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DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

ENDORSED BY THE

B4P TRANSFORMATION TOOLBOX

NEIGHBOURHOOD EVALUATION CRITERIA

01.0

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B4P TTB GL NEIGHBOURHOOD EVALUATION CRITERIA

CONTENT

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Graphic illustration of cover page:
Uddam Pen, Prosob Media, Phnom Penh.

01.0 NEC

FOREWORD

Dear planners, real state developers, city administration, national authorities and all stakeholders in the development of Phnom Penh's urban landscape:

As urbanization continues to accelerate in Phnom Penh, as in many other Cambodian cities, the need for sustainable neighbourhoods has never been more pressing. In the face of climate change, resource depletion, and social inequalities, it is our collective responsibility to create urban environments that are not only functional and aesthetically pleasing but also environmentally resilient and socially inclusive.

In collaboration with the German Sustainable Building Council (DGNB), our inter-disciplinary team has intensively collaborated to develop the B4P Neighbourhood Evaluation Criteria. These are designed to provide a comprehensive framework for the planning and development of sustainable neighbourhoods in Phnom Penh.

The evaluation criteria include indicators for assessing key aspects of sustainability: Integrated Urban Design, Blue-Green Infrastructure, Sustainable Urban Mobility, Climate Protection & Energy Flows, Social Inclusion & Local Economy as well as Governance & Participation. By focusing on these six core areas, we aspire to foster that every neighbourhood development – from early stages planning to operation – takes into account the long-term well-being of the community and the local environment.

The B4P Neighbourhood Evaluation Criteria provide both a roadmap and a benchmark for sustainable urban development in the city. We believe that by following these criteria, we can make sustainability more measurable and transparent. In this way, greenwashing can be reduced. In general, these criteria can transform Phnom Penh into a model of sustainable urban living, setting the stage for future generations to thrive in harmony with their surroundings.

We thank you for your commitment to building a sustainable future for Phnom Penh.

Sincerely,

Dipl.-Ing. Rolf Messerschmidt

CEO of Eble Messerschmidt Partner
Leader of B4P Work Package"Sustainable Neighbourhoods"; DGNB Senior Auditor and Member of the Technical Board

Dr. -Ing. Stephan Anders

Director Network and Consulting
German Sustainability Building Council (DGNB)
Member of the B4P Expert Advisory Board

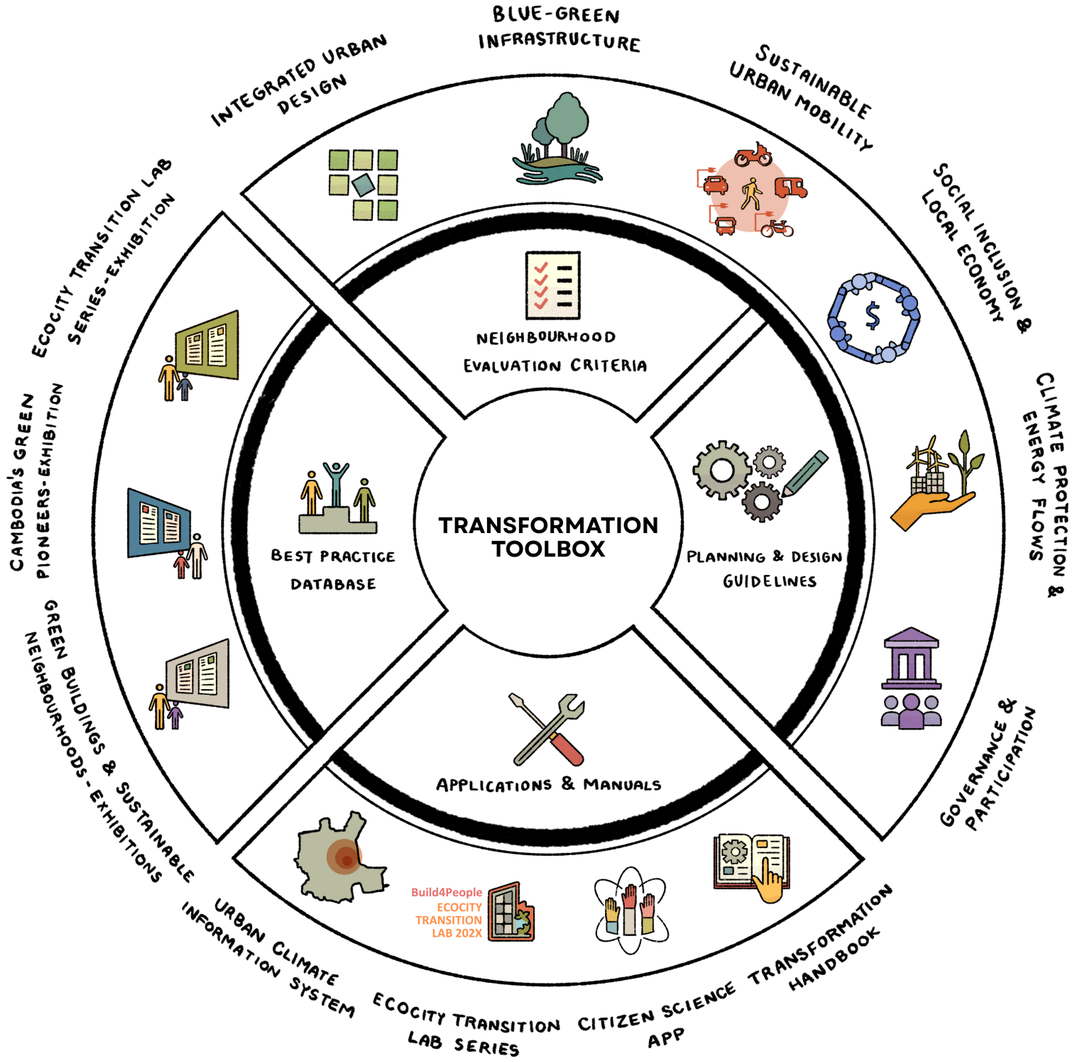


Figure 1. Overview of the B4P TTB GL Toolbox components. The present publication corresponds to the first section, the Neighbourhood Evaluation Criteria. Source: Build4People

CRITERIA 01.0

1 INTRODUCTION

TO BE FURTHER DISCUSSED WITH LOCAL STAKEHOLDERS DURING B4P IMPLEMENTATION PHASE 2025-2027

In recent years the rapid urbanization of Phnom Penh, Cambodia's capital city, has led unorganised urban sprawl, unplanned infrastructure, environmental degradation and social inequities. Recognizing the need for more sustainable and livable urban spaces, there has been a growing interest of public and private sector on incorporating comprehensive neighborhood evaluation criteria that prioritize environmental, social and economic qualities in new urban areas with mostly residential use.

The presented neighbourhood evaluation criteria shall serve as guide for assessing, on the one hand the sustainability performance of new mixed-use dwelling areas, and on the other hand, how those areas meet the fundamental needs of the users.
These criteria are designed to consider various interconnected factors that contribute to the overall livability, resilience and sustainability of neighborhoods, ultimately aiming to improve the quality of life for residents, workers, and visitors alike.

The neighbourhood evaluation criteria was developed by the B4P Work Package "Sustainable Neighbourhoods" in close cooperation with the German Sustainability Building Council (DGNB). It encompases the research conclusion and empirical knowledge of the different disciplines that integrate the B4P consortcium while integrating strieved benchmarks and qualities of the DGNB neighbourhood certification system, tailored for the Phnom Penh context.

Aligned with the overarching B4P Toolbox framework the criteria are organised in the following six different categories:

- Integrated Urban Design
- Blue Green Infrastructure
- Sustainable Mobility
- Climate Protection & Energy Flows
- Social Inclusion & Local Economy
- Governance & Participation

CONTRIBUTION
OF THE NEIGHBOURHOOD EVALUATION CRITERIA TO THE UN SUSTAINABLE DEVELOPMENT GOALS

Figure 2. Overview of the Contribution of the B4P TTB NEC to the UN Sustainable Development Goals. Source: Eble Messerschmidt Partner

III Application of B4P TTB GL Neighbourhood Evaluation Criteria

There is a strong interrelation between the Build4People Criteria and the Build4People Guidelines, both of which contitute key components of the Build4People Toolbox.

The Guidelines serve as an instrument for integrating sustainability aspects in order to achieve the targets defined by the Criteria. For each category of the Criteria, a corresponding Guideline is provided.

At the outset of neighbourhood development, project goals – including sustainability objectives– should be clearly defined. In this context, the B4P Planning and Design Guidelines should be systematically considered.

During the development of initial planning concepts, alternative variants should be evaluated on the basis of the B4P Neighbourhood Evaluation Criteria. A preliminary assessment, with particular emphasis on the Early Stages Criteria, is intended to support decision-making regarding the further course of action.

The Criteria should accompany the entire master planning process, with repeated assessments of sustainability qualities to ensure consistency and alignment with objectives.

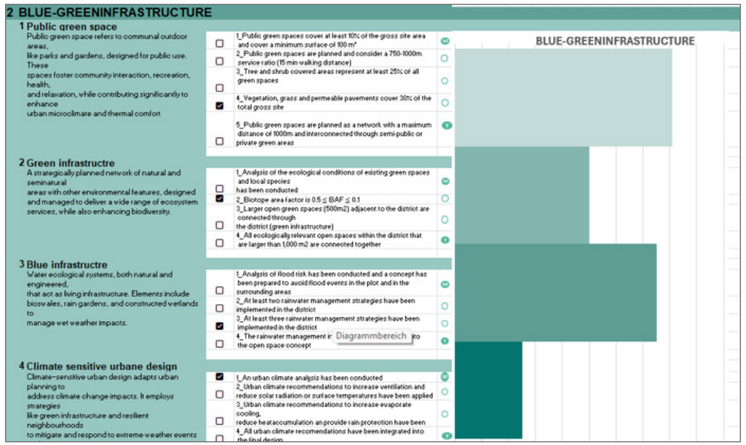
In the implementation phase, regular evaluation checks can be incorporated into status reports to monitor the sustainability performance of the neighbourhoods, thereby serving as a quality assurance mechanism.

For the evaluation process, checklists of criteria and indicators, as well as a structured presentation of overall results, are provided within a dedicated project evaluation tool.

Figure 3. Strong interrelation between Build4People Criteria and Guidelines
Source: Eble Messerschmidt Partner

CRITERIA 01.0

Checklist Blue-Green Infrastructure



Checklist Integrated Urban Design

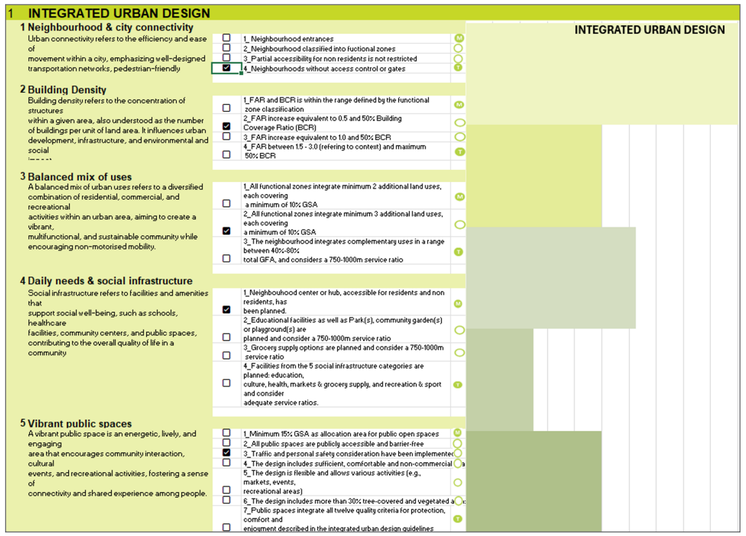
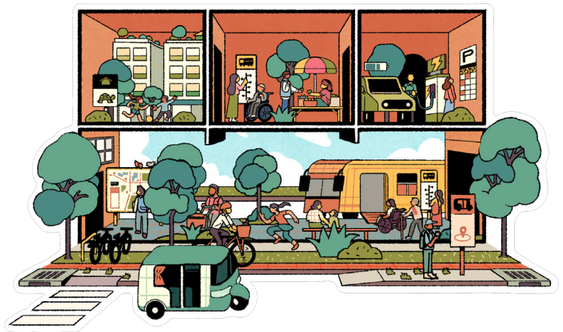


Figure 4. Examples for Build4People Checklist
Source: Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB)

STRUCTURE
OF THE B4P TTB GL NEIGHBOURHOOD EVALUATION CRITERIA



SUSTAINABLE URBAN MOBILITY

Sustainable Neighbourhood Development Goal

The objective of the sustainable mobility evaluation criteria is to promote environmentally friendly, accessible, and efficient transportation solutions in new neighborhoods of Phnom Penh. It prioritizes public transit, cycling, walking and the concept of Mobility-as-a-service (MaaS) to minimize environmental impact, enhance commuter comfort, and provide strategic, non-individual mobility alternatives.

Goal Objective

RELEVANCE

Importance of this criteria set

1. **ENVIRONMENTAL CONSERVATION:** Reduces carbon emissions, air pollution, and dependence on fossil fuels.
2. **IMPROVED PHYSICAL & MENTAL HEALTH:** Encourages active transportation, enhancing physical fitness and reducing health risks.
3. **ECONOMIC EFFICIENCY:** Promotes dense urban development and thus lowers overall urbanisation costs (compact development = overall less public works requirements)
4. **COMMUNITY WELL-BEING:** Active mobility promotes social cohesion, thus building stronger communities bonds.

PEDESTRIAN & BIKE FRIENDLY ENVIRONMENT |

Criterion Name

A pedestrian and bike-friendly environment prioritizes safe and convenient spaces for walking and cycling. It features well-designed sidewalks, bike lanes and traffic-calming measures, fostering sustainable, healthy and accessible urban mobility.

M **Proportion of areas designated for slow mobility have generally a minimum width of 2m for pedestrians and 1.8m for bikes per direction**

Minimum Requirement

Incremental Indicators

- Urban structure facilitate walking and cycling mobility by adjusting block length between 100m and 200m
- Bike and pedestrian networks are planned considering safe crossings and barrier-free to guarantee universal accesibility
- Traffic calming measures are included as part of the street design standard: e.g. chicanes, speed bumps, lane narrowing, shared streets.
- Pedestrian and bike paths are designed as attractive and comfortable spaces for users, with shaded and sheltered areas, low-maintenance landscape design and using long lasting materials and urban furniture
- Street network has direct connection to a neighbourhood mobility hub

Target Quality

T Buildings integrate bicycle access, bike parking and adequate spaces for bike users such as lockers, showers and dressing rooms

Criterion Description

***OPTIONAL EVALUATION CRITERIA**

Neighbourhood qualities that are not mandatory but can be considered for evaluation.

- Noise control measures
- Include mobility sharing services

Figure 5. Guideline cover illustration: Uddam Pen, Prosob Media, Phnom Penh.

EARLY STAGES SUSTAINABILITY CRITERIA

HIGHER INFLUENCE AND LOWER EFFORT DURING THE EARLY STAGES OF A PROJECT

Making informed decisions during the early design phases plays a crucial role in improving a project's long-term sustainability and reducing future costs. At this stage, key choices such as site selection, zoning and green space allocation can significantly influence environmental performance. Early interventions have a far-reaching impact compared to construction, operation and maintenance phases, where the scope for improvement is limited and often more expensive. By strategically planning these elements early, projects can reduce environmental impact and achieve better overall performance throughout their lifecycle.

Phnom Penh´s rapidly growing urban areas present both opportunities and challenges for sustainable neighborhood development. Municipalities often face difficulties translating sustainability goals into practical measures due to limited resources and tools. Early-stage sustainability criteria offer public authorities a structured framework to support sustainable neighborhood planning and implementation. They help set clear project requirements, ensure transparency and reduce long-term risks, creating more resilient and future-proof urban areas. These criteria also serve as practical instruments for aligning neighborhood planning with broader municipal goals, helping authorities manage growth while preserving environmental quality and community well-being.

For private neighborhood developers, early-stage sustainability criteria provide valuable guidance in designing and managing projects with long-term environmental and social benefits. They can be used to meet international standards such as the DGNB Certification System for Districts and to position projects as forward-thinking and environmentally responsible. This alignment with recognized sustainability frameworks not only enhances a project's reputation, but also improves its attractiveness to stakeholders and future residents.

These early-stage criteria were developed based on various sources, including the DGNB district certification standards, the Ecocity book series, the Phnom Penh Sustainable City Plan (2018–2030) and the Build4People Ecocity Transition Lab outcomes. They provide a practical pathway for improving the sustainability performance of neighborhood projects in Phnom Penh.

DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

KEY EARLY STAGES CRITERIA

FOR SUSTAINABLE NEIGHBOURHOOD DEVELOPMENT

Neighbourhood & City Connectivity	Neighbourhood entrances, with and without access control, connect with main surrounding paths and roads
Building Density	FAR minimum 1.5 or within the range defined by an up-to-date functional zone classification
Balanced Mix of Uses	All functional zones integrate minimum 2 aditional land uses, each covering a minimum 10% of GSA
Public Green Space	It should represent minimum 10% of total development area
Blue Infrastructure	Analysis of flood risk has been conducted and a concept has been prepared to avoid and/ or mitigate flood events on the site and in the surrounding areas
Pedestrian & Bike Friendly Environement	Proportion of areas designated for slow mobility have generrally a minimum width of 2m for pedestrians and 1.8m for bikes per direction
Public Transport Infrastructure	Integration of paratransit (Tukuks and taxis) into the roadway with waiting areas and pickup-drop-off zones
Energy Effient Buildings	Passive design strategies to reduce cooling demand have been implemented
Life-Cycle Oriented Design	Reduction of 20% of concrete, steel and sand usage in comparison to a similar project in scale and use / own initial design proposal has been calculated and can be proved
Circular Neighbourhoods	Define a waste management concept for the construction of the development
Affordable Housing	10% of residential units are planned for affordable housing
Social Mix & Diversity	Mixed-use typologies and housing alternatives for different socio-economic classes have been included
Community Involvement & Participation	Information events took place during design or construction phase
Sustainable Lifestyles	Initiate social marketing campaigns to promote sustainable life styles

IV B4P TTB GL NEIGHBOURHOOD EVALUATION CRITERIA

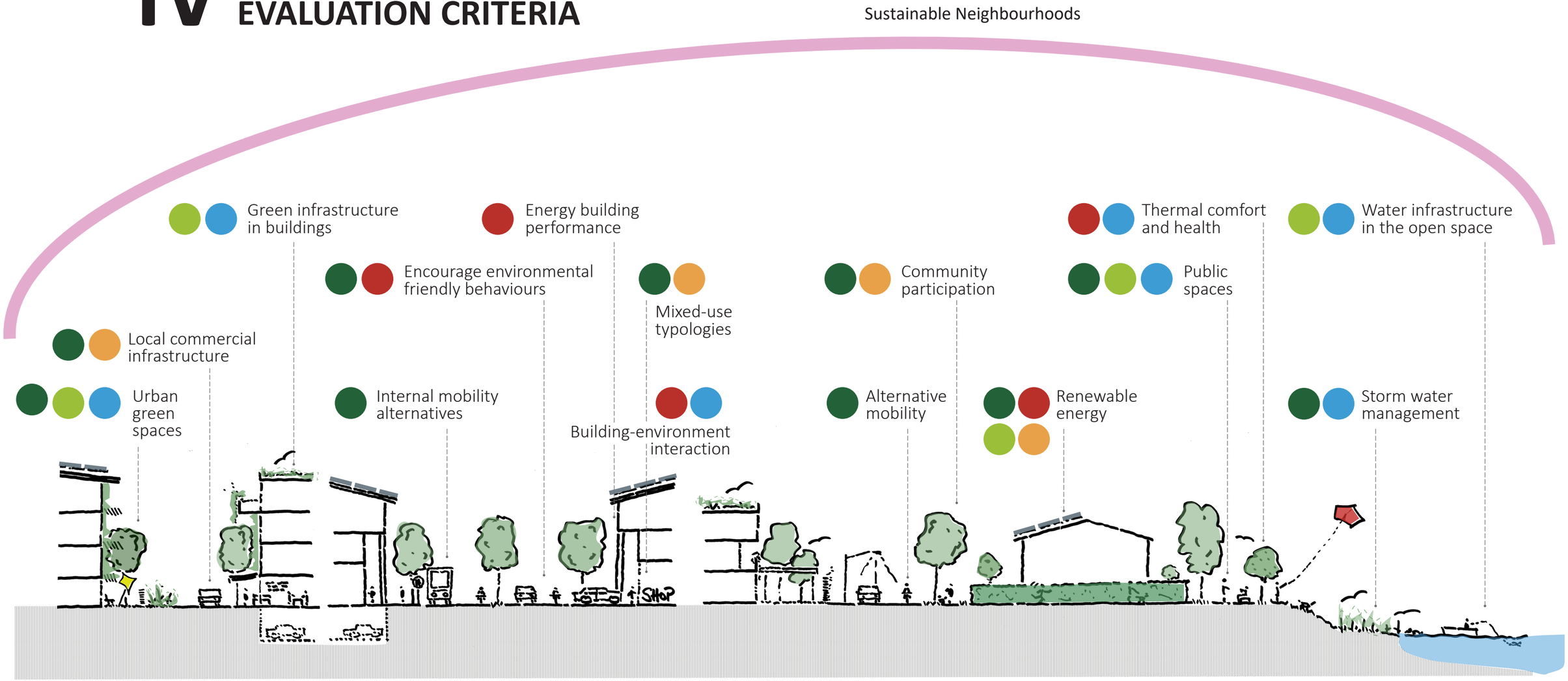
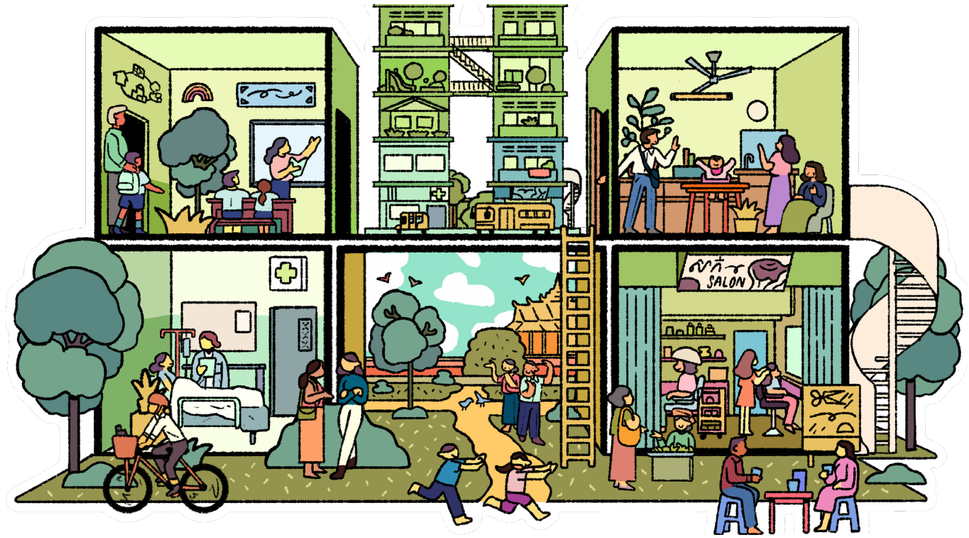


Figure 6. During the B4P Ecocity Transition Lab 2023 in cooperation with the Phnom Penh property developer company Peng Huoth, this comprehensive graph was developed to illustrate the need to integrate the thematic approaches from different B4P Work Packages to achieve sustainable urban development.

CRITERIA 01.0



INTEGRATED URBAN DESIGN

The objective of the integrated urban design criteria is to ensure the seamless integration of new urban fabric and its inhabitants by providing a neighborhood where residents can fulfill their basic needs, such as health, education and recreation within close proximity. It aims to design economically viable neighborhoods with high-efficiency land use, functioning as urban acupuncture to enhance not only the neighborhood itself but also the surrounding areas.

RELEVANCE

1. **SUSTAINABILITY:** Addresses environmental and social concerns, promoting eco-friendly practices.
2. **EFFICIENCY:** Optimizes resource allocation, reducing waste and improving infrastructure.
3. **COMMUNITY WELL-BEING:** Creates cohesive, livable spaces, meeting diverse needs and enhancing residents' quality of life.

Figure 7. Graphic illustration: Uddam Pen, Prosob Media, Phnom Penh.

M *Minimum*
T *Target*

NEIGHBOURHOOD & CITY CONNECTIVITY |

Urban connectivity refers to the efficiency and ease of movement within a city, emphasizing well-designed transportation networks, pedestrian-friendly pathways and accessible public spaces, promoting social inclusion, seamless integration and mobility.

- M **Neighbourhood entrances, with and without access control, connect with main surrounding paths and roads**
- The neighbourhood has been classified into fuctional zones and considers appropiate urban transitions between them
- Partial accessibility for non residents is not restricted
- T Neighbourhoods are planned without access control or gates

BUILDING DENSITY |

Building density refers to the concentration of structures within a given area, also understood as the number of buildings per unit of land area. It influences urban development, infrastructure and environmental and social impact.
** Floor Area Ratio (FAR)*
** Building Coverage Ratio (BCR)*

- M **FAR minimum 1.5 or within the range defined by an up-to-date functional zone classification**
- FAR of 2.0 or higher and maximum 80% BCR
- FAR of 2.5 or higher and maximum 80% BCR
- T FAR of 3.0 or higher and maximum 80% BCR

BALANCED MIX OF USES |

A balanced mix of urban uses refers to a diversified combination of residential, commercial, and recreational activities within an urban area, aiming to create a vibrant, multifunctional, and sustainable community while encouraging non-motorised mobility.
** Gross Flor Area (GFA)*

- M **All functional zones integrate minimum 2 additional land uses, each covering a minimum of 10% GFA**
- All functional zones integrate minimum 3 additional land uses, each covering a minimum of 10% GFA
- T The neighbourhood integrates complementary uses in a range between 40%-80% total GFA, and considers a 750-1000m service range

DAILY NEEDS & SOCIAL INFRASTRUCTURE |

Social infrastructure refers to facilities and amenities that support social well-being, such as schools, healthcare facilities, community centers, and public spaces, contributing to the overall quality of life in a community.

- M **Neighbouhood center or hub, accessible for residents and non residents, has been planned**
- Educational facilities as well as Park(s), community garden(s) or playground(s) are planned and consider a 750-1000m service range
- Grocery supply options are planned and consider a 750-1000m service range
- T Facilities from the 5 social infrastructure categories are planned: education, culture, health, markets & grocery supply, and recreation & sport and consider adequate service ratios

VIBRANT PUBLIC SPACES |

A vibrant public space is an energetic, lively, and engaging area that encourages community interaction, cultural events, and recreational activities, fostering a sense of connectivity and shared experience among people.
** Gross Surface Area (GSA)*

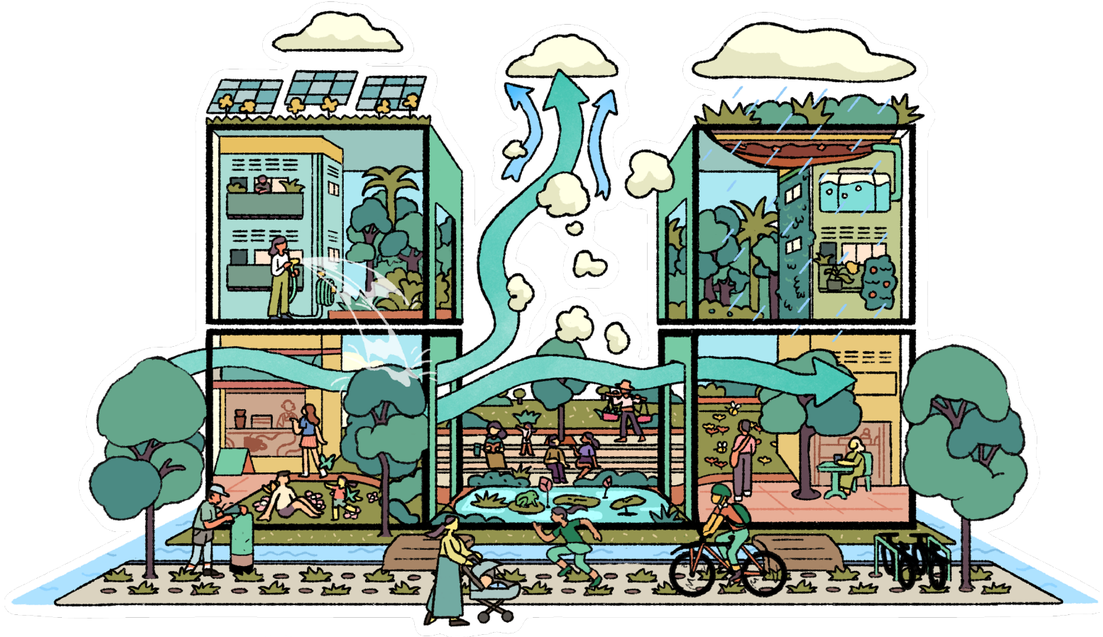
- M **Minimum 15% GSA as allocation area for public open spaces**
- All public spaces are publicly accessible and barrier-free
- Traffic and personal safety consideration have been implemented
- The design includes sufficient, comfortable and non-commercial seating
- The design is flexible and allows various activities (e.g., markets, events, recreational areas)
- The design includes more than 30% tree-covered and vegetated areas
- T Public spaces integrate all twelve quality criteria for protection, comfort and enjoyment described in the integrated urban design guidelines

*OPTIONAL EVALUATION CRITERIA

- Design aproved by an advisory board with consideration of local cultural heritage

Further information:
B4P Transformation Toolbox

02.1 INTEGRATED URBAN DESIGN GUIDELINE



BLUE-GREEN INFRASTRUCTURE

The objective of the blue-green infrastructure criteria is to ensure equitable access to green spaces while integrating water management and climate adaptation strategies. It focuses on creating resilient neighborhoods through features like green roofs, rain gardens, and sustainable drainage, reducing urban heat islands, minimizing water stress, and enhancing thermal comfort and environmental quality.

RELEVANCE

1. **FLOOD MANAGEMENT:** Mitigates flood risks through sustainable drainage systems.
2. **BIODIVERSITY ENHANCEMENT:** Creates habitats and promotes ecological diversity.
3. **CLIMATE RESILIENCE:** Improves urban resilience by addressing climate change impacts through sustainable water management practices.
4. **WATER DEMAND:** Integrates natural systems to replenish aquifers, and reuse water, reducing demand on municipal supplies.

Figure 8. Graphic illustration: Uddam Pen, Prosob Media, Phnom Penh.

M *Minimum*
T *Target*

PUBLIC GREEN SPACE |

Public green space refers to communal outdoor areas, like parks and gardens, designed for public use. These spaces foster community interaction, recreation, health, and relaxation, while contributing significantly to enhance urban microclimate and thermal comfort.

- M **Public green spaces cover at least 10% of the gross site area and cover a minimum surface of 100 m²**
- Public green spaces are planned and consider a 750-1000m service range (15 min walking distance)
- Tree and shrub covered areas represent at least 25% of all green spaces
- Vegetation, grass and permeable pavements cover 30% of the total gross site area
- T Public green spaces are planned as a network with a maximum distance of 1000m and interconnected through semi-public or private green areas

GREEN INFRASTRUCTURE |

A strategically planned network of natural and semi-natural areas with other environmental features, designed and managed to deliver a wide range of ecosystem services, while also enhancing biodiversity.
** Biotop Area Factor (BAF)*

- M **Analysis of the ecological conditions of existing green spaces and local species has been conducted**
- Biotope area factor is $0.1 \leq BAF \leq 0.5$
- Larger open green spaces (min. 500m2) adjacent to the district are connected through the district (green infrastructure)
- T All ecologically relevant open spaces within the district that are larger than 1,000 m^2 are connected together

BLUE INFRASTRUCTURE |

Water ecological systems, both natural and engineered, that act as living infrastructure. Elements include bioswales, rain gardens, and constructed wetlands to manage wet weather impacts.

- M **Analysis of flood risk has been conducted and a concept has been prepared to avoid and/or mitigate flood events on the site and in the surrounding areas**
- At least two rainwater management strategies have been implemented in the district
- At least three rainwater management strategies have been implemented in the district
- T The rainwater management infrastructure is integrated into the open space concept

CLIMATE SENSITIVE URBAN DESIGN |

Climate-sensitive urban design adapts urban planning to address climate change impacts. It employs strategies like green infrastructure and resilient neighbourhoods to mitigate and respond to extreme weather events and changing climatic conditions.

- M **An urban climate analysis has been conducted**
- Urban climate recommendations to increase ventilation and reduce solar radiation or surface temperatures have been applied
- Urban climate recommendations to increase evaporate cooling, reduce heat accumulation an provide rain protection have been applied
- T All urban climate recomendations have been integrated into the final design

Further information:
B4P Transformation Toolbox
02.2 BLUE-GREEN INFRASTRUCTURE GUIDELINE

*OPTIONAL EVALUATION CRITERIA

- Definition of water budget for irrigation and green spaces maintenance
- Drinking water provision is ensured
- Measures for water monitoring and reporting have been applied
- Integration of green infrastructure on building level: green gardens, green roofs, green fassades
- Plan for green infrastructure management

SUSTAINABLE URBAN MOBILITY

The objective of the sustainable mobility evaluation criteria is to promote environmentally friendly, accessible and efficient transportation solutions in new neighborhoods of Phnom Penh. It prioritizes public transit, cycling, walking and the concept of Mobility-as-a-service (MaaS) to minimize environmental impact, enhance commuter comfort and provide strategic, non-individual mobility alternatives.

Figure 9. Graphic illustration: Uddam Pen, Prosob Media, Phnom Penh.

RELEVANCE

1. **ENVIRONMENTAL CONSERVATION:** Reduces carbon emissions, air pollution, and dependence on fossil fuels.
2. **IMPROVED PHYSICAL & MENTAL HEALTH:** Encourages active transportation, enhancing physical fitness and reducing health risks.
3. **ECONOMIC EFFICIENCY:** Promotes dense urban development and thus lowers overall urbanisation costs (compact development = overall less public works requirements)
4. **COMMUNITY WELL-BEING:** Active mobility promotes social cohesion, thus building stronger communities bonds.

M *Minimum*
T *Target*

PEDESTRIAN & BIKE FRIENDLY ENVIRONMENT |

A pedestrian and bike-friendly environment prioritizes safe and convenient spaces for walking and cycling. It features well-designed sidewalks, bike lanes and traffic-calming measures, fostering sustainable, healthy and accessible urban mobility.

- M **Proportion of areas designated for slow mobility have generally a minimum width of 2m for pedestrians and 1.8m for bikes per direction**
- Urban structure facilitate walking and cycling mobility by adjusting block length between 100m and 200m
- Bike and pedestrian networks are planned considering safe crossings and barrier-free to guarantee universal accesibility
- Traffic calming measures are included as part of the street design standard: e.g. chicanes, speed bumps, lane narrowing, shared streets
- Pedestrian and bike paths are designed as attractive and comfortable spaces for users, with shaded and sheltered areas, low-maintenance landscape design and using long lasting materials and urban furniture
- Street network has direct connection to a neighbourhood mobility hub
- T Buildings integrate bicycle access, bike parking and adequate spaces for bike users such as lockers, showers and dressing rooms

PUBLIC TRANSPORT INFRASTRUCTURE |

Public transport infrastructure encompasses the physical components supporting mass transit systems, including bus and train stations, tracks, terminals and associated facilities. It facilitates efficient and accessible transportation for the public.

- M **Integration of paratransit into the roadway with waiting areas and pick-up-drop-off zones**
- Intermodal integration of city bus, paratransit and vehicle sharing within 10-15 min. walking distance
- Bus stops are planned within 10-15 walking distance around and within the neighbourhood
- Multimodal transportation hubs have been provided. At larger bus stations safe motorbike parking areas (termini) are planned
- T Neighbourhood mobility plan considers the diversification of public transport modes aligns with the overarching district / city mobility masterplan

INFRASTRUCTURE FOR ALTERNATIVE FUEL VEHICLES |

Infrastructure for alternative fuel vehicles includes charging stations, hydrogen fueling stations and other facilities that support the adoption of environmentally friendly transportation options, reducing reliance on traditional fossil fuels.

- M **Preferential parking spots for e-vehicles have been defined**
- Plan sufficent charging stations to serve 10% of parking spaces
- T Alternative fuel vehicles are part of the internal neighbourhood mobility strategy

***OPTIONAL EVALUATION CRITERIA**

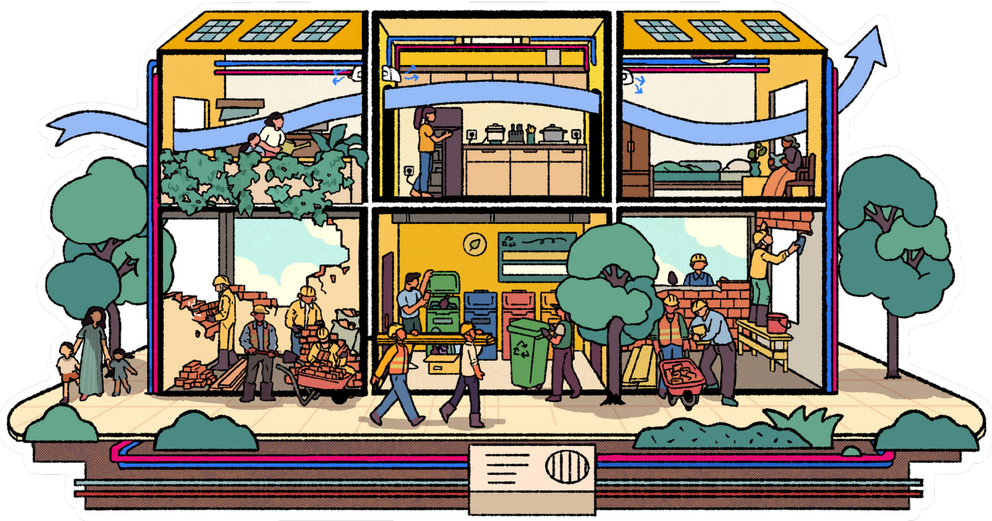
- Noise control measures
- Include mobility sharing services

CAR-REDUCED NEIGHBOURHOOD |

A car-reduced neighborhood minimizes reliance on private vehicles by prioritizing pedestrian-friendly spaces, efficient public transportation and alternative modes of mobility, reducing risk of accidents and contributing to a more livable urban environment.

- M **Home zones or play streets have been designated and integrate adequate measures for pedestrians, cyclists, and residents incl. children**
- Optimize traffic speeds on arterial roads
- Regulate parking needs around the neighbourhood mobility hub
- Define shared streets with 5km/h speed limits in residential zones
- District off-street parking areas have been integrated and private car parking has been reduced by 25%, thus 0.75 parking space per household
- T Average amount of parking spaces is below 0.5 per household options are provided for home to car-park trips: e.g. 2-wheeler parking

Further information:
B4P Transformation Toolbox
02.3 SUSTAINABLE URBAN MOBILITY GUIDELINE



CLIMATE PROTECTION & ENERGY FLOWS

The objective of the climate protection and energy flows evaluation criteria is to mitigate climate change through emission reductions, circular economy strategies, and resource efficiency. It prioritizes renewable energy and sustainable practices in new urban areas of Phnom Penh, paving the way for low-carbon development and contributing to the 2030 UN carbon reduction goals.

RELEVANCE

1. **MITIGATING CLIMATE CHANGE:** Reducing emissions to prevent the planet from warming to more extreme temperatures.
2. **RESOURCE EFFICIENCY:** Circular neighborhoods minimize waste and optimize resource use.
3. **ENERGY STRATEGY:** Promoting sustainable energy flows ensures a cleaner, resilient, and eco-friendly urban environment.

Figure 10. Graphic illustration: Uddam Pen, Prosob Media, Phnom Penh.

M *Minimum*
T *Target*

ENERGY EFFICIENT BUILDINGS |

Energy-efficient buildings are structures designed and constructed with features that minimize energy consumption. They incorporate efficient insulation, cooling and domestic hot water systems. The concept takes also into consideration integrating sustainable sources such as solar to generate electricity, reducing reliance on non-renewable resources and minimizing environmental.

- M **Passive design strategies to reduce cooling demand have been implemented**
- Low-energy devices have been integrated on buildings, i.e. cooling devices
- Building envelop thermal insulation has been enhanced
- Low-impact cooling technology has been integrated, i.e. natural refrigerants
- Building design considers the future integration of renewable energy sources, i.e solar panels
- A reduction of at least 30% of total energy demand per year has been achieved in comparison to a building of similar scale and use
- T Buildings generate 100% of their own energy requierements

ENERGY EFFICIENT NEIGHBOURHOODS |

Energy-efficient neighborhoods integrate sustainable design, renewable energy sources, and technologies to, on one hand, minimize energy consumption, while incorporating sustainable energy supply to reduce the invironmental impact

- M **Passive design strategies to reduce neighbourhood cooling demands have been implemented, i.e. climate sensitive recommendations**
- Low-energy devices have been integrated, i.e. efficient street lightning devices
- T Low-impact cooling technology on a neighbourhood level has been integrated, i.e. efficient district cooling systems

LIFE CYCLE ORIENTED DESIGN |

Life-cycle-oriented architecture integrates sustainability principles throughout the design, construction, operation, and eventual demolition of buildings. It emphasizes minimizing environmental impact and optimizing resource efficiency across the entire lifecycle.

- M **Reduction of 20% of concrete, steel and sand usage in comparison to a similar project in scale and use / own initial design proposal has been calculated and can be proved**
- 25% of material used are nationally produced
- 25% of material used are renewable and certified / legally obtained and can be proved
- 25% of building material used are recycled or reused
- 80% of the building structure material can be recovered after use
- More than 80% of building structure, can be reused as construction material
- T Building design fulfills or exceeds all above described criteria

CIRCULAR NEIGHBOURHOODS |

Circular neighborhoods embrace circular economy principles, minimizing waste generation. They prioritize recycling, reuse, and sustainable practices, creating communities that strive for a closed-loop system.

- M **Define a waste management concept during construction**
- Integrate waste collection points and designate areas for compost
- T Design a schedule for waste collection and sign a contract with a recycling company

Further information:
B4P Transformation Toolbox
02.4 CLIMATE PROTECTION & ENERGY FLOWS GUIDELINE

*OPTIONAL EVALUATION CRITERIA

- **Calculate an energy budget on a building and neighbourhood level on an early design phase**
- Life cycle (LC-) reasoning has been used to evaluate the environmental impacts of buildings and neighbourhoods: design, construction, use and end-of-life phases
- 50% materials have low environmental impact in its life-cycle

SOCIAL INCLUSION & LOCAL ECONOMY

The objective of the social inclusion and local economy criteria is to ensure equal access to urban amenities and opportunities for residents from diverse socio-economic backgrounds, fostering a strong sense of belonging. By supporting local businesses and promoting economic resilience, the criteria aim to build a more equitable, connected and sustainable community.

RELEVANCE

1. **COMMUNITY COHESION:** Social inclusion fosters a sense of belonging and diversity.
2. **ECONOMIC RESILIENCE:** A thriving local economy promotes sustainable development and resilience.
3. **ENHANCED QUALITY OF LIFE:** Social inclusion and the support of local economy contribute to a more vibrant, connected, and livable urban environment.

Figure 11. Graphic illustration: Uddam Pen, Prosob Media, Phnom Penh.

M *Minimum*

T *Target*

AFFORDABLE HOUSING |

Affordable housing refers to residential units that are reasonably priced and within financial reach for individuals or families with moderate or low incomes, providing access to safe and secure shelter.

*Synergy with ***Neighbourhood & City Connectivity*** criteria from the ***Integrated Urban Design*** section.

- M **10% of residential units are planned for affordable and middle income housing typologies**
- Neighbourhood amenities are accesible for everyone* (N)
- Social and commercial infrastructure is accessible for everyone* (N)
- T 20% of residential units are planned for affordable housing and all infrastructure and amenities are accesible for everyone

ACTIVE STREETS|

Active commercial streets are vibrant urban thoroughfares with a concentration of bustling businesses, shops, and services. They encourage pedestrian activity, social interaction, and a lively commercial atmosphere, enhancing the urban experience.

- M **Thermal comfort recommendations, i.e. shading, evaporative cooling, ventilation, rain protection, included in the climate sensitive design guidelines have been implemented to exhance public-space-user experience, e.g. recesed ground floors**
- 20% Ground Floor Area (GFA) has been defined for commercial use
- 50% of all façades have activation elements: balconies, terraces
- T All aboved described criteria have been fulfilled or exceeded

STRENGTHENING LOCAL ECONOMY |

A local economy refers to the economic activities within a specific community. It emphasizes the production and consumption of goods and services locally, fostering community sustainability and resilience.

- M **Public squares are designed to host public events once a month: farmers market, annual festival**
- Shops and restaurants support local economy: offer locally produced goods, use locally produced ingredients
- T The provison of low-cost/free spaces for local start-ups or craft businesses are planned

SOCIAL MIX & DIVERSITY |

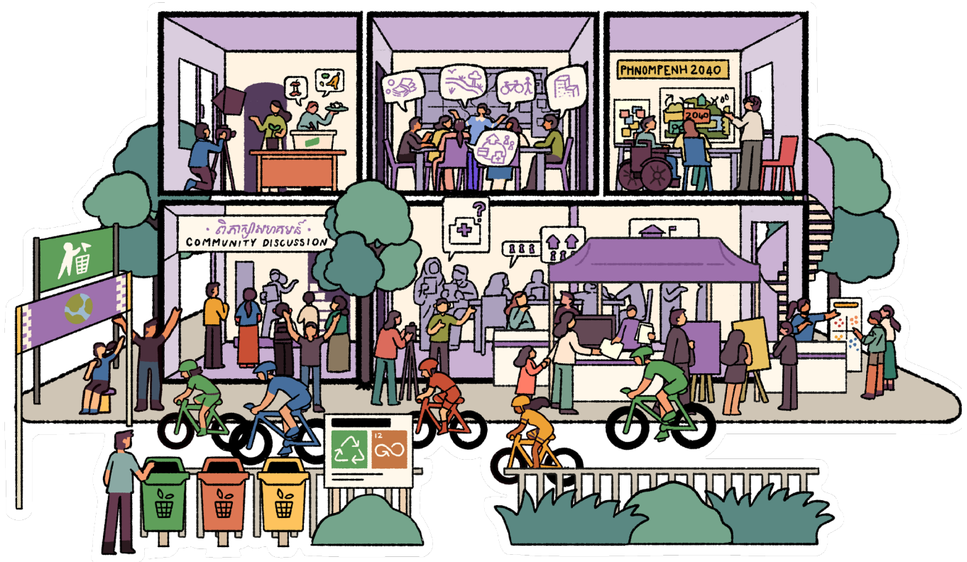
Social mix and diversity involve a varied composition of individuals from different backgrounds, cultures, and socioeconomic statuses within a community. It promotes social cohesion, inclusivity, understanding, and a rich tapestry of experiences.

- M **Mixed-use typologies and housing alternatives for different socioeconomic stratus have been included**
- Commercial-residential typologies have been included
- Office-residential typologies have been included
- T Barrier-free design for all typologies have been included

*OPTIONAL EVALUATION CRITERIA

- Life cycle cost (LCC) as design tool
- Introduce sharing economy initiatives: tool-lending library, donation collection points (zu verschenken).

Further information:
B4P Transformation Toolbox
02.5 SOCIAL INCLUSION & LOCAL ECONOMY GUIDELINE



GOVERNANCE & PARTICIPATION

The objective of the governance and participation criteria is to foster inclusive, transparent and accountable decision-making processes across all levels—city administration, planning teams, and citizens. By actively involving all stakeholders, including private developers and residents, the criteria aim to create a collaborative approach to building a more sustainable and environmentally conscious Phnom Penh.

RELEVANCE

1. **INCLUSIVE DECISION-MAKING:** Encourages diverse perspectives in urban planning.
2. **TRANSPARENCY AND ACCOUNTABILITY:** Builds trust by involving citizens in decision processes.
3. **RESPONSIVE POLICIES:** Ensures urban development aligns with community needs and aspirations.

Figure 12. Graphic illustration: Uddam Pen, Prosob Media, Phnom Penh.

Ⓜ *Minimum*

Ⓣ *Target*

COMMUNITY INVOLVEMENT AND PARTICIPATION |

Community involvement and participation entail active engagement of individuals in local affairs, decision-making processes, and collaborative initiatives. It fosters a sense of belonging, empowers residents, and strengthens community bonds.

- Ⓜ **Information events took place during design or construction phase**
- ○ Consultation events or workshops took place during design or construction phase
- Ⓣ Public participation events and co-production workshops took place during design phase

INTEGRATED PLANNING |

Integrated urban planning involves coordinating various aspects of city development, including transportation, housing, and public spaces. It seeks to create cohesive, sustainable, and well-functioning urban environments.

- Ⓜ **Define an interdisciplinary design team and organise at least one interactive workshop during the predesign phase**
- ○ Design scenarios und variants have been developed and evaluated
- ○ Define an interdisciplinary design team and organise at least three charrette events/workshops during predesign, design and construction phase
- Ⓣ The interdisciplinary design team schedules charrettes and regular meetings, i.e. jour-fix, to discuss planning and construction issues

SUSTAINABLE LIFESTYLES |

Sustainable lifestyles involve conscious choices and practices that minimize environmental impact, prioritize resource efficiency, and contribute to a balanced and ecologically responsible way of living for individuals and communities.

- Ⓜ **Initiate social marketing campaigns to promote sustainable life styles**
- ○ Information campaigns for waste reduction and separation have been organised
- Ⓣ Define waste separation standards for collecting neighbourhood waste

*OPTIONAL EVALUATION CRITERIA

- ○ Support the creation of neighbourhood commitees
- ○ Support for initiatives for recycling/environmentally friendly actions

Further information:
B4P Transformation Toolbox
02.6 GOVERNANCE & PARTICIPATION GUIDELINE

V SYSTEM BASICS

AREA DEFINITIONS FOR NEIGHBOURHOODS

Gross Site Area (GSA)	Developed land or land intended for development, including public development and parking areas, green and supply areas.
Net Site Area (NSA)	Sum of all developed and building plots within a building area.
Private Green Spaces (PRGS)	Home garden areas, terraces, allotments, rooftop gardens.

AREA DEFINITIONS FOR BUILDINGS

Gross Floor Area (GFA)	The gross floor area is defined as the above and underground gross floor area of all main buildings (incl. staggered storeys) as well as underground main usable areas (e.g. commercial, granny flats) and utility areas, but excluding external features like balconies or terraces.
Building Coverage Ratio (BCS)	Building Coverage Ratio (BCR) is the percentage of a plot area covered by a building's footprint, excluding open spaces like gardens or parking. It helps regulate land use, ensuring balanced development and sufficient open areas.
Floor Area Ratio (FAR)	Floor Area Ratio (FAR) is a zoning regulation tool used in urban planning to control the intensity of land use. It measures the total floor area of a building in relation to the size of the plot of land on which it is constructed, influencing density and building size within a defined area. This metric is also known as Floor Space Index (FSI).
Building Footprint Area (BFA)	The horizontal area as seen in plan, measured from outside of all exterior walls and supporting columns.

DETERMINATIONS

Walking Distance	It refers to the distance that can be comfortably traversed on foot. The average walking distance for most people is approximately 400 to 800 meters in urban areas, taking about 5 to 15 minutes to walk, or an average of 1.42m/s.
Mixed Use	Mixture of different uses (residential, commercial, leisure, cultural, educational) within an urban district, construction site or building.

DETERMINATIONS (CONTINUATION)

Gated Communities	They are residential areas enclosed by physical barriers, such as walls or fences and controlled points of entry. These communities often feature amenities such as security personnel, surveillance systems and restricted access to outsiders.
Active Ground Floors	It refers to the street-level area of a building designed to engage pedestrians and foster vibrant urban activity. It typically includes transparent facades, retail, dining, or community-oriented spaces, encouraging interaction and accessibility.
Public Spaces (PS)	The areas that are freely accessible to the public at all times and are usually managed and maintained by the municipality (public transport areas, green and open spaces, squares).
Public Green Spaces (PGS)	Generally accessible and usable green spaces, which serve the ecological stabilisation of the environment, the improvement of the climate, the recreation and health of the population as well as the promotion of cultural and sports leisure interests. Water areas and recreational areas are also taken into account as green spaces according to DGNB. If a green space is private but publicly accessible, it can be included in the calculation. For example, this could be a private large garden in front of a company.
Private Green Spaces (PRGS)	Home gardens, terraces, allotments.
Tree Covered Areas	Land cover classification characterized by the dense presence of trees, typically forming extensive forests or woodlands.
Vegetated Areas	General land cover classification characterized by the presence of vegetation, including trees, shrubs, grasses, and other forms of plant life. It is a generalistic term that does not denote any.
Slow Mobility	It refers to modes of transportation that prioritize a leisurely pace, such as walking, cycling, or the use of non-motorized vehicles. It emphasizes human-powered movement, promotes physical activity, reduces environmental impact and fosters a more connected and enjoyable experience of travel within communities.
Shared Space	The road space is designed in the mixing principle for as many traffic subsystems as possible, i.e. without spatial separation. Signage and traffic signals are largely dispensed with.
Paratransit Mobility	It comprises informal, flexible transportation modes like tuk-tuks, motorcycle taxis, and small shared vans. These services fill gaps in the public transport system, offering affordable, on-demand travel for short distances.
Home Zones	They are residential streets designed to prioritize pedestrian and cyclist safety while discouraging through-traffic. They typically feature traffic calming measures, such as speed bumps, narrowed roadways and landscaping to create a shared space for residents, children and visitors to socialize, play and move about safely.

DETERMINATIONS (CONTINUATION)

Passive Design	Design approach that involves utilizing natural elements like sunlight, shade, and airflow to create comfortable indoor environments with minimal reliance on mechanical heating or cooling systems. It integrates building orientation, insulation, ventilation, and materials to optimize energy efficiency and thermal comfort. Passive design strategies aim to reduce energy consumption, lower utility costs, and minimize environmental impact in building construction and operation.
Low Energy Devices	Appliances or equipment engineered to operate with minimal energy consumption compared to conventional counterparts. These devices prioritize efficiency through advanced technologies, such as LED lighting, energy-efficient motors, and smart controls. By reducing energy demand, they contribute to cost savings for consumers and mitigate environmental impacts associated with energy production, supporting sustainability goals and energy conservation efforts.
Total Energy Demand	Refers to the aggregate amount of energy required to meet all consumption needs within a specified area, such as a city, region, or country, encompassing residential, commercial, industrial and transportation sectors. It quantifies the overall energy consumption, serving as a key metric for energy planning and policy-making.
Renewable Material	Resources derived from natural sources that can be replenished over time through natural processes or sustainable practices. These materials, such as wood, bamboo, and cork, are harvested or cultivated in a manner that ensures their continued availability, reducing reliance on finite resources and mitigating environmental impacts.
Certified Materials	Products or resources that have been verified to meet specific standards or criteria established by an independent certification body. These standards often encompass factors such as sustainability, environmental performance, social responsibility, and ethical sourcing practices, providing assurance of quality and compliance with recognized benchmarks.
Recycled Materials	Resources that have been reclaimed or recovered from waste streams and processed into new products or materials, diverting materials from landfills.
Live Cycle Approach Reasoning	Life Cycle Reasoning involves considering the entire life cycle of a product or process, from raw material extraction to disposal, to assess its environmental, economic, and social impacts. This holistic approach enables informed decision-making by evaluating the sustainability and efficiency of various options across their entire life span.
Social Infrastructure	Facilities for the common good, which serve the general public and ensure that our cultural, social and health needs are adequately met.

DETERMINATIONS (CONTINUATION)

Affordable Housing	Affordable housing refers to residential units that are reasonably priced and within financial reach for individuals or families with moderate or low incomes, providing access to safe and secure shelter.
Barrier Free Design	Designing environments that are accessible to everyone, regardless of their physical abilities or limitations. It aims to eliminate obstacles and barriers to mobility, communication, and participation, promoting inclusivity, independence and equal opportunities for people of all ages.
Sharing Economy	At a neighborhood level involves local residents exchanging goods, services and resources directly within their community, often facilitated by online platforms or informal networks. It fosters collaboration, resource optimization, and community cohesion by leveraging neighborhood assets and promoting mutual assistance and trust among residents.
Interdisciplinary Design Team	Collaborative group comprising professionals from diverse fields, such as architecture, engineering, urban planning and social sciences, working together to address complex design challenges. By integrating expertise from multiple disciplines, the team aims to achieve holistic and innovative solutions that consider various perspectives and requirements.
Interactive Workshop	A collaborative session where participants engage in hands-on activities, discussions, and exercises to explore ideas, solve problems, or develop skills in an interactive and participatory manner, fostering creativity, learning and teamwork.
Sustainable Lifestyle	A way of living that minimizes negative environmental impacts while promoting social equity and economic prosperity, characterized by conscious consumption, renewable resource use, waste reduction and respect for ecosystems and future generations

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BUILD4PEOPLE GUIDELINES FOR FURTHER INFORMATION

02-1 Integrated Urban Design Guideline

02-2 Blue-Green Infrastructure Guideline

02-3 Sustainable Urban Mobility Guideline

02-4 Climate Protection & Energy Flows Guideline

02-5 Social Inclusion & Local Economy Guideline

02-6 Governance & Participation Guideline

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VII BIBLIOGRAPHY

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