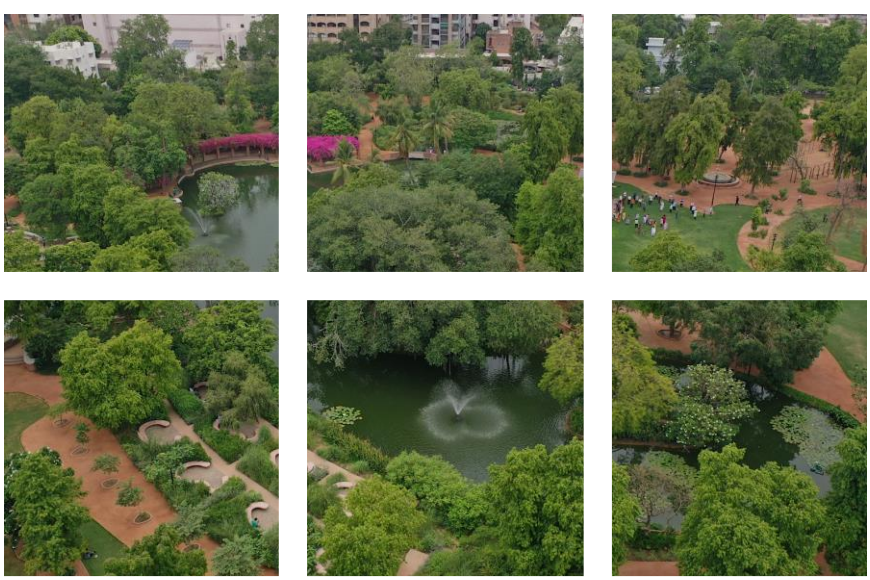

POLICIES AND GUIDELINES FOR PARKS

FOR INDIAN CITIES

Landscape Environment Advancement Foundation, INDIA

September 2023

Landscape Environment Advancement Foundation (LEAF), 2019

LEAF is engaged in research and publication in the area of landscape design and environmental planning. It supports research programs of varying durations every year. Over the years, LEAF has increased its area of exploration to developing city management matrices, governance and administration studies, urban generation and one space outreach efforts.

It has also worked on a country wide exhibition on landscape design – Tracing Narratives : an exhibition that explored the various facets of landscape design and its history in India.

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PREFACE

The document is developed with an aim of defining standards that will improve the park development process, and serve as a reference tool to guide planning bodies, governing agencies and professionals engaged in planning and development of public parks .

Note - The is an evolving document and might vary across different regions depending upon various environmental and social factors. The design parameters and attributes may be affected climate zones, rainfall, soil types, urbanity, social status, cultural considerations, etc .

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- Design For User Range and Experiences
- Place making And Design Identity
- Accessibility and Connectivity
- Preservation and Aesthetics
- Sustainability and Environmental issues
- Design for Safety and Security
- Effective Administrative Management And Enforcement
- Formulate A Definitive Operations And Maintenance Program
- Design For Public Health , Wellbeing and Recreation

PARK ATTRIBUTES & RECOMMENDATIONS

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- Internal Circulation
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- Shading & Shade Structures
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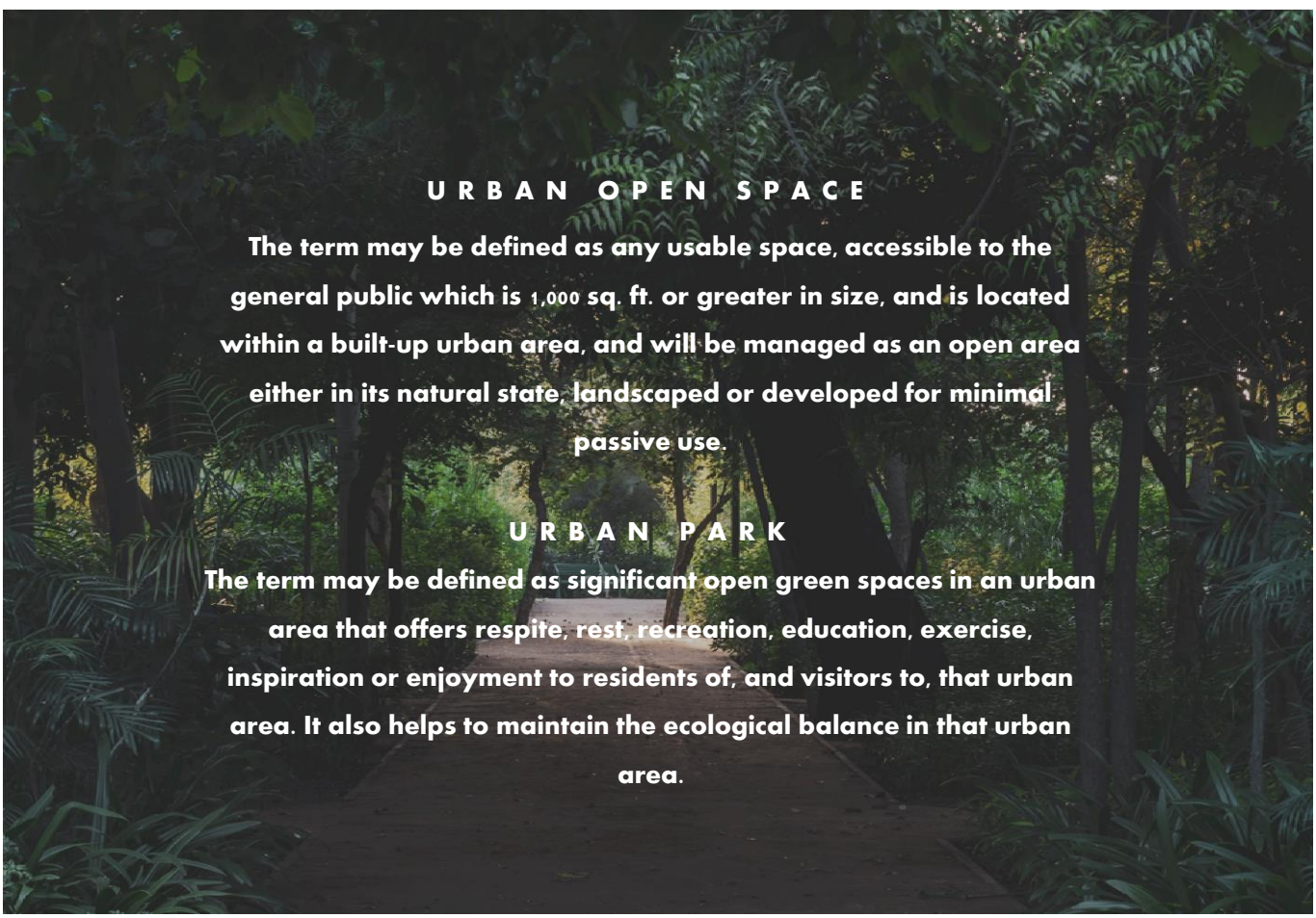
- Lighting
- Signage
- Fence, wall and Screens
- Public Art
- Water Management

OPERATION & MAINTENANCE

- Maintenance Planning
- Public & Private Partnership
- Capital investment
- Training



URBAN OPEN SPACE

The term may be defined as any usable space, accessible to the general public which is 1,000 sq. ft. or greater in size, and is located within a built-up urban area, and will be managed as an open area either in its natural state, landscaped or developed for minimal passive use.

URBAN PARK

The term may be defined as significant open green spaces in an urban area that offers respite, rest, recreation, education, exercise, inspiration or enjoyment to residents of, and visitors to, that urban area. It also helps to maintain the ecological balance in that urban area.

IMPORTANCE OF URBAN PARKS

To improve the liveability and quality of life

To increase habitat and biodiversity

To provide identity to towns and cities

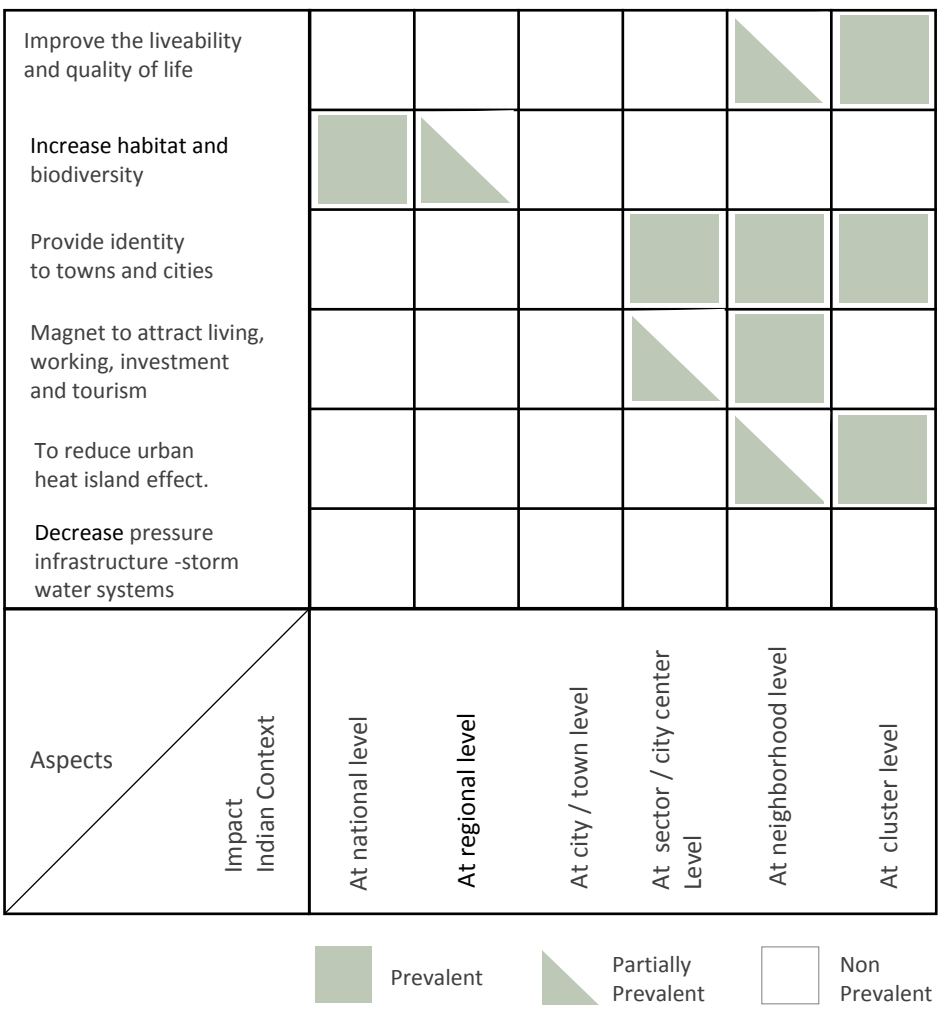
To create a magnet to attract living, working, investment and tourism

To reduce urban heat island effect.

To decrease pressure on built infrastructure (Integrated storm water systems)

URBAN PARKS
INDIAN SCENARIO

Matrix



INFERENCE

Parks in our city have not entirely fulfilled all the aspects due to various reasons including poor planning, design, and lack of safety, access and image ability. Most importantly, there is a lack of norms, guidelines and standards applicable to the quality of parks.

1. INTRODUCTION

OBJECTIVE

1. To improve the quality of parks by incorporating sustainable landscape strategies and urban design methodologies.
2. To ensure that the parks, adequately support the active and passive needs of the city and its inhabitants.
3. To streamline the park design process.
4. To support the development of facilities and systems that are aesthetically pleasing, functional in design and cost effective to operate.
5. Help development of parks that act as magnets that attract living , working , investment and tourism – Imageability of the city / town / region.
6. Adaptation of sustainable solutions that reduce pressure of the urban infrastructure.

SCOPE

1. The guidelines primarily comprise of planning and design standards of different attributes for urban parks (shall not cover standards for open areas under Green belt & Regional Park).
2. The planning and design standards of Parks and permissible activities.
3. Suggestions on the design and development process to be followed.
4. Suggestions on the operations and maintenance regime.
5. Build a evaluation matrix for rating the state of parks.

OPEN SPACES AND CITIES - GLOBAL EXAMPLES

**Calculated on a per person basis.*

OPEN SPACES AND CITIES - INDIAN SCENARIO

**Calculated on a per person basis.*

1. INTRODUCTION

CHALLENGES WITH THE DEVELOPMENT OF PUBLIC PARKS IN INDIA

The challenges associated with public parks in India are two-fold - **Design and Management** - especially since the benefits associated with them are, for the most part, non-tangible.

These include:

1. The development of a comprehensive model or policy that can address the design and refurbishment of public parks is impacted by the fact that there is no nationalized or state level database on the number of public parks.
2. The effort for the maintenance is often not led or governed by trained manpower.
3. The strategy for the long-term maintenance of these parks can be better articulated.
4. The process is often not informed by user group consultation.
5. Typically the budgets available for the maintenance of these parks is limited, given the other public services that a city needs to provide.

Key Concerns regarding parks

CONCERNS	L	M	H	REMARK
Limited area / green cover in the city		●		With increasing pressure on urban infrastructure and housing needs (urban densities) , Indian cities are grappling to provide for the required standards for per person opens space required in the city.
Accessibility			●	Lack of greenways to access parks, neighborhoods walkability
Security and Safety			●	Unattended / monitored spaces – prone to theft an illegal activities.
Encroachment			●	Park land get taken over or encroached by community or vendors.
Maintenance			●	Parks experience poor upkeep - littering, overgrown vegetation, damaged equipment and poor sanitary conditions.

H - High **M -** Medium **L –** Low

HOW TO MATCH GLOBAL STANDARDS ?

1. Planning parks for flexibility and adaptability to account for shifting community requirements, new trends and changing demographics.
2. Working together with organizations, professionals, exchanging information and getting technical support that will help built and operate good facilities.
3. Law enforcement – for encroachments, anti socio and illegal activities that may be carried out in the park premises.
4. Adopt sustainable design solutions.
5. Guidelines to be formulated and amended for park development, usage, management and maintenance.

1. INTRODUCTION

METHODOLOGY TO BE ADOPTED FOR THE DEVELOPMENT OF PARKS

1. CASE STUDY / SURVEY

To understand activity pattern and user behavior / profile, ownership and participation within parks and its context.

- Activity Mapping

Mapping activities (morning, afternoon and evening), identifying peak hours and type of users (age, gender) during different times.

- Usage

Flexibility and variations in activities.

- Questioner

Analyzing public needs, demand and expectations.

2. ANALYSING EXISTING CHALLENGES

Identification of areas of concern with respect to park planning, zoning of activities, individual elements, operation and maintenance.

- Surveying

Existing stakeholders, ownership, rentals on site

- Contextual study

Neighborhood, public transport distances, access from landmarks, amenities, cultural and historical aspects, connection with natural features.

- Site study and Mapping of existing physical features

Correct contour survey , mapping of vegetation , drainage of land / existing hydrological patterns and influence of other utilities and encroachments (if any)

3. DESIGN PRINCIPLES

Identification of existing challenges forms the basis of framing of Design Principles.

- Site demands

Conservation, restorations, up keepings

- Community requirements

Amenity, security, accessibility, maintenance.

4. PLANNING AND DESIGN

Ensure that the layout and characteristics of parks, adequately support the active and passive needs of the city. Improve the quality of parks by incorporating sustainable landscape strategies and urban design methodologies, to strengthening community cohesion.

- Sustainability

Choosing correct material for hardscape and soft-scape that can be resilient as per site conditions.

- Planning without disturbing natural features.

- Optimum usages

Optimum usage of water for irrigation, lighting as much as required without creating night sky pollution.

5. PARK ATTRIBUTES

Design an develop Park elements or attributes on the basis of framed park design principles.

- Materials

Durable and environmentally sustainable

- Ease of usage

Height of park element, visibility, access towards these elements.

6. OPERATION AND MAINTEINANCE

Prepare a park maintenance plan/document for operation and maintenance measures an implement it to ensure efficient operation, utilization and upkeep of parks.

- Operation level plan

- Yearly audit

- Community review

CATEGORIZATION OF PARKS

Categorization of parks could be done on various parameters – size , area that they cater to, functions or level / pattern of usage.
The planning and design standards of Parks can be formulated accordingly. Depending on the location, size and hierarchy level of the park, attributes with recommended planning norms and design standards need to be considered.

CASE OF DELHI

Categories established for Planning Norms, Standards for Recreational Areas / Parks at City level

URBAN PARK CATEGORY	CONSTITUENTS	SIZE GUIDELINE	POPULATION
City Park	Aqua park/water sports park, Arboretum, Botanical Garden, National Memorial (approved by Cabinet/ Govt. of India), Amphitheatre, Open Playground, Aquarium, other activities same as permitted in District Park.	100	10 lakh
District Park	Theme park, Recreational Club, National Memorial, Open-air food court, Children Park, Orchard, Plant Nursery, Area for water harvesting, Archaeological Park, Specialized Park, Amusement Park, Children Traffic Park, Sports activity, Playground, Amenity structures.	25	5 lakh
Community Park	Park, Children Park, Open-air food court, Playground, etc.	5	1 lakh

Categories established for Planning Norms, Standards for Recreational Areas / Parks at Neighborhood level

URBAN PARK CATEGORY	CONSTITUENTS	SIZE GUIDELINE (HECTARE)	POPULATION
Neighbourhood Park	Common open space	0.1	10,000
Housing Area Park	Anganwari / Tot Lot and convenience shopping area	0.5	5000
Tot lot Housing Cluster level		0.0125	250

2. PRINCIPLES OF PARK DESIGN

Following are the basic principles of park design which, at present, also pose as the challenges for parks in in the cities -

1. Design for user range and experiences
2. Placemaking/ Design Identity
3. Accessibility and Connectivity
4. Preservation and Aesthetics
5. Sustainability and Ecological Issues
6. Safety and Security
7. Administration and Enforcement
8. Operation and Maintenance
9. Public Health

2.1 DESIGN FOR USER RANGE AND EXPERIENCES

Parks are designed to provide a public space that is safe, comfortable, and healthy. A place where diverse activities can be experienced by all, contributing to people's physical and mental wellness, and providing a high quality of life.

- Encourage Social Interaction
- Planning for multiple activities in an organized manner.
- Providing recreational activities for diverse groups.
- Allow ease of movement – shading, material selection, etc.
- Provision of amenities & Equipment's- Seating, shaded structures, restroom, etc.
- Planning and design interventions for the differently-abled.

2.2 PLACE MAKING AND DESIGN IDENTITY

Park may be planned to accommodate visually interesting zones that are multi-functional, flexible in nature , which may render a special identity to the city / town /region that they are planned in. A unique identity of parks can be achieved by following :

- Preservation of existing vistas, heritage and natural features.
- Place for art / Installations
- Aesthetics – Product / Furniture design
- Conservation and enchantment of exiting land / water feature.
- Interesting Signage and Wayfinding Identity
- Planting that support regional identity
- Introduction of rare plant species

2. PRINCIPLES OF PARK DESIGN

2.3 ACCESSIBILITY AND CONNECTIVITY

Interconnectivity of the zones within a park as well as access to external areas enhances the mobility of people , this can be done by providing continuous and free movement of pedestrians, cyclists and other non motorized modes of transport. Access of vehicles within the park must be avoided with only special consideration given to the emergency vehicles in the time of need.

Effective methods to do so will include :

- Logical connection between immediate urban context , built structures and zones. Avoid inaccessible or inconvenient ingress/egress points of parks.
- Logical connection between different zones within the park.
- Pathway hierarchy for pedestrians and bicycles. Preferably segregated –to avoid Bicycle and pedestrian conflict.
- Planning for continuous uninterrupted green belts.
- Universal Access design.

2.4 PRESERVATION AND AESTHETICS

Efforts taken to enhance the appearance of the community greens often yield additional benefits –economic attractiveness for business of the area , encouraging local tourism . Restoring historic structures improves the appearance of the built environment, adds to property values, is environmentally positive and increases public awareness and appreciation of local history.

The key actions would include :

- Preserving historic and natural elements to create identity and appeal.
- Restoration of the dilapidated historic structures within the park premises.
- Ensuring building aesthetics and design considerations for all built structures within the park.
- Screening from undesired surroundings and utility areas (Energy storage systems, Sewage treatment plant, Trash yard, etc.).
- Planting as per seasonal variations.

2. PRINCIPLES OF PARK DESIGN

2.5 SUSTAINIBILITY

Adapting sustainable solutions while designing an developing the park . This would also include determine strategies to mitigate and adapt to the affects of changes made in an existing park, while promoting and ensuring the long term resilience of parks and the landscapes scheme .

- Heat island mitigation and microclimate enhancement.
- Water table restoration and water security
- Air quality improvement.
- Control Noise pollution and buffering.
- Controlling night sky /light pollution
- Habitat preservation and protection of hydrology, topographical features that may exist.
- Efficient utilization of materials.
- Implementing – Reduce , Reuse and Recycle.
- Use of green certified items (environmentally sustainable) - furniture, plays equipment etc.
- Leaf litter and other degradable waste of the park to be collected and composted in Composting pits, to be used later with manure within the park.

2.6 DESIGN FOR SAFETY AND SECURITY

Provide consideration to safety and security for the park at planning and design phase itself, by understanding and utilizing the appropriate and specific strategies.

- Provision of proper safety measures at entry points (gates, enclosures, security cabins, screening), if required.
- Provision of secure fencing/ barrier along the park boundary.
- Ensure spaces are well lit within the park and park periphery.
- Administrative control and maintenance needs to be effective.
- Safety standards of furniture, play equipment etc. need to be followed.

2. PRINCIPLES OF PARK DESIGN

2.7 EFFECTIVE ADMINISTRATIVE MANGEMENT AND ENFORCEMENT

An important part of park management, to ensure the efficient use of park resources, and the enforcement of the legal mandates must empower the functioning of the park by defining the limits under which they must operate.

a. Execution of a proper administrative control and supervision plan.

b. Action against any kind of encroachment to be taken.

c. Provision of designated space for hawkers & vendors to avoid sale at improper and unorganized spaces.

d. Restriction of construction of religious structures within park premises.

e. Restriction of construction/installation that aren't planned as part of the park .

f. Action against any damage done to the park property.

g. Action against individual or group that may use the park premise for illegal actions / activities.

2.8 FORMULATE A DEFINITIVE OPERATIONS AND MAINTENANCE PROGRAMME

Parks are to be developed through a cooperative effort of government and/or private stakeholders to ensure a high quality public space that all stakeholders will contribute to. A definitive operations and maintenance programme is to be formulated and executed to ensure continued contribution to the identity and usability of the park.

- Ensure regular cleanliness activity to maintain hygiene standards within the park.
- Use of secure, durable and sturdy light fixtures / loose furniture / art installations.
- Use of low-maintenance (drought-tolerant, long-life, etc.) planting scheme to reduce maintenance and replacement cost.
- Use of durable and environmentally sustainable materials to reduce repair and replacement costs.
- Access to and provision for maintenance equipment needs to be done.

2.9 DESIGN FOR PUBLIC HEALTH , WELLBEING AND RECREATION

Planning and design of parks to promote active fitness, improve air quality and microclimate, and enhance the health and wellbeing of park users and surrounding neighborhood.

This could be done by introduction of the following :

- Provide active recreation for a diversity of user groups.
- Provide play opportunities for children that build coordination, flexibility, and strength.
- Provide attractive areas to exercise and meditate for adults and senior citizens.
- Provide passive recreation - Walking trails, Nature trails.
- Use materials that add value to the activity such as soft surfaces for running and exercising.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Common elements of a park can be classified as park attributes. Each attribute has to be defined and assigned with respective **planning norms & design standards**. All attributes with their norms and standards should be considered for the designing of parks in synchronization. However, the amount of applicability will depend on the hierarchy level and the land use the park falls under.

3.1 SPATIAL ORGANIZATION

Spatial Organization refers to the relationship between activities and future expansion of opportunities in both indoor and outdoor spaces of a park that encourages social interaction and user participation to form a cohesive site design.

Physical Access & Adjacency

Physical Access gives consideration to safety, compatibility, privacy, concentration of activities, ease of operations and administration.

- Activities shall be grouped to maximize desirable effects - accessibility, control of participants, multi-uses. Activities shall be separated to minimize conflicts including noise and degree of physical activity.
    a. Locate facilities that draw the largest number of users such as gymnasiums, recreational centers, and pool facilities near or within view of established public transit routes.
    b. Locate public facilities like restroom, drinking water fountains within a walkable radius – 150 m , or 45 m radius of recreation fields and a 30 m radius of children's play areas.
    c. Trash collection enclosures shall be placed at least 15 m away from all public use buildings.
    d. Locate parking facilities near major park site features to facilitate the park user.
    e. Locate services like storm water management, rain-water harvesting tanks, etc. in non pedestrian/ non recreational areas.
    f. Locate maintenance yards away from children's play areas.
    g. Screen maintenance yards from adjacent activities.

- Consider all adjacencies when placing park features such as large group gatherings, pools, open gymnasiums, kid's play area, recreational activity zone, etc. which are potential sources of disturbance to the surrounding community, and measures to be taken for minimizing their impact on adjacent land uses.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Security and Safety

i. Surveillance and security features:

Placement of physical features and activities in such a way as to maximize visibility and foster positive social interaction among legitimate users of public spaces.

- Provide surveillance through landscape design, especially in proximity to designated and opportunistic points of entry.
    a. Security cameras must be installed at strategic locations of the park.
    b. Fencing and gates along site boundary / entry points shall be designed for visual porosity to allow passive surveillance. Height of the fencing shall be minimum 1.2 M.
- Lighting shall be designed to ensure all usable areas (pathways, steps, entrances/ exits, parking areas, kiosks, children's play areas, recreation areas, pools, storage areas, etc.) of the landscape are well lit and there is no dark spots.
    a. Avoid too-bright lighting that creates blinding glare hindering the view for potential observers.
    b. Use shielded or cut-off luminaries to control glare.

ii. Access Control:

Design shall clearly differentiate between public space and private space by selectively placing entrances and exits to limit access or control the flow.

a. Use clearly identifiable points of entry.
b. Use low, thorny bushes beneath ground level windows.
c. Eliminate design features that provide access to roofs or upper levels.
d. All visual overlooks must have an open unobstructed view of the park. Maintain clear sightlines to playgrounds, toilets, concession facilities, and other usable spaces.

3.2 RECREATIONAL FACILITIES

Any activity area in the park, both active and passive, that are occupied and used by park visitors.

Active Recreational Area: Sports activities and creative recreational amenities provided within a park for all age groups (with and without equipment's) to have an active and healthy lifestyle.

Passive Recreational Area: An open, unobstructed area used for non-programmed recreational activities.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Active Recreational Areas

- Develop playgrounds that provide enhancement of children's total developmental needs, including physical, social, creative, reflective and tactile experiences.
- Children's play areas fall into two age group classifications: Pre-school age children of two to five (2-5) years and school age children ages five to twelve (5-12) years. Each age group category must have a distinctly different play space.

i. Spatial Considerations**:**

- Play areas should be sited considering safety in mind. 30-45m wide safety buffer should be maintained between play area and vehicular access areas or a 1.2m. high fence should be provided to prohibit children from running into vehicular traffic.
- Play areas shall be linked to open spaces and segregated by natural barriers or features from conflicting or incompatible uses like parking, waterbody, etc.
- Play areas shall include shaded seating (tree canopy/ pavilion) for parental supervision.
- Restrooms and drinking fountains must be in a clear line of sight from play areas. Provide restrooms, within a distance of 30m of play area. Drinking fountains shall be located at a minimum distance of 7.5m from all play areas.

ii. Layout & Play equipment:

- Playground equipment and design shall meet respective safety standards.
- The design and equipment shall include a variety of play elements that encourage: Swinging, Spinning, Hand-over-hand and side-to-side climbing, Balance challenges, Overhead activities, Sliding, Sensory development, Crawling, Imagination, Adventure.
- Play equipment shall be from the standard manufacturers and play structure footings as per manufacturer's details.
- Play equipment design shall consider durability and the long-term maintenance requirements, as well as the potential for vandalism and graffiti. All proposed play equipment shall be installed for a minimum of 20 years.

iii. Surfacing:

- Selection of surfaces is an important issue and can, without careful consideration, use a significant proportion of the play space budget. The dominant factor in choosing surfaces, at least around equipment, has been safety in the event of falls from a height. Impact absorbent surfacing is also often used as a general surface treatment around equipment to avoid the erosion and muddy patches. It also helps to maintain play spaces in a usable condition all year round.
- Loose-fill surfaces such as sand and grit are good for tactile play.
- Bound rubber surfaces such as wet-pour can help introduce color to a play space. Wet pour can also be used to form mounds.
- Grass shall be considered for surfacing in some situations, though high levels of usage mean that it will be worn away, leaving bare soil, which may not be practical in all situations. In very busy play areas, where space is tight, use sand or grit rather than trying to maintain a grass surface.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Passive Recreational Areas

Natural and naturalized areas may accommodate passive recreation activities such as picnic, biking, nature trails with interpretive signage and rest areas, or similar activities.

i. Open Play Areas:

- Passive open play areas shall remain unobstructed by trees, to support activities such as throwing a ball, a frisbee, and/or flying kites.
- Provide shade trees at the perimeter of open play areas.
- Passive open play areas shall not slope greater than 5%.

ii. Picnic Areas:

- Provide a shade shelter for all group picnic areas. Small group picnic areas shall accommodate twenty-five to fifty (25-50) people. Large group picnic areas shall accommodate fifty to one hundred (50-100) people.
- Provide lighting within shade shelters.
- Provide security fencing around group picnic areas for rental purposes.
- Provide restrooms within 45M of group picnic areas.
- Provide seating pockets for different group of people at regular intervals.

3.3 EXTERNAL LINKAGES

Connect to nearby green spaces such as green belts, waterways, and wildlife sanctuaries, to provide greater habitat connectivity, and watershed functionality. Connect to social networks as well, such as adjacent streetscapes, land uses, and character creating opportunities for synergy with existing activities, commercial areas etc.

- Create opportunities for cross-programming, collaboration, and engagement with nearby organizations and resources such as greenways, blue belts, wildlife sanctuaries, Bicycle routes, museums, performance halls, Schools, etc.
- Enhance ecological connectivity for native plant species, birds, insects and other fauna.
    a. Create habitat connectivity to waterfronts, wetlands, bird migration corridors.
    b. Increase tree canopy cover in the neighborhood surrounding the park.
    c. Preserve and protect existing vegetation and site features during construction and other activities.
- Provide unobstructed accessibility to park entrances along major access corridors.
- Install signage indicating the nearest accessible entrance.
- Expand visual and character connectivity.
    a. Connect to visually appealing corridors that contain landscape and streetscape features in order to extend park qualities into the surrounding urban fabric.
    b. Use greenways and bikeways to link parks to areas of population to increase use and access.
    c. Capitalize on borrowed views and long range vistas.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.4 ACCESS

It refers to the connection of open spaces to surrounding transport facilities (bus/metro/MRTS) that are accessible for a wide range of users, including pedestrians, cyclist, transit riders and those using private modes of transport.

- Plan walkway and roadway widths to accommodate anticipated maintenance vehicle widths and turning radii without damage to kerb or soft-scape areas.
    a. Width of main approach road shall not be <9m.
    b. Approach road to building and open spaces on all sides shall not be <6m.
- Do not use vulnerable pavements in vehicle areas.
- Accommodate emergency vehicle access.
    a. Minimum turning radius of road shall be 9m. for fire tender movement.
    b. The height of canopy / archway coming in fire tender route shall not be<6m.
- Provide safe and direct access for pedestrians and cyclist.
- Create a hierarchy of entrances that reflects the streetscape hierarchy.
- Ensure that all primary entrances in new park sites are accessible to all user groups.
- Ensure accessible routes to park buildings coincide with general circulation paths.
- Avoid steps in design by doing grading / adding ramps for universal access.
- Provide pedestrian entrances near existing or proposed crosswalks.
- Direct pedestrian entrances toward public transit centers to encourage and facilitate alternative modes of travel to the park.

3.5 INTERNAL CIRCULATION

A well-connected network of park roads and paths providing an effective means to accommodate all forms of travel inside a park including; walking, bicycling, and transit.

Pedestrian -

i. Entry:

- Park shall follow a highly visible and distinct park entry design to create an identity, a sense of transition and arrival to the destination.
- Provide a clear separation between the park's vehicular and pedestrian entrances.

ii. Create a hierarchy of pathways with a primary pathway as organizing element & secondary pathways to link features in the park:

- Provide at least 1 primary travel path 3m wide minimum within the park which connects all major use areas. All curves within this route shall contain radii no less than 3m.
- Secondary paths shall be a minimum of 1.8m. wide.
- Tertiary paths consist of non-circulation routes, e.g. (around play areas), and shall be a minimum of 1.5m. wide.

iii. Circulation Elements:

- Pedestrian circulation path shall consist of sidewalks, wheelchair ramp, and landings.
- Provide deliberate focal points such as a circular drop-off or plaza where the network of pedestrian paths, bicycle routes and vehicular roads meet.
- Create anticipation and visual interest by framing views and directing attention to landscape features along the pathways.

3. PARK ATTRIBUTES & RECOMMENDATIONS

iv. Materials:

- Natural materials such as stone, or man-made materials such as tiles or cast in-situ concrete, of appropriate thickness may be used as paving finish in external areas.
- Adequate slope and drainage facility shall be provided for all external paved surfaces.
- Surface treatment of the finishes shall remain anti-skid throughout the seasons. Smooth finish is not recommended for external areas except to convey a design concept.
- Change in levels and steps shall be depicted in different texture & colour as a visual cue.
- Provide a pavement warning tile system and identify the path with visible signage and/ or striping, where a pedestrian path crosses a vehicular road.

Vehicular

i. Entry point:

- Locate the park vehicular entry to avoid conflicts with existing traffic volume on road.
- Locate the entrance to the maintenance yard off the parking lot.

ii. Provide maintenance vehicle access from the parking lot to the major, 3m. wide hard paths. The path shall be secure from public vehicular access via removable bollards. This path must be designed to support large maintenance vehicles with load weights of up to twenty (20) tons.

Bicycle

i. Encourage and facilitate bicycle travel to the park by providing bicycle path connections from the park to the following locations - Public bicycle paths, Street paths, Bike racks.

ii. Provide accessible route from designated differently-abled access parking stalls to all accessible entrances.

Universal Access

i. Pedestrian routes shall be made unobstructed by locating light posts, signage posts, waste bins , trees, benches and other furniture or fixtures off limits of the width of the route. Maintain a minimum unobstructed width of all pathways.

ii. Create a clear distinction between pedestrian routes and adjoining surfaces using visual and audible indicators and tactile paving.

iii. On all pedestrian routes: Use a maximum gradient of 1:20. For gradients above 1:20 use steps with integrated ramps.

iv. All ramps shall have minimum width of 1.20m., excluding edge protection. The cross slope of ramp shall not exceed 1 in 50 and the longitudinal slope of ramp may not exceed 1 in 12. All ramps may have an unobstructed level landing both at top and bottom of the ramp. The landing shall have the minimum width as that of the ramp.

v. Handrails shall be provided for any ramp with a vertical height greater than 300mm. To prevent pedestrians and wheelchair users slipping from the ramp. The height of the top handrail shall be 900mm from the top surface of the ramp. The ramp surface shall be rough finished. All ramp and landing shall be designed so that water does not collect on the surface of the ramp or landing.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.6 PARKING FACILITIES

'An enclosed or unenclosed space, covered or open area, sufficient in size to park vehicles. Parking spaces shall be served by a driveway connecting them with a street or alley and permitting ingress and egress of vehicles.'

Location

i. Provide adequate parking at each park location:

- To minimize parking on residential and arterial streets.
- For overflow parking in case of special events

ii. Locate parking lots in close proximity to major park activity areas.

iii. Parking lots must remain visually unobstructed and highly visible at all times.

Access Elements

i. Provide a barrier gate at park vehicular entries.

ii. Provide minimum 3m. Wide maintenance vehicle access to the primary park circulation system off the parking lot. The entrance from the parking lot shall be protected by locking removable bollards.

iii. Provide vegetated screening or visual barriers to prevent vehicle headlights from shining into residential areas; and access barriers at parking lot perimeters.

iv. Provide proper edging / kerbs to prevent parked vehicles from encroaching onto adjacent walkways or adjacent landscaped areas. Provide kerb cuts wherever necessary.

Planting

i. Provide shade to vehicles and lower the heat island effect in parking lots.

ii. Provide trees, shrubs, and ground cover at suitable intervals in order to break up the continuity of the parking area.

- Provide one planter per four parking space.
- Planter width excluding kerb – 1.75m minimum. Kerb height shall be 150 – 300mm.

iii. Plantation shall not block the view of motorists and pedestrians.

Space Reduction

i. Reduce parking space sizes by allowing cars to overhang planting areas or porous aggregate stone strips at the edge of parking areas.

ii. Reduce the number of paved parking spaces by developing shared parking strategies with adjacent property owners.

Materials

i. Use stabilized grass paving areas for infrequent use areas.

ii. Use light-colored/high albedo materials or open grid pavement for the parking lots to help in reducing the heat island effect.

Sustainability

i. Provide preferred parking space and signage for Low-Emission & Fuel Efficient Vehicles at high use park sites such as community buildings/ nature centers arboretum/botanical gardens.

ii. Provide best water management practices for drainage.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Design Elements for People with Physical Disabilities

i. Locate differently-abled access parking near the primary circulation route.

ii. Provide a minimum of 10% reserved parking facilities for differently-abled access with minimum dimensions of 2.3m x 4.8m with a 1.2m access zone.

iii. A parking space must have a minimum width of 2.7m-2.8m for ambulant differently-abled and minimum 3.0m, preferably 3.3m, for wheel chair users allowing adequate space on one side.

Other Regulatory Considerations

i. Provide authority compliant parking space and signage.

- The parking area shall be clearly marked to delineate parking spaces and to direct traffic flow.
- Pedestrian connections to and fro the parking lots shall be denoted with easily recognizable signage elements.
- Parking space shall be 2.5m × 5m as per local codes of parking for differently abled.
- Space for two wheeler and bicycle must be minimum 1.25sq. m. and 1.00sq.m. respectively.
- Each equivalent car space (including circulation) to be maintained at 23 sq.m for open parking.

ii. Parking spaces must be provided off-street or as dedicated parking pockets with ample turning radii for maneuver-ability of the vehicles.

iii . All parking lots must include security lighting.

3.7 BUILDING AMENITIES, SERVICES AND UTILITIES INFRASTRUCTURE

Parks have various types of built structures depending on their scale and location in the city. These buildings can include maintenance buildings, restrooms, community buildings, restaurants or guest houses.

Site Context

i. Design Continuity

- All structures shall be sited to recognize, preserve and protect established major vistas. Locate buildings to enhance sightlines and emphasize views.
- All structure designs must consider the distinctive qualities and character of the surrounding architectural vernacular design.
- Encourage a visual and connective interaction between interior and exterior spaces through large windows and door openings and shaded outdoor terraces and arcades.

ii. Ecological

- The Consultant shall consider Indian Green Building Council's (IGBC) "Leadership in Energy and Environmental Design" (LEED) criteria as it applies to the design and construction of a building project.
- All structure designs and historical restorations must be sensitive to environmental, cultural and historical context.

3. PARK ATTRIBUTES & RECOMMENDATIONS

iii. Other Considerations

- When locating a new park structure, consideration must be given to site variables (size, shape, topography, orientation, views, and natural features) and climatic variables(severe or temperate).
- Consideration, while building addition, must be given to the building's spatial organization and orientation which must be planned to support functional and site sensitive expansion.

Restroom Buildings

i. Spatial Considerations

- The building must be visible and in close proximity to a parking lot or public street.
- The building shall be located within a 30M radius and 45M of children's play areas and active recreation fields respectively.

ii. Amenities

- Provide ample paving around the building perimeter for ease of accessibility and entry.
- All fixtures, including; sinks, toilets, handrails and surface hand dryers shall be stainless steel and vandal resistant.
- Provide a minimum of two hand washing sinks outside/inside the restroom building.
- Provide an ambulatory accessible toilet for people who use canes or walkers.
- Provide vandal resistant exterior security lighting for all restroom buildings.
- One standard drinking fountain must be located outside of each restroom building.

Community Buildings

i. Spatial Considerations

- Intended to support indoor organized community events, meetings and activities.
- The building shall be visible and reasonably close to a parking lot and public street.
- Provide a drop off/pick-up zone near the main entrance where possible.
- Provide ample paving around the perimeter of the building for ease of entry, and prevent water penetration into the building. The building perimeter paved and unpaved areas, must have a minimum 2% slope away from all exterior walls within the limit of the first 3M for positive drainage.
- In restrooms, provide an ambulatory accessible toilet for people with canes or walkers

ii. Amenities

- Provide multi-functional activity rooms to be used throughout the day for different age groups. Each activity room shall accommodate 20 to 30 people.
- Provide a kitchen/pantry that meets all standards with adjacent storage space to accommodate supplies for two weeks to one-month.
- Provide a storage room to contain equipment and materials used to support park programs and activities.
- Provide ample natural lighting.
- Provide bicycle racks, trash receptacles, and drinking fountains near the building entrances.
- Provide security lighting at or nearby the building.
- Provide directional signage from the street to the main entrance.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Maintenance Buildings/Yards

i. Spatial Considerations

- Intended to support a broad spectrum of recreational facilities.
- Provide space in the maintenance building to accommodate maintenance vehicles, maintenance tools, supplies and materials & building and maintenance materials.
- Separate and screen maintenance facilities from public circulation routes and major usable areas by providing secured gates and fencing around the perimeter of all maintenance yards.

Services/Infrastructure

- Locate utility and access boxes outside the pedestrian travel zone which can also be treated as a public art element.
- Provide a two-tier drinking fountain for people of varying heights and those who have trouble bending, located adjacent to the community center restrooms.

3.8 SHADING AND SHADE STRUCTURE

A built structure (permanent or temporary), or a natural element, that provides relief from both natural and artificial elements present in the park.

Pergolas: A semi-sheltered area with trellis overhead for shade along passageways or sitting areas.

Covered Walkways: An unobtrusive sheltered path to link all blocks to the car park, drop-off porches and other major activity nodes and amenities.

- Provide shade at limited access points, kiosks, viewing points and for interpretive displays to promote outdoor activities and lifestyle & increase social interaction.
- Use various types of shade providing elements such as temporary built structures, soft-scape elements such as trees with large canopy.
- Provide shade structures with steel posts and rigid metal roofing or shade fabric.
- Provide continuous shade for 80% of primary walkways based on a minimum 1.8m width and 60% of secondary walkways based on a minimum 1.8m. width.
- Provide a minimum 1 number of shaded rest area for every 500 linear meters of primary walkway and for every 1000 linear meters of secondary walkway.
- Provide a minimum of 40% shade for all surface car parking.
- Provide 100% shade coverage for all play structures.
- Provide a minimum of 40% shade for informal play areas.
- Provide a minimum of 80% shade for all gathering areas and minimum 40% shade for all informal gathering areas.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Pergolas:

- Locate close to activity areas or at quiet places with nice views. For pergolas designed as spaces for sitting and viewing, should be located off the main walkway to avoid obstructing pedestrian flow.
- Orient pergola east-west so that horizontal members provide maximum shade.
- Design pergolas to allow creepers to grow over structure for shade and greenery. Provide sufficient planting area for creepers.
- Select the type and size of structural members or wires depending on the plant species.

Covered Walkways:

- Ensure adequate provisions for weather protection.
- Height: Width of roof cover shall be 1:1.
- Simple design and construction details are encouraged.

3.9 SOFTSCAPE DESIGN

Softscape serves to soften large exposed hard lines in the landscape. It also provides privacy to adjacent public spaces, delineates areas of different use, and creates organizing elements in the design of outdoor spaces.

- Provide open lawn area for unstructured play. Lawn types that require less mowing and water must be selected. Lawn areas shall be graded no steeper than a 5:1 slope for easy mowing.
- Minimum 1 tree/every 80sq.m. of plot area for plot sizes >100sq.m. shall be planted within the setback of the plot.
- Combination of dense landscaping, screen walls, beaming and/or mounding shall be used to screen service, loading, maintenance & storage areas, trash enclosures, utility cabinets, and other similar elements.
- Select plant materials that promote and support the regional identity to the park location.
    a. Use only non-invasive plants that are nursery grown or legally harvested.
    b. Use low maintenance, drought tolerant, hardy plants.
    c. Shrubs shall be selected and located with consideration for their function and size at full maturity to minimize pruning, and maintain the natural characteristics of the selected shrubs.
    d. Medium canopy trees with non-invasive roots shall be specified for areas adjacent to paved circulation paths and parking, to provide shade, reduce heat build-up, and minimize glare.
- Avoid creation of hidden areas in the landscape to support security and visual surveillance. The understory / shrubs planted along property line fences shall not grow above 2.4m. high, while shrubs planted in open areas should not grow over 1.2m.high.
- Compensatory plantation shall be done for felled / transplanted trees in the ratio 1:3 within the premises under consideration.
- Provide a two inch (2”) layer of organic mulch (free of weed seed) to all planted areas.

3. PARK ATTRIBUTES & RECOMMENDATIONS

Ecological Aspects

- Softscape design must be responsive and appropriate for the project site to minimize disruption to existing plant habitats. Use climate appropriate drought tolerant plants to support the design intent. Planting design should consider biodiversity and water conservation.
- Naturally occurring features including tree groves, dry streambeds, rock features, etc. are design elements that enhance the natural character of the site and must be protected.
- Plantation around buildings should be done to create micro-climates, lower energy consumption, and reduce costs associated with indoor energy needs.
- Identify, assess, and protect existing vegetation of aesthetic, historic, and ecological value.
- Protect and enhance ecological connectivity and habitat within the site's neighbourhood, and region.
- Design water efficient landscapes. Promote plant survival through plant selection and placement, associating plant needs with available water resources, appropriate soils, and mulch. Use storm-water as a resource by directing storm-water runoff from impervious areas to plant beds where infiltration, limited ponding, detention, evapotranspiration, and pollutant filtering can occur.
- Locate vegetated bio-swales outside of active recreation areas to achieve storm-water management goals for the park site.
- Design Low impact Irrigation Systems. Reduce irrigation to the minimum, for establishment periods and high use lawn areas. Prioritize use of systems that reuse storm-water and greywater.
- Increase quantity, density, and diversity of different canopy forms, understory shrub and herbaceous layers in planting areas. This may not necessarily mean expanding the plant palette, but rather plant to expand the palette of landscape types beyond lawn and trees has enormous environmental benefits and significantly reduced long term costs.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.10 HARDSCAPE AND MATERIALS

Hardscape refers to hard landscape materials in the built environment structures that are incorporated into a landscape. This can include paved areas, driveways, retaining walls, sleeper walls, stairs, walkways, and other landscaping made of materials such as wood, stone, concrete.

- Provide a variety of play surfaces, hard and soft, natural or synthetic. Alter hardscape materials to indicate space transition.
- Hardscape must be appropriately graded to direct storm water to the adjacent planted areas or to the designed storm-water management network.
- Limit the net paved area of the site under parking, roads, paths, or any other use so as not to exceed 25% of the site area or net imperviousness of the site not to exceed the imperviousness factor. *(TERI, Griha Maunual: volume 1: Introduction to national rating system, p.31.)*
    a. More than 50% of the total paved area must have pervious paving/open grid pavement/ grass pavers, OR
    b. A minimum 50% of the total paved area (including parking) must have shading by vegetated roof/pergola with creepers OR
    c. A minimum 50% of the total impervious paving area (including parking) must be topped with finish having solar reflectance of 0.5 or higher.
- Use good-quality compacted crushed natural stone or gavel on pathways. (jogging tracks)
- Use impact proof material for play areas.
- Use anti-skid paving around utility areas, waterbodies, other amenities and buildings.
- Use stabilized grass paving areas for infrequent use areas.
- Use local resources and manufacturing facilities that reduces transport costs and benefits the local economy.
- Use recycled materials to reduce landfill burdens, carbon emissions, and mining.
- Decreased pavement can help decrease storm water runoff volume and velocity. It can also improve water quality, infiltration and recharge for vegetative areas.
- Hard landscape materials and details of these shall be worked out so that sharp corners/ injurious edges, easily breakable materials are avoided in the public landscape.

Environmental Impact

- The urban heat island effect is the increase in ambient temperature due to heat absorption and storage by urban areas. Pavement is a primary cause of this phenomenon. The best way to decrease this is by decreasing its area, to shade areas with trees, or place it in areas shaded by buildings or park structures
- Reduce the environmental impact of concrete to make it a more sustainable construction material which can be achieved with less use of concrete, and use recycled aggregate in concrete mix.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.11 PARK FURNITURE

Park Furniture includes the various categories benches, tables, dustbins, receptacles, drinking fountains and light fixtures.

- All park furniture must be accessible for it to effectively perform its function.
- Provide a variety of seating options in clusters to maximize social and community interaction. Design seating arrangements to allow mobility restricted users to sit alongside friends and family or in groups.
- It must not obstruct clear access to other park feature, shop fronts, buildings or structures.
- Provide consistency in the design character of park furnishings.
- All park furniture and equipment must include recycled and natural materials content that are durable, conserve energy and water, and reduce greenhouse gas emission and thus have minimum negative environmental impact.
- All play equipment shall consider long-term maintenance requirement and potential to resist vandalism and graffiti, thus be expected to be in place for a minimum of 20 years.
- Securely anchor the play equipments to paving or installed in footings.

Benches:

- Distribute benches evenly throughout the park.
- Provide benches at key locations throughout the park including at the park entry, at regular intervals along the main circulation path, singular and grouped to support gathering, for viewing activities or vistas, and at recreational facilities such as organized play areas, tennis courts, etc. for supporting the visual supervision of children.
- Locate benches to maximize shade in summer and sun exposure in the winter.
- The minimum length of a seating section must be 1.5m.
- Position benches with back toward a wall, landscape planting, or trees to increase a sense of user security.
- Provide benches designed with a center armrest or center break to discourage sleeping.

Drinking Fountains:

- Locate drinking fountains near (with a clear line of sight from) athletic courts, group picnic areas, restrooms, sports facilities, & children's play areas.
- Position drinking fountains so that pathways are unobstructed by the fountain user.
- All drinking fountains must be vandal resistant.
- Provide anti-skid paving around the drinking fountain, gradually sloping towards the adjacent soft-scape.

Bicycle Racks:

- Provide shaded bicycle racks at all park entrances and near park amenities accessible by vehicular roadways.

Trash Receptacles:

- Provide an adequate number of trash receptacles throughout the park. At a minimum, locate near all parking areas, at the entrances to major buildings and restrooms, playgrounds, picnic areas, spectator areas, and at active recreation areas.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.12 SPECIAL FEATURES – WATER FEATURE , BRIDGES , DECKS

Special features in a park includes Water features – Natural pond / Lake / Fountains , Bridges, Decks and Boardwalks.

Natural pond/lake:

- Execute water management techniques like Rainwater Harvesting.
- Install fountains for aeration.
- Maintain a minimum depth of the pond/lake in consultation with designated professional.
- Maintain maximum depth of 400mm.

Fountains / Water play:

- Locate water features in areas of high activity or accessibility.
- Minimize the use of water by using timed water features such as pop jets, spouts and mist & recycle water.
- Provide water features, rippled or flowing.
- Integrate public art within water features.
- Prefer to place water play features adjacent to children's play areas.

Bridges:

Bridges shall facilitate safe access across water bodies, unstable ground conditions, elevation changes, or other site conditions.

- Bridges shall be designed to accommodate lightweight construction equipment and vehicles.
- Bridges shall have 6 feet minimum clear horizontal width. For remote trails, 4 feet minimum clear width shall be provided for pedestrian only use.
- Bridge deck surface shall be of a material and/or finish which inhibits slipping.
- Bridge surfaces shall be sloped to shed water.

Decks and Boardwalks:

Elevated structures, such as decks and boardwalks, shall be provided where water bodies, unstable ground conditions, elevation changes, or other site conditions impede access, or for elevated pathways over protected natural scenic areas.

- Structures shall have 6 feet minimum horizontal clear width.
- Surfaces shall slope to shed water.
- Structures shall be located along existing trails and paths when possible.
- Approaches shall have a smooth transition and comply with current universal access standards.
- Transitions shall not exceed ½ inch vertical dimension without a ramp.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.13 LIGHTING

- Lighting plays an important role in the perceived safety and visual interest of an area. Lighting is integral to creating a safe night-time environment for both pedestrians and vehicles. In addition, it is important to consider the effect lighting has on the larger area – glare, light pollution, and reducing the quality of the nighttime sky. Reducing light pollution saves energy, improves safety and security, protects plant and animal circadian rhythms, and restores the beauty of the night.
- Provide exterior security lighting at the following locations:
    a. Primary circulation routes
    b. Parking Lots
    c. Restroom Buildings
- Avoid haphazard placement of landscape light fixtures. Each light should have a clear purpose so as to enhance and complement the character of the site.
- Light should never be brighter than necessary and should be integrated into a needs – oriented control system to prevent night sky pollution. Glare, stray light and lateral or upward light emission from the luminaires should be avoided.
- Light should only be directed to where it is needed. The light fixtures should emit minimum light as per the specified total fixed lumens and only light the areas as required for safety and comfort.

    Uncovered Parking Areas

    a. Parking lots and drives - 1.6 W/sq.m

- **Building Grounds**
    a. Walkways less than 3m. wide - 3.28 W/linear meter
    b. Walkways 3m. wide or greater - 2.15 W/m2
    c. Plaza areas - 2.15 W/sq.m
    d. Special feature areas - 2.15 W/sq.m
- Illuminate treads, risers and any other level differences along primary and secondary pathways.
- Highlight public art, landscape, foliage and water features.
- Design to provide for the efficient use of energy through proper fixture selection and system controls. They must be sturdy and durable to prevent vandalism.
- Prioritize the use of Solar Lighting, LED and other high efficiency lighting. Considering LED lamp source emits 80-100 lm/W. In this case, 4/5W for each sq.m is recommended.
- Oversize electrical panel by 30% for future expansion.
- In natural surroundings in particular, shielded light points close to the ground should be planned and implemented wherever possible.
- Luminaires should have the highest possible protection type to prevent insects from entering and subsequently dying inside the luminaire housings.
- The surface temperature of the luminaires should be as low as possible. Avoiding unnecessary heat radiation will additional protect wildlife.
- The height of light fixtures to be decided based on their spacing to prevent wastage of energy or creation of dark patches

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.14 SIGNAGE

The purpose of these signage design guidelines is to provide guidance for their type and placement for building identity, branding, and wayfinding.

- Avoid placement of signage in locations that interfere with pedestrian or cyclist through sightlines. Place to reinforce primary gateways and landmarks.
- Each park must have a park identification sign at its main entry with the park facility name and authority seals.
- Provide a park information board and/or kiosk at street and pathway intersections, entrances to promote park events and activities, as indicated by the facility program.
- Provide a consistent hierarchy of signage and wayfinding elements. The signage must be classified based on functional requirements such as emergency, way finding, etc.
- Use a unified visual language through the medium of materials, colors and types for all signages. Use durable, easily maintained and non-reflective matte finish on all signages.
- Any graphic/interpretive element displays with narrative information must be located where best viewed by a seated individual. The written information shall also be provided in brail.
- Integrate use of lighting in areas of high night time usage. The recommended lighting power density is 130 W/m2 , max for internally illuminated signage, and 25 W/m2 , max for externally illuminated signage.

Entry Signage

- Heights of the dominating text:125mm (5”) or 150mm (6”). The adequate letter height shall be determined by the factors such as, placement of the signage and the viewing distance.

Educational Signage

- Header: 1/8th of the panel height. The dimensions of the sign are typically 2’x3’.
- Sign Base/Support: 3”x3” 1/8” square steel posts. Posts shall be 30” tall plus a 24” extension on a 45° angle.
- Sign Placement Signs: Located on either a paved or decked surface adjacent to a walkway or public space surface mounted with differently-abled friendly connectivity.

Way Finding Signage

- Heights of the dominating text: Either 50mm (2”) – 125mm (5”), although the size shall also depend on the site and the viewing distance. The size of all other graphic components shall be proportionally related to the height of the text.
- Sign Support Structure: All way finding signs 12” wide or less shall be post mounted on a 2”x2” metal post and a 6”x6” recycled plastic post for over 12” wide signs.
- Sign Placement: Along roadways, the height to the bottom of the sign must be a minimum of 5-feet. Along walkway and trails, height to the bottom shall be between 4-feet and 5-feet.
- **Regulatory & Warning Signs**
- Text Height: 1”-2”, although, the size may vary slightly depending on the site and the viewing distance. The size of all other graphic components shall be proportionally related to the height of the text

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.15 FENCE WALLS AND SCREENS

- Use fences/walls/screens only to define utility areas and restrict public access where appropriate.
- Minimize perimeter fencing.
- Use walls to a maximum height of 0.5m. to accommodate seating unless otherwise as prescribed by landscape architect.
- Use fences/walls/screens that are constructed of the same or similar materials expressed in the park design.
- Use berms, low walls and dense, locally occurring plant materials for screening.
- Use walls/fences/screens that do not restrict views to maintain park security and encourage safety of park users.
- For park refurbishment projects, new fencing must match existing park fencing unless otherwise specified by landscape architect.

3.16 PUBLIC ART

Public art constitutes sculptures, installations, murals, frescoes, bas-relief, folk and tribal art, artisan craft, wall paintings, indoor installations and other art forms relevant to the habitat. It is an important part of the urban spatial experience, which can be incorporated in the form of functional objects such as street furniture and paving designs. Public Art can be a powerful tool for education and outreach. Carefully designed art has a significant impact on the behavioral patterns of people.

- Use public art to enhance the public realm. Provide interpretive public art that focuses on culturally, historically or environmentally significance.
- Provide public art in primary gathering areas.
- Locate public art to accent view corridors and mark gathering areas.
- Locate smaller public art near entrances or gateways to help draw user into the space.
- Public art should be visual and tactile to generate interest and activity.
- Use public art constructed of durable and low-maintenance materials.
- Design public art to ensure public safety.
- Provide interactive sculptures for children – limit maximum height to 1.8 M.
- Use public art that is sensitive in colour and material to the park design palette.

3. PARK ATTRIBUTES & RECOMMENDATIONS

3.17 WATER MANAGEMENT

The built environment affects the natural ecosystems in various ways. Development of greenfields or raw lands that were previously undeveloped impacts the natural environment. Impervious surfaces are increased and the natural hydrology and existing wildlife habitats are affected.

Process

- Identify natural flow paths and small streams.
- Identify natural landscape recharge areas and depressions.
- Identify and delineate areas of natural hydrological benefit or sensitivity.
- Plan for long term protection of existing small streams and flow paths.

Design

i. To preserve and protect basic site hydrology

- Design new facilities around preserved areas and basic site hydrology, maintaining as much continuity and connectivity between preserved areas and original drainage patterns as possible.
- Minimize Soil Disturbance.
- Minimize cut and fill as much as possible.
- Develop planting plans in compatibility with soil conditions and storm water management techniques; plants are a major component of the water cycle.
- Develop erosion and sedimentation control measures to protect existing water features and hydrologic patterns.

ii. Protect small stream and flow paths

- Design buildings, roads, and infrastructure to avoid the removal, grading, or compaction of small streams and flow paths. Where crossings are unavoidable, design open bottomed culverts of the minimum required length shall allow for passage of aquatic organisms.
- Reduce unnecessary grading.
- Design to prevent the discharge of storm sewers directly into small streams and natural flow paths. Use berms, level spreaders, and other measures to dissipate water flow upstream of small streams.
- Avoid the concentrated discharge of storm water onto slopes where erosive conditions may develop.
- Situate built elements or areas of intense activity (such as playfields) with a buffer area that can absorb and slow runoff before it enters small streams and flow paths.

iii. Restore Existing Small Streams and Flow Paths:

(where small streams and flow paths have been damaged)

- Provide soil stabilization measures as needed.
- Create Absorbent Landscapes.
- Once source of excessive flows & erosive conditions have been addressed, use materials and methods to reduce flow velocities & restore sediment deposition, such as woodland .

3. PARK ATTRIBUTES & RECOMMENDATIONS

iv. Create Small Streams and Flow Paths

- Where possible, storm pipes shall be replaced with vegetated swales.
- In dense landscapes, small depressions shall be created by grading and soil amendments to catch and infiltrate water.
- Multiple depressions shall be linked to create connected water surfaces during periods of heavy rain.
- Depressions shall be limited to no more than four inches in depth, and incorporate soil amendments and plantings.

v. Rainwater Harvesting

- The Ground Water Recharge is mandatory for open spaces and parks, parking, plazas, and playgrounds having a plot area more than 500 sq.m
- Rainwater harvesting system shall be provided to capture at least 10% of run-off volumes from non-roof areas. The harvesting system designed shall cater to at least 1 day of normal rainfall occurred in the last 5 years.

vi. Irrigation system

Water demand for irrigation shall be reduced through highly efficient irrigation systems by the following measures:

- One or more central shut-off valves, as appropriate.
- Moisture sensor controllers , Time based controller for the valves such that the evaporation loss is minimum and plant health is ensured.
- Pressure regulating devices, to maintain optimal pressure to prevent water loss.
- Appropriate planting beds, based on landscape species and irrigation systems.
- Water leak detection system

vii. Storm water Management

- Manufactured sediment traps shall be used to intercept storm water runoff carrying silt and other debris from landscape areas to drainage devices.
- Grade all planted or lawn areas at a minimum slope of two percent (2%).
- Avoid grading lawn slopes steeper than the maximum mowing slope of 5:1.
- Crown playing fields a minimum of two percent (2%).
- Gradients shall not exceed a two percent (2%) cross slope on walkways.
- Do not exceed 20:1 or five percent (5 %) longitudinal slope gradient on walks.
- Place on-site storm water devices in areas outside of active recreation use areas.
- Incorporate the following where feasible: Bio-retention Area, Dry Stream Beds, Vegetated Buffers, Vegetated Swales, Porous Pavers.

viii. Reuse of Treated Waste Water

Municipal and ground water usage shall be minimized for landscape applications, so as to conserve potable water.

- All Parks with building having a minimum discharge of 10,000l. and above per day shall incorporate waste water recycling system.
- Reuse treated wastewater (on site& off-site) and/ or harvested rain water for atleast 20% of the landscape irrigation requirement.

4. OPERATION & MAINTENANCE

4.1 MAINTENANCE PLANNING

Prepare a park maintenance plan docket (written and illustrated) to be used for all future maintenance and operations by staff for better management of records and to gauge progress.

This will help in the following :

- Provide a base line to judge the management and performance of operation and the general upkeep of the park.
- Help device a detail schedule for operations over time.
- Encourages learning from earlier challenges / issues.
- Helps identifying staffing needs along with cost, material and equipment associated.
- Provides basis for maintenance budgeting and capital investment.

Maintenance Plan Docket

This needs to be handed to the maintenance agency that undertakes the activity.

The following needs to be included :

a. The park's design intent - scaled plan and relevant documentation of park design (this shall include original design documents and critical construction records for future planning and evaluation).

b. A plan that marks the degrees of maintenance and regime required for each zone or area of the park.

c. List all park attributes (signage's, benches, lights, bins, etc.) and their recommended care and repair solutions.

d. A manual with levels of service, task descriptions, that need to be undertaken on a daily / weekly or month basis with cost rates (both for in-house and out sourced activities).

e. For soft-scape - Provide guidelines and alternatives for the effective maintenance of trees, shrubs, ground cover and creepers along with directions on management of pests and beneficial organisms.

f. Directives for practices like mulching, watering, pruning and waste disposal.

Monitoring Performance

a. Conduct annual park inspections and success ratings against the published plans.

b. Provide user feedback forms to understand the users perspective and enhance maintenance activities accordingly.

c. Conduct annual review to evaluate the budget allocation according to escalating costs.

d. Map the park over time – through periodic photo documentation.

4. OPERATION & MAINTENANCE

Maintenance Regime :

DAILY MAINTENANCE	WEEKLY / FORTNIGHT MAINTENANCE	MONTHLY MAINTENANCE	YEARLY MAINTENANCE
Security guard and CCTV surveillance.	Maintenance, upkeep and repair for gym equipment's.	Entrance and all circulation areas to be damage free and leveled.	Trimming of branches.
Cleaning, Sweeping,	Mulching, pruning, de weeding	Plumbing repairs	Pest control and treatments
Proper irrigation as per their water requirement.	Checking quality of water – in cases of water features	Repainting, polishing, and repair of play equipment	
Cleaning of Toilets		All the light fixtures should be in working condition.	
trash, and litter collection and disposal.			

4.2 PUBLIC AND PRIVATE PARTNERSHIP

An agreement between the authority and a private sector or nonprofit entity through which the assets and resources of the authority and the skills and experience of the partner are shared in delivering a service or system for the use of the general public. At the moment, public private partnerships are the most cost effective way to improve park maintenance funding.

Advantages :

- Increase the quality or level of service.
- Partnerships helps foster support from the local community.
- Procurements are simpler and faster if there are in-place agreements with a private sector or local community group.
- Partnerships can bring specialized expertise that would not otherwise be available.
- Accelerate implementation and improvements process.

The type of partnership that could be explored :

1. Community-based partnership
2. Not-For-Profit organization / Community
3. Private sector company as a pert of their CSR initiative

4. OPERATION & MAINTENANCE

4.3 MAN POWER AND CAPITAL EXPENDITURES

Manpower required for maintenance and operation activities in the park would include – Security guard , sweeper / cleaning staff , gardeners and supervisor. They need operate in shifts and the number of persons to be employed will depend on the size and nature of the park .

The cost incurred and man power required for soft-scape maintenance is in the range :

AREA	PERSONS REQUIRED
10000 sq.ft.	1 (considering manual Irrigation)

Monthly salary expense

a. Gardener INR. 19500 /-

b. Supervisor(Diploma , Bsc.) INR. 25000 /-

Manure and Fertilizer INR 0.60 / sq. ft / month (includes annual top dressing- 1 inch , manure for shrub and lawn)

On an average the cost of soft-scape maintenance is INR. 2.10 / sq. ft / month (this includes labour , supervisor , manual irrigation, cleaning of leaf litter , cutting punning , top soil dressing , fertilizer / maturing and replacement in case of plant mortality)

4.4 TRAINING

Training – to keep up to date knowledge to the maintenance activity and clear doo's and don'ts for the staff. Transfer of knowledge to the staff responsible for future maintenance regarding utilities, material assemblies, equipment and systems. To ensure that the staff understands the installed equipment's are constructed, operated, and maintained.

i. Provides detailed understanding of how the project was conceived and built.

ii. Provides adequate time to learn system programming and operations and discuss setup requirements with installing contractors.

iii. Allows staff to develop a working relationship with contractors or subcontractors who may be used in the future for repairs or expansion of systems.

5. CASE REFRENCE- PRATITI INITATIVE

5.1 INTRODUCTION

A public parks initiative that has been developed keeping in mind **the need to develop a sustainable and cost-effective model for the redesign and refurbishment of public parks,** and public spaces in the Indian Context.

Over the past 7 years, this initiative has demonstrated, with no uncertainty, **the ability to develop these spaces irrespective of their size, geographic context, or urban density within which they find themselves.**

Since its inception, **the model has also continued to be cost-effective; instilling value in these public spaces within the city.**

5.2 THE PROCESS

- **Undertaking a study of parks across the city** – irrespective of scale, and geography.
- **Identifying the parks** that may be redeveloped under this initiative.
- **Developing a kit of parts** on the basis of these studies that can be adapted to public parks across the city.
- **Developing and presenting a design** to the commissioner, and requisite government authorities.
- **Undertaking a process of consultation** with the user groups.
- **Undertaking a Memorandum of Understanding**.
- **Identifying consultants and teams** required for execution.
- **Handing over the garden** to the user group.

5.3 CHALLENGES

The existing gardens in the city had several challenges , listed below are a few :

a. Bad Design :

- Too much of hardscape in comparison to softscapes,
- Lack of amenities,
- Inadequate or nonexistent ramps and access / connections in the parks,
- No planned shelters within the parks.

b. Lack of Bio diversity

- Limited Planting palette.

c. Lack of Maintenance

- Toilets and drinking water facilities were not maintained well.
- Poor security that encourages unethical activities within the parks .
- Poor condition of vegetation is seen in parks.

5. CASE REFRENCE- PRATITI INITATIVE

5.4 PARK ATTRIBUTES _ KIT OF PARTS

For effective design and maintenance a kit of parts was developed.
One that was cost-effective, sustainable, and adaptable.

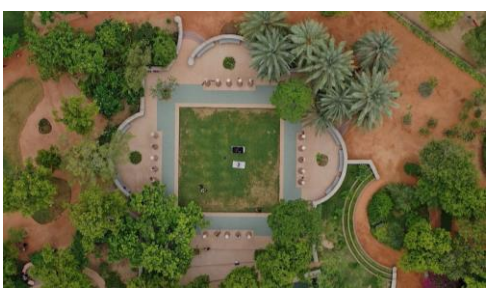
Signage


Accessible entrance


Playground


Seating courts

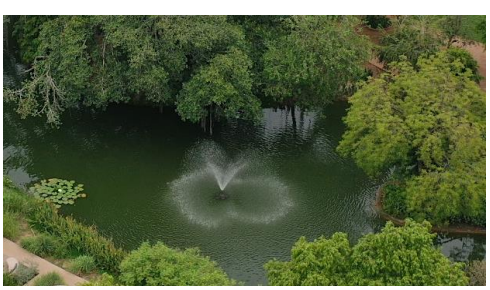

Shaded Walkways


Meditation ground


Outdoor Gym


Biodiversity and Experientially


Amphitheater


Waterbody / Fountain

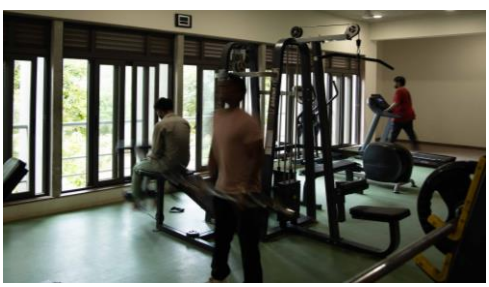
5. CASE REFRENCE- PRATITI INITATIVE

5.4 PARK ATTRIBUTES _ KIT OF PARTS

Loose furniture – Seating and Waste bins

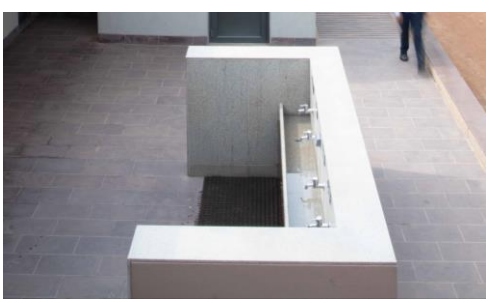
Lighting

Pet park



Gym Building

Waste Bins



Drinking water facilities

Hygienic Toilets

Installations

5.5 PARK ATTRIBUTES _ ECONOMICS OF OPERATIONS AND MAINTAINCE

Based on the parks developed so far for the PRATITI INITATIVE , the cost can be broken up as follows :

Cost of Design and Maintenance - 600 INR per sq. m Per Annum.

Depending on design, these parks cost Rs. 2750-4000 per sq. m to develop.

5. CASE REFRENCE- PRATITI INITATIVE

5.6 STAKEHOLDER AND RESPONSIBILITY MATRIX

Ahmedabad Municipal Corporation

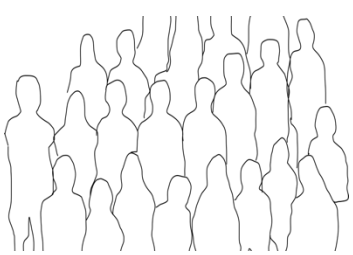
The Ahmedabad Municipal Corporation takes on the responsibility of **identifying the parks** that may be taken under the umbrella of this initiative, and **ensuring the acquisition of permissions** that would allow the requisite design and management interventions and, in so doing, becoming instrumental in furthering this process.

U.N Mehta Foundation

While the Foundation, of course, has taken on the responsibility of **funding this initiative, as well as that of the management and maintenance** of these parks for posterity, they also **act as liaisons between the Corporation, and the Design Team** as and when required.

Design Team

Not only does the design team undertake the **management, curation, and execution of the design process**, it also looks at the **selection of the gardens** that are redesigned and refurbished as a part of this initiative. Of great criticality is the fact that designers from LEAF visit and monitor the quality and maintenance of all parks on a bi-monthly basis for perpetuity.



Park Users & Local Residents

The user group tends to become the **custodians of these spaces** – looking at the day to day – once the redesign and refurbishment of the space is complete, and the garden is returned to the community.

At each step, **consultation with stakeholders, and various user groups has been critical to the process of design and execution**

SINDHU BHAVAN PARK

SWATI BUNGALOWS PARK

PARIMAL GARDEN

VICTORIA GARDEN

6. EVALUATION PARAMETERS FOR PARKS

Parks are all not the same and dealing with them through generalization standards will not be justifiable and fair. Although there are certain desirable qualities that are a resultant of general aspects that are considered while designing and management of the park . To evaluate a park , these aspects can be looked at and a framework be developed to rate / score the park. This evaluation will help in analyzing the issues better and address them.

6.1 EVALUATION BASED ON PARK ATTRIBUTES

SR No	ATTRIBUTES	CRITERIA (Refer Section 3.1 – 3.17 for detail list)	EVALUATION	REMARKS
1.	Spatial Organization	- Spatial organization and orientation planned to support functions and site context - Clear well defined spaces with defined ingress points	★ ☐ ★★ ☐ ★★★ ☐	
2.	Recreational Facilities	- Adequate recreational facilities for all age groups - Well maintained and functional facilities	★ ☐ ★★ ☐ ★★★ ☐	
3.	Safety and security	- Securing the park boundary and edges – wall , screens , fences . - Security cameras installed at strategic locations within the park.	★ ☐ ★★ ☐ ★★★ ☐	
4.	Internal Circulation	- Well connected spaces with no obstruction to movement. - Separate walking and cycle paths - Universal Access	★ ☐ ★★ ☐ ★★★ ☐	
5.	Parking facilities	- Adequate parking for 2- wheelers and 4 wheelers (within or in close vicinity of the park)	★ ☐ ★★ ☐ ★★★ ☐	
6.	Hardscape	- Area under hardscape - Durability of material	★ ☐ ★★ ☐ ★★★ ☐	
7.	Softscape	- Plant materials that promote and support the regional identity - low maintenance shrubs varieties - Lawn type that require less water and mowing activity	★ ☐ ★★ ☐ ★★★ ☐	
8.	Lighting	- Energy efficient lighting solutions - Scheme to avoid night sky pollution - Scheme to ensure all area of circulation and gatherings are secured	★ ☐ ★★ ☐ ★★★ ☐	
9.	Irrigation	- Recycle or treated water to be utilized if available - Selection of correct system to optimize water consumption	★ ☐ ★★ ☐ ★★★ ☐	
10.	Park furniture , Signage & Way finding	- Durable and well designed park furniture placed at logical locations - Signage must include - Park information boards, park rules , way finders	★ ☐ ★★ ☐ ★★★ ☐	
11.	Public Art	- A powerful tool for education and outreach - public art constructed of durable and low-maintenance materials and ensures public safety	★ ☐ ★★ ☐ ★★★ ☐	

Compliance with recommendations	50 - 65 %	65 - 80%	80% and above
Rating	★ Points +2	★★ Points +5	★★★ Points +10

6.2 PARAMETERS – TO ASSESS SUSTAINABILITY

Aspects of sustainability such waste generation and management, water and electricity usage, and demand for both can be evaluated for an existing or under development park .
This evaluation will address issues if prevalent and help take measures in improving sustainability.

RATIO OF HARDSCAPE : SOFTSCAPE AREAS	
Upto 15% : 85%	★★★
Upto % 25%: 75 %	★★
Upto 35 %- 65%%	★
LIGHTING WATTAGE (PER SQM.)	
< 5 w/ Sq. m	★★★
5 – 15 w / Sq. m	★★
> 15 w / Sq. m	★
IRRIGATION WATER DEMAND (PER SQM.)	
< 4 liters/ Sq. m	★★★
4- 7 liters/ Sq. m	★★
7-10 liters/ Sq. m	★
SOFTSCAPE - SPECIES DIVERSITY IN PARK	
100 % native vegetation	★★★
75 %- 100 % species matches with native vegetation	★★
50 %- 75 % species matches with native vegetation	★
RAIN WATER MANAGEMENT (SPONGE GARDEN)	
Zero run off	★★★
Upto 25 % run off	★★
Upto 50 % run off	★
WASTE MANGEMENT (ON SITE – REDUCE , REUSE , RECYCLE)	
100%	★★★
70 %	★★
50 %	★

Rating ★ Points +2 ★★ Points +5 ★★★ Points +10

7. ANNEXURE

7.1 STATISTICS AND NORMS

OPEN SPACE / PER PERSON – ORGANISATIONS

Open space per person and percentage for open space differ as per different organisations..
Given below is the data for a few organisations:

ORGANISATIONS	AREA OF OPEN SPACE PER PERSON
World Health Organisation (WHO)	9 sq.m
Public Health Bureau & the Ministry of Housing (USA)	18 sq.m
European Union	26 sq.m
United Nations	30 sq.m

Sir Patrick Abercrombie *formulated the* ***Greater London Plan in 1946 in which he considered 1.62 Ha. of open space per 1000 population*** *which was reasonable figure to adopt for London.*

OPEN SPACE / URBAN PARK –GLOBAL CASES

Open space per person and percentage for green cover differ in different cities in the world.
Given below is the data for few of the cities:

CITY	OPEN SPACE PER 1000 PEOPLE (Ha)	OPEN SPACE PER PERSON (SQM)	% GREEN COVER	TOTAL NO. OF PARKS
LONDON	3.1	31.6 sq.m	47 %	376
NEW YORK	0.6	6.07 sq.m	35 %	1700
SHANGHAI	0.8	8.5 sq.m	58 %	532
HONG KONG	0.1	1 sq.m	40 %	26
SINGAPORE	0.75	7.5 sq.m	46 %	300

7. ANNEXURE

7.1 STATISTICS AND NORMS

OPEN SPACE / URBAN PARK -INDIAN SCENARIO

As per the URDPFI (Urban and Regional Development Plans Formulation and Implementation) guidelines, there should be **10- 12 sq.m of per-capita green space in urban areas and 1.2 to 1.4 Ha of green space per 1,000 population**.

CITY	OPEN SPACE PER 1000 PEOPLE (Ha)	OPEN SPACE PER PERSON	% GREEN COVER	TOTAL NO. OF PARKS
DELHI	2.1	21.5 sq.m	46.2 %	376
AHMEDABAD	0.03	0.37 sq.m	56.2 %	202
MUMBAI	0.1	1.24 sq.m	10.13%	532
BENGALURU	1.7	17.32 sq.m	12.3 %	938
CHENNAI	0.08	0.81 sq.m	51.6 %	300

7. ANNEXURE

7.2 REFERENCES

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