Pentagon City Planning Study

ARLINGTON VIRGINIA | GOODYCLANCY | Biophilic Design

May 2021

OVERVIEW

What is Biophilic Design?

Biophilic design is architectural and environmental design that prioritizes human connection with nature. It applies to all scales of design, from a single site to a neighborhood to a region, but is most relevant and transformational in preserving, introducing, or re-introducing nature and natural analogues into higher density settings where nature is often less present.

The goal is to have regular, frequent interactions with nature because it is omnipresent, rather than a destination one occasionally visits to escape places that are devoid of nature.

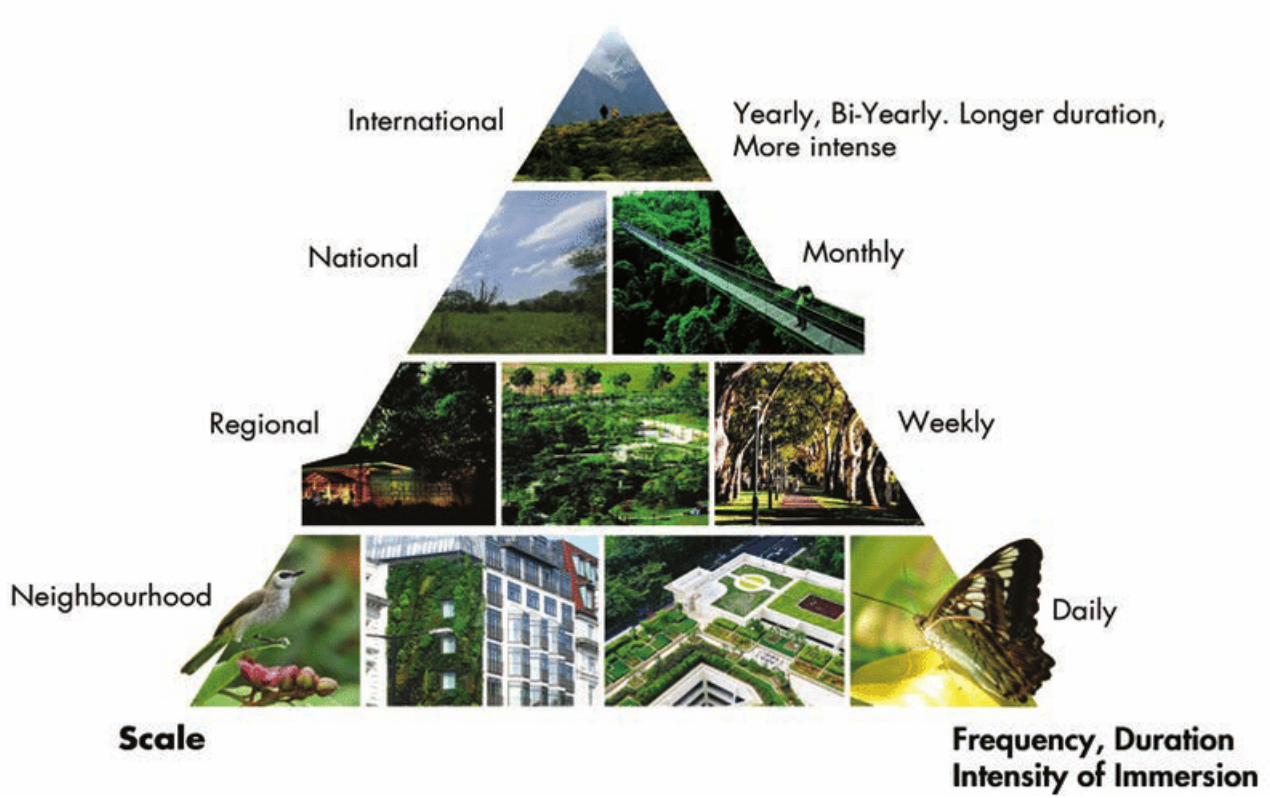


Image source: Singapore National Parks Board

OVERVIEW

How Does Biophilic Design Differ?

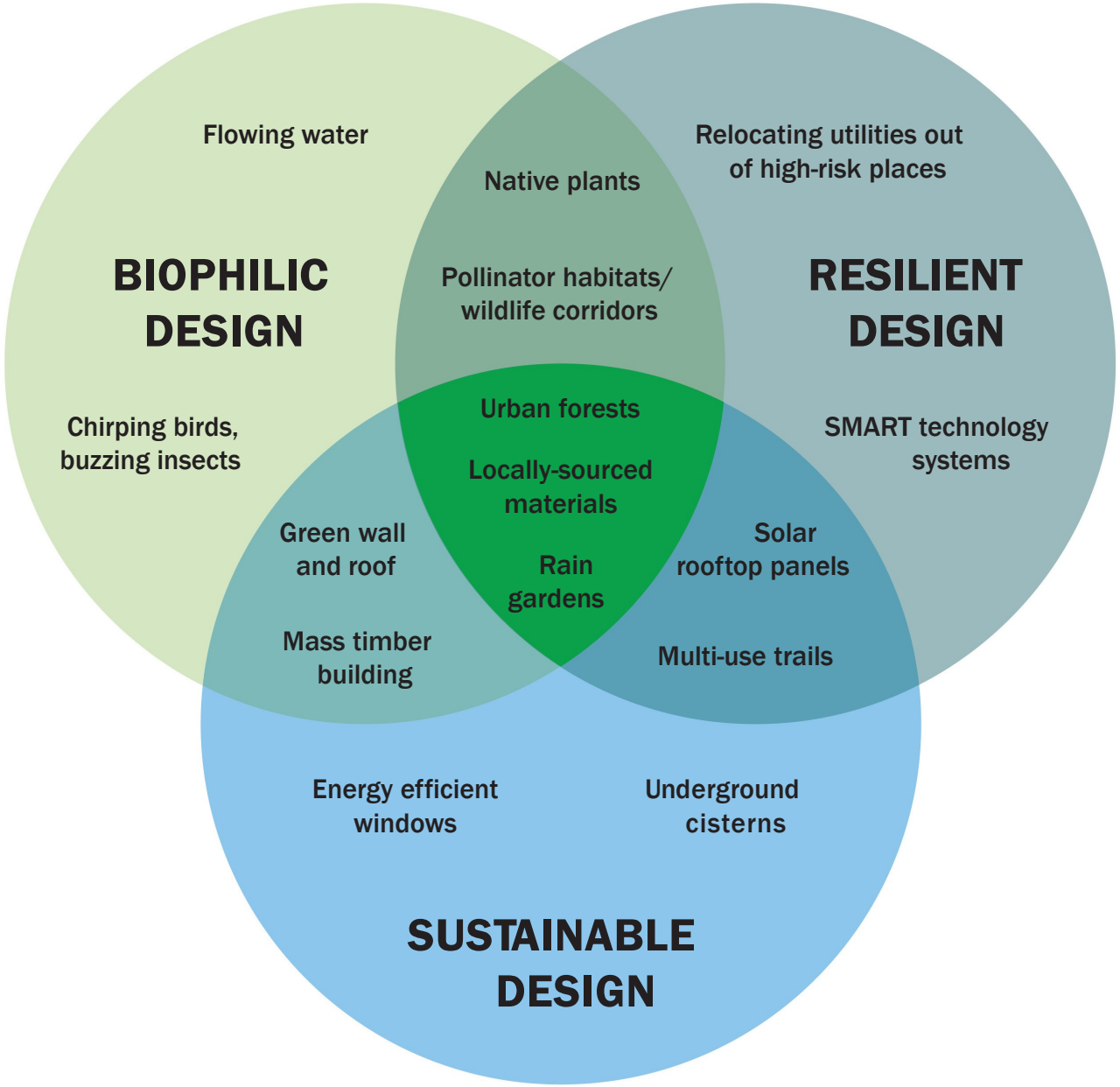
Simply put, biophilic design is experiential, primarily focused on human interaction with nature. Sustainable design and resilient design have many overlapping tools and principles, but they tend to focus on quantitative measures of how systems perform and do not have to be experienced to meet those performance criteria.

	BIOPHILIC DESIGN	SUSTAINABLE DESIGN	RESILIENT DESIGN
FOCUS OF DESIGN	Human health and well-being	Economic, social, and environmental factors	Adaption to withstand shocks and reduce risk
RELATIONSHIP WITH NATURE	Experiential	Performative	Working with nature
ELEMENT VISABILITY	Visible	Both visible and invisible	Both visible and invisible
TIMEFRAME OF IMPACT	Immediate and cumulative	Immediate and cumulative	Long-term and often not felt immediately
MEASURE OF DATA	Qualitative	Quantitative	Quantitative

OVERVIEW

How Does Biophilic Design Differ?

While each approach to design and sustainable performance is slightly different, they are complementary and are often used together to create a healthy environment for the people, vegetation, and wildlife inhabiting them.



BIOPHILIC CITIES
Indicators

1. Expanded natural elements within Arlington's built environment, as well as conservation of our natural resources
2. Equitable access to green spaces, parks, and other natural elements
3. Creation of publicly accessible urban nature projects
4. Educational opportunities for the community, including residents and development stakeholders, about the benefits of biophilic principles to further the presence of nature in our buildings, facilities, homes, and public spaces
5. Expanded biophilic planning and design principles throughout existing policies and processes, such as comprehensive plan elements, sector plans, site plans, park master plans, and multimodal transportation plans and projects

BIOPHILIC CITIES
Livability 22202

Foster Environmental Sustainability

- Advance sustainable building design practices for new construction to meet the Community Energy Plan goals
- Strategically increase the amount of natural open spaces and improve the tree canopy, with a focus on reducing heat island intensity, improving stormwater management, and increasing urban biodiversity
- Emphasize the incorporation of biophilic design elements into site plans, including private and public space, and the application of biophilic approaches to integration of the built and natural environments
- Create and support community gardens within the Pentagon City and Crystal City neighborhoods

SPECIFIC CONCEPTS IDENTIFIED FOR ENVIRONMENTAL SUSTAINABILITY

Establish interconnected green, biophilic corridors across the 22202 community **that integrate existing open spaces, both public and private**, through the neighborhoods. Align future development to build these corridors and fill in missing links.

Create innovative streetscapes addressing runoff, heat, etc. (vine walls, meadows, drought & flood tolerant plants), permeable/ impermeable surfaces, and shading especially along East-West streets.

Plant large trees as development proceeds **to restore the canopy** and provide faster mitigation of future tree losses.

Create several community gardens across the high-density residential neighborhoods.

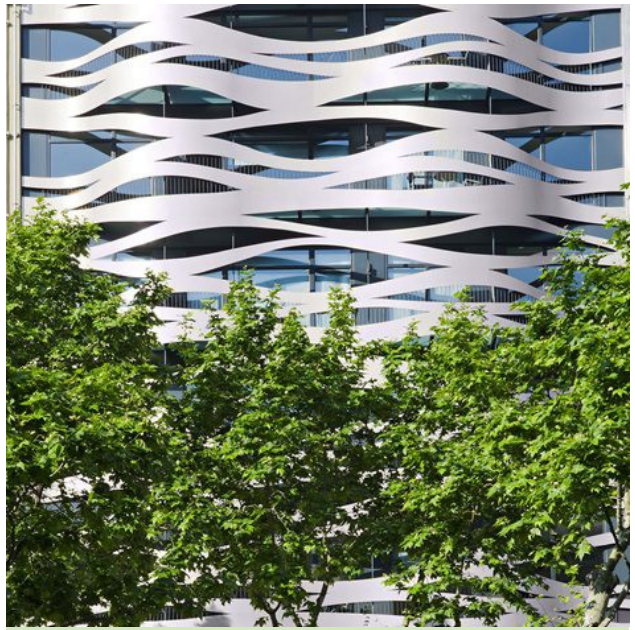
Incentivize the combination of aesthetics/innovation and function. Challenges such as stormwater runoff, energy production, and heat gain can be addressed with artistic solutions.

Source: Livability 22202, 2019

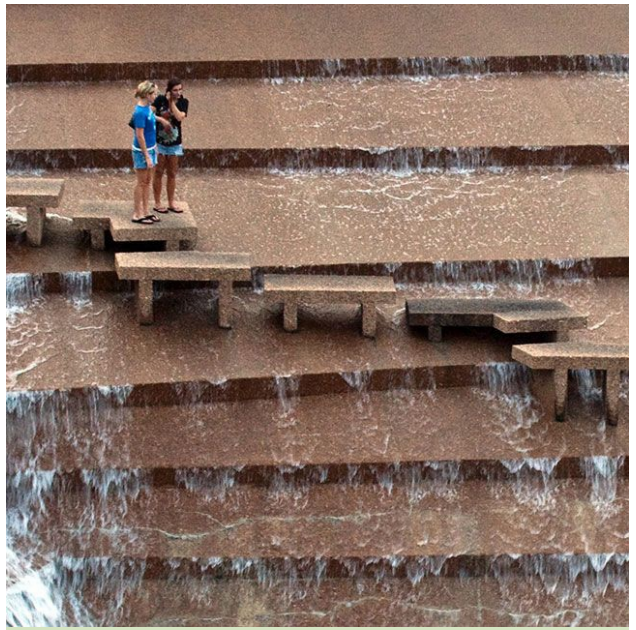
PATTERNS OF BIOPHILIC DESIGN

14 Patterns from Terrapin Bright Green

NATURE IN THE SPACE



NATURAL ANALOGUES



NATURE OF THE SPACE

Source: Browning, W.D., Ryan, C.O., Clancy, J.O. (2014). 14 Patterns of Biophilic Design. New York: Terrapin Bright Green llc.

PATTERNS OF BIOPHILIC DESIGN

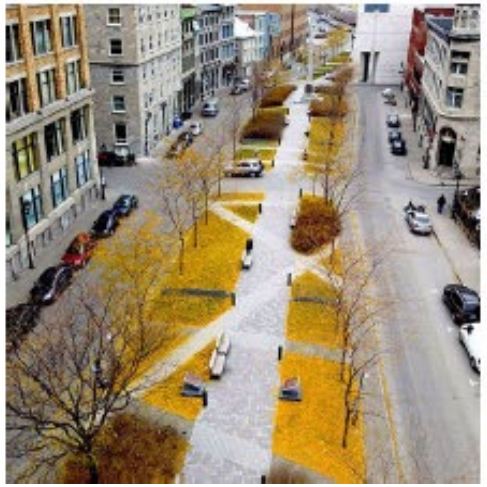
Nature in the Space

Visual connection with nature. Non-visual connection with nature. Non-rhythmic stimuli. Thermal + airflow variability. Presence of water. Dynamic + Diffuse light. Connection with natural systems.







PATTERNS OF BIOPHILIC DESIGN

Natural Analogues

Biomorphic forms + patterns. Material connection with nature. Complexity + order.







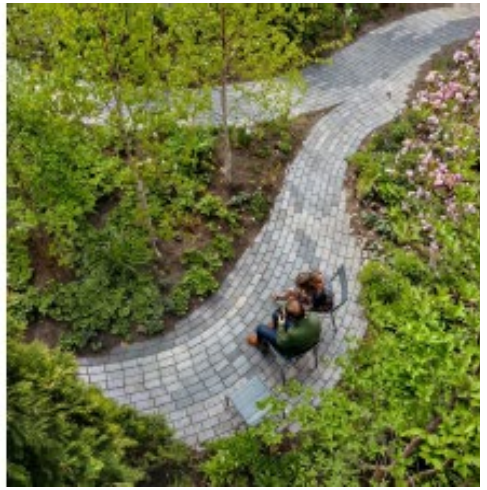


PATTERNS OF BIOPHILIC DESIGN

Nature of the Space

Prospect. Refuge. Mystery. Risk/Peril.




GENERAL GUIDELINES

Layering Biophilic Design Patterns

Buffalo Niagara Medical Campus, Buffalo, NY

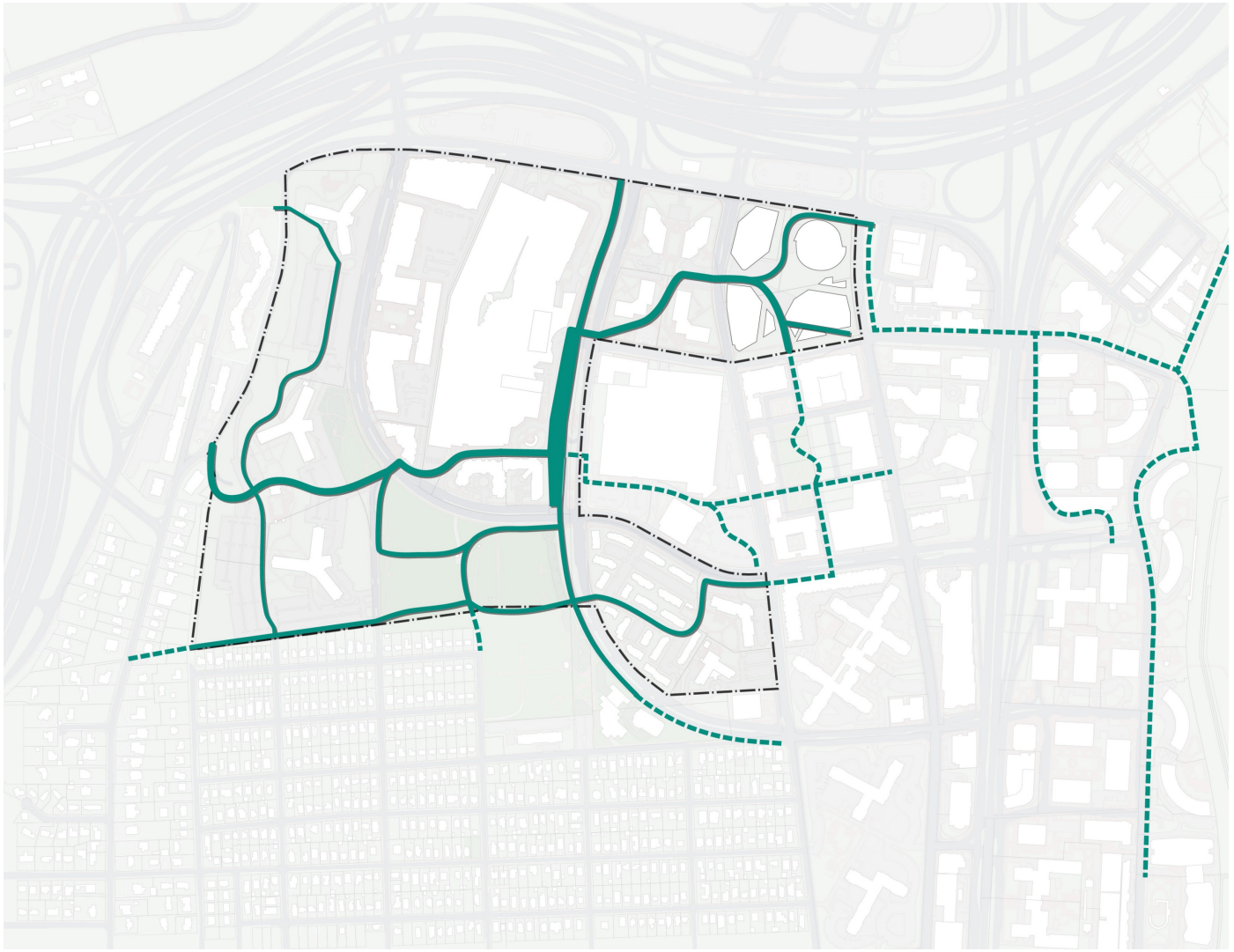
Mariposa Greenway, San Francisco

Liuyan Xiaoqu, China

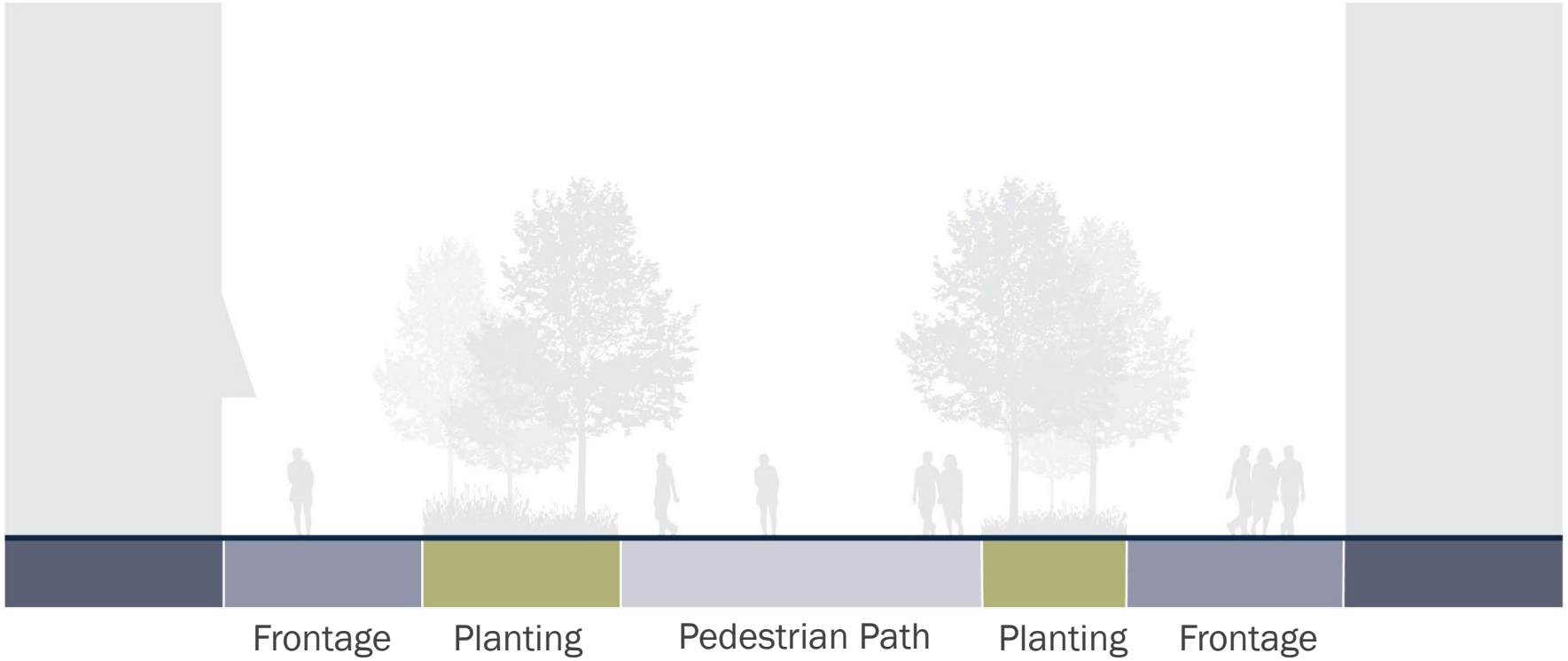
GENERAL GUIDELINES

Biophilic Design Throughout Pentagon City

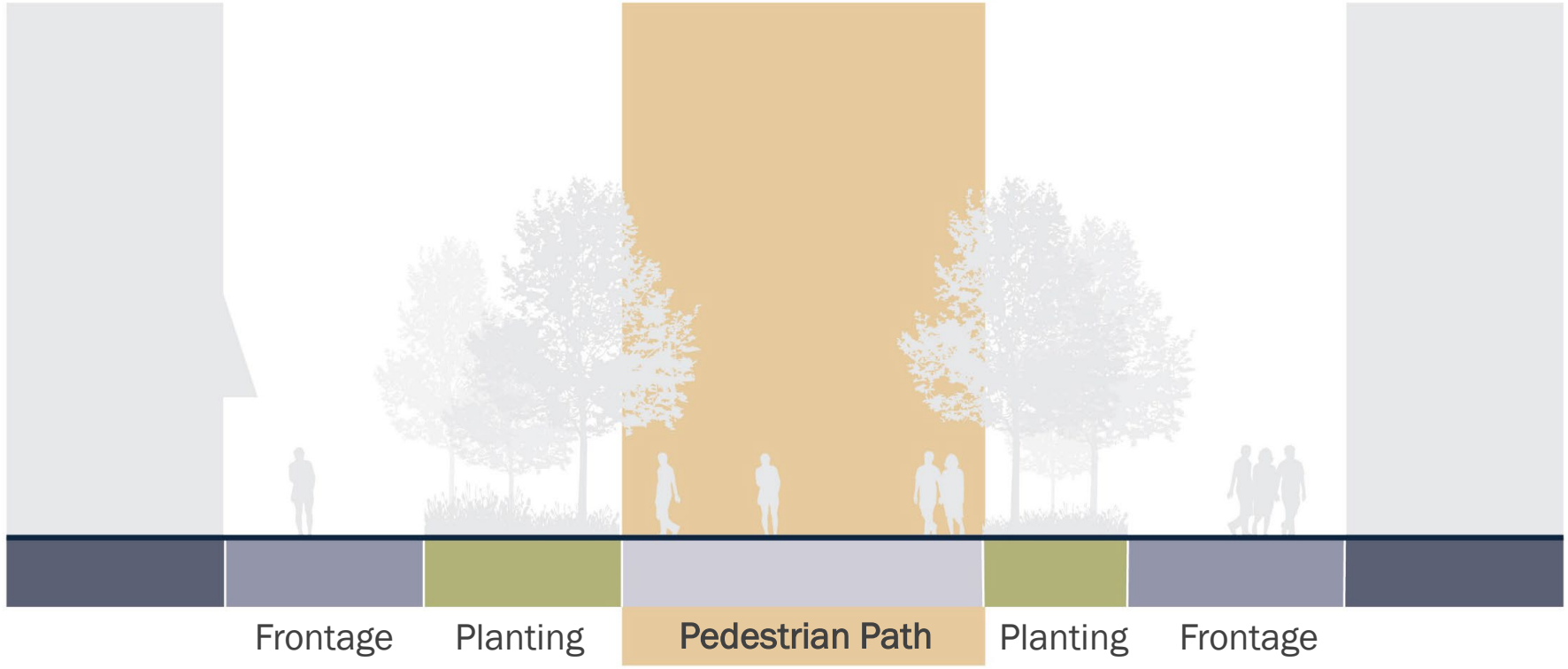
- Green Ribbon
- Boulevards
- Public Spaces
- Private Development



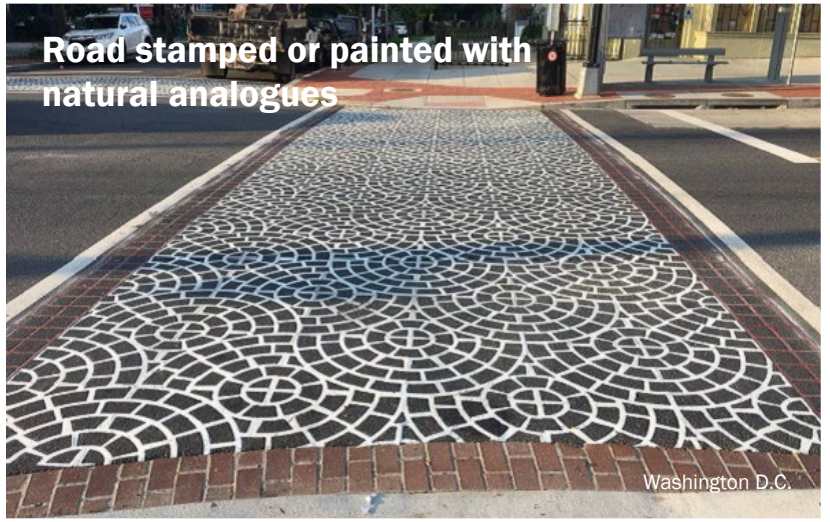
GREEN RIBBON
Zones

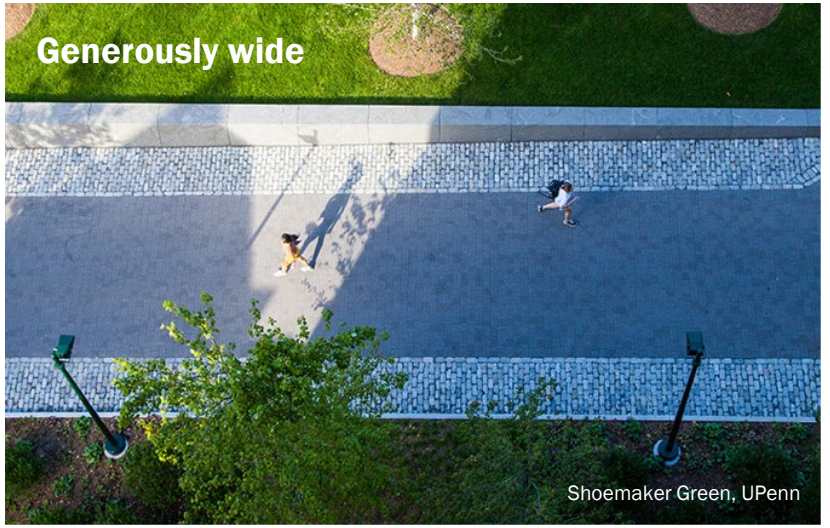


GREEN RIBBON
Pedestrian Path

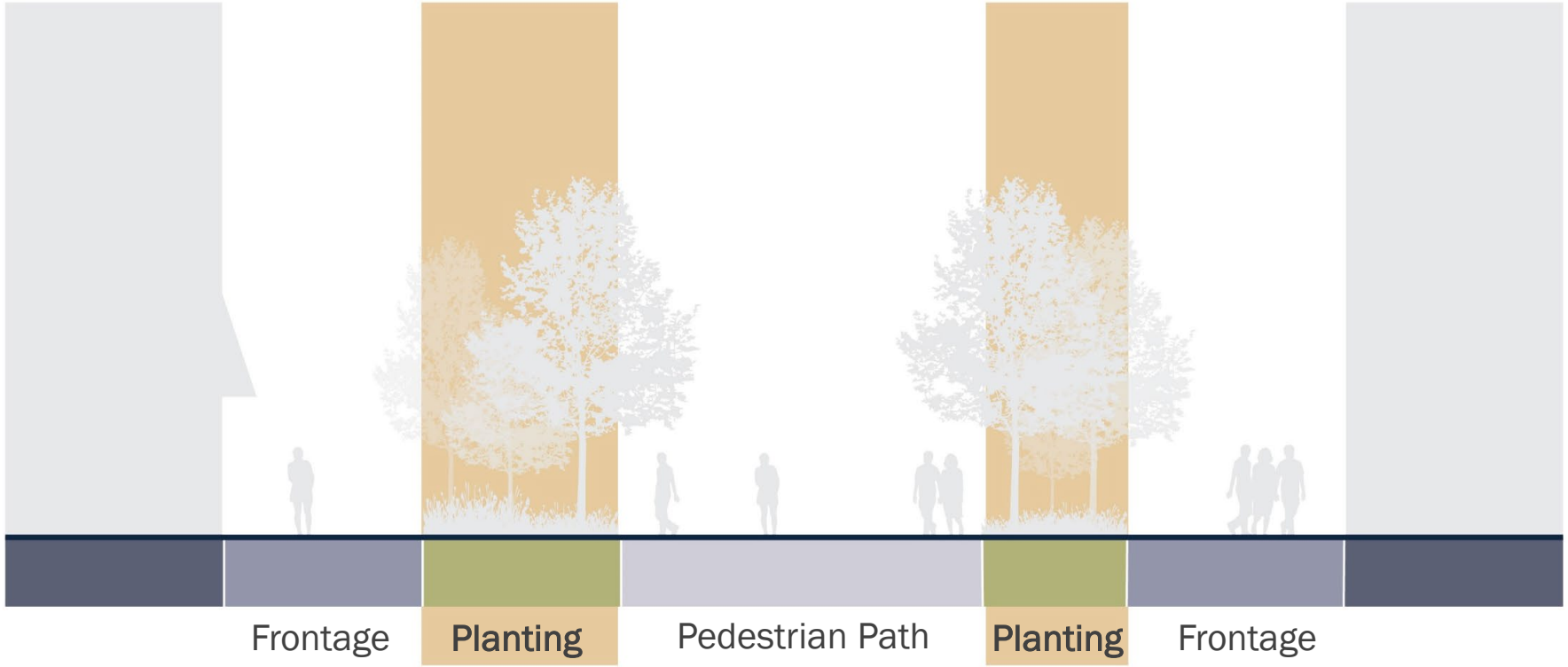


GREEN RIBBON
Pedestrian Path

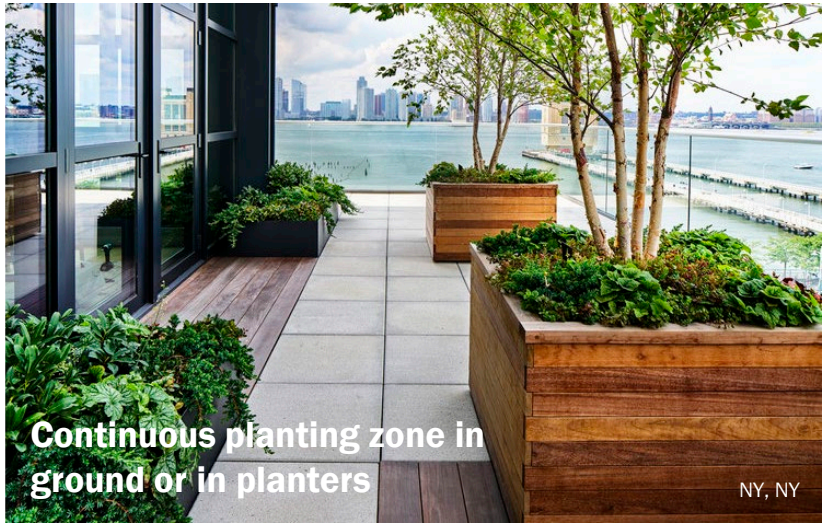




GREEN RIBBON
Planting Zone

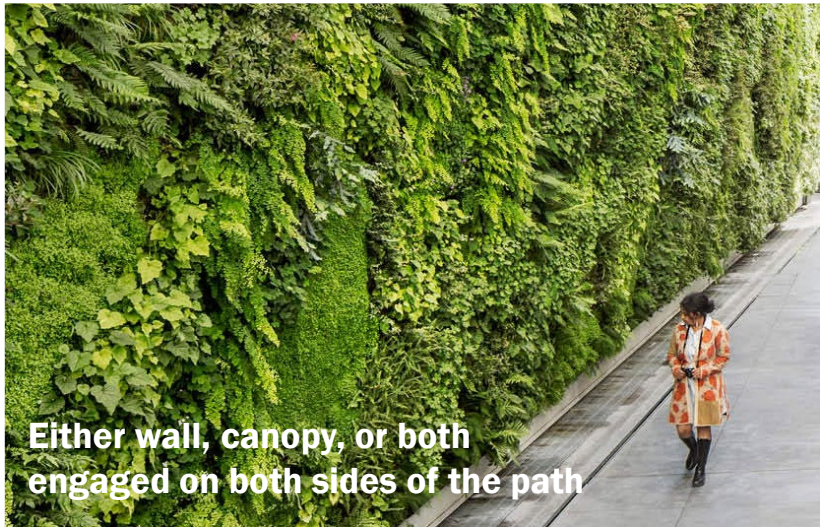


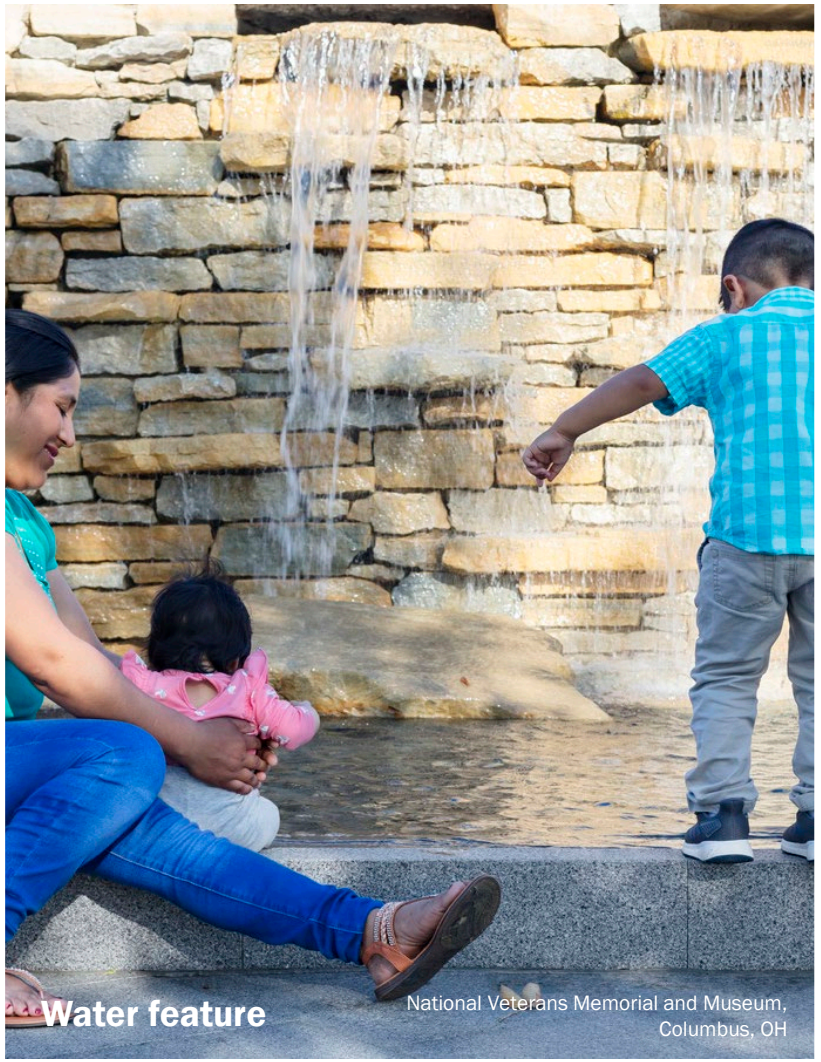
GREEN RIBBON
Ground Plantings



GREEN RIBBON

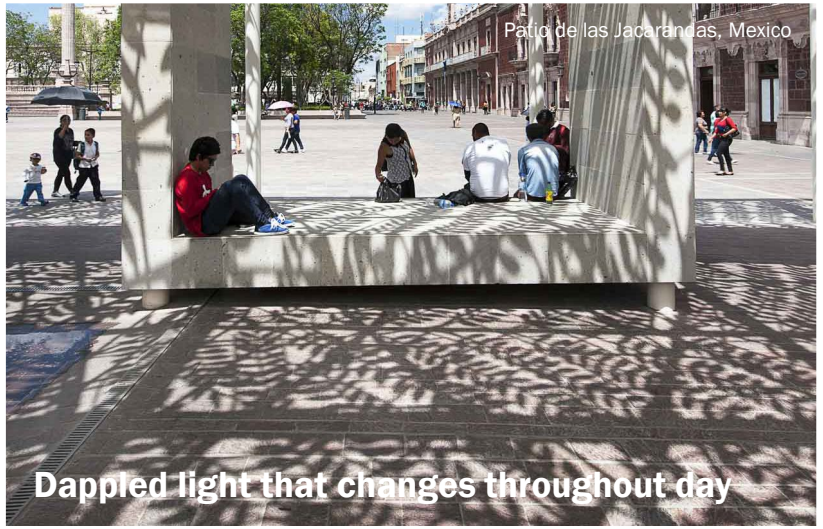
Walls & Canopy (Vertical elements)





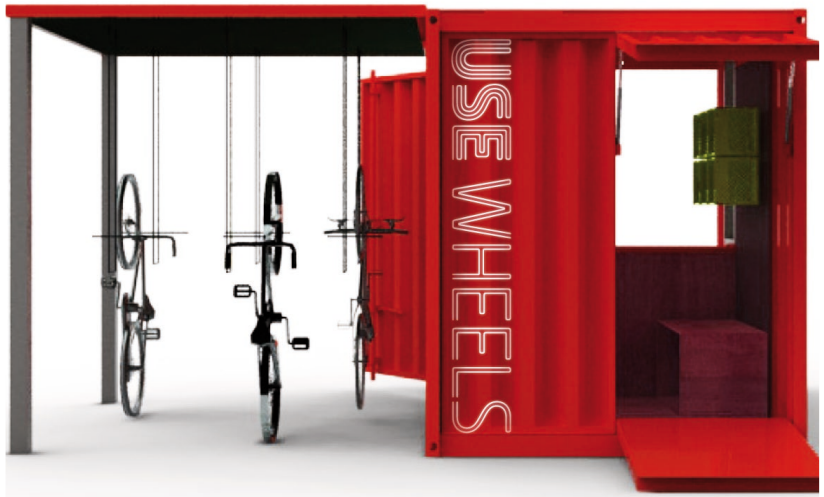
GREEN RIBBON
Refuge & Prospect

GREEN RIBBON
Furnishings & Lighting



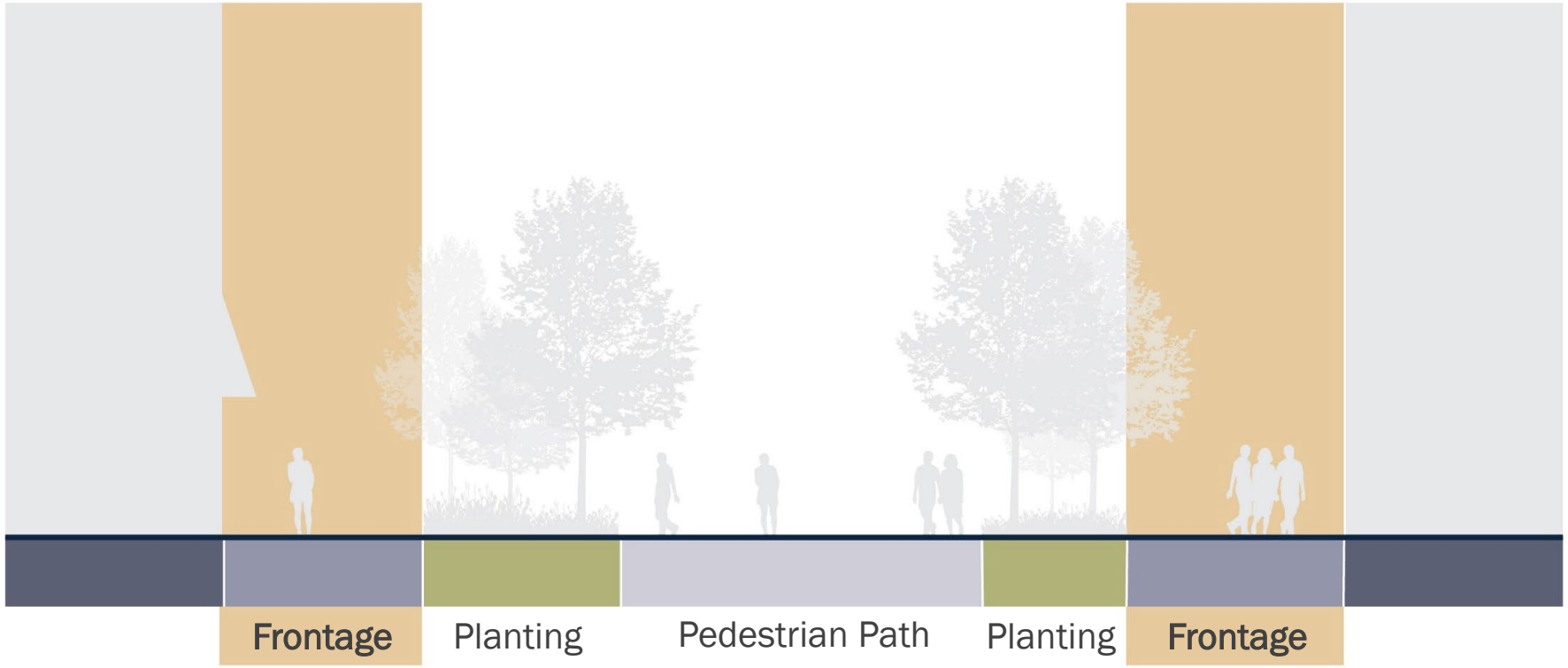
GREEN RIBBON

Unified Branding / Identity



Syracuse Connective Corridor, Syracuse

GREEN RIBBON
Frontage Zone



GREEN RIBBON
Frontage Zone

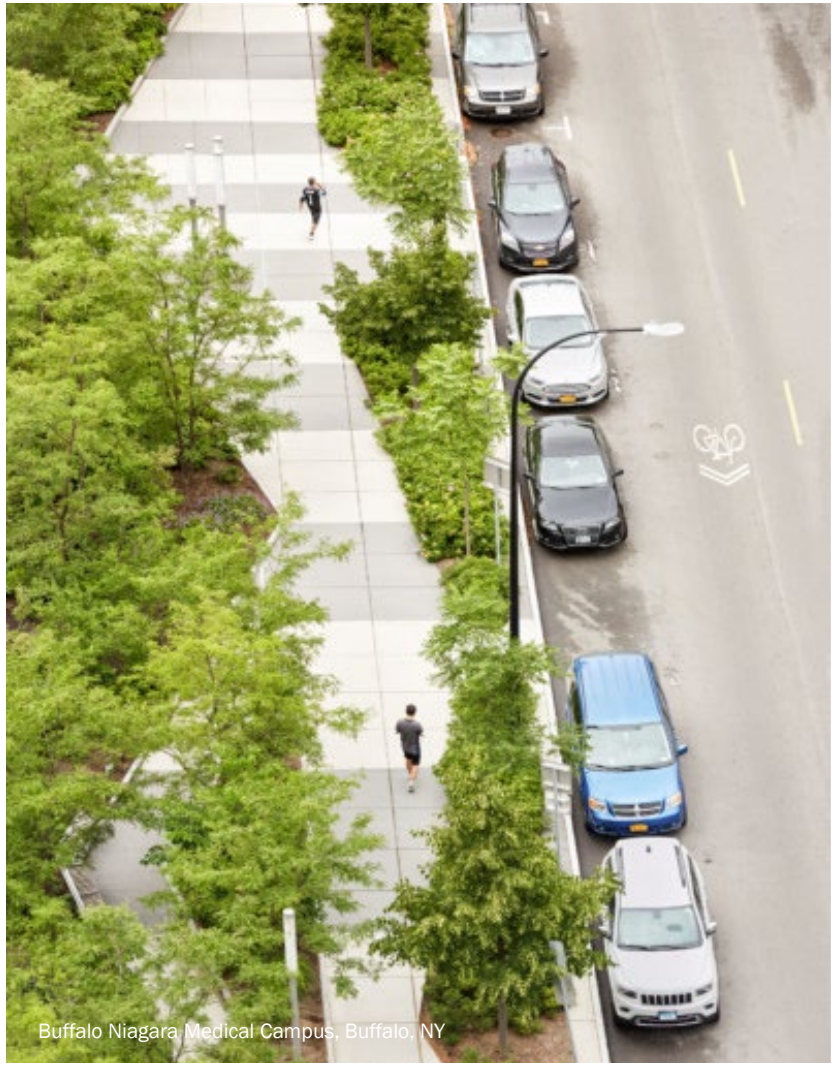

Minneapolis, MN

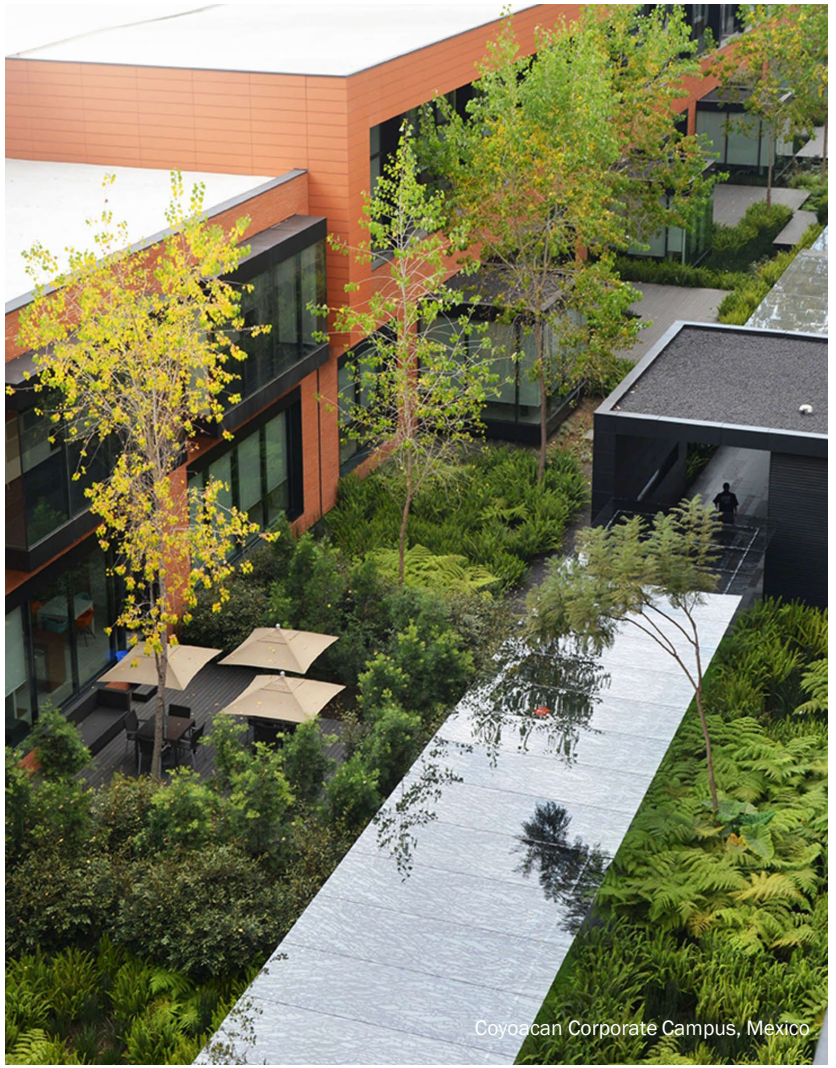

Carroll Street MTA Plaza, NY

NY, NY


Shirlington, Arlington

GREEN RIBBON
Overall

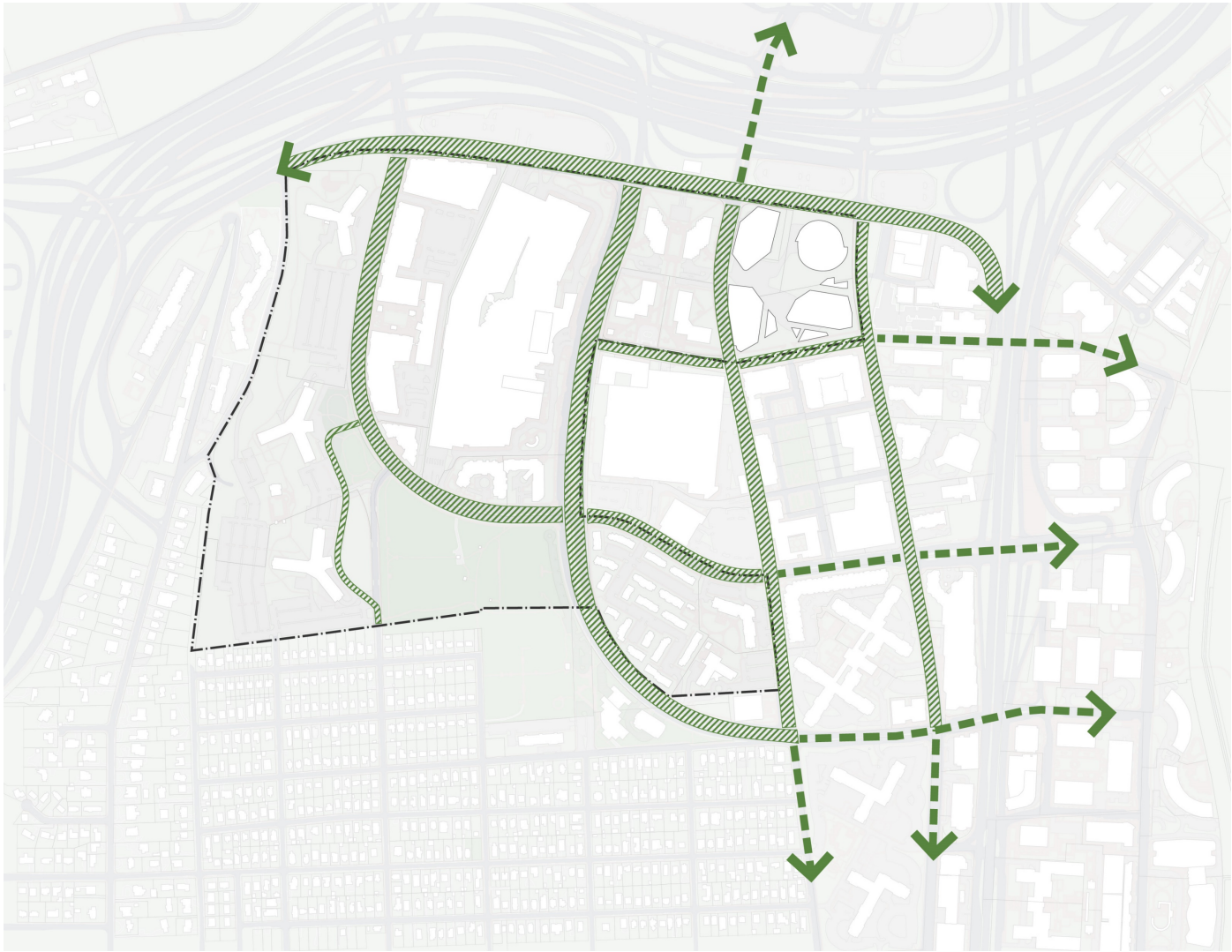

Buffalo Niagara Medical Campus, Buffalo, NY


Coyoacan Corporate Campus, Mexico

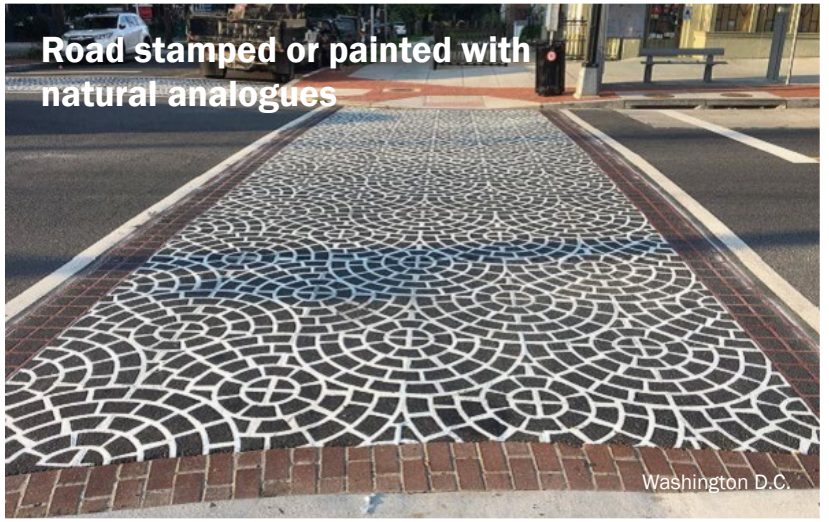
GENERAL GUIDELINES

Biophilic Design Throughout Pentagon City

- Green Ribbon
- Boulevards
- Public Spaces
- Private Development



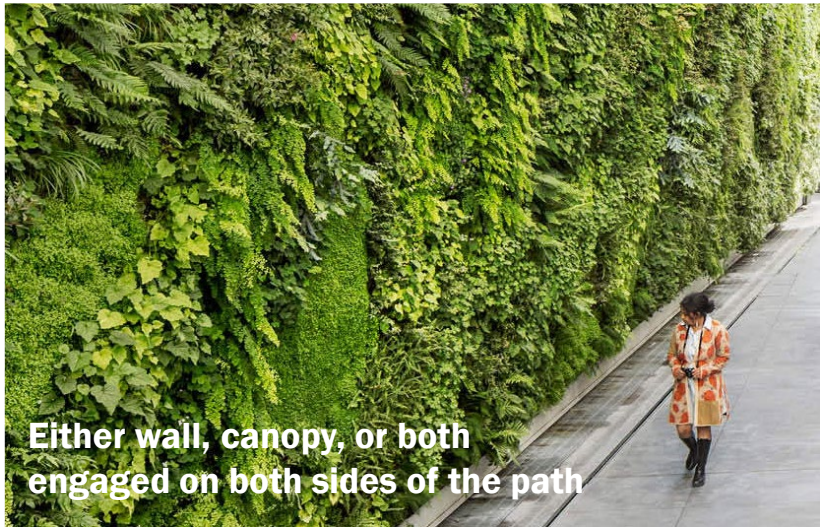
BOULEVARDS
Pedestrian Sidewalk

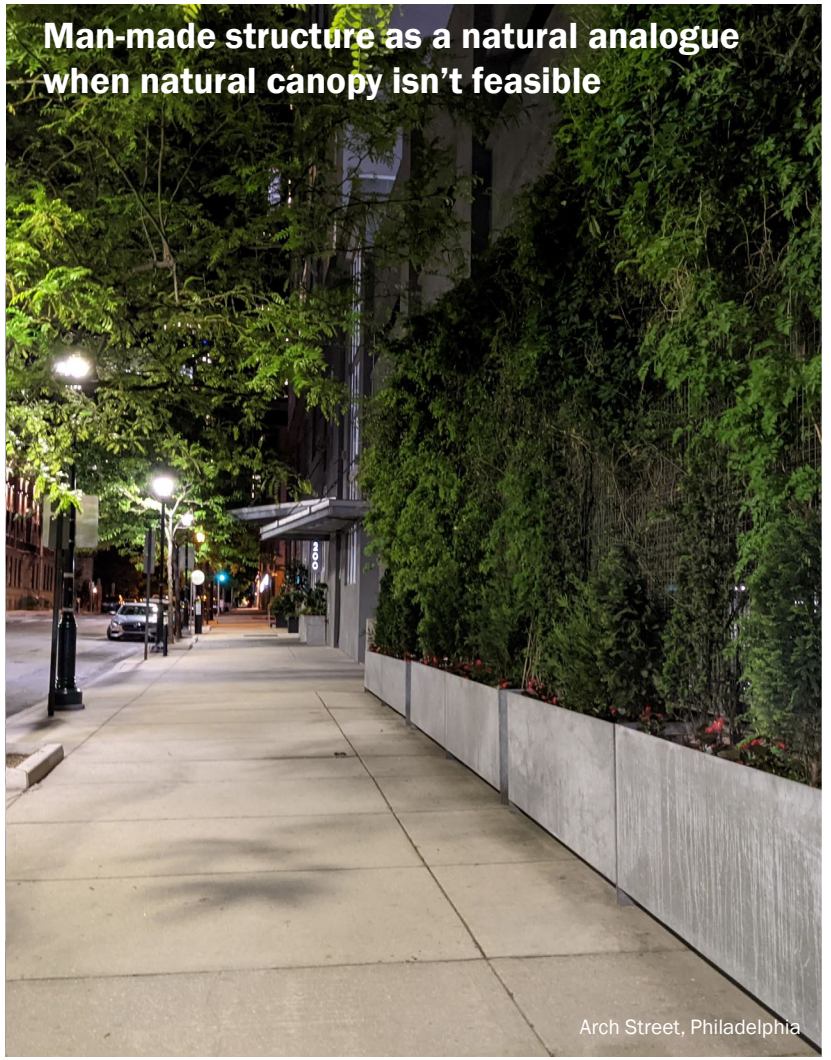


BOULEVARDS
Plantings

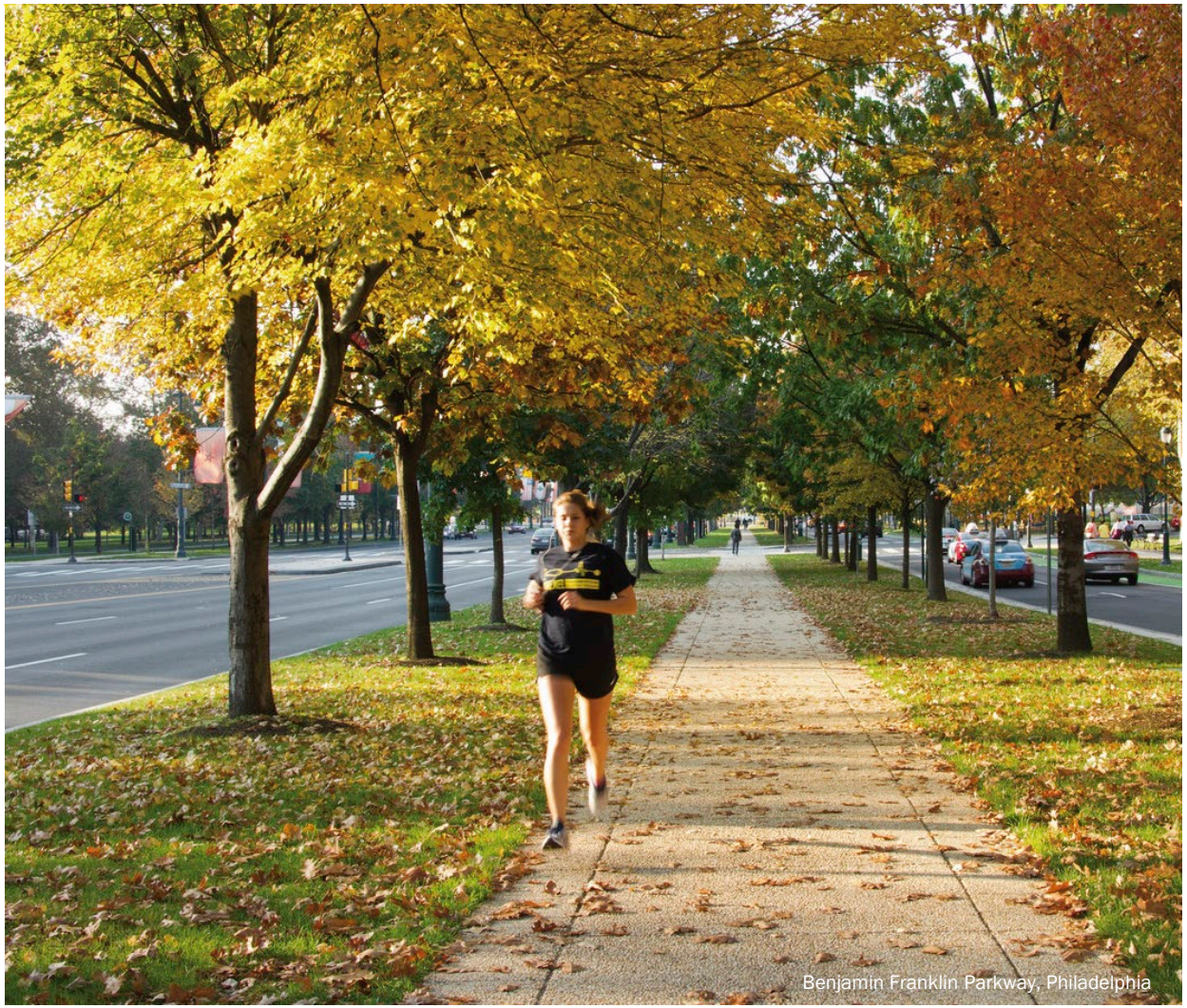
BOULEVARDS

Walls & Canopy (Vertical elements)





BOULEVARDS
Medians



GENERAL GUIDELINES

Biophilic Design Throughout Pentagon City

- Green Ribbon
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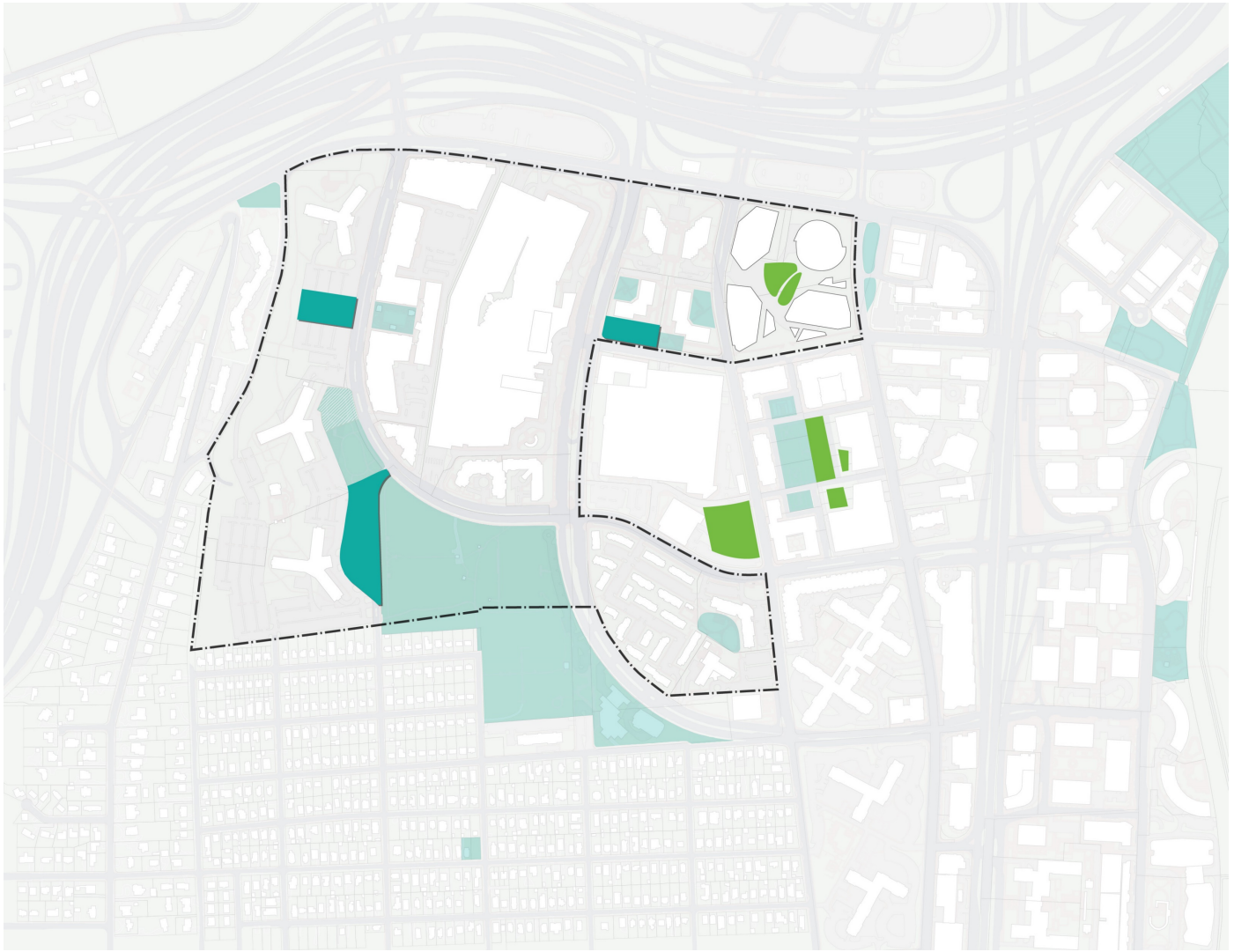


PUBLIC SPACES
Plantings

PUBLIC SPACES
Entrances

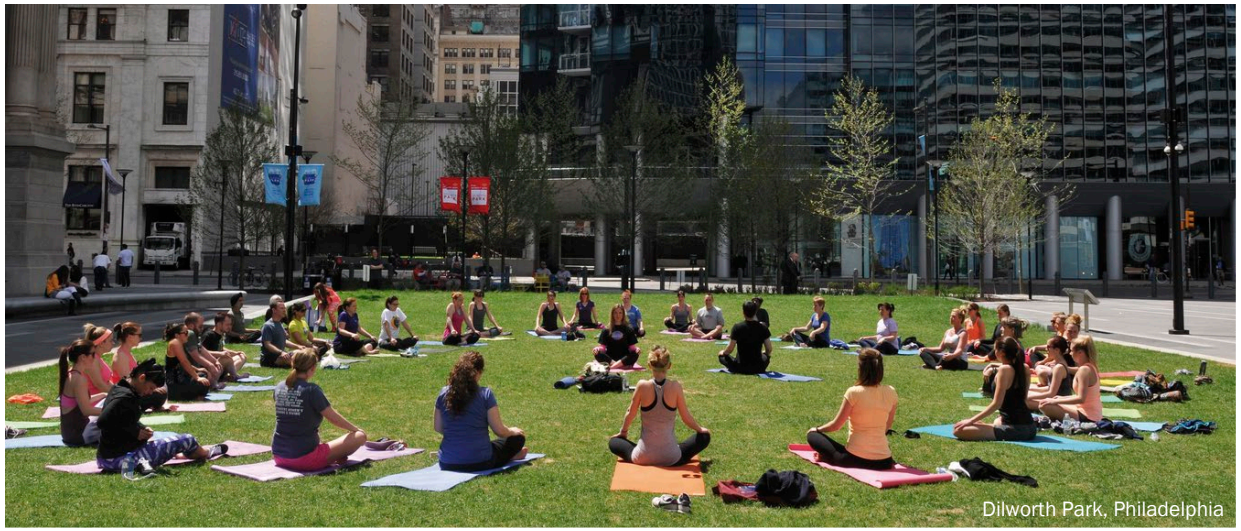
Rocky Run Park, Arlington


Centennial Commons, Philadelphia


Dilworth Park, Philadelphia

PUBLIC SPACES

Casual Use Spaces



Dilworth Park, Philadelphia

Impromptu use

Lincoln Center, NY

Spaces that fit different age groups needs and experiences

Fort C.F. Smith Park, Arlington

GENERAL GUIDELINES

Biophilic Design Throughout Pentagon City

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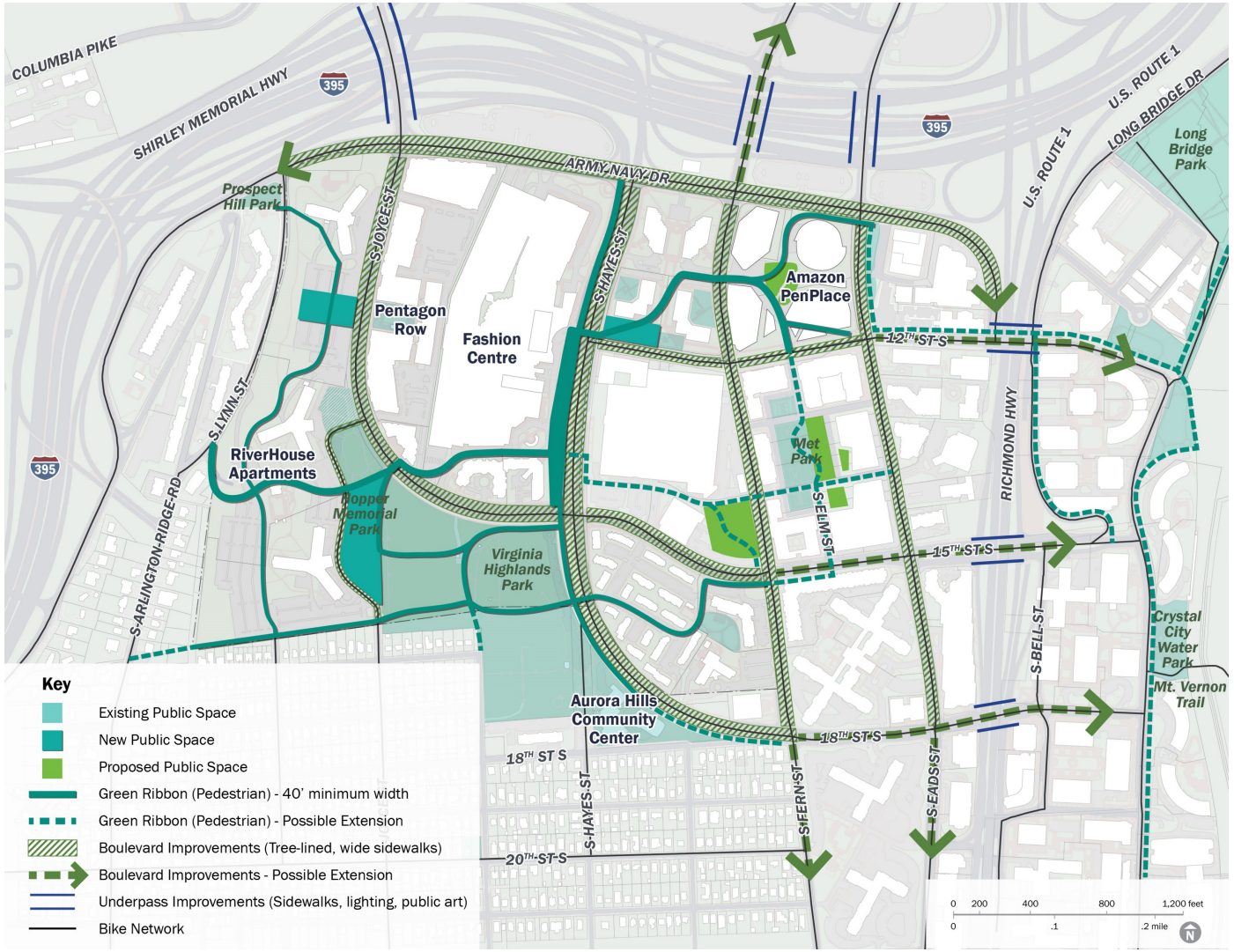
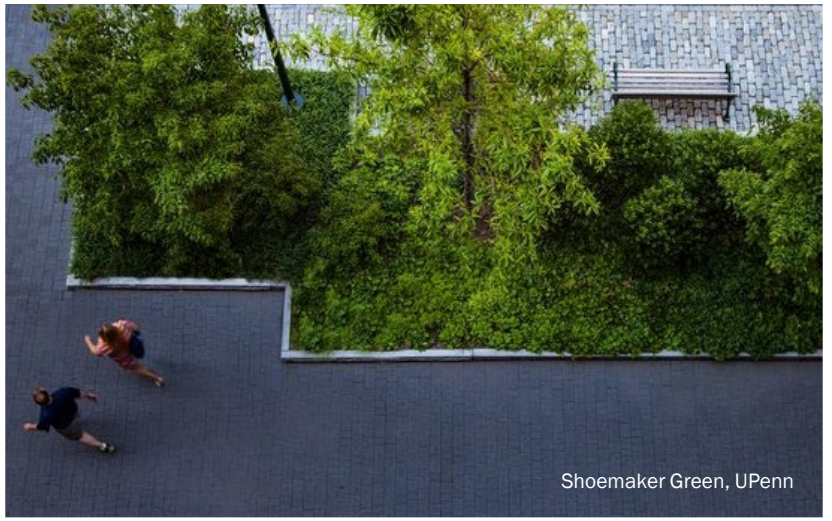
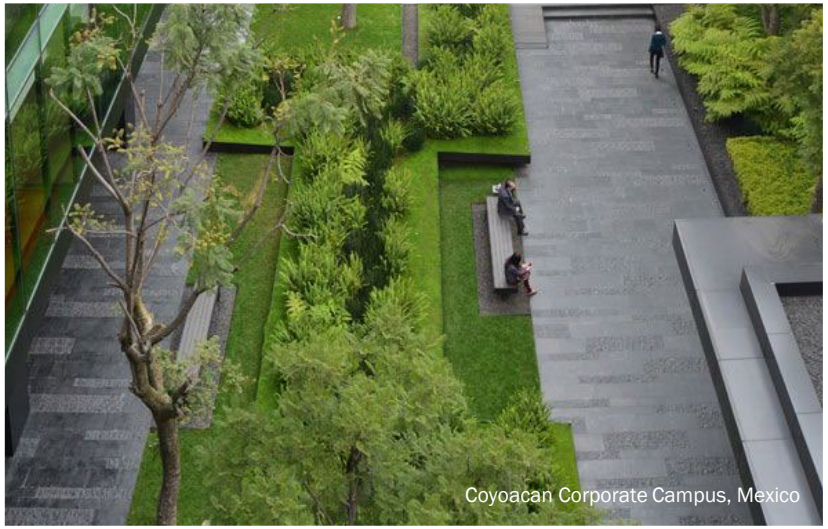


PRIVATE DEVELOPMENT
Pedestrian Paths

Buffalo Niagara Medical Campus, Buffalo, NY


Shoemaker Green, UPenn

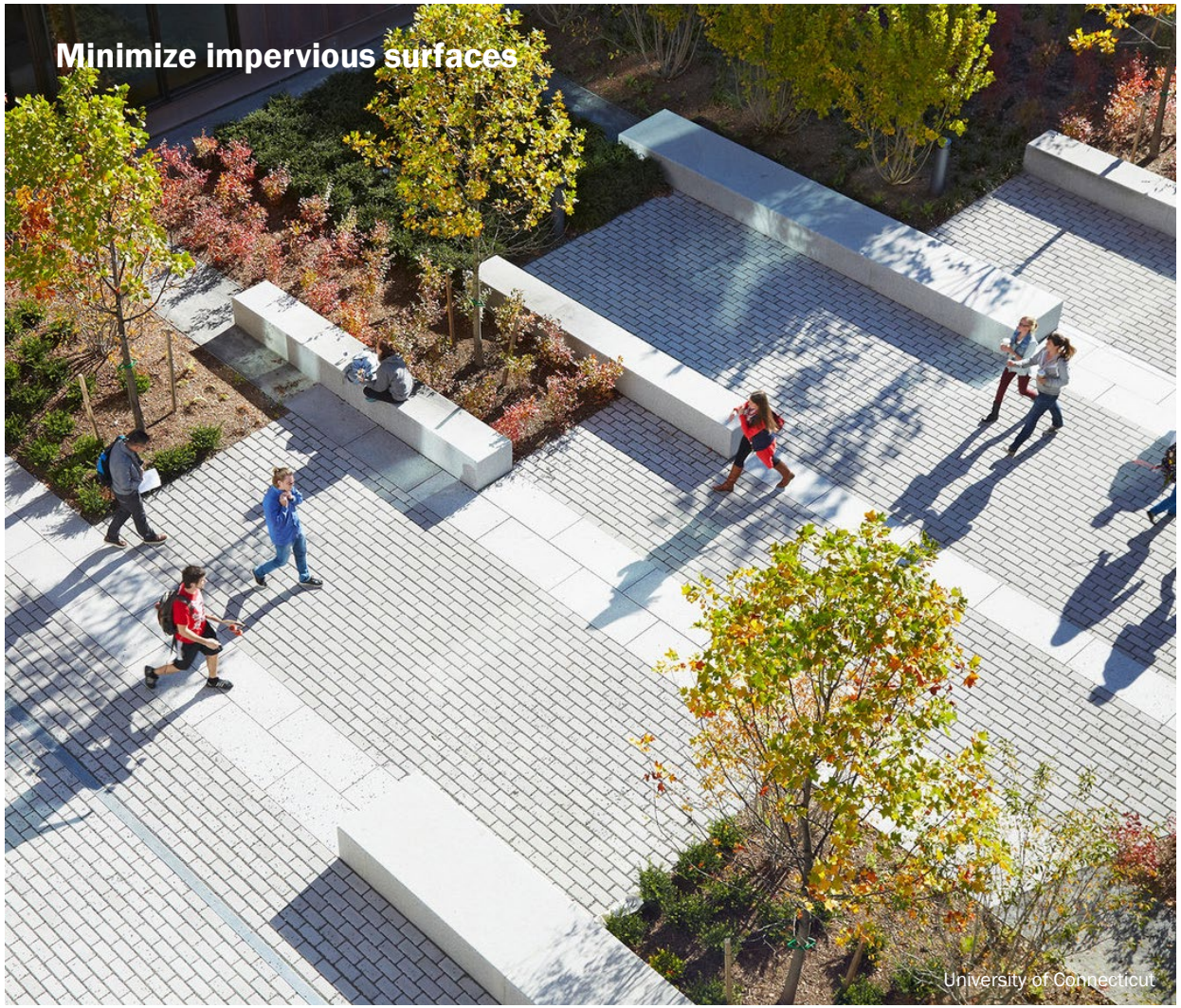

Coyoacan Corporate Campus, Mexico

Teardrop Park, NY

PRIVATE DEVELOPMENT
Driveways & Parking


Tompkins County, NY


France



University of Connecticut

PRIVATE DEVELOPMENT

Open Spaces

Welburn Square, Arlington


Dilworth Park, Philadelphia

Shoemaker Green, UPenn

PRIVATE DEVELOPMENT
Buildings & Structures


Minneapolis, MN


Carroll Street MTA Plaza, NY

NY, NY


NYTimes Lobby Garden, NY