INFANT, TODDLER, CAREGIVER FRIENDLY NEIGHBOURHOOD 2.0

DESIGN GUIDELINES

Nurturing Neighbourhoods Challenge

Ministry of Housing and Urban Affairs
Government of India

Smart City

The Ministry of Housing and Urban Affairs is the apex authority of Government of India to formulate policies, coordinate the activities of various Central Ministries, State Governments and other nodal authorities and monitor programmes related to issues of housing and urban affairs in the country. The Smart Cities Mission was launched by the Ministry in 2015 to promote sustainable and inclusive cities that provide core infrastructure and give decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions.

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URBAN 95

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Nurturing
Neighbourhoods
Challenge

The Nurturing Neighbourhoods Challenge is hosted by the Smart Cities Mission, Ministry of Housing and Urban Affairs, Government of India, in collaboration with Van Leer Foundation and with the technical support of WRI India. This Challenge aims to incorporate a focus on neighbourhood-level improvements that promote healthy early childhood development (0-5-year-old children) in the planning and management of Indian cities.

https://smartnet.niua.org/nurturing-neighbourhoods-challenge/web/

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ABOUT THE DESIGN GUIDELINES

The 'Design Guidelines' document answers the question of "how" can we achieve the benchmarks in the Infant Toddler Caregiver-friendly Neighbourhoods (ITCN) indicators from guide two, 'Evaluation and Monitoring Metrics'.

The guidelines herein are conceived as a supplement to other urban design guideline packages that already exist for the Indian context. This document looks at key features of pedestrian-oriented public space and offers pointed insights about what young children and caregivers need from those features.

Installing a bench in the public realm can be a positive expenditure. But when that bench is carefully coupled with shading and is designed with an extra wide and flat surface for a baby to crawl on, the generic bench becomes a specific piece within the public realm that supports early childhood development outcomes. The young children and caregiver-friendly neighbourhood emerges when a critical mass of those pieces is achieved.

Streets and public spaces guidelines

ITCN guidelines

The following ITCN design guidelines are organised so that they can be read as a supplement to other established street design guides. Young children and caregivers need to be considered at every step of the planning process. These guidelines offer focus on what is pertinent to this user group within current best-practices of walkability and pedestrian-oriented urban design.

The purpose of this guide is to:

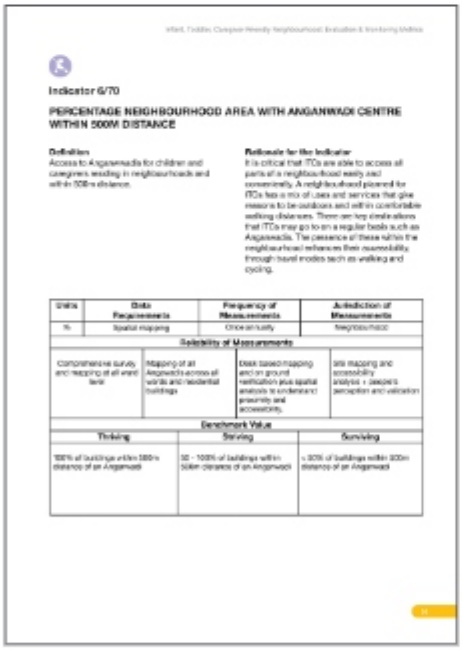
- **Define physical components** and approaches that specifically improve the quality of the public realm for young children and caregivers.
- **Illuminate the interrelationships** of these elements placed in the neighbourhood, giving users greater depth of insight.
- Communicate the **means by which objectives are achieved**, as well as make a clear connection to the evaluation and monitoring methodology.

HOW TO READ THE GUIDELINES

The document sets out specific design guidelines for various project domains, such as streets, open spaces and others. Along with it, each domain co-relates to specific indicators to be measured for a successful young children and caregiver-friendly neighbourhood, which are detailed in ITCN guide two - Evaluation and Monitoring Metrics. For each indicator, there are three service level benchmark values that give users clear definition on the provision of a feature ranging from 'surviving;' the most basic provision, through 'striving,' to 'thriving.'

If the indicator benchmarks tell users 'what' interventions a neighbourhood needs, the Design Guidelines offer guidance on 'how' to bring the interventions into being.

Sample page from the Evaluation and Monitoring guide:



Indicator 6/70

PERCENTAGE NEIGHBOURHOOD AREA WITH ANGANWADI CENTRE WITHIN 500M DISTANCE

Definition
Access to Anganwadis for children and caregivers residing in neighbourhoods and within 500m distance.

Rationale for the Indicator
It is critical that ITCs are able to access all parts of a neighbourhood easily and conveniently. A neighbourhood planned for ITCs has a mix of uses and services that give reasons to be outdoors and within comfortable walking distances. There are key destinations that ITCs may go to on a regular basis such as Anganwadis. The presence of these within the neighbourhood enhances their accessibility through travel modes such as walking and cycling.

Units	Data Requirements	Frequency of Measurements	Jurisdiction of Measurements
%	Spatial mapping	Once an hourly	Neighbourhood

Reliability of Measurements

Comprehensive survey and mapping of all ward level	Mapping of all Anganwadis across all wards and residential buildings	Desk based mapping and on ground verification plus spatial analysis to understand proximity and accessibility	site mapping and accessibility analysis + people's perception and validation

Benchmark Value

Thriving	Striving	Surviving
100% of buildings within 500m distance of an Anganwadi	50 - 100% of buildings within 500m distance of an Anganwadi	< 50% of buildings within 500m distance of an Anganwadi

Benchmark Value		
Thriving	Striving	Surviving
100% of buildings within 500m distance of an Anganwadi	50 - 100% of buildings within 500m distance of an Anganwadi	< 50% of buildings within 500m distance of an Anganwadi

Design guidelines show interventions through which neighbourhoods can reach 'thriving' status.

These guidelines are organised by the elements of a neighbourhood, giving the reader an easy-to-navigate list covering the breadth of the public realm.

Neighbourhood Layout: covers the larger scale organisational factors, such as the overall character, the density, distance, and mix of facilities with the area.

Informal Settlements: cover basic infrastructure improvement, placemaking and specific solutions for informal settlements.

Streets: cover mainly design of streets and access areas concerning the practicalities of moving comfortably in neighbourhoods.

Mobility: cover city-level transit aspects to become suitable for young children and caregivers.

Parks and Open Spaces: cover public spaces and destinations that are critical for young children and caregivers.

Social Infrastructure: cover local amenities and community facilities.

Urban Services: cover water, electricity, waste, drainage, and other environmental factors.

Ambient Environment: covers solutions and guidelines to curb pollution.

HOW DOES ONE DECIDE WHICH COMPONENT TO USE?

Understanding ITCN objectives and the service level benchmarks of the ITCN indicators will give Urban local bodies (ULB), a clear way forward in addressing the shortcomings of their respective neighbourhoods. Still, interventions need to be planned wisely.

Most cases of recent success in the Indian urban context have come from collaborations between urban design firms and ULBs. (See JM Road Pune et al.) A well-selected design professional will possess sensitivity in materiality and think through the complexities of combining elements.

It is when a bench is well located and is installed in combination with other key factors, like good shade and even and clear lighting, where the bench is transformed from a neutral piece of equipment into something that is actively contributing toward early childhood development goals.

Infrastructure becomes developmentally supportive in the right combination with other elements.

More people will use a great bench. A bad bench will usually be empty.

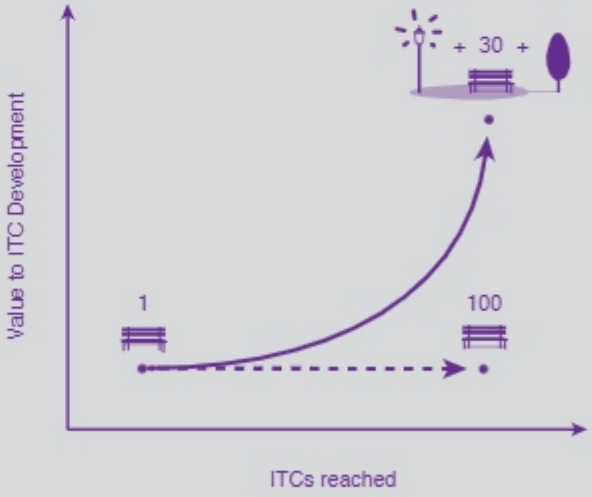
The elements included here for guidance work best for young children and caregivers when they are used in combination.

For example,

Next time you are thinking about a new public property, such as:

Fence: add a sittable surface, plant vines at its base for shade, and include solar lighting.

Crossing: include bollards, paint extra colour into the crossing, include solar lighting, and think about rainwater catchment.



Young children and caregivers use the public realm in specific ways, and the design needs to respond to it.

This bench offers a clear example of what young children and caregivers need from a place to sit. It is a low-height seat, making it easy for toddlers to climb and sit. It also reduces the risk of injuries from falling. It is a wide and completely flat surface, which would allow a mother to lay a baby on its back or to lay a baby carrier flat next to her instead of on the ground. And it provides a back to lean against, which makes a huge difference in comfort for longer stays— say, in the case that there is an older sibling playing nearby.

Fontaine d´Ouche Dijon district, France
© Mmcite group

In combination with other key elements like a sense of quiet, trees and shrubs, and benches in the right number and with plenty of variation, seating systems can become rich spaces of wonder and learning for young children. These shaded and semi-private seating areas provide an ideal setting for caregivers to spend quality time with their young children and even ensure comfort for feeding in public spaces.

DECISION MAKING STORIES

New projects in the neighbourhoods will have competing points of view on what to do, where to do it, and when it should happen. The **'statue effect'** describes the tendency to push for high-profile projects that are attention grabbing but which have minimal positive effects on the wellbeing of residents. The statue effect can be counteracted by fair use of data and drive a dialogue about young children and caregivers-centric interventions.

Data can focus discussion by delimiting the possibilities of what can be proposed as well as offering stakeholders a common language.

Examples of unfocused stakeholder viewpoints in the absence of data are below. Stakeholder's frequent first impulse is to think personally and to say 'no.' Data can help to ground dialogue in the realm of what is possible, rallying residents around positive outcomes.

Urban Local Body official

"I want something that will bring media attention to our young children and caregivers. It needs to be relatively cheap and easy to install."

Residents Welfare Association

"We want to make sure that the parking places around the park will not be threatened by any new intervention."

Young children and caregivers' family

"Our children need much more space to play ball games in the park near our house."

Business owner

"Widening the street next to the park for walkers will prevent people from finding my business easily."

ITCN Indicators and Objectives

A statue of a mother and child in a park, more parking, or the fear of lost business wouldn't clearly satisfy any of the ITCN objectives or indicators. These tools can be a useful first filter for any ideas of expenditures.

Use data to anchor and orient conversations about what to build.

These data can be useful entry points.

FINDINGS OF BASELINE SURVEY:
SHOWS A MAJOR LACK OF NATURAL SPACE IN NEIGHBOURHOOD PARKS

Consult of ITCN objectives and the benefits of "Connection to nature" and informal play for young children.

Through balancing data with ITCN objectives, solutions may emerge that no resident nor local politician previously knew that they "wanted" or "needed"—or was even possible for that matter—but which offers the field of stakeholders a common cause that can be rallied around.

High-profile Ecologically Conscious Park

The Hillside Eco-Park, Hunan Province, China. © Z+T Studio

In addition to deciding what to build, using data to establish where new interventions should get implemented will add complexity to the dialogue. Data ensures the evenness of benefits to young children and caregivers from new projects.

FINDINGS OF BASELINE SURVEY:
INVESTMENT OCCURRED IN A SINGLE BLOCK, BUT NOT THE SURROUNDING STREETS.

Consult of ITCN objectives for the benefits that come from safe, healthy, and interconnected streets.

Though a new park will be well liked, its benefits will be undermined if people cannot comfortably walk to it. Indeed it may make sense to invest in basic upgrades to the neighbourhood park, and to simultaneously allocate for improvements to the streets immediately surrounding it.

Safe and Green Pedestrian Route to Park

DP Road, Pune, India
© Prasanna Desai Architects

MANAGEMENT, MAINTENANCE AND ORGANISATION

Integrating management, maintenance considerations, and the organisation of public space at the outset of the planning and design process is essential. It helps to optimise the benefits and support the productive functioning and ultimate success of public spaces. Examples of these considerations include good organisation of functions, durable materials and design quality, wayfinding, and free public activators of space, such as music, storytelling, food, or nature education events.

These considerations include:

A combination of short-term, hands-on action, and long term strategies

- Long term strategies can include elements of regulation (for example, for building approval), stimulation (incentivising occupiers or owners to make improvements), activation of public space and physical improvements, as well as focused communications campaigns.
- Combining uses and transforming spaces throughout the day, for example, a parking space that is temporarily transformed into seating pockets in the evening hours.
- Be aware of the places that the community already spends time and meets in, e.g. pay attention to street corners and commonly used walking paths.
- Vacant and leftover spaces can (temporarily) become natural community areas or gathering spaces.
- Building in modularity enables the space to be adapted by the community for the desired uses at any time e.g., depending on weather, number of people and space available etc.

Co-creation, coalitions and self-organisation

- Creatively involving the community in decision making and the planning and design process will make spaces more relevant and usable by responding to demand, prompting buy-in, and bolstering civic pride.
- Integrate co-creation and engagement into the community's existing gatherings and places where they spend time, rather than organising events to new places that they need to visit.
- Create incentives for a sense of ownership and care of public space by the community and the consideration of spaces as something truly for the public.
- Community involvement in management and operation, directly or indirectly.
- Cross-sectoral approaches include parks and recreation, health, culture, transport, urban development, sport and leisure.

Place management

- Visibly active maintenance program that comforts and encourages young children and caregivers to spend time in public spaces and explore, especially women and girls.
- Progressive policies that address adults' misconception of play, the risks for children in public space and support creative ideas to provide safe spaces for young children.
- Inclusive policies for young children and caregivers, such as breastfeeding, toilets with diaper changing areas and drinking water.
- Maintenance, cleaning, waste and water management, lighting that can adapt to different uses and seasons.

Public park in India
© Van Leer Foundation and BDP

This park possesses some good features including safety from the street, sound protection, and a good amount of open space for kids to run. However, they can never use it because it is always occupied by large groups of men. Regular programming activities and weekend events in the park, specifically designed for women and children, such as storytelling sessions, puppet shows, outdoor book reading sessions, outdoor picnics, gardening workshops, music and dance classes, art and craft workshops, outdoor family movie nights, or community festivals will redefine young children and their caregivers' sense of ownership, making it feel more welcoming and inclusive for all.

Quick wins experiment

- Demarcate new approaches and catalyse improvements with pilots and trials, e.g., play streets / happy streets (street closures to traffic) or, 'building parties' - where the communityis involved in cleaning streets, planting trees, or painting facades as spaces change. Children can be the most active members of such events.
- Build trust and encourage buy-in from building owners/occupiers, decision-makers and the community.
- Must be combined with a long-term strategy for evaluation, scalability and replicability.

Costs and benefits

- Understanding underlying financial patterns and the actors influencing public space, such as managers, building owners, occupiers, and developers.
- Allocation of funds for maintenance and social components, such as placemaking.

NEIGHBOURHOOD LAYOUT

Objectives Achieved	Indicators
	1. Perception of safety for young children and caregiverss of key public amenities -streets, parks, play spaces, school, health services (Supporting)
	2. % of buildings within 300m distance of a green space above 125 square metres(Core) 3. % area informal settlements with parks in walkable distance (Core) 4. % neighbourhood area with PHCs within 1000 metres distance (Core) 5. % informal settlements with PHCs within 1000 metres distance (Core) 6. % neighbourhood area with Anganwadi Centre within 500 metres distance (Core) 7. % informal settlements with Anganwadi Centre within 500 metres distance (Core) 8. % of households that have access to a crèche within 500 metres (Core)
	9. % of open space in the neighbourhood (Core) 10. % of open spaces in informal settlements (Core)

Refer: ITCN 2.0 Evaluation and Monitoring Metrics

*Anganwadi Centre (AWC) - Early childhood care and learning centre in India.

01 Neighbourhood Layout

Neighbourhood Layout guidelines are concerned with the larger scale organisational factors within an area, its urban design. This is the process of giving form, shape and character to urban spaces that will influence the overall physical environment.

Major urban layout changes within existing neighbourhoods can only be implemented over a long period. In the short term it is possible to bring about changes and improvements to destinations in a neighbourhood, but then only in a step-by-step manner. New greenfield developments should aim to follow the guidelines for destinations given below for a thriving young children and caregivers community.


Dwarka Community shopping
©Radhika Mathur

MIXED USE

Ideally, neighbourhoods should be planned to enhance everyday journeys and experiences outdoors. A neighbourhood planned for small children and their caregivers has a mix of uses and services that give reasons to be outdoors and within comfortable walking distances.


M. G. Road, Gangtok, Sikkim
© Navanil C.

This means that the positioning of destinations, such as health care centres, daycare centres, play grounds and other amenities within a neighbourhood requires careful consideration. Where there are more than one of the same type of amenity in a neighbourhood, these should be spread as evenly as possible around the neighbourhood. If there is only one specific amenity, such as a health centre, this should be placed at an easily accessible point in the neighbourhood.[1]


Community Park, Kirti Nagar, New Delhi
© Navanil C.

Consider setting up a Child Priority Zone:

[1] VLF Urban Starter Kit page 78 talks about the concept of setting up a Children's Priority Zone, which is focused around the main amenities frequented by children. It is worth looking this up to see if it can apply to your neighbourhood.

The first steps involve signage about the Children's Priority Zone, messages about the importance of early years, behavioural prompts to trigger interactions between caregivers and young children, or temporary activities such as pop-up play and play streets. It also involves finding ambassadors in the community who will promote the zone in day-to-day life.

click here for Children Priority Zone animation video

INFANT, TODDLER, CAREGIVER PROFILES AND THEIR CHARACTERISTICS

Caregivers of children are those who assure that the children are safe and healthy. They also equip and nurture children with the skills and resources to succeed as adults. Caregiver profiles vary for a young mother, an older sibling, an uncle, or a grandparent.

In order to identify and categorise various caregiver profiles in the city, we can use criteria of classification like age, gender, relationship with the child, social, and economic profile.

The physical space occupied, activities performed, utilities required, walking speed, walking patterns etc. largely differ with each profile.

There is a strong connection between the behavioral characteristics and the physical environment. A fair understanding of this relationship helps in the better design of the space. Characteristic details of various profiles are dependent on attributes, such as age, gender, and relationship with the child.

Based on the user profiles, design solutions can be customised to serve the needs of the local people. Detailed data collection from neighbourhood and referencing them with the profiling of the users could help towards evidence-based design.

Below are a few Infant, Toddler and Caregiver profiles that are often observed in public spaces. Every profile has unique requirements and characteristics, and these should be taken into account while designing public spaces.

Figure 3.1 Different types of young children and caregivers profiles

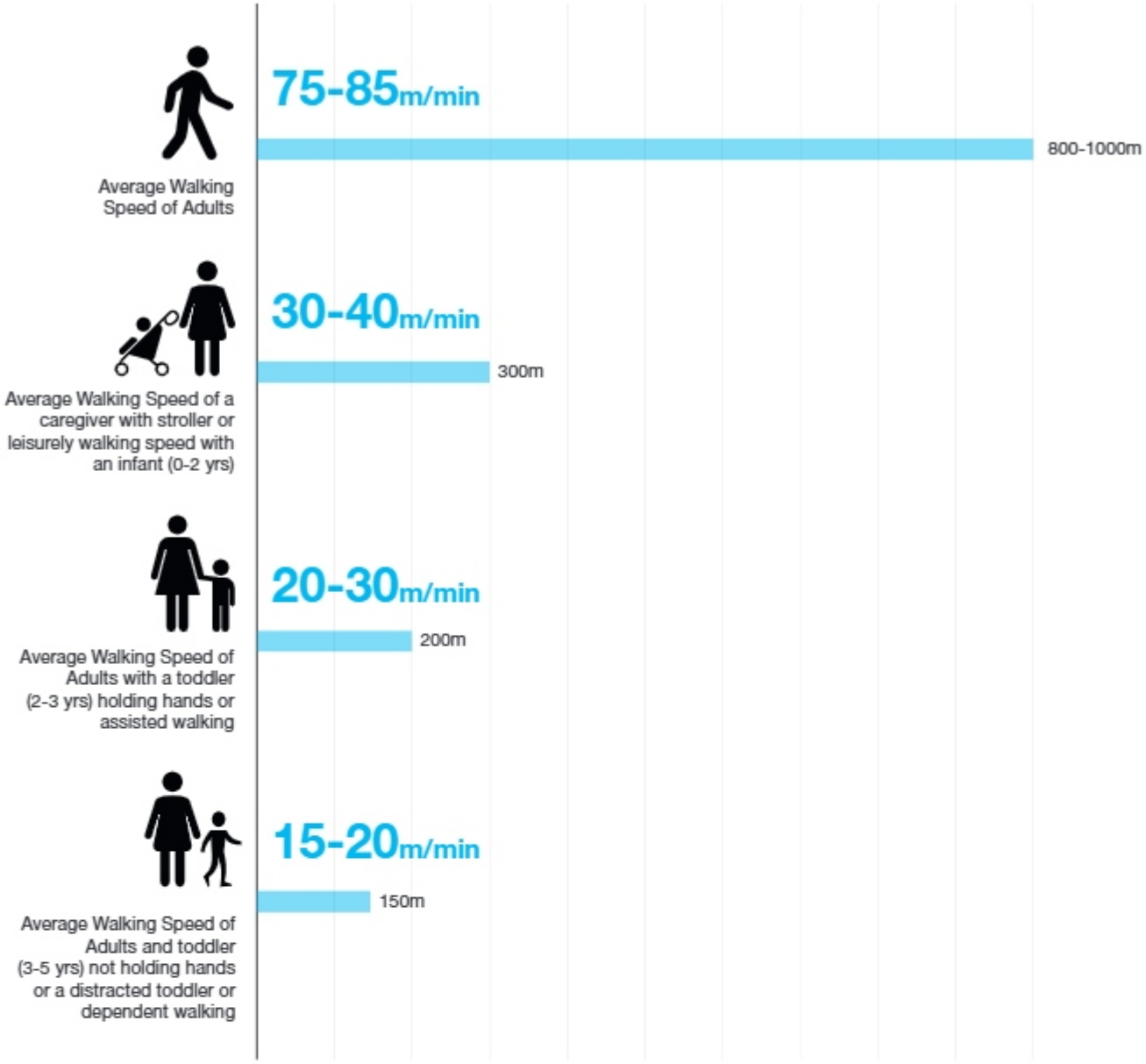


Figure 3.2 Walking speed of young children and caregivers

Note: We estimate that 3-5 y/o moves slower than a 2-3 y/o because they are more confident in the public realm to be curious.

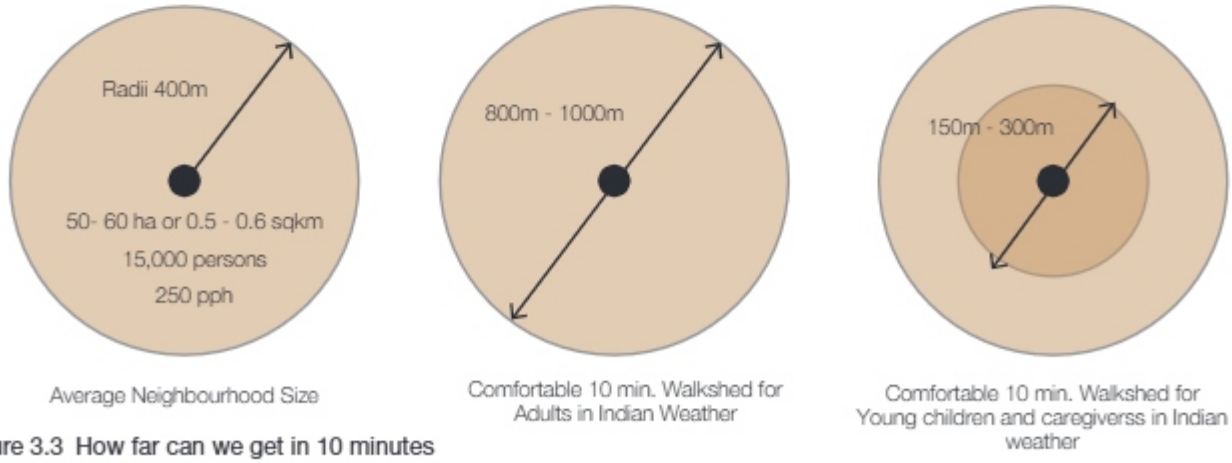


Figure 3.3 How far can we get in 10 minutes

[2] Table 8.1, Pg 283 , URDPFI Guidelines 2015, Ministry of Urban Development GoI, MoUD

WALKING RANGE AND ACCESS BY AGE

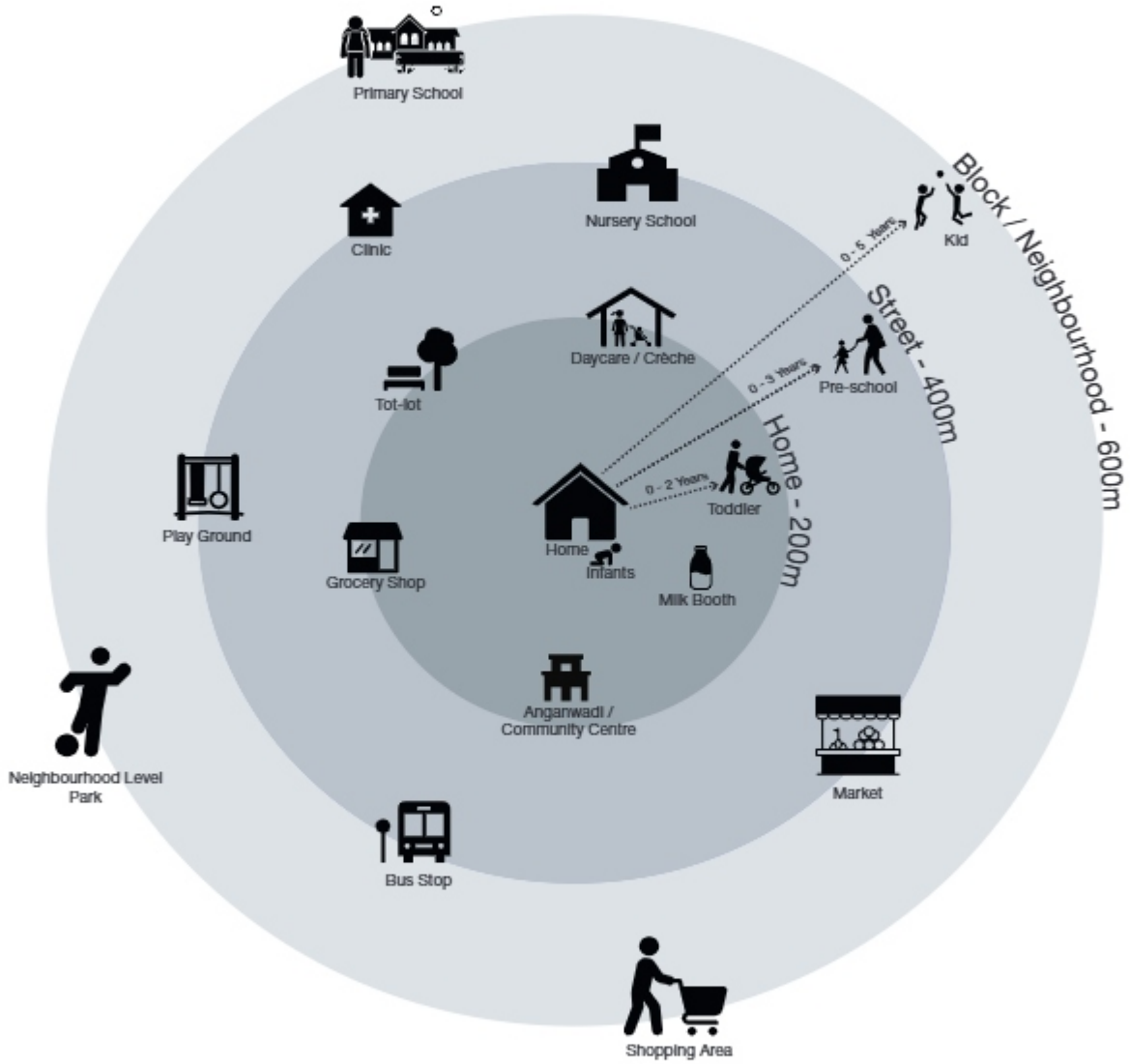


Figure 3.4 Location and hierarchy of amenities linked to child's physical development

HIERARCHY, DISTANCE AND DENSITY OF YOUNG CHILDREN AND CAREGIVERS FACILITIES

Because young children and caregivers have a shorter range of mobility, it makes sense to cluster a mix of destinations and complimentary services together. For example, a playground could be positioned close to a shop so that both destinations could be visited in one trip. Facilities for the young and old could be placed together to foster contact between these age groups.

Strategically positioning mixed facilities along frequently used pedestrian routes in the neighbourhood will stimulate more active mobility because all are within a convenient and comfortable walking distance. A caregiver often visits different amenities in one trip: a trip to fetch small children from a daycare centre may be combined with buying food and with a visit to the playground. Where amenities cannot be placed close together, link them via a clearly marked, continuous pedestrian route that is well marked.

Amenities can also be placed along or in close vicinity to the bus/ train/Bus Rapid Transit stops at the edge of a neighbourhood. Putting these daily destinations within walking distance of transit could increase the likelihood of working parents utilising transit while balancing the logistics of getting to daycare and work each day.

The placement of various young children and caregivers based infrastructure is currently given based on the city development plan or the master plan. These guidelines, however, do not specifically cater to young children and caregivers. We have to consider that their journeys are slightly different than the ones of a regular adult using the urban space. The walking speeds, distances covered, and things observed are very specific to this group. Also, the local climate and weather conditions make the whole experience of using the public space quite challenging in India. The needs of babies and toddlers differ from those of children in general as they are always with caregivers, their range of mobility is shorter, and their bodies and brains are more vulnerable.

Consider the following:

- Place amenities where they are **well connected** to the whole neighbourhood. For example, place along major pedestrian connections or at junctions of pedestrian paths.
- **Cluster** different types of amenities together that can be visited in one trip.
- Fences around amenities may be necessary for safety reasons, but they should not become obstacles. **Give gateways generous dimensions** so that caregivers with prams/children can pass through easily.
- Planting close to amenities should not become an obstacle. Ensure that there is space to comfortably walk with a pram or while holding hands with a small child around planting.
- Carefully consider the choice of ground surface materials around amenities. Materials should ensure that the facilities always have good accessibility, independent of weather.

The odds of extended park use (>15 minutes) increased fourfold when the distance between home and the nearest neighborhood park is decreased by 100 meters. Additionally, the odds of any park use (>5 minutes) doubled when moving from the 25th to the 75th percentile for park greenness/vegetation density. Neighborhood Park Use by Children

For more information on benefits of good amenities placement, please see: Local services and amenities, neighborhood social capital, and health

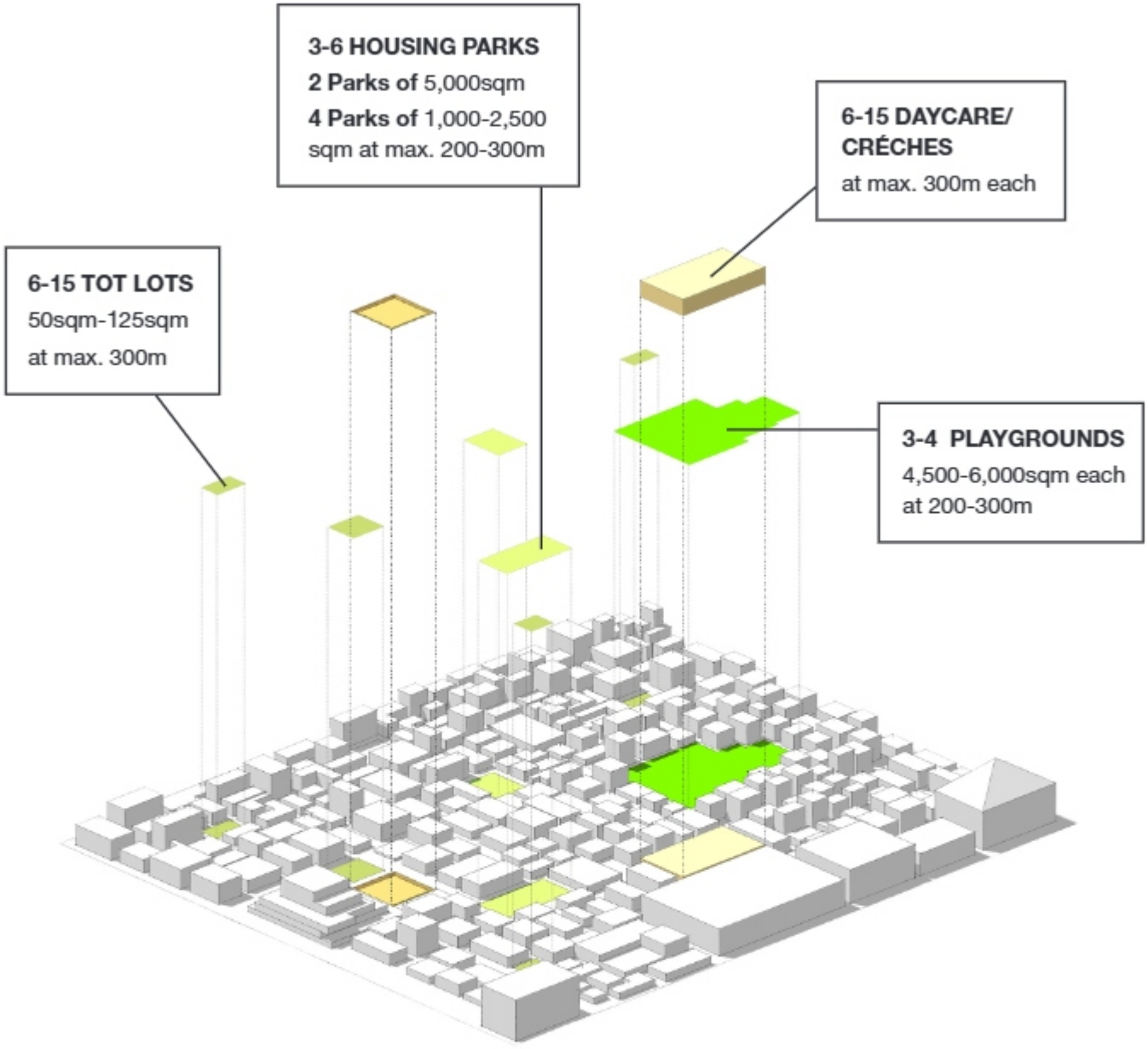


Figure 3.5 Neighbourhood model for young children and caregivers

* Total Area of the Neighbourhood is 60 Ha Approx. and the total population is 15,000 people. The recommendations mentioned here are based on the existing space standards suggested by URDPFI and Urban Greening Guidelines. The existing norms have been modified keeping in view the reduced speed of movement and comfortable outdoor time relevant for Indian climate. The recommendations are not mandatory and should be understood with respect to young children and caregivers specific needs only.

	Hierarchy	Distance	Density	Area	Remarks	Indicator to Refer
Open Spaces	Tot Lot Infants and caregivers : 0-2 yrs.	No existing Data **Recommended: Placed at walking distance of max.10 minutes or 300m.**	6 for a neighbourhood[a] **Recommended: 6-15**	125 square metre (sqm) each covering a total area of 750 sqm.[a] **Recommended: 50-125sqm. Covering a total area of 750sqm.**	We suggest that tot-lots as small as 50sqm can also be developed specially in denser areas as 125sqm may not be possible to acheive in all cases. This will incresae the spread and population reached across the neighbourhood.	31
	Housing Area Park Toddlers with caregivers: 2-3 yrs.	No existing Data **Recommended: Placed at 200-300m**	3[b] **Recommended: 3-6**	5,000 sqm Each. covering a total area of 15,000 Sqm.[b] **Recommended: 2,500 - 5,000sqm. covering a total area of 15,000sqm**	The number of Housing Area Parks is suggested to be increased for better reach.	27
	Neighbour-hood Park/ Playground Toddlers with or without caregiv-ers: 3-5 yrs	No existing Data **Recommended: Placed at 200-300m**	1[b] **Recommended: 3-4**	10,000sqm.[b] **Recommended: 4,500-6,000sqm covering a total area of 18,000sqm**	UN Habitat guideline suggest neighbourhood parks area to be atleast 400-4000 sqm. whereas we recommend minimum 10,000 sqm which may be broken into 2-3 numbers of parks for better distribution and Young children and caregivers reached.	28
	Average per capita Open Space		10 -12sqm per person Including recreational space, Organised green and other common open spaces (such as vacant lands/ open spaces including flood plains, forest cover etc. in plain areas. Min. 3sqm/ person In the built up area (excluding recreational space, vacant land, flood plain, forest)[b] **Recommended: 3-4sqm per person**		The range provided in URDPFI is a gross figure of open space and therefore not relevant for young children and caregiverss. The NBC stadard of 3sqm is a baseline standard. A range of 3-4 sqm is suggested in an attempt to better the existing norm.	29

Table 3.1 Recommended changes to norms for facilities in a neighbourhood

[a] Page 7, Urban Greening Guidelines, TCPO, GoI, MoUD

[b] Pt.8.4.5. Open Spaces, Page 362-63, URDPFI Guidelines 2015, Ministry of Urban Development

	Hierarchy	Distance	Density	Area	Remarks	Indicator to Refer
Education Facilities	Day Care Centers or Crèches *Young children and caregivers : 6 months to 6 years*	5-15 minutes walking distance (300-800m) **Recommended: Walking distance of 5-10 minutes or 150-300m**	No existing Data **Recommended: 6-15**	150-200Sqft 6-8sqft per child [c]	Day care centers or crèches should be placed preferably with a tot lot or open space. So the density of crèches is suggested to be matched with density of tot-lots. Number of children in a crèche should not be more than 25. Of these, at least 40 percent of children should, preferably, be below 3 years of age.[c]	8 48
	Pre-Primary, Nursery School *Toddlers: 3-5 yrs.*	5-15 minutes walking distance (300-800m) **Recommended: 200-400m**	6[d]	800sqm each[d]	To be located near a housing area park or a neighbourhood park. [d] In denser areas school space should be used as tot-lots after school hours.	6 7
	Primary School *Toddlers: Above 5 yrs.*	5-15 minutes walking distance (300-800m) **Recommended: 400 - 600m**	3[d]	4,000sqm, 2,000sqm built foot print and 2,000sqm playgound[d]	Playfield area with a minimum of 18m x 36m to be ensured for effective play [d] and open during non-school hours for young children.	
Health care Facilities	Dispensary	5-15 minutes walking distance (300-800m) **Placed at walking distance of 5-10 minutes or 150-300m**	1[e] **Recommended: 2-3**	800 - 1,200sqm each[e] **Recommended: 800-1,200sqm**		4 5
	Anganwadi Centre (AWC)	5-15 minutes walking distance (300 -800m) **Placed at walking distance of 5-10 minutes or 150-300m**	3[f]	200 - 300[f]	To be located near a Housing Area park	6 7

Table 3.2 Recommended changes to norms for facilities in a neighbourhood (as per URDPFI)

Anganwadi Centre (AWC): Early childhood care and learning centre in India.

[c] Rajiv Gandhi National Crèche Scheme for Children of Working Mothers, under the The Maternity Benefit Act 2017

[d] Pt.8.4.2. Education Facilities, Page 357, URDPFI Guidelines 2015, Ministry of Urban Development

[e] Table 8.50 Health Care Facilities, Page 360, URDPFI Guidelines 2015, Ministry of Urban Development

[f] Pt.8.4.4 Socio-Cultural , Page 361, URDPFI Guidelines 2015, Ministry of Urban Development & Pt.8.4.10.2 Amenities, Page 368, URDPFI Guidelines 2015, Ministry of Urban Development

PLANNING PRIORITY ZONES

Priority zones can be defined as spaces in the city where infants, toddlers, and caregivers live, play, learn and access various essential services and public spaces. An area encompassing clusters of parks, crèches, daycare centres, primary health centers, Anganwadi Centres and other related services could be designated as priority zones.

Stressors from the built environment, such as loud horns, speeding vehicles and lack of pedestrian facilities add to caregivers' anxiety while navigating in the neighbourhood. Thus, it is essential to implement holistic solutions in the priority zones which reduce stress and fear among caregivers and provide comfort.

Key factors for Priority Zones:

- **Reliable mobility** (Last mile connectivity) - Integrate mobility options to improve access to key destinations
- **Places to pause and stay**- Young children walk slowly and tire easily, so ensure enough places to rest.
- **Wider sidewalks** - Infants and toddlers are dependent upon caregivers to move in the city. Generally, when walking with infants and toddlers, caregivers hold children's hands, use strollers or other walking aids. For this, wider sidewalks and vehicle-free areas are necessary to ensure children and caregivers can walk and use the space comfortably.
- **Social interaction**- Streets and public spaces should be designed to encourage everyday experiences and invite meaningful interactions amongst community members.
- **Priority to walk or cycle-** The street network should be designed to prioritise non-motorised transport, giving priority to pedestrians and cyclists. Street design should ensure slower speeds of vehicles as well as promote lower emissions, especially in priority zones.
- **Visibility**- During design and planning, ensure that children are visible at all points, especially on street corners and junctions and similar conflict areas.
- **Spaces for play**- Create opportunities for children to play and learn in open spaces, and along the streets. Co-locate pocket parks and tot-lots in adjacent to their amenities to maximise usage.
- **Access to green open spaces-** Develop easy access to existing green and blue infrastructure in the city and enhance access to green open spaces and public spaces within priority zones.

Designing streets for kids-Global design cities Initiative-NACTO

Photo source Circling avenue-http://landezine.com/index.php/2018/04/circling-the-avenue-by-bo/

INFORMAL SETTLEMENTS

Objectives Achieved	Indicators
	3. % area informal settlements with parks in walkable distance (Core) 5. % informal settlements with Primary Health Centre (PHC) within 1000 metres distance (Core) 7. % informal settlements with Anganwadi Centre within 500 metres distance (Core)
	10. % of open spaces in informal settlements (Core)
	51. Household level coverage of SWM services through door-to-door collectio of waste in informal settlements (Core) 53. Quality of water supplied to household in informal settlements (Supporting) 64. % of encroached/informal area of total neighbourhood area (Supporting) 65. Community based organizations deliberately inviting women and representatives from informal settlements to planning meetings and delivering recommendations to ULB (Core) 66. Number of initiatives where NGOs working for women and children-oriented development were consulted or partnered with (Supporting)

Target Behaviours
1. Infants and toddlers spend more time playing outdoors and around nature 1.1 Infants, toddlers and caregivers engage in diverse types of play - formal and informal 1.3 Young children and caregivers in vulnerable community spend more time playing outdoors
2. Caregivers take infants and toddlers to visit public spaces / facilities more often 2.3 Young children and caregivers in vulnerable community use the available public spaces and facilities
5. Community encourages young children and family-friendly changes in the neighbourhood 5.2 Caregivers and community engage in community action for upkeep of interventions 5.4 Caregivers in vulnerable communities participate in decision-making for interventions related to them

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

01 Informal Settlements

VULNERABILITY OF YOUNG CHILDREN AND CAREGIVERS

In India, many young children and their families live in informal settlements with inadequate access to basic services, poor and unhygienic living conditions and lack of open or play spaces and safe mobility, hindering their early cognitive, mental, and physical development. They do not have easy access to quality Early Childhood Development (ECD) services, and, often, these settlements are not considered in the overall city and transport service planning. The specific issues impacting the lives of young children and families are listed in Figure 3.6, essentially categorised into four- social, livelihood and play, environment, and health and protection.

Cities can decide which settlements require immediate attention by first analysing certain parameters, such as risk of hazards, access to services, density, and population. Relevant parameters for this identification process are listed in the box below.

Critical parameters for informal settlement identification at city level

- 0-5-year-old population
- Housing density
- Access to basic services – water, sanitation, electricity
- Land status
- Hazards
- Permanence

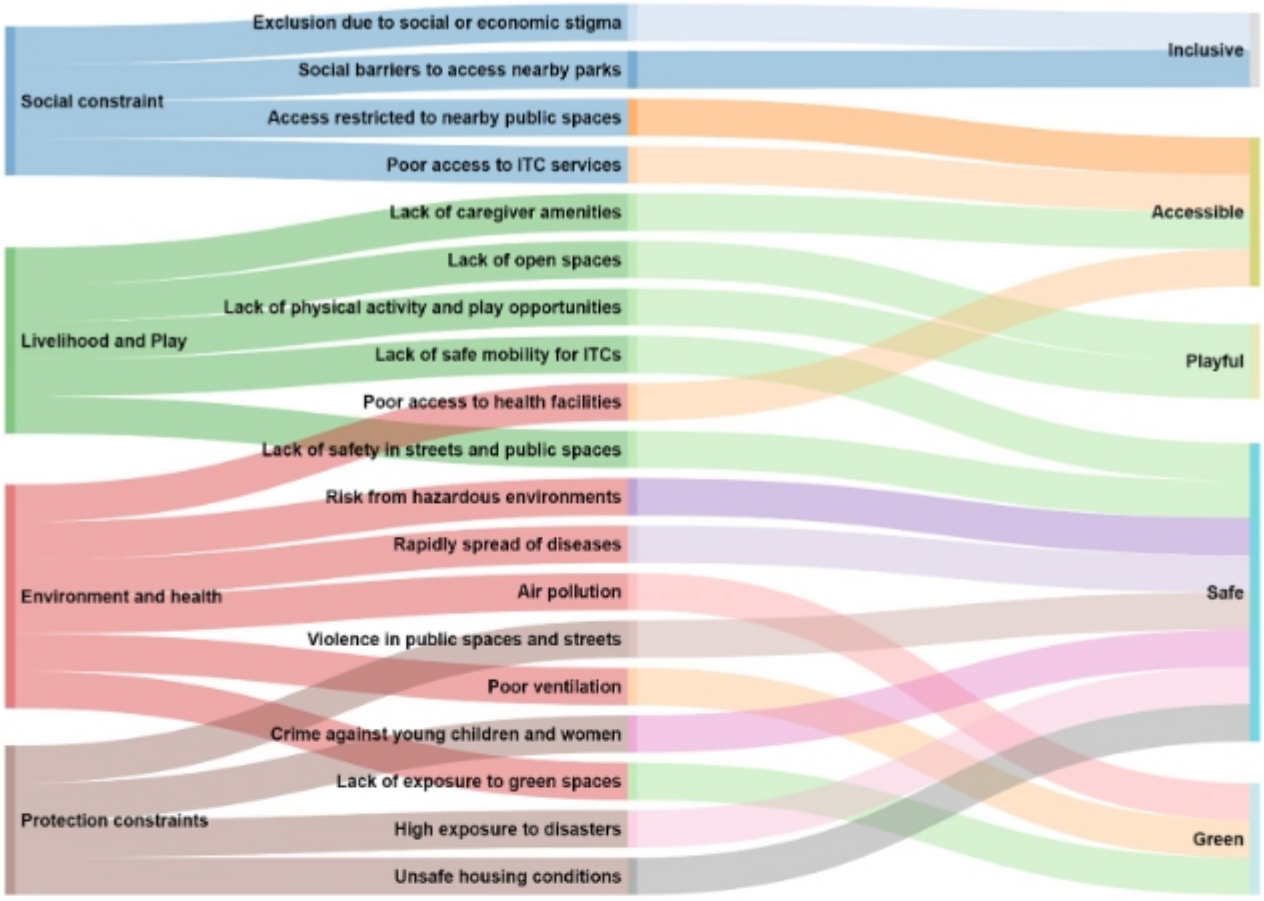


Figure 3.6 Issues impacting young children and caregivers in informal settlements

ASSESSMENT OF EXISTING SITUATION

Cities can use various tools for the purpose of analysis and can modify parameters as per local context. In a selected settlement, cities should assess the existing situation by collecting baseline data (quantitative) as well as participatory data (qualitative) to arrive at prevalent issues pertaining to the selected settlement.

Solutions should be co-created along with communities and may range from core to supportive i.e., improving infrastructure around public areas or specific solutions enhancing the experience of young children and caregivers within the settlement.

Situational analysis with baseline data

Cities should carry out the situational analysis for the settlements by collecting a set of baseline data. This can be collected from local government agencies or other secondary sources, such as NGOs. Using this, cities can understand which sector needs more attention. However, only quantitative data can be collected from these data points. To understand the qualitative aspects, residents of the settlements should be involved through participatory tools. It is also important to collect baseline data on existing behaviours observed in the settlements. A list of indicative data points is given below, which may be modified as per context.

- Core services – Water, sanitation, hygiene, electricity
- Supportive environment – Access to health and education facilities, open/public spaces, mobility, behaviours of community, caregivers and officials

Core services	Water	Source of water supply
		Coverage of piped water supply
		Duration of piped water supply
	Sanitation and hygiene	Availability of drainage and sewerage connection
		Availability of toilets
		Usage of toilets by households and children
		Presence of open drains
		Frequency of cleaning of drains
		Availability and frequency of garbage disposal
	Electricity	Self-owned metered power supply
ITC-supportive environment	ECD services	Distance to the nearest health facility (PHC, Govt. Hospital, Maternity centre, Private clinic)
		Distance to the nearest education facility (Anganwadis, Pre-primary school)
	Safe mobility	Condition of internal streets
		Distance from the nearest motorable street
		Approach street to the slum
		Presence of street lighting
	Play opportunities	Number of accessible play spaces within 100m
		Distance to the nearest open or public space (parks/gardens/Playgrounds)
	Behaviours-officials	Projects and officials incorporating community participation tools in various programs
		Trainings of officials and frontline staff towards young children and caregiver-oriented approach in their practice
	Behaviours-community	Presence and participation of community groups or leaders in project design, implementation and communications
		Advocacy by community groups or leaders towards women and children-oriented approach
	Behaviours-caregivers	Time spent outdoors by young children and caregivers
		Positive caregiving practices by caregivers in the settlements

*This is not an exhaustive list of baseline data points

Table 3.3 Baseline data points for situational analysis

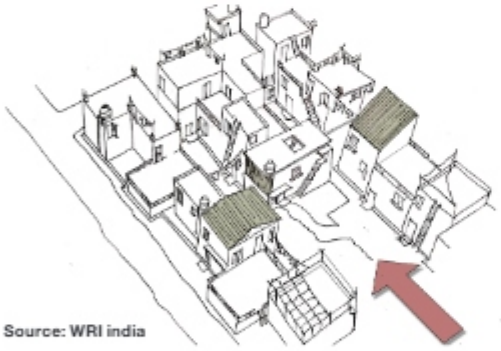
Play in informal settlements
© Urbaser Sumeet

Guidelines for two types of solutions are elaborated in the following sections.

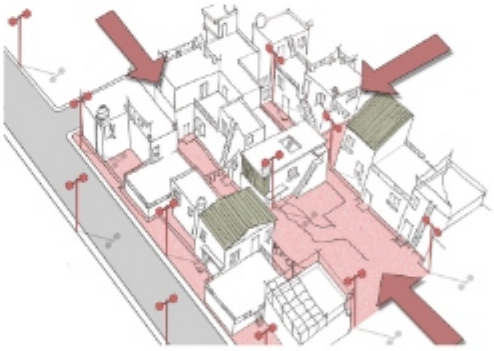
- Improving basic infrastructure around public areas
- Young children and caregiver-specific solutions

IMPROVING BASIC INFRASTRUCTURE AROUND PUBLIC AREAS

The basic infrastructure in informal settlements, such as streets and public spaces is generally found unsafe, dilapidated and even hazardous, risking the most vulnerable population i.e. women and young children. Improving their infrastructure, creating public spaces and preventing hazards is key for building resilience.



Source: WRI india



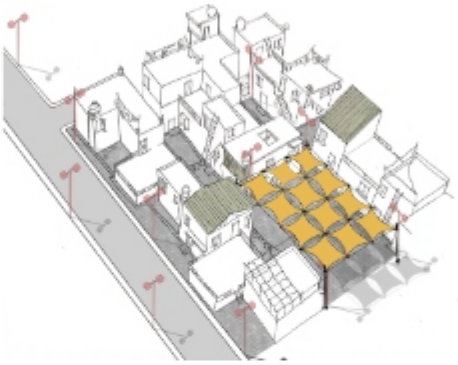
Connection with surroundings – Settlements should have multiple access points to ensure safe mobility of young children. Dark, unsafe alleys should be made safer with adequate lighting.

Source: WRI india

Safety from hazards – Exposed utilities, open solid waste and dumpsites should be either cleaned or barricaded to ensure young children are not exposed to a hazardous environment.

Building resilience – Flooding and water logging can be prevented by creating a network of storm water drains, improving surface conditions by covering open nallahs, and ensuring firefighting circulation. This will ensure protection from disasters and build resilience within the settlement.

Source: WRI india



Creating public space – Small public spaces can be created by cleaning and paving unused or dumped areas. This helps to create sense of ownership towards common areas and ensure cleanliness and maintenance of the surroundings.

Positive behaviours for sustenance and resilience

It is important to address behavioural barriers that affect the use of public areas in the settlements. The common behavioural issues observed range from open dumping of garbage and anti-social activities to fear of safety among women and social stigmas. Cities need to undertake a systematic approach and apply behavioural strategies to address these issues.

- Cities should undertake formative research to identify current behaviours in the settlements. This includes conducting intercept surveys, in-depth interviews (IDIs) and focused groups discussions (FGDs) with the community to gain a nuanced understanding and identify the target behaviours.
- Identify behavioural interventions and involve locals in implementing them to reap long-term and sustained changes. The interventions may range from campaigns and messaging to sensitisation workshops to solutions in the built environment, which can promote positive behaviours among caregivers, the community and city officials.
- Post implementation, it is critical to monitor the impact of behavioural interventions to see whether the desired behaviours are sustained after a period and if there is a need to rework on a few aspects for long-term sustenance of positive behaviours.

Case example – Leprosy Pada, Rourkela, India

Creating public spaces to break social stigma around marginalised groups

The children in Leprosy Pada, Rourkela, had no access to play/public space in the settlement. This project targeted the creation of public spaces and improved hygiene to extend better opportunities to this vulnerable community. The space provides the much needed outdoor activity space for the slum residents. It invites young children and caregivers from within and nearby colonies for play and community-based activities, breaking the barriers of social stigma around leprosy affected communities.

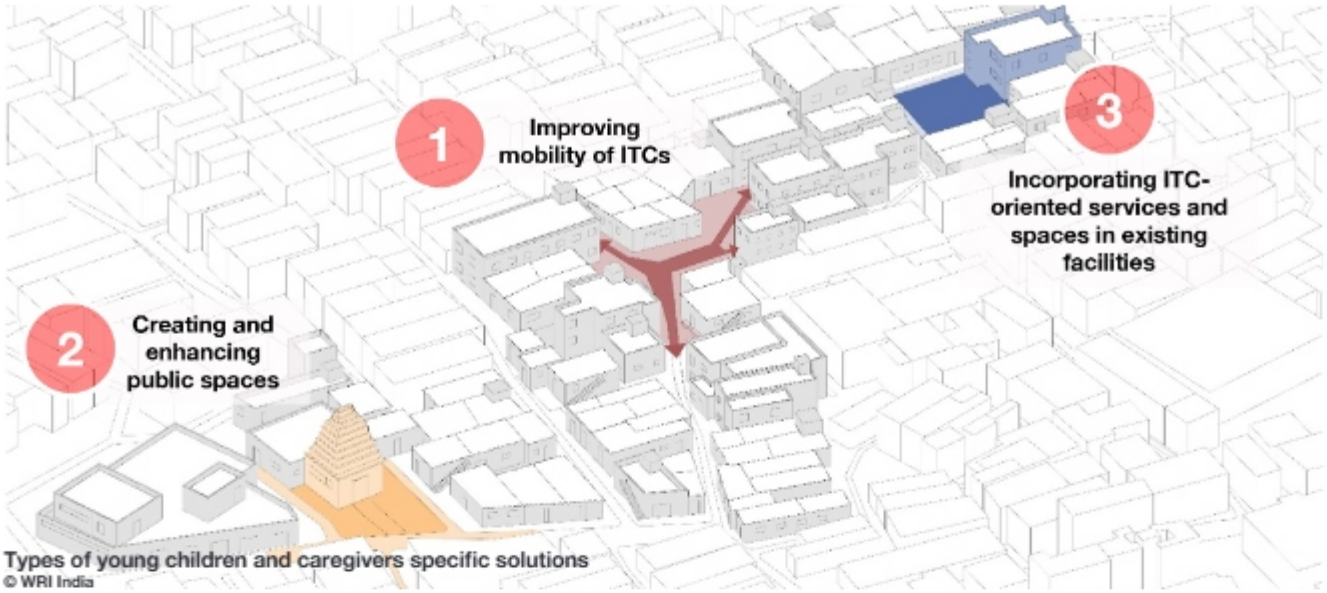
For more details: https://www.youtube.com/watch?v=ey7fyf2j9hg

Case example – Sanskriti Nagar, Indore, India

Flood prone zones to community spaces

In Sanskriti Nagar, a park in a residential neighbourhood was rendered unsafe and inaccessible due to waterlogging in the monsoons, lack of maintenance, and frequent anti-social activities. A nearby Anganwadi Centre was shifted here and an open space was developed around it, with play opportunities. Plantation with local species, pathways, and seating areas were added with the help of the local community. This has resulted in reduced flooding and the park has become an extended play space for the Anganwadi children, with an outdoor space for the community.

For more details: Nurturing Neighbourhoods Challenge Stories from Rourkela and Indore



Types of young children and caregivers specific solutions

YOUNG CHILDREN AND CAREGIVER-SPECIFIC SOLUTIONS

Young children in informal settlements require certain specific solutions within their built environment to ensure safe access to their daily destinations, play opportunities and supportive amenities. Their caregivers also require safe and stimulating spaces that promote positive interactions among each other.

Leveraging existing opportunities

Since space and resources are a constraint in informal settlements, cities should leverage either residual/abandoned spaces or enhance the existing public spaces with young children and caregiver-oriented solutions.

These could be quick and easy-to-implement ideas that directly enhance the everyday experience and can be done as placemaking projects with minimal interventions, such as seating, planters, and play elements. Cities with limited resources can leverage the opportunities available in terms of space, resources, government schemes and programmes and community buy-in to implement suitable solutions.

The following categories of solutions can be considered:

1. Improving mobility - Safe access, legible network, pedestrian safety
2. Creating and enhancing public space - Residual areas into public space, revamp existing open spaces
3. Incorporating suitable services and spaces in existing facilities - ECD functions included in existing facilities, such as community halls
4. Regular programming with activities – Recurring activities for activation of space and sustained usage.

While implementing these solutions, placemaking can become an effective tool to test quickly and using less resources and build momentum within the community to make permanent changes. The next section illustrates the placemaking tool and provides guidelines around the four solutions.


Accra markets, Ghana
© Mmofra Foundation

Case example: Play spaces in local markets, Accra, Ghana

Markets in the settlements of Accra have been uplifted with children-centric play elements to enable vendors who are caregivers to let their children play while they work. Multiple play opportunities engage children and enable caregivers, especially women, to carry on their employment activities with ease.

Placemaking tool to test solutions

Low-cost, quick and innovative solutions

The placemaking approach has proven to be effective in many Indian cities where space and resources are limited but community can be enabled to drive the change on the ground. Through Placemaking Marathon initiative of Smart Cities Mission, many cities implemented innovative projects to develop new public spaces within a short period of time and with low-cost materials.

Through placemaking projects, any abandoned or underutilised spaces, such as public squares, street corners, open lots and the space below flyovers can be transformed into vibrant, playful public spaces for families. This tool can be most effective for informal settlements where space and resources are limited but community-led efforts work well.

Converting dumpyards into Chitti parks - Warangal, India

Warangal converted the dumpyards of MH Nagar slums into a pocket park with play elements made of recycled materials, low height seating and porous boundaries, allowing caregivers to keep an eye on their children.

Build momentum within community and create local ecosystem

Quick and innovative projects can build momentum among the communities residing in informal settlements and generate buy-in from the government agencies to build permanent spaces or scale across other areas. Settlements having lack of formal open spaces can benefit the most as these can provide them a public space and encourage caregivers to step outside frequently with their children and interact with peers, leading to their improved well-being.

In Vadodara, the space below Vadsar flyover adjacent to an Angnawadi Centre was transformed into a public plaza within three days. The vulnerable population residing next to it started using it for community events, such as garba, conducting neighbourhood meetings and tuitions for children outside the Anganwadi Centre. The neighbouring shop owners and residents keep a watch over this space to discourage any anti-social activities and vandalism.

Reclaiming parking spaces for recurring community events and activities, Kohima

Anganwadi Centre premises below the flyover transformed into a public plaza in Vadodara

1. Improving mobility

Figure 3.7 Before – Dark lanes, exposed utilities, and dumped waste

Figure 3.8 After – Legible, safe, and interactive streets

Streets in informal settlements are usually dark, narrow lanes that lack dedicated walking areas and a legible network. These are often encroached upon with spillover activities, unhygienic dumps, and poor surface conditions. This makes it difficult for people to safely move around for their daily activities. The following guidelines should be considered for improving mobility in the settlement:

- Create a legible network with dedicated walking areas and shortcuts to their daily destinations.
- Improve surface conditions by clearing encroachments, paving lanes, and covering open drains.
- Identify pockets along the lanes to provide resting spaces.
- Provide lighting and wayfinding systems in dark, narrow lanes to enhance security, especially for women caregivers.
- Connect to the nearby public transit stop.
- Enhance *chowks* and common areas with paving, seating and shade for caregivers to use.

Legible access

Resting opportunities

Safety and security

Informal wayfinding

Case example: UN-Habitat's Model Street Initiative in Informal Settlements, Dandora, Nairobi

More details: How Can One Public Space Transform an Entire Neighborhood? UN-Habitat's Model Street Initiative | ArchDaily

Nairobi's Dandora neighborhood shines again

2. Creating and enhancing public places

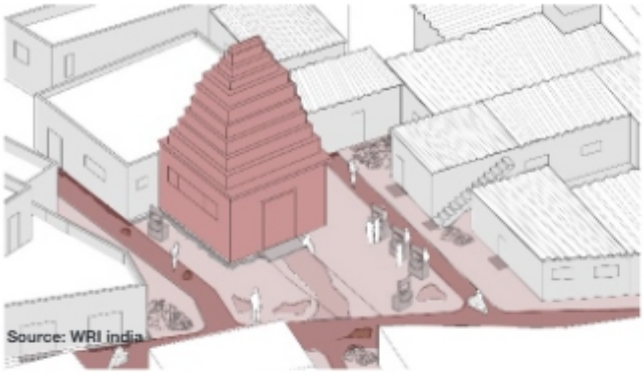


Figure 3.9 Before – Residual space, haphazard activities, and dumped garbage

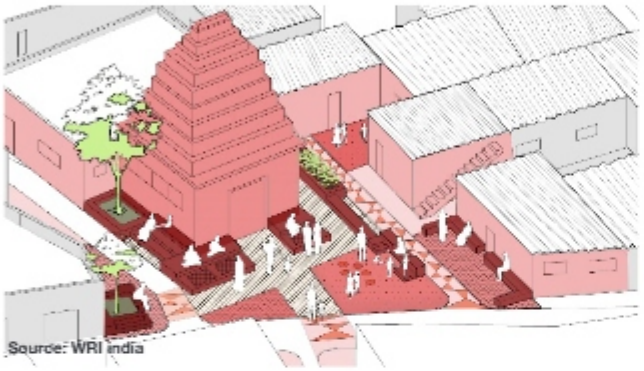
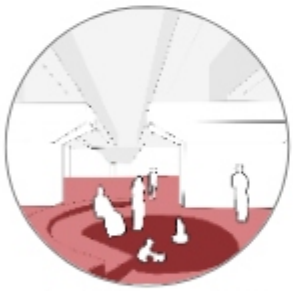


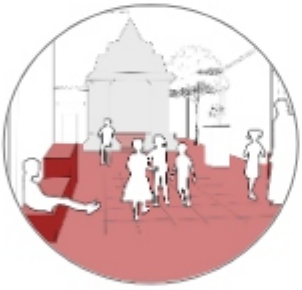
Figure 3.10 After - Dedicated activity pockets in public space, seating, and play areas

Space is a constraint in informal settlements and young children are often deprived of formal public spaces. The common areas of the settlements, which are the only public realm for the settlements, are generally found filthy and unsafe for caregivers, and children are discouraged from using these. In order to create public spaces, the following guidelines should be considered:

- Residual, underutilised spaces around the settlements can be revamped as a public park, such as residual around chowks and the space below flyovers
- Dumpyards and encroached parking areas can be cleaned and converted into play pockets
- Settlements can be connected to nearby existing public spaces, with direct access and entry
- These existing public spaces can be redesigned as per specific needs
- Religious precincts and markets spaces in informal settlements can be plugged with play elements and waiting area for caregivers visiting with their children



Reclaiming residual space under flyover



Extending social anchor premise, such as temple

Using vacant plots, open grounds

Enhancing existing public space, such as parks

Case example: Developing formal playspaces in slums, Rourkela, India

More details: Rourkela Placemaking Marathon

3. Incorporating suitable services and spaces in existing facilities

Figure 3.11 Before – Garbage dump, unused land outside community centre

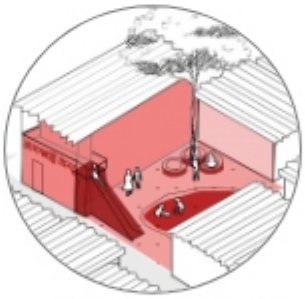
Figure 3.12 After – Playground and outdoor learning centre adjoining community centre

Having access to young children-oriented services and amenities is crucial. Lack of space in informal areas may not allow for new provisions. Therefore, the following guidelines should be considered for incorporating suitable services and spaces in existing facilities:

- Integrating play and learn opportunities within existing Angnawadi Centres, crèche, school and health centre premises
- Adding children-oriented functions in existing facilities, such as Anganwadi Centres in community halls and indoor play space in women skill centres
- Adding caregiver-supportive amenities, such as feeding cubicles and restrooms around existing facilities
- Pop-up ECD services, such as mobile clinics can ensure access to health, education, and play
- For these interventions to work, utilise existing social networks and preferred modes of communication to address behavioural barriers, knowledge gaps, and gender norms in the community

Caregiver-friendly amenities– feeding booth, crèche

Adding ECD function in existing facility- rooftop Anganwadi Centre



Extending premises of existing facilities for play and learn

Pop-up ECD services – Mohalla Clinic

Case example- Incorporating a play and learn pocket in Anganwadi Centre, Kochi, India
More details: Kochi Nurturing Neighbourhoods Challenge

4. Regular programming with activities

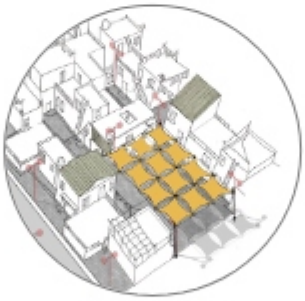
Festivals and celebrations in developed spaces
© WRI India

Community-led plantation drive, Indore
© WRI India

Any projects in informal settlements will require participation by local community groups to ensure sustained usage and long-term impact. Regular programming activities that involve local groups, NGOs and private partners can be scheduled so that the community takes the lead and fosters a sense of ownership.

- Initially, city officials can provide support in onboarding community groups, NGOs and local leaders to conduct regular programmes in developed spaces.
- Further, a calendar of events should be created for partners to continue the activities.
- Need-based support and training can be provided to community groups and private partners who can lead recurring activities.
- Monthly *mahila sabhas*, ward committees, and SHG meetings can be held in the public spaces developed. Children's activities, such as storytelling and, outdoor games, can be conducted on a daily or weekly basis. Festival celebrations in public spaces will also build a stronger sense of ownership.

NGO-led activities for communities, such as health camps, yoga, coaching



Pop-up events, festival celebrations

Community meetings, *mahila sabhas*, storytelling sessions

Case example- Health camps, yoga sessions for the community, Rourkela, India

Community activities
© Rourkela Municipal Corporation

Community activities
© Rourkela Municipal Corporation

LONG-TERM SUSTENANCE

Institutional Setups

The sustenance of implemented projects is possible if communities take ownership of the spaces, and the city provides them necessary support. To do so, at the city level, formal setups should be created to lead and co-create solutions with communities. Informal working groups within the settlements can grow further to become a part of such formal setups at the city level. Government agencies should provide them with a pool of support in terms of funding and resources required to implement young children and caregiver-oriented projects benefitting vulnerable population.

- Institutional setup at city level – cell, dedicated committee
- Formalising informal working groups – Trust, co-operative
- Network of champions – local leaders, women leaders, NGOs, Individual experts
- Support from government – funding, approvals, programmes and policies

Case example- Multisectoral Nurturing Neighbourhoods Cell, Rourkela, India

Rourkela has set up a multi-sectoral Nurturing Neighbourhoods Cell (NN Cell) cell headed by the Municipal Commissioner (RMC). The Cell works as a centralised decision-making body to ensure child-friendly development in the vulnerable settlements of the city.

Figure 3.13 Multi-sectoral child-friendly institutional cell

Co-creating with communities

Vulnerable population residing in informal settlements often do not get the opportunity to participate in decision-making processes related to their development. Their participation needs to be enabled at all stages of solution-building right from the start. Strengthening capacities of the communities will help in demystifying the planning and development processes for them, thus enabling them to voice their concerns freely and contribute effectively.

Leverage the existing network of local leaders, Accredited Social Health Activist workers (ASHA), women groups

Converge with existing programmes– multiplied benefits, shared resources

Create working groups, informal setups – coordination group, monitoring groups

Enable ownership – monitoring and surveillance, maintenance of projects, activation

References for projects around informal settlements:

Creating play spaces in slums – Leprosy slum, Rourkela - https://smartnet.niua.org/placemaking-marathon/#/p/Rourkela/0

Improving Anganwadi Centre premises, Macchi bazar, Indore - https://smartnet.niua.org/placemaking-marathon/#/p/Indore/0

Space below flyover reclaimed as public space for low-income neighbourhood- https://smartnet.niua.org/placemaking-marathon/#/p/Vadodara/0

Converting unused lanes into play area, Chennai- https://www.newindianexpress.com/good-news/2019/Nov/19/residents-turn-chennais-sewage-infested-lane-into-beautiful-play-area-2063616.html

Child Play Spaces in Malata & Nirma Markets- https://www.archdaily.com/945952/lessons-from-un-habitat-how-to-design-spaces-for-and-with-the-people

UN-Habitat's Model Street Initiative in Informal Settlements of Dandora, Nairobi - https://www.archdaily.com/951250/how-can-one-public-space-transform-an-entire-neighborhood-un-habitats-model-street-initiative?ad_medium=widget&ad_name=navigation-next

© Nasik Lababan/Unsplash

STREETS

Objectives Achieved	City level indicators
	11. % street length with walkable footpaths (Core)
	12. % of streets with unobstructed and continuous footpath. (Core) 13. Presence of Kerb cuts y/n and no. of kerb cuts per road per km. (Supporting) 14. Presence of cycle routes in the city and major bordering roads (kms would be future indicator) (Supporting) 15. % of total street length closed to 4-wheel and 2-wheel traffic (Core) 16. Fatality rate for pedestrian and NMT users (%). (Core) 17. No. of fatal accidents occurring due to traffic in the city. (Supporting) 18. Percentage of traffic intersections with safe pedestrian crossing on major roads. (Core) 19. Percentage of children (0-14) fatalities because of road crashes.(Core)
	Neighbourhood level indicators
	20. Percentage of caregivers and infants/toddlers walking to public amenities (day care centres, pre-primary and primary schools, primary health facilities, local markets) (Supporting)
	21. Provision and quantity of public seating to stop and rest by in the neighbourhood (Core)
	22. % of streets with adequate lighting (Core) 23. Streetlight spacing in the neighbourhood (Core) 24. Encroachment on NMT section of roads at neighbourhood level by Vehicle Parking (%) (Core) 25. Presence of traffic calming measures in the neighbourhood and average speed of vehicles in the neighbourhood (Core)
	26. Percentage of tree cover on major streets in a neighbourhood. (Supporting)

Target Behaviours
2. Caregivers take infants and toddlers to visit public spaces / facilities more often 2.1 Caregivers and children are accessing / using ECD services, such as Anganwadi Centres and PHCs
3. Young children and their families are choosing to walk and use public transport more to access amenities and facilities 3.1 Pedestrians walk on dedicated crossings and walkways 3.4 Front line workers, such as security guard, ticket counter staff, traffic police and other staff prioritises ITC
5. Community encourages young children and family-friendly changes in the neighbourhood 5.2 Caregivers and community engage in community action for upkeep of interventions

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

02 Streets

Bebedom City Playmats
© confusedparent.in

THE FIRST PUBLIC REALM

The first space that young children encounter outside the home is the street. Streets make up over 20% of a city's space,[3] and are a very important open space available to us that can be attractive and enjoyable places. There has been a global shift in designing urban streets where pedestrians take top priority, followed by cyclists and transit riders, then by people providing city services, and lastly by people in private vehicles.[4]

The Indian neighbourhood street serves primarily as a place of movement. Except for quick stops at vendors, it is generally not a safe or pleasant place to spend time. Completely pedestrianising streets gives the entire streetscape back to residents of a neighbourhood. Other solutions that can balance conflicting demands, like prioritising pedestrians while also reserving space for vehicles, making better use of the space available, and keeping neighbourhoods vehicularly accessible. Redesigning or 're-profiling' a street can offer caregivers and children the vital space they need for free and safe movement while still allowing for cars.

The first step when designing a good, balanced street is to consider the different uses and forms of movement taking place: pedestrians, cyclists, transit riders, cars, parking spaces, vendors and local inhabitants. By re-allocating the space available and sharing it between the users more equitably, a more balanced design of the street can be achieved.

[3] CSE India Press release
[4] Prioritising People in Street Design

Click here to watch "Tim Tim – the journey of a toddler with his mom walking in the streets, Brazil"

LIMIT, LINK AND SHARE STREETS - 3 STEP APPROACH

Streets are a vital part of our cities and facilitate a range of uses, from vehicular transport to pedestrian movement. But the different users of streets can have conflicting needs. These conflicts have at times been resolved by completely banning cars from certain streets in the city, but not every city or neighbourhood is ready for such a big step.

Hence, to make our streets friendly for young children and caregivers, we need to undertake 3 main steps. These are to **limit** the use of streets by vehicles, to **link** key destinations within the neighbourhood and establish a priority route, and to **share** the street by improving the use efficiency. [5]

LIMIT - TRAFFIC CALMING TO ALLOW MORE CHILDREN ON ROADS

As identified in the ITCN Framework, Indian neighbourhoods are car-centric. One of the critical challenges is the unsafe nature of the street, which allows through-way traffic, limiting the child's independent mobility. The first step to take in your neighbourhood is to reduce car dominance by:

- **Preventing unnecessary traffic movement:** Prohibit vehicular traffic completely from streets wherever possible to give pedestrians and young children priority and more space to move freely, without fear of traffic. Access for emergency vehicles should be permitted if there is a calamity.

- **Set speed limits:** Globally, many neighbourhoods have set and imposed speed limits of 15-30 km/hr in local streets. Research has shown that children are unable to gauge the speed of vehicles travelling faster than 32km/h, and may believe it is safe to cross when it is not. It is important to enforce this limit as well. [6]

- **Yield streets:** Neighbourhood streets need a clear obstacle-free pedestrian space and slower vehicular traffic. Yield streets have significant parking alternatively on either side and observe slower movement of vehicles, which is suitable for residential areas.

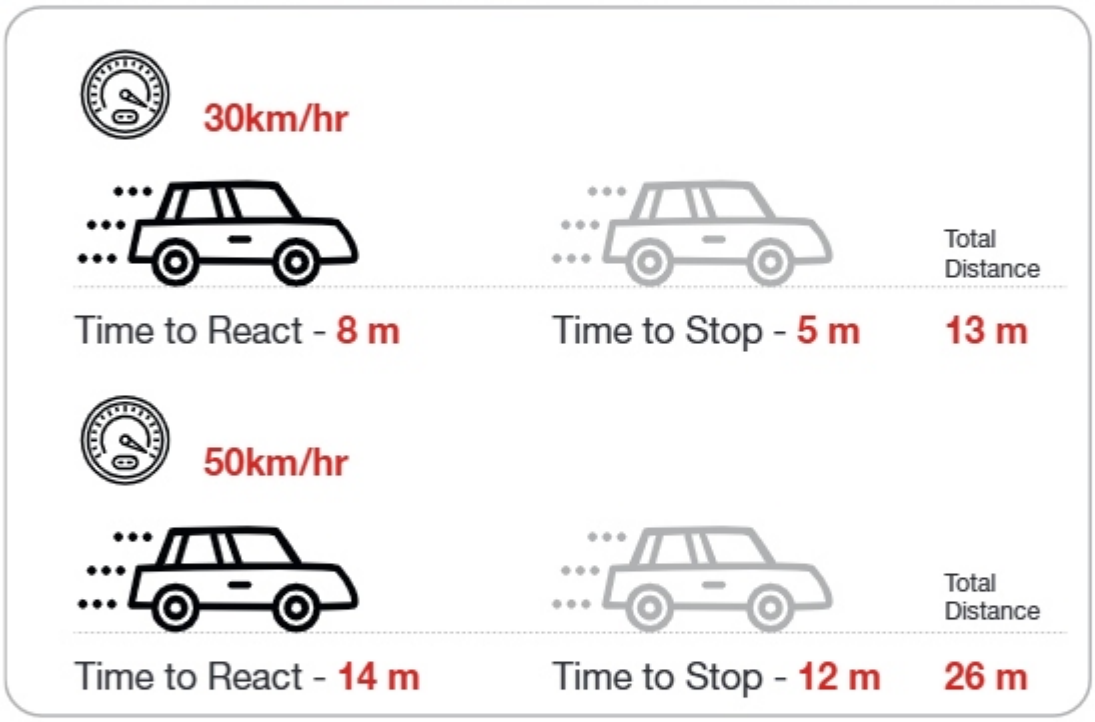
- **Chicanes:** Chicanes increase the amount of public space available on a corridor and can be activated using benches, bicycle parking, and other amenities. Chicanes break long lines of traffic and have the added benefit of calming traffic.

- **Shared street spaces:** These spaces are increasingly becoming popular worldwide, where streets are places for people rather than cars. Their shared usage by various users requires well-designed traffic calming measures and appropriate signage.

- **Crossings/Speed tables:** Speed bumps, the way they are currently used in Indian streets, are ineffective in reducing the traffic speed. Sign-posted crossings or speed tables are a better option on routes where restriction of traffic is not possible.

- **Temporary streets Closures,** such as play streets, block parties, street fairs, and open streets demonstrate the range and diversity of ways in which a city's streets may be utilised. Whether done as a precursor to a future permanent project or as a seasonal or weekly event, temporary closures can activate the street and showcase wider benefits to participating businesses and communities.

https://urban95.org.br/como-escolher-a-via-para-implementar-uma-rua-de-brincar/



Chances of fatality	
30km/hr	15%
40km/hr	30%
50km/hr	60%
60km/hr	85%

- Based on vehicle speed and its reaction time, traffic calming measures should alert drivers 13m to 26m before the stop line.
- 30km/hr is desired speed for neighbourhood internal streets. In case young children frequent any major/arterial road with 50km/hr speed, traffic calming should be installed 26m prior to stopping
- The probability of fatality due to cars driving at 60kmph is roughly five times higher than cars driving at 30kmph

Figure 3.14 Distance required by speeding cars to stop

[5] Cai Liangwa. The Research on Safety Children's Travel Route on Child-Friendly City of Netherlands. International Journal of Environmental Protection and Policy. Vol. 5, No. 6, 2017, pp. 94-98. doi: 10.11648/j.ijepp.20170506.12

[6] Speed judgement by children https://www.sciencedaily.com/releases/2010/11/101123101539.htm?trendmd-shared=0

LINK - ESTABLISH PRIORITY ROUTES THAT CONNECT DAILY ACTIVITIES OF CHILDREN

A child priority route within the neighbourhood can be established by identifying the key destinations that are frequented by infants, toddlers, and their caregivers. These would include key public services, such as primary schools, tot-lots, daycare centres, Anganwadi Centres, convenient shopping, and so on.

Cities in the Netherlands and some other European countries have adopted this by creating a route called 'kindlint'[7] in their neighbourhoods. The City of Pune in India has initiated a program called 'School Travel Improvement Plan'[8] which targets to establish streets around schools as child-priority streets.

- This route should be an obstacle-free pedestrian right of way. It should be a **minimum of 1.8m wide** for a 2-way movement of single strollers.
- The route should lead to an **anchor** facility in a neighbourhood.
- **Traffic calming measures** should be added with no or minimal parking in the delineated area. **Shared surfaces** would be the most preferred treatment for streets.
- **Micro markers** of resting and play equipment should be added at regular intervals.
- **Mixed use** should be encouraged along these routes to have passive surveillance.
- **Signages and wayfinding measures** should be placed at either end and along the route to signal and create awareness.
- **Safety from strays** and other dangers should be tackled.
- Routes should have **large foliage trees**/for better microclimate, shade, and cleaner air.

[7] The Kindlint is developed by SOAB, a traffic consultancy firm with the idea that by using this route children can safely and independently move across different places in their neighbourhood. It is assumed that play does not only occur at particular destinations but also on the route to these places. Child-Friendly Urban Design: Observations on public space from Eindhoven (NL) and Jerusalem (IL)

[8] For information on safe routes to schools: School Priority Zone Guidelines for Pune

Case example: The first Kindlint in Spaarndammerbuurt, Amsterdam

The first Kindlint (child route) was established in 2007 in Spaarndammerbuurt, Amsterdam. "The Kindlint consists of blue pavement tiles with images of animals. The animal motifs in the pavement are portrayed through different poses and display where children should wait, where they can walk, and where they can run. On the route, different play elements, specific measures for traffic safety, and adequate lighting are added."[9]

There were some immediate benefits.

- Children walked to school more often.
- Almost all children and parents know the Kindlint and like it.
- It contributed to safer traffic.
- The route was engaging for children.

However, the limitations included:

- Children do not always use the Kindlint, only if it aligns with where they are already going.
- It did not link to some key destinations within the neighbourhood
- Not everybody understood the intention of the tiles.[10]

Subsequent examples of Kindlint have been more successful in other cities.

Therefore, before setting up a child priority route in your neighbourhood, make sure that

- The needs of the residents are considered.
- Many of the key destinations and frequented walking routes are identified and connected; and
- The route is made as clear and legible as possible.

Kindlint in Amsterdam
© https://commons.wikimedia.org/wiki/File:Kindlint_met_springende_hond.jpg

[9] http://www.metamorphosis-project.eu/case-studies/kindlint-%E2%80%93-child-route-amsterdam
[10] Child-Friendly Urban Design: Observations on public space from Eindhoven (NL) and Jerusalem (IL) *Page 28* https://vanleerfoundation.org/publications-reports/child-friendly-urban-design-observations-on-public-space/

Church street in Bengaluru, India
© https://bycs.org/church-street-bengaluru/

SHARE - ALLOWING CHILDREN TO USE THE FULL WIDTH OF THE STREET

Shared streets, also known as 'Woonerf'[11], provided in a residential context have worked well in some of the European cities. In the shared street concept, cars, cyclists, and pedestrians share the same street surface.

In this situation, where the zoning is unclear, drivers become more alert and drive slower. Traffic may be further prompted to slow down by strategically placing planters or bollards in the street so that cars have to drive around them and, in so doing, slow down. Shared streets have no level differences, and one paving material is applied to the whole area. This makes shared streets easy to use by toddlers and their caregivers. In Dutch neighbourhoods that have adopted the concept, traffic accidents dropped by 40% or more.

Keep the following in mind when designing shared streets:

- Choose a **material** that is associated with footpaths for the shared street. This encourages traffic to slow down and sends a clear signal that it's a zone with pedestrian priority.
- Use **planters or bollards** that cars have to drive around to slow them down further.
- Keep the planters **low** so that small children playing or walking behind the planters are visible to oncoming traffic.
- Place **clear signs at the beginning of the shared street** to indicate to vehicles that they are entering a shared street zone.
- Introduce a clear speed limit to the zone: **15 kmph is a speed limit** that is ideal.
- Monitor use through local traffic police by strictly fining the offenders.

[11] The concept of Woonerf originated in Delft, NL as a result of citizens action in reclaiming their residential street (1960s) https://nacto.org/docs/usdg/woonerf_concept_collarte.pdf
[12] Transport Act 2000 http://www.legislation.gov.uk/ukpga/2000/38/section/268

AGE-APPROPRIATE MOBILTY REQUIREMENTS ON STREETS

Infants and toddlers are dependent on their caregivers while navigating the streets in the neighbourhoods. Caregivers are often seen carrying their infants in arms or holding their toddler's hand while walking. The following guidelines provide specific requirements based on age groups of children that should be considered while designing any streets.

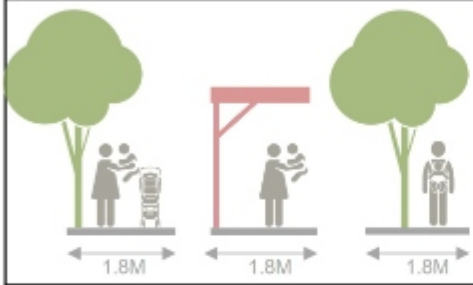
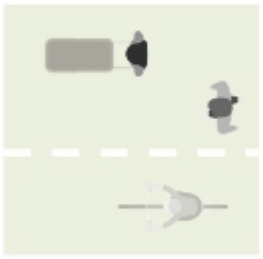
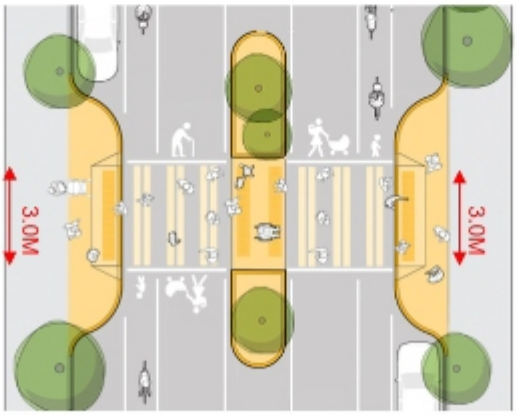
<table>
<tr><th colspan="2">MOBILITY REQUIREMENTS 0-1 years</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Min walkway width as 1.8m for comfortable movement with pram/baby/ baby carrier</td><td>Min walkway width as 3m to allow easy cross-flow of people on footpath</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Gentle slope at level changes for easy stroller movement</td><td>Avoid littering on ground to keep pram wheels clean</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>Designated spaces to walk and separate protected lane for bicycles to avoid collision</td><td>No honking zone on streets/ ITC frequented areas</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">Min. 3m wide stroller-friendly pedestrian crossing on streets adjacent to a public space</td></tr>
</table>

Table 3.4 Mobility requirements for 0-1 years old
Source: WRI India

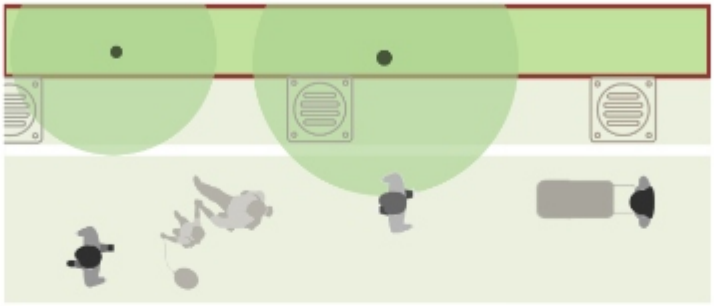
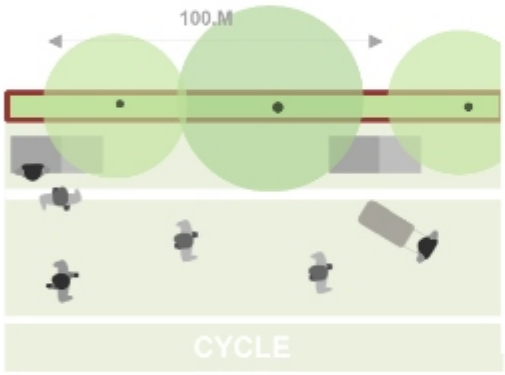
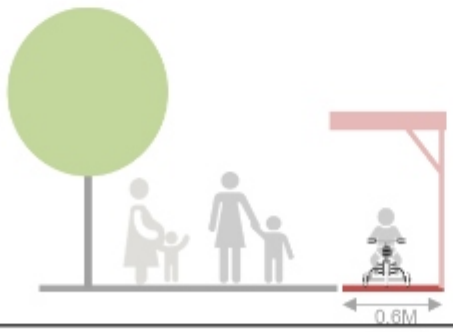
MOBILITY REQUIREMENTS 1-3 years		
		
Protected lane for bicycles to avoid collision	Colorful pavements and walls to engage child	Shaded pathways to combat heat and rains
		
Closed drain covers to avoid mosquito breeding		
		
Benches at regular interval of 100m	Hawking onto walkways must be prohibited for comfortable and obstruction free movement	
MOBILITY REQUIREMENTS 3-5 years		
		
Clear space to ride tricycle/ bicycle with trainer wheels	Ease in crossing street- avoid speeding vehicles	

Table 3.5 Mobility requirements for 1-3 years old

Source: WRI India

SEGREGATION OF USES IN NEIGHBOURHOOD STREETS

Street widths in urban neighbourhoods in India predominantly range between 6 and 15 metres. Space is scarce in the dense urban fabric of cities. Therefore, it is critical to use the space available judiciously to accommodate the various and sometimes conflicting uses.

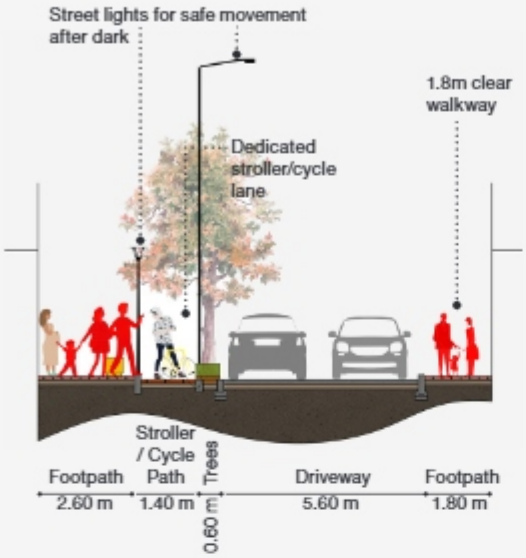
Currently, many streets do not have marked segregation of uses. The streets are predominantly used for illegal car parking, with space allocated for footpaths taken over by cars, access ramps to homes, cabins for security guards and unauthorised privatisation by homeowners or by vendors.

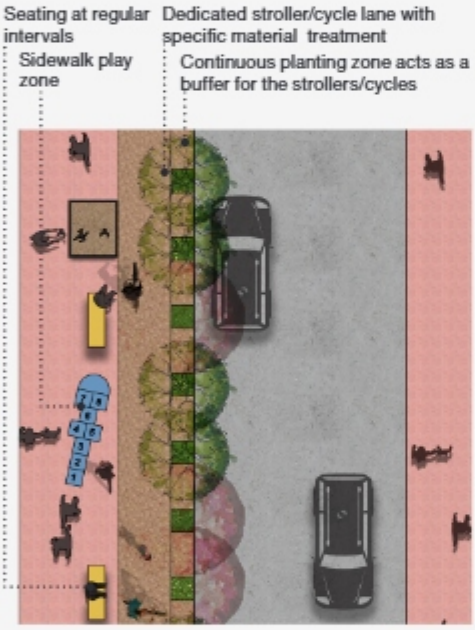
The section alongside is of a typical 9 metre street in Indian neighbourhoods that shows cars dominating the space. To address this, it is critical that neighbourhood wide parking strategies are adopted at the outset.


Street in East of Kailash, New Delhi
©Simon Batisti

Figure 3.15 Existing street section and plan

Designing specific uses across the surface





Note that all of these situations contain "elements": Elements that are added to the street to improve its usability and comfort. Later in this section, we will cover common elements and how they impact young children and caregivers.

Figure 3.16 Proposed street section and plan

For more information on segregation of use in Indian streets:
UTTIPEC - Street Design Guidelines (Approved)

PARKING STRATEGY

Parking is one of the most recurring urban issues in Indian megacities. Most of the public space is taken over by unauthorised on-street parking. Addressing it is very critical to free up public space for families with young children. Parking is also the most visually obstructing activity for infants at their eye level. Key considerations for parking in a neighbourhood are as follows:

- **Parking management plan** for the neighbourhood to be developed.
- **Designated, paid, or shared parking** to be provided wherever possible in neighbourhoods.
- On-street parking to be regulated.
- **No parking** on 6 metre wide roads.
- **One-side parking** on 9 and 12 metre roads, in designated areas, only if required.
- Two-side parking to be broken down by giving alternative bays on either side.
- Two-way streets under 9 metre are not recommended for parking.
- No parking at intersections. Prohibit on-street parking within 50 metres of intersections.

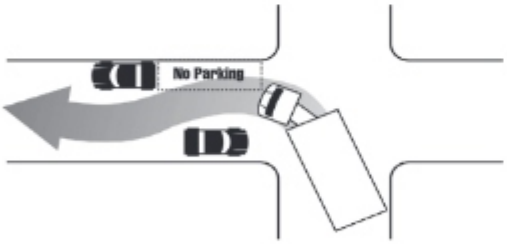


Figure 3.17 No parking at intersections

- **Queuing** – Designing streets so that the moving cars must occasionally halt between parked cars before moving forward, which will help in successfully developing narrow streets while encouraging vehicles to move slower, and also allowing areas where a wide, clear area is available for parking.
- The length of parking rows should be limited to 60 metres (20-23 contiguous spaces) to create breaks for landscaping and sidewalk play spaces.
- **Kerbside** motorcycle parking can be easily integrated with the parallel car parking space about the same width of 2.5 metre.
- **Bicycle parking** can be placed between the main walkway and the kerb. A minimum clearance of 0.6 metre from kerb to a parallel bicycle stand should be kept in mind.
- In cases of wider footpaths, clusters of bicycle parking may be oriented perpendicular to the kerb.

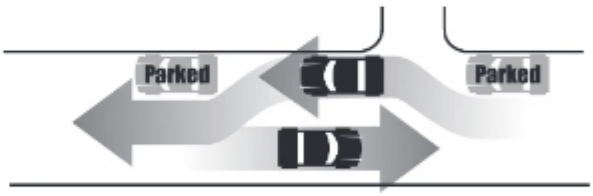


Figure 3.18 Queuing to slow traffic

For more information on parking management, please see:

UTTIPEC - Parking Policy as a Travel Demand Management Strategy (October 2010- Draft)

On-Street Parking International Toolkit, SUTP Document # 14

ITDP – Shared Parking Concept and cases

Key principles and steps involved in managing on-street parking and regulating off-street parking. ITDP – Parking Basics,October, 2015

ITDP India – Park It right!

International strategies and recommendations from many regions where parking has been tackled in a variety of ways ITDP – Parking Guidebook to Chinese Cities

HOW TO APPROACH THE DESIGN OF STREETS

The following section shows examples of how some of the standard streets (widths as per IRC guidelines) can be redesigned.
Many variations are suggested, keeping in mind that each neighbourhood will have a different requirement. Pedestrians have been given priority. Also, standard carriageway for two way traffic is considered to be 5.6 metre as per UTTIPEC Street Guidelines for roads 12 metre wide and less, and minimum footpath width is to be 2 metres.

When re-designing the streets in your neighbourhood, consider the following as your priorities with the first being the topmost priority and decreasing down to the last.

- **Unobstructed and continuous** pedestrian movement space to be given priority
- **Traffic calming measures** to be applied especially on streets with child priority routes to children-centric amenities
- **Safe crossings** of streets to be designed whenever necessary
- Services and utilities to be placed clear of pedestrian movement zones.
- Design the street as a public space with provisions for spaces for social activities.
- Vehicular movement greater than 30 kmph to be discouraged through design interventions.
- On-street parking space to be minimised and regulated.

It is important to conduct audit of existing streets before redesigning. Refer to Annexure A (provided at the end of this document) for street sudit checklist to conduct the audit, which may be modified further as per context.

Paid parking in Pune
©www.itdp.org/category/location/india/pune/

JM Road
© www.itdp.org/category/location/india/pune/

Reclaiming the parking in London, UK
©healthystreets.com

For more information on street guidelines relevant for India, please see:

ITDP – Complete Streets Guidelines - Better streets, better cities: A guide to street design in urban India

IRC - Guidelines for Pedestrian Facilities

USDG - Pune Municipal Corporation

NACTO - Urban Street Design Guide

Better Streets Plan, San Francisco

NEIGHBOURHOOD STREET- 6 METRE WIDE

A narrow neighbourhood lane with a width of 6 metres or less should have a predominantly pedestrian feel to it and be treated as shared surfaces. As per IRC guidelines, its not mandatory to have footpaths in a 6 metre street but these have to be designed to be the most young children and caregiver-friendly spaces in the neighbourhood. Therefore, these should be treated as **shared surfaces or woonerfs.**

These lanes are not suggested to have two-way traffic, as this reduces the space available for pedestrians to almost nothing, making it impossible to use by young children and caregivers. One-way traffic should be allowed at a speed of 15 kmph in these innermost streets of a neighbourhood.

In these streets, cyclists, pedestrians, young children and differently abled people all share the space with vehicles. Therefore, safety measures are of utmost importance.

The Woonerf concept is relevant for lanes smaller than 6 metres also, especially in dense neighbourhoods and inner city areas.

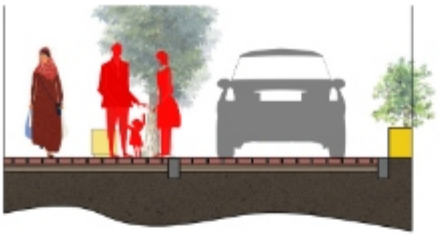
Shared surface /woonerf - one way traffic

- Clear and visible signage at the entry of a shared street.
- Single level, curb-less shared surface for pedestrians, cyclists, and vehicular movement.
- Space for street furniture, planters to be organised
- If possible, provide a clear walkway zone of 2 metres width.
- Trees or buffers from the traffic to be placed regularly, if segregated.
- Singly paved surface material for calming the traffic.

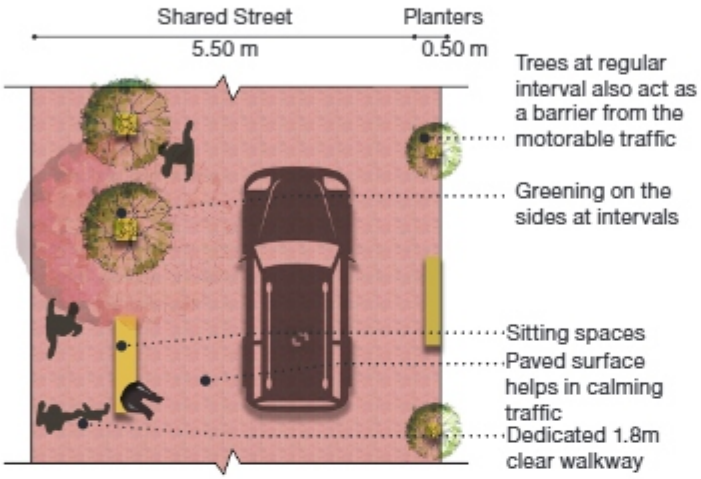
For more information on Woonerfs, please see:

Woonerf: Inclusive & Livable Dutch Street

Woonerfs in Suburban Environments



One Way - Footpath on both sides



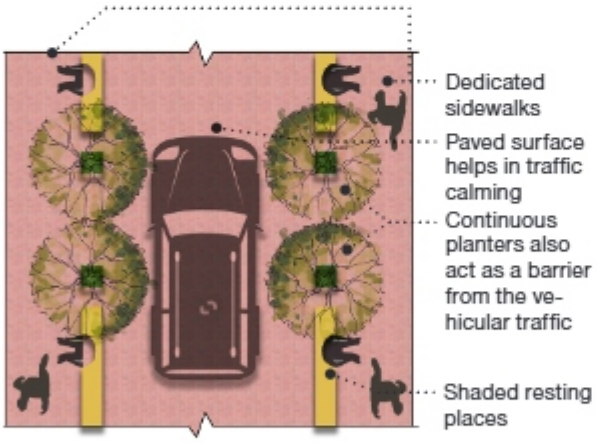
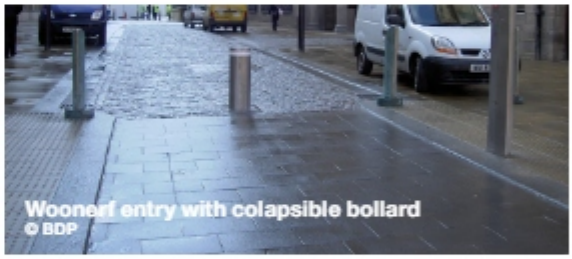


Figure 3.19 6 metre shared street section and plan as shared surface/Woonerf with one way traffic



Woonerf signage

In a woonerf signage, people are shown bigger than cars.

LOCAL STREET - 9 METRE WIDE

A 9 metre wide neighbourhood local street may need to be designed for some vehicular movement. The ideal solution for it is a shared street design. In this scenario, the levels are maintained the same throughout the section, with different paving materials laid to demarcate the carriageway, parking, informal activity zone, transition space for two-way traffic, and pop-up play zone. The carriageway is made in a meandering manner to further slow down the traffic. It is advisable to keep the traffic lanes as narrow as possible so that more space can be allocated to pedestrians and so that the speed of traffic reduces. It is preferable to have at least a clear walkway of 1.8 metre on either side of the street.

If shared streets are not possible and two way traffic needs to pass through the neighbourhood then at least 1.8 metre footpaths should be designed on both sides.

Two-sided footpath - Two-way traffic

- One footpath on either side of the street: with a clear width of 2 metre each and 150 mm kerb height;
- Two-way traffic lane widths kept to a minimum, as a traffic calming measure and prioritising pedestrian movement;
- Preferably used with a table-top crossing at the beginning of the street.
- Smaller plants provided at intervals act as a protective element from traffic.

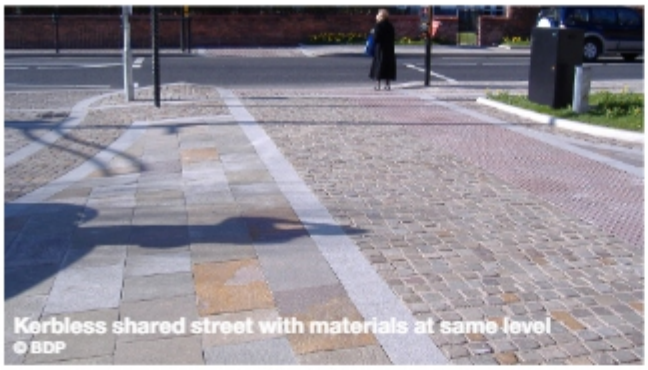
Shared Street

- Encourage a greater diversity of activity and use of the street by residents.
- Holistic paved surface treatment increases pop-up playing zones and children's activity area.
- Paving material, multiple activities, and narrow bending carriageways reduce the traffic speed significantly.
- People are encouraged to walk and cycle within their local areas, and to nearby destinations safely.

For more information on kerb heights and footpaths see:

ITDP – Footpath Design Guide

UTTIPEC - Kerb Heights for Footpaths & Medians



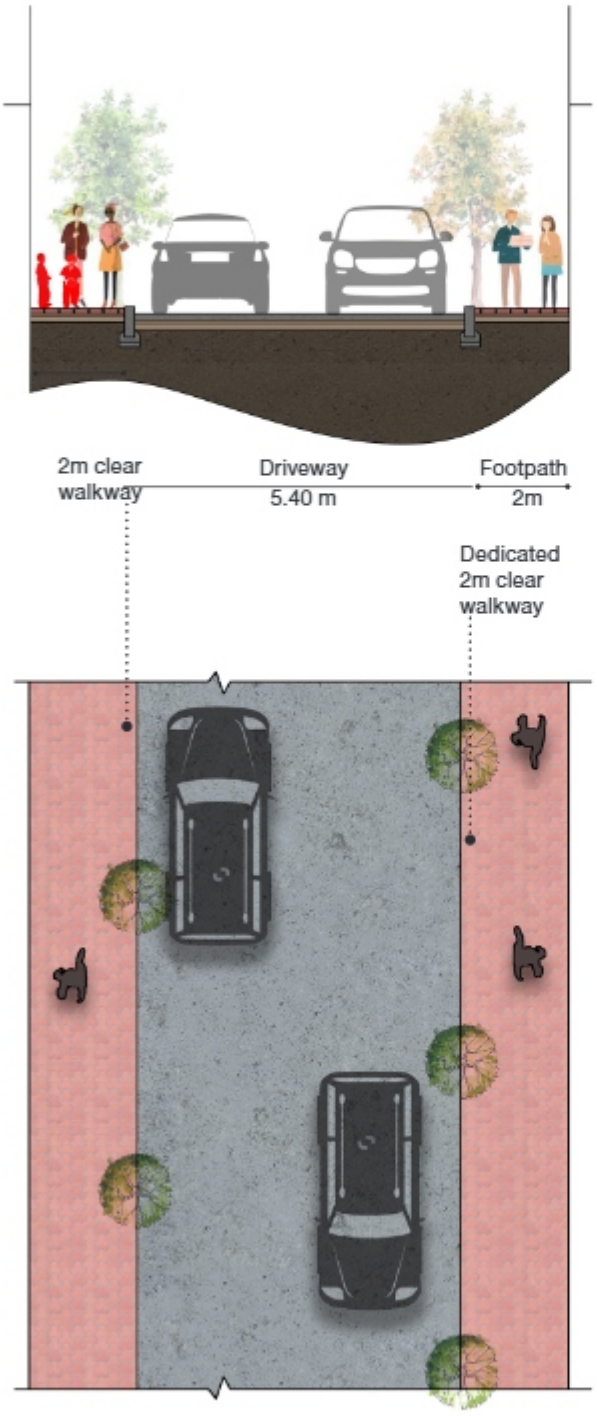


Figure 3.20 9 metre local street section and plan with two-sided footpath and two-way traffic

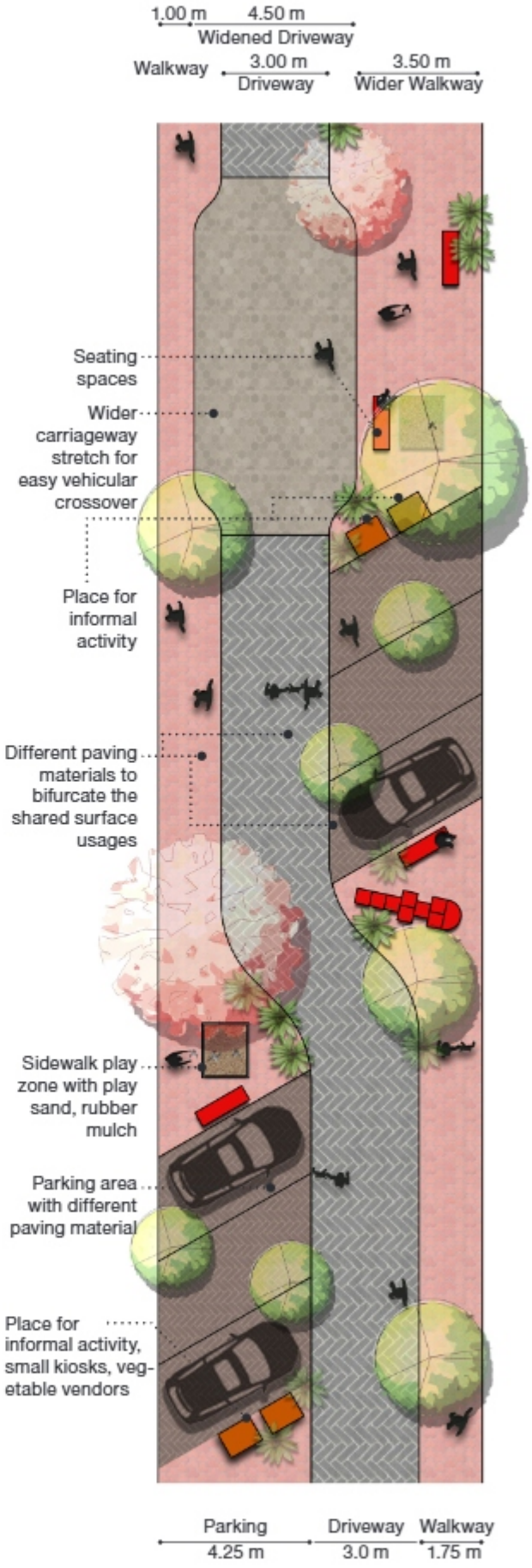


Figure 3.21 Shared street section and plan

NEIGHBOURHOOD STREET - 12 METRE WIDE

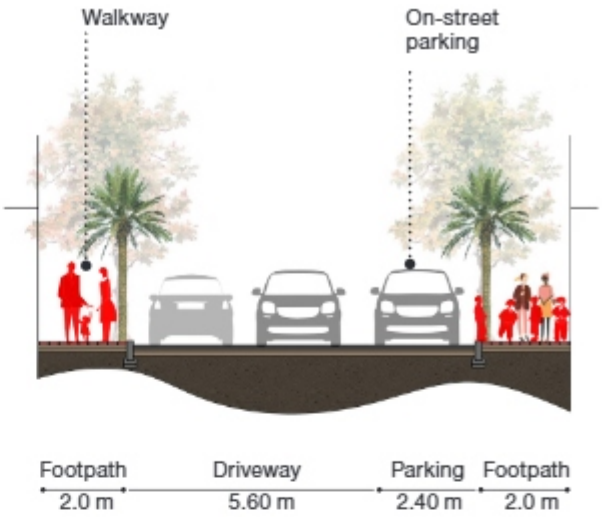
Wider neighbourhood streets connecting it to the city fabric need to have safe and continuous space for movement. It may seem important to clear vehicular traffic on these roads quickly to avoid congestion. But adequate traffic calming measures should be applied to make it safe for young children and caregivers to move along these neighbourhood streets.

Consider the following while designing any configurations of 12 metre streets:

- The street should ideally have designated footpaths with minimum 2 metre width. A wider pedestrian zone may be made on one side of the street, which can accommodate play zones, resting zones, and green pockets. This should be a clear of 2 metre walking area.
- The street may also accommodate designated parking alongside the lanes. In such cases, the parking areas may be created at intervals with alternative planters.
- Separate planter zone with trees, lighting acting as a buffer between the vehicular road and stroller path.

For more information on physical barriers for footpaths and dedicated stroller lanes, please see:

UTTIPEC - Guidelines and Design Specifications for Crash Barriers, Pedestrian Railings and Dividers (Approved)



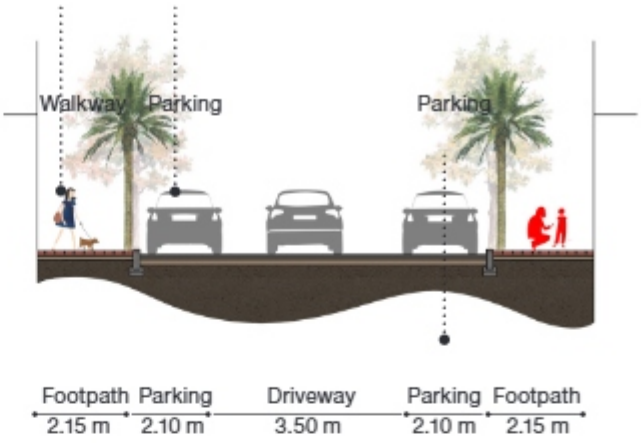
12 metre street - parking with chicanes/bulb-outs

- Chicane is a sharp double bend created to form an obstacle on a road to calm traffic and reduce speeds.
- 12 metre street can have a two-way chicane street with footpaths on either side and alternative parking on one side.
- Alternate parking spaces on one side of the street only.
- Where the parking spaces for young children and caregivershes are on the other side, the projected bulb-out areas become multifunctional spaces.
- Green spaces also serve as an interactive art zone for children, while the trees on the side facing the road act as a safety buffer from the traffic.
- A clear walkway of 2 metre on either side is maintained.

Figure 3.22 12 metre chicane street section and plan

For more information on chicanes, please see:
Chicane - San Francisco Better Streets
NACTO - C hicanes

Table top crossing, Pune
© ITDP Footpath Design Guide, November 2013



One way pinch points

- One-way street with continuous parking on both sides.
- Footpaths on both sides, with 2 metres of clear walkway and planters at intervals.
- 'Pinch points' at every 60 metres to create a safe crossing zone, a wider pavement area with an area for pop-up play zones, and larger trees for shading and seating spaces.
- Table-top crossing point with stroller-friendly surface materials.

For more information on pinch points on streets, please see:

Pinch point design

http://www.aviewfromthecyclepath.com/2015/07/a-pinch-point-design-which-slows-cars.html

NACTO - Pinch Points

https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/pinchpoint/

IRC - Guidelines for Pedestrian Facilities

https://www.irc.nic.in/admnis/admin/showimg.aspx?ID=345

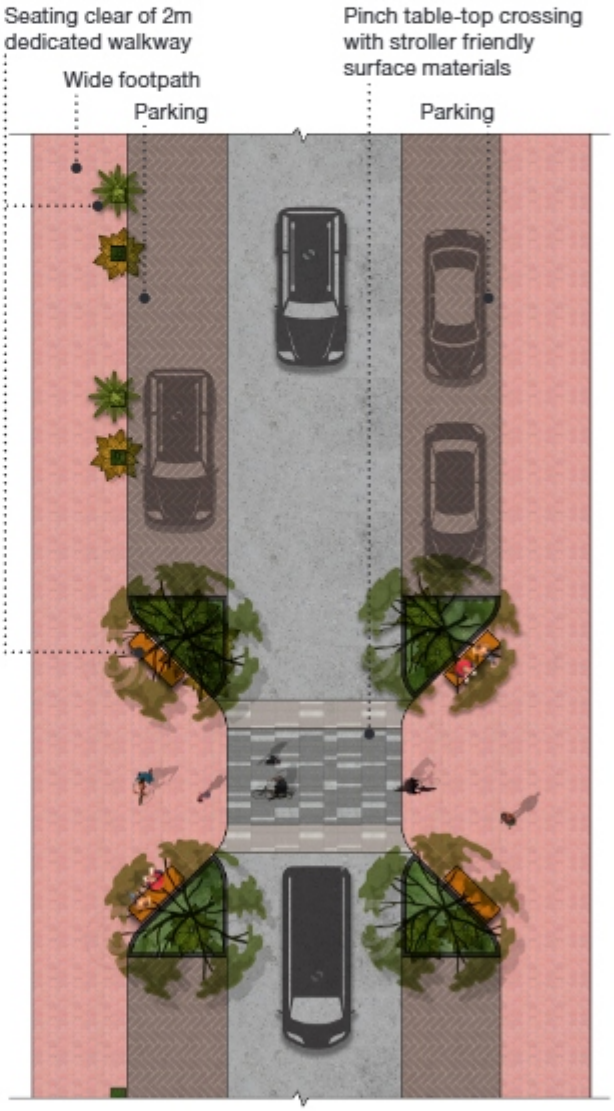


Figure 3.23 12 metre pinch point street section and plan

NEIGHBOURHOOD MAIN STREET - 15 METRE (OR 18METRE) WIDE

Neighbourhood main street is the primary access road and carries continuous traffic. It is essential to have continuous pavements on both sides of the street and create safe crossing points at regular intervals. The on street parking zone may be realigned at crossings to create a wider pedestrian area for queuing space. This should happen at every 60 metres maximum. Following is the most effective two-way street cross section for dense neighbourhood's main streets.

Two-way traffic, with parking, two footpaths, and pinch points

- Two-way street with continuous footpaths and parking on both sides.
- It is strongly advisable to create several pinch-point safe crossing zones.
- The pinching allows a visual break in the parking, creates spaces for greenery and resting.
- The table top crossing acts as a traffic calming measure and is also a barrier-free movement space for strollers.

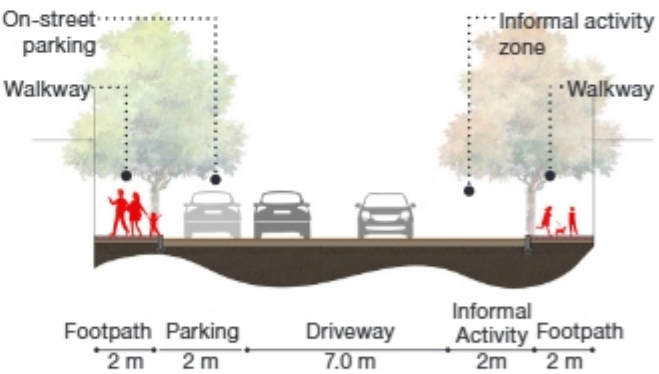
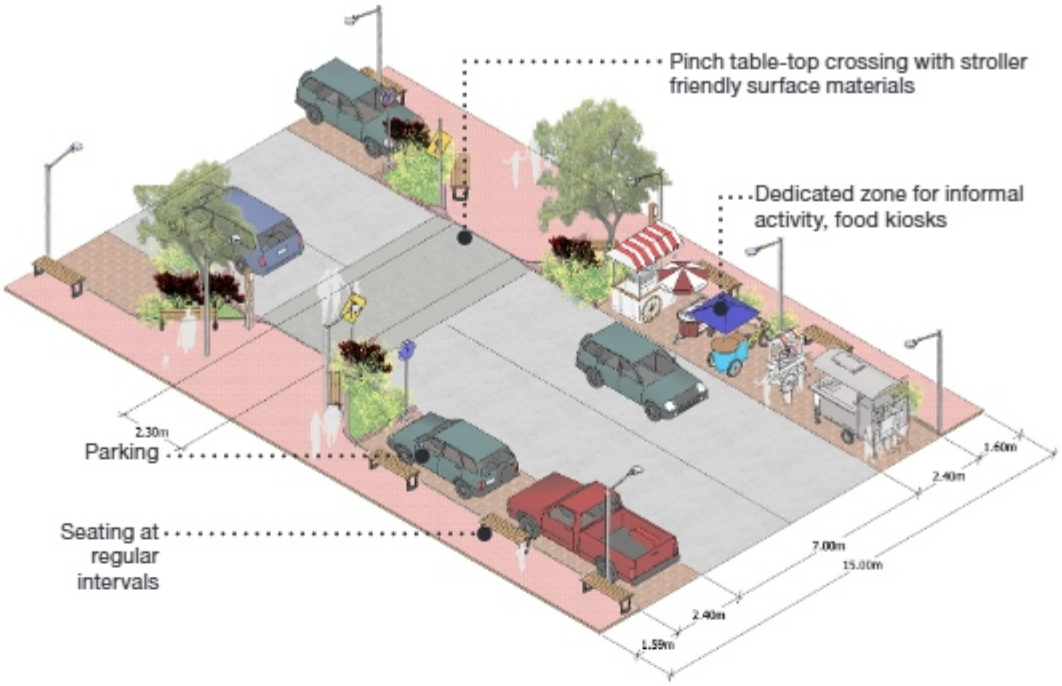


Figure 3.24 Neighbourhood main street section



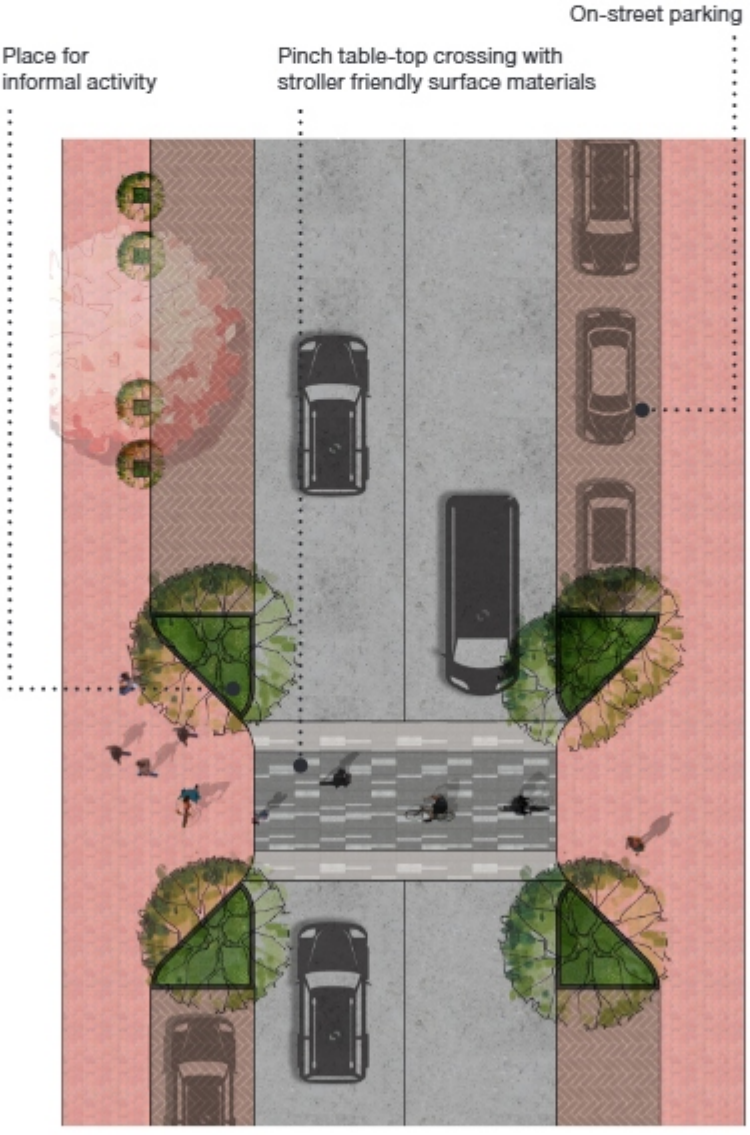


Figure 3.25 15 metre neighbourhood main street plan and view

GUIDELINES FOR STREET COMPONENTS

There are many elements that need to come together to make streets that are welcoming, safe, and inclusive of young children and their caregivers. These have been sub-divided on the basis of the five ITCN objectives for a healthy neighbourhood for young children and caregivers.

STREETS

Safe Streets	• Pedestrian crossings • Safety at junctions and property entry areas • Refuge islands • Footpath buffer • Traffic calming measures • Active facade and Interactive Edges • Lighting • Wayfinding • Pedestrian signal appropriation
Green Streets	• Street planting • Shading and cooling elements • Resilience measures in streets
Accessible Streets	• Groundcover materials and colours • Inclination ramps • Pause points to rest • Seating area
Playful and Inclusive	• Playful furniture • Sidewalk games • Pop-up playing • Temporary street closure

SAFE STREETS

The foremost priority for parents when children are outside is to keep them safe. Only then will they have the freedom to explore the public realm and derive the maximum benefit by playing, socialising, running, or coming into contact with nature.

DP Road, Pune
©www.itdp.org/category/location/india/pune

SPECIFIC SAFETY IN STREETS

At present, road safety regulations in India do not feature 'children' as a vulnerable group, especially 0 to 5-year-old children who are the most vulnerable on roads. This age group, generally accompanied by their caregivers, requires specific safety measures due to their small size and limited capacity to evaluate risk. Hence, it is essential to provide certain guidelines for safe design of neighbourhood streets that should cater to the specific needs of young children and caregivers considering their size, abilities, and space requirements. Designing for young children can create beneficial infrastructure for other vulnerable groups as well, like the elderly and disabled.

To allow young children the freedom to explore the public realm and derive the maximum benefits by playing, socialising, or being outdoors, it is important to design streets through the following three overarching layers of safety.

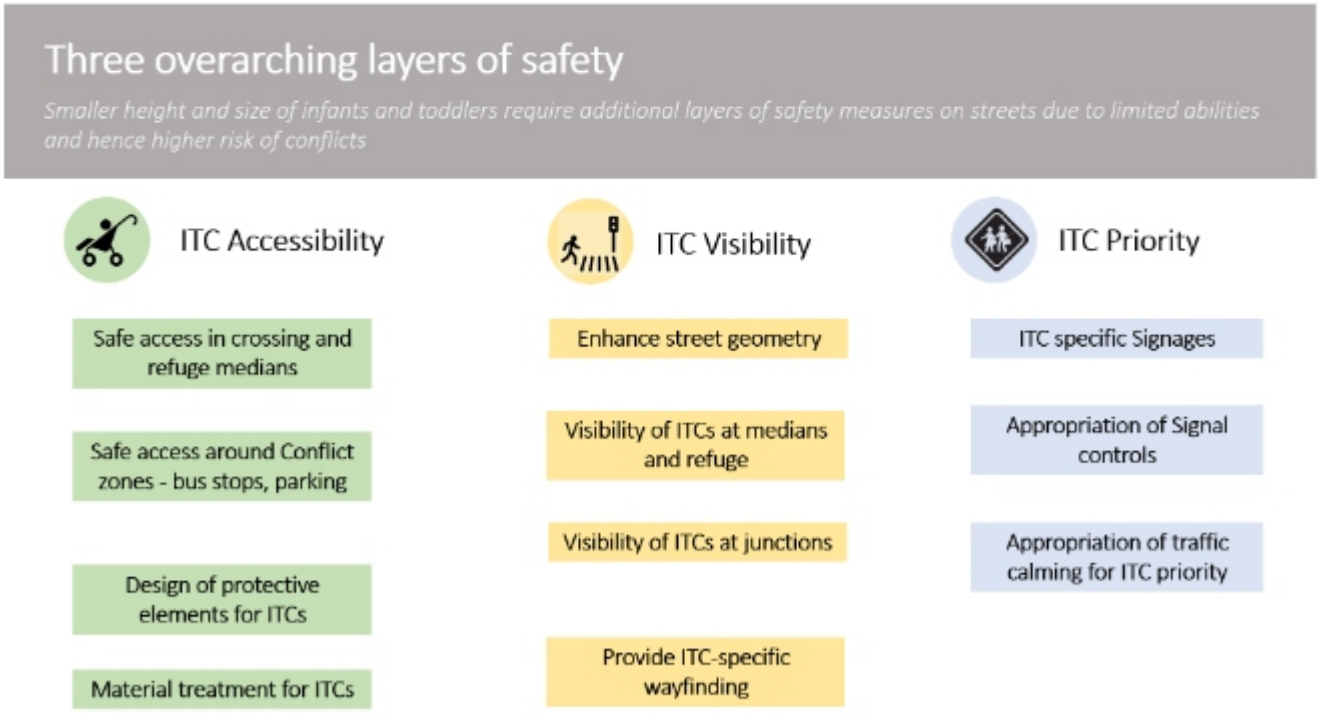


Figure 3.26 Three overarching layers of safety

PEDESTRIAN CROSSING

Young children are especially vulnerable at crossings because they move slower than adults. In addition, the viewing angle of children can easily be blocked by trees, planting, or parked cars. Navigating raised surfaces without ramps is another obstacle for children and for the caregivers carrying a pram as well.

Therefore, it is essential to follow certain guidelines for pedestrian crossings that ensure visibility of young children for drivers, easy navigation, and protective measures. For calculating appropriate crossing distances and time required for caregivers with young children, consider walking speed of 15-20 metre/minute.

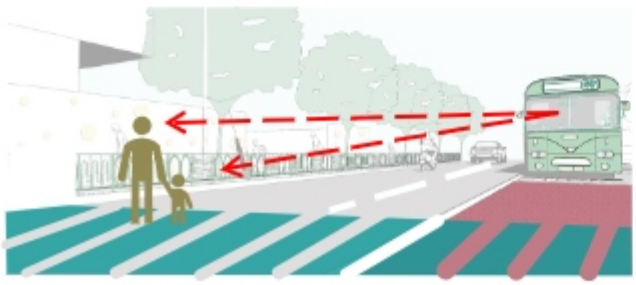


Figure 3.27 Visibility at pedestrian crossing
Source: WRI India

Consider the following guidelines for pedestrian crossing:

- Place an at-grade or raised crossing at **regular intervals of 250-300 metres** to avoid walking extra to find the crossing point.
- Provide a minimum **2.4 metre wide** crossing to accommodate prams.
- Keep crossing clear of obstacles that may obstruct visibility. No parking or tall vegetation should be placed next to crossings.
- In case of at-grade crossings, provide **ramps on either side connecting to the footpath** with a maximum 1:15 slope. In case of raised crossings, flush the crossing at the same level as the footpath.
- On either side of the crossing, provide bollards at 900 mm c/c, with any two bollards placed at 1200 mm c/c for stroller/wheelchair accessibility.
- Caregivers carrying prams and, strollers require more queuing space and therefore, **ensure 2.4 metre clear queuing space** before crossing.
- Brightly coloured zebra crossing markings **make the crossing identifiable** for children.

SAFETY AT JUNCTIONS AND PROPERTY ENTRY AREAS

Children in the age group of 0–5 have low height and therefore are less visible from a car. At the same time, the child may not see oncoming traffic because their view may be obstructed, for example, by a parked car next to the street.

Young children tend to act on impulse, and therefore, they need extra measures to protect them from traffic, especially at junctions where the risk is higher. Safety bollards, low fences, or introducing a green buffer with trees between the footpath and the street can help. Similarly, property entry areas of adjacent plots are frequented by vehicles going in and out. Safe design of these property entry areas is essential to allow children to use footpaths freely and walk independently, for example, a toddler walking without holding the hand of their caregivers.

Figure 3.28 Footpath extended at junction corners
Source: WRI India

Consider the following guidelines:

- **Compact junctions** to ensure the shortest crossing distance for pedestrians.
- Orient traffic lanes correctly and **maintain lane balance** at the junction.
- Place continuous **protective elements, such as bollards or railings with a maximum 600 mm** height along the junctions near young children's destinations. This will prevent children from accidentally running into the street.
- Locate crossings that **ensure visibility so drivers and caregivers** can also see approaching vehicles. Slow down vehicles with traffic calming measures.
- Highlight the junction area and property entry areas with **material or colour change for better legibility.**
- Provide bollards with **two layers of warning tactile** along property entry and crossings. The spacing between any two bollards should be 1.2 metre for a stroller to cross by.
- Keep **on-street parking and transit stops away from** junctions.

REFUGE ISLANDS

Young children are usually accompanied by their caregivers and move around as a unit. It is important to allow them sufficient refuge spaces to wait and navigate streets.

While providing refuge islands in junctions and medians along the street, ensure adequate space to safely wait for caregivers carrying young children. The design of refuge islands should consider specific space requirements and protection needs of this group.

Figure 3.29 Wider refuge median with staggered crossing
Source: WRI India

Consider the following guidelines for refuge space:

- Provide **accessible junction islands**, so they act as refuge spaces and cut down crossing lengths.
- Provide adequate space on the island/ median for the caregiver and toddler to wait halfway, as they may not be able to cross a wide street at once. Ensure a **minimum width of 2.4 metre** for refuge islands to accommodate caregivers pushing strollers.
- Protect refuge with **bollards along the edges at 900mm c/c**, with at least two bollards placed at 1200mm c/c for stroller/wheelchair accessibility.
- **Avoid tall vegetation or elements** that may block visibility of children and caregivers waiting at refuge island to cross.
- In heavy footfall areas, caregivers with toddlers or strollers may require additional refuge space. In such cases, provide **staggered crossings** to widen the refuge area (can be 1.5 times).

FOOTPATH BUFFER

Buffer is the physical barrier that separates pedestrian movement from the vehicular lane to ensure the safety of pedestrians on footpaths. Use of green buffers, especially, can also reduce exposure to vehicle exhausts and their pollutants.

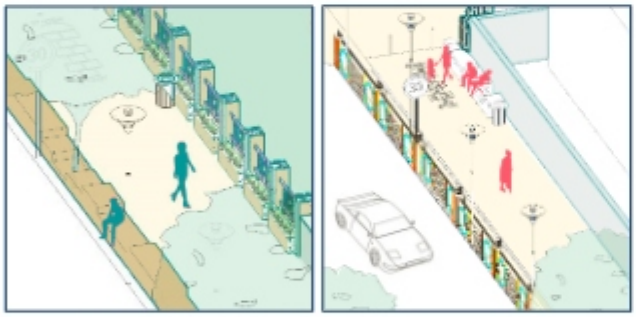


Figure 3.30 Interactive buffer types

Source: WRI India

Consider the following guidelines while providing different types of buffers:

- Provide a **green buffer** with a minimum width of 0.5-1 metre to provide safety from vehicular traffic.
- The height of the green buffers should not be more than 0.8 metre so that it does not block the visibility of the toddler.
- **Bio-swales and tree trenches** can be integrated within the green buffer.
- Along the parks and public spaces, provide a **45 cm short wall as a buffer** and act as a seating edge.
- Along ECD premises, provide **interactive railing,** such as Abacus railing at 95 cm as a buffer. Railing should be such that a child can hold it and walk.

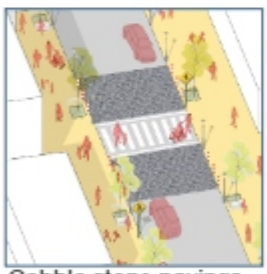
TRAFFIC CALMING MEASURES

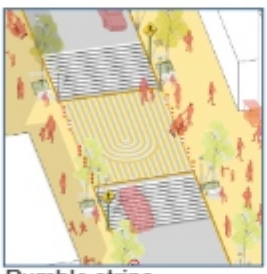
It is important to provide traffic calming measures in areas frequented by young children and caregivers so that their movement is prioritised over motorised traffic. Traffic calming is especially crucial for hilly areas, where the streets have steep slopes.

Providing traffic calming measures can gradually slow down vehicles prior to the crossing.

Consider the following guidelines for providing traffic calming measures:

- Provide **curb extensions** to reduce the crossing distance and increase their visibility as well. Provide these, especially at junction crossings near young children's facilities.
- Provide chicanes[13] around children's facilities, which make **vehicles turn in short curves and hence slow them** down. The space of chicanes can accommodate planters or seating.
- Provide **tabletops near the entrance** of these facilities to slow down vehicles while pedestrians cross.
- **Set a speed limit of 30 km/hr** for these frequented zones to ensure slower streets and thereby increase perceptions of safety.


Cobble stone pavings


Rumble strips


Chicanes

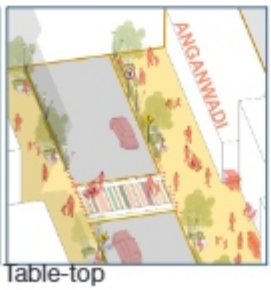


Table-top


Bulb-out

Figure 3.31 Types of traffic calming measures
Source: WRI India

[13] Chicanes – A double bend section designed on the road to create sharp curve slowing down vehicles.


Communtiy Shopping along DP Road, Pune
©www.itdp.org/category/location/india/pune/


J M road boundary
© Oasis Design Inc

ACTIVE FACADE AND INTERACTIVE EDGES

Caregivers are less likely to take children on an isolated street. The presence of people and activity along a street acts as a means of passive control and forms 'eyes on the street. If streets have active facades and interactive edges, it will generate curiosity and interactions among children and caregivers and make them feel safer. Thus, making the building edge active and porous with low-height compound walls will improve perceptions of safety.

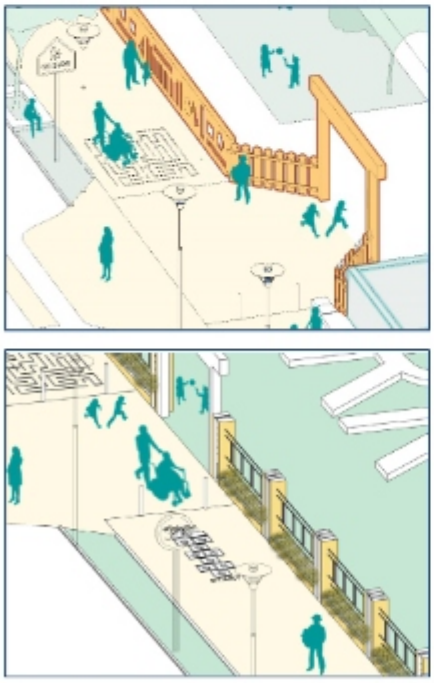


Figure 3.32 Active and porous edges
Source: WRI India

Consider the following guidelines for ensuring interactive edges:

- Ensure **porous, interactive compound walls,** especially at 95 cm.
- On dead edge walls, provide **murals** painted with vibrant colours, green planters and creepers, and hollow blocks.
- For commercial streets, provide colonnades, **building edges with steps, katta, and a series of planters** to allow interaction.
- For ECD premises, provide an interactive porous boundary wall with playful openings.
- For parks and public spaces, provide a **low height porous green wall** as the boundary.
- In case of long dead boundaries, add interactive elements at every 50 metres.
- **Avoid parking along the building edge** abutting the street.


Street lighting, Rourkela
© WRI India

LIGHTING

Lighting plays a vital role in the perception of safety. Good lighting also prevents young children from tripping over obstacles lying on the pavement or uneven paving. Well-lit routes along streets will attract more people, be safer, and allow for extended use of the street into the evening hours. Well-chosen light-poles and armatures can contribute to the character of a street and make them feel friendly.

Take the following into account for a well-lit street:

- Choose a **lighting type to reflect the use of the public realm**. Provide high unadorned lights of 10 lux level to shine onto road surfaces at 20-30 metres c/c. Provide lower, attractive armatures of 6-8 lux level to light footpaths at 10-20 metres c/c.
- Provide l**ow-level lighting where the paving is uneven** or where there are steps for better visibility.
- Place lighting elements for pavement areas at frequent intervals. As a general rule of thumb, **at least every 30 metres.**
- Place lighting elements such that **no shadow zones or dark spots** should be left along the footpath.
- Have a lighting expert calculate the level of lighting along the whole street. Ideally, the lighting level along the entire length of the pavement area should be constant at min. 6-8 lux level.
- **Avoid significant changes in lighting levels** along a street.
- Consider the **position of lighting elements relative to the position of trees** and other plants to avoid branches obstructing any light.
- Always keep in mind that, apart from safety, lighting can add value to a place in many and creative ways.

For more information on pinch points on streets, please see:

Lighting against crime - A Guide for Crime Reduction Profes- sionals

"We are born to walk", School children in Milan promoting walk to school. Photo of Besana, Milan
© www.greenews.info/comunicati-stampa/siamo-nati-per-camminare-23-000-bambini-vedono-cose-che-noi-adulti-20160314/

WAYFINDING

When young children walk in their neighbourhood with their caregivers, they gain important knowledge of the world around them. They also gain self-esteem and learn to explore. The urban environment in cities can be very hostile and bewildering for young children.

The ability to use directions, such as left and right does not fully develop until the age of 10 years.[14] It is difficult, if not impossible ,for children to move and explore independently, as they could get lost easily. Young children cannot read street names and so have to rely on other measures to show them the way. A good signing and wayfinding system designed especially for children will teach them to recognise where they are and show the route to familiar destinations. A wayfinding system designed for children prepares them for the next step in their development when they will step out into the world independently without their caregiver.

When designing wayfinding for young children, consider the following:

- Place the system so that it is visible at an eye-level of **95 cm.**
- Use **bright and recognizable** features. Young children cannot read; clear symbols should be used instead.
- The use of (enhanced) **existing landmarks** can also work well for children wayfinding, while street art can further help children orient in the city.
- Easily **recognizable objects**, placed at regular intervals, or a signage system with symbols on boards can indicate the way.
- Map and incorporate the **informal routes** taken by children in the wayfinding system.

[14] Developmental differences in the ability to give route directions from a map , Blades and Medlicott, 1992

For more information on development of wayfinding abilities in children, please see

https://doi.org/10.1016/j.jenvp.2014.11.008

Traffic signal in Pune
© WRI India

PEDESTRIAN SIGNAL APPROPRIATION

While pedestrian signals are crucial for safe movement of young children and caregivers across junctions, it is important to appropriate them to best suit their requirements.

IRC guidelines state that the crossing time should be considered as crossing length +7 seconds. This is found insufficient since caregivers with young children walk slower than adults. Out of various user profiles, caregiver with stroller/wheelchair profile is found most vulnerable and with slow speed at crossings and therefore is used to arrive at average speed of 35-45 m/min. Based on this speed, signal timing for junctions should be calculated.

The location, phasing, and timing of pedestrian signals play a key role in safe crossing. Locate pedestrian signals such that the timing display is clearly visible to caregivers with young children at the start of the crossing.

Consider the following guidelines for pedestrian signals:

- **Crossings should be automated and timed for pedestrians**, as per their walking speed and crossing distance.
- As per walking speed of 35-45 metre/minute, for the 9 metre length of crossing, 20 seconds should be provided to safely cross. However, in high footfall areas, this time could be doubled to ensure a high flow of pedestrians crossing safely.
- **All-red signal configuration** can allow caregivers with young children to freely cross in all directions of junction.
- **Pedestrian waiting time can be reduced** by shortening overall signal cycle length. This provides a higher frequency of pedestrian signals.
- Pedestrians can get a **green signal prior to the traffic** going in the same direction, so they get a head-start.
- Provide **audible pedestrian signals** for people with hearing disabilities. Also, provide alerts for moving traffic to stop.
- **Install sensors on the crossing area** to extend crossing time, if necessary, by checking if pedestrians are still crossing.

GREEN STREETS

The quality of the air we breathe, our exposure to the sun, noise or car-fumes and many other environmental factors drastically affect the way young children act, live, and develop. Green streets provide climatic protection and buffer from noise and pollution, and harsh climatic conditions.


New Delhi Street
© Chuy Aftamira/Flickr

STREET PLANTING

Planting is important to create shade and cooling on streets. They create a pleasant environment (protection from glare and heat).

In a retrofit context, there are opportunities to add green to the public realm that do not require much space, such as window boxes or climbing plants against facades and arbors across small streets. These don't require great amounts of time for maturation before healthy amounts of shade are provided.

Planting zones, if placed alongside roads, act as a buffer between the street and the pavement and, double up as protection.

Planting zones, if placed along facades, mitigate heat absorbed and radiated from the buildings (cooling factor). Plants let small children come in contact with nature.

Underground utilities can obstruct root growth. It is important to consider how utilities are placed in relation to trees.

Consider the following:

- Use planting at different heights- trees for shading and **lower plants at the scale of small children.**
- Plants can be placed in various zones in the street: against facades, in a zone between traffic and pedestrians. **If there is no space for planting on the pavement, consider planting between parked cars.**
- Where streets are very narrow, like in inner city areas, consider using **climbing plants against the facades**. Place **potted plants** along a façade. However, ensure that there is still enough pavement width for a caregiver pushing a pram.
- **Use indigenous plants and local species.**
- Try to retain existing trees when retrofitting a street. Large trees add instant character to a street.

For more information trees and plants, please see

IRC Guidelines on Trees and Planting

Identifying Indian Trees and flowers

GoI-CPWD - Landscape Works & Horticulture Activities

Important Native trees of India

SHADING AND COOLING ELEMENTS

A well-used street is a street that provides a comfortable environment to its users. In India, this often means protection from extreme heat during the majority of the year. Providing shaded areas on pavements and, creating canopies along well-used routes is crucial for small children and their caregivers. Resting and seating areas should be shaded from heat and rain for year round usage.

Consider the following shading and cooling elements:

- Ideal shading is **natural shading**; where possible, use trees, bushes, and climbers.
- Provide **continuous shade** on well-used neighbourhood routes.
- Besides built canopies, consider trellises overgrown with climbing plants. These provide shade while also having a **cooling** factor.
- Provide shaded spots where children and their caregivers **need to wait**: at bus stops, at busy traffic junctions, and in play areas.
- Make sure that resting elements, like benches, have shade.

For sun protection and skin health importance in babies and toddlers, please see: http://www.sunsmart.com.au/downloads/resources/info-sheets/sun-protection-babies-toddlers-info-sheet.pdf

Kolkata Street
© Gautam Bose, Telegraph India

RESILIENCE MEASURES IN STREETS

Street designs should incorporate a mix of nature-based solutions to build long-term resilience in streetscapes.

Various urban greening solutions, such as vegetated swales, and rain gardens can enhance the overall green cover of the streets and reduce the heat island effect. At the same time, storm water drainage systems, tree trenches, and permeable pavements can enhance resilience, especially risks from disasters (flooding, water-logging etc). Adaptation measures, such as sustainable design practices by use of local materials and native plant species also help in building resilience in the long term.

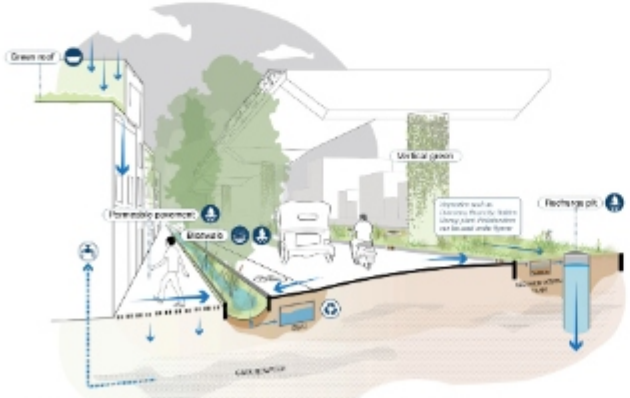


Figure 3.33 Climate resilience in streets
Source: WRI India

Consider the following nature based solution in the streets:

- Place plantation buffers along the street with **flower rich and green bio-swales**. These can manage suface runoff to improve resilience.
- Introduce **green surfaces with biodiversity rich plantations**. These surfaces can be green walls, green roofs, grasslands etc.
- Use **permeable pavement** along the streets that allows more rainfall to soak into the ground. Common types include permeable concrete, porous concrete and interlocking pavers.
- **Community gardens and urban farming** can be provided along the streets to increase green cover.
- **Tree trenches should be added** to streets and parking lots with limited space to manage storm water.
- Use of lo**cally sourced materials and native plant species** can build long-term resiience.

ACCESSIBLE STREETS

As with a park or a small neighbourhood square, the pavement area can also be a place where people wish to linger and so make streets more livable and vibrant. To make streets accessible for young children and caregivers, it is important to consider components such as ramps for strollers, low kerb-stones that allow a young child to climb up, ground cover, and safe resting equipment.

Bridge Pavillion in San Fransisco by Jensen Architects
© jensen-architects.com/work/golden-gate-bridge-pavilion/

GROUNDCOVER MATERIALS AND COLOURS

Ground cover materials used for pavements should be carefully selected. Small children stumble and fall easily where paving is uneven, and wheels of prams could get stuck in rough surfaces. At the same time, different types of paving may also subtly indicate zones where it is safe to walk. A change in the paving pattern around a playful piece of street furniture could indicate this informal playing area on the pavement. In the same way, colours can be used to indicate zones on a pavement for children. For example, yellow painted pavements at each street corner will make these recognizable for children.

Its critical to have locally available, durable, cost effective ground covers and paving materials. Some such examples are below:

Brick Tiles | Stone Tiles | Cobbles | Murram

Cement Concrete | Cement Concrete Interlocking Pavers

Consider the following when choosing groundcover materials for pavements:

- **Avoid uneven** ground cover materials.
- If a pavement is made of gravel pavement or soil, add a smaller, **smooth strip of paving** over which prams can easily be pushed.
- Use **different types or patterns** of paving to divide the pavement area into recognizable zones, such as a safe walking zone, a playing zone, and an unsafe zone next to parked cars.
- Indicate specific zones, such as street crossings or bus stops by **adding colour** to the pavements of these areas.
- Some other common surface **materials for children** friendly surfaces include: bark softfall, impact absorbing sand, wet pour rubber, rubber tiles, and pavers.

For guidelines on pavement tiling, please see:

IRC-Guidelines for the use of interlocking concrete block pavement

CPWD Specifications

A combination of steps and inclination ramps in Santiago, Chile
© Beau Lebens on Flickr

INCLINATION RAMPS

Young children and caregivers have special requirements where level differences are concerned. A small level difference, such as a kerb of just 10 cm high, is an obstacle for a small child and a pram. Kerbs should be inclined at all street crossings, to ensure a safe and easy crossing.

Steps in the public realm could pose an insurmountable problem for a caregiver pushing a pram and a small child. Adding a ramp where there are larger level differences[15] in the public sphere will ensure that all children, wheelchair users and caregivers with buggies can have access to the full extent of the public realm.

Consider the following when designing inclinations and ramps:

- Ramps with an incline of **1:20 (5%) to 1:15 (6.7%)** is preferred for strollers.[15]
- Flat **5-foot long plateaus** should be provided after every vertical 30 inches of elevation gain.[15]
- Ensure that the ramp is min. **1.8 metre wide** to accommodate an adult with a pram and a small child walking beside.
- In case **bollards** have to be added around the ramps, they should have **1.2 metre** clear space between them.
- Provide a **good handrail** beside the ramp. Include a lower rail at the height of a small child.
- **Tactile paving at the start and end** of the ramps should be given for toddlers who are differently abled.
- A staircase designed to accommodate baby strollers should have treads **18-20 in deep and risers 3-4 in high**, resulting in slopes of 16-20%. This is a **shallower slope** than normal staircases.

[15] For barrier free and accessibility guidelines, please see:

CPWD - Handbook on Barrier Free Design and Accessibility 24

CPWD Guidelines and Space Standards for barrier-free built environment published by Ministry of Urban Development in 2016

PAUSE POINTS TO REST

Pedestrian movement of children and caregivers should be supported with rest and pause points at regular intervals, especially along key destinations, such as near ECD services, parks and public spaces, commercial areas, and transit stops.

Rest and pause points may be integrated with the buffer/MUZ. These spaces should be functional with shade (through trees, canopies or, pergolas), lighting, dustbins, and perhaps activities of vending that can enhance eyes on the street.

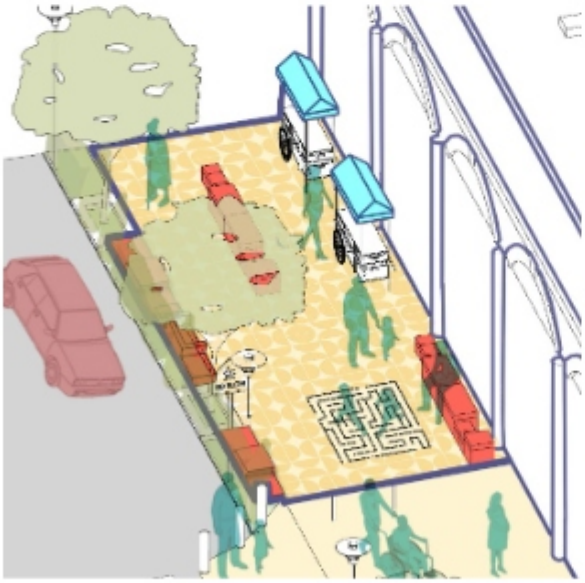


Figure 3.34 Pause points to rest
Source: WRI India

Consider the following while providing resting and seating spaces along the streets:

- Provide **shaded clustered seating** in at regular intervals(every 50-100 metres) to ensure comfortable pause points.
- Provide interactive elements, such as **sidewalk games, interactive wall surfaces, and sensory elements,** such as flowering plants in the pause points.
- Dedicated vendor zones may be provided in the pause points to **activate the space and ensure eyes on the street**.
- **Provide amenities,** such as drinking water kiosks at child and adult height, dustbins, and adequate lighting to ensure comfort in the pause points.

© WRI India

SEATING AREA

Seating elements along the streets provide the means for infants, toddlers, and caregivers to rest and encourage spending more time outside. For a parent carrying his/her child around the market, resting for a few minutes in shaded, well-lit, comfortable seating can be of high value.


Seating around tree planter in Pune
© www.[illegible].org/category/location/india/pune/


Multi-height clustered seating
© WRI India

Consider the following guidelines for providing comfortable seating for caregivers with young children:

- Provide wider flat top seating (650 mm) wherever possible for giving caregivers a place to safely put down their baby.
- Add multi-height seating options along the footpath to enable both adults and young children to sit comfortably.
- Create clustered seating spaces to enable interactions between caregivers and children.
- Provide seating for toddlers with a height of 270 mm.
- Integrate seating with other elements, such as low-height bollards (400-500 mm height) with flat tops, wooden cut logs, etc.

For guidelines on public seating areas, please see:

Public Seating - Smithsonian Institution Accessibility Guidelines

Benches for everyone - Young Foundation

PLAYFUL AND INCLUSIVE

There are endless possibilities for informal play along streets and lanes. With careful planning and simple objects, children can be stimulated to use their imagination to transform any object or space into a perfect playground. It is up to designers to provide children with the right creative tools to create their own play-world.


Play Facilities at JM Road, Pune by Oasis design
© oasisdesigns.org/pune.asp

PLAYFUL FURNITURE

Urban furniture in public spaces or primarily along streets, if well-chosen and placed, can become playful elements for toddlers and infants.

The same applies to everyday objects like the border of a tree planter or number of steps, which can give new play experiences for the children. For example, a simple bus stop shading rail may double up as a place to put up a pop-up swing from for small children while waiting for the bus. For small children, simple, colourful benches can become exciting elements to climb, crawl, and have different playful experiences.

Think of the following when choosing outdoor furniture:

- Consider the street furniture through the eyes of a small child. Think of how they would perceive and use it.
- Choose **low** benches and seating with flat tops so that children can use them easily.
- Choose **colourful** street furniture.
- Choose edging along planters with railings that are low and wide enough for small feet.


Playful installations
©https://www.youtube.com/@WalkinginIndia


Playful benches at Circling the avenue Israel
©Yoav Peled

Play zone at street corners
© Pune Municipal Corporation and WRI India

Access street along sensory park with games, Rourkela
© Rourkela Smart City Ltd

SIDEWALK GAMES

Sidewalk games are an excellent example of how children can use their imagination to create a world of play within the boundaries of a footpath. As a first step, designers need only provide children with an empty and protected space and some stimulating pointers to fire the imagination and keep them reinventing and engaged for hours.

Sidewalk games can be stimulated by:

- Introducing **patterned pavement** over a small portion of the pavement area.
- Providing a smooth, flat area of pavement where children **can draw** their own pavement figures.
- Painting simple lines or squares onto pavement areas.
- **Drawing the beginnings of a game** or some shapes on the pavement for children to fill in.
- Using **contextual and traditional games** for easy and universal understanding.

For ideas on traditional Indian outdoor games, some of which can be added to a sidewalk, please see:

https://www.parentcircle.com/clipbook/9-indian-traditional-games-for-children/

For ideas on how to create simple sidewalk chalk games, please see:

https://www.craftymama-in-me.com/how-to-create-a-simple-sidewalk-chalk-stem-game/

https://www.familyeducation.com/videos/7-fun-driveway-side-walk-games-kids

Interactive Play at Tango Triangle by 100architects, Shanghai, China
© architizer.com/projects/tango-triangle-1/

POP-UP PLAYING

Pop-up-playing is when a playing area with a temporary character is introduced into a neighbourhood in a place that is normally not used for play. This could be for a few hours or a whole day. This offers small children the opportunity and space to play outside, close to the home that they would typically not have, and also brings caregivers together, helping to build healthier and stronger societies.

Some examples of pop-up play are:

- Using **temporary elements** to fence off an area, for example, a parking space, and painting interactive surfaces and bringing loose play objects for children to use.
- A **mobile pop-up play van** could be placed, which can be towed to different areas of the neighbourhood.
- A small area of the street could be fenced off with temporary structures, such as barricades and bollards. This area can be used for gathering toddlers to watch **a puppet show or to have a story read** to them.

For ideas on pop-up play ideas, please see:
https://www.playstreetmuseum.com/blog/2016/10/17/pop-up-play-street
Toddler play ideas, for age 1-3 years
https://raisingchildren.net.au/toddlers/play-learning/getting-play-started/toddlers-at-play

© Rahagiri, Gurgaon

TEMPORARY STREET CLOSURES

A neighbourhood street can temporarily be closed to vehicular traffic so that other street-activities can be facilitated and explored.

This can be an annual closure, for example, to facilitate a street party, but could also happen more often. For example, a neighbourhood street can be closed on a weekly or monthly basis to give small children the opportunity and freedom to safely play on the streets while parents and caregivers can socialise. Quite often, these closures are a test for the future and may lead to a permanent closure.

Keep the following in mind when organising temporary street closures:

- Consider which **street is most viable to close** on a temporary basis and how this will affect neighbourhood traffic. Closing a major entrance street of the neighbourhood will only block traffic and cause irritation.
- **Inform** all residents well in advance of the upcoming street closure.
- **Organise events** to take place on the day the street is closed. Street games, street art, a barbecue, and music will create a positive vibe and attract people.
- Consider **how traffic will be diverted** on the days that the street is closed. Give clear signs to direct the diverted traffic.

For examples of temporary street closure activities, please see:

Global Designing Cities Initiative - Temporary Street Closures

Actions for Streets as Places: How Government makes it happen Zumba on Indian Streets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RUN
© WRI India

MOBILITY

Objectives Achieved	City level indicators
	40. % of daily trips by non-motorised means (Supporting) 41. Percentage of non-motorised transport network coverage in the city. (Core) 42. Service coverage of public transport in the city. (Core) 43. % neighbourhood area with transit stops in walkable distance. (Supporting)
	44. Percentage of transit stops with supportive elements (Shaded seating, Playful elements, Public toilets, Nursing station) within 100mts. (Supporting)
	Neighbourhood level indicators
	45. % of journey destined at crèche/ kindergarten/ play school is by walking or cycling (Supporting) 46. Percentage of Anganwadi Centres having public transit stops within 300m (Supporting)

Target Behaviours

3. Young children and their families are choosing to walk and use public transport more to access amenities and facilities

3.1 Pedestrians walk on dedicated crossings and walkways

3.3 Caregivers are increasingly using public transport for commute

3.4 Front line workers, such as security guard, ticket counter staff, traffic police and other staff prioritises ITC

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

03 Mobility

MOBILITY CHARACTERISTICS

Mobility of young children and caregivers primarily involves walking within their neighbourhoods. It also extends to using public transport and Intermediate Para Transit (IPT) services to travel to their destinations around the city.

Caregivers' convenience, comfort and safety plays a significant role in making travel choices for young children. Travel experience also has a significant cognitive and psychosocial impact on young children.

Caregivers often do not find mobility options that meet their unique needs, forcing them to depend on private vehicles, taxis, autorickshaws. These modes are environmentally and even economically unsustainable for caregivers for their daily trips. Hence, it is important to provide multiple, comfortable public transport and active transport modes for them.

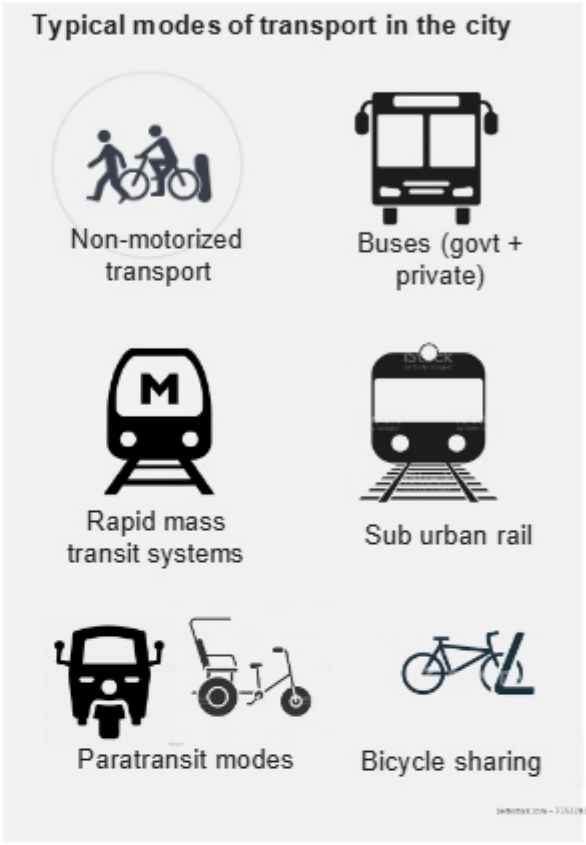


Figure 3.35 Various modes of transport

a. Travel patterns

Caregivers with young children are often seen visiting multiple destinations in one journey, making it a chain of trips. Their typically visited destinations include schools, Anganwadi Centres, crèches, hospitals and clinics, parks, gardens, markets, and other recreational and social spaces. Their have typically shorter trips but with multiple destinations, lower walking speed and frequent pauses.

Figure 3.36 Profiles of caregivers travelling with young children

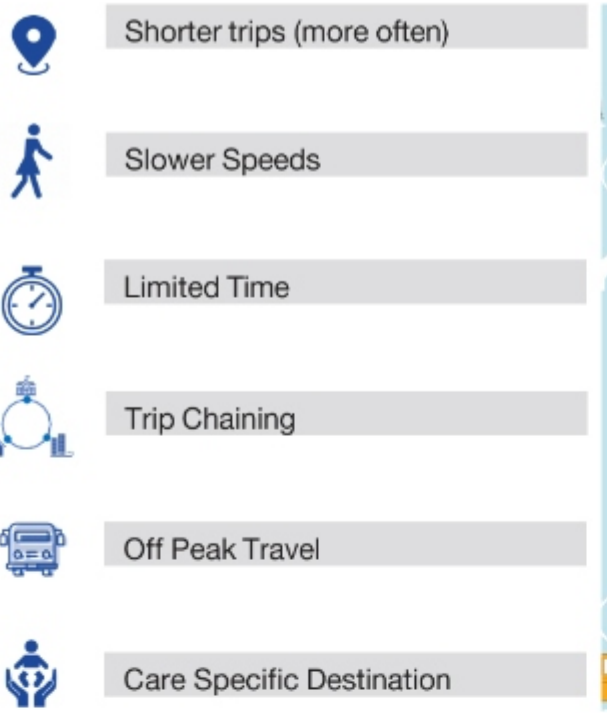


Figure 3.37 Young children and caregivers travel patterns
Source: WRI India

b. Barries and challenges

Caregivers with young children face several challenges related to public transport, such as the following:

- Poor access to streets around ECD facilities and public transport stops
- Poor frequency of public transport
- Lack of awareness of route information
- Longer waiting time and crowding in public transport modes
- Unaffordable public transport and mass rapid transit
- Lack of last mile connectivity from transit stop to the destinations
- Lack of suitable infrastructure and services, such as feeding rooms and diaper changing stations
- Inconvenience while travelling with infants- lack of level boarding for stroller, space to park stroller in buses, priority seating.

Travel modes, if not catering to caregivers, especially women, restrict their travel range and deprive them of necessary opportunities. Caregivers who do not have a choice but to work for their livelihood have to travel in overcrowded public transport or rely on private vehicles.

Access to public transport | Safety from speeding vehicles | Protection from pollution and environmental stressors

Figure 3.38 Issues related to mobility of young children and caregivers
Source: WRI India

ASSESSMENT FOR MOBILITY PLANNING

To improve the mobility experience of young children and caregivers in the city, it is important to first assess the mobility conditions through various tools, such as surveys, interviews and spatial analysis. Specific tools can be used for specific purpose, such as mapping travel patterns and behaviours, mode choices, experiential aspects, and network functioning. Each of the tools listed below supplement each other to develop a comprehensive understanding of young children and caregivers' mobility in the city.

SURVEY	PURPOSE	DATA COLLECTED
In-person interviews/IDI/ questionnaire	To understand ITC-specific travel needs, available options, travel choices, and perceptions of caregivers and help in designing the programmes and interventions that can better address the needs of ITCs	Trip purpose Trip length Mode choice Cost of travel Perception of quality of travel
Spatial Mapping	To understand spatially of gaps and inadequacies in public transit and NMT modes, network planning of public transport, and last-mile connectivity to the ECD facilities	Key ITC destinations Public and IPT transit stops and stations, NMT infrastructure Crash history and vehicle speeds Land use
Infrastructure assessment (photo survey, checklists, memory maps)	To identify specific design issues in mobility infrastructure, which impair the ability of ITC to move around safely	Infrastructure audit in vicinity of key ITC destinations, transit stops and stations, and their catchment areas for factors, such as safety, accessibility, and comfort
Observation surveys	To develop a nuanced understanding of how different types of caregivers with children access, use, and behave on the streets and theelements that trigger certain patterns	Observe and note type of caregiver and child, their patterns of walking, crossing, waiting, using public transport and behaviours during transit
Other surveys for captive users	To gather nuances of mobility experiences of those who use public transport or walk versus those who do not	• Challenges faced while using public transport and IPT or walk and cycle • Willingness and factors to encourage shift to PT and NMT modes

Table 3.6 Types of surveys around mobility

SPECIFIC SOLUTIONS

The main purpose of improving mobility for young children and caregivers is to ensure that they can travel anywhere and everywhere in the city with safety and comfort. The high-level solutions to achieve this focus on the availability of transit and paratransit network, especially around children's destinations, safe access around ECD facilities, and major public spaces and suitability of the transit infrastructure for caregivers accompanying young children from different socio-economic groups, age groups and gender.

7 Principles for ITC-friendly mobility

The seven principles for improving mobility of vulnerable road users are presented in Figure 3.39. Primarily, these cover the experiences of walking, waiting, accessing various modes of transport and wayfinding.

Availability of transit

- Availability public transport and IPT within walking distance
- Convenient schedules and frequency
- Seamless multimodal integration

Access to transit

- Safe and easy access to nearby transit stop from ECD services and public spaces
- Last mile connectivity options

Suitability

- Perception of safety at all hours, especially for women
- Caregiver amenities
- Behaviour of service providers- empathy towards young children and caregivers

Figure 3.39 7 Principles of ITC-friendly mobility

Source: WRI India

Design guidelines for enhancing mobility can be categorised into three major domains. The first major domain is improvements in mobility services, the second is improving the physical infrastructure of transit spaces, and the third is supportive measures for young children and caregivers.

a. Services

Mobility services and their operations should be improved from the lens of caregivers accompanying young children, to ensure ease and convenience. The following four categories of solutions are recommended for Indian cities.

Figure 3.40 Integrated transport services

Network

- Ensure complete network with last mile connectivity, such as autorickshaws and bicycle stands around frequented areas i.e. Anganwadis, pre-schools, crèches, hospitals, parks, and public spaces.
- Ensure a public transit stop or IPT stand within 50 metres from ECD facilities and other frequented areas to support vehicle-independent lifestyle of walking cycling.
- Ensure complete street network on the frequented routes connecting residential areas to ECD services and public spaces.
- Provide services, such as drinking water, public toilets with diaper changing and feeding rooms near transit stops and in major transit stations.

Operations

- Introduce special services, such as minibuses and shared autorickshaws for travel beyond 1.5-2 km based on the catchment of ECD services to cater to last mile connectivity. Regular bus operations can be looped to connect residential areas to metro stations to encourage a modal shift.
- Operate convenient transit services for women and children during peak hours e.g. school timings, evening hours

Payment

- Offer special passes for women with young children, with subsidised rates to ease their chained trips.
- Ensure easy and integrated payment methods for buses, metros and other IPT modes.
- Provide priority queuing for caregivers with young children at ticket counters with necessary signage.
- Grievance redressal should be made available offline and online to ensure safety and to boost confidence among caregivers using public transport.

Transit vehicles

- Ensure at-grade boarding and alighting in autorickshaws/buses/other modes, prefer low floor buses and add extendable ramps for differently-abled.
- Provide dedicated spaces for pram/stroller/wheelchair inside vehicle with locking system and priority alighting/boarding for caregivers with young children
- Provide a legible route map/locality map within buses/metros and at stations for easy wayfinding.
- Ensure the provision of emergency first aid kits in all types of vehicles. Provide panic buttons for emergencies.

b. Infrastructure

Infrastructure design guidelines largely cover physical improvements to ensure barrier- free, seamless and comfortable movement for young children and caregivers.

Access to transit station

- Provide transit stops closer to children's destinations for easy access.
- Ensure continuous footpaths with a minimum width of 2.4 metres connecting to transit stops without obstructions. Level differences with ramps with 1:15 slope ratio.
- Ensure slow streets within 500-metre radius of transit stops, with vehicular speed limits not exceeding than 30 km per hour, especially near frequented areas.
- Ensure safe and at-grade crossings near transit stops and IPT stands.
- Provide railings at 0.45-0.6 metres height for children to hold wherever required.
- Family restrooms, drinking water facility, and feeding booths should be accessible within a distance of 500 metres.
- Safety buffer from street should be provided, such as handrail and green buffer.

Transit stop infrastructure

- Ensure shaded waiting space with low height seating (150-250 mm).
- Provide engaging elements, such as small play equipment, floor/wall painted games, and scribble walls at the transit stops.
- Ensure legible maps showing bus number, origin and destinations, timings, nearest para-transit stops and emergency contact numbers.
- Ensure adequate lighting at all hours at transit stops, with minimum 35lux level and surveillance cameras to ensure safety.
- Provide sensory elements for differently abled to identify the transit stop, such as wind chimes, braille board, and information board with sounds.

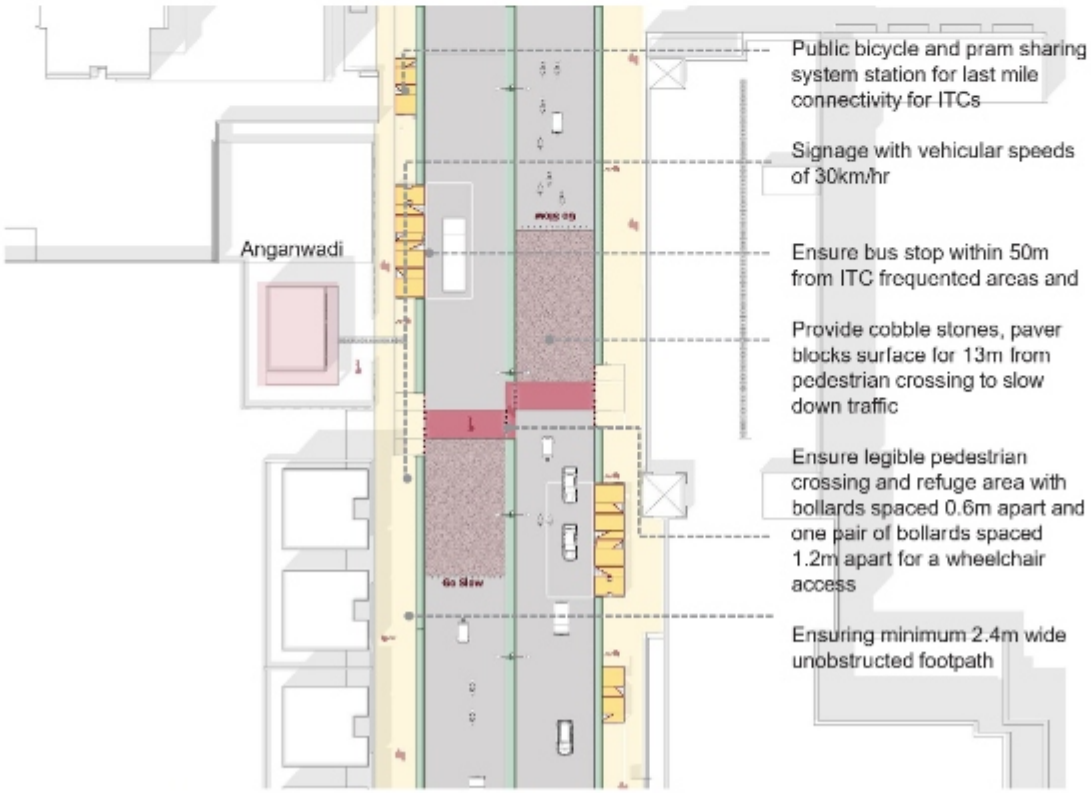


Figure 3.41 Transit zone designed for safety and convenience

Source: WRI India

Figure 3.42 Bus stop design catering to specific needs

Source: WRI India

Figure 3.43 Bus stop design catering to specific needs

Source: WRI India

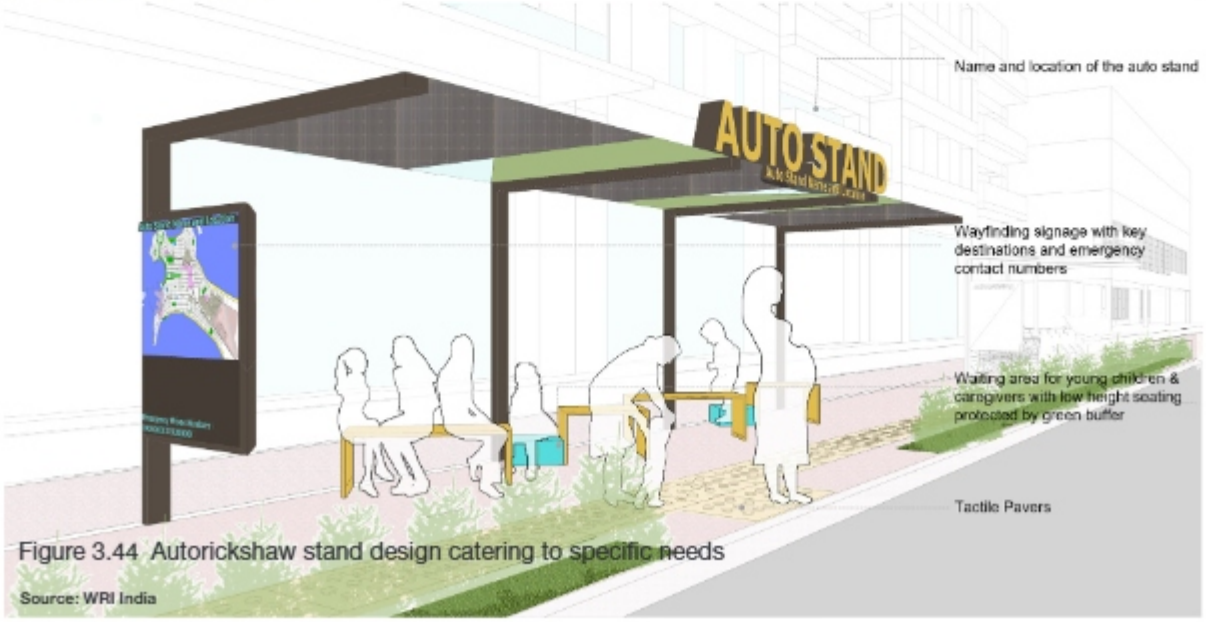


Figure 3.44 Autorickshaw stand design catering to specific needs

Source: WRI India

Figure 3.45 Shared bicycle and pram stands catering to children and caregivers

Source: WRI India

Figure 3.46 Ticket counter design at transit stations to cater to specific needs

Source: WRI India

Public Bicycle sharing stand at Pune Metro station

© WRI India

c. Supportive measures

Transit agencies can adopt various supportive measures to encourage caregivers with young children to use public transport often. Special schemes and enhanced interfaces in public transit can make it convenient to travel and therefore increase their ridership. Behaviour change is required at the level of the service provider as well as among other commuters using the transit service.

- Helmet and seatbelt regulations for child safety in the vehicles should be in place.
- Traffic signals should cater to varying walking speeds of caregivers with children.
- Ensure the presence of women in transport services at ticketing counters, deploy women security staff to ensure safety, especially during off-peak hours.
- Subsidise fares and travel schemes for women and children.
- Ensure special bus services for women and children on their frequent routes.
- Develop an integrated interface across various modes for easy transfers.
- Gender and age disaggregated data collection and monitoring systems should be established.
- Prompt grievance redressal and feedback mechanism should be set in place.
- Branding and campaigns around women and children-friendly transport initiatives should be initiated on various platforms, such as print and digital media, social media, radio, and podcasts.

Young children and caregiver-friendly BRTS system in Hubballi Dharwad

Agencies involved: DULT, HDBRTS, NWKRTC, Nurturing Neighbourhoods challenge

Service: HDBRT system piloted shared pram system in Hosur interchange in Hubballi to ensure hands-free movement for caregivers travelling with young children.

Infrastructure: Prams (currently private) are allowed inside the Chigari (BRTS) buses and space is allocated inside buses for prams and wheelchairs. A harness is provided to lock the them to ensure safety. The space for prams can be easily identified with specific signages.

Priority seating for caregivers with young children is provided inside the buses and priority ticket counter is also provided.

Soft measures: Capacity building of ticketing staff, security guards, and drivers is conducted. An announcement is made when a bus with children-centric amenities arrives.

Policy anchor: DULT has amended the checklist used for accessing State Urban Transport Fund (SUTF), with young children and caregiver-specific components required in bus stations.These changes in the policy were placed in front of Empowered Committee (EC) that governs the funds. Once approval was granted by EC, DULT issued a government order in the form of an official memorandum.

INSTITUTIONAL FRAMEWORK: INTEGRATED TRANSPORT

Mobility is a multi-jurisdictional domain that includes multiple government agencies at the city level as well as State level. There is a need to integrate such agencies and ensure a coordinated approach, using data evidence of user age, gender, ridership and trip patterns to make informed decisions collectively.

a. Mapping policy landscape

To achieve integrated mobility, it is necessary to map different stakeholders and policy landscape in the city related to urban transport and identify their role in the system.

These agencies need to coordinate regularly and concentrate their efforts towards a shared vision of mobility. Typically, the following agencies and stakeholders are involved in decision making for urban transport in cities:

- Municipal Corporation
- State Road Transport Corporations
- City bus transit corporations
- Metro rail, sub-urban railway or other mass transit authority
- Bus rapid transit system
- Regional Transport Offices
- Development authority
- Public Works Department
- State Transport and Urban Development department
- Traffic police

Non-government stakeholders who can support mobility-related decision-making are the following:

- Residential Welfare Associations (RWA)
- Local leaders
- Urban mobility and ECD experts
- Local organisations/NGOs
- Private stakeholders

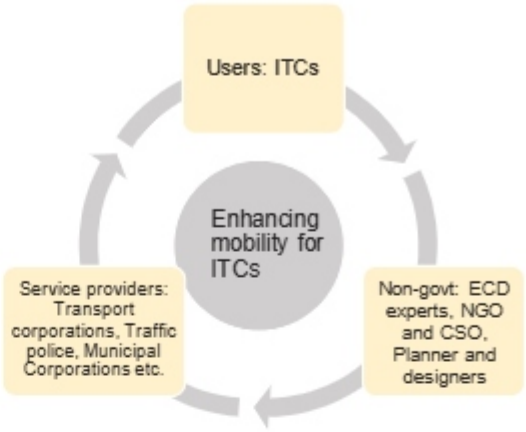


Figure 3.47 Ecosystem of stakeholders

In 2006, the Government of India (GoI), through the Ministry of Urban Development (MoUD), released National Urban Transport Policy (NUTP), as a response to the growing urban transport challenges.

The main features of NUTP 2006 are:

- Integrated land-use and transport planning
- Promoting the use of public transport Promoting non-motorised transport, such as walking and cycling
- Equitable allocation of road space
- Use of cleaner and efficient technologies in the urban transport sector
- Use of innovative financing mechanisms
- Capacity building of State and city officials and other stakeholders.

b. Institutional setup:

There is a need for the creation of a dedicated institutional setup to play a central role in developing mobility services for the city. Unified Metropolitan Transport Authority can also play this role to integrate all the agencies working on mobility.

- Interdepartmental coordination and seamless approval process
- Building capacity of all level of staff
- Ensuring adequate funds and resources
- Multimodal integration measures – spatial, time, payment, technology and data
- Policy and plan level efforts and long-term plans.

PARKS AND OPEN SPACES

Objectives Achieved	Indicators	City level indicators
	27. Number of good quality housing area park spaces in the city (Core) 28. Number of good quality neighbourhood park spaces in the city (Core)	
	29. Per capita organised green open space in the city (Core)	
	30. % of parks at the city level with free public drinking water, toilets and other facilities for families (Core)	
	67. Frequency of maintenance of parks (Core)	
	68. % of municipal budget allocated for open spaces or parks (including management / maintenance and programming) (Core) 69. Provision of public art expenditure in budget to enhance the aesthetics of public spaces - (Y/N) (Supporting)	
	Neighbourhood level indicators	
	31. Number of Tot-lots with play equipment (Supporting)	
	32. Number of hours per day open areas is occupied in a neighbourhood, such as tot-lot, housing area park, neighbourhood playground (Supporting) 33. % of infants, toddlers and their caregivers among all users of the park (Core) 34. % of area in parks dedicated to play spaces suitable for young children 0-5 yrs old (Core) 35. Presence of natural materials in play equipment (y/n) play space (y/n), natural areas (e.g. greenery, sand, safe and clean water) as percentage of total play space. (Core) 36. Number of parks that have quality seating facing 0-3 play areas (Core)	
	37. % of parks with adequate lighting (Supporting) 38. Presence of stray animals in parks (Supporting)	
	39. Percentage distribution of children engaged in formal and informal play in organised green spaces (Supporting)	

Target Behaviours
1. Infants and toddlers spend more time playing outdoors and around nature 1.1 Infants, toddlers and caregivers engage in diverse types of play - formal and informal 1.2 Caregivers take infants and toddlers to public open spaces, such as parks, gardens, etc. more often 1.3 Young children and caregivers in vulnerable community spend more time playing outdoors
2. Caregivers take infants and toddlers to visit public spaces / facilities more often 2.2 Caregivers use amenities, such as feeding booths, toilets and drinking water while in public spaces - seating, shaded waiting areas 2.4 Caregivers spend more time socialising in public spaces with friends, neighbours, family 2.5 Front line workers, such as security guard, ticket counter staff and other staff prioritises ITC
4. Caregivers of young children adopt responsive caregiving practices at home and in public spaces 5. Community encourages young children and family-friendly changes in the neighbourhood 5.2 Caregivers and community engage in community action for upkeep of interventions

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

04 Parks and Open Spaces

Public spaces, such as neighbourhood parks and playgrounds are important elements of daily life for young children and caregivers. While streets are primarily used for movement and connecting to destinations, the open spaces of the neighbourhoods are the destinations and used primarily for recreation and social activities.

Toddlers need a safe outdoor space for play in proximity of their homes. Babies and caregivers need outdoor time with fresh air and the stimulation of plants, trees, wind, and connection to the natural environment. Playing is the prime activity for young children, especially for the 0-5 age group. Playing is a way to have fun, to socialise, but also to learn various skills. A big portion of this valuable playing time happens in designated open spaces where the environment is designed especially for playing, such as small tot-lots, play areas in parks, playgrounds, street squares, or green areas. If a city invests in better quality play areas for children, it also invests in creating better citizens for tomorrow. Outdoor play gives children physical exercise, closer contact with nature, and a means of socialising with their peers. However, if play spaces are designed and planned poorly, they can be dangerous and unhealthy. Therefore, it is of utmost importance that cities ensure safe, accessible, and inclusive design of public open spaces to be suitable to all ages and abilities.

The likelihood of a child using a destination declines beyond about 800 m from their home. This restricts their range and access to amenities to below one kilometer. Hence, it is important to plan for quality public open spaces at the neighbourhood level.

TYPES OF OPEN SPACES

According to the present guidelines in India, open spaces in a neighbourhood can be categorised based on the size, the population it serves, and the function of the space. They vary based on the minimum area of the space, the minimum distance from a residential zone, and density as per the population present in the neighbourhood.

Tot-lots, being the smallest, require a minimum of 125 square metres. Whereas, a housing area park and a neighbourhood park require 5,000 square m. and 10,000 squre metres respectively. The average per capita open space stands at 3 square metres as per norms.[16]

Public open spaces take any form, ranging from formal parks to natural/green recreational spaces to reclaimed spaces in the public realm.

[16] Open Spaces, Page 362-63, URDPFI Guidelines 2014, Ministry of Urban Development

Committee on Integrating the Science of Early Childhood Development; Jack P. Shonkoff; Deborah A. Phillips; Board on Children, Youth, and Families; Commission on Behavioral & Social Sciences & Education; National Research Council and Institute of Medicine, 2000. From Neurons to Neighborhoods: The Science of Early Childhood Development, Washington, D.C.: National Academy Press.

For further reading on importance of play and type of play during early childhood, please see: https://www.psychologytoday.com/us/blog/freedom-learn/201404/risky-play-why-children-love-it-and-need-it


Neighbourhood park, Jalandhar
© Manisha Bhartia

NEIGHBOURHOOD PARKS/ HOUSING GARDENS

Neighbourhood parks/housing gardens are the main recreation spaces for everyone in the neighbourhood and beyond. It is ideal when the park is located within a walking distance of 300 to 600 m. These parks serve to strengthen social ties in a neighbourhood and create more coherent societies. They can offer an excellent form of recreation and bring children closer to nature. These are also developed as family-friendly spaces and should consist of jogging trails, play equipment and natural mediums of play, seating spaces, and green areas to facilitate recreation and play for all.

The URDPFI norms suggest placing three housing area parks that are 5000 square metres in size in a neighbourhood. These can, however, be smaller, starting at 2500 square metres. and more in number so that the access to these parks is increased. Similarly, one neighbourhood park of 10,000 square metres is suggested. However, as per international standards, two such parks can be provided. Neighbourhood parks should be located along major neighbourhood spines, and they may or may not consist of commercial and mixed-use activities.

POCKET GREENS

In neighbourhoods lacking vacant space for new parks or gardens, greenery can still be introduced through small pockets. When combined, these green spaces can transform the streetscape and provide communal areas for families. Examples include green façades, street corners with planters and seating, or converting unused parking spaces into green areas. While individually small, these pockets collectively improve air quality, reduce heat island effects, and create a healthier environment for children and caregivers. Additionally, pocket greens offer spaces for caregivers to relax and unwind and improve wellbeing.

Small spaces can be converted to green areas
© Manisha Bhartia

TOT-LOTS

Young children in the 0-5 age group do not need large areas for play. Instead, they need many small-scale areas near their homes. These can be scattered across the neighbourhood to serve as easily accessible tot-lots. The Ministry of Urban Development guidelines for the density and proximity of tot-lots suggest placing at least 6 to 15 such spaces in a neighbourhood of fifteen thousand people, within 300 meters of most residential homes. The size of tot-lots can vary between 50 and 125 square metres.[17]

Tot lots should be located along 6 metre, 9 metre and 12 metre wide neighbourhood streets and not to be placed near major vehicular traffic and intersections.

Keep the following in mind:

- Have at least **three different play objects** in the tot-lot.
- Choose play objects **specially designed** for the youngest children.
- A **low fence around** a tot lot is sufficient to confine children to the tot-lot.
- Try to create tot-lots **where there are existing trees, or plant trees** to provide shade.
- Tot lots can promote **play in natural settings** by incorporating loose materials, such as pebbles, twigs, and sand, thereby enhancing children's sensory experiences. This approach emphasises unstructured play over the use of plastic equipment.
- **Place tot-lots along routes that are frequently** used by young children and caregivers. For example, the routes going to the markets or schools, day-care.
- Consider **how caregivers will wait** while the children are playing. Place a bench, or design a planter with a wide edge, or design a bench with the fence, etc.

[17] Urban Greening Guidleines - Page 7, suggests having a 125 Sqm tot-lot for every 2500 persons.

TOT-LOT

Figure 3.48 Model tot-Lot

Size - **50sqm - 125sqm**
Distance - **@ 300m**
Density - **6 to 15 nos. every neighbourhood; total 750sqm minimum**
Guidelines/Standards - **Existing URDPFI standard of 20nos. tot lots for 5000 population**

Critical elements for young children and caregivers:

- Accessible footpaths
- Natural ground surface
- Soft-surface play area
- Resting/seating area
- Adequate shading
- Adequate, visually porous fencing
- Green/planted area
- Variety of play equipment
- Lighting along paths and seating
- Toilets
- Feeding/Nursing booth

Tarr Coyne Tot Lot, NY, USA
© www.centralparknyc.org/things-to-see-and-do/attractions/tarr-coyne-tots-playground.html


© Eirian Evans

MAIDANS / MULTIPURPOSE GROUNDS

Maidans are open spaces for play and leisure for children and families and serve as multipurpose grounds for facilitating socio-cultural and community gatherings. The maximum area should be open and devoid of any hinderance for physical activities. Such open spaces may contain few play equipment and more of natural play spaces as per age groups. They can also include various athletic courts and large seating spaces for social interaction. URDPFI guidelines suggest that there should be at least 3 playgrounds or neighbourhood play areas of 1.5 ha for a population of 15000 persons. However, playgrounds can also be of smaller size and more in number, distributed throughout the neighbourhood. These should usually be located along collector or sub-arterial streets in the neighbourhood.


© https://www.maggiewin.com/pocket-parks-in-medellin/

POCKET PARKS

Pocket parks can serve as small play areas with spaces to sit and relax or, at times, act as event or gathering spaces. Pocket parks should be easily accessible by foot or bicycle and should not require the use of a car. The size of a pocket park should not exceed the cumulative area of 3-4 plots and should be distributed across the neighbourhood to provide access to all. Pocket parks should usually be located along feeder or collector streets in the neighbourhood, which connects multiple residential areas.

COMMUNITY GARDEN

Community gardens are a unique form of open space that are self-managed by the community and contribute to a sustainable urban environment. Community gardens should accommodate at least 10–15 no. of plots gardened by children and caregivers collectively. It can also offer a playful environment with customised facilities for young children to learn about nature and instill a sense of ownership. There should be at least 1 community garden for every 10,000 persons in the neighbourhood. (Source: The Open Space Index, New Yorkers 4 Parks) The gardening plots can be of sizes 3x3 metres, 3x6 metres (but not limited to). Community gardens should be usually located along feeder or collector streets in the neighbourhood or may be clustered with any frequently visited public facilities.

PLAYGROUND

Figure 3.49 Model playground

Size - **4500-6000sqm**
Distance - **@ 200-300m**
Density - **3-6 nos. every neighbourhood**
Guidelines/Standards - **Existing standard is 1 10,000sqm. The Dutch standard is min 300sqm.**

Critical elements for young children and caregivers:

- Delineated areas for children 0-2 age group
- Resting/seating area
- Play equipment
- Lighting
- Toilets
- Nursing booth
- Multi-functional open space
- Adequate, low-height fencing

Children skate under Matunga Flyover, Mumbai
© www.swatantrabharatnews.com/in[illegible]hp/news/2097

USE OF SEMI-PRIVATE SPACES AND URBAN LEFTOVERS

Certain neighbourhoods in Indian cities are often dense and lacking vacant spaces to build parks, whereas, some neighbourhoods may have underutilised public lands. The scarcity of open spaces in such high density neighbourhoods can be compensated by 'reclaiming' these underutilised or leftover spaces and convert them into play spaces for children and relaxing pause points for caregivers.

These are 'left over' spaces, unbuilt because they have an awkward shape or dimensions, or the condition is such that it is looked at as an encroached, dingy space. These areas may be found next to building entrances, under flyovers, besides parking zones, or may be a forgotten and neglected pocket of green. It is often possible to transform these small 'leftover' spaces into a safe, accessible play area for children in the 0–5 age group.n

For examples of urban leftover spaces, please see:

Mumbai parks under skywalks and flyovers

Amenities planned below Flyovers in Chennai

Delhi's use of spaces below flyovers

Scrutinise the neighbourhood for the following types of spaces to transform

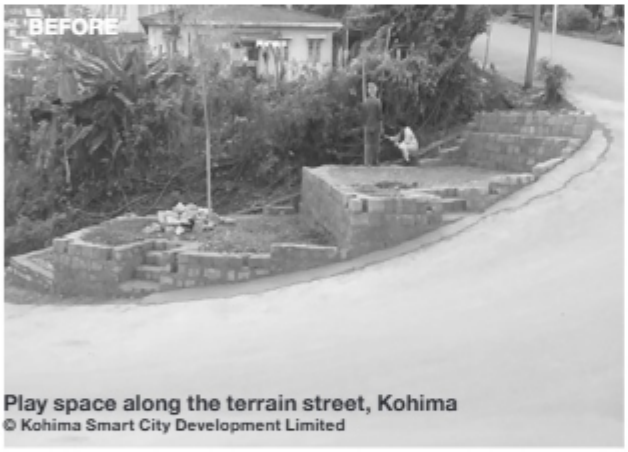
- Are there any underutilised or enroached areas in the neighbourhood, no matter how small? Convert them for positive utilisation.
- Are there any areas with forgotten parking spaces that are seldom used?
- Are there any neglected planted areas that could better be transformed into a small neighbourhood play area?
- Urban leftover spaces like an area under the metro/monorail line, odd shaped corner spaces, the frontage zone of a semi-public building , an area under flyovers/skywalks , leftover space in parking lots, space around neighbourhood shops, unused railway yards/lines, etc. can be converted into small yet usable open spaces for children.

Some of these residual and leftover spaces include (but are not limited to) –

- Spaces in private premises - setback of buildings, communal spaces
- Street corners – which can be used as public seating spaces
- Medians along streets – which can be developed for bioswales or public seating niches
- Spillover spaces along public facilities, such as schools, AWCs, daycare and markets
- Vacant lots in the neighbourhood – which can be developed as tot-lots, pocket parks, etc.
- Parking lots – which can be converted to play spaces for young children
- Unused pockets in informal settlements.

A few examples given below from the Nurturing Neighbourhood Challenge in Indian cities show how leftover, residual spaces can be transformed into meaningful public spaces.

Space below flyover, Vadodara
© SMAID University



Play space along the terrain street, Kohima
© Kohima Smart City Development Limited

Play space along the street, Kochi
© Cochin Smart City Limited

Figure 3.50 Identification of existing open spaces to form network of open spaces

For planning public open spaces, an extensive study of the neighbourhood should be conducted to understand the condition of existing spaces and availability of any unutilised space which has the potential to serve young children and caregivers.

The existing public open spaces can be upgraded with suitable infrastructure to become young children and caregiver-friendly. Vacant lots or spaces with other uses can be reclaimed and developed according as per the local context and needs of the neighbourhood.

The type of open space to be developed will largely depend on the following aspects:

1. Location
2. Size
3. Pontential of the site
4. Accessibility
5. Target population
6. Abutting land uses
7. Need of the neighbourhood

Any open spaces within the neighbourhood should be seamlessly connected as a network allowing people to move across and utilise different spaces.

For any parks or open spaces to be suitable to young children and caregivers, it is essential to first conduct an audit with specific parameters. Refer to Annexure B for the public spaces audit checklist. It may be modified further, depending on the local context or the type of open space.

DISTRIBUTION STANDARD FOR OPEN SPACES

The following guidelines provide a benchmark for the distribution of public open spaces in a neighbourhood. It categorises open spaces according to their sizes and sets out a maximum desirable distance that residents in the neighbourhood should travel in order to access each of these open spaces.

Figure 3.51 Distribution standard for different types of open spaces

Open space typology	Size guideline (in sq.m.)	Distance guideline	Distribution guideline
Tot-lot	125	200 – 300m	1 for every 250 persons
Pocket park	300 – 1000	200 – 300m	1 pocket park for every 1-2 blocks
Playground/ Multi-purpose maidan	10000 - 15000	400 – 500m	1 for every 10000 population
Housing area/ Neighbourhood level park	5000 – 30000	600m	0.5Ha for every 5000 population
Community garden	500 – 1000	600m	1 for every 10000 population

Table 3.7 Standards for open space by types

To maintain an optimal distribution of public open spaces in a neighborhood, it is proposed that more open spaces with moderate areas should be constructed in the neighbourhood rather than fewer open spaces with greater areas.[18]

[18] For more information regarding distribution of various public facilities, refer to : McAllister, Donald M. et al. "Equity and Efficiency in public facility location." Geographical Analysis, Vol 8 (January 1976)

GUIDELINES FOR PARKS AND OPEN SPACES

There are many elements that need to come together to make open spaces welcoming, safe and inclusive for young children and their caregivers. The following section provides guidelines for these elements which are sub-divided on the basis of the five ITCN objectives for a healthy neighbourhood.

PARKS AND OPEN SPACES	
Safe Open Spaces	• Legibility, sightlines and signage • Lighting • Fencing/permeable perimeter • Passive surveillance
Green Open Spaces	• Trees/planting • Shading and cooling elements • Natural play elements • Young children-friendly landscapes • Resilience in public open spaces
Accessible and Playful Open Spaces	• Play equipment • Seating spaces • Entrances and ramps for young children and caregivers • Accessibility to the public space • Public art • Combinations of uses/activities • Young children's play diversity • Age-appropriate play
Inclusive Open Spaces	• Rest Stations/ Nursing Booths

SAFE OPEN SPACES

The design of a park can have a direct impact on a caregiver's safety perception and their willingness to use the space. If parents or caregivers know that their children are safe within the boundaries of a play area, they will relax more and be less stressed. Safety considerations in parks include an efficient layout of the space, clear sightlines, passive and active surveillance, permable boundaries, and a clear signage and lighting system.[19] People will spend more time in open spaces if they feel a sense of security about being in these spaces.

[19] Role of Design in creating safer parks https://www.pps.org/article/what-role-can-design-play-in-creating-safer-parks

LEGIBILITY, SIGHTLINES AND SIGNAGE

Parks in the neighbourhood should be easily visible for young children and caregivers moving around and should provide a clear understanding of how to approach and manoeuvre within the space. In bigger parks, and those with a diverse landscape, it might be difficult to achieve clear sightlines everywhere due to the vast spread. Thus, the layout of the park should be made clearly understandable to a first-time user. Signage to guide the user to interesting destinations and activities is also important. Visibility and clear sightlines are an important factor in enhancing the perception of safety.

Take the following into account for a legible park:

- Entrances and exits should be **easy to locate** for a first time user and provided with legible signage.
- Locate active areas such that there is **clear visibility** between them to encourage natural surveillance.
- Make sure that there are **no solid walls, planting edges** along main routes that **obstruct** sightlines.
- Ensure any user can see **what lies ahead** and guide them to reach that destination.
- To make a sightline interesting, the designer can provide **'an interesting object'** - a goal to navigate toward. It might be some feature or object that is striking or unusual, something to spark the navigator's interest.
- Locate signage at key activity areas. Ensure that signage is positive, informative and well-lit.
- Signs and/or labels installed in the play area or on the equipment should give some guidance to supervisors as to the age appropriateness of the equipment.[20]

[20] Handbook for Public Playground Safety Page - 6 https://www.cpsc.gov/s3fs-public/325.pdf

Race course street, Coimbatore
© https://oasisdesigns.org/racecourseroadu.asp

LIGHTING

Good lighting in a park provides a caregiver with a good overview of the space, pathways, entrances and exits, and gathering places. The space should be lit adequately (15-30 Lux), uniformly, with low light pollution, and aesthetically pleasing. The lighting should be easy to maintain regularly and made from vandal resistant materials.[21] Lighting systems can be coordinated to provide a sense of order and clarity in a park.

Take the following into account for a well-lit park:

- Establish a **hierarchy of lighting** types and intensities in the park layout.
- Provide lighting at the **perimeter to complement street lighting**.
- Choose a lighting type to reflect the use of the public realm being lit: **High, unadorned lights** to shine onto grassed surfaces, and **lower, attractive armatures** to light footpaths and pavements.
- Place lighting elements for the pathway at frequent intervals. As a general rule of thumb, at least every **20 m with a 20 lux level uniformly.**[21]
- Consider the position of lighting elements **relative to the position of trees** and other plants. Make sure that branches do not obstruct any light.
- Ensure that **play areas are well lit**. Also, lighting levels should not cause excessive glare.
- Always keep in mind that, apart from safety, lighting can add value to a place in many creative ways.

For tips on lighting parks, please see:

http://thelightingresource.eaton.com/features/2017/lighting-tips-for-parks-and-recreation-areas

[21] Public space lighting standards for safety-Page -12 https://www.pps.org/article/what-role-can-design-play-in-creating-safer-parks

Porous boundaries around Morabadi Ground, Ranchi
© WRI India

FENCING / PERMEABLE PERIMETER

Fencing around a playground or park is required for a variety of reasons, such as safety and a sense of enclosure to the space. If the perimeter of the park is permeable and inviting from the street, people will be more inclined to enter it, as against solid, high compound walls. Also, fencing as a safety measure will prevent children from accidentally running out into traffic or wandering off.

When designing fencing around public spaces, keep the following in mind:

- Fencing does not necessarily mean using actual fences. Depending on the public space, fencing can be **hedges or plants**, **street furniture,** or simple **ground demarcation**.
- Carefully consider **how high the fence needs to be**. A fence with the main purpose of keeping stray animals out or prevent small children from accidentally wandering off, can be kept low. A fence around a field where ball games are played needs to be high.
- Keep fencing permeable, with **frequent openings every 50-80 metres**.
- Make entrances welcoming and with **large dimensions, min. 1.8 metre wide**. Caregivers carrying children or pushing a pram need gates that are fairly wide to pass through.
- Consider the fence as an **interactive element**. It can add value to a space by doubling up as a trellis plant, having benches incorporated into the fence, or having attractive patterns or art.

For more ideas and guidelines on choosing the right fencing for parks, please see: https://www.projectlink.com.au/blog/parks-week-2017-safety-and-right-fencing/

TM Mohammed Park in Eraveli neighbourhood, Fort Kochi
© WRI India

PASSIVE SURVEILLANCE

In parks and public places, installing a camera monitoring system should be an absolute last resort. Studies show consistently that the presence of surveillance cameras has a greater negative emotional impact on law abiding visitors, than on deterrence of crime. Instead, passive surveillance with “eyes on street” and lively character of the space makes people feel safer.

Active parks that are usable into the evening, with families present at all hours, is a more effective way to make visitors feel at ease. Benches with well-designed views will make people want to visit the park. Build plenty of shade while maintaining clear sight lines, and make sure that seating, pathways, and activity areas are well-lit during the evening hours.

Introduce programming activities into parks, especially in the evening hours. This will further establish and send the message that this is a populated, family place, where safety is ensured.

Parks without Borders, New York, USA

New York has one of the most extensive neighbourhood park systems in the United States. With more than 5,000 individual properties comprising around 29,000 acres of land, the parks and playgrounds and community gardens add up to a significant share of the city’s space. NYC Parks launched Parks Without Borders, a new programme focusing on the corners, borders, and other underused spaces around parks.

Park Adjacent Space - Before

Park Adjacent Space - After

https://www.citylab.com/design/2015/11/how-the-parks-without-borders-aims-to-make-new-york-parks-safer/416469/

In addition to elements listed in the previous sections, it is important to look at overall safety requirements in the public open spaces specific to different age-groups of children as below.

Safety requirements for children aged 0-1		
		
Rounded edges at interface of interaction with built environment to avoid abrasion	At- grade spaces/ networks to avoid obstacles or vibrations while pushing the pram	Warm lighting at night to avoid glare for the infant in pram

Safety requirements for children aged 1-3			
			
Minimum change of levels as child has wobbly legs; require handrails for support	Use plants that are non-allergic and free of thorns or sharp edges	Provide seating for caregivers around play space for supervision; play area with low-heighted shrubs as barriers to allow free play with peers	Sidewalk curbs with low-heighted shrubs as barriers – so that the child cannot easily walk down to the carriageway

Safety requirements for children aged 3-5		
		
Permeable boundary walls around play area to ensure safety and security because children tend to run around a lot	Vehicle parking alongside walkways creates dark spots on streets which in turn renders it unsafe for ITCs during late hours	Civic agencies must ensure regular collection and disposal of waste from waste bins at public spaces to avoid unhygienic conditions such as littering and spread of rancid odor

Table 3.8 Age-appropriate safety requirements on streets
Source: WRI India

GREEN OPEN SPACES

Increased contact with nature has benefits that impact the child's overall development.[22/23] Similarly for caregivers, access to a green space will have a direct bearing on their mental health.[24] A study by Finnish researchers showed that even a ten minute visit to an urban park or woodland significantly improved stress indicators. Parks and open spaces should have a diverse landscape and varied vegetation, natural groundcover, shading, and natural play materials.

Ian Potter Children's WILD PLAY Garden by ASPECT Studios, Sydney, Australia

TREES/ PLANTING

It is important to provided access to nature through public space projects in the city. Cities shall find creative ways to incorporate more plants and trees in an efficient way such that young children come into close contact with them while being safe and exploring freely.

A concern to improve safety in parks can sometimes result in a sterile landscape, which will more likely result in less frequent use of the park. It is important that parks have a indigenous, diverse and visually rich mix of plant species that are balanced throughout the various seasons across the year.

Consider the following when adding green to neighbourhoods:

- Choose planting and green elements with a range of colour, texture, shape, and use.
- Consider seasonal varieties and local species so that the open spaces are interesting to visit at different times of the day and different seasons.
- Look at all scales of planting, from avenues of trees and large beds with flowers to shrub thickets.
- Choose indigenous plants that suit the climatic conditions of the area. Provide information on them for educating children.
- Plan for the future: consider how much space fully developed plants will need above and below ground.

For more information on trees and plants, please see

Identifying Indian Trees and flowers

GoI-CPWD - Landscape Works & Horticulture Activities

Important Native trees of India

[22] Childhood development and Access to nature https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3162362/

[23] The importance of outdoor play for young children's healthy development https://www.sciencedirect.com/science/article/pii/S2444866416301234

[24] The influence of urbangreen environment on stress relief measures https://www.sciencedirect.com/science/article/abs/pii/S0272494413000959

Shade Structures in Yagan Square, Perth
©worldlandscapearchitect.com/yagan-square-a-welcoming-active-cultural-and-civic-destination-for-perth/#.XCCJSFUzZaR

SHADING AND COOLING ELEMENTS

A good public space provides a comfortable environment year round to its users. In India, this often means protection from extreme heat for most parts of the year.

A caregiver is less likely to bring a young child to a par if he/she does not have a shaded and comfortable spot to rest while children play. Thus, providing shade in outdoor play areas is crucial for encouraging caregivers to spend time outdoors with their children.

Consider the following elements:

- Ideal shading is **natural shading**, wherever possible: use trees, bushes, and climbers.
- Besides built canopies, consider trellises overgrown with **climbing plants**. These provide shade while also having a cooling factor. However, effective periodic **maintenance** of the same should be carried out.
- Consider providing **shading over play areas** as well to ensure that children are cool and comfortable during the hot months.
- **Use of cool reflective materials** - The materials used in the space should be heat reflective and high albedo content.
- **Water surfaces -** Incorporating a water body or planning a space around a natural water resource will help reduce the micro-temperature.
- Incentivise shading playgrounds by giving grants to schools and NGOs for providing shade structures.[25]
- **Wind Movement –** Spaces should be planned for allowing adequate wind movement across, cooling the space.

[25] The American Academy of Dermatology offers incentives for installing playground shade structures. The AAD Shade Structure Program offers up to $8,000 in grants to public schools and nonprofit organizations for installing permanent shade structures for outdoor playgrounds· https://www.aad.org/members/volunteer/shade-structure-program

Logs become natural climibing elements at Mountsfield Park, London, UK, Landscape by BDP
©bdp.com

Children love playing with soil and water
© Manicha Bhartia

NATURAL PLAY ELEMENTS

Children have an unlimited imagination, and they never miss a chance to use it, especially when they are playing. Apart from the pre-designed play equipment that children love playing with, less defined objects offer countless possibilities of play.

Natural play elements often have flexible, open ended use where children can play imaginary games. A stick can be used to draw patterns on the ground or become a boat in a puddle. Treehouses and sandpits can encourage free play. "In this process of reinvention and assigning new meaning to objects, it is possible to mobilise skills related to divergent thinking, creativity, and problem solving, among others."[26]

Natural materials are eco-friendly, cheap, easy-to-find, and offer children a unique experience: to connect with nature. Natural elements have textures, smells, properties, and colours that can be stimulating. Contact with such elements can also stimulate children's learning ability in a very creative way, whilst also developing a sensibility towards nature from a young age.

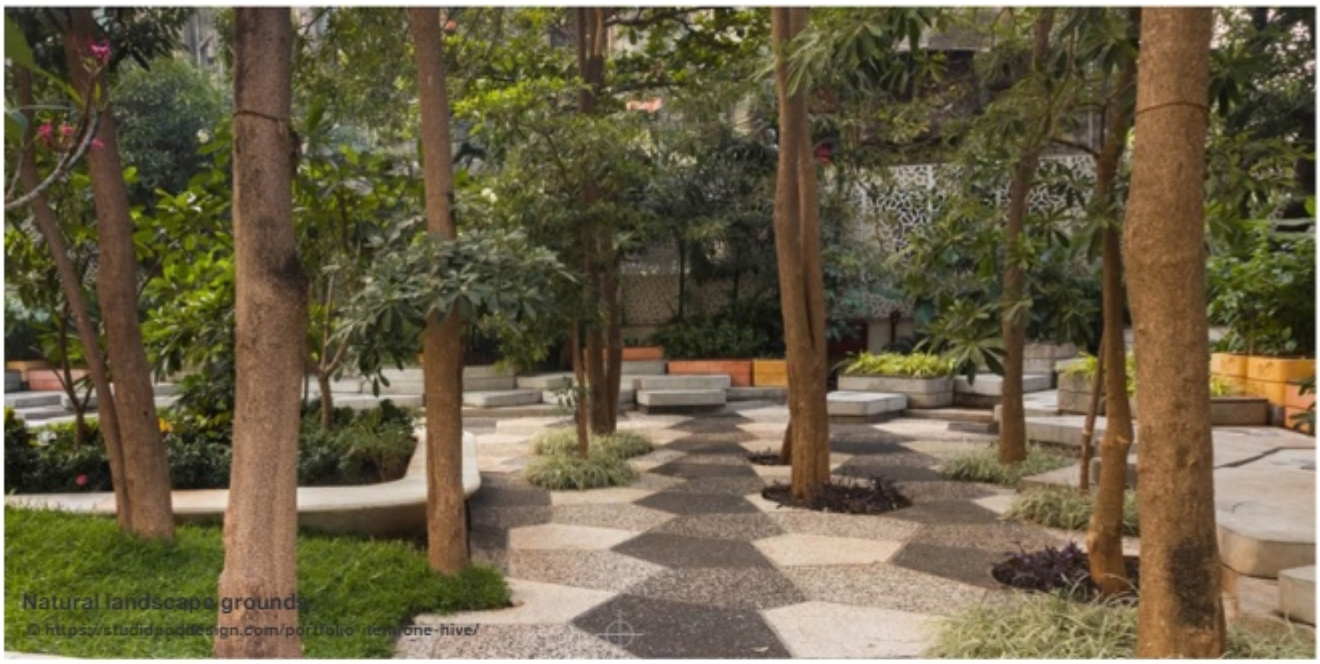
Consider the following to introduce natural play elements:

- **Make use of simple materials at low prices:** water, sand, tree branches and trunks, stones and pebbles, different plants or insects, and more.
- Be sure that the used materials are **clean and non-allergenic.**
- Keep in mind that natural materials are to be **maintained** under different conditions compared to artificial materials.
- Be sure of **safety regulations**.
- Some other common surface materials include bark, grass, impact absorbing sand, wet pour rubber, rubber tiles and grass pavers.

[26] The importance of outdoor play for young children's healthy development https://www.sciencedirect.com/science/article/pii/S2444866416301234

For safety features of play surfaces, please see:

https://www.choice.com.au/babies-and-kids/children-and-safety/toys-and-safety-at-play/articles/playground-surfaces-not-all-equal



YOUNG CHILDREN-FRIENDLY LANDSCAPES

Consider the following while designing landscapes suitable for young children and caregivers:

Tree and ground cover

- Ensure trees with thick foliage to protect from harsh sunlight and rain and for comfort at all times of the day.
- Include medicinal, herbal, air-purifying, indigenous plants, vegetables, and fruit-bearing plants, with gardening opportunities.
- Provide grass, shrubs, and plants with different colours, textures, shapes, and smells with height up to 1 metre.
- Include noise berms/ landscape mounds towards the periphery to block the noise from adjacent streets.

Child-friendly plant species

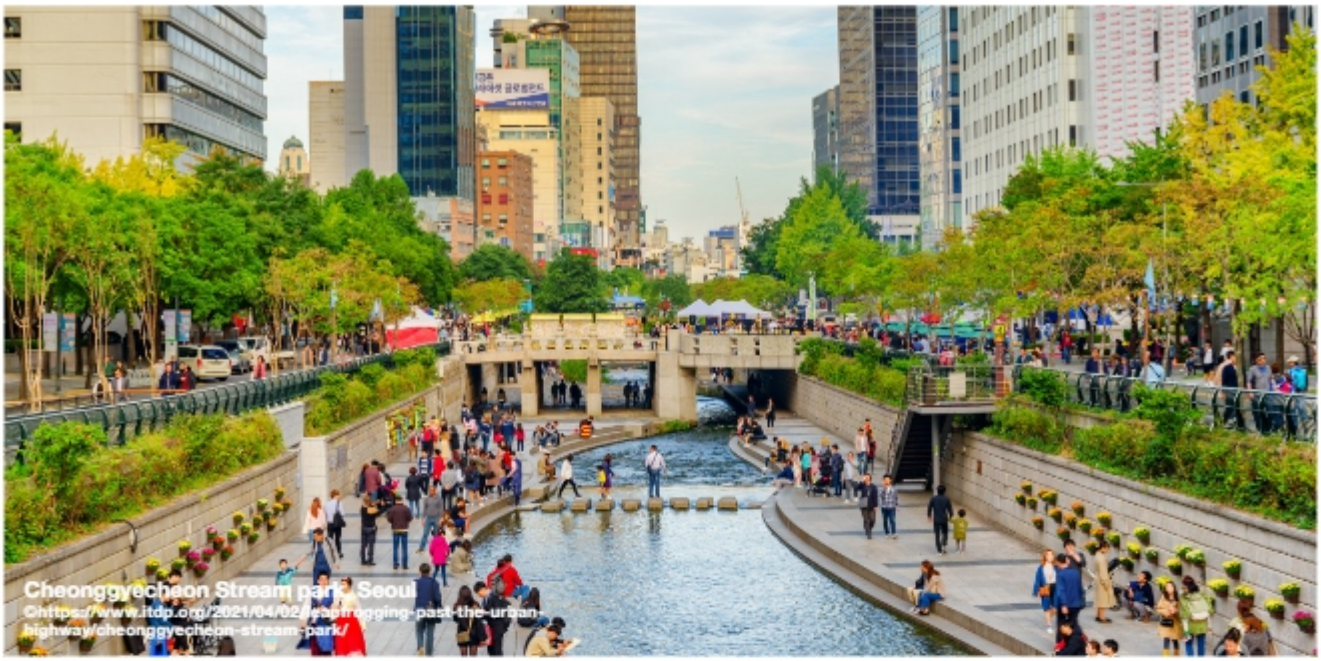
- Plant species that are hypo-allergenic and flowering (sunflower, rose, passionflower, nasturtium, butterfly pea, lavender etc.) and safe for children's oral consumption along walkways and play spaces.
- Avoid planting species, such as oleander, philodendron, money plant, and caladium, around play spaces.
- Label different species and its usage to educate and raise awareness.

Sheltered spaces for climate protection

- Add man-made sheltered structures, such as pergolas, huts, and bamboo tents, for climatic protection, such as from harsh sunlight, rain, and wind and for comfort at all times of the day.

Sensory landscape

- Include small sensory trails including soft grass, pebbles, stones of different sizes, gravel, sand, wooden chips, and mosaic tiles.
- Provide fishponds and bird houses/ feeders to encourage interaction with biodiversity.



Cheonggyecheon Stream park, Seoul
©https://www.itdp.org/2021/04/02/leapfrogging-past-the-urban-highway/cheonggyecheon-stream-park/

RESILIENCE IN PUBLIC OPEN SPACES

Public open spaces play an integral part in making cities resilient, from offering spaces to camp during disasters to acting as lung space for the people in terms of recreation and play.

Resilience of a public space is the capacity to face any challenges and quickly recover from any difficulties. When it comes to public open spaces, it is crucial to make the spaces resilient to climate change, disasters and also make them socially resilient. Such spaces can shape a city's long term resilience as well.

Consider the following for ensuring resilience in public spaces:

- Increased foliage cover by planting more indigenous trees with high ecological functions.
- Reducing excessive paved areas and configuring green pockets as a continuous network, thereby reducing heat islands.
- Creating usable water pools for storm water to drain off and introducing rainwater harvesting methods.
- Using permeable pavers wherever required to retain water percolation.
- Planning flexible spaces for multi-functionality during disasters.
- Nurture a sense of belongingness towards the community spaces within people, especially in children, to ensure maintenance and sustenance of the space.
- Public open spaces can be equipped with safe assembly points, basic emergency services, fresh water, electricity, and communication for providing rapid resilience in the event of disasters.
- Public spaces can help in reducing the risk of natural calamities, such as floods and draughts by planning floodable plains and water harvesting pools within open spaces.

ACCESSIBLE AND PLAYFUL OPEN SPACES

To make any public open spaces accessible for young children and caregivers, they should include measures, such as easy and universal accessibility, age specific design, resting facilities, and safety at all points. Similarly, to ensure playfulness, these spaces should have age-specific play and allow adventurous and sensory play while being accessible for all children, including those with disabilities.

Adventurous Play on Eat Street, Kakinada, India
© WRI India

PLAY EQUIPMENT

Play equipment in public open spaces keeps young children physically and mentally active in different ways. Each piece of equipment stimulates various senses. Typical equipment like swings and climbers are popular for their own reasons. According to the 'National study of playgrounds', conducted in the United States of America[27], the most common play equipment, swing, activates all 8 senses, which makes it one of the most popular equipment on the ground. Being said that, the study also puts forward the importance of innovative playgrounds that have creative spaces that promote children's development through unique play elements, interactive features, and using natural materials. Two times more users were seen using such playgrounds that are designed to instill moderate to vigorous activities, such as balance beams, vine walks, playhouses, and treehouses.

Kilburn Grange Park- Erect Architecture[28]

The playpark is an adventure playground that consists of new topographies, and climbing structures designed around the theme of playing in and around trees.

Think of the following:

- Combine playing objects with the **suitable floor covering**: soft, elastic, artificial rubber, sand or, cork.
- Carefully check **safety regulations.**
- Introduce equipment that promotes **adventurous and sensory play,** especially for **differently abled children** and children with learning disorders.
- Always combine a minimum of **3 playing objects** for a successful playground.

[27] The National Study of Playgrounds by studioludoorg - Issuu
[28] https://erectarchitecture.co.uk/projects/kilburn-grange-park-play/

Waiting area at H Siddaiah Rd. Referral hospital, Bangalore
© WRI India

Boundary edge for multi-height seating, Pune
© Source: https://www.hindustantimes.com/bhopal/pune-s-footpaths-get-a-welcome-makeover/story-9YTo3snNJrvZXsyqOprCXI.html

SEATING SPACES

Well designed seating elements can extend the time spent in a space by caregivers with young children.

Seating for caregivers needs to provide a comfortable space where they can sit and watch their children play. Also, parks are an ideal place for caregivers to meet other adults, so clustered seating can make it possible for relaxation and socialising.

Young children need more downtime than elder children and would want to rest between playing. Consider benches that are low in height for toddlers to crawl onto and wide to lie down on and be safe.

Vandalised and broken furniture makes a park or open space feel neglected. Choose robust, vandal proof furniture that is easy to maintain.

Caregivers and young children typically spend longer time in a park, and they may become thirsty or hungry. Consider where and how a drink or a snack may be eaten in the open space.

A few suggestions for seating are:

- **Group benches** together so that caregivers can socialise. Provide **shade** over benches.
- Position benches so that they give a **clear view of the area** where children will be playing.
- Choose benches that can be used by both caregivers and young children. Benches need to be at least **650 mm** wide to accommodate a toddler to sit comfortably.[29]
- Consider the appropriate **material** of the furniture. Concrete and steel benches absorb heat and can be uncomfortable to sit on in the summer. Wood and stone stay cooler.
- Place an element with a flat top close to the benches to allow caregivers to place their infants and interact. Ensure litterbins are available nearby.

[29] https://www.researchgate.net/publication/265685147_The_Minimum_Area_Required_for_Children_Aged_Between_3_and_5_Years_Old_in_a_Kindergarten

For guidelines on bench placement, please see: https://www.pps.org/article/movable-seating[31]

A combination of steps and inclination ramps at Tres Aguas, Madrid; Landscape by BDP
© bdp.com

ENTRANCES AND RAMPS

Open spaces need to consider that young children, either independently or with their caregivers, have limited accessibility. Narrow entrances, a level difference with even 10 cm high kerb, steps are all obstacles for a child and for a caregiver with a stroller.

Figure 3.52 Minimum of 2M wide walkways for easy stroller access

Consider the following:

- Entrances should have at least a **clear 2 metre** passage to allow a person with stroller move easily.
- **Kerbs should be inclined** wherever there is a designated entrance to the park to ensure safe and easy access.
- **Ramps** are necessary where there are larger level differences to ensure easy passage for all children, wheelchair users, and caregivers with buggies.
- The entrances should directly **connect to a continuous** stroller-friendly **walkway** inside the park.
- There should be a provision of **wide openings at entrances for a group of 15-20 children** to enter together, if required.

For barrier free and accessibility guidelines, please see:

CPWD - Handbook on Barrier Free Design and Accessibility 2014

CPWD Guidelines and Space Standards for barrier-free built environment published by Ministry of Urban Development in 2016

Wide tabletop pedestrian crossing to access public space
© WRI India

ACCESSIBILITY TO THE PUBLIC SPACE

Accessibility around the public space plays a very crucial role in maximising the usage of that space. The surroundings of public spaces should have easy and safe access for caregivers with young children to allow frequent visits.

Figure 3.53 Minimum of 2 metre wide footpaths

Figure 3.54
Accessible entrance

Consider the following:

- **Street infrastructure** - Continuous pedestrian infrastructure, crossing and access to nearby public transit
- **Legible entry/exit points** – Nameboards on gates or signage information, clearly demarcating entry-exit
- **Waiting/gathering space -** Adequate space near the entrance for waiting and easy circulation
- **Transparent street edges** - Low or transparent boundary walls for clear visibility of the inner spaces
- **Non-motorised transport access** - Adequate streets should facilitate safe walking, cycling, and use of strollers
- **Attractiveness -** Playful furniture and design features visible from the entrances for attraction

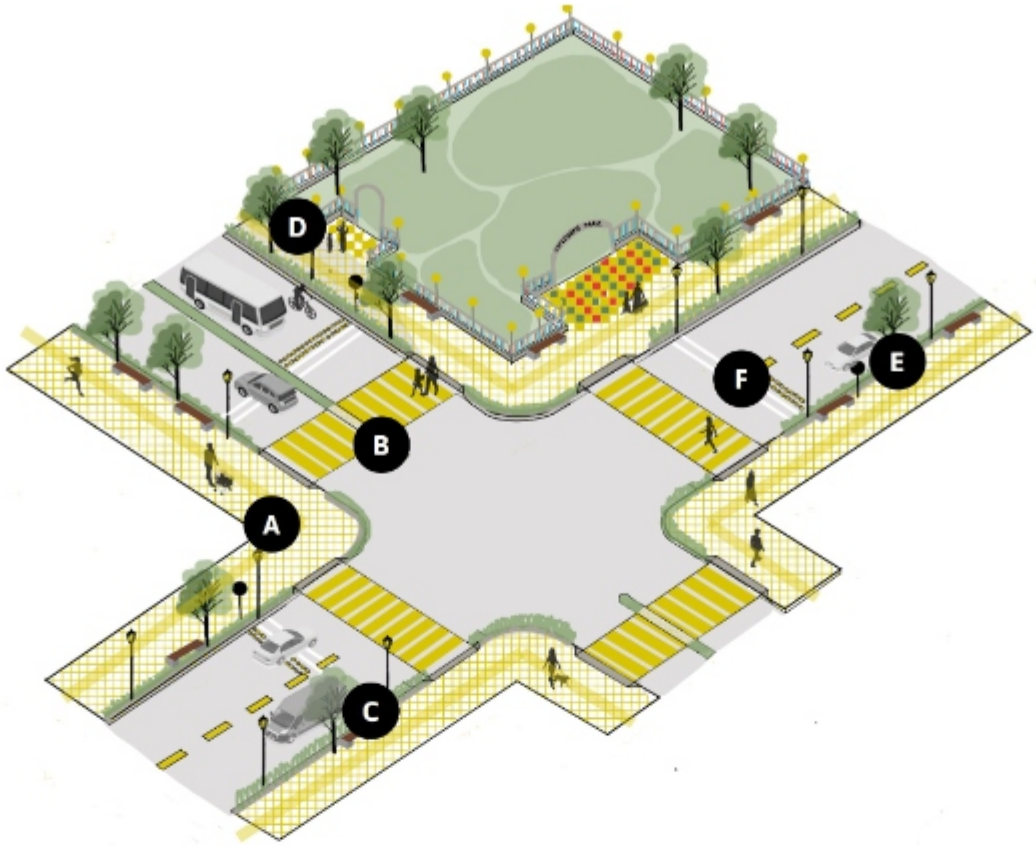


Figure 3.55 Safe access design around parks and open spaces
Source: WRI India

A. Walkways

- Ensure a continuous, unobstructed network of minimum 2-2.4 metre wide at-grade, shaded walkway around a 500-metre radius of park.
- Provide tactile paving of suitable anti-skid material along the walkway for universal accessibility.

B. Pedestrian crossing

- Provide wide dedicated pedestrian crossings of minimum 3 metres. If feasible, provide a tabletop at junctions and mid-block crossing outside parks.
- Connect the footpath to the crossing using ramps with a slope not exceeding 1:12 for safe access to parks.

C. Safety buffer between carriageway and walkways

- Provide a green buffer (maximum height 0.8 metre) or interactive railings (maximum height 0.95 metre) along the footpath for safety from traffic.

D. Park entry

- Ensure a wide and legible entrance of the park (atleast 3 metres wide).

E. Wayfinding and safety

- Add a signage, indicating speed limits, pedestrian crossings, bus stops, parking areas, important landmarks 20 metres before.
- Provide pedestrian lighting of height 3.5-5 metres and of 6-8 lux level at intervals of 12-15 metres.
- Ensure low-height, porous boundary for visibility and safety.

F. Traffic calming measures

- Indicate slow traffic zones in front of parks/playgrounds.
- Provide traffic calming measures, such as rumble strips/speed hump/ cobblestones 13 metres before pedestrian crossings on access streets.

Connected and seamless circulation within open spaces
© WRI India

CONNECTEDNESS

- Physical connectedness within space – At-grade linkages between spaces, ramps to connect different levels for ease of movement.
- Connected through information - Information boards, signage to connect spaces through information.
- Visual connectedness - Spaces to be connected visually to ensure openness and safety.

PROXIMITY AND CONTINUITY

- Proximity to amenities- Suitable amenities should be placed in proximity for ease of access and comfort.
- Proximity to residential neighbourhood- The public space should be planned in proximity to the residential area, targeting a maximum population of young children. They should be well connected to all parts of the neighbourhoods.

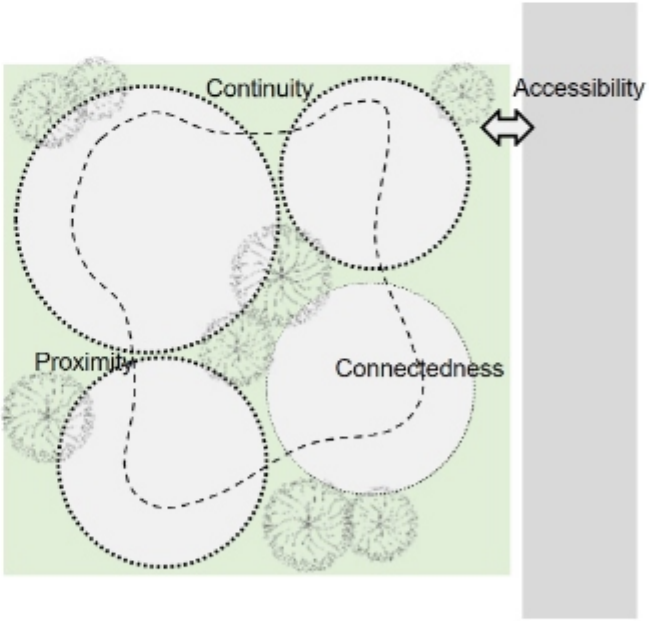


Figure 3.56 Proximity, continuity, connectedness and accessibility

Source: WRI India

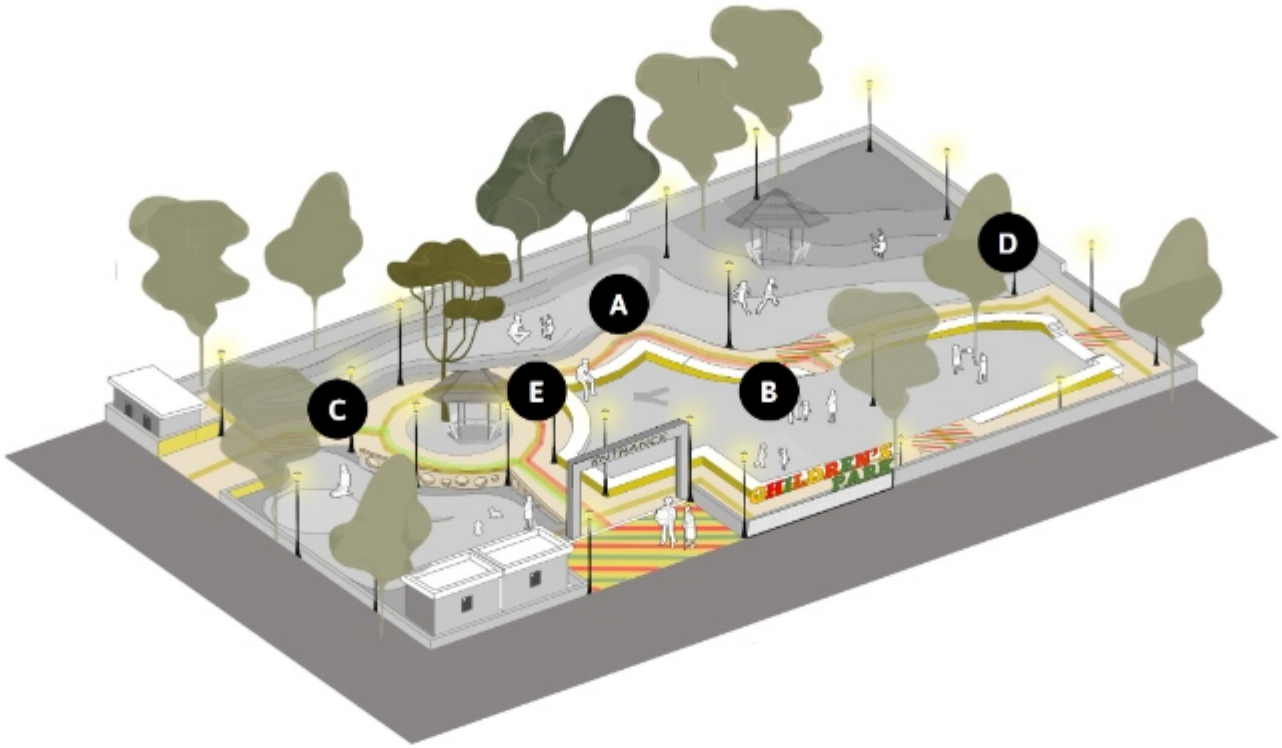


Figure 3.57 Circulation design within parks and playground
Source: WRI India

A. Internal walkways

- Ensure all playspaces, facilities and amenities are connected via a well-shaded, well lit pedestrian walkways, which are minimum 2-3 metres wide, for safe movement of children and caregivers with strollers.
- Ensure gentle slope ranging from 1:15-1:20 at all level changes along pedestrian walkways.
- Provide a tactile paving strip of suitable anti-skid material along the walkway to ensure universal accessibility.
- Provide clear wayfinding signages along walkways.

B. Curved or figure-eight pathways

- Design "walking loops" or curved pathways that are well lit and shaded to promote physical activity while limiting the risk of getting lost and to encourage children to walk along edges and explore spaces.

C. Material selection

- Use materials with high albedo value, such as reflective concrete, tinted concrete, flagstone with local stones, and lime, preferably in white or bright colors for walkways to reduce urban heat island effect and smooth stroller/ wheelchair movement.

D. Plantation along walkways

- Ensure a minimum clearance height of 2.1-2.4 metres for trees with thick and wide canopies along walkways.
- Avoid planting rain trees to prevent accidents.

E. Multi-heighted seating spaces

- Provide well-lit, multi-heighted seating spaces at intervals of 100 metres.
- Add engaging patterns/ play elements near pause spaces to highlight seating areas.

Isamu Noguchi, Playground, Atlanta, USA
© https://www.interiordesign.net/articles/13659-isamu-noguchi-s-creative-playground-designs-exhibit-at-sfmoma/

Giant ant is both public art, and play
© everydaytourist.ca/2014/2014/6/10/playgrounds

PUBLIC ART

There is a natural synergy between combining public art with play spaces. Artwork can give identity to a playground, and make it a destination. Children naturally engage with art, and it can stimulate young children's imagination. Sometimes park spaces are fronted with dead walls, which could be an excellent canvas for young children to paint or create art on. Engaging children and their caregivers in co-creating the art can have a powerful impact and improve their sense of ownership towards the public space. Co-creation workshops and events can be a great way for community building as well. This can also include tree plantation events arranged within community spaces.

Pot painting activity conducted in a public space, Indore
© WRI India

Consider the following:

- Use bright colours that stimulate children.
- Think about what the artwork looks like from a children's eye level, 95 cm.
- Depict scenes that **relate to** and interest **young children**, such as animals or everyday activities.
- Consider how children can **learn** through the artwork; add numbers to the work; use distinct shapes.
- **Engage caregivers** and children when designing street art.
- **Interactive Art** – Art inducing curiosity and allowing conversations.
- **Integrate environmental-friendly group activities,** such as tree plantations and gardening.


Blandan park – Lyon (France), BASE Landscape Design
© http://www.baseland.fr/

COMBINATIONS OF USES/ACTIVITIES

The design of a successful public space is more than just choosing play objects from a catalogue. Thinking about how space will be used and designing it to accommodate those functions should be the main objective.

Children of different age groups will use neighbourhood play areas. Age-mixed play offers opportunities for learning as younger children learn more from older playmates than they could from playing with only their peers.[30] Games and play objects should be chosen that serve the needs of different age groups.

How the space is allocated between different users should also be considered, as young children may need a safer, segregated zone for certain play, and caregivers would require seating nearby. Only a good mix of activities and a careful allocation of the space can guarantee a successful public space to be used by all. The space should also accommodate local cultural activities within the community.

Consider the following when designing combinations of activities in playgrounds:

- Consider that **children of different age groups** will be using a playground. Choose play objects that suit the needs of a diverse age group.
- As a rule of thumb, at least **three different play objects** are required for each playground.
- Provide **seating for caregivers** that allows supervision, but is still far away enough for children to feel free.
- **A cafeteria next to the play area** is a positive addition and provides space for caregivers to relax and meet with other adults while also keeping an eye on the children.
- **Design for flexible use**: ensure that a part of a playground is also free of objects, leaving space for a ball game, skipping, hop-scotch, a picnic, etc. This will maximise the use of the space.

[30] The Special Value of Children's Age-Mixed Play: https://www.psychologytoday.com/files/attachments/1195/ajp-age-mixing-published.pdf

YOUNG CHILDREN'S PLAY DIVERSITY

A 2020 study on play areas in fast growing Indian cities and high-rise housing developments found that the current state of play areas for young children in India are limited to standardised play equipment.[31]

Children, especially, infants and toddlers need a play environment that supports their holistic development by providing them opportunities where they can engage in a range of play types.

Design professionals can incorporate a diverse range of play opportunities for infants and toddlers in public open spaces in the following ways:

Consider the following:

1. **Physical play:** Play areas should challenge infants' and toddlers' physical and mental strength by giving them opportunities to grasp objects, climb, crawl, run, and jump (supports gross motor, locomotor, object play).
2. **Construction play**: Play spaces should have loose parts for free play so that infants and toddlers can build, control and manipulate during play (supports mastery, construction, and manipulative play).
3. **Sensory play:** In play areas, infants and toddlers should have rich sensory experiences, preferably with natural elements (supports fine motor, sensory, and exploratory play).
4. **Social play:** Play areas should have interactive elements where infants and toddlers have opportunities to engage, empathise, cooperate, and socialise with peers (supports group and communication play).
5. **Creative play:** Play spaces should be stimulating spaces that encourage infants and toddlers to exercise their creativity and imagination (supports symbolic, creative, socio-dramatic, imaginative, fantasy, and role play)

[31]Atmakur-Javdekar, Sruthi, "Young Children's Play in High-rise Housing: A Window into the Changing Lives of Urban Middle-class Families in Pune Metropolitan Area" (2020). CUNY Academic Works

AGE-APPROPRIATE PLAY

It is critical to address the unique requirements of various age groups and make sure that the various play elements support their development. Specific considerations for 0-1, 1-3 and 3-5 age groups of children are provided in the following sections.

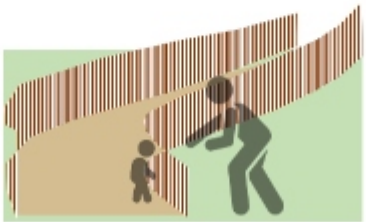
PLAY SPACE REQUIREMENTS (Children aged 0-1)		
		
Use vibrant colors only as highlights in play equipment	Shallow water pools for play	Use dynamic objects such as hanging balls/ pinwheel to engage attention
		
Use appropriate soft and levelled surface treatment for activities such as rolling and crawling	Low heighted support structures for sitting/ leaning	Small heighted support structures for babies of 9 months and older to stand upright
		
Well shaded play and walking space	No stray animals in parks/playgrounds	Clean and hygienic play spaces
		
Small gentle green mounds upto height of 0.6m to aid physical activity	Small sensory trails for cognitive devlepment	

Table 3.9 Age-appropriate play for 0-1 years old
Source: WRI India

Figure 3.58 Play spaces for children aged 0-1 years
Source: WRI India

Dedicated play area for 0-1 year-old, allowing activities, such as crawling, walking on knees, rolling, and balancing

- Provide natural and soft textured surfaces, such as soft groomed grass areas, sand pits and shallow water pools to allow crawling, rolling, and exploration.
- Provide play space enclosed by low-heighted stockade for enhanced safety.
- Include small, gentle green mounds up to a height of 0.3-0.5 metres to aid body balance that develops between 10 and12 months of age.
- Add support structures at low height, such as standing/climbing frames or handrails (maximum height 0.45 metre and frame diameter below 50 mm) for infants that are either nine months old or older to clasp on and stand upright.
- Provide comfortable and well-lit adult and child seating to ensure close contact with play space.

Sensory trails

- Include small sensory trails for cognitive development, including fragrant, soft grass, coloured pebbles, stones of different sizes, gravel, sand, wooden chips, and mosaic tiles

Interactive water play

- Add water features, such as shallow pools or splash pads, to allow water play for infants, such as splashing the water by palms and, pouring out cups of water, which help in the development of gross motor skills.

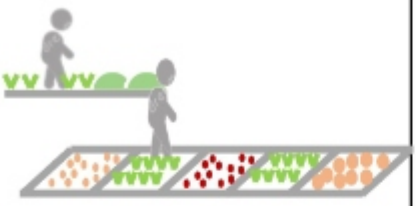
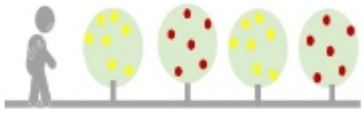
PLAY SPACE REQUIREMENTS (Children aged 1-3)		
		
Mix of softscape (green lawns) and hardscape. Walking trails for experiencing various textures.	Water pit- min depth 3 inch and max depth 6 inch or inflatable pool tube with colorful balls	Low heighted climbers/ jungle gym
		
Trampoline for encouraging physical activity	Short obstacle course for developing body balance	Plant ornamental shrubs of max. height of 0.95m to attract attention
		
Plant trees with low branches (within height of 1ft)	Seating spaces for caregivers adjacent to play area	Sandpit for loose play
		
Flower beds to engage in nature play		

Table 3.10 Age-appropriate play for 1-3 years old

Source: WRI India

Figure 3.59 Play spaces for children aged 1-3years
Source: WRI India

Sensory play elements

- Use loose parts, such as stones, pebbles, wood, pipes, tyres, and construction material, for allowing creative play in the space.
- Design play spaces with sandpits, loose wooden logs, and climbing walls to explore risk and adventure play opportunities as babies walking by between 1 and 2 years of age.
- Include water pool of depth of 3-6 inches.
- Include ornamental shrubs that have a maximum height of 0.45 metre to stimulate nature interaction.

Play to support physical development

- Add a short obstacle course for developing body balance.
- Provide low heighted climbers/ jungle gym to encourage physical development.
- Ensure all climbing structures are less than 0.8 metre in height, with appropriate fall surface treatment around it.

Seating for caregivers

- Include comfortable, well-lit adult and child seating to ensure close contact with play space.

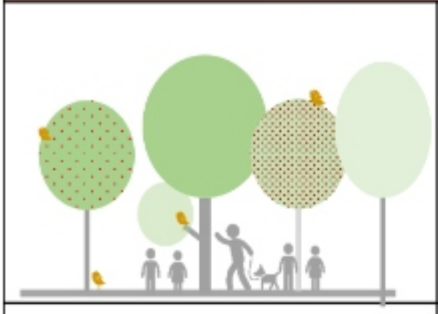
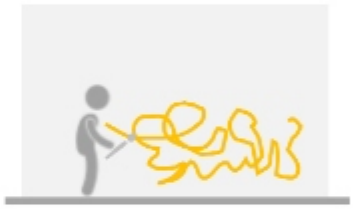
PLAY SPACE REQUIREMENTS (Children aged 3-5)		
		
Dedicated shaded open greens as children develop curiosity about nature	Dedicated tricycle/cycle trails around park	Opportunities for pretend play
		
Dynamic play equipment such as swings, merry go round and climb bars	Nature based adventure play opportunities	Provision for free art on walls for children
Options for adventure play		
		
Play across bridge	Balance beam play	Mound tunnel play
		
Traffic parks to sensitize young children about traffic rules – combining play with education		

Table 3.11 Age-appropriate play for 3-5 years old

Source: WRI India

Figure 3.60 Play spaces for children aged 3-5 years
Source: WRI India

Diverse play opportunities

- Incorporate landscape features that afford play, such as little clearings, bridge over the stream, stepping stones, and loose rocks in pond.

Dedicated play area for 3-5 year-olds

- Include play opportunities, such as pretend play, adventure play (bridge, mounds, tunnel), and balance beam.
- Provide water bodies, such as shallow pools and ponds that are atleast of 0.3 metre deep.
- Provide dedicated tricycle/cycle trails that are at least 100 metres long and 1.8 metres wide and are either eight-shaped or a continuous loop.
- Include a gentle 1.5-metre-high play mound.
- Include short walls that are less than 0.3-0.45 metre high for balancing activity.
- Include play equipment, such as simple machines including pulleys, and baskets attached to ropes, for the development of gross motor skills.

Seating for caregivers

- Include comfortable, well-lit adult and child seating to ensure close contact with play space.

While the unique needs of young children are critical, it is also important to cater to various caregivers' profiles accompanying children. Well designed spaces supporting caregiver's activities will engage, entertain and relax them while attending to their young children. A few recommendations for creating supportive environments for caregivers are included below.

OPEN SPACE REQUIREMENTS FOR CARGIVER CHARACTERISTICS		
		
Open gym spaces planned adjacent to children's play area	Dedicated play space/ walking space away from older kids play area (cricket ground) to avoid accidents	Provision of gentle ramps for easy wheelchair movement
		
Cluster seating for caregivers near play space for age 0-1 yr old	Wide entry to the park for smooth movement	Cluster seating for caregivers near play space for age 3-5 yr old
		
Provision of green open space for exercise and meditation such as yoga, laughter club etc.	Design caregiver friendly spaces such as resting spaces, picnic tables or library to attract more ITCs to public spaces	

Table 3.12 Open space requirements for caregivers

Source: WRI India

Adventure play elements in De Margriet School, Rotterdam
© WRI India

Case example: Green-blue schoolyards adventure playgrounds, Rotterdam, Netherlands

According to the Rotterdam's Green Agenda 2023-2026, the city is making efforts towards greening by developing city-level public spaces, greening neighbourhood streets, creating parks, and transforming underutilised spaces around schools into green-blue schoolyards.

Rotterdam's Green Blue Schoolyards programme addresses child-centric and climate adaptation agendas with a common solution: more nature in schoolyards. The programme supports schools to transform their outdoor spaces with natural play areas for outdoor educational projects and community use.

Green-blue schoolyards provide young children with various adventure and nature-based play and learn opportunities, where they are not afraid to take risks and explore their surroundings.

These schoolyards consist of natural trails, sandpits, rainwater collection pits, wooden play elements, and other sensory play elements that help in the cognitive and overall development of children. These schoolyards also act as community spaces, post school hours.

Balancing elements
©WRI India

Wooden bridges
©WRI India


All Abilities park in Visakhapatnam, India
©Greater Visakhapatnam Municipal Corporation-Smart City

Case example: All Abilities Park, Visakhapatnam, India

The All Abilities Park in Visakhapatnam serves the needs of differently abled children without segregating them from the rest of the community. The park targets all types of differently abled users, including visually impaired, hearing impaired, and those with physical disabilities.

Most of the play equipment is made of soft rubber, which makes it a safe by design and solves the problem of rust and damage. Also, the park is constructed in such a manner that a person in a wheelchair can manoeuvre every corner of the park with ease.

The park is equipped with sensory experiences, including tactile pavements and textured walls.

The park gives an opportunity for children to draw and express themselves on the large blackboard that has been incorporated in the space.


Diverse play zones
©Greater Visakhapatnam Municipal Corporation-Smart City


Active play with safe design
©Greater Visakhapatnam Municipal Corporation-Smart City

INCLUSIVE OPEN SPACES

Inclusive measures are important to make sure that parks and open spaces serve everyone equally. An inclusive space is thoroughly and consistently supportive of everyone who uses it. Facilities of drinking water, toilets, and lactation pods should be provided in parks to ensure that the needs of young children and caregivers of all abilities and social classes are catered to.

Breastfeeding cubicle in public park of Rourkela
© WRI India

REST STATIONS / NURSING BOOTHS

Breastfeeding supports everything from stronger disease resistance to maintaining a healthy weight in infants, which is crucial for early childhood development. Nursing pods or resting stations play a vital role in creating child-friendly neighbourhoods. As more cities around the world integrate lactation stations into their neighbourhoods, it's essential to focus on the most important factors for their setup. While not mandatory, nursing booths provide a sense of security, comfort, and respect, empowering women to confidently breastfeed in public spaces.

Hirkani Kaksh, Maharashtra, India

The Maharashtra government is planning to implement the pilot project "Hirkani Kaksha", started in Nashik, through primary health centers (PHCs) across the state to promote breastfeeding among lactating mothers.

©ESakal

Consider the following while providing rest stations/feeding booths:

- The space should be fitted with **comfortable seats**, and washing facilities.
- The room should be **well lit and quiet**.
- The space should be checked routinely for cleanliness.
- The access to the space should be **stroller-friendly,** and the room should have sufficient area to accommodate a stroller.
- Availability of a **change table or a diaper deck** is necessary.
- Ideally, it should **overlook a tot-lot and clubbed with toilet facilities.**
- Temporary or mobile structures can be used for placing these pods across neighbourhoods.

For more ideas on making nursing pods, please see: https://www.esakal.com/pune/st-starts-hirkani-service-women-17927 and https://www.mamava.com/

Caregiver amenities in public spaces can encourage more caregivers to step outside with their young children and avail various facilities in and around the neighbourhood. The design of the public amenities, such as drinking water points, feeding booths, and diaper changing stations, should adhere to the following guidelines.

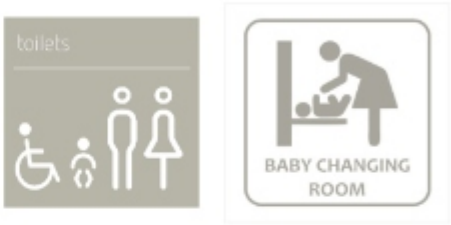
PUBLIC AMENITIES (Children aged 0-1)		
		
Clean and well-lit breastfeeding cubicles	Wide benches with proper backrest (min 50-55cm wide and 45-50cm high)	Clean diaper changing stations with provisions for wet wipes and fresh diapers and clean toilets
		
Access to clean drinking water	Accessible garbage disposal bins at regular intervals	
PUBLIC AMENITIES (Children aged 1-3)		
		
Access to clean drinking water	Legible wayfinding signages to amenities	Child-heighted attractive bins to dispose garbage

Table 3.13 Public amenities requirement for young children and caregivers
Source: WRI India

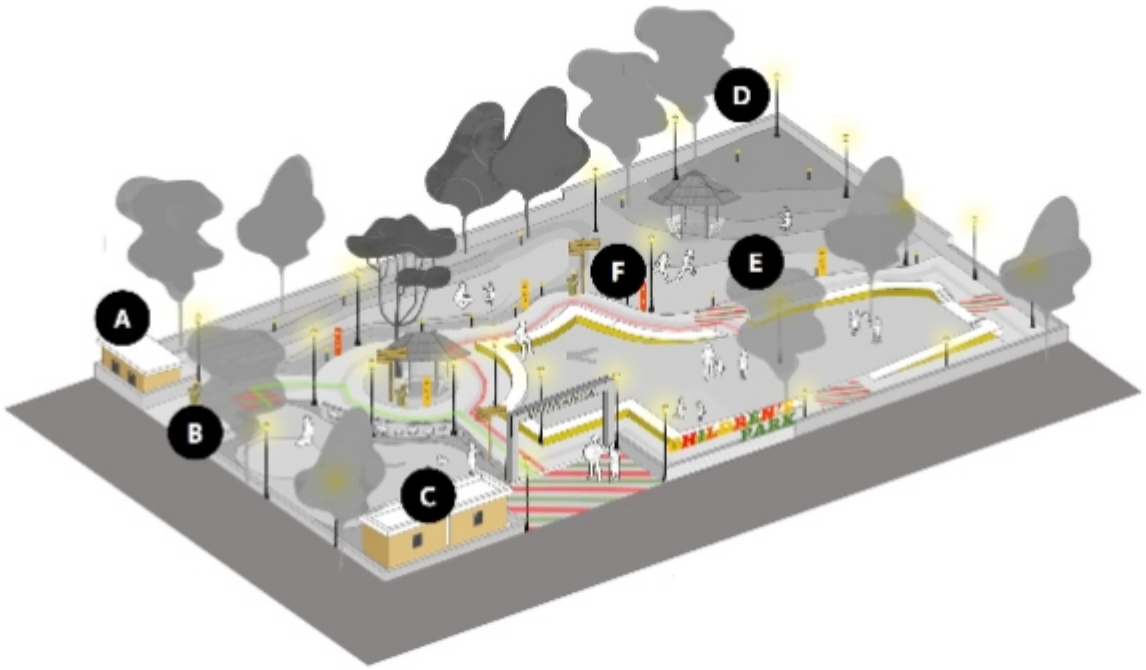


Figure 3.61 Public amenities suitable for young children and their caregivers
Source: WRI India

A. Nursing stations

- Provide clean, well-lit, and ventilated feeding booths for nursing mothers with diaper changing tables (2.1X 2.4 metre nursing station, provide for at least 2 nursing mothers).

B. Garbage disposal bins

- Provide accessible, legible garbage disposal bins at a height of 0.45-0.5 metre at regular intervals (every 100 metres) and near seating spaces.

C. Drinking water and toilet facilities

- Provide clean drinking water facilities at both adult and child (0.5-0.55 metre) heights for easy access.
- Provide clean toilets with toilet fixtures at child height; max. height of toilet seat as 0.25-0.3 metre and max. height of hand basin as 0.5-0.55 metre.

D. Lighting

- Provide pedestrian lighting at 3.5-5 metre height and of 6-8 lux level at intervals of 12-15 metres, to lighten up walkways.
- Provide warm bollard lighting of height of 0.2-0.3 metre, c/c spacing 2.4 metres or height of 0.5-0.55 metre, c/c spacing 4.6 metres or height of 0.8-0.9 metre, c/c spacing 9 metres to illuminate the ground surface.

E. Rainwater harvesting

- Provide rainwater harvesting pits based on natural terrain of the site to use collected water for water play and watering plants.

F. Wayfinding

- Provide well-lit signage showing entry-exit points; park map with facilities.
- All orientation signage, key map, and information plaques should include text in braille or relief.
- Bright and thematic color palette should be used for all signage (identity, directional and informative)
- Provide signage at height of 0.5-0.55 metres including interesting facts about native plants or species.

Mini library at the play coutyard in Naga Hospital, Kohima
©WRI India

©WRI India

CAREGIVER AMENITIES IN PUBLIC OPEN SPACES

Beyond caregiving amenities such as feeding booths, caregivers also seek opportunities to interact, play, relax, and engage in activities and events while they are in public spaces.

Consider the following amenities to engage caregivers:

- **Picnic tables or comfortable and shaded seating spaces** with good visibility to children's play area help caregivers relax and socialise while watching their children. Seating with backrests and seating spaces for wheelchair/stroller users makes it inclusive and accessible for all users.

- **Reading corners** with book-shelves where caregivers can lend, and swap books will encourage community involvement and reading while children remain engaged in play. This collection can also include books for young children, enabling caregivers to introduce the habit of reading to them from an early age.

- **Affordable and healthy eateries** that offer a menu with a focus on nutritious options, such as fresh fruits, vegetables, whole grain snacks, and low-fat dairy products, provide families with convenient and wholesome food choices. These allow caregivers to spend more time in public spaces while allowing them to access healthy food choices for the family.

STORIES FROM THE FIELD:
NURTURING NEIGHBOURHOODS CHALLENGE

DOOR-STEP PLAY IN DENSE HOUSING- PUTTANI PARK, BENGALURU

The pocket park offers diverse play opportunities for young children in dense government housing quarters. It has enabled caregivers to spend more time outdoors with their children, fostering a sense of belonging within the community.

Total estimated cost: Rs. 14,00,000

313 sqm

Grass mound with tunnel | Sand pit | Acoustic play | Play equipment | Multi-height seating | Ramps | Herb garden

POCKET PARK IN VULNERABLE SETTLEMENT- CHITTI PARK, WARANGAL

Reclaiming an unused pocket for providing a pocket park for families in M H Nagar Slum has created a stimulating community space within distance from homes.

Total estimated cost: Rs. 6,50,000

200 sqm

Balancing beam | Sand pit | Play equipment | Low height seating | Porous boundary

A simple tunnel mound play and a sand pit of 50 sq.meters will cost between Rs. 50,000 to Rs 80,000.

ROOFTOP SENSORY PARK, KOHIMA

The land-starved city of Kohima strategically converted a rooftop space of a public toilet complex to create a sensory park with variety of play opportunities and community gathering, close to the city centre with high footfall.

Total estimated cost: Rs. 8,00,000

342 sqm

Grass mound with tunnel | Sand pit | Sensory pathway | Acoustic play | Play equipment | Shaded multi-height seating

UMANG VATIKA, VIGYAN NAGAR, INDORE

The park offers inclusive, nature-based play for young children with sandpit, climbing ropes, balancing areas, sensory trail, water play, butterfly zone, and themed gardens, all designed to support sensory and cognitive growth.

Total estimated cost: Rs. 1,60,00,000

3290 sqm

Interactive wall | Grass mounds | Sand pit | Sensory pathway | Acoustic play | Wooden log seating | Shaded multi-height seating

An interactive play wall of 3m length and 1.5m height can cost between Rs.20,000 to Rs.30,000.

DATA COLLECTION FOR OPEN SPACES

Prior to the design of a public space, extensive data collection and studies should be carried out within the neighbourhood. There are many frameworks for data collection available, and GEHL Urban95 toolkit is a useful framework to collect data. It is a reference document that includes different types of surveys for studying people, quality of existing spaces, activities performed, and their characteristics during different times of the day in a space. This toolkit encompasses different survey methodologies in detail, which will help in acquiring necessary information on infants, toddlers and caregivers and their needs.

The data will also help understand the current scenario, assess gaps, and learn about the needs of the neighbourhood for better decision-making.

List of surveys included in the GEHL toolkit

People Moving Count

- The survey is simply about counting people moving through a space. This gives us data on the volume of people moving through a space, which can be used as an attribute to compare different sites with respect to time, day, week, and year.

Activity Mapping

- In order to understand how a public space functions for its people, it is crucial to understand the kind of activities taking place in that space. This understanding helps in identifying what works well and what requires further enhancement.

Intercept Surveys

- It is crucial to understand how the users, which in this context are the caregivers and young children, are experiencing the space. Intercept surveys provide strong evidence for the observations recorded during the previous exercises. The user perception survey is meant to study the quality of a public space by recording the experiences and perception of the users of that space.

Sensory Mapping

- Mapping different environment stimulants of senses – touch, see, smell, hear and balance.

	10 min	Total
Baby		
Toddler		
Child up to 5		
Caregiver		
Others		

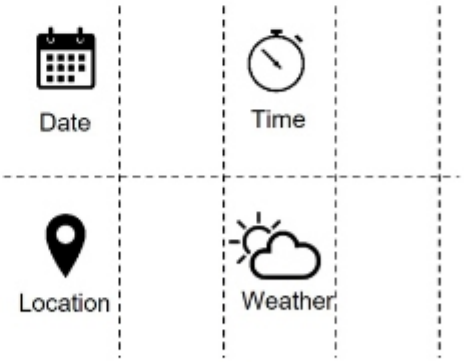


Figure 3.62 Sample of data collection format from GEHL toolkit

Read more at : https://vanleerfoundation.org/publications-reports/measuring-urban-experiences-of-young-children/

SOCIAL INFRASTRUCTURE

Objectives Achieved	City level indicators
	4. % neighbourhood area with PHCs within 1000 metres distance (Core) 5. % area of informal settlements with PHCs within 1000 metres distance (Core) 6. % neighbourhood area with Anganwadi Centre within 500 metres distance (Core) 7. % area of informal settlements with Anganwadi Centre within 500 metres distance (Core) 8. % of households that have access to crèches within 500 metree distance (Core)
	47. Presence of Anganwadi Centres with health clinics in the city (y/n) (Core)
	Neighbourhood level indicators
	48. Total Number of private kindergartens in the neighbourhood and whether they have attached outdoor space (Core)
	49. % of Government schools that allow usage of school campuses during non-school hours (Core)

Target Behaviours
2. Caregivers take infants and toddlers to visit public spaces / facilities more often 2.1 Caregivers and children are accessing/using ECD services, such as AWCs and PHCs 2.2 Caregivers use amenities, such as feeding booths, toilets and drinking water while in public spaces - seating, shaded waiting areas 2.5 Front line workers, such as security guard, ticket counter staff and other staff prioritises ITC
4. Caregivers of young children adopt responsive caregiving practices at home and in public spaces
5. Community encourages young children and family-friendly changes in the neighbourhood 5.2 Caregivers and community engage in community action for upkeep of interventions

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

06 Social Infrastructure

HOW TO APPROACH THE DESIGN OF SOCIAL INFRASTRUCTURE

Besides open spaces, young children in a neighbourhood also have other destinations that they go to on a regular basis. They may make regular visits to daycare centres, health centres and nearby markets. These public facilities should be designed with the needs of young children in mind.

Every neighbourhood when planned by the city, generally provides basic amenities as per the guidelines. These are most of the time the 'minimum' possible solutions given. It is important to note that amenities and facilities like early education centres, health care, daily shopping, cultural facilities, and utilities like toilets are the most frequented spaces in a neighbourhood. While redesigning any ECD facility or social infrastructure, it is important to conduct the audit of these spaces with specific parameters to understand necessary improvements. Refer to Annexure C for ECD infrastructure audit checklist for the same. It may be modified further depending on the local context or type of ECD infrastructure.

Young children and caregivers generally perform these daily trips with little or no assistance. It is important that these facilities and their immediate access aredesigned keeping them in mind as a target group.

General rules to consider when designing social infrastructure facilities are good access, an interesting array of uses, stimulating enviornment, peaceful and friendly space for caregivers. If caregivers enjoy their time outside, they will take young children out more, which will give them more time for outdoor play and opportunities to learn and enjoy.

Connemara Library, Chennai
©Luca Comparini on Flickr

Drink Stall
©Luca Comparini on Flickr

NBS School in Dwarka, Delhi
© www.landscapeindia.net/a-school-in-delhi/

Anganwadi Centre nd outdoor play area at Sanskriti Nagar, Indore
©WRI India

ANGANWADI CENTRES (AWC)

Anganwadi Centres are one of the important government centres for delivering early childhood services in Indian cities. They cater to young children below the age of 6 years, by providing early education along with nutritional meals, healthcare and immunisation. They also offer health and nutrition education to families, especially pregnant women, on how to breastfeed, motivating families to adopt family planning and educating parents about child growth and development.

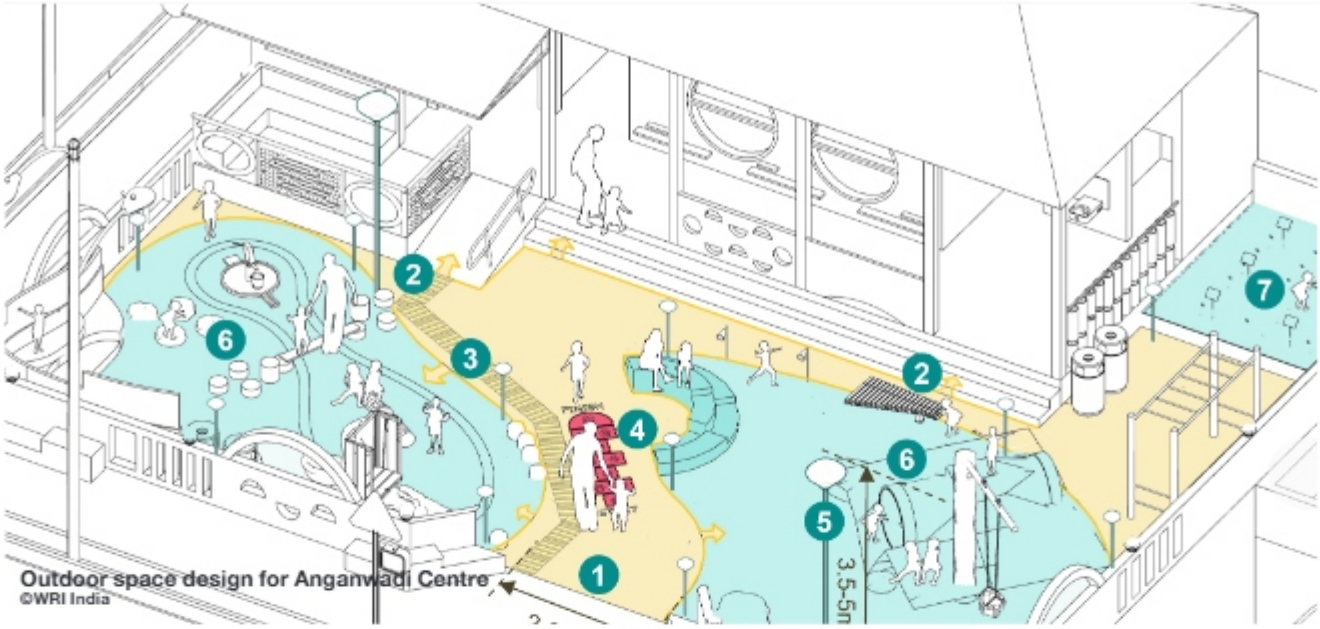
At present, many anganwadis face challenges such as poor building conditions, unsafe access, limited outdoor play and inadequate caregiver amenities. Consequently, young children and caregivers are often deterred from using these facilities and have to depend on private services that may not be affordable to all.

Ensuring safety and providing play opportunities within the premises can be the first step to support families using these sevices everyday.

Consider the following:

- There should be at least one Anganwadi Centre in a neighbourhood with a population of 5,000 (URDPFI Guidelines). These can be mini Anganwadi Centres but spread out so that most homes have access within a 5-10 minute walking distance.
- The outdoor spaces of Anganwadi Centres should ensure nature-based elements, interactive play elements, soft surface, low height plantation, shading, and a porous boundary wall for enhanced safety.
- A dedicated play area should include age-appropriate elements for 0-6 years children.
- Comfortable waiting areas for caregivers should be provided in the premises.


Anganwadi Centre 3,11 at Kalavathy, Kochi
©WRI India



Outdoor space design for Anganwadi Centre premises

1. Minimum 2-metre wide unobstructed walkway within premises
2. All sub-spaces are connected via walkways
3. Tactile paving of suitable anti-skid material for universal accessibility
4. Floor games
5. Adequate lighting of height 3.5-5 metres and of 6-8 lux level at intervals of 12-15 metres
6. Age-specific play spaces
7. Gardening area to engage children in sensory experiences

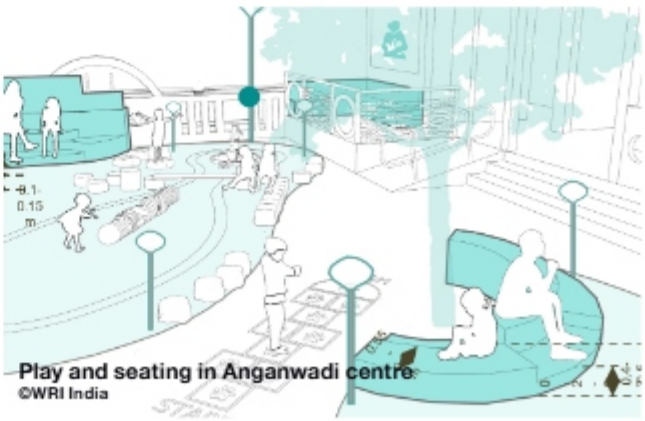
Critical elements for young children and caregivers:

Access to Anganwadi Centres

- Continuous, well shaded 2m wide footpath
- Green buffer or interactive railings with maximum height of 0.95 metre along the footpath
- Pause spaces with multi-heighted seating

Play and seating spaces

- Age-appropriate play equipment i.e. toddler swings and low-height climbers
- Landscape features, such as mounds
- Sensory-play elements, such as xylophones
- Obstacle course/balancing beam up to a height of 0.2 metre with soft fall area to encourage risk play
- Stepped seating (with riser of 100-150 mm and tread of 400 metre) for hosting group events and open classroom sessions
- Shaded seating area for caregivers to wait



Naga Hospital Courtyard, Kohima
©Kohima Smart City Development Limited

PRIMARY HEALTH CENTRES AND NUTRITION REHABILITATION CENTRES

Primary Health Centres (PHCs) provide healthcare facilities for young children and caregivers including prenatal, delivery, and postnatal care and vaccinations, nutrition, and general health services. NRCs provide dedicated care required for under nourished children in need of special care.
These centres are typically frequented destinations by young children and their caregivers, including pregnant and nursing mothers, and act as anchors for the community.

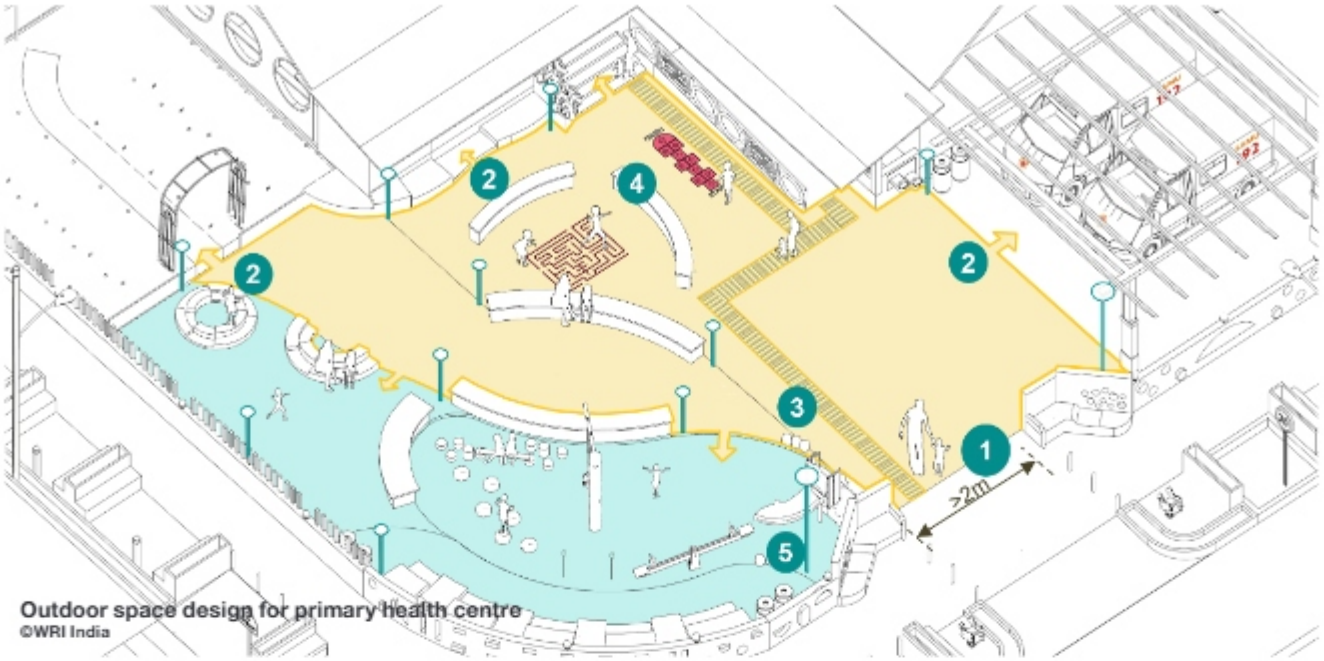
Many of these centres do not offer safe, inclusive environment for its visitors and need specific measures to create a positive outlook towards them. Safe access, comfortable waiting areas for caregivers, and engaging play opportunities for young children will enable comfort and a stress-free environment and enable more caregivers to avail these essential services. It will maximise the usage of such affordable government services by all sections of society.

BBMP Maternity home, Wilson Garden, Bengaluru
©Directorate of Urban Land Transport

Consider the following:

- According to the Urban Primary Health Centre (UPHC) Guidelines 2018 of National Health Mission, UPHCs are to be established for every 50,000 population, in close proximity to urban slums. UCHCs are to be established for every 2.5 lakh population.
- Some of the indoor space can be converted into temporary nursing booths, with appropriate safety measures.
- Dedicated age-specific play area for 0-6 year-olds, along with comfortable shaded waiting areas for caregivers, should be incorporated.
- Incorporating nature-based play opportunities around waiting areas can make the waiting time more engaging and interactive.

Refer to Stories from Smart Cities- Nurturing Neighbourhoods Challenge



Outdoor space design for primary health centre
©WRI India

Outdoor space design for PHC premises

1. An unobstructed walkway within premises, which is at least 2 metre wide
2. All sub-spaces within premises are connected via walkways
3. Tactile paving of suitable anti-skid material for universal accessibility
4. Engaging elements, such as hopscotch, murals and informative graphics on walkways
5. Adequate lighting that is 3.5-5 metre high and of 6-8 lux level at intervals of 12-15 metres

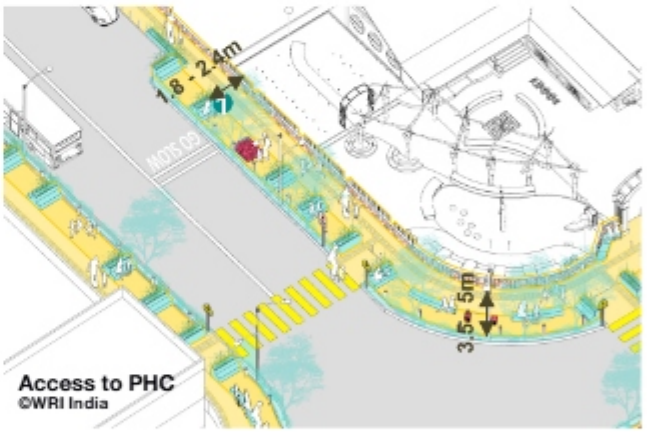
Critical elements for young children and caregivers:

Access to PHC

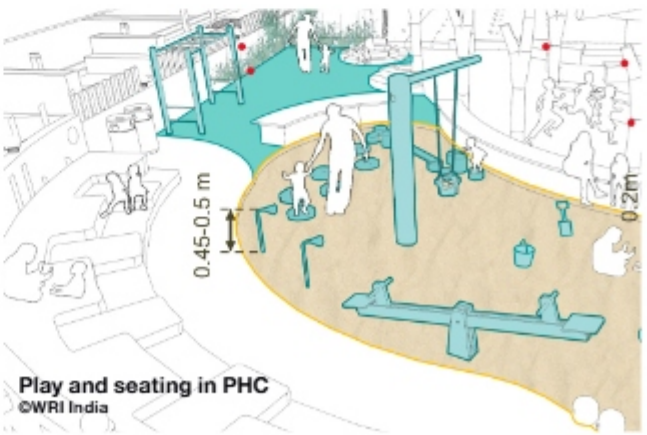
- Continuous 2m wide footpat
- Pause spaces with multi-heighted seating within a 300-metre radius
- Green buffer or interactive railings with maximum height of 0.95 metre along the footpath.

Play and seating in PHC

- Shaded waiting areas using large canopy trees or elements, such as tensile fabric and green trellis
- Pits with sand/mud for free play
- Pocket play (sandpit, mounds, seesaw, slides, balancing beams etc.)
- Sensory play elements, such as xylophones



Access to PHC
©WRI India



Play and seating in PHC
©WRI India

Children's School, New Delhi
© learningmatters-india.org/childrens-school/

DAY CARE CENTRES/PLAY SCHOOLS

Daycare centres or playschools for infants and toddlers should be well planned and offer a stimulating environment. They should provide innovative play-based learning and basic early education for infants, toddlers, and their caregivers and ensure supportive amenities.

Consider the following:

- For infants, the **areas for play, feeding, and napping** should be set up to maximise contact between the caregiver and the infant. These areas should allow the interaction to be unhurried and quiet.
- Play areas for mobile infants and toddlers should be separate from those for non-mobile infants. They need **sufficient uninterrupted space for exploration** and discovery.
- The napping area should be physically separate from other activity areas.
- Ceilings, walls, and lights need to be pleasantly coordinated. Avoid bold colours, patterns, and bare light bulbs.
- The **outdoor activity area** should have a soft surface, be well-lit and be protected from extreme heat.
- The outdoor activity area should be equipped with a **variety of age-and developmentally-appropriate toys** and equipment for large-motor and sensorial play.
- Outdoor activity area should be enclosed by a barrier (fence, porous wall) with 0.95 metre high.
- Every level of the premises should be equipped with **diaper change, feeding, and napping areas.** They should also have facilities for food preparation and storage.

For detailed guidelines, there are a number of resources online. See Infant Care Guidelines

DAY CARE CENTRE

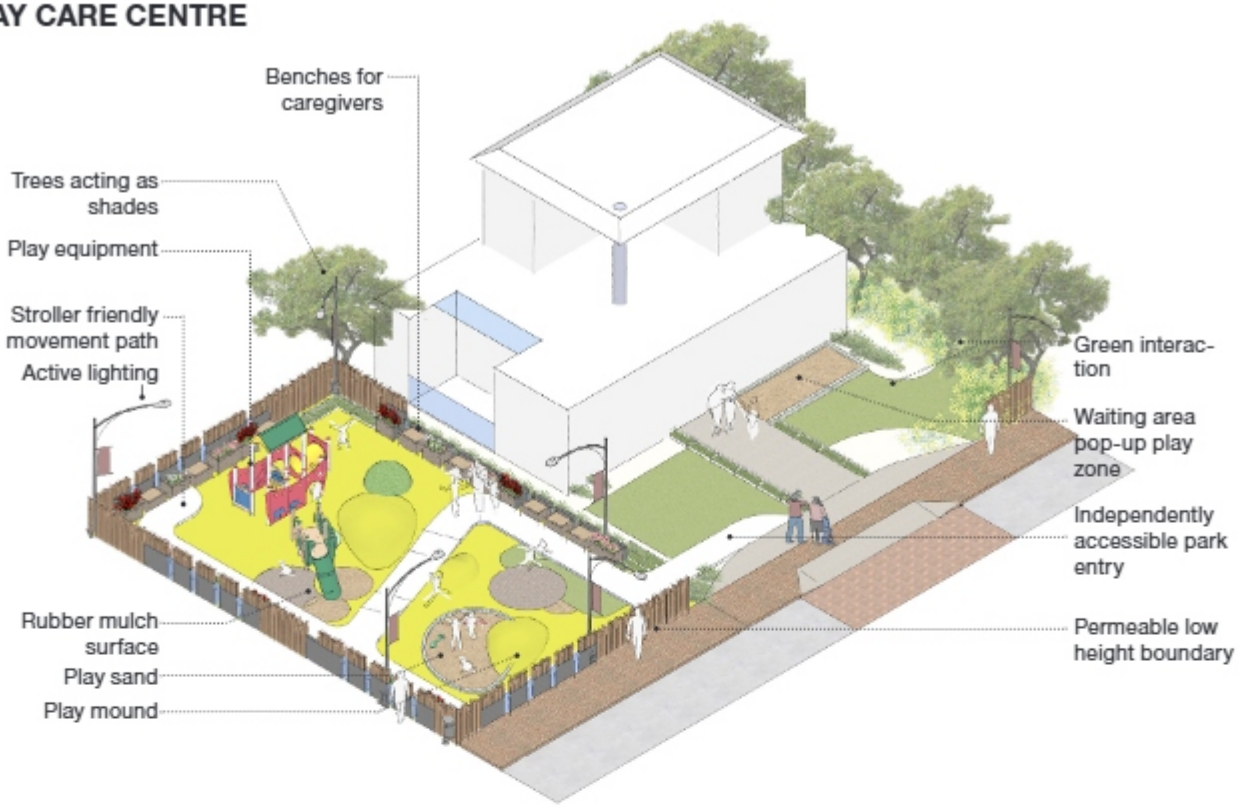


Figure 3.63 Model day-care centre

Size - **800sqm - 2000sqm**
Distance - **@max. 500m**
Density - **6 nos. every neighbourhood**
Guidelines/Standards - **800sqm / 2500 Population**

Critical elements for young children and caregivers:

- Continuous footpaths to reach
- Outdoor activity area.
- Play area with soft surface.
- Natural play elements.
- Shade
- Resting equipment, seating
- Toilets
- Resting/Nursing Booth.
- No parking at the edge
- Landscape elements

School, Krishnamurti Foundation India
© www.theschoolkfi.org/
© www.centralparknyc.org/things-to-see-and-do/attractions/tarr-coyne-tots-playground.html

USE OF SCHOOL RESOURCES AFTER HOURS

Many neighbourhoods may not have adequate open space for young children. Partnering with schools in the neighbourhood to allow their outdoor facilities beyond school hours for the community children can provide a safe and familiar space for children and their families.

The school's playground, outdoor play spaces, exercise rooms, and fields can be leveraged for neighbourhood to have direct access and increase opportunities to play and socialise for young children and families.

Joint Use Agreements

In California, school districts, local governments, and community-based organisations share the costs and responsibilities of opening school property to the public after hours through joint use agreements. For further information on this and how to incorporate it in your neighbourhood, read the toolkit developed by ChangeLab Solutions, USA.

Consider the following:

- Work with **administrators, school boards, and authorities** to have the school open during non-school hours for community physical activities.
- **Organise community events and activities** to attract more people and maximise usage.
- Send flyers home with students, post announcements in local newspapers, and alert the media to **notify the community** about school facility availability and upcoming programs.
- Make sure **lighting**, both natural and artificial, is adequate, and that the school has young children and caregivers specific furniture.
- **Age aggregated play area** for 0-5 years should be designed as part of the accessible open school ground.
- Some of the **indoor amenity/space** can be converted into temporary lactation booths with appropriate safety measures.

Vegetable vendors, Rourkela
©Rourkela Municipal Corporation

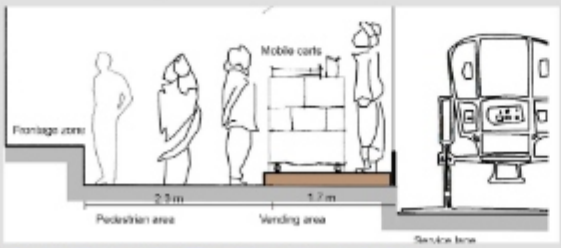
VENDORS AND KIOSKS

Children and their caregivers often visit nearby vendors and kiosks in the neighbourhood as part of their daily trips. Designing such vending areas to cater to their specific needs will enhance their everyday experiences.

Cities can design specific spots within the neighbourhood where mobile vending stalls can be set up without obstructions from vehicular traffic. Such kiosks can enhance the liveliness of the neighbourhood and encourage caregivers to feel safe taking their children outside.

Inclusive Design for Street Vendors in India Guide by Centre for Urban Equity, CEPT University

This is a very informative guide for detailed guidelines on incorporating food vendors and kiosks in the public realm.



Inclusive Design for Street Vendors in India

When designing vending kiosks, take the following into account:

- Creative ways to combine vendors with playgrounds, schools, or recycle points.
- Vendors, kiosks, and local service providers should **not be placed to block the public realm**. They should be placed within designated areas, leaving a clear 1.8 m width of movement around them.
- Mobile stalls can be designed to precisely **fit the dimensions of a parking space**, including the area needed for customers to stand.
- **Shaded waiting spaces and drinking water facilities** for caregivers should be present close to the vendor kiosks.

Polo View Market, By Srinagar Smart City
© https://kashmirpulse.com/jk/kashmir/under-smart-city-srinagar-gets-maiden-wire-free-pedestrian-market/102571.html

NEIGHBOURHOOD MARKET SPACES

As part of neighbourhood services, convenient shopping areas play an important part. They should be well designed and planned, keeping in mind the needs of caregivers with young children.

When providing neighbourhood market spaces, keep the following in mind:

- Ideally, tot-lot, **play areas can be co-located** with neighbourhood markets to club multiple activities for caregivers in one trip.
- **Sidewalk play zones** can be integrated wherever a dedicated play area is not possible.
- A separate play area should be easily accessible from the shopping area with low height fencing for continuous visibility.
- **Central open space** in between the convenient shops to act as a socialising area.
- **Resting benches** with wide tops and varying heights.
- **Stroller-friendly surface** for the entire shopping area with ramps.
- **Natural shading and well-lit** throughout to make safe after dark.
- Integrating **safe street crossing from the shopping zone.**

NEIGHBOURHOOD MARKET SPACES

Figure 3.64 Neighbourhood market spaces

Size - **1500sqm**
Density - **3 nos. every neighbourhood**
Guidelines/Standards - **1500sqm / 5000 Population**

Critical elements for young children and caregivers:

- Multi-heighted seating
- Shaded area
- Permeable boundary/fencing
- Stroller friendly surfaces
- Curb ramps
- Bollards
- Lighting
- Play equipment
- Toilets, drinking water and feeding rooms

Toddler Play Space in La Ramblas Neighbourhood Market, Barcelona
© WRI India

Unity Park next to a Cathedral, Kohima
©WRI India

CULTURAL ANCHORS

Cultural anchors, such as religious centres and tourist spots and their surrounding areas often experience a high footfall of young children and caregivers. Retrofitting these spaces with comfortable and interactive elements can create attractive 'pause points' for passersby, enriching their experience and adding functionality to the area.

Children need to have access to cultural facilities from the earliest age to maximise their development potential. Open air theatres, religious precincts, and historical centres can incorporate such family-friendly spaces around them.

Cultural activities can be stimulated by planning the following:

- Open-air theater
- Podiums for small performances
- Placement of art objects
- Open air museums
- Reading corners
- Public art or Street art
- Mobile libraries

The open air theatre across the historic national monument of Pune
© https://bv.cenytransferowe.biz/it/open-air-theater.html

Mobile Library, Ruputola Slum, Rourkela
©WRI India

Toilet in Tete d'or Park, France by Jacky Suchail Architects
© www.archdaily.com/302966/public-toilets-in-the-tete-dor-park-jacky-suchail-architects

PUBLIC TOILETS AND DRINKING WATER

To extend the hours spent outdoors, some basic facilities, such as toilets, are needed for both parents and young children.

Please consider the following while adding public toilets and drinking water facilities :

- Design public toilets **close to large public spaces** where people tend to gather and spend longer periods of time. Do not place them in dark, dingy areas perceived as unsafe.
- The design of toilets should be such that chances of **vandalism are low**.
- The space should be fitted with comfortable seats, and washing facilities, ideally, **child-sized toilets and washbasins,** should also be provided.
- **Maintenance and periodic cleaning** of the toilet is probably the biggest problems, and no toilet should be designed unless the issue of maintenance is resolved.
- Young children require **frequent fresh drinking water,** and thus a drinking water point should be available nearby.
- The access to the space should be **stroller-friendly,** and the room should have sufficient area to accommodate a stroller.
- Availability of a **change table or a diaper deck** is necessary.
- Temporary structures or mobile structures can be used for placing these pods across neighbourhoods.


Jogupalya primary school an Anganwadi Centre, Bengaluru
© Will India

SUPPORTIVE OPERATIONAL MEASURES

Social infrastructure needs to be complemented with enhanced service provisions and softer measures to ensure they function suitably for young children and caregivers. Frontline workers play a significant role in providing these services, and therefore they should be given regular staff training to build sensitivity and advanced skills, such as playwork. For example, Anganwadi workers (AWW), helpers, auxiliary nurses and midwives, and ASHA workers can help ensure responsive caregiving practices.

The period from conception through the first few years of a child's life presents the greatest risk and the greatest opportunity for making a positive difference. Therefore, the quality of services provided through social infrastructure is essential for building resilience in the children and community. This can be achieved by the following guidelines:

Consider the following:

- Ensure caregivers are comfortable while waiting in queues and give quick assistance from nurses and helpers to help with breastfeeding and engaging children.
- Sensitise Anganwadi Workers (AWW) on the importance of outdoor play and incorporating play as a learning tool in their daily curriculum.
- Enhance access to affordable health facilities through connected mobility services and pedestrian infrastructure.
- Incorporate crèches in frequently visited destinations of young children and offices.
- Invest in regular staff training on various caregiving topics.
- Provide counselling support to caregivers.

STORIES FROM THE FIELD: NURTURING NEIGHBOURHOODS CHALLENGE

OUTDOOR PLAY 'AANGANS' IN ANGANWADIS, KOCHI

Carving out spaces for outdoor play in anganwadis by using residual spaces within the premises or in the immediate surroundings. This has benefitted over 100 young children, enhancing their time spent in outdoor play. The city is scaling up the initiative across 29 anganwadis.

Total estimated cost: Rs. 26,66,000

70 sqm per *anganwadi* (average)

Shaded multi-height seating

Play equipment

Child-height wash and toilet

Playful railings

PLAYFUL WAITING AT BBMP MATERNITY HOME, BANGALORE

In the hospital premises, comfortable waiting spaces with adjoining play area, and amenities such as drinking water points and toilets were added. The transformation aimed at easing the waiting experience of families.

Total estimated cost: Rs. 14,00,000

130 sqm

Shaded multi-height seating

Sand pit

Play equipment

Drinking water

Lactation room

Herb garden

A multi-heighted seating cluster with planters made of concrete can cost between Rs.40000 to Rs. 70,000.

PLAYFUL COURTYARD AT NAGA HOSPITAL, KOHIMA

A neglected central courtyard at Naga Hospital in Kohima was transformed into an inclusive play space with level walkways, comfortable seating, and play elements creating a calming environment where children can play and caregivers can rest comfortably during stressful visits.

Total estimated cost: Rs. 15,00,000

423 sqm

A climbing frame made of metal frames and child-friendly ropes tied safely without scope for entrapments can cost between Rs.10,000 to Rs.15,0000.


© WRI India

URBAN SERVICES

Objectives Achieved	City level indicators
	50. Household level coverage of SWM services through door-to-door collection of waste (Core) 51. Household level coverage of SWM services through door-to-door collection of waste in informal settlements (Core) 52. Quality of water supplied to a household in the neighbourhood (Supporting) 53. Quality of water supplied to household in informal settlements (Supporting)
	Neighbourhood level indicators
	56. % of road length with storm water drains. (Supporting) 57. % of parks and open spaces within the neighbourhood with rainwater harvesting systems (Core) 58. % of Anganwadi Centres, PHCs, schools and other public buildings within the neighbourhood with rainwater harvesting systems (Core) 59. Presence of lighting with renewable energy source in and around housing parks (Supporting)
	54. % neighbourhood area with public toilets within 500m distance (Supporting) 55. % neighbourhood area with Women public toilets within 500m distance (Supporting) 70. Efficiency in redressal of customer complaints on urban services and public spaces (Supporting)

Target Behaviours
2. Caregivers take infants and toddlers to visit public spaces / facilities more often 2.2 Caregivers use amenities, such as feeding booths, toilets and drinking water while in public spaces - seating, shaded waiting areas
5. Community encourages young children and family-friendly changes in the neighbourhood 5.2 Caregivers and community engage in community action for upkeep of interventions

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

07 Urban Services

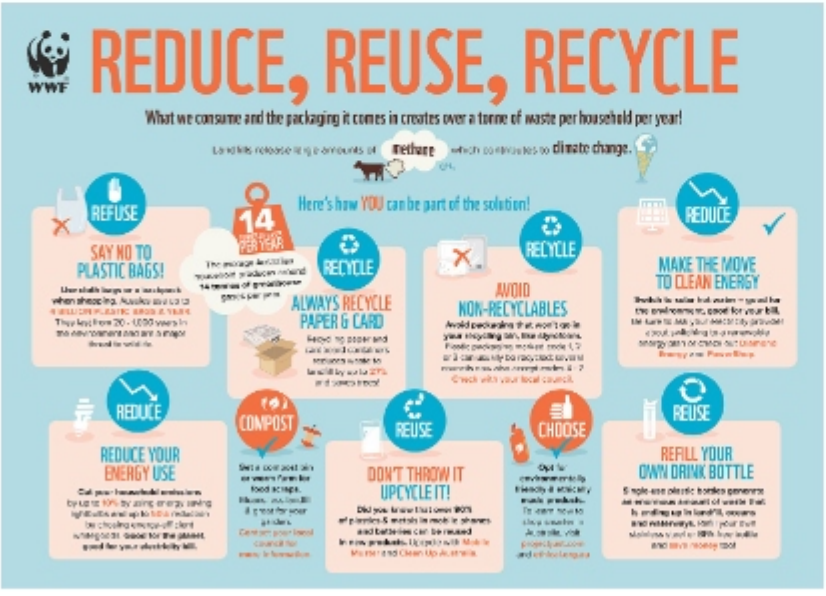
HOW TO APPROACH THE DESIGN OF URBAN SERVICES

In India, proper provision and management of public utilities and services in a neighbourhood are as relevant as the physical design and layout of the neighbourhood.

Water logging in the neighbourhoods, due to poorly designed infrastructure, are breeding grounds for mosquito-borne diseases, such as dengue, and chikungunya and are debilitating, more so for children.

Even the issue of poor waste management diminishes the urban environment and air quality and can also be a source of diseases, especially in impoverished areas. Cities like Delhi produce 8000 tons of garbage a day[32], all of which is distributed in landfill sites. These sites also contaminate the surrounding neighbourhoods, groundwater, and are a significant cause of air pollution.[33]

Urban utilities need both adequate provision and constant management. Building trust is central, both from the management system and also by the residents to use it properly. From the earliest stages of development, young children can be taught to contribute to keeping streets, parks, and playgrounds tidy and free of waste and contribute to the economical use of resources. Not only is it necessary for our cities, but letting children learn about concepts of "Reduce, Re-use, Recycle"[34] at a young age is the best investment for the future of the cities. The 3 R's shown below apply to the management of waste, water, and power.



Involve children in caring for their neighbourhoods
© www.greenandgrowing.org/

Create Inforgraphics to educate children on the 3 R's- Reduce Reuse Recycle
© www.wwf.org.au/get-involved/change-the-way-you-live/reduce-reuse-recycle#gs.Bhb4lo0

[32] Make Wealth from Waste by Satwik Mudgal, Aug 2015 www.downtoearth.org.in/coverage/waste/make-wealth-from-waste-47164

[33] Gone to waste: How India is drowning in garbage

[34] Reduce, Reuse, Recycle

WATER SANITATION AND HYGIENE (WASH)

Poor water, sanitation, and hygiene services in the city can severely impact the health and wellbeing of young children and their families. Children from vulnerable populations are most impacted, as these settlements generally lack safe and adequate access to water and sanitation services and are more prone to health-related risks and diseases. These services should be improved at both city and neighbourhood levels.

The following measures are recommended for WASH services as per Bureau of Indian Standards (BIS), Central Public Health and Environmental Engineering Organization (CPHEEO) standards, and Swachh Bharat Mission (SBM) guidelines.

Block Level:

- Provide at least 1 drinking water fountain per 100 people at hospitals, community centres, office buildings, and other public buildings.
- Provide at least 1 drinking fountain for every 50 pupils in schools and educational institutions.
- Crèches are to be fitted with 1 water closet for every 10 people, 1 wash basin for every 15 people and 1 water tap for every 50 people.
- Ensure provision of handwashing facilities, menstrual hygiene management facilities, and baby changing facilities across all the public toilets.

Community Level:

- 100-150 lpcd of water should be supplied to communities with a population between 20,000 and 1,00,000 with a full flushing system. 150-200 lpcd needs to be supplied if the population exceeds 1,00,000 with a full flushing system.
- Ensure provision of community toilets (CT) and public toilets (PT) in a reasonable vicinity. As per SBM guidelines, CTs and PTs should be located at a distance of 1 km and 500 m respectively, from the dependent users.
- Provide at least one seat for 35 men/25 women while planning a community toilet.

Trasande, L. (2009, October). Environmental Health and Child Survival: Epidemiology, Economics, Experiences. Retrieved October 02, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2897228/

- Provide at least one public toilet every 1 km on roads and open areas, including parks, plazas, OATs, swimming areas, car parks, and fuel stations. Toilets should be disabled friendly and in a 50-50 gender ratio (M/F).
- Ensure 100% coverage of open drains to control water-borne diseases. Take strict action on encroachment of drains.
- Ensure quality monitoring of water at source and destination levels.
- Promote localised treatment of drinking water at home and at ICDS facilities.

WASH Adaption

Following are some of the measures that can be followed during flood and drought situations.

Floods/ Rainfall

- *Build bunds/drains to divert flow away from water points and latrines; implement wider catchment management measures to reduce flood risk and physical damage.
- *Adopt robust construction standards and materials for water supply-distribution infrastructure.
- **Locate latrines, water points, storage, and treatment facilities away from flood prone areas and sources of pollution risks, e.g., sewers.
- **Regular pumping or emptying of latrines to prevent overflows and clearing of drains and sewers to prevent blockages.
- **Adapt or design new systems – e.g. elevated latrines; non-return valves on septic tanks; separate sewage and stormwater removal, natural stormwater systems
- **Strengthen upstream catchment management and flood defenses.

Droughts

- *Dig wells, reservoirs, or retention ponds in dry season with adequate depth.
- *Develop supplementary/backup sources and storage.
- *Adapt intake structures on rivers and reservoirs to accommodate low/ intermittent flows.
- *Use appropriate investigation techniques to target the most productive parts of aquifer.
- **Adapt or design new systems – e.g. low/zero water use latrines; decentralised sewerage systems; treatment processes that can function effectively with reduced dilution.
- **Step up maintenance programs to detect and clear blockages in sewers.

*Measures to be taken for creating resilient infrastructure towards hazards

**Measures to be taken during the time of hazards

Source: (GWP and UNICEF, 2017)

Storm water collection pits
© ET Government

WATER COLLECTION MANAGEMENT

Water management is a constant issue in cities, whether it is the conservation of water in dry areas or preventing flooding during the monsoons. Extreme weather events through climate change are exacerbating the problems of both drought and flooding.

In neighbourhoods it is important to have good drainage to prevent stagnant water and puddles from forming in the public realm where mosquitoes can breed. Groundwater recharge can be done by some economical methods at the building level, such as bore wells, or infiltration galleries.

In parks, provide percolation pits or create artificial aerated water harvesting ponds. On roads, ensure that slopes are accurately calculated to allow rainwater to drain properly. Infiltration trenches, paved with porous pavers, should be provided for absorbing excess rainfall along the pavement. Ensure segregation of sewage from storm water runoff.[35]

On a neighbourhood level, consider the following to improve the water collection:

- Ensure that every neighbourhood has a good drainage system.
- Try to design natural drainage systems like rain gardens, where possible.
- Make sure drains are kept clear of leaves and unblocked.
- Fill up potholes on the roads regularly.
- Consider the drainage of play areas and plazas.
- Ensure segregation of sewage from storm water runoff.
- Provide for percolation ponds or infiltration trenches depending on the type of public realm.

[35] RWH-Karnataka State Council for Science & Technology https://www.kscst.org.in/rwh.html

Neighbourhood and home level segregated bins
© www.dustbins.co.in/waste-segregation-bins.htm

SOLID WASTE MANAGEMENT (SWM)

Establishing an efficient waste management system is one of the first steps to creating healthy neighbourhoods. The management system should dispose of waste in a systematised, regulated way that is reliable for residents.

Defence Colony Compost Facility, New Delhi:[36 & 37]

The decentralised Solid Waste Management in Defense Colony project is a collaborative effort of RWA, Defense Colony and NGO, Toxics Link. Residents of the colony set up and manage a composting facility for their park waste.

The facility was set up in a small unused corner within the neighbourhood in 2004 at a cost of Rs 70,000.

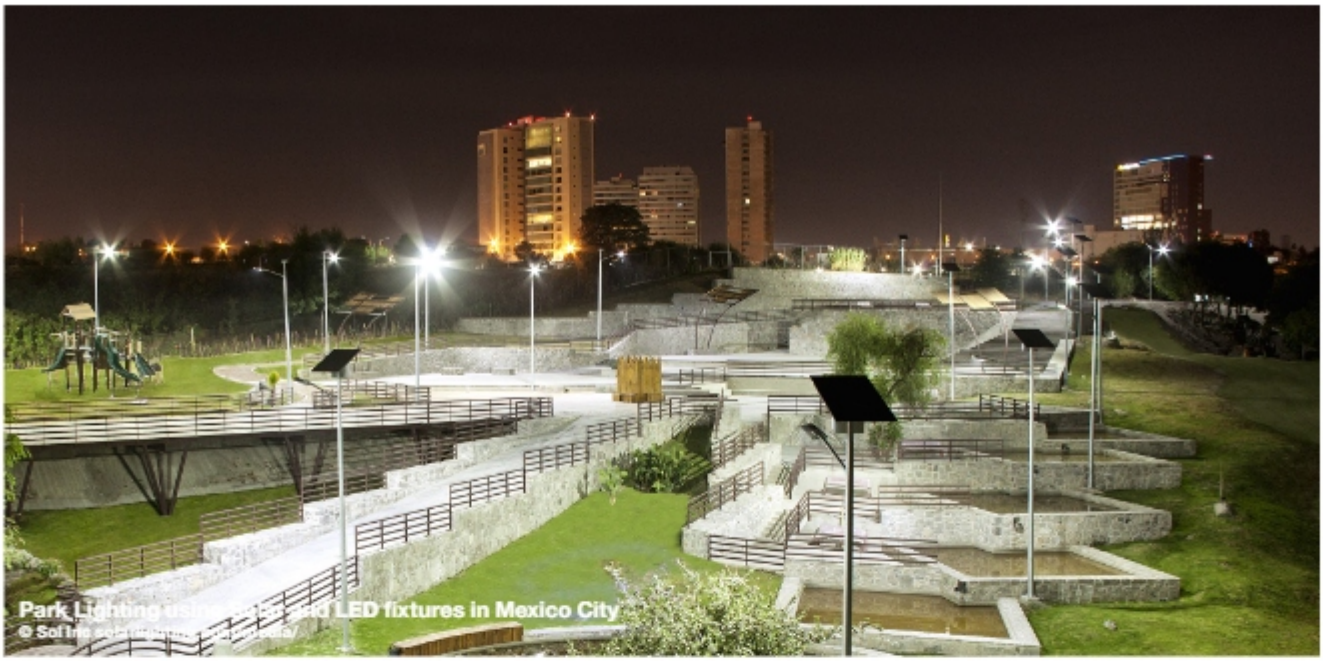
The RWA has trained two ragpickers to run it, and their salaries come from the money generated by the plant itself.

Technology: EM1 microbial pit composting
Final Product: Organic compost
Composting Period: 3-4 months cost
Per Household Cost :Rs 45 only
Land Required: 30 sq m

Consider the following steps as part of the waste management approach:

- **Provide adequate garbage bins** in play areas, public spaces, and along the frequently used pedestrian routes in the neighbourhood.
- Choose garbage bins that children can also reach.
- Use **symbols** on garbage bins to indicate what type of garbage should be disposed of in different bins.
- **Inform residents** of a neighbourhood about the importance of proper waste disposal. Encourage residents to compost waste.
- Organise collection of household **compostable waste** along with biodegradable waste in open areas for neighbourhood wide composting (local waste management plants).

[36] Make Wealth from Waste by Satwik Mudgal, Aug 2015 www.downtoearth.org.in/coverage/waste/make-wealth-from-waste-47164
[37] Decentralised municipal waste



Park Lighting using [illegible] and LED fixtures in Mexico City
© Sol Inc. [illegible]

RENEWABLE SOURCES OF ENERGY (RSE)

The benefits from the use of renewable sources of energy in the design of public realms can be beneficial in the long-term sustenance of public spaces. Renewable sources of energy have been used in many projects around the world in a very successful way, especially in developing countries.

Public space lighting, smart sensors and applications, or cooling and shading systems can all be powered by renewable sources very easily and at a cost that keeps on reducing year after year, making it an affordable technology.

The environmental awareness around renewable sources of energy among the younger population can go a long way and prove to be the most important investment, having a huge positive impact on the children of the future.

On a neighbourhood level, consider the following:

- Make **use of cheap technology.** Cheap doesn't only refer to the buying price but mostly to the maintenance cost, which can be a continuous and heavy expense for local communities.
- Lighting, **smart sensors,** and cooling and shading systems in public spaces should use renewable sources, such as solar energy.
- Find creative ways to incorporate **renewable sources** of energy.
- **Think wisely when using renewable sources** of energy, as a particular climate condition is appropriate for specific renewable energy.

For more information on energy efficient street lighting, please see:

Energy Efficient Street Lighting

MANAGEMENT OF UTILITIES AND COMPLAINTS REDRESSAL

A citizen-centric dashboard is crucial for easy redressal of complaints in a timely manner and thus managing the urban services efficiently. For example, the Ministry of Housing and Urban Affairs Swachhta app and web platform sets service level benchmarks and allows citizens to address everyday issues, such as dead animals on roads, overflowing garbage, issues for garbage dumps or collection vehicles, malfunctioning public toilets, and dirty streets.[38] The success of such platfroms will be with adoption by a large number of residents.

DigiTaf Card, Tel Aviv, Israel [39 & 40]

Tel Aviv has introduced a unique residents card called DigiTaf which is specifically for parents with young children. This is a new addition to their citizen dashboard called Digitel.

DigiTaf connects families with local childcare facilities, healthcare, upcoming public events specific for young children, and so on. This card recognises the need to support parents with very young children in navigating the city and has been very well received since its implementation.

Consider the following:

- **Promote the use of already available** digital complaint platforms.
- Encourage residents to **set up a digital bulletin board** via WhatsApp groups or other platforms to discuss and address neighbourhood issues.
- **Set up WhatsApp** or voice-based help-lines.
- **Train civic officials** in adopting digital applications. Digital exposure for public officials is critical to the success of such platforms.
- Consider **integration of digital dashboards across all utilities and public services** in a neighbourhood - for example, a single app that allows residents to address issues with water supply, mosquito breeding, waste management, park mulch, community events, school availability, childcare facilities, and so on.

[38] http://swachh.city/
[39] https://www.tel-aviv.gov.il/en/Live/ResidentsCard/Pages/default.aspx
[40] Tel Aviv is prioritising young children

AMBIENT ENVIRONMENT

Objectives Achieved	City level indicators
	60. Air Quality index in the city. (Core)

Neighbourhood level indicators

	61. Average noise level at the neighbourhood level (in dB) (Supporting) 62. Presence of no honking zones in the neighbourhood. (Core) 63. RSPM (Size less than 10 microns) (Core)

Target Behaviours

1. Infants and toddlers spend more time playing outdoors and around nature 1.2 Caregivers take infants and toddlers to public open spaces, such as parks, gardens, etc. more often
5. Community encourages young children and family-friendly changes in the neighbourhood 5.1 Community participates in activities to enhance environment, such as cleanliness drives, plantation, etc.

In addition to physical indicators, it is important to measure behaviour change across diverse stakeholders. Above target behaviours may be modified based on project requirements and context.
Refer: ITCN 2.0 Evaluation and Monitoring Metrics

08 Ambient Environment

With the growing stress of climate change on our urban spaces, children are becoming more and more susceptible to increasing pollution levels, scorching temperatures, and high frequency of disasters. These challenges limit children and their caregivers' day-to-day activities, highly impacting their time outdoors in public spaces. Children are at greater risk than adults due to many adverse health effects of pollution, owing to a combination of behavioural, environmental, and physiological factors. The following are a few common considerations:

- Children breathe faster than adults, inhaling more air and, with it, more pollutants.
- Due to their height, children are always closer to the ground where they are more exposed to a higher concentration of pollutants and dust particles.
- In the womb, they are vulnerable to their mothers' exposure to pollutants. Exposure before conception can also impose latent risks.

A study by University of Surrey shows that the average in-pram concentration of fine particles are always higher, by up to 44% as compared with adult breathing height during both morning and afternoon hours.

Consider the following strategies:

- Plan specific measures to mitigate air pollution in the public realm by prioritising non-motorised transport, ensuring resilient streets, and promoting the use of electric vehicles in public transport.
- As transport is the major contributor of air pollution in many cities, heavy traffic should be restricted around areas where children spend more time, such as schools, parks, and residential areas.
- School zones and other frequented zones should have a "No idling and honking" policy.
- Provide strict regulations against open waste burning in the city, specially within residential areas and in close proximity to public spaces.

Air Pollution and Child Health - WHO

Make Listening Safe - WHO - Noise exposure limit for children in recreational settings

© iSCAPE - The Living Lab Guidebook for cities fighting against Air Polution

Green infrastructure should be increased, including all types of urban vegetation, such as trees, roadside hedges, green walls, and green roofs. It offers very different advantages for the environment, such as carbon sequestration, microclimate regulation, and air pollution reduction. The impact of urban forests and trees on urban thermal comfort is not only limited over the streetscape but also extends to larger neighbourhood areas.

Physical systems or solid barriers may be introduced, which cover any barriers used in the built environment to reduce the impact of noise and air pollution. **Noise barriers and low boundary walls** pose as distinct solid barriers in the built environment, which can influence air flow, pollutant deposition, and dispersion.

© iSCAPE - The Living Lab Guidebook for cities fighting against Air Polution

Raising awareness

Disseminate knowledge regarding the health impacts of air pollution on children and pregnant women and make people aware of the practices that contribute to increased levels of air pollution in the city. Methodical play and cycling events, such as Raahgiri Day in the city can help generate the idea of open streets and propagate vehicle-free zones.

Consider the following to tackle exposure in public realm through design:

- On streets, children are exposed to vehicular traffic the most. Providing **soft vegetation, such as hedges and shrubs along the streets** can act as a buffer between the pedestrian and the pollution source from vehicles.
- **Urban vegetation** can greatly reduce people's exposure to harmful emissions. It does this by changing the speed and distance that pollutants travel before they reach people.
- **Evergreen plant species** should be considered for continuous impact over the course of the year.
- **Trees with larger crown distances and smaller foliage densities** are to be preferred. They assist in the deposition and removal of particulate pollutants.
- **Noise barriers** are an effective strategy alongside busy arterials and high-speed, high-traffic highways, best when complemented with roadside vegetation. These are generally 4-5 metres tall. Noise barriers can also reduce air pollutant concentrations behind the barrier by approximately 15%.
- **Low boundary walls** improve urban air quality by enhancing pollutant dispersion in street canyons. They act as a baffle at street level and increase the distance between the pollutant source and human reception. These should be generally 1-2 metres high.

Motibagh road, Delhi

09 Demonstrating Design Guidelines through Tactical Urbanism

WHAT IS TACTICAL URBANISM?

Tactical urbanism is one of the useful methodologies for implementing young children and caregiver-friendly solutions that are illustrated in the previous sections of Design Guidelines. Characterised by rapid, low-cost, and scalable interventions, tactical urbanism serves as an effective tool to pilot urban design solutions and drive long-term transformation. Often led by cities, institutions, or citizens, these temporary changes can help test and refine strategies before permanent implementation.

Create value - When we re-look at cities with the lens of a young child, we understand the needs, challenges, and issues of this user group. Addressing them through tactical urbanism can create value in our cities.

Test and Try - Tactical interventions are easy, low-cost/quick fix solutions, that could be tested out and tried before creating any long-term infrastructure improvement.

Engage Community - Tactical intervention helps engage residents, leaders, volunteers, and NGOs, further allowing them to have an ownership of the space.

Showcase - Through tactical interventions, cities can showcase big impacts with minimal changes.

Scale-up - Being low-cost, tactical interventions can easily be scaled up in a city.

Figure 3.65 Creating a campaign for tactical interventions

Tactical trial at Kumaraswamy Lake intersection, Coimbatore
©WRI India

Why use tactical urbanism for children-centric projects

Young children fully depend on caregivers for mobility and access to services and, hence it is important to make spaces that are safe, accessible and interactive for them. Through tactical interventions we can test such inclusive spaces that are exciting to play and interact before implementing them permanently.

These demonstrations are short-term, low-cost, and scalable in nature, which can instigate and facilitate long-term change towaeds making public spaces suitable for young children and caregivers.

PROCESS OF TACTICAL URBANISM

The process of tactical interventions primarily involves the following steps:

Assess and Design - Identify the issues faced by young children and caregivers as well as their needs, and develop a design for temporary intervention.

Implement – Seek necessary buy-in and permissions from the relevant departments and stakeholders, which are often siloed. Implement on-ground changes.

Learn and Improve – An important step in the tactical process is to monitor impact, make necessary modifications in final proposal, and accordingly make it permanent or scale it up.

The process of tactical interventions requires multiple types of stakeholder collaborations, which includes the involvement of the local community, city leaders, subject experts as well as volunteer and support groups.

Assess and Design	Implement	Learn and Improve
Understand the context, issues and potential	Crowdsourcing or identifying innovative funding mechanisms	Measure and evaluate the impact
Collect data and observations from community on ground	Sourcing and procuring locally available cost-effective materials	Alter and apply solutions to test cases
Collaborative design with all the stakeholders	On ground implementation and community engagement	Devise permanent solution

Figure 3.66 Process of tactical urbanism

Targeting children-oriented areas to conduct tactical interventions:

- School premises
- Parks or playgrounds
- Healthcare and ECD facilities
- Streets and intersections frequented by young children and caregivers

School zone tactical implementation in Pune
© Shunya Studio and PMC

INVOLVING PEOPLE- WHO, WHEN, HOW

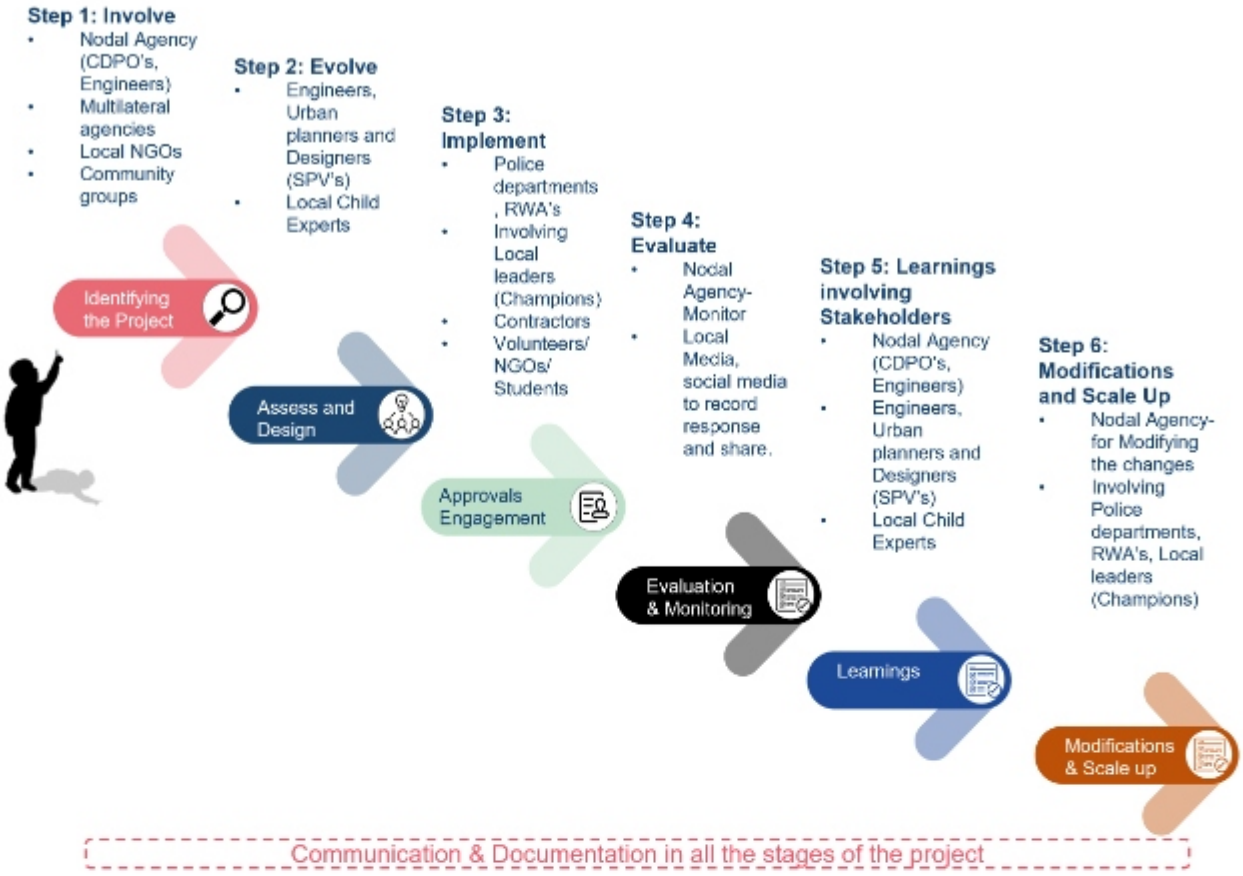


Figure 3.67 Stages of stakeholder involvement in tactical project

The steps om Figure 3.67 illustrate the key people and agencies who are to be involved in various stages and processes. Various examples of communication tools for wider reach are as follows:

- Branding and messaging - slogans, drives/campaigns
- Enabling local leaders, local child experts, and key influencers to lead the event
- Communicating through social media/mass media for spreading awareness

SOLUTIONS UNDER TACTICAL URBANISM

The primary types of solutions that can be achieved through tactical interventions are the following:

1 Reclaiming space for young children and caregivers

2 Adding amenities and playful elements

3 Beyond physical change

1. RECLAIMING SPACE FOR YOUNG CHILDREN AND CAREGIVERS

Public open spaces for young children and caregivers in the cities are either very limited or in need of improvement. It is necessary to find the opportunity to reclaim a space in the city and reimagine it as public space. Underutilised space in front of ECD facilities, unused vacant spaces, dump yards, and residual space along the street can be converted into play spaces for young children by conducting tactical trials. A few suggestions on where to look for opportunity and reclaim space for young children and caregivers in the public domain are listed here.

Defining and activating the space

Unused vacant spaces or dump yards spaces can be reclaimed by simply cleaning and defining the space for certain activities. Activating the space happens only by ensuring that recurring activities are being conducted and communities are involved.

Temporal reclaiming

Streets today are predominantly vehicle-centric and lack proper pedestrian infrastructure. This, in turn, has rendered streets unsafe and uncomfortable for use by all age groups and gender. A short-term solution can be the temporary closure of a neighbourhood street for a day or once in a month to reimagine it exclusively for play. Residents can be encouraged to celebrate a festive day to establish a case for streets as public spaces. Although such temporary street closures require approvals from the corporation/ development authority, the locals can actively join in organising and participating in street events. Rent a jumping castle for the children, organise a competition with the neighbours, have a street barbecue, let children create street decoration.

Figure 3.68 Temporal reclaiming
©WRI India

Converting underutilised spaces into playspaces

Accessibility to public parks in brownfield areas is a challenge and most of our parks have play spaces/equipment that are not suitable for infant and toddlers. Therefore, underutilised spaces in the neighbourhood can be converted into play and interactive places for the community. Using age-specific play elements will promote play and increase the amount of time that children spend outdoors, thus leading to healthy development.

Existing condition of a park in Ranchi
© WRI India

Transformation of park with young children-friendly element
© WRI India

Roadside space at Forest Colony, Kohima
© WRI India

Transformation of the roadside pocket park by painting
© WRI India

Case example: Eat Street, Kakinada

Reclaiming public space for children

A tactical trial can be implemented as a combination of temporary, semi-permanent and permanent interventions. The Eat street pilot project in Kakinada is a case example, that explored the combination of temporary street closure, creation of a toddler-friendly zone and recreational space for young children and caregivers, under Nurturing Neighbourhoods Challenge. City officials identified the neighbourhood where the footfall of ITCs is relatively higher and has numerous ECD facilities present. The pilot aimed to convert vacant pockets into public open space and adjoining streets as pedestrianised stretch with eateries.

Eat street, Kakinada
© WRI India

The street is surrounded by a school, healthcare facility and frequented by children and their families. The tactical intervention transformed a 190-metre stretch of this street into Eat Street and converted unused spaces around the street into play spaces with interactive elements and resting spaces for families. A total of 2,730 square metres of area was converted into a street plaza after witnessing a unanimous positive response from the people and stakeholders involved.

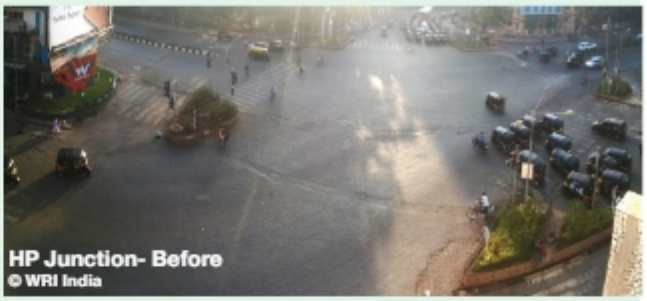
The trial was carried out by restricting vehicular movement on the stretch with alternative routes demarcated. Low-cost materials were used to paint games on the street surface and build play elements for young children, such as small climbing blocks and, walls. Shaded, low-height seating spaces and natural elements for sensory play helped cater to various user groups and showcase the true value of space.

Involving the local community from the start helped build consensus and understand their priorities. Engaging with caregivers helped understand their specific issues. Detailed feedback from the people showcased the need for more such children-friendly spaces to be scaled up in the city.

Case example: HP Junction, Mumbai

Improving junction safety

HP junction in Bandra is located in one of the busiest areas and is surrounded by shopping streets and traffic through the day and night. A tactical intervention was conducted before a permanent project to test various safety solutions for pedestrians accessing this junction. By making roads safer for pedestrians, it is being made safer for everyone.



HP Junction- Before
© WRI India

Reclaiming the streets with traffic cones and paint

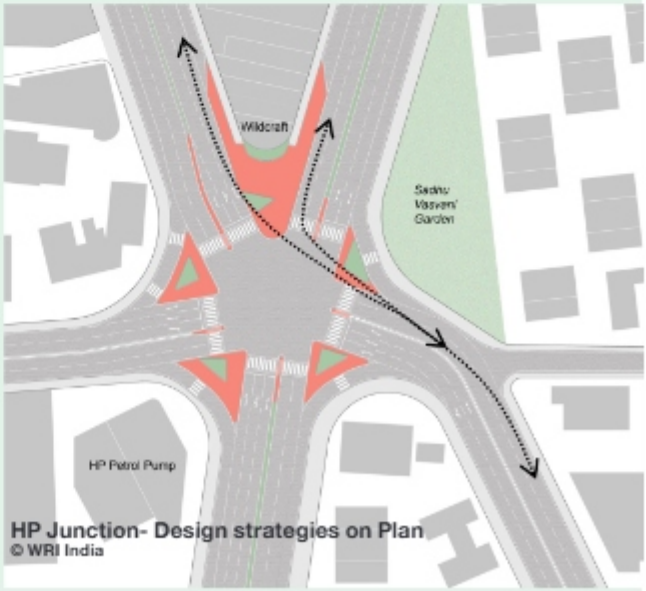
Tactical trial wad done using simple tools – traffic cones and paint – to fix safe pedestrian movement. The design introduced tighter corner radii and increased and improved footpaths and refuge islands. Lane balance was maintained through design and refuge islands were redesigned for pedestrians to wait and cross the junction safely. Residual spaces along the street corners and unnecessary slip lanes were moved into footpath space, which helped to reduce crossing distances from one side to the other.

HP Junction- During trial
© WRI India

HP Junction- Permanent intervention, post trial
© WRI India

Engage the community and gather input

A vital feature of this project was seeking feedback from the local community, shopkeepers, traffic police, and concerned stakeholders through a series of interviews. Public feedback was also collected via local social media groups. As opposed to the conventional approaches for road development in Mumbai, the city implemented this experimental trial and then promoted public dialogue on its outcomes. Ultimately, all the responses were incorporated into the final design to guarantee maximum public consent for permanent implementation done later.



HP Junction- Design strategies on Plan
© WRI India

2. ADDING AMENITIES AND PLAYFUL ELEMENTS

As compared with adults, young children walk at a slower pace and tire easily and, thus, require suitable amenities and places to pause and rest along the way. Tactical interventions can be implemented to add such essential amenities and playful elements for them at appropriate locations, such as ECD services (Anganwadi Centres, hospitals) or in public places. Developing these spaces to play-pause-sit can invite more social interactions and encourage families to use spaces outdoors.

This section discusses various tactical elements to be added as amenities around ECD services and public spaces.

Seating

Seating around the ECD services and public spaces can be easily added to support caregivers to wait comfortably. It will also encourage them to interact with other caregivers. Playful seating designs through tactical materials can generate active play among children.

Multi-height seating, Erode
© WRI India

Lighting

Walking around in the neighbourhood with young children, where places are badly lit, can hamper the time spent outdoors after evenings. Adding adequate lighting during tactical projects along the streets can increase safety, leading to a pleasant walking experience.

Science Museum, Oslo
© Flickr

Planter boxes

Adding temporary planter boxes can act as a barricade and an element for children to interact with nature. Adding planter boxes along the footpath can help reduce the direct exposure of air pollution at the height of 95 cm.

Use of planter boxes, Ranchi
© WRI India

Feeding cubicles

The interaction between a child and the caregiver impacts the child's brain development. Spaces around ECD service should be improved with caregiver amenities, such as restrooms and feeding cubicles, to support activities, such as feeding and caregiving.


Breastfeeding booth in Rourkela
© Rourkela Smart City ltd.

Pram or stroller routes

A tactical pilot to introduce shared pram routes along the streets frequented by young children and caregivers can be an interesting activity. Such interventions can gauge the response of caregivers towards permanent services of shared pram systems.


Shared pram system in BRT stations, Hubballi Dharwad
© Directorate of Urban Land and Transport

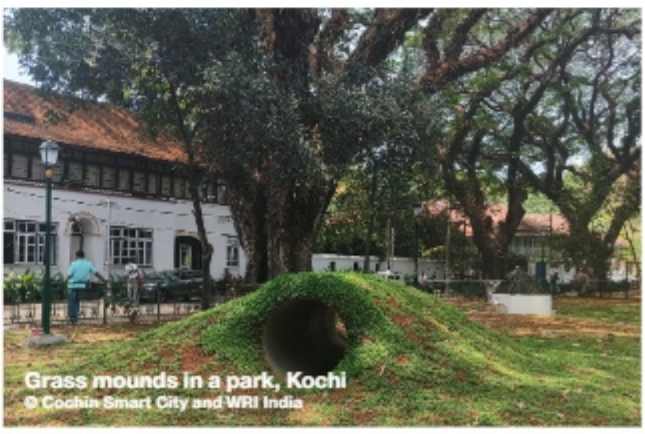
Street art/games on the floor

Street art can change the way young children and caregivers perceive and interact in the space. Street art can be creatively used in tactical projects to generate the play and learning culture among children.


Games on the floor, Kota
© WRI India

Natural play areas

Simple elements, such as climbing structures and slopes, which offer possibilities for children to play should be explored. Some interesting nature play areas could be created by using trunks of fallen trees to form gentle slopes for children to climb.


Grass mounds in a park, Kochi
© Cochin Smart City and WRI India

BEYOND PHYSICAL CHANGE

Beyond infrastructure changes, tactical interventions should include communication and softer measures to make it successful i.e. raising awareness about the needs of caregivers and children in public spaces. This section discusses how children's participation, outreach, and community programmes can generate momentum across the city on the tested ideas and get buy-in for the long-term changes. A community-owned project or creating community groups around the project can go a long way in the maintenance of the projects.

Outreach and engagement

Engage with various stakeholders, such as government agencies, private groups, NGOs, and RWAs, in various forms to ensure that solutions are co-created.

On site discussions with stakeholders, Kohima
© Kohima Smart City

Participation from young children and caregivers

Children are often overlooked when it comes to decision-making, and their specific needs are often unaddressed. Cities should emphasise on involving young children and caregivers as part of the planning process and discussions. Such engagement will help in building more nuanced solutions.

Children's drawing competition, Kochi
© WRI India

Maintenance and awareness

Clean streets and buildings often contribute to the high spatial qualities of a neighbourhood. It is important for both the residents and government agencies to contribute towards maintaining a clean neighbourhood. Residents can individually or collectively contribute to maintaining the sidewalks in their neighbourhoods where as municipalities can help in cleaning the public premises.

Community-led planting in a park, Indore
© Indore Smart City and Corporation

Awareness campaign, Kochi
© Cochin Smart Mission Ltd.

Cochin Smart Mission Ltd and Rotary Club collaborated for a traffic awareness campaign at Gandhi Square, in Ernakulam, which involved the Divisional Ward Councilor, Rotary Club members, and the traffic police. Children were guided by zebra mascots and adults while crossing the road. Traffic awareness flyers and juice boxes were distributed to motorists who stopped for pedestrians.

No Mobile zone posters, Warangal
© WRI India

Feedback posters, Warangal
© WRI India

Posters in Children's Park, Balasamudram, under NNC in Warangal advocate against cell phone use near play areas for caregivers and encourage regular family visits to the park.

COMMON ELEMENTS FOR TACTICAL INTERVENTIONS

The commonly used elements used for tactical interventions are presented in the graphic below. These may be used by city engineers in estimating, procuring, and implementing tactical interventions projects. This is not an exhaustive list and may be modified based on local context and availability of resources.

Seating

S.No	Description of the Item	Type
1	Portable Chairs	Temporary
2	tires seating	Semi Permenent
3	Benches	Permanent
3	Wooden crates	Permanent
4	Shipping pallets	Permanent
5	Concrete Solid block	Permanent

Surface marking

S.No	Description of the Item	Type
1	Acrylic distemper paint	Semi Permanent
2	Floor coat emulsion paint	Semi Permanent
3	Water based epoxy paint	Semi Permanent
4	Thermoplastic paint	Semi permenanat
5	Spray paint	Semi Permanent
6	Aerosol line marking machine	Permanent
7	Acrylic distemper paint	Semi Permanent

Shading

S.No	Description of the Item	Type
1	Cloth/fabric Shading	Semi Permanent
2	Umbrella	Semi Permanent
3	Tensile Cloth shading	Semi Permanent
4	Cane mats + Bamboo Poles	Semi Permanent
5	GI Steel pipes with Poly carbonate sheet	Permanent

Landscape

S.No	Description of the Item	Type
1	Vertical Garden pots	Semi Permanent
2	Potted Planters	Semi Permanent
3	Tire Planters	Semi Permanent
4	Synthetic grass	Semi Permanent
5	Wooden crate planters	Semi Permanent
6	Concrete planter boxes	Permanent

Signage

S.No	Description of the Item	Type
1	Mill board/ MDF board with Bamboo	Temporary
2	Cardboard	Temporary
3	Acrylic distemper paint	Semi permanent
4	Thermoplastic paint- On ground	Semi permanent
5	Spray paint- On ground	Semi Permanent
6	Reflective boards - On ground	Semi Permanent

Lighting

S.No	Description of the Item	Type
1	Serial sets	Temporary
2	LED lights	Semi permanent
3	Bamboo poles	Semi permanent
4	Casuarinna poles	Semi permanent

Demarcation

S.No	Description of the Item	Type
1	PVC Traffic Cones	Semi permanent
2	Plastic Jersey Barriers	Semi permanent
3	PVC bollards	Semi Permanent
4	Collapsible Barricades	Semi Permanent
5	Metal Barricades	Semi Permanent
6	Temporary fencing	Semi Permanent
7	Concrete Jersey Barriers	Permanent
8	Stainless Steel Bollards	Permanent

Safety

S.No	Description of the Item	Type
1	Nylon ropes	Temporary
2	Floor marking tape	Temporary
3	a. Duct tape & b. Reflective tape	Temporary
4	Wooden pallets	Semi permanent
5	Tires barrier	Semi Permanent
6	Reflectors	Permanent

Temporary

Permanent

Semi-permanent

Learn more about various elements, materials and their application in the ITC Master Checklist developed under the Pune Urban95 program.

MEASURING IMPACT OF INTERVENTIONS

Tactical intervention is not merely about activation or reclaiming the spaces but also measuring the impact that helps to understand if the desired objectives of the project are achieved or not. It is also important for taking data-driven decisions for permanent project planning or scaling up such interventions elsewhere in the city. Table 2.14 list certain indicators with which the interventions can be evaluated to measure the impact.

A tactical intervention should be monitored for either a week or a month, depending on the type of project and the local context. The assessment should consider the following aspects:

- There should be a clear monitoring and evaluation framework/method developed for the project to capture the right indicators.
- Ensure that feedback is collected from varied users of the spaces and across varied times and looped into impact evaluation.
- Ensure that impact is measured across multiple aspects, such as spatial design, usage level and patterns, operational measures, participation and interaction of young children and caregivers, and activities being conducted.

1	Monitoring done over how many days?	
2	Average no. of 0–5 year-old children present daily	
3	Average no. of women present daily	
4	Average no. of users/people present daily	
5	Total no. of volunteers engaged in implementation process	
6	No. of people users/ benefitted	

Table 3.14 Sample of on-ground survey to measure the impact of tactical intervention

The following is a sample feedback survey to measure the impact from primary user groups (caregivers and young children):

- Would you like these interventions to be made permanent here? Y/N
- Would you like to spend more quality time with your kids, family, and friends at this place? Y/N
- How safe do you feel bringing young children here after the intervention? Y/N
- Please rate the play area and seating added for young children and caregivers at the site.
- Please mention any other significant outcomes.
- Please share if you have any comments or suggestions for us.

This on-ground survey and feedback questionnaire are for reference purposes only. It may vary, depending on the outcomes of the tactical project that needs to be measured.

FROM TACTICAL INTERVENTION TO PERMANENT CHANGE

Durgapur Leprosy Colony, Rourkela

Durgapur Leprosy Colony lacked basic infrastructure facilities and play spaces. The city developed a play space using low-cost, easily available, and recycled materials. These temporary play elements received an overwhelming response from the children and caregivers in the community. Access was clearly demarcated towards the play space, with interactive paintings and seating added near the play space for caregivers.

Involving stakeholders

Throughout the project, the team actively engaged with local leaders and residents through focused group discussions. It fostered a sense of commitment amongst the community members who took up various roles and responsibilities. They were involved in maintaining the enhanced facilities, instilling a sense of ownership and pride within the neighbourhood, which guaranteed the diligent upkeep of the space. Events were organised on a regular basis after the tactical intervention, which attracted the community members along with outsiders as active participants.

Seeing the growing public acceptance, the city expanded the scope of work by closing open drains and installing seating, an outdoor gym, and formal play equipment.

Impact

The play area sees a high footfall of children, attracting residents even from the adjacent colonies, breaking the barriers of social stigma. The space is also widely used for community activities, health camps and women's self-help group meetings.

Scale-up

Positive feedback from the tactical intervention led city officials to plan for scaling up the idea in more neighbourhoods and conduct transect walks with slum residents to understand the on-ground situation better.

Unused land in Leprosy colony, Rourkela
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After tactical intervention
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Permanent changes post tactical
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A city wide GIS mapping of open spaces in the city also revealed the unequal distribution of vulnerable settlements and affluent colonies.

Suitable sites around the existing community spaces were then identified for developing more public spaces for children to ensure improved access. The city secured finance for extending interventions by converging funds from various schemes, such as JAGA Mission, MUKTA Mission, and SHAKTI Mission. The city is now in the process of developing similar opportunities in 138 slums across the city.

10 Long Term Sustainability

HOW TO ENSURE SUSTAINABILITY OF INTERVENTIONS

To ensure scaling and long-term sustainability of projects as per the guidelines, it is important that certain measures or mechanisms are outlines in the beginning itself by city agencies. Budgetary norms can help in timely and necessary resource allocations. O&M planning shall be integrated within project formulation itself to ensure long-term sustenance. The mechanisms could vary from O&M contracts with private agencies to community-led maintenance model to partnerships with local NGOs, CSOs for operationalizing the space.

Operations and Maintenance

Depending on the type of project such as Streets, Parks or ECD facilities, O&M mechanism shall be formed by the city agencies.

- In RFP and tender documents, O&M provisions for 3 to 5 years can be included to ensure regular maintenance post implementation.
- Public-private partnership (PPP) model can be created to maintain the developed spaces for long term.

MoU signing with RWA for upkeep of park, Jabalpur
© Jabalpur Smart City and Corporation

Community Engagement models

Cities can also explore more localized, community-oriented model for O&M through partnerships with local RWA or community groups who can take ownership of the developed space and ensure vigilance, maintenance and regular activation. Local NGOs, CSOs can also become part of this partnership to maintain safety, cleanliness and conduct regular activities in the space. Nearby schools or institutions can be brought in for activation events to support this model community-led O&M.

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In Kochi, recurring activation events are conducted by involving self help groups, ward councilors and local groups and is helping to maintain the spaces as well.

Budget norms and Mandates

To integrate necessary sustenance mechanisms in each project, relevant mandates and budgetary provisions shall be made by city agencies. Such mandates can be towards sustained implementation of design guidelines, scaling of projects, maintenance of developed spaces or any governance models that may be required for long term sustainability of young children and caregiver-centrid development.

- Dedicated annual budgets for incrementally scaling any type of project across the city
- Adopting Masterplans, policies or guidelines by city agency to systematically implement and scale projects across the city.
- A mandate for municipal agencies to form RWA partnership for maintenance of public space projects.
- A mandate for participatory project designs to ensure project proposals are responding to community needs.
- Regular audit mandates to ensure developed spaces are well maintained post implementation.

Jabalpur launched a city level Khel Plan (Play Masterplan) to systematically develop open spaces across the city with young children and caregiver-centric design guidelines.

A ANNEXURE - A

STREET AUDIT CHECKLIST

Category	Indicator	Checklist	Response (Y/N)	Benchmark
Traffic calming elements	Average speed of vehicles in the neighbourhood	Are traffic calming elements provided on streets with a high footfall of young children and caregivers?	(Y/N)	
		Are kerb extensions such as bulb-outs and chicanes provided to slow down traffic near early childhood facilities?	(Y/N)	
		Is seating cluster provided in kerb extensions as waiting spaces for early childhood facilities?	(Y/N)	
		Is the width of the kerb extension sufficient to accommodate waiting spaces?	(Y/N)	
		Is there a green buffer or railing provided for safety at the edge of kerb extension	(Y/N)	
		Is there space to queue on kerb extensions before crossing	(Y/N)	
		Are speed bumps provided to slow down traffic?	(Y/N)	
		Is there any rough surface provided before crossing to slow down traffic, such as cobblestone, pavers, or rumble strips?	(Y/N)	
Mid block crossings	% of mid block crossing with safe pedestrian crossing facilities such as ramps and bollards	Is crossing provided at regular intervals of 200-300 m on the street?	(Y/N)	
		Is the crossing highlighted with material/colour change?	(Y/N)	
		Is there demarcated space for queuing on footpaths at crossings?	(Y/N)	
		Is the at-grade crossing provided with ramps on either side connecting to the footpath with ramps (>= 1:15 ratio)?	(Y/N)	
		Is the width of the crossing sufficient for comfortable crossing of young children crossing along with their caregivers?	(Y/N)	
		Are there any obstructions compromising the driver's visibility to cross?	(Y/N)	
		What is the average crossing length ?	150m	
		Is the distance between STOP line and crossing sufficient to protect young children crossing?	(Y/N)	
	% of mid block crossing having queueing space of 'x' sq. m. per person on the footpath	Is there a kerb extension provided at mid-block crossings to reduce crossing length?	(Y/N)	
		Is there any rough surface provided before mid-block crossing to own traffic, such as cobblestone, paver blocks, or rumble strips?	(Y/N)	
		Is there signage provided at both ends of mid-block crossings?	(Y/N)	
		What is the average waiting time for pedestrian crossings at signalized crossings?	5secs	
		Are there bollards provided at both ends of the mid-block crossings?	(Y/N)	
		Is the typical c/c distance between bollards 0.6 m, with any two bollards having 1.2 m c/c for stroller/wheelchair accessibility?	(Y/N)	
		Is the height of bollards used on the footpath up to 0.6 m?	(Y/N)	

Category	Indicator	Checklist	Response (Y/N)	Benchmark
Junctions	Number of signalized traffic intersections with pedestrian signal phasing	Do the junctions have pedestrian crossing signals?	(Y/N)	
		Is the pedestrian crossing time sufficient for young children and caregivers?	(Y/N)	Walking speed of 15-20m/min
		Are there bulb-outs provided at junctions to reduce crossing length?	(Y/N)	
		Is the junction highlighted with material/colour change?	(Y/N)	
		Is the junction raised to slow down traffic and facilitate pedestrian crossing?	(Y/N)	
		Is there an audible pedestrian signal?	(Y/N)	
	Number of junctions having bollards at crossings	Are the zebra crossings at junctions highlighted with material/colour change?	(Y/N)	
		Is the junction protected with bollards along the edge?	(Y/N)	
	Percentage of traffic intersections with demarcated pedestrian crossing in all directions	Is there continuous pedestrian crossing in all directions of junctions?	(Y/N)	
		Is parking located a minimum of 15 m away from the junction?	(Y/N)	
		Is there playful wayfinding signage at a low height for young children?	(Y/N)	
		Is the turning radius at the junction providing clear visibility of young children walking on the footpath?	(Y/N)	
		Are the junctions free of visual obstructions (statues, electrical junction boxes, transformers, hoardings, trees, parking, encroachment, etc.) so that visibility for drivers is not compromised?	(Y/N)	
		Is there any rough surface provided as a warning before reaching the junction, such as cobblestone, paver blocks, or rumble strip?	(Y/N)	
Refuge medians and islands	Presence of kerb cuts y/n and no. of kerb cuts per road km (Supporting)	Is there a refuge median or island provided for crossings and junctions around early childhood facilities?	(Y/N)	
		Are the refuge medians and islands accessible without any enclosure such as railings, high kerbs?	(Y/N)	
		Is the width of refuge sufficient for comfortable queuing of young children with caregivers?	(Y/N)	
		Is the refuge space protected by elements such as railing, raised kerb and bollards?	(Y/N)	
		Is the height of bollards used for refuge space provided up to 0.6 m?	(Y/N)	
		Is refuge median accessible at the same level as crossing for easier stroller accessibility?	(Y/N)	
		Is refuge space providing clear visibility of young children waiting to cross for the drivers?	(Y/N)	

Category	Indicator	Checklist	Response (Y/N)	Benchmark
Footpath	% of clear and unobstructed pedestrian footpath of total road length	Is there a footpath on both sides of the carriage-way?	Yes	
		Is the width of the footpath sufficient to accommodate the unobstructed flow of young children and caregivers?	Yes	Min 1.8M clear
		Is the width of the footpath clear of obstructions (statues, electrical junction boxes, transformers, hoardings, trees, parking, encroachment, etc.) for the continuous flow of young children accompanied by caregivers?	Yes	Min 1.8M clear
		Does the width of the footpath accommodate waiting space in high footfall areas such as schools, clinics, Anganwadi Centres, etc.	No	2.5-4M
	% of universally accessible pedestrian footpath	Does tactile flooring exist for footpaths?	No	
		Do the footpaths have accessible ramps at the crossings and junctions (making it universally accessible)?	No	Ramp ration mininum 1:15
	% of streets with adequate lighting	Does the footpath have street or pedestrian lights at regular intervals?	Yes	Streetlight at 20-30m c/c Pedestrian lights at 10-20m c/c
	% of streets with bollards at property entrance	Are the entries of the properties clearly defined?	Yes	c/c distance is 0.6m Any two bollards with 1.2m c/c distance for stroller accessibility
		A continuous footpath is provided with a vehicular ramp in front of the entry to the properties.	Yes	
		Are there bollards before and after property entrances?	No	
		Are bollards present on footpaths at midblock crossings and junctions?	No	
		Is c/c distance between bollards 0.6 m, with any two bollards having 1.2 m c/c for stroller/wheelchair accessibility?	No	
		Is the height of bollards used on the footpath up to 0.6 m?	No	
		Reflective material on bollards for visibility at night	No	
		Are dustbins available at adequate intervals?	Yes	Every 50-100m

Category	Indicator	Checklist	Response (Y/N)	Benchmark
Footpath	Percentage of streets with interactive building frontage	Are compound walls of adjacent property edges more than 2 m high?	(Y/N)	
		Do adjacent properties have a non-porous edge like a solid compound wall?	(Y/N)	
		Do building edges have colonnades that provide a shaded pathway for pedestrians?	(Y/N)	
		Are there any green planters on the compound walls?	(Y/N)	
		Does building edge give opportunities for young children to interact like street art, seating spaces, planters/trees, and jaalis?	(Y/N)	
		Does the street have street art along the early childhood facilities/amenities zones?	(Y/N)	
		Are there any learning elements along the edges- local art, language, culture, history?	(Y/N)	
	Presence of play zone along the walking area on streets	Are there any dedicated play areas on the footpath clear of the walking zone?	(Y/N)	
	Presence of natural materials in play equipment or in play space	Are there any natural play elements along the streets (natural- like mounds)?	(Y/N)	
		Are there any fixed play equipment along the streets, like swings?	(Y/N)	
		Do streets have sensory elements such as flowering plants (fragrance), touch sensitive elements, and music-based play equipment?	(Y/N)	
		Are there noise buffers installed on streets near early childhood facilities in the form of noise berms, thick shrubs, and sound absorbing materials?	(Y/N)	
	% of the footpath provided with anti-skid material such as rubber tiles and paver	Is there anti-skid material provided for the footpath for ensuring children's safety?	(Y/N)	
		Are different materials used for demarcating different zones on the footpath, such as play zones, utility zones, walking areas, cycle tracks, shared spaces?	(Y/N)	
		Are materials used in the play zone low-impact and soft, such as bark, sand, rubber tiles, and pavers?	(Y/N)	
		Are non-Toxic paints used for painting the surfaces?	(Y/N)	
	Presence of non permitted activities on streets	Are there any encroachments on the footpath (on street vending, parking, shop spillover, junction boxes, hoardings, transformers, etc.)?	(Y/N)	
		Is vending obstructing clear walking and waiting spaces?	(Y/N)	
		Are electrical junction boxes secured with barriers around so that it is safer for young children and caregivers while walking?	(Y/N)	
		Is there any encroachment on the footpath with parking	(Y/N)	

Category	Indicator	Checklist	Response (Y/N)	Benchmark
Footpath	Percentage of the street edges protected / guarded	Is there a buffer, such as a railing or short wall, or vegetation between the footpath and carriage-way on the street?	(Y/N)	
		Does the height of railing along a footpath affect the visibility of young children?	(Y/N)	Upto 0.6M
		Is the height of the plantation in green buffer such that it doesn't hamper the visibility of young children?	(Y/N)	Upto 0.6M
		Does the street have any bio-swales?	(Y/N)	
		Is plantation on bioswales at a height that does not hamper the visibility of young children?	(Y/N)	Upto 0.6M
		Are there open drains along the streets?	(Y/N)	
		Is a stormwater catchment inlet provided at regular intervals to catch surface runoffs?	(Y/N)	20-25m
		Does the street have any overflooding areas during the rains?	(Y/N)	
	Presence of signages denoting nearby early childhood facilities	Are there any special signages for young children, denoting their presence near early childhood facilities/ amenities	(Y/N)	
		Are the signages placed at a height visible to young children?	(Y/N)	
		Are signages painted on the footpath for better visibility of young children and caregivers?	(Y/N)	
		Are the signages visible without any obstructions?	(Y/N)	
		Are there signages for differently abled? (Digital with sign language, braille, sound)	(Y/N)	
		Are there any designated parking zones along the footpath?	(Y/N)	
Rest and play spaces	Provision and quantity of public seating to stop and rest by, along the street	Is seating available at regular intervals of 100-150 M?	(Y/N)	
		Is seating available at various heights ranging from 0.15-0.45M for young children and caregivers?	(Y/N)	
		Is the width of seating sufficient for young children and caregivers?	(Y/N)	0.45-0.6
		Is the seating playful? play opportunities near seating	(Y/N)	
		Are there any special signages for young children near early childhood facilities/amenities?	(Y/N)	
		Are there any learning elements along the edges- local art, language, culture, history?	(Y/N)	
	Presence of low-impact/soft materials such as Ex: bark softfall, impact absorbing sand, Wet pour rubber, rubber tiles and pavers etc.	Is seating provided as a cluster near early childhood facilities?	(Y/N)	
		Is lighting provided near seating?	(Y/N)	
		Is the seating space shaded?	(Y/N)	
		Are there green spaces/vegetation near seating?	(Y/N)	
		Does seating obstruct the pedestrian flow?	(Y/N)	
		Are there designated vending zones around pause points?	(Y/N)	
		Are dusbins available near pause points?	(Y/N)	within 20m
		Are there drinking water facilities near pause points?	(Y/N)	within 20m

Category	Indicator	Checklist	Response (Y/N)	Benchmark
Transit zone	% of early childhood facilities having public transit stop within 5-10 minutes walking distance	Is the transit stop obstructing pedestrian flow?	(Y/N)	
		Is there a pedestrian crossing before the transit stop?	(Y/N)	
		Does transit stop have crossing facilities connecting all 4 directions?	(Y/N)	
		Is there legible and unobstructed signage near the transit stop?	(Y/N)	
		Are there signages at transit stops with route maps to all destinations in all directions?	(Y/N)	
		Is there a sufficient demarcated queuing space near transit stops?	(Y/N)	
	Number of transit stops with adjoining play and learn opportunities	Is there sufficient seating/rest spaces near transit stops that are shaded and well-lit?	(Y/N)	
		Are there opportunities for play at transit stops?	(Y/N)	
	Number of transit stops having public toilet facility within 50m	Are there public toilets and nursing facilities available in proximity to transit stops?	(Y/N)	
	% of transit stops with drinking water facilities	Are there drinking water facilities near transit stops?	(Y/N)	
	Presence of signage around transit zone	Are there wayfinding signage provided for the convenience of caregivers with young children?	(Y/N)	
		Is the bus stop located a minimum 30-50 m away from the nearest junction?	(Y/N)	
Cycling infrastructure	% of streets with cycling tracks	Are there cycle tracks provided on footpaths?	(Y/N)	
		Is there dedicated cycle parking provided along the footpath?	(Y/N)	
		Are there any Public Bicycle Sharing stands with rental facilities for strollers, tricycles, wheeled vehicles (wagons, bicycles with training wheels) at every 200-400 m?	(Y/N)	
		Is the bicycle track segregated from carriageway with buffer?	(Y/N)	
		Is one-way cycle track minimum 1.5 m wide?	(Y/N)	
		Are cycle lanes (at carriageway level) demarcated with paint markings or cat eyes or bollards?	(Y/N)	
		Is cycle track demarcated with colour change?	(Y/N)	
		Are cycle tracks shaded and unobstructed?	(Y/N)	
	Presence of signages for cycle tracks	Are signage painted on cycle tracks at every 20 m?	(Y/N)	
		Are signages denoting cycle tracks provided at regular intervals along the street?	(Y/N)	200m c/c

B ANNEXURE - B

PUBLIC SPACES AUDIT CHECKLIST

IMPROVING ACCESS AROUND 500-METRE RADIUS OF PARKS AND PLAYGROUNDS

Young children and family-friendly walkways:		**Response**
1	Continuous network of min. 1.8-2.4 m wide unobstructed and shaded walkway around 500 m radius of park/playground	Y/N
2	Tactile paving strip of suitable anti-skid material along the walkway to ensure universal accessibility	Y/N
Pedestrian crossing for young children and families:		
1	Min. 3 m wide dedicated pedestrian crossings near the park entrance	Y/N
2	The footpath to the crossing is connected using ramps with slopes ranging from 1:12-1:15 for safe access to parks and playgrounds	Y/N
Traffic calming measures in adjoining streets:		
1	Traffic calming measures 13 m before pedestrian crossings on all surrounding streets, including:	Y/N
	a) raised crossing	
	Or rumble strips/speed bump/speed hump	
	Or cobblestones or any other suitable material	
	Or safety studs	
	b) pedestrian signage	
Wayfinding and safety:		
1	Use of signage to indicate speed limits, pedestrian crossings, slow vehicular speeds, bus stops, designated parking areas, important landmarks, and destinations 20 m before pedestrian crossings along footpaths	Y/N
2	Low, attractive pedestrian lighting of height 3.5-5 m and of 6-8 lux level to light footpaths and pavements at intervals of 12-15 m	Y/N
3	Low-height boundary walls with a colorful, and visually porous wall area between the heights of 0.6 and 0.9m for increased visibility and safety	Y/N
Safety buffer between street carriageway and pedestrian walkways:		
1	Green buffer (plantation height max 0.8 m) or interactive railings (max height 0.95 m) along footpath for safety and clear visibility	Y/N
Park entry:		
1	Wide and legible, highlighted entrance of park/playground (at least 3 m wide)	Y/N

CIRCULATION WITHIN PARKS AND PLAYGROUNDS

	Young children and family-friendly walkways:	**Response**
1	All play and pause spaces, facilities, and amenities in parks and playgrounds are connected via well-shaded, well-lit, and wide pedestrian walkways.	Y/N
2	Min. 2-3m wide unobstructed walkway for comfortable movement of caregivers with pram/baby carrier	Y/N
3	Gentle slope ranging from 1:15-1:20 at all level changes along pedestrian walkway to allow easy stroller and wheelchair movement	Y/N
4	'Walking loops' or curved pathways are well-lit and shaded, to promote physical activity while limiting the risk of getting lost and to encourage children to walk along edges and explore spaces.	Y/N
5	Materials such as concrete, tinted concrete, and crushed stones can be considered for building primary pathways; flagstone with local stones for secondary pathways.	Y/N
6	Tactile paving strip of suitable anti-skid material along the walkway to ensure universal accessibility	Y/N
Material selection:		
1	Materials with high albedo value, such as reflective concrete, tinted concrete, flagstone with local stones, and lime, preferably in white or bright colors for walkways to reduce urban heat island effect and smooth stroller/wheelchair movement; permeable materials, such as porous bricks, grass pavers, or open-joint brick laying, can be considered.	Y/N
Trees along walkways:		
1	Min. clearance height of 2.1-2.4 m for trees with thick and wide canopies along walkways	Y/N
2	Avoid planting rain trees to prevent accidents.	Y/N
Multi-heighted seating spaces:		
1	Well-lit, multi-heighted seating spaces for young children and their caregivers at intervals of 100 m; coloured pavements near pause spaces to highlight seating areas (refer to page 10 for design parameters of seating).	Y/N

AMENITIES AND FACILITIES WITHIN PARKS AND PLAYGROUNDS

	Nursing station:	**Response**
1	Clean and well-lit feeding booths for nursing mothers with diaper changing tables ((2.1m X 2.4m nursing station, provide for at least 2 nursing mothers)	Y/N
	Drinking water and toilet facilities:	
1	Clean drinking water facilities at both adult and child (0.5-0.55m) heights for easy access	Y/N
2	Clean toilets with separate cubicles equipped with toilet fixtures at child height; for young children, max. toilet seat height should be 0.25-0.3m and max. height of hand basin should be 0.5-0.55m	Y/N
	Lighting:	
1	Low, attractive, and warm pedestrian lighting of height 3.5-5m and of 6-8 lux level to light walkways at intervals of 12-15m	Y/N
2	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	Y/N
	Garbage disposal bins:	
1	Accessible garbage disposal bins and child-heighted waste bins at a height of 0.5-0.55m at regular intervals (every 100m) and near seating spaces	Y/N
	Wayfinding:	
1	Well-lit signage showing entry-exit points; park map with facilities (in city-level parks) at entrance/exit	Y/N
2	Inclusion of braille or relief in all orientation signage, key map, information plaques	Y/N
3	Bright and repetitive colour palette for all signage (identity, directional and informative)	Y/N
4	Innovative, playful, and stimulative informational signage at height of 0.5-0.55m including interesting facts about trees or native plants and insects	Y/N

YOUNG CHILDREN-FRIENDLY LANDSCAPES

Landscape features:		Response
1	100% shade around all play areas; shade trees with thick foliage for climatic protection (e.g., from sun, rain and wind) and for comfort at all times of the day	Y/N
2	Inclusion of medicinal, herbal, air-purifying, indigenous plants, vegetables, and fruit-bearing plants with gardening opportunities for young children and their caregivers	Y/N
3	Provision of grass, shrubs, and plants with different colors, textures, shapes, and smells at height of 0.95m	Y/N
4	Avoid planting species such as *oleander*, *philodrendron, money plant, caladium* etc. around play spaces; plant species that are hypo-allergenic (*sunflower, rose, passionflower, nasturtium, butterfly pea, lavender* etc.) and safe for children's oral consumption	Y/N
5	Label different species and include plant uses to educate and raise awareness amongst public especially children	Y/N
6	Noise berms/ landscape mounds towards park/playground periphery to block noise from adjacent streets	Y/N
7	Fishponds and bird houses/ feeders to encourage interaction with biodiversity	Y/N
8	Small sensory trails for cognitive development including fragrant, soft grass, colored pebbles, stones of different sizes, gravel, sand, wooden chips and mosaic tiles	Y/N
9	Man-made sheltered structures such as pergolas, huts, nooks, bamboo tents etc. for climatic protection (e.g., from sun, rain, and wind) and for comfort at all times of the day	Y/N
10	Raised mounds, wooden logs, tree stumps and small rounded boulders as seating and play components	Y/N

PLAY SPACE CHARACTERISTICS FOR YOUNG CHILDREN (0-5 YEARS)

Play space features		Response
1	Dedicated play and walking space for young children away from play areas of older children such as cricket grounds, badminton courts, etc. to avoid accidents	
2	The presence of natural elements with different textures, such as plants, sand, pebbles, soil, mud, water, etc., for facilitating interactions with nature	Y/N
3	Sandpit: clean, washed sand of particle size 0.25-1.5 mm for the play area, ensuring removal of crushed seashells or other material injurious to young children.	Y/N
4	Seating spaces near the sand play area located in quiet, wind-free, and well-shaded zones	Y/N
5	Loose fill impact absorbing surfaces such as sand, mulch, etc. with a minimum depth of 300 mm to absorb the fall safely without causing any injury to the child.	Y/N
6	Active play zone with predominant use of bright primary colors such as red, yellow, and orange	Y/N
7	Passive/quiet zone with prominently cool colors such as blue and green	Y/N
8	Playground surfaces such as sand, pea gravel, rubber mats, and poured-in-place rubber surfacing to lessen chances of major injuries	Y/N
9	Timber such as teak, bamboo, and mango for building innovative play equipment for young children	Y/N
10	Installation of an appropriate impact-absorbing surface such as sand, pea gravel, rubber flooring, etc. around any play equipment with a fall height greater than 600mm	Y/N
11	Playground surfacing extended at least 1.8 meters beyond play equipment.	Y/N
12	Rounded edges/corners of furniture and play equipment to avoid abrasion or injury	Y/N
13	Wheelchair accessible swings, merry-go-rounds, or moving bridges for universal accessibility	Y/N
14	Minimum landscape screening around play areas to ensure maximum visibility	Y/N

PLAY SPACE CHARACTERISTICS FOR YOUNG CHILDREN (0-5 YEARS)

	Multi-heighted seating spaces:	Response
1	All-weather street furniture made of natural materials that ensure comfort most times	Y/N
2	Comfortable and well-lit adult and child seating to ensure close contact with play space; waste disposal bins near seating spaces	Y/N
3	Wide benches with proper backrests (min. 0.5-0.55 m wide and 0.45-0.5 m high) for adults; low height seating (0.2-0.3 m high) for young children	Y/N
4	Cluster seating arrangements near play areas to aid use of sign language (i.e., the ability to sit facing each other)	Y/N
5	Informal seating such as low heighted ledge walls, rounded boulders, and old tree stumps integrated with regular seating facilities	Y/N
6	Multifunctional features that encourage variety of cultural uses and attract more families to public spaces (e.g., amphitheater, community tables, etc.)	Y/N

PLAY SPACE FOR AGE GROUP 0-1 YEAR

	Play space features:	Response
1	Separate infant play area; natural and soft textured surface for crawling, rolling, and exploration	Y/N
2	Play space enclosed by a low-heighted stockade	Y/N
3	Comfortable and well-lit adult and child seating to ensure close contact with play space	Y/N
4	Water features such as shallow pools or splash pads for water play	Y/N
5	Small sensory trails for cognitive development include fragrant, soft, and colored grass, pebbles, stones of different sizes, gravel, sand, wooden chips, and mosaic tiles	Y/N
6	Small, gentle green mounds up to a height of 0.3-0.5 m to aid body balance	Y/N
7	Small-height support structures such as standing/climbing frames or handrails (maximum height 0.6 m) for babies of 9 months and older to stand upright	Y/N

PLAY SPACE FOR AGE GROUP 1-3 YEARS

Play space features:		Response
1	Loose parts such as stones, pebbles, wood, pipes, tires, construction material, etc. for creative play	Y/N
2	Play spaces with sandpits, loose wooden logs, and climbing walls to explore risk and adventure play opportunities	Y/N
3	Water pool of depth of 3-6 inches	Y/N
4	Ornamental shrubs of a max. height of 0.95 m to stimulate nature interaction	Y/N
5	A short obstacle course for developing body balance	Y/N
6	Low-heighted climbers/jungle gym to encourage physical development; all climbing structures must be under the height of 0.8 m with appropriate fall surface treatment around it	Y/N
7	Comfortable and well-lit adult and child seating to ensure close contact with play space	Y/N

PLAY SPACE FOR AGE GROUP 3-5 YEARS

Play space features:		Response
1	Dedicated play space and walking space away from older kids play areas such as cricket grounds, badminton courts, etc. to avoid accidents	Y/N
2	Landscape features that afford play, such as little clearings, bridges over the stream, stepping stones, and loose rocks in ponds	Y/N
3	Play opportunities that include pretend play, adventure play (bridge, mounds, tunnel), and balance beam	Y/N
4	Water bodies such as shallow pools or ponds of min. water depth of 0.8 m	Y/N
5	Dedicated tricycle/cycle trails of length 100m and width 1.8m in a figure of eight or a continuous loop	Y/N
6	Gentle play mound up to a height of 2.5 m for child play	Y/N
7	Short walls below a height of 0.6 m for balancing activity	Y/N
8	Play equipment such as simple machines including pulleys, baskets attached to ropes, etc. for the development of gross motor skills	Y/N
9	Comfortable and well-lit adult and child seating to ensure close contact in the play space	Y/N

C ANNEXURE - C

ECD INFRASTRUCTURE AUDIT CHECKLIST

IMPROVING ACCESS AROUND 500-METRE RADIUS OF ECD CENTER

	Young children and family-friendly Footpaths:	AWC	PHC	NRC	Score (0/1/2)
1	Continuous network of min. 1.8-2.4 m wide, well-shaded, at-grade footpath, clear of all encroachments or obstructions such as open drains, public utilities, light poles, and parking, within 500 m radius of the ECD center				
2	Height of the footpath to range from 0.1-0.15 m from the carriageway				
3	Use of locally available, permeable, anti-skid (stone tiles, grass pavers, cobblestone, brick, unpolished tiles) materials for paving footpath				
4	Tactile paving strip of suitable anti-skid material along the footpath for universal accessibility				
5	Pause spaces with multi-heighted seating along footpath within 300 m radius of the ECD center				
6	Child height seating is of ht. 0.2-0.3m, width 0.55-0.6m, and adult height seating is of ht. 0.45-0.5m, width 0.55-0.6 m				
7	Floor-based games such as hopscotch, snake and ladders, etc. on the multi-utility zone (MUZ) of the footpath to engage children				
8	Colorful patterns on the boundary walls adjacent to footpaths to divert attention of the child from the traffic				
9	Social messages about healthy practices such as breastfeeding habits, the importance of outdoor play for young children, etc. on boundary walls along footpath leading to ECD center				
10	Adequate shading along footpaths through large canopy trees or parasols				
11	Green buffer of plantation height max 0.45m or interactive railings of max height 0.95m along footpath for safety and ensuring clear visibility				
12	Adequate pedestrian lighting of height 3.5-5 m and of 6-8 lux level at intervals of 12-15 m for well-lit walking space				

Core guideline (Score:2)

Supportive guideline (Score:1)

AWC: Anganwadi Centre

PHC: Public Health Centre

NRC: Nutrition Rehabilitation Centre

IMPROVING ACCESS AROUND 500-METRE RADIUS OF ECD CENTER

	Pedestrian crossing and traffic calming measures	AWC	PHC	NRC	Score (0/1/2)
1	Min. 3m wide dedicated pedestrian crossings near ECD center				
2	Footpath connected to the crossing using ramps with slopes ranging from 1:5-1:8 for safe access				
3	Permissible vehicular speed limit around ECD center is limited to 30 kmph				
4	Traffic calming measures such as rumble strips/speed bumps/ cobblestones/safety studs or any other suitable material, 13 m before pedestrian crossings on all surrounding streets (at 30 kmph)				
5	Slow traffic zones in front of entry and exit points of ECD centers by painting or providing different treatments with textures on the footpath				
6	No on-street parking zones within a 50m radius of the ECD center for clear visibility and safe walking				
	Wayfinding				
1	Signage indicating speed limits, pedestrian crossings, bus stops, designated parking areas, important landmarks (school ahead), and destinations (children at play) 20m before pedestrian crossings in multi-utility zone (MUZ) or green buffer				
	ECD entry	**AWC**	**PHC**	**NRC**	**Score (0/1/2)**
1	Min. 3m wide entrance of ECD center				
2	Highlighted ECD entrance with engaging patterns on the footpath				
3	Multi-heighted seating with proper backrest and rounded edges at entry				
4	Child height seating is of ht. 0.2-0.3m, width 0.55-0.6m, and adult height seating is of ht. 0.45-0.5m, width 0.55-0.6m				
5	Play pockets with interactive elements at 95cm height near waiting spaces in front of entry				
6	Safety bollards with clear spacing of 0.9m for walking and 1.2m for wheelchair movement along the footpath in front of the main entry				
7	Ramp with slopes ranging from 1:5-1:8 at plot entry for safe access				
8	Compound wall with min. 50% permeability for ensuring visual connection of premises from the street and vice-versa				

SITE PLANNING

Waiting/Seating area		AWC	PHC	NRC	Score (0/1/2)
1	Waiting area close to all young children and caregiver-oriented amenities (breastfeeding booth, OPD, play area, classrooms etc.)				
2	Multi-heighted seating with proper backrest and rounded edges at frequent intervals				
3	Child height seating is of ht. 0.2-0.3 m and width 0.55-0.6 m and adult height seating is of ht. 0.45-0.5 m, width 0.55-0.6 m				
4	Gradually sloped, stepped seating of riser-100-150mm and tread–400 m within premises for hosting community events and conducting open classroom sessions				
5	Pocket play opportunities (seesaw, swing, spring riders, sandpit etc.) beside seating spaces for engaging young children				
6	Informal seating using boulders, wooden logs or stumps (specially along play areas)				
7	Shading in outdoor waiting areas using large canopy trees or use materials such as tensile fabric, recycled cloth, or colorful polycarbonate sheets with GI steel pipe frames				
8	Child -friendly drinking water fountain at a height of 0.5-0.55 m				
9	Waste disposal bin				
10	Signage indicating young children and caregiver-oriented amenities such as toilets, breastfeeding booth, consultation room, immunization room, play spaces, etc. near waiting area				
11	Adequate lighting of min. 6-8 lux level in waiting area				

SITE PLANNING

	Safety measures	AWC	PHC	NRC	Score (0/1/2)
1	Open drains covered in and around ECD center premises to avoid accidents				
2	Utilities such as transformers/ telephone lines if any present within the premises taken underground or warded off via utility screens. Minimum screening height is 2.5 to 3 m from the ground				
	Building entry				
1	Ramped entry of slope- 1:15-20; width 1.2 m to the PHC/NRC building for easy stretcher movement				
2	Ramped entry of slope- 1:10-12; width 1.2 m to the Anganwadi Centre building for easy movement of young children and pregnant mothers				
3	Grab bar of ht. 0.45-0.5m and dia. 00.05m for young children on the ramp for universal accessibility				
4	Gradual steps of riser-100-150mm and tread – 300mm for easy access by young children				
	Young children and family-friendly landscape				
1	Local herbs, medicinal plants, vegetable, and fruit gardening opportunities for young children and caregivers				
2	Low-height signage at a height of 0.45 m in herb/kitchen garden with information about plant species and its benefits				
3	Presence of air-purifying species of plants such as neem, ashoka, arjuna or pipal trees that absorb harmful gases				
4	Presence of trees with thick foliage/ evergreen variety such as kadamba, neem, bakul, karanj or banyan for climatic protection (e.g. from sun, rain, and wind) and comfort during all seasons				
5	Groundcover/ flowerbeds/indigenous variety of ornamental shrubs or medicinal plants of hypo-allergenic species at a height of 0.45 m to engage children with nature				

OUTDOOR PLAY

	General play guidelines	AWC	PHC	NRC	Score (0/1/2)
1	Seating spaces for caregivers near play areas to ensure supervision				
2	Play spaces at grade with the walkways				
3	Adequate lighting with 6-8 lux level in and around play area				
4	Play equipment is compliant with safety standards with rounded and smooth edges and has gentle fall area around the equipment				
5	Play opportunities for differently abled such as wheelchair-accessible swings, merry-go-rounds with soft fall area				

OUTDOOR PLAY: PLAY OPPORTUNITIES FOR YOUNG CHILDREN

	Play opportunities for children aged 0-1	AWC	PHC	NRC	Score (0/1/2)
1	Open green play spaces using locally available and child-friendly variety of grass (Mexican/ Bermuda/ Korean/ Soft Buffalo) for crawling				
2	Pits with sand/mud/clay for imaginative play				
3	Gentle green mounds of height up to 0.3 m for rolling and crawling				
4	Small heighted support structures of max. height 0.45m, frame dia below 50mm for babies of age 9 months and older to stand upright				
	Play opportunities for children aged 1-3				
1	Open green play spaces using locally available and child-friendly variety of grass (Mexican/ Bermuda/ Korean/ Soft Buffalo) for walking and running				
2	Pits with sand/mud/clay for play				
3	Loose parts such as pebbles, balls, buckets, spades, etc. in play pit for imaginative play				
4	All climbing structures are under the height of 0.45-0.6m with appropriate fall surface treatment around it				
5	An obstacle course of wooden stumps/ balancing beam upto height 0.2m with soft fall area to encourage risk play				
5	Age-appropriate play equipment such as toddler swings, spring riders, low-height climbers/jungle gym, slides				
6	Sensory trails with sand, pebbles, different textured grass, wooden chips, mulch, loose soil, and gravel				

OUTDOOR PLAY: PLAY OPPORTUNITIES FOR YOUNG CHILDREN

	Play opportunities for children aged 3-5	AWC	PHC	NRC	Score (0/1/2)
1	Open green play spaces using locally available and child-friendly variety of grass (Mexican/ Bermuda/ Korean/ Soft Buffalo) for group play				
2	Pits with sand/mud/clay for play				
3	Loose parts such as pebbles, balls, buckets, spades, etc. in play pit for imaginative play				
4	Gentle play mounds up to height of 1.2 m for play				
5	Play opportunities such as small bridge/tunnel/balancing beam/hanging tires from trees to encourage pretend play				
6	Landscape features that afford imaginative play, such as little clearings /stepping stones/ loose rocks in pond etc.				
7	Sound-based play elements such as xylophones or drums/ at a height of 0.45-0.5m for sensory stimulation				

YOUNG CHILDREN AND CAREGIVER-ORIENTED AMENITIES

	Child-friendly toilets	AWC	PHC	NRC	Score (0/1/2)
1	Clean toilets equipped with toilet fixtures at child height; for young children, max. toilet seat height is 0.25-0.3 m				
2	Wall-mounted grab bar at a height of 0.5-0.55 m near WC for support and toilet hand showers at low-height for easy access from toilet seat				
3	Max. height of hand basin is 0.5-0.55 m				
4	Anti-skid tiles for flooring				
5	Picture guide for children to operate the toilet fixtures and personal hygiene				
	Breastfeeding cubicle or Consultation room				
1	Examination/consultation room (5X4 m) includes diaper changing station, bed, table, chair, storage space, and information chart on neonatal care				
2	Well-lit, ventilated breastfeeding cubicle/room (2.1 x 2.1 m) includes 2 nursing chairs, diaper changing station, sink, diaper dispenser and waste disposal bin				

BUILDING AS LEARNING AID

		AWC	PHC	NRC	Score (0/1/2)
1	Punctures creating play niches/ jaali with different patterns on verandah walls forming light and shadow patterns on the floor				
2	Numbers, alphabets, murals of animals, birds, plants, day and night painted on walls to aid in storytelling; Sensory walls with mosaic tiles or any recycled material for cognitive development				
3	Grooved writing (local language or English) on the wall for enhanced tactical experience				
4	Chalkboard paint (black) providing drawing space on walls for toddlers up to 1.2m from the ground				
5	Window sill level of < 0.45 m for children to sit and engage in various activities at sill level				
6	Interactive railing to engage children				

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