in high-traffic areas such as transit hubs, beaches, and parks.
- Ensure the availability and proper functioning of sanitary product dispensers in all public toilets, especially in locations frequented by women and girls (markets, transit hubs, parks, beaches, remote areas).
- Ensure regular cleaning and maintenance of drinking water facilities and containers.
- Regularly inspect and repair water fetching points to ensure reliable access to clean water.

EMERGENCY AMENITIES

- Ensure clear, unobstructed, and well-maintained pathways to SOS buttons, emergency exits, police booths, and toilets.
- Prioritize accessibility for all users, address broken pavements and uneven flooring promptly.
- Ensure the proper functioning of CCTV cameras, surveillance systems, digital signboards, and alarm systems through daily checks.
- Equip high-traffic areas with smoke detectors and fire extinguishers. Regular checks and maintenance of these systems is critical.

INFRASTRUCTURE	BEST PRACTICE
PARKS	• Engage in community consultations during the planning of parks and playgrounds to determine appropriate facilities—such as basketball or football—based on the local context. • All play equipment shall consider long-term maintenance requirements, thus be expected to have a lifespan of minimum 20 years. • For Medium/ large parks - Introduce low speed vehicular based maintenance and safety patrol like battery-operated buggies, cycles.
BEACHES	• Engage in community consultations during the planning of beaches to determine appropriate facilities—such as landscape or recreational facilities or fishing community livelihood infrastructure—based on the local context. • Equip beach vendors with special training as ambassadors for beach sanitation and safety in a set radius around the shop. • Introduce beach upkeep personnel (part-time) with certificates and courses. • Apart from maintenance personnel lifeguards are essential in public beaches to monitor swimmers and beach users.
FOOT OVER BRIDGE **SUBWAYS** **SPACES BELOW FLYOVERS**	• Subways and underpasses are built to last for several decades and there is a need to consider the 100 year design life and provide adequate programmatic, spatial and maintenance facilities. • A well-designed drainage system must be provided to allow for satisfactory disposal of runoff and prevent flooding or pooling on approach to or within the underpass.
TRANSIT HUBS	• Information kiosks, digital and tactile signs that point to schedules, emergency, amenities for women, elderly and persons with disabilities and digital sign boards are crucial for transit hub user experience and comfort. • Ensure elevators / escalators are working in all locations. Ensure wheelchair rental facility and personnel are well-equipped and trained.
MARKETS	• Since markets tend to generate large amounts of non-biodegradable and food waste, providing coloured segregated waste bins that are accessible to all vendors are crucial to maintain hygiene levels. • Introduce mandatory Waste to Wealth programs by partnering with local NGOs and businesses that use recycled products and help with waste management. Example - India Wasted 360*.Inklink Charitable Trust - Kannagi Nagar.
COMMUNITY HALLS	• Assign atleast 2 paid designated persons from the community or neighbourhood to care for the space and ensure its appropriate use, prevent misuse and maintain access.

V

ALONG WITH DESIGN

What impact can design have?

1. Design can be empathetic— it can consider the individual who will have access to public space only because of a design change. It asks whether a feature is essential for certain groups of people to use a space, even if each of those groups is small. Design should also consider whether it provides necessary support during emergencies, even if these situations occur infrequently.
2. Design can foster connectivity and seamless transitions to, within, and between public spaces frequent public transport to varied destinations, spatial planning, and clear signage within the space, and creative planning between spaces.
3. Design can improve users' experience of a space through thoughtful layouts, safe environments, and community engagement.
4. Design can encourage people to visit a space regularly and repeatedly. Such return visits enhance the utilization and value of public spaces.

This study involved an in-depth literature review, a rigorous exploratory research design, including multiple methods of data collection and documentation of diverse user experiences. It has led to a comprehensive design checklist for over ten public spaces sanctioned, financed, built, and maintained by the GCC. The checklist reflects the design intentions listed above and proposes practical interventions aimed at making Chennai's built environment more accessible, inclusive, and safer for women of diverse identities and life circumstances.

The limitation of the built environment design is that it cannot work in isolation. Consider the following scenarios:

- The beach access path is often crowded with people walking, making it difficult for wheelchair users to get to the water. The built design of the beach access path eases the water access route for everyone. While walking on sand is more challenging for everyone, many do not realize that the access path is the only route available to wheelchair users, making their unrestricted access

essential.

- An open market may have toilets with signage that includes transpersons, but a group of transwomen are not allowed into the market by the police personnel on duty because of their biases. While the built and signage design is inclusive, people's attitudes disallow and keep marginalized groups away from such public spaces.
- A gender-mixed group of young people has left college early and is spending the afternoon at a park. All goes well until another park user chides them for being 'loud and disruptive', targeting the women specifically for having 'loose morals.' Design cannot keep women safe from regressive or patronising attitudes, and an incident like this will not make women feel welcome to be themselves in a public space, resulting in them avoiding using such spaces at all.

To sum up, design can make a place physically accessible, but it cannot, on its own, make people feel welcome and safe. A place can be designed to respond to emergencies, but it cannot alleviate the feeling of being unsafe or unheard. Rather, inclusive design is a foundation on which an inclusive community can be fostered.

Inclusive built environments should be supplemented by sensitization training for the staff, and public awareness campaigns that slowly but steadily chip away at people's prejudices, moral stances, and internalised behaviour patterns. Spaces that are designed specifically keeping in mind accessibility, inclusivity, and safety will remain underutilized by women from diverse walks of urban life if awareness is not placed alongside design.

Another limitation of built environment design is that while it needs constant upgrade, it is not simple to do due to a lack of human and financial resources. The only way then to get the design to work and do so continuously is to

- build collaborative models between designers and users, builders and neighbourhoods, government agencies and activists, the planner and the public,
- foster cultures of listening where user needs are prioritised, and feedback is valued.
- allow diverse and local community ownership to oversee, engage, and intervene in the making and maintaining of public spaces and infrastructure.

Most importantly, it would mean a commitment as planners, policy makers, engineers, and builders to put our ears to the ground before we build from the ground up.

Reimagining the Everyday City: Designing for Inclusion

Greater Chennai Corporation Inclusive Design Manual, developed by the Greater Chennai Corporation and Gender and Policy Lab, addresses a vital question: What does inclusive infrastructure truly mean? Rooted in Chennai's unique realities and informed by global best practices, this manual is a call to action to design a city that works for everyone. It reveals how everyday spaces—from bus stops and markets to public toilets and beaches— can be made more accessible, welcoming and safe by design.

Combining rigorous field research with community insights, the manual offers practical design strategies for twelve key public infrastructure types. Each chapter unpacks barriers to access, comfort, and safety, and provides a checklist to assess and improve inclusivity. Designed for engineers, planners, architects, civic actors, and administrators, this manual is both a technical guide and a roadmap for creating a more equitable city.

design co:lab

GENDER & POLICY LAB
GREATER CHENNAI CORPORATION