Urban Design and Climate Change
Presentation Outline

MAIN TOPICS

Urban Design Elements
Climate Relevance of Urban Design
ELEMENTS OF URBAN DESIGN

• Urban Structure
• Urban Grain
• Density + Mix
• Height + Massing
• Streetscape + Landscape
• Facade + Interface
• Details + Materials

HLURB Technical Planning Assistance on CLUP Preparation
Urban Structure

The overall framework of a region, town, zones or district, showing relationships between zones of built forms, land forms, natural environments, activities and open spaces. It encompasses broader systems including transport and infrastructure networks.

- Facilitates systems approach to resilience building and low emission development
- Helps define zones and areas at risk to climate change
- Can promote implementation of the overall adaptation strategy in spatial terms across ecosystems
- Takes into consideration climate elements (e.g. sun, wind, rainfall patterns, water cycle) in the zoning and use of spaces to build resilience
Urban Grain

The balance of open space to built form, and the nature and extent of subdividing an area into smaller parcels or blocks. It takes into consideration the hierarchy of street types, the physical linkages and movement between locations, and modes of transport.

- Determines ideal size of blocks and spaces based on CC context
- Defines linkages, accessibility and movement—crucial in responding to extreme or sudden onset events
- Can help identify appropriate transport modes (e.g. finer grain promotes walkability/non-motorized transport, larger blocks and wider streets for mass transport, etc) that leads to emission reduction
- Can contribute to better wind flow to temperature management
Density | Mix

The intensity of development and the range of different uses (such as residential, commercial, institutional or recreational uses).

- Compact development with efficient density balances urban demand with resources, increases access to public services, and prevents urban sprawl (and resulting GHG emissions)
- Mixed use encourages integrated, inclusive urban systems that are needed to effectively implement adaptation strategies
- Could support risk avoidance when intensity is maximized in safe or less hazard prone areas
Height | Massing

The scale of buildings in relation to height and floor area, and how they relate to its surroundings. It also incorporates building envelope, site coverage and solar orientation.

- Appropriate building height can increase shade, and alleviate impacts of increased temperature
- Massing and orientation can maximize sun and wind: decrease heat gain, improve ventilation, minimize energy load, etc (passive design)
- Building heights can be defined/adjusted to address sea level rise and flooding
Streetscape | Landscape

The design of public spaces such as streets, open spaces and pathways, and includes landscaping, and planting.

- Open spaces can be designed to absorb/contain excess water
- Green spaces can serve as carbon sink (with appropriate trees/plants)
- RROW can be designed to accommodate walking, biking, public transport to help reduce GHG emissions
- Drainage and similar infrastructure can be integrated into these spaces to build a resilient infrastructure system
Façade | Interface

The relationship of buildings to the site, street and neighboring buildings (alignment, setbacks, boundary treatment) and the architectural expression of their facades (projections, openings, patterns and materials).

- The interface can be designed to direct excess water/rain from buildings to detention facilities
- Buildings and sidewalks can provide shade to its surroundings (height, arcades, trees etc)
- “Green” façades and surfaces can help absorb heat and deflect solar radiation
- Can help attract people and encourage inclusive mobility
Details | Materials

The close-up appearance of objects and surfaces and the selection of materials in terms of detail, craftsmanship, texture, color, durability, sustainability and treatment. It includes street furniture, paving, lighting and signage. It contributes to human comfort, safety and enjoyment of the public domain.

- Pavement materials can promote water absorption and groundwater recharge crucial for managing increasing precipitation
- Appropriate materials for built structures can reduce heat gain and contain excess water (roofs, facades, etc)
- LED lighting and the use of renewable energy can contribute to emission targets
- Combination of hard and soft infrastructure can address impacts
It is important to consider how these elements complement and build on one another to achieve climate resilience.

Other components of local development need to be factored into the physical design: at-risk or vulnerable communities, economy, larger urban system.

Urban design should follow climate resilience principles and criteria.
Developing climate-resilient urban designs

1. Identify specific CC issue
   - Refer to CDRA
2. Decide risk management strategy
   - Ignore, Avoid, Reduce, Manage?
3. Decide what to promote
   - Design ideas in line with strategy to address CC issue
4. Decide what to avoid
   - Design ideas to avoid so issues are not aggravated
5. Come up with design solution
   - Specific actions

Design charette
Thank You