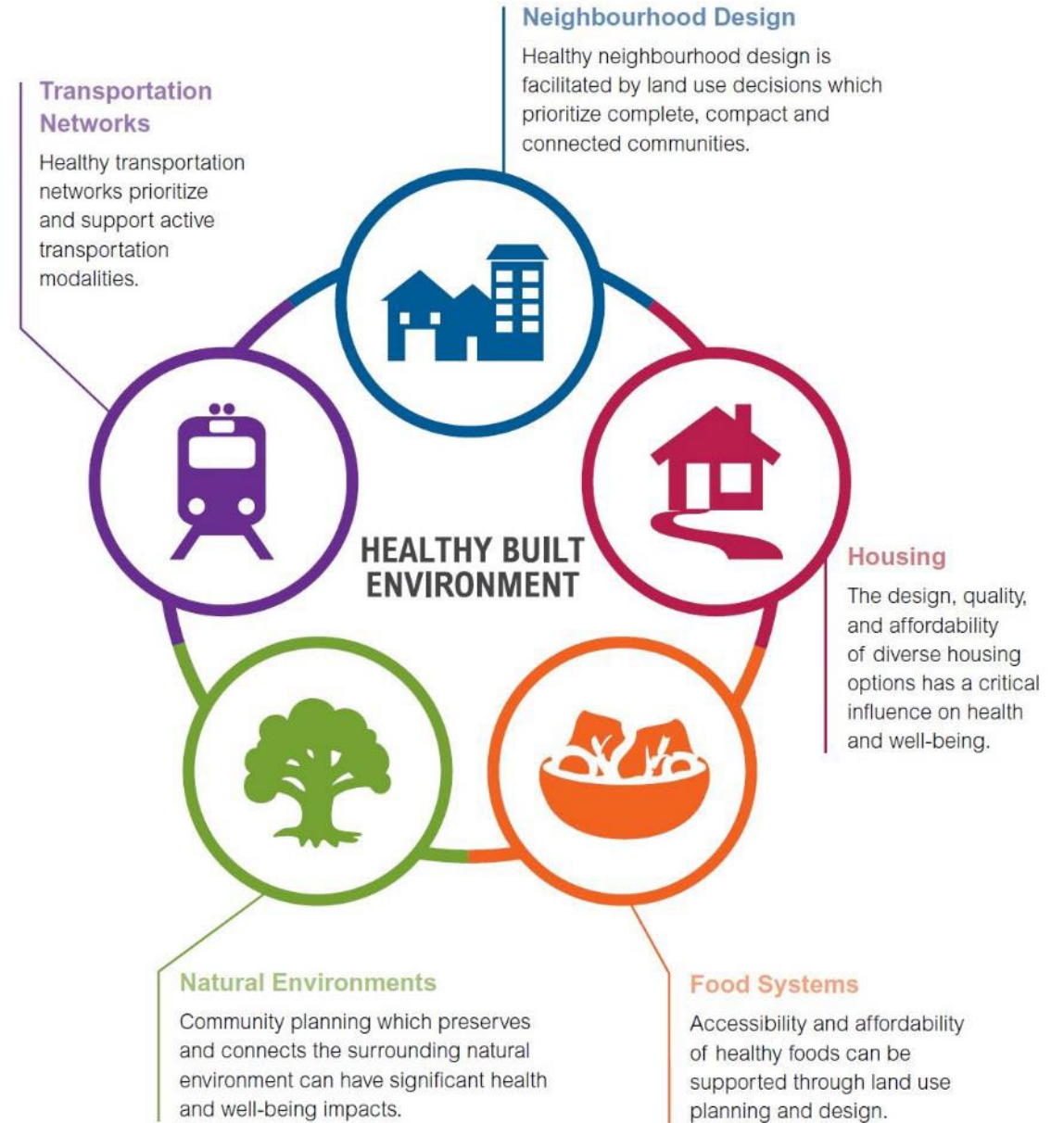




Biophilic Streets

Penelope Kuhn
Healthy Built Environment Coordinator
Healthy Communities – Central Zone

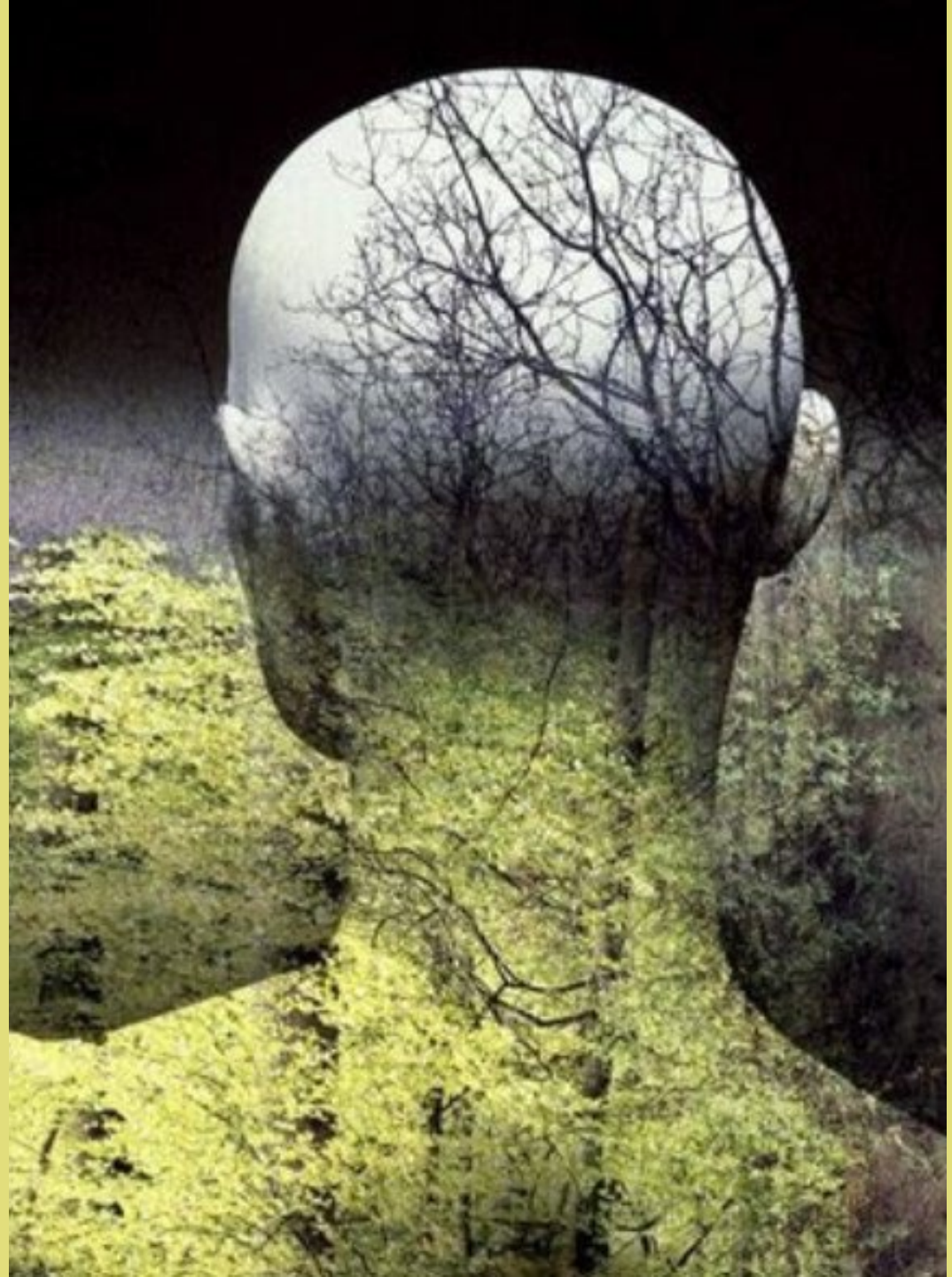
Healthy Built Environment Framework





*...humans possess
an innate tendency
to seek connections
with nature and
other forms of life*

Biophilia





Full length article

Exposure to natural environments during pregnancy and birth outcomes in 11 European birth cohorts

Maria Torres Toda^{a b c} ✉, Demetris Avraam^{d e} ✉, Timothy James Cadman^{e f} ✉, Serena Fossati^{a b c} ✉, Montserrat de Castro^{a b c} ✉, Audrius Dedele^g ✉,



The Benefits of Natural Environments for Physical Activity

Danielle F. Shanahan ✉, Lara Franco, Brenda B. Lin, Kevin J. Gaston & Richard A. Fuller

Sports Medicine 46, 989–995 (2016) | [Cite this article](#)

4704 Accesses | 76 Citations | 49 Altmetric | [Metrics](#)

Childhood obesity and proximity to urban parks and recreational resources: A longitudinal cohort study

Arrett^b, Kim Reynolds^c, Rob McConnell^d, Roger Chang^d, Frank Gilliland^d, Jason G. Si



Nature and mental health: An ecosystem service perspective

GREGORY N. BRATMAN, CHRISTOPHER B. ANDERSON, MARC G. BERMAN, BOBBY COCHRAN, SJERP DE VRIES, JON FLANDERS, CARL FOLKE, HOWARD FRUMKIN, JAMES J. GROSS, L.-J. AND GRETCHEN C. DAILY +16 authors [Authors Info & Affiliations](#)



Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood

Kristine Engemann ✉, Carsten Bøcker Pedersen, Lars Arge, and Jens-Christian Svenning [Authors Info & Affiliations](#)

Edited by Terry Hartig, Uppsala University, Uppsala, Sweden, and accepted by Editorial Board Member Susan T. Fiske January 14, 2019 (received

Urban natural environments as nature-based solutions for improved public health – A systematic review of reviews

M. van den Bosch^{a b}, Å. Ode Sang^c ✉

PaRx

*A Prescription
for Nature*



parkprescriptions.ca

biophiliccities.org





The NEW ENGLAND
JOURNAL of MEDICINE

EDITORIAL

Call for Emergency Action to Limit Global Temperature Increases, Restore Biodiversity, and Protect Health

Lukoye Atwoli, Abdullah H. Baqui, Thomas Benfield, Raffaella Bosurgi, Fiona Godlee, Stephen Hancocks, Richard Horton, Laurie Laybourn-Langton, Carlos Augusto Monteiro, Ian Norman, Kirsten Patrick, Nigel Praities, [et al.](#)

“The greatest threat to global public health is the continued failure of world leaders to keep the global temperature rise below 1.5° C and to restore nature.”

“Urgent, society-wide changes must be made and will lead to a fairer and healthier world...”

Bioswale



Raingarden



Daylighting



Street Trees



30% tree canopy increase
prevents 1/3 heat-related deaths

Living Pillar



On-Street Parklet



Boulevard Garden



Business Boulevard Gardens



ROW
Garden
(Before)



space.
support bees,
birds that rely
landscapes
food and shelter.
more information:
ca/naturalization
HALIFAX



Main
Street
Parkette



Framework functions and objectives		Biophilic design elements		
Design functions	Selected design objectives	Building façades	Road reserves	Pocket parks
Traffic planning	Creating space for biophilic designs by redesigning traffic lanes, traffic calming schemes, reducing lanes, prioritizing pedestrians, transit and bicycle lanes and providing pocket parks.	Integrating vertical greenery into and onto buildings, such as green walls, green balconies, planter boxes; green roofs.	Integrating native gardens, edible gardens, nature playgrounds and other biophilic features on verges, median strips, round-about, 'ramblas', green bridges and flyovers, buffers between roads and cycling and/or pedestrian paths.	Integrating native gardens, edible gardens, nature playgrounds, water features, habitats for birds, insects and small animals, street furniture and amenities in median strips, 'ramblas', roundabouts, vacant lots, plazas, spaces between buildings.
Energy management	Cooling streets for walking, reducing urban heat island effect and saving energy through insulating buildings.	Green walls, roofs, and balconies to provide thermal insulation; cooling (evapotranspiration); air purification; relaxation. Combination of green roofs and solar panels.	Tree canopies that shade pedestrians as well as shading buildings.	Pocket parks can be built around all three energy management ideas.
Stormwater management	Water retention, purification, and reuse.	Green walls, green roofs, green balconies that filter rain.	Street trees, tree pits, linear gardens, bioswales, rain gardens, daylighted streams.	Rainwater tanks, pervious pavements.
Biodiversity management	Biodiversity enhancement, restoration, creation of various habitat sizes and types that enable regeneration of urban ecosystems.	Green walls, green roofs, green balconies.	Street trees, tree pits, linear gardens, bioswales, rain gardens, daylighting streams.	Plant beds, potted shrubs and trees, green walls, water features.
Street furniture	Incorporating biophilics into every small function in the street, including seats, signs, bus shelters, street art.	Street art combined with filtration systems to conduct runoff from green roofs.	Parklets Green roofs on top of bus and transit shelters. Street art combined with filtration systems. 'City trees' installation to facilitate air purification. Vertical pallet edible gardens.	Urban furniture to support natural systems. Green roofs on top of bus and transit shelters. Street art combined with filtration systems. 'City trees' installation to facilitate air purification. Vertical pallet edible gardens.
Activity and education	Enabling both activity that uses street functions and understanding of how nature fits into the city as well as the social and cultural value of the street.	Tourist and visitor information in streets explaining biophilic facades.	Integrated street furniture with green features explained. Educational features – information plates, educational stations; activity points (smart play equipment, art installations, water features).	Integrated street furniture with green features explained. Educational features – information plates, educational stations; activity points (smart play equipment, art installations, water features).

A woman with dark hair is sleeping peacefully in a green tent pitched in a lush, mossy forest. In the background, a waterfall cascades over rocks. The scene is overlaid with a semi-transparent grey filter and two parallel yellow lines that run diagonally across the image.

Thank You

Contact

penelope.kuhn@nshealth.ca

References & Resources

Slide 4

[Biophilia hypothesis – Wikipedia](#)

Slide 5

[Nature and mental health: An ecosystem service perspective | Science Advances](#)

[Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood - PubMed \(nih.gov\)](#)

[Urban natural environments as nature-based solutions for improved public health – A systematic review of reviews – ScienceDirect](#)

[Childhood obesity and proximity to urban parks and recreational resources: A longitudinal cohort study - ScienceDirect](#)

[The Benefits of Natural Environments for Physical Activity | SpringerLink](#)

[Exposure to natural environments during pregnancy and birth outcomes in 11 European birth cohorts – ScienceDirect](#)

[Biophilic streets: a design framework for creating multiple urban benefits | Sustainable Earth Reviews | Full Text \(biomedcentral.com\)](#)

Slide 6

[Sports | Free Full-Text | Nature–Based Interventions for Improving Health and Wellbeing: The Purpose, the People and the Outcomes \(mdpi.com\)](#)

[PaRx: A Prescription for Nature \(parkprescriptions.ca\)](#)

[Biophilic Cities](#)

Slide 7

[What are Biophilic streets? - RTF | Rethinking The Future \(re-thinkingthefuture.com\)](#)

[Biophilic streets: a design framework for creating multiple urban benefits | Sustainable Earth Reviews | Full Text \(biomedcentral.com\)](#)

Slide 8

[Call for Emergency Action to Limit Global Temperature Increases, Restore Biodiversity, and Protect Health | NEJM](#)

Slide 12

[http://dx.doi.org/10.1016/S0140-6736\(22\)02585-5](http://dx.doi.org/10.1016/S0140-6736(22)02585-5)

[How to Reduce Wind and Storm Damage on Trees | Davey Tree](#)

[Best Trees for Sidewalks and Streets | Hardscape Blog \(reliance-foundry.com\)](#)

Slide 15

[Hellstrip Plantings: Creating Habitat in the Space Between the Sidewalk and the Curb - Ecological Landscape Alliance \(ecolandscaping.org\)](#)

[Add Curb Appeal With a Hellstrip Garden - This Old House](#)

Slide 17

[Boulevard Gardening | Halifax](#)

[Administrative Order 2020-014-OP, Respecting Boulevard Gardens | Halifax.ca](#)

Slide 20

[Green Street Principles | National Association of City Transportation Officials \(nacto.org\)](#)

[Biophilic streets: a design framework for creating multiple urban benefits \(biomedcentral.com\)](#)